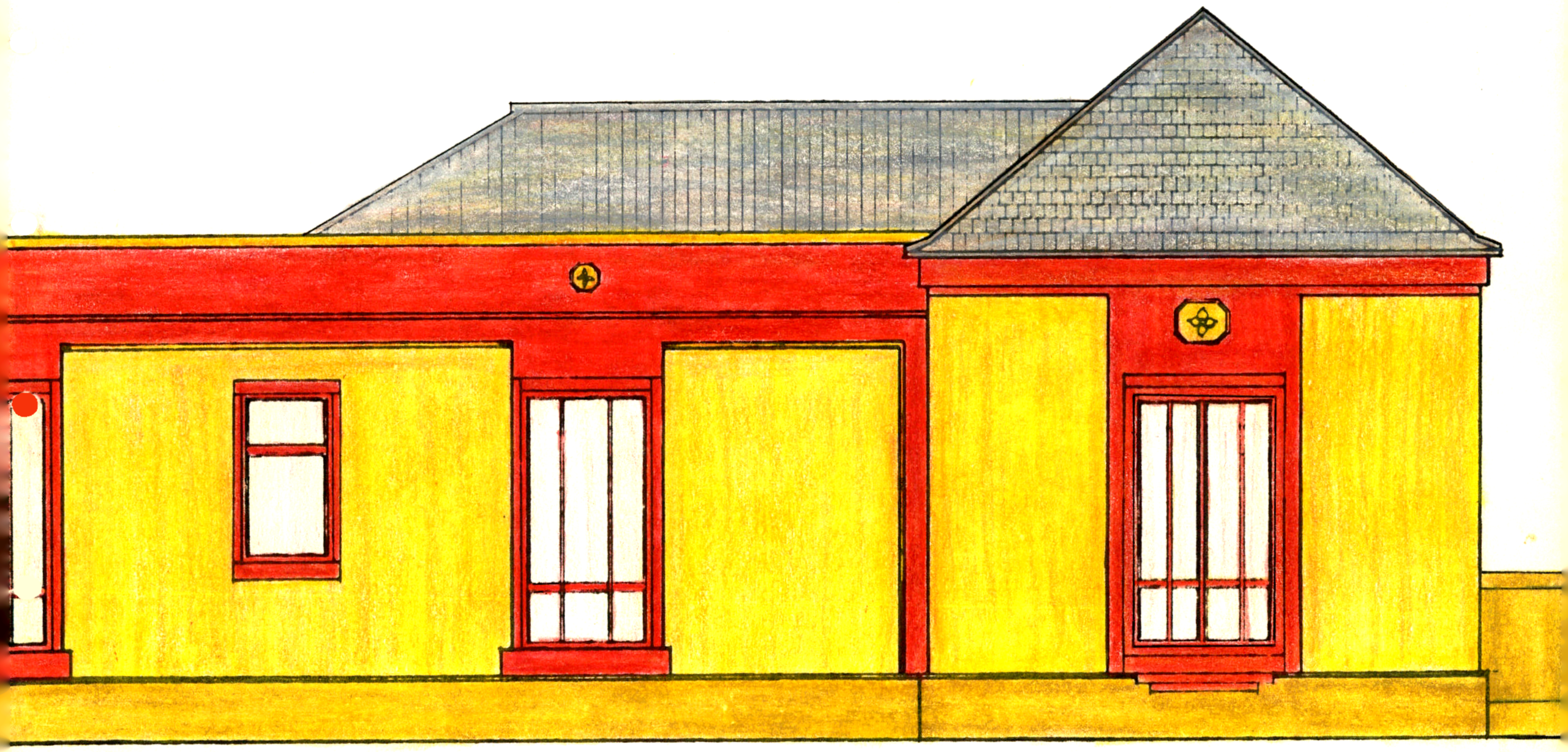
# THE CONSTRUCTION OF NEW NEIGHBORHOODS FOR GUASARE NEW TOWN, VENEZUELA



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CENTER FOR ENVIRONMENTAL STRUCTURE

MAY 1983

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# INTRODUCTION

In this document we shall describe the form, character, and method of production of the houses in the neighborhoods of Guasare new town.

It is intended that Guasare new town will make a major breakthrough in the problem of housing production, in Venezuela, and in the world. In particular, the housing in the neighborhoods is intended to have a humane and personal character, intimate in feeling, and strongly related to the individuality and needs of the users. It is intended to remove, entirely, the alienation and despair produced by so-called mass housing, in most forms of housing production throughout the world.

Each neighborhood will be laid out according to a system of fundamental principles which are described in chapter 1. These principles define the position of streets, location of major public space and public buildings in the neighborhood, minor streets, subdivision of lots, and arrangement of lots to guarantee the climatic suitability of the individual houses.

The density and layout of lots is such that individual lots will have about 470 $m^2$ each, thus making it possible for each family to build a good house, and also keep a large garden for agriculture, fruit trees, animals, or recreation. This is in keeping with the rural character of the region, and with the character of life and vegetation in the immediate Guasare area.

The range of financing packages will be such that every single family who comes to the Guasare area will be entitled to receive a lot which they can pay for very slowly, according to their capactiy to pay:

and there is a sufficiently wide range of financing schemes so that every single family will be able to have a house of some kind, large or small.

In a typical neighborhood of 200 families, only about 20 houses will be built without the involvement of families. One hundred and eighty houses will be built according to the wishes of the family, and according to the specific needs of their own day-to-day life. Of these 180 houses, about 30 will be fully financed and built in one time period. Of the remaining 150 houses, all will receive financing sufficient for the construction of one or two rooms: and other financing programs will then ensure the possibility that the family can add new rooms every year or two, and complete a house of 80 $m^2$ within four to seven years.

Most of the construction in this very rich and varied program will be provided by a professional construction company, according to the specification of the families.

However, in addition, the methods of financing will allow self-help (construction undertaken by the families themselves), or additions done by small local builders. Each neighborhood will have a local builder's yard, managed by Proguasare, which will provide materials and assistance for self-help construction, and which will simultaneously coordinate and administer the process by which families design their own houses, and have them built by the construction company.

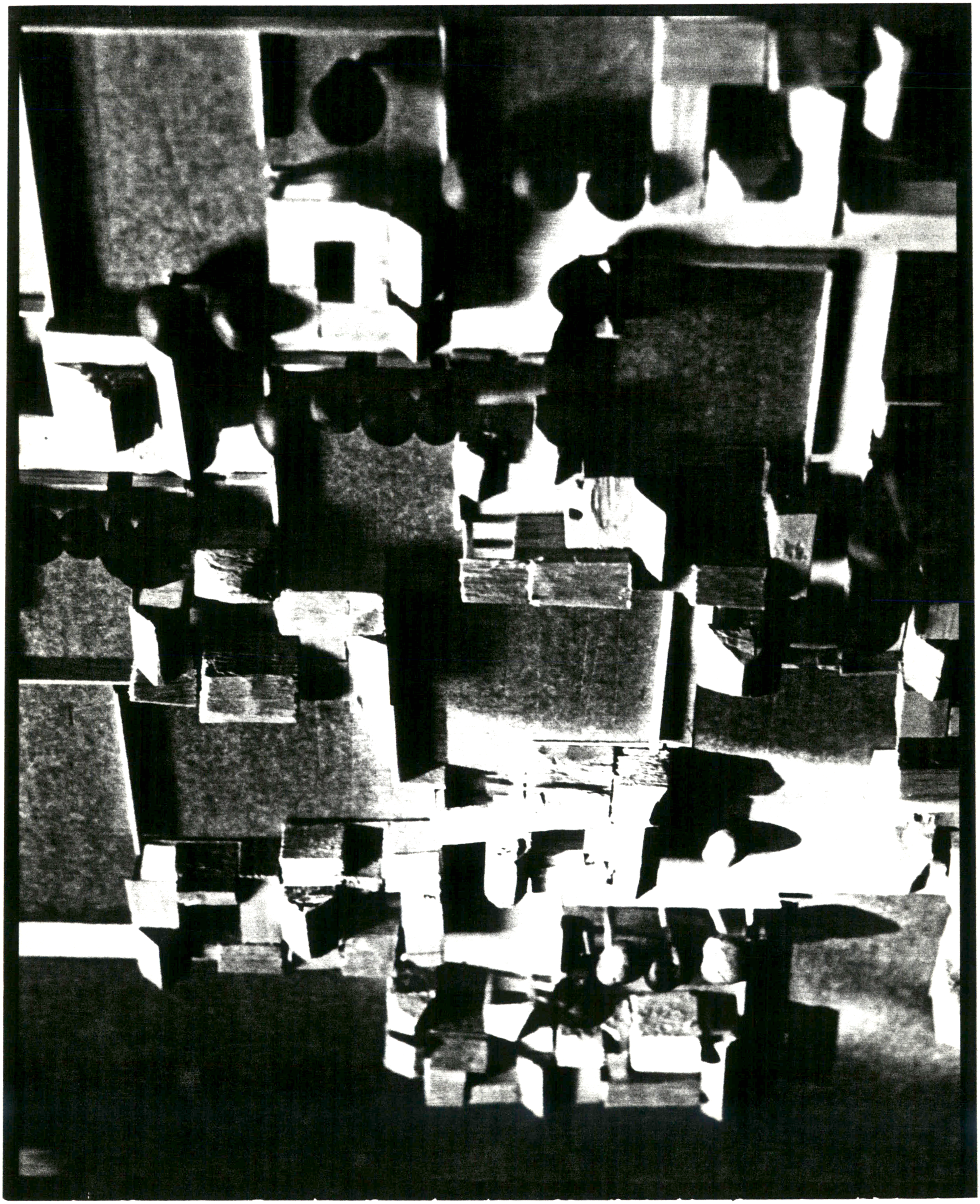
The program of construction will have one additional quality, which is essential to the well-being of the new town. It is so organized that all houses will have some garden walls, some trees, some ornament

in the construction itself, and some beautiful colors on the outside of the houses. Thus the streets are themselves taken care of by the program of construction, and made into happy, beautiful places which reflect the spirit of the people... and have more relationship with traditional Venezuelan building than with the mass housing of recent towns.

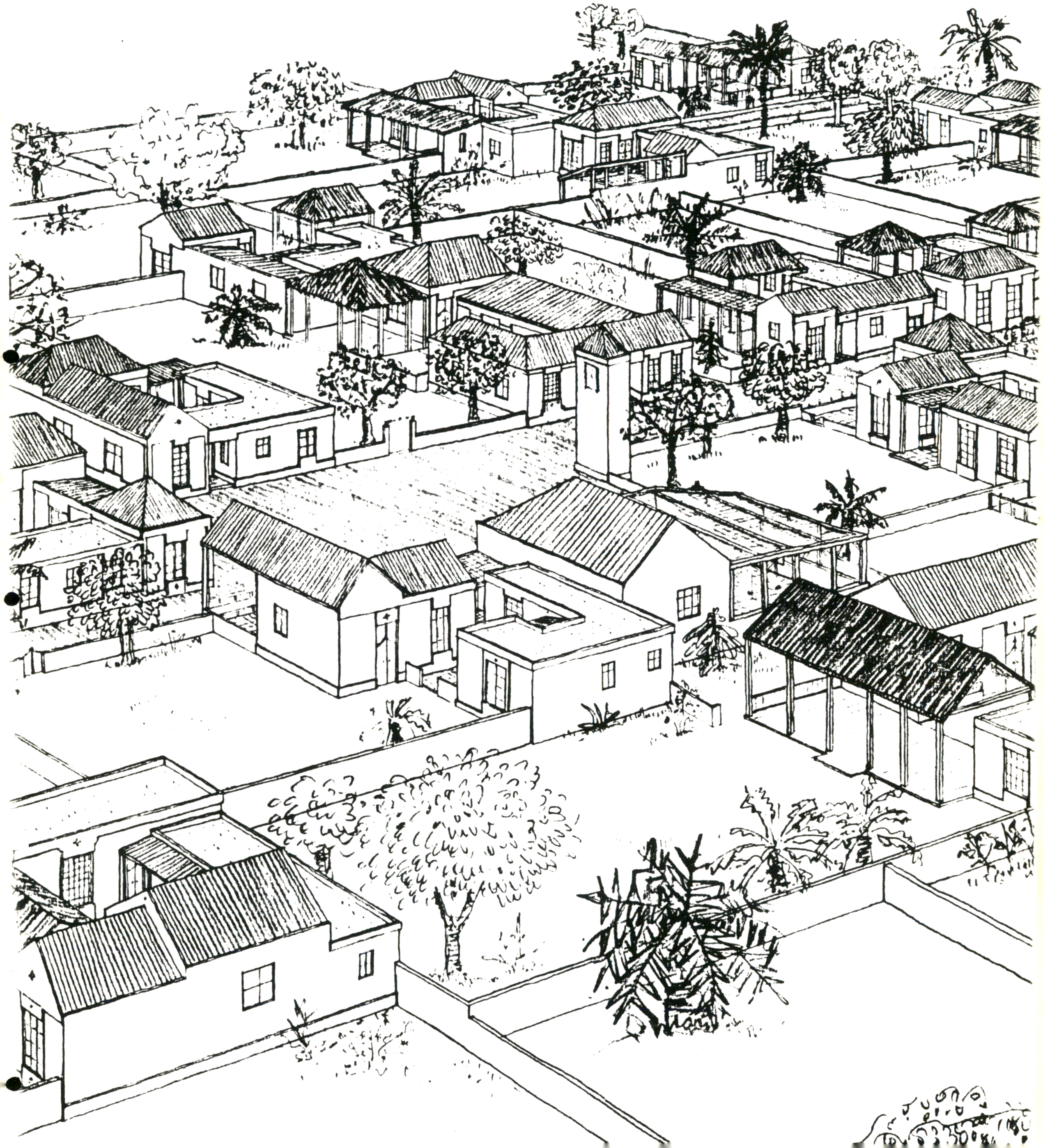
In the following chapters, we shall define the detailed programs and processes needed to implement this general plan. The chapters are organized as follows:

1. The layout of the neighborhood.
2. The layout of individual houses.
3. Financing and administration of houses.
4. Construction and embellishment of streets.
5. Outline of a contract for implementation.

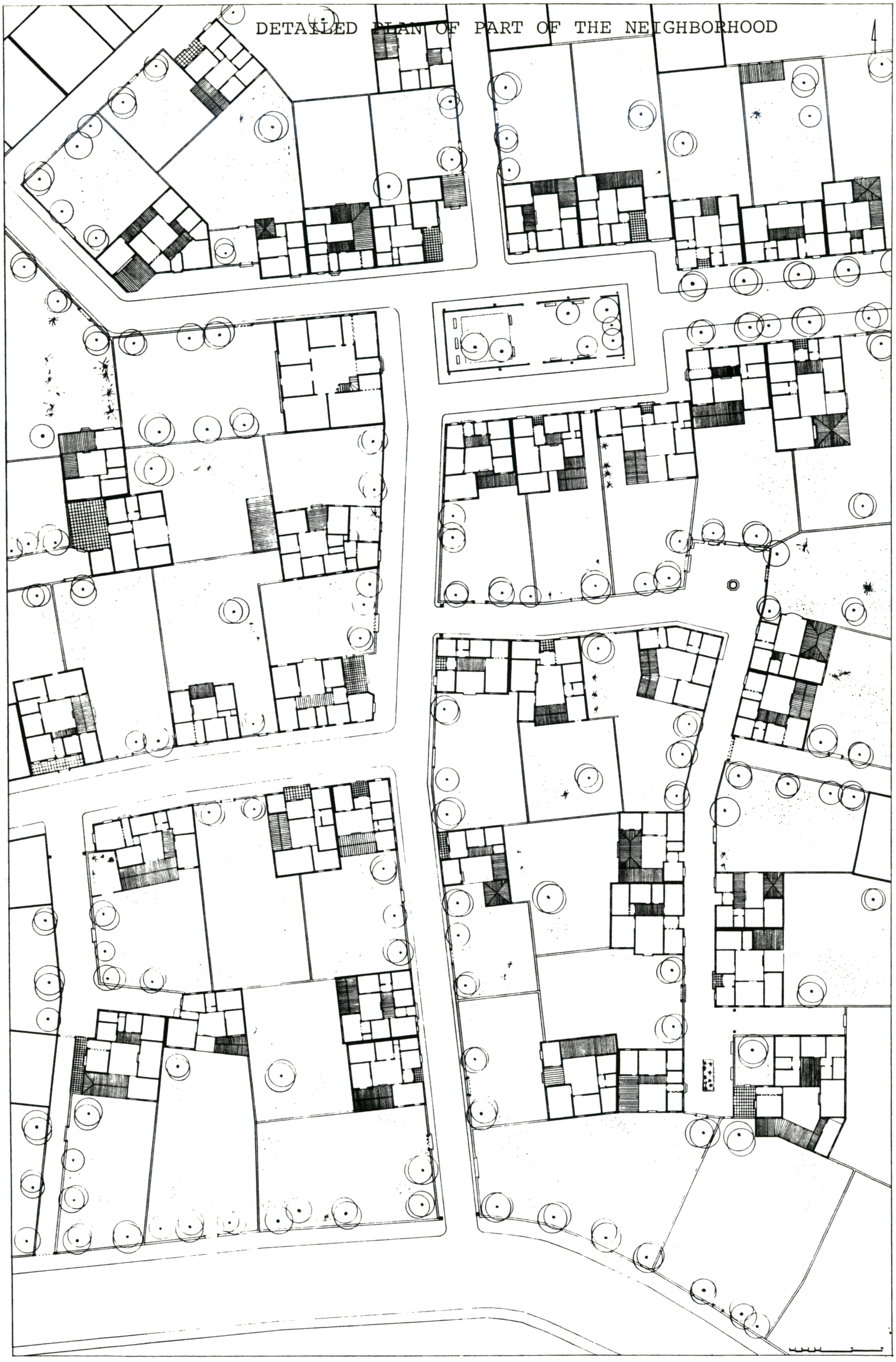
THE PLAN OF THE FIRST TWO NEIGHBORHOODS IN GUASARE TOWN



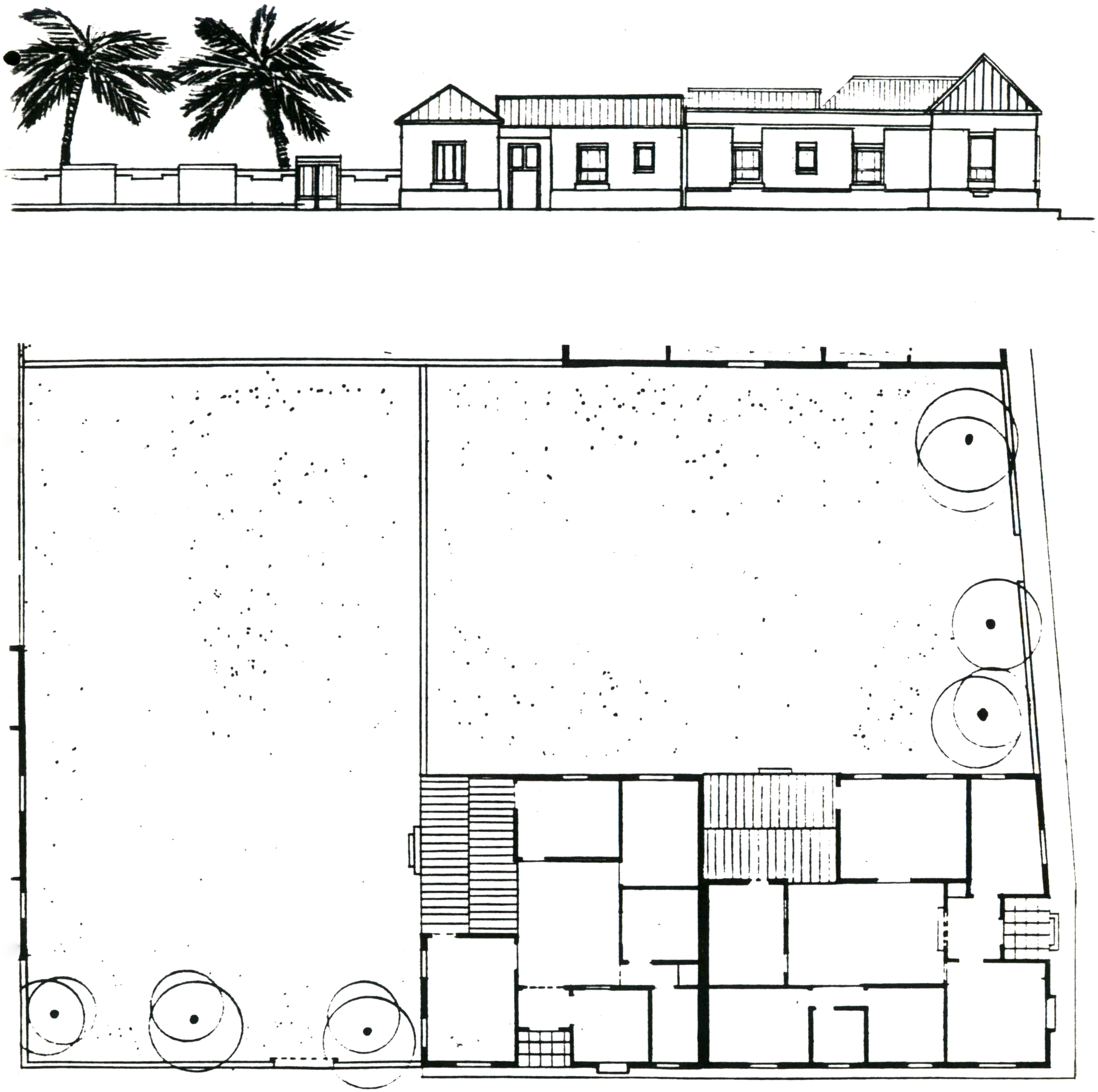
# HOUSES AND GARDENS IN THE NEIGHBORHOOD



DETAILED PLAN OF PART OF THE NEIGHBORHOOD



# THE GUASARE PATIO-HOUSE



Kitchen
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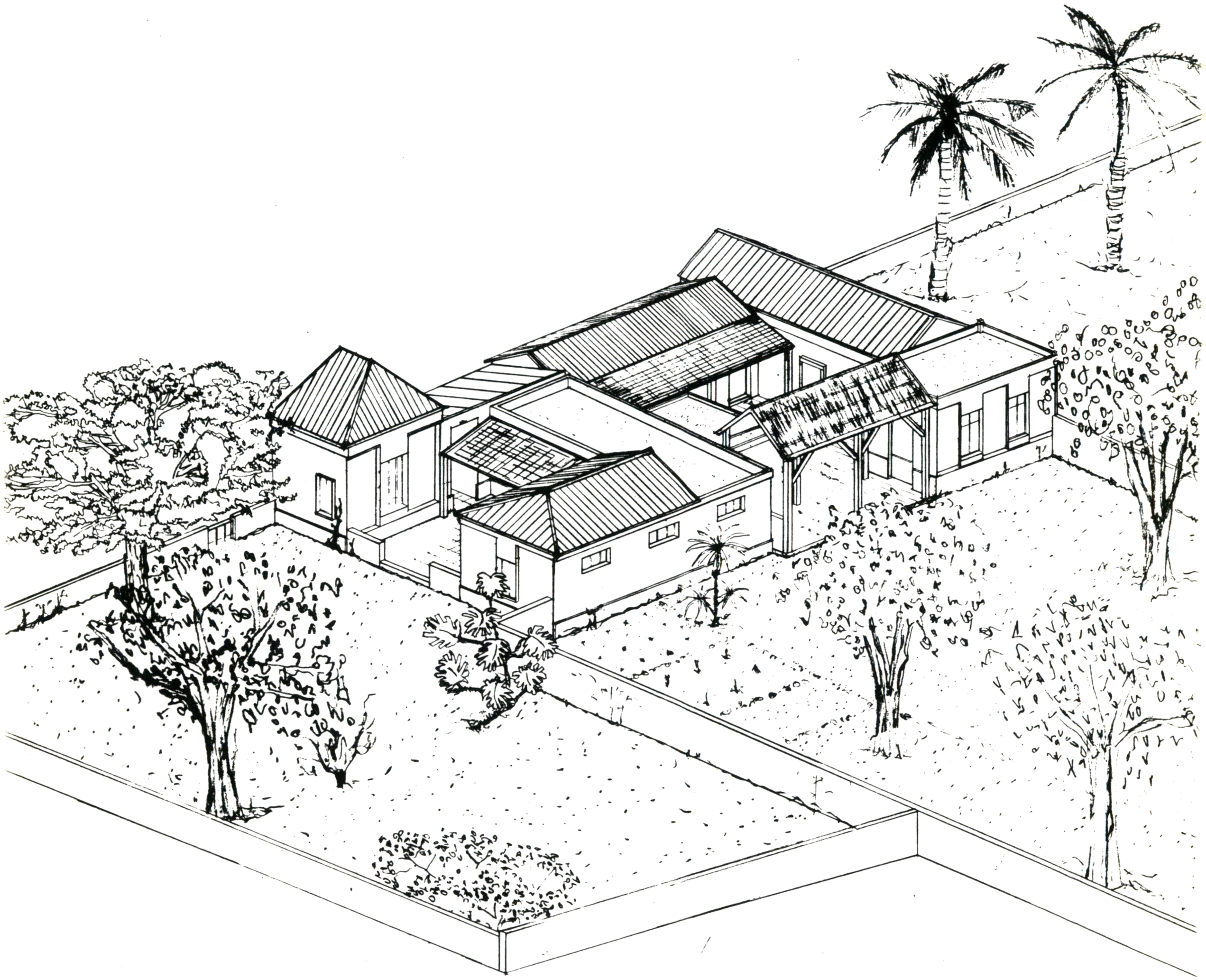


# FINANCING PROGRAMS FOR HOUSING CONSTRUCTION

| | FINANCING PROGRAMS FOR THE CONSTRUCTION OF A HOUSE | | | FINANCING PROGRAMS FOR THE PIECEMEAL DEVELOPMENT OF A HOUSE | | FINANCING PROGRAM FOR THE CREATION OF STREETS |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| | FINANCING FOR THE CONSTRUCTION OF HOUSES FOR THE MINERS' FAMILIES | FINANCING FOR THE CONSTRUCTION OF A COMPLETE HOUSE | FINANCING FOR THE CONSTRUCTION OF THE FIRST INCREMENT OF THE HOUSE | CREDITOS POPULARES FOR THE CONSTRUCTION OF THE SECOND INCREMENT OF THE HOUSE | CREDIT FOR MATERIALS FOR THE SECOND INCREMENT OF THE HOUSE | FINANCING FOR THE IMPROVEMENT AND EMBELLISHMENT OF THE STREETS |
| THE PROGRAM WILL FINANCE IN TOTAL THE FOLLOWING NUMBER OF HOUSES IN EACH NEIGHBORHOOD | 20-30 houses | 20-30 houses | 150 houses | 120-140 houses | 40-60 houses | 200 families |
| MAX. AMOUNT OF LOAN OFFERED BY THE PROGRAM TO EACH FAMILY | Bs. 120.000 | Bs. 80.000 | Bs. 16.000 | Bs.20.000 | Bs. 9.000 | Bs.5.000 |
| AVERAGE AREA OF HOUSE TO BE BUILT WITH THE LOAN | $120m^2$ of house | $80m^2$ of house | $20-30m^2$ of house | $25-35m^2$ of house | $15-20m^2$ of house | $40m^2$ of garden wall, $30m^2$ of painting, $20m^2$ of paving. |
| FAMILIES ELIGIBLE TO THE PROGRAM | All miner's families living in the neighborhood | Families with more than Bs.3000 per month. | Families with less than Bs.3000 per month | Families with monthly income between Bs.900 and Bs.3000 | Families with less than Bs.900 per month | All families in the neighborhood |
| AGENCY SPONSORING THE PROGRAM | Loan from Carbozulia | Loan from INAVI | Subsidy from Corpozulia | Loan from INAVI | Loan from Corpozulia | Subsidy from Corpozulia |
| TOTAL INVESTMENT NEEDED FROM THE AGENCY FOR ONE NEIGHBORHOOD | Bs. 2.400.000-Bs.3.600.000 | Bs.1.600.000-Bs.2.400.000 | Bs.2.400.000 | Bs.2.400.000-Bs.2.800.000 | Bs.360.000-Bs.540.000 | Bs.1.000.000 |

# CHAPTER ONE

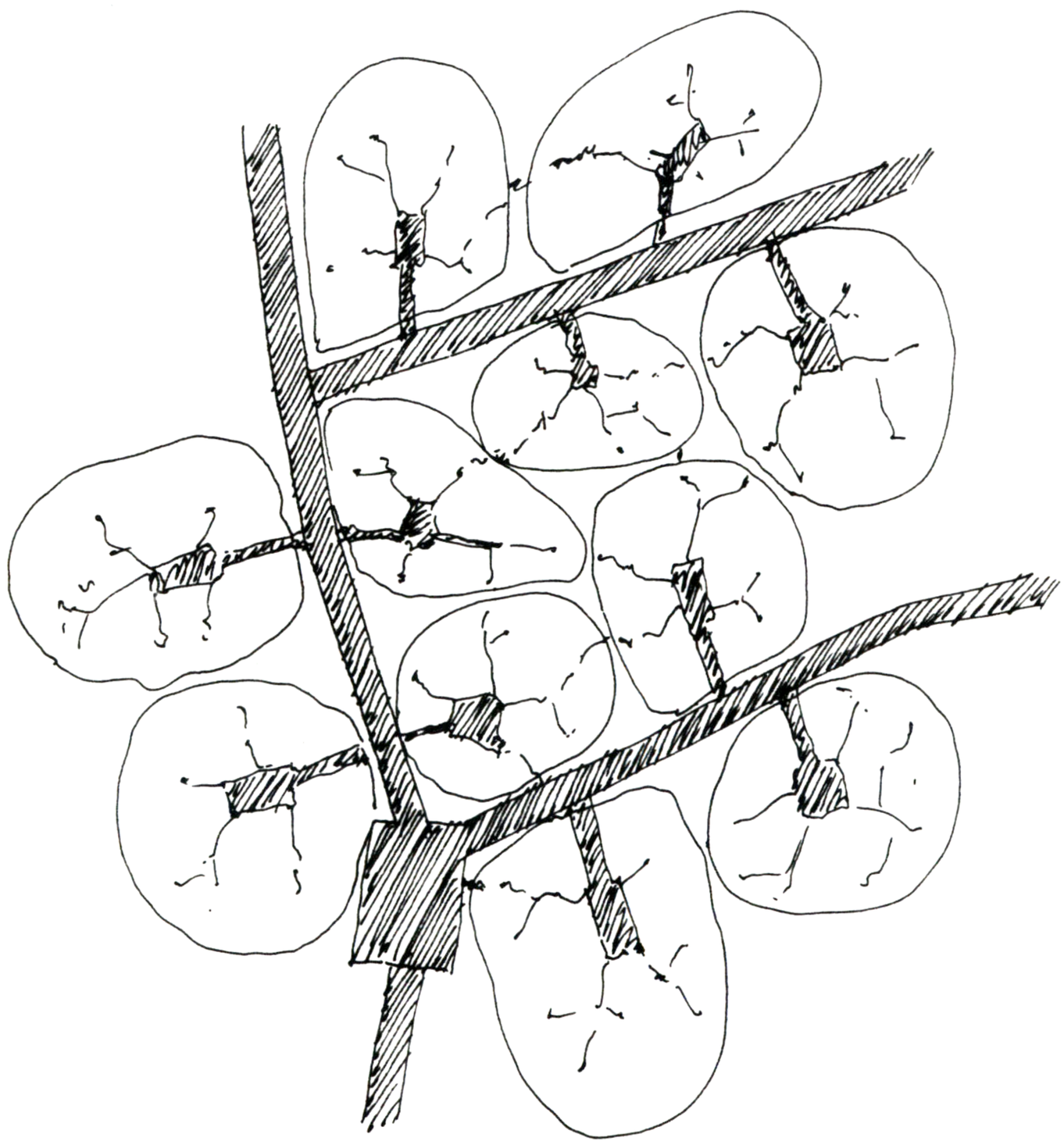
# THE LAYOUT OF THE INDIVIDUAL NEIGHBORHOOD

# 1. LOCATION OF NEIGHBORHOODS IN THE TOWN

We begin by describing the large scale structure of the town in such a way that we see clearly how the individual neighborhoods will be embedded in the town.

Essentially, we may envisage the town as a system of arterial collector roads, with neighborhoods hanging on these collectors like a bunch of grapes. At the center of the system of collectors the town has a square or main center: thus we may see the neighborhoods as hanging on the collector roads, and also connected, by the collectors, to the main square of the town.

This conception is described in the following diagram, which was worked out together by CES and ISA and Kevin Lynch during discussions of September 1982 in Maracaibo.



The critical conditions that must be met, for the proper implementation of this diagram are the following:

1. The neighborhoods are not too large and not too small. Specifically, we believe that they need an area of about 6 - 9 hectares each. If they are much smaller than that, they do not have enough structure to mean anything. If they are larger, they will become too amorphous and not capable of providing people with local identity.
2. Each neighborhood has a small central square.
3. Each neighborhood has one "mouth" where it meets the collector road, and which provides the neighborhood with its entrance. This mouth connects directly to the central square of the neighborhood.
4. The neighborhood has a collector along <u>one</u> side only, and remains open for growth and development on the other three sides. The neighborhood must not be surrounded by collector roads.
5. Local traffic within the neighborhood is extremely slow and mainly pedestrian.
5. There are a few small local link roads and paths, from one neighborhood to the next, but these are always minor, and are placed so that they never destroy the function of the main square and the mouth of the neighborhood as its primary channel of movement to and from the outside world.
7. As the town grows, new neighborhoods and new collector roads may be built to extend the population and area of the town, but always in such a way as to preserve the essential structure defined by these few parameters.

The Guasare master plan, prepared by ISA, has been written in such a way as to guarantee that these seven conditions will be met.

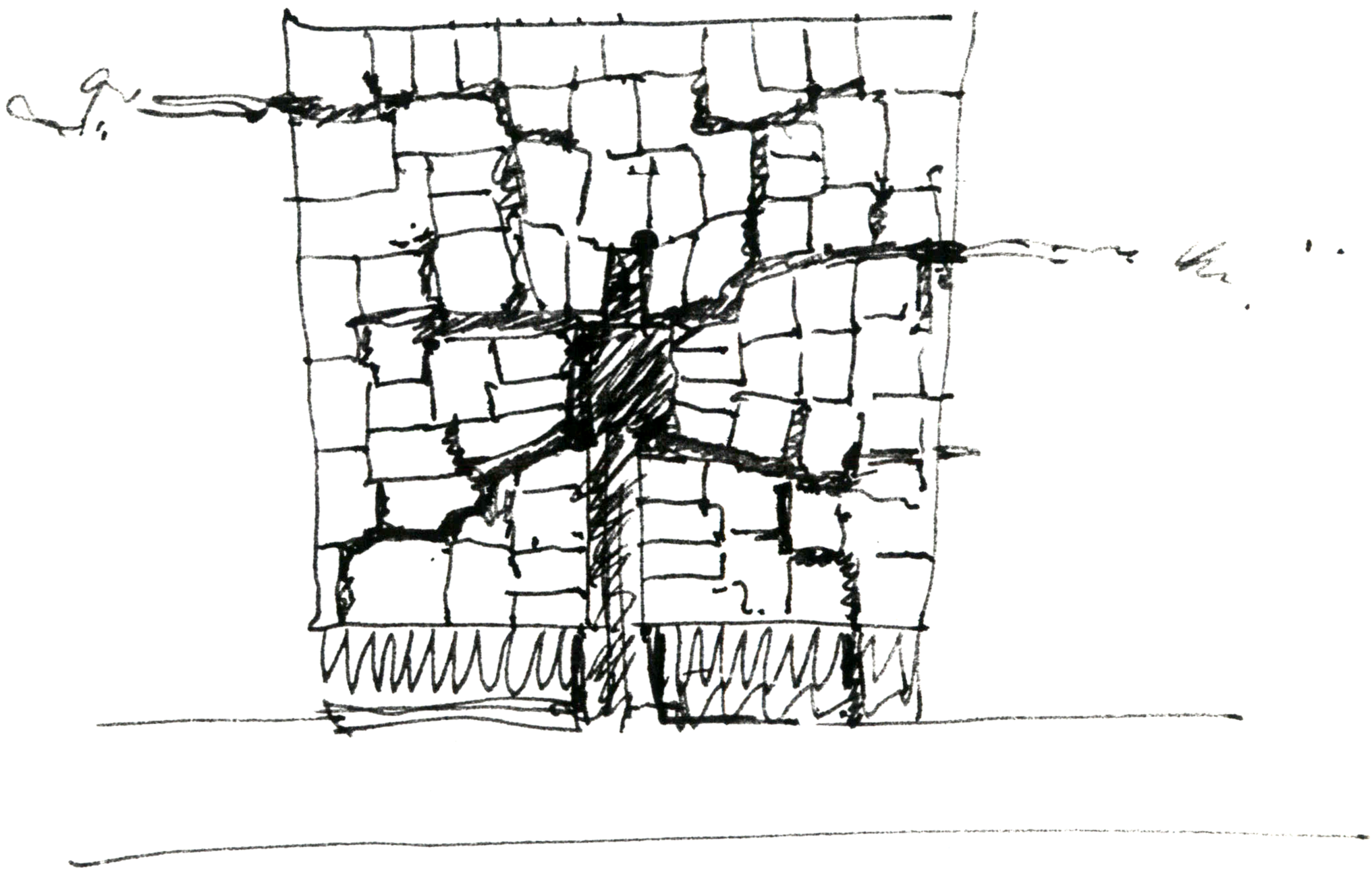
The following drawing represents one version of the ISA master plan, which is intended to meet these seven conditions. The first two neighborhoods which are to be built in this plan are designated by shading and marked 1 and 2.

The following report describes the production of houses in <u>all</u> neighborhoods, but frequently uses the specific details of neighborhoods 1 and 2 as examples.

# 2. THE INTERNAL LAYOUT OF THE NEIGHBORHOOD

We shall now define the global structure of the neighborhood. We may summarize this structure by stating certain general rules for each neighborhood. The form of each neighborhood which is created by these rules may be summarized by means of the following diagram.

STRUCTURE OF A TYPICAL NEIGHBORHOOD



1. We assume that each neighborhood is served by a main street, which opens like a mouth, from the main artery outside the neighborhood, at right angles to the artery. This conforms to a common pattern of markets, visible throughout Latin America.
2. We assume that this main street is wide and pleasant, probably with trees. It may have pedestrian traffic down the middle, or down the sides, or both, but it also allows for the passage of cars.
3. The main street leads to some kind of square, or wider opening, or park, in the middle of the neighborhoods.
4. At this point there is an important public building, preferably a church, if this is still realistic, otherwise a school, or other public hall of some kind. In some cases, school, church, etc., although appearing as a main building in one neighborhood, may serve another next-door neighborhood which has a different public building at <u>its</u> respective center.
5. This public building is elaborate in some important sense, in that it contains feeling and ornament, and has the capacity to function as the psychic center of the neighborhood.
6. Opening off the main square of the neighborhood there are a number of secondary streets, five the maximum, depending on the size and shape of the neighborhood. They are rather long and straight streets, and they provide for the main vehicular traffic in the neighborhood. The secondary streets are located in the neighborhood in such a way as to allocate equally the main vehicular traffic in all different parts of it.

# ACTUAL NEIGHBORHOOD 1

7. The secondary streets are given a slight angle, off the grid, so that they are oriented by a few degrees towards the middle of the neighborhood. Thus, although they will tend to be roughly parallel to the sides of the neighborhood, they are given a slight radial bias to make them lead, psychologically, more strongly to the center of the neighborhood, and to create a closer feeling between individual houses and the center.
8. The width of the secondary streets varies from 7 - 10 meters. At the points where the secondary streets reach the boundary of the neighborhood they become narrower, so that they do not allow for main vehicular access in and out from the neighborhood at these points. Some of the secondary streets could possibly turn into pedestrian streets for about 30 - 50 meters before they exit the neighborhood.
9. Opening off the secondary streets there are tertiary smaller streets which are primarily for pedestrians, though they allow for limited car traffic, when necessary. These smaller streets are, in effect, pedestrian streets, that are narrow enough to allow car movement and parking without danger to children.
10. These tertiary streets are about 4 - 6 meters wide; they are rather short, and there is a gate at the point of their entrance.
11. Some of these tertiary streets reach the boundary of the neighborhood and pass through a small gateway to the next-door neighborhood. Others terminate within the neighborhood itself.
12. The smaller tertiary street has an intricate structure and shape, generated by its adaptation to the configuration of the site and by

# ACTUAL NEIGHBORHOOD 2

its intention to give access directly to the house volume and not to the garden of the house. Therefore, the tertiary street allows easily for change of direction, for change of street width, for the occasional formation of very small, almost tiny squares at the points of change of direction or at their ending points.

13. The streets and public open spaces of the neighborhood will be created with one major concern in mind: to make them lively, in the right and appropriate scale for people walking along them or sitting there. Therefore, public open spaces have not been separated into distinct areas for cars, others for pedestrians, others for parking, and so on, an arrangement that tends to bring them to disproportionately large dimensions. The streets of the neighborhood provide for all these different activities and functions in a unified way, reflecting concern to create livable and human streets and squares.

14. There are no parking lots in the neighborhood, since they create dead areas in the fabric of the town. Parking will be provided along the main, secondary, and tertiary streets. The existing length of these streets provides for one-side parking for about 150 cars, about 70 - 80 per cent of the houses of the neighborhood.

15. Each neighborhood contains one builder's yard, a building supply store, subsidized by Corpozulia, which will provide many houses with materials for construction, and also provide professional assistance in construction.

16. Many houses in the neighborhood are given the opportunity to have a small local shop at the front of the house.

# 3. THE SIZE OF LOTS

One of the most crucial aspects of the neighborhood is its density, directly reflected in lot size.

In the early studies of Guasare, and especially those undertaken by the urban design group in Maracaibo, the lots proposed tended to be small and narrow--something like the traditional city lots of Santa Lucia.

The assumption inherent in these lots was that, because of their narrowness, they would have a continuous built frontage, and would therefore produce a stongly "urban" character. Since modern developments are so often characterized by loss of coherent space, and loss of coherence, this desire on the part of the urban designers was understandable.

It is, nevertheless, we believe, quite strongly mistaken as a direction for the project.

The studies made by the financial group (Echenique et al.) have clearly shown that lot size is one of the principal factors that will attract people to the Guasare new town. The location of this new town is not especially desirable. People will not choose to live there unless it has some clear advantage over other places. In the Guasare region, the most obvious advantage that can be given is, quite simply, size of land.

Careful inspection of the present developments in the Guasare region, and their character, points in the same direction. The character is above all rural. There are trees, animals, groups of small outbuildings. The land around a house is not an urban "yard" or "garden" but a potentially productive area, which can produce food for the family (in the form of vegetables or animal care), and can also provide

incidental space for various kinds of economic activity (storage of tires, machinery, building supplies, etc.).

This points, unequivocally, towards a relatively large lot size for the houses of the new town.

Furthermore, it is clear that the regional character, with its intense damp heat and very slight breeze, strongly requires a format, or layout which is as open as possible, to allow breeze to circulate, and to maintain a reasonably open character. This means that lots must not be long and narrow (as they are in higher density towns, or in other regions of Latin America), but must be as close to a square as possible, since this will increase the openness and pleasantness of each lot and its associated garden. This rather obvious point about the shape of the lots must be firmly underlined, since tendencies of conventional urban design theory may lead to long, narrow lots, for the reasons stated. We believe that construction of long, narrow lots in Guasare would be an extremely drastic mistake.

After studying these factors carefully, we have come to the conclusion that the average lot should have a size of about 470 $m^2$, and that this lot should never be less than about 15 meters wide. If the lots were rectangular, this would imply a distribution of lots ranging in shape from 15 x 30 m to 22 x 22 m but always relatively wide, so that the breeze can flow comfortably through the lot and through the house.

However, as we shall see in the next section, more careful consideration of the same factors indicates that these lots should not be simple rectangles, but should be composed of two adjacent rectangles, one approximately 11 m x 11 m and the other approximately 16 x 22 m, making a total of 470 $m^2$ for the two parts together.

# 4. LOT SUBDIVISION AND MICROSTRUCTURE

We are now ready to describe the microstructure of the project in detail. By microstructure we mean the detailed local arrangement of lots.

In most modern neighborhoods, the lack of feeling and endless sense of sameness is aggravated by a type of layout in which exactly similar lots and houses repeat themselves, block after block, in an unending repetition in which it is extremely difficult for individual persons to feel their own uniqueness, or to feel themselves at home.

This problem cannot be solved artificially by merely changing layout in a random fashion, since this merely produces an equally strange sense of unreality, which does not help the problem at all.

What is needed is a clear understanding of deep structure, which generates variety in a natural way, so that each part of the town becomes unique, for good reasons, which make intuitive sense, and which create an authentic and profound sense of individuality at each point.

In this project we believe that we have finally reached a breakthrough in modern housing planning by identifying a series of assumptions which, taken together, do produce just this kind of organic variation, in an authentic way. These assumptions are the following:

1. We assume that each house has a garden.
2. We assume that the house itself, is a compact cluster of buildings which are built around an open courtyard or patio which communicates with the garden.
3. We assume that the controlling factor which governs the location of a house, with respect to garden, is the wind direction... since

breeze and cooling must play the governing role in a house correctly adapted to the climate of the Maracaibo region.

4. We also assume that each house, itself, arranged around its patio, is a compact and beautiful entity, with a reasonable sense of enclosure and identity.

5. We also assume that the garden, outside the house and patio, must itself be a compact and sensible shape, suitable for agriculture, trees, children playing, and other uses. This requires that the garden itself must also be a compact and simple shape, so that land is not wasted in narrow strips around the house.

6. We assume that the street system will not govern the organization of the neighborhood, but that an adequate pattern of small streets can be adapted to the house lots, once the pattern of the house lots has been determined in such a way as to meet the previous considerations.

On top of these assumptions, what we have done, quite simply, is to identify a series of rules which must influence relative layout of house, garden and street in such a way that the interaction of these rules produces a syncopated, non-repetitive structure because their interaction is so complex, and because it also varies naturally from point to point in the terrain.

The rules we have identified are the following:

1. The house is a courtyard structure of about 11m x 11m and covers an area of about 120 $m^2$. This area includes both house and patio.
2. The garden is an area about three times as big, that is, of about 350 $m^2$ additional.
3. Each of these two areas must, as far as possible, preserve its integrity as a positive space. This means that the lot (house plus garden) is not necessarily a single rectangle, but must be seen as a joining of two rectangles, one about 120 $m^2$, and the other about 350 $m^2$.
4. The house and patio are open to the garden, and there is a natural view through this opening from the house patio into the garden beyond.
5. The location of the house is clearly known at the time of the lot subdivision. Thus at the time of lot subdivision, the position of the house on the lot, and the position of the garden are already defined. This is an unusual practice, since in normal practice, the house may usually be placed anywhere within the setback in the lot, within the setback limits. In the system we are proposing, the actual position of the house will be defined at the time of the subdivision.
6. The relative location of house and garden in any given lot is determined by two factors: the slope, and the wind.
7. In general, if the house is on a slope, then the house is placed uphill, and the garden is placed downhill. This is essential, since a house with a garden uphill from it creates a very unnatural situation which strongly inhibits use. It means that the line connect-

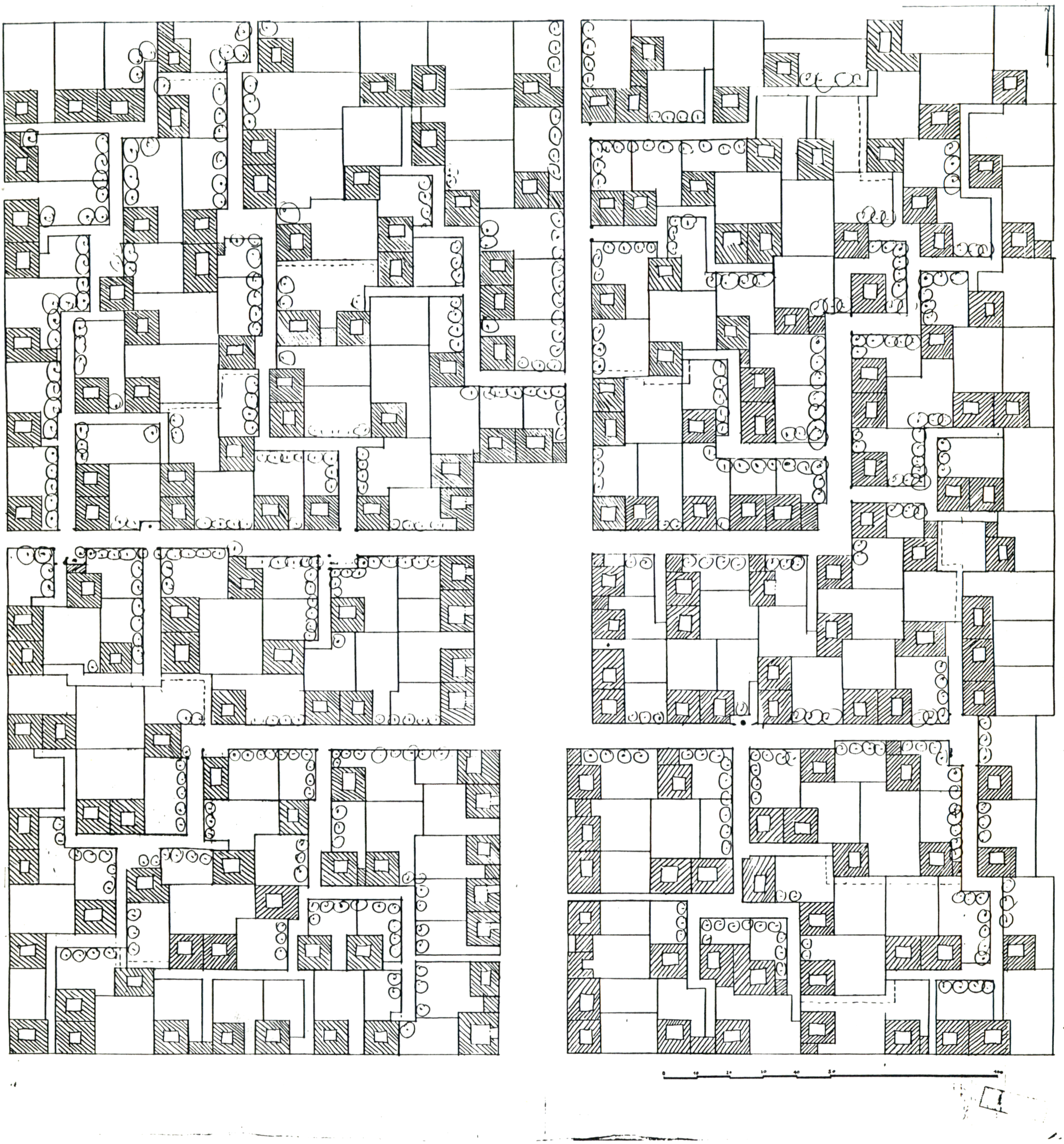
ing the center of the house and the center of the garden should be as nearly as possible at right angles to the contour lines.

8. In the case where the land is flat, the house and garden are placed in such a position that the prevailing breeze blows from the garden into the house patio, and then into the house. This requires that the line connecting the center of the house to the center of the garden should be as close as possible to the line of the prevailing breeze.

9. In the hilly case, where we require the house to be up the slope from the garden, the breeze will <u>also</u> blow from the garden into the house, since on hills breezes most often blow up the hill anyway, and have a direction which is governed by topography, not entirely by the overall direction of the breeze in the region. The two previous rules are therefore consistent, since both create conditions where the breeze blows from the garden into the house.

Although these rules are quite elementary, we have discovered that the interaction between these rules, when they are carefully followed, produces a highly assymetrical, syncopated structure of the type illustrated in the following diagram.

# LOT SUBDIVISION AND STREETS IN A PROTOTYPE NEIGHBORHOOD



In order to create this structure, it is necessary to build it up one lot at a time by paying attention to the rules.

If the rules are followed strictly, then lots will, in general, not be rectangles, but coupled pairs of rectangles, which are in line with either slope, or prevailing breeze. The overall structure is un-predictable, because the local interaction of the rules creates an aperiodic structure in an entirely unpredictable way.

In order for the rules to work effectively, it is essential that the two rectangles which represent house and garden respectively be as pure as possible. The functional reason for this is that the positive space thus produced is more useful and calmer in its nature. This means that arrangements in which the garden forms an L-shape are ruled out as far as possible.

Once the general structure of lots has been arrived at in this way, local streets are then introduced between the lots in such a way as to follow three further rules:

10. Every house fronts directly on the street. This means that the edge of streets is made of houses, not of garden walls, and produces an important social feeling in the neighborhood.
11. The total length of streets is as short as possible.
12. In order to reduce street length, and reduce the cost of services, it may be helpful to relax rule 10 slightly. If we allow ten per cent of all houses to be off the street, and to be approached by a front path through the garden, it then becomes possible to reduce

total street length from about 17 meters per house to about 12 meters per house: an enormous saving, which makes the layout more economical.

The resulting neighborhood structure has a simple and almost endless variation, which is extremely charming. When we combine this layout with the sense of physical streets that is described in chapter 4, we believe that we have for the first time solved the problem of combining modern techniques of subdivision that are necessary in a rapidly growing new town with the charm and delightfulness that make each person feel at home in the uniqueness of their own lot and the uniqueness of their own street.

The precise rules and procedure for layout are specified in detail in the next section.

# 5. THE LAYOUT AND SUBDIVISION PROCESS

The archetypal form of neighborhood, which has been described above, will take different forms in each of the different neighborhoods of the new town. This will happen because each neighborhood must be adapted to a specific set of conditions which vary from one neighborhood to another. The following factors will control the overall form of the neighborhood:

1. Its size.
2. The location of arteries along its boundary.
3. Its topography.
4. Its orientation with respect to the center of the town.

As a result of the interaction of these four factors, with the general structure described in the last section, each neighborhood will take on a unique configuration. For example, we show the first two neighborhoods, below. Each one has its particular configuration as a result of its unique combination of size, shape, bounding arteries, topography, and orientation.

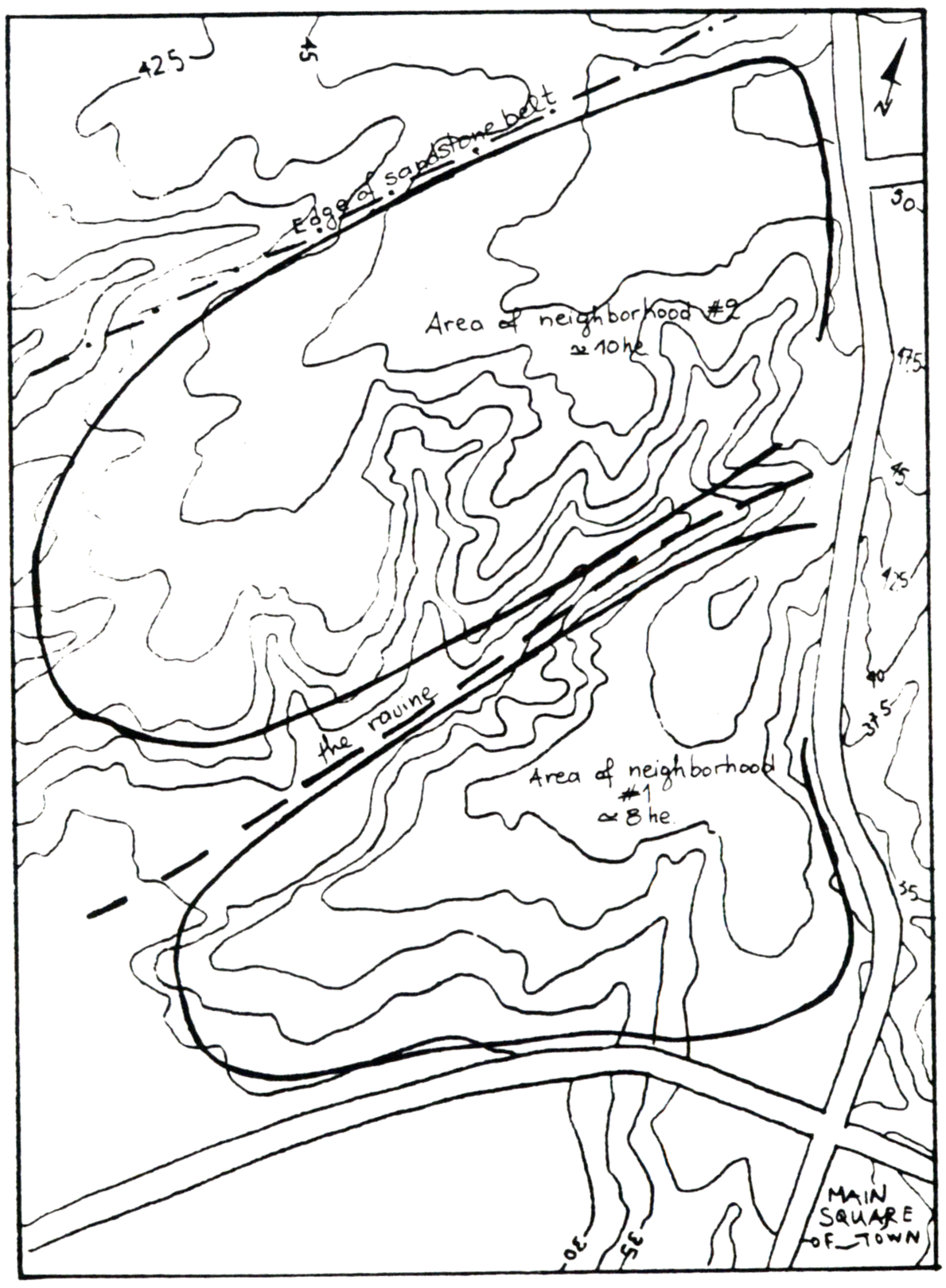
We shall now present the organized steps which are needed to generate the interaction of the structure, and local factors, for a particular neighborhood. In order to create the neighborhood plan it is simply necessary to lay out each neighborhood, step by step, in the sequence presented below. We propose that this work be done directly by planners or architects of Proguasare, possibly with the help or consultation of CES (the authors of this document).

<u>All the following steps must be done on the site itself, after careful inspection and feeling for the actual place.</u>

# RULES FOR THE LAYOUT PROCESS

## STEP 1: DEFINE THE SIZE AND BOUNDARIES OF THE NEIGHBORHOOD

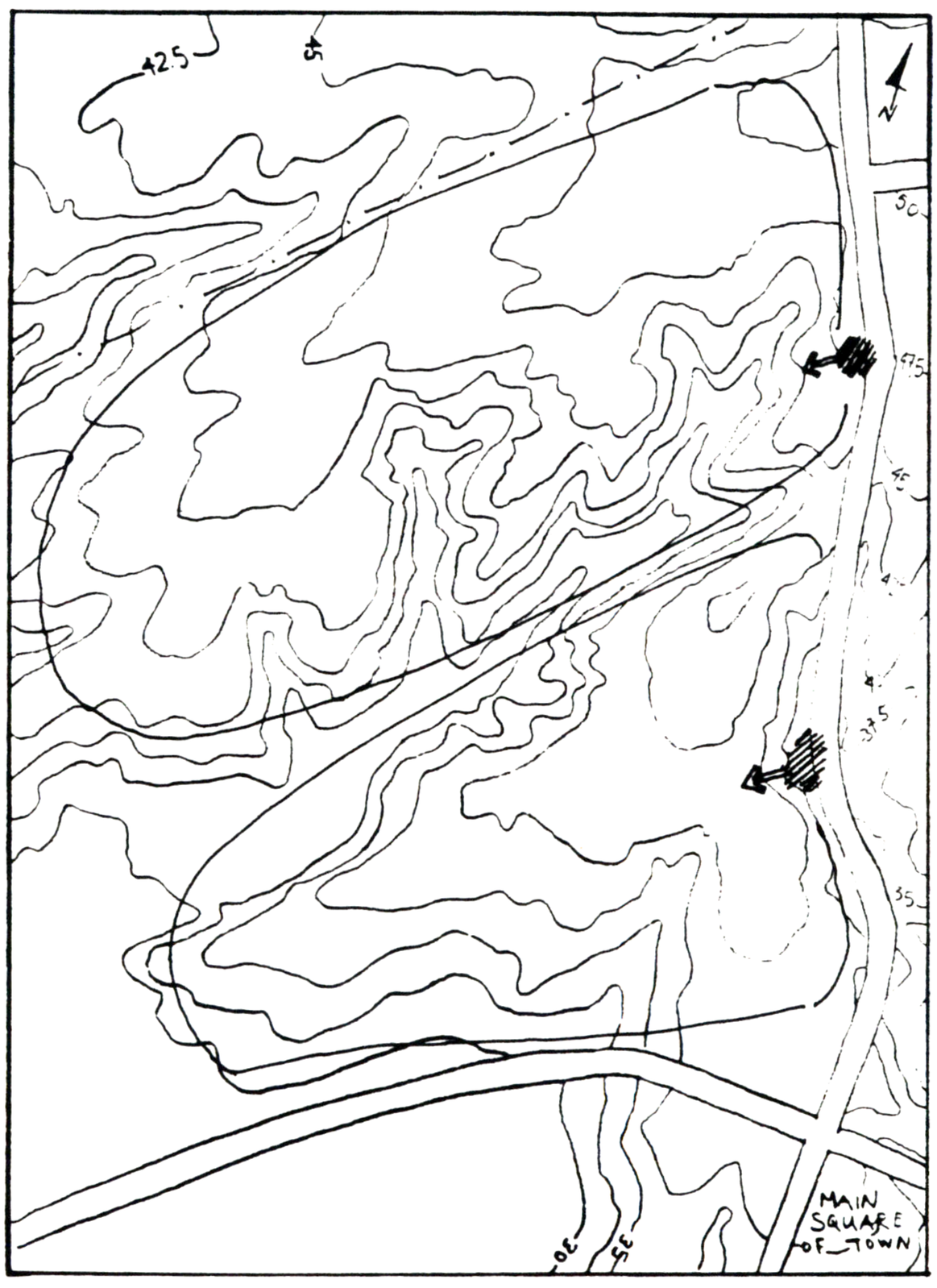
After the general position of the new neighborhood has been selected, spend some time trying to understand the reality of the site and its configuration, slopes, ravines, big reees, small rivers. Then, having in mind that the size of the neighborhood varies between 6 to 9 hectares, try to find out where the most natural boundaries of the neighborhood will be. At least one of the boundaries of the neighborhood must be defined by an existing collector road, or by the extension of an existing collector. Ravines or small rivers, or pronounced changes in the direction of slopes on the ground will naturally define some of the boundaries of the neighborhood.



STEP 2 LOCATE THE MAIN ENTRANCE TO THE NEIGHBORHOOD

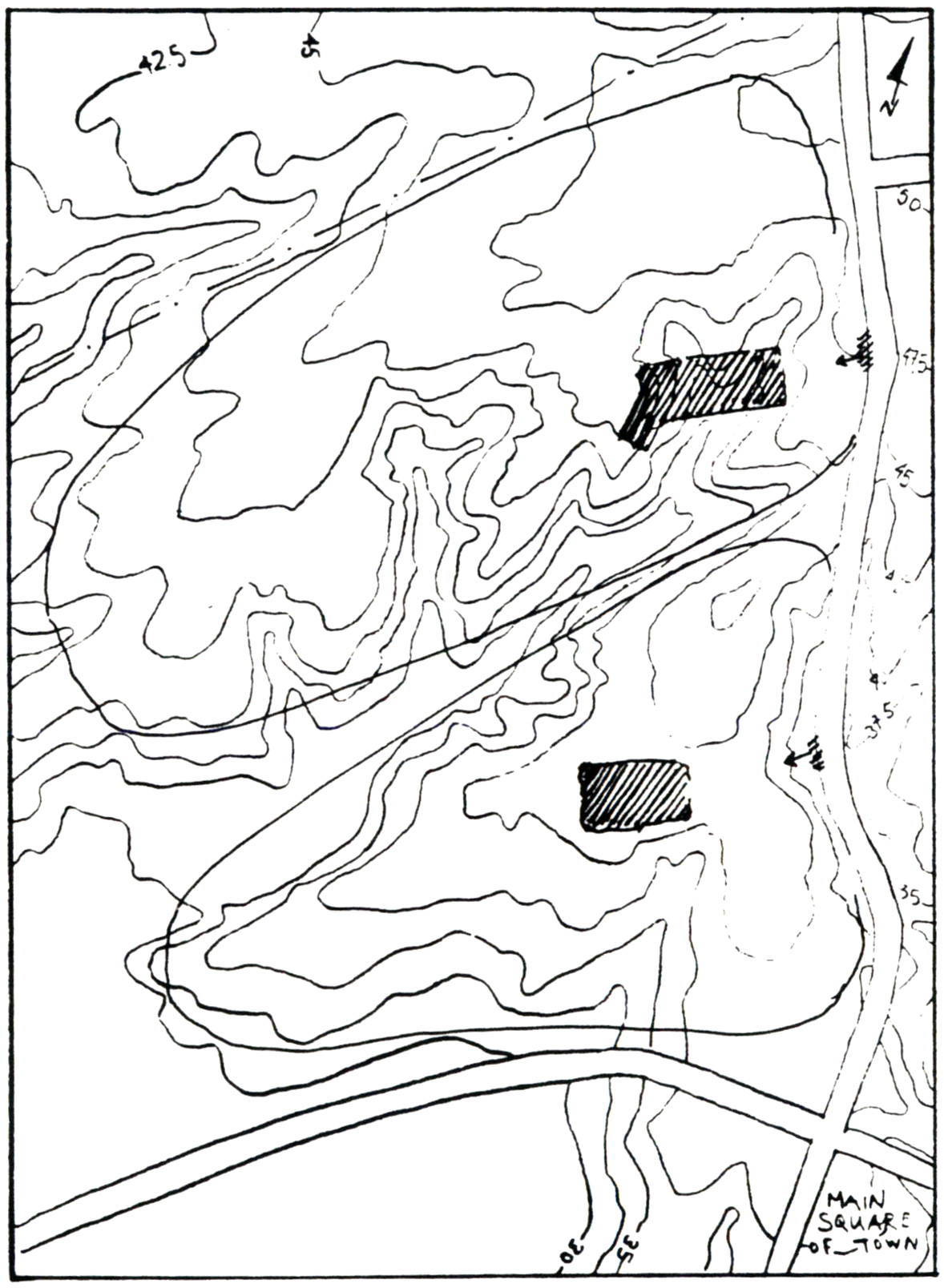
Along the collector that defines one of the boundaries of the neighborhood look for the place that will be most appropriate for the main entrance into the neighborhood. This place will have to provide for access towards the main square of the neighborhood, and will therefore have to be somewhere close to the middle of that part of the collector road that shapes the boundary of the neighborhood. It should also be a place that would seem the most natural as a turning point from the collector road into the neighborhood.

In case there is more than one collector road along the boundaries of the neighborhood, the main entrance should be placed along that collector which has the stronger link with the central square of the town.



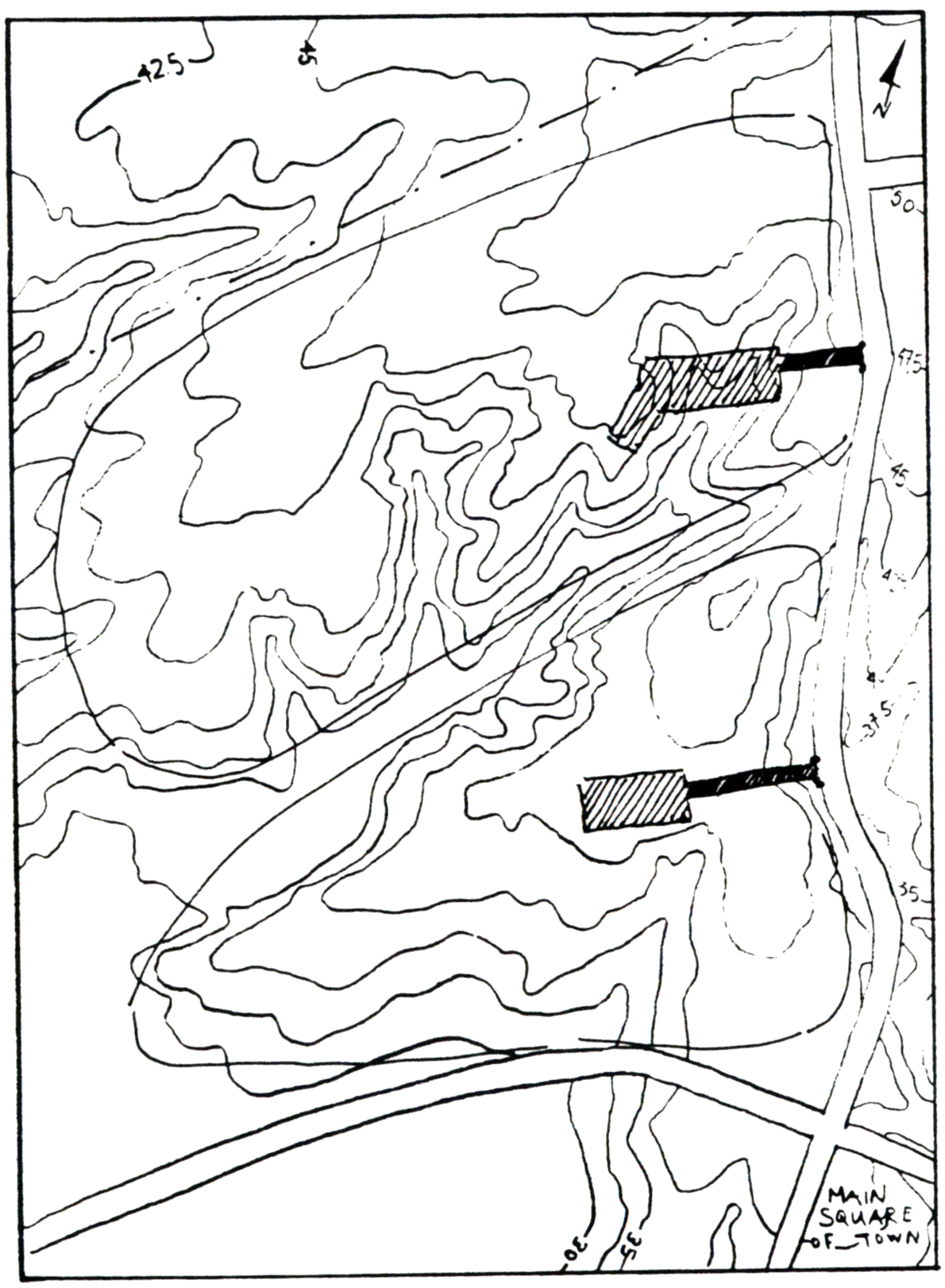
STEP 3: LOCATE THE MAIN SQUARE OF THE NEIGHBORHOOD

Now try to find the best place for the main square of the neighborhood. It should hold an area somehow central in the neighborhood, it should be clearly visible from the collector road and therefore not too far from it, and it should be on a place that is beautiful, probably flat with some big trees, probably also it could be a high place in the neighborhood compared with the rest. The place that you will identify should feel large enough to contain the main square of the neighborhood, whose size will vary between 20 x 45m to 25 x 60m, depending on the size of the whole neighborhood.



STEP 4: LOCATE THE MAIN STREET INTO THE NEIGHBORHOOD; THIS STREET LINKS THE MAIN ENTRANCE INTO THE NEIGHBORHOOD WITH THE MAIN SQUARE

At this stage you already know the position of the main entrance, and the position of the main square. The next step is to create a link between them. This link will be the main street of the neighborhood, and the only vehicular street that will provide direct access into the neighborhood. This main street into the neighborhood is one of the widest streets of the neighborhood, its width depending on its length, with a two-way vehicular lane, and with wide sidewalks with trees. Or, in some cases, it can be made of two separate vehicular one-way lanes on either side of a wide pedestrian "alameda" in the middle, planted with trees.



## STEP 5: THE CORNERS OF THE MAIN STREET AND THE MAIN SQUARE

At this stage you know the position of the main entrance, the position of the main square and its approximate size and shape, and the position of the main street that links the main entrance to the main square.

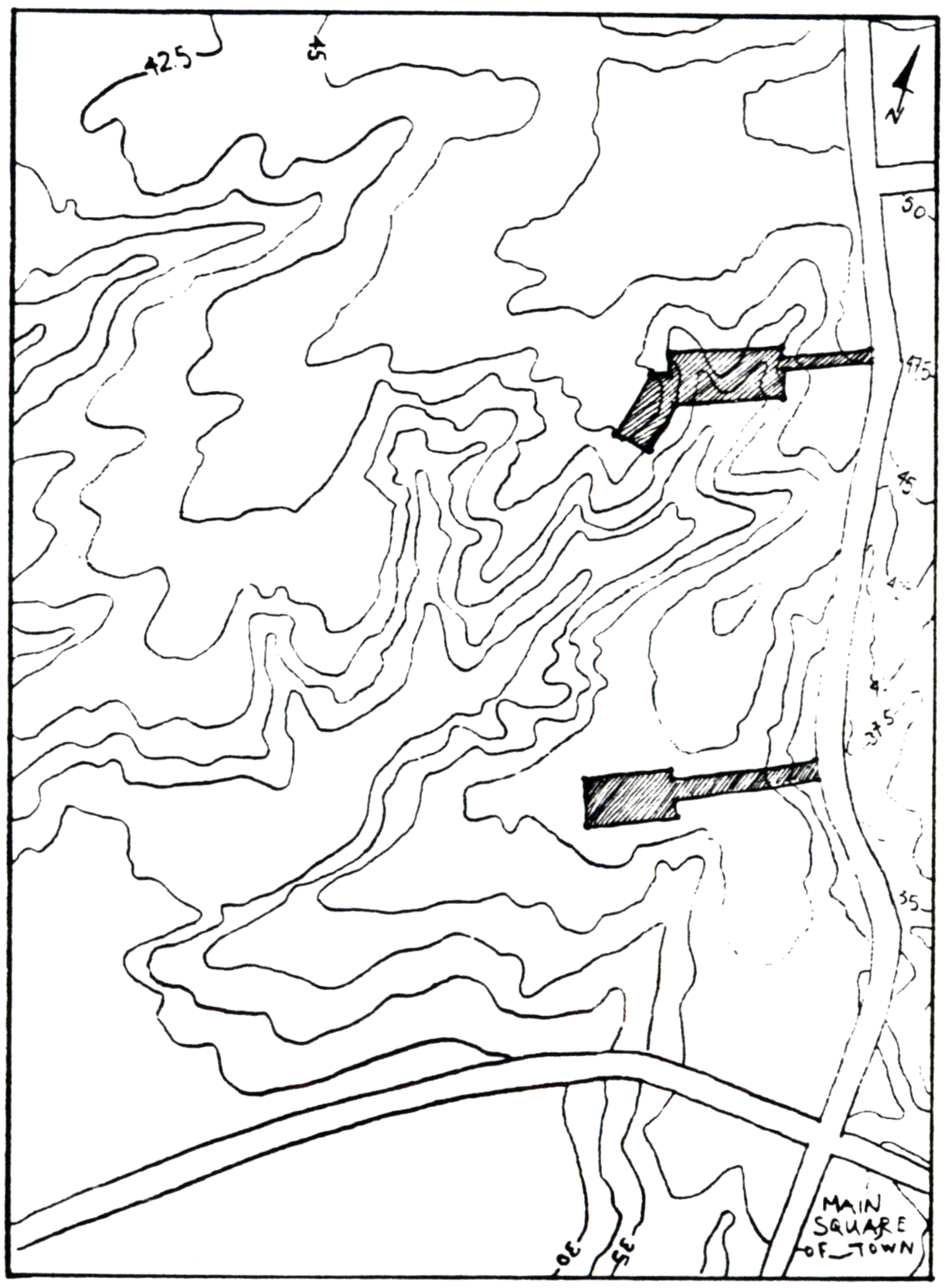
Now you must shape these places precisely on the ground by putting stakes on the corners of these places, and by extending a thick rope along their sides. It is necessary to do this in order to experience the feeling of these places as accurately as possible.

First, place two stakes where the main entrance into the neighborhood is. These two stakes will have to mark the width of the main street that will vary between 10 to 15m, depending on its length. Imagine that at this place will be a gate to emphasize the point of entrance into the neighborhood.

Now, shape the main street that will lead from the main entrance to the main square. Place the main street as nearly perpendicular to the collector road as possible; that will give a more natural way of entering from one place to the other. However, a slight angle may be necessary because of the topography of the site. Extend two ropes along the two sides of the main street, all the way from the main entrance to the main square. Walk along the main street, imagine one-storey houses touching each other on both sides, and also distinguish the vehicular lanes of the street from the pedestrian areas, probably by laying some ropes on the ground. Walk up and down on this street several times trying to get its scale right. You might have to adjust its width or its length slightly until you fet it to feel right.

Now proceed to the staking of the square. Place four stakes in its corners and extend rope along its four sides. Try to get the scale of the main square of the neighborhood right. Think that it is not the main square of the whole town; therefore it should not be so big as to compete with the main square of the town. Also it should not be too small, so that it can receive the activities of the neighborhood. It should be an intimate place, not too big, not too small, surrounded mainly by one-storey buildings. Think also of the area to be given to pedestrians, and of the area where vehicular traffic will mainly occur.

You may have to go through several small changes and admustments until you get the right size and shape of the main square and the main street.



## STEP 6: LOCATE THE VEHICULAR SECONDARY STREETS OF THE NEIGHBORHOOD

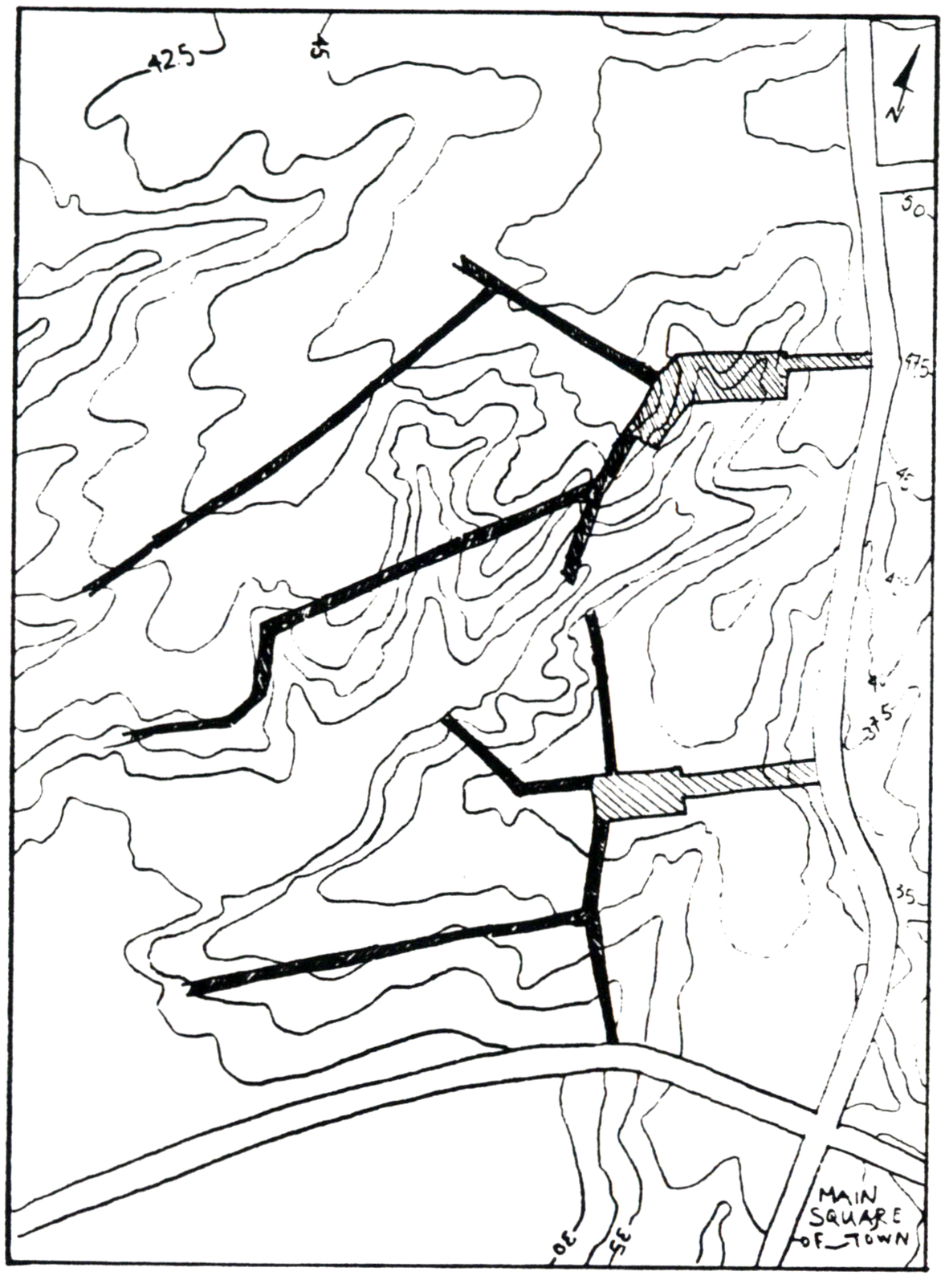
The vehicular secondary streets are 7 - 10 m wide and they provide the main vehicular circulation in the neighborhood.

There are three criteria that will guide the location of the vehicular secondary streets in the neighborhood:

a. All the secondary streets will have to lead in some way to the main square of the neighborhood, and none of them will exit directly to the collector road or to the main street of the neighborhood.
b. The location of the secondary streets will be guided by the configuration of the ground. A secondary street could be on the ridge of a small hill, or it could follow as closely as possible the same contour line.
c. The secondary streets should be located in such a way that they serve all different parts of the neighborhood in an equal way.

There are 3 - 4 vehicular secondary streets in each neighborhood. Globally, they must be placed to create a radiant kind of configuration, all of them converging towards the main square. Sometimes a secondary street can lead into another secondary street that then leads directly to the main square.

First make a decision about the approximate locatin of the secondary streets, and specify the way they will lead to the main square. Try to form a simple pattern of secondary streets. Walk along them, and visualize them by laying ropes along their edges. After you have walked along them several times and have become familiar with them, and probably after some changes and adjustments, you will start to have a better understanding of all the secondary streets of the neighborhood as a whole. When you feel they are right, make good sense, and create a simple and coherent pattern, put some stakes along them to finalize your decisions.



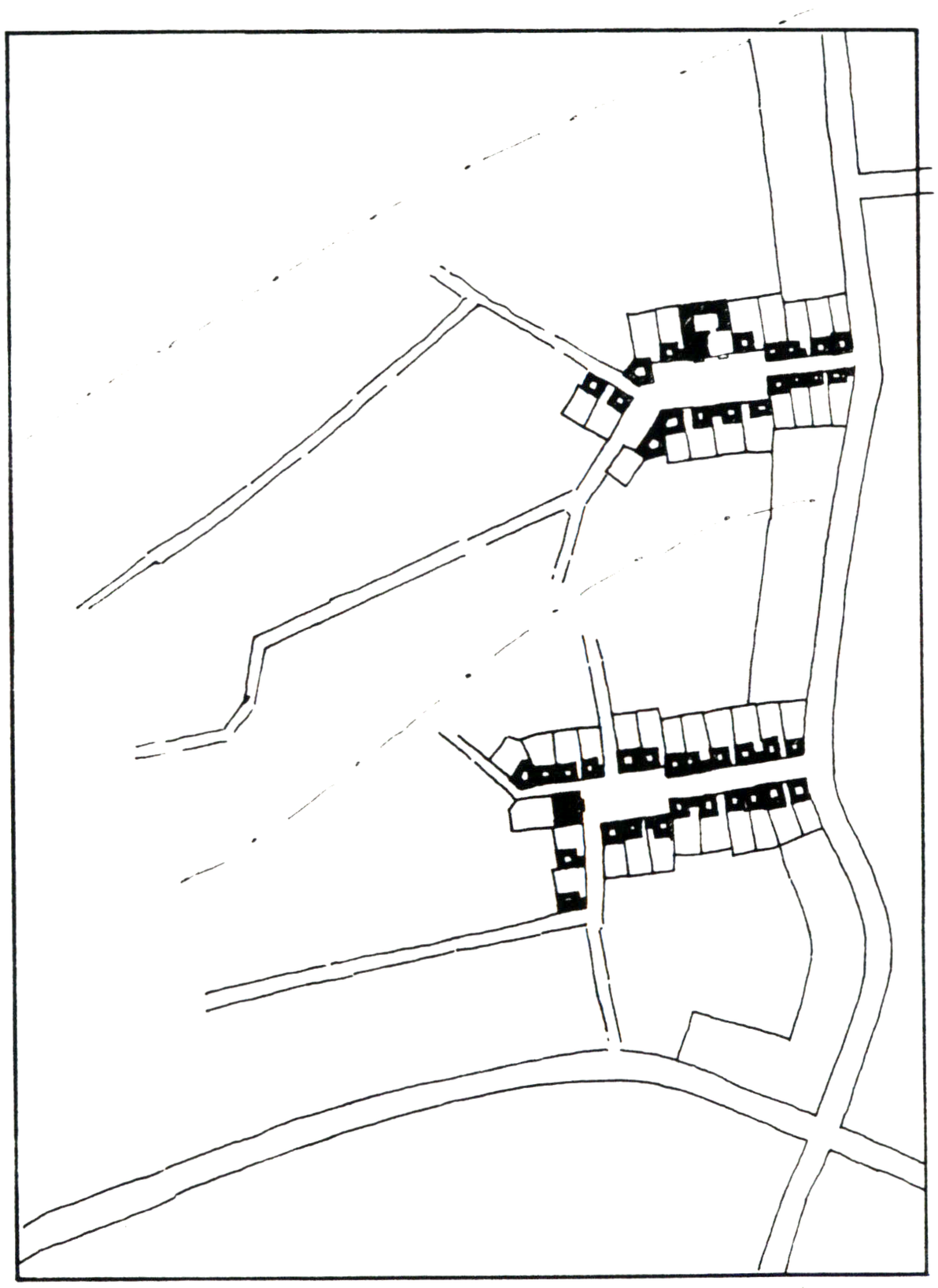

STEP 7: PLACE THE PUBLIC BUILDING OF THE NEIGHBORHOOD ON THE MAIN SQUARE

Now choose a place on the main square where the public building of the neighborhood will be. It should hold a prominent and appealing place and its location on the square should be such as to contribute the most to the wholeness and liveliness of the square.

STEP 8: SUBDIVIDE THE AREA ALONG THE MAIN STREET AND AROUND THE MAIN SQUARE OF THE NEIGHBORHOOD

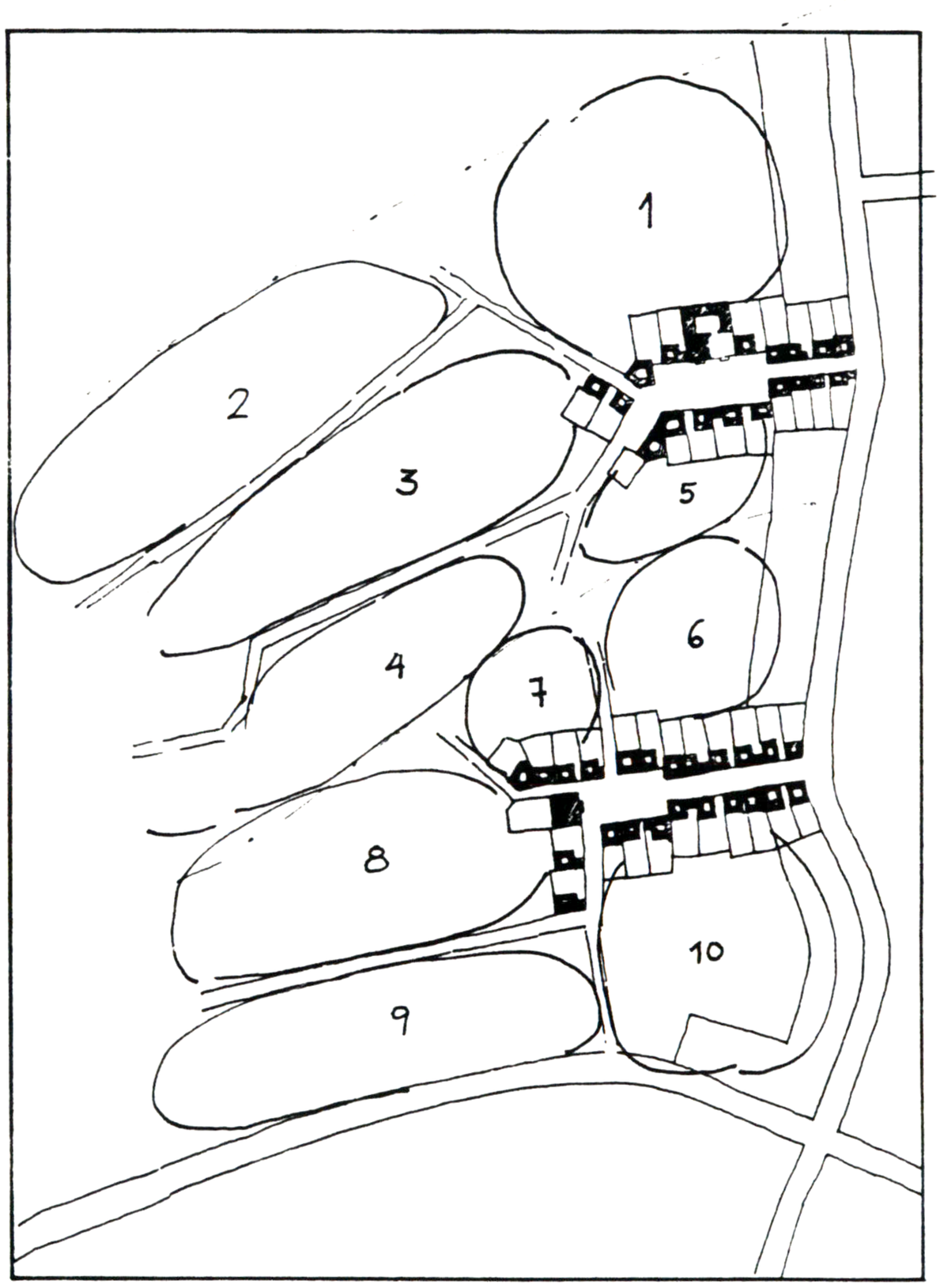
The first part of the neighborhood to be subdivided is the area of the main street and the main square. These two places are the densest areas of the neighborhood, since they form its center. Therefore, it is mostly the houses themselves, and not gardens, that will form the sides of the square and the main street.

Make the lots along the main street and around the main square narrow and long; their frontage should be 10 - 12 m wide, and they should be about 35 m long. The part of the lot facing the street should be given to the house. The houses will form a continuous frontage, most of them touching each other.



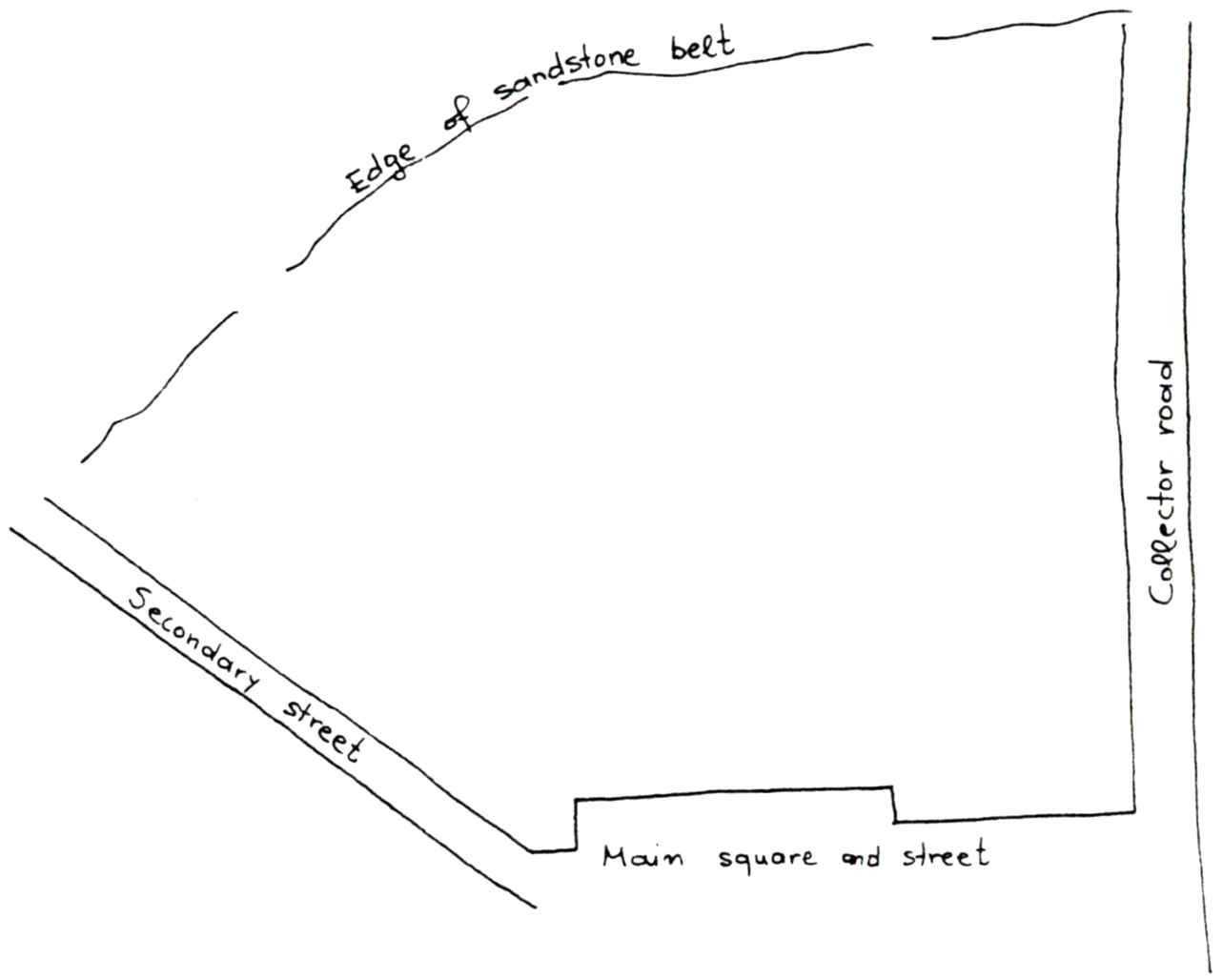
STEP 9: IN EACH NEIGHBORHOOD IDENTIFY THE DISTINCT LOCAL AREAS TO BE SUBDIVIDED IN SEQUENCE ONE AFTER THE OTHER

The main and secondary streets of the neighborhood, located already on the site, define distinct areas in the nieghborhood. The boundaries of one area are defined either all of them by secondary streets or by a combination of main and secondary streets, and in some cases by the collector road too, depending on the actual location of the area in the neighborhood.



Now start subdividing one area after the other. In the following steps we will demonstrate the steps that have to be followed in the subdivision of such an area.

We choose local area #1 as an example to show the subdivision process in its detailed sequential operations.




STEP 10: START THE LOT SUBDIVISION IN THE LOCAL AREA

This step of the layout of the neighborhood is the most crucial. All the microstructure of the neighborhood, its small streets and paths, and small local squares which will serve each specific area of the neighborhood will be established. During this step it is necessary to accomplish two things simultaneously:

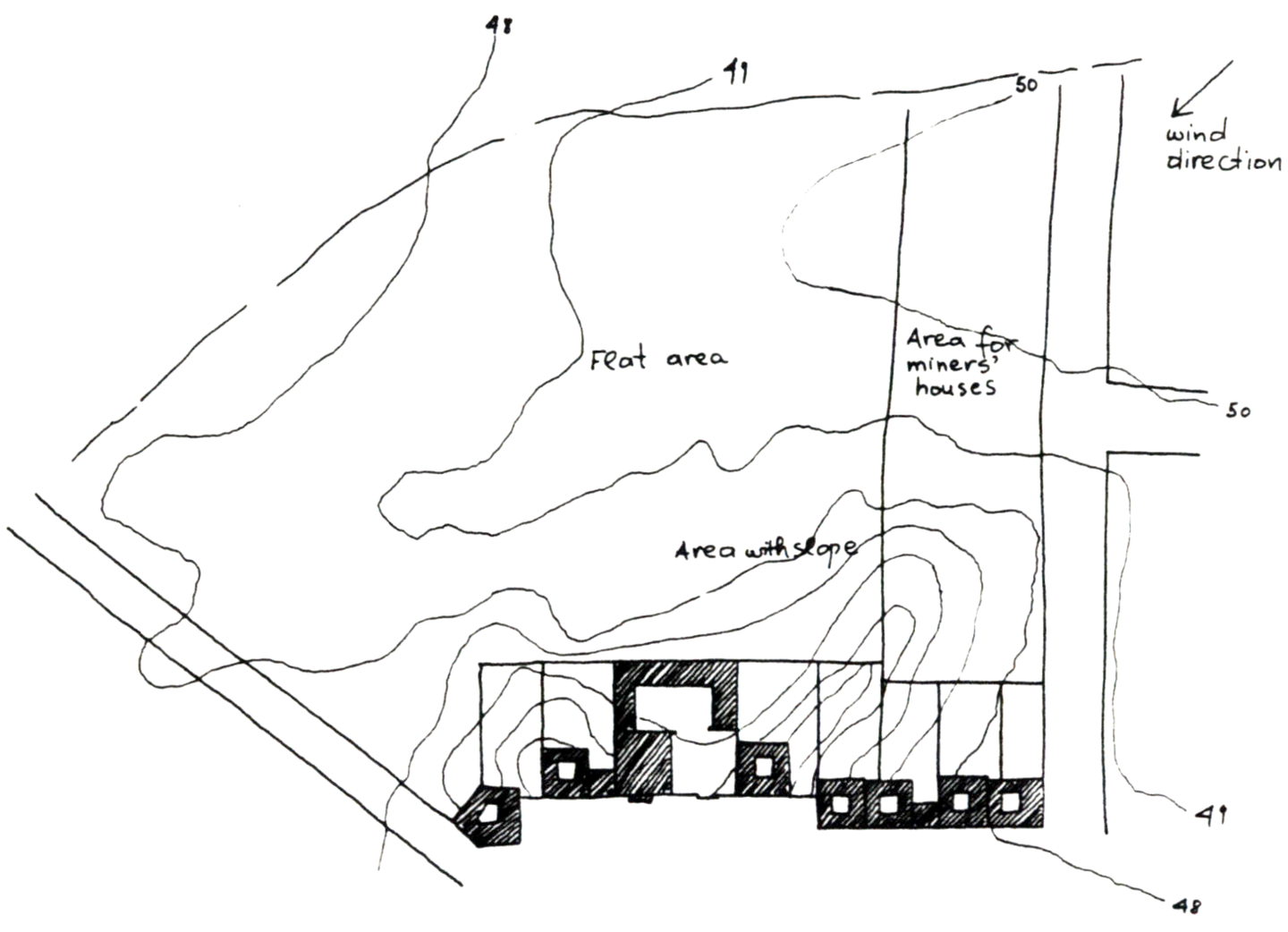
a. Subdivision of lots
b. Location of smaller streets and local centers that will serve each area of the neighborhood defined by the main and secondary streets.

These two things will happen step by step in a series of cycles, as we shall see:

STEP 10a: First you try to get a good feeling of the local area to be subdivided.

What its boundaries are, the already subdivided areas along the main and secondary streets, if any, where the wind blows from, the configuration of the land with its slopes, important trees and views, etc.

In the example that we present the situation is the following:



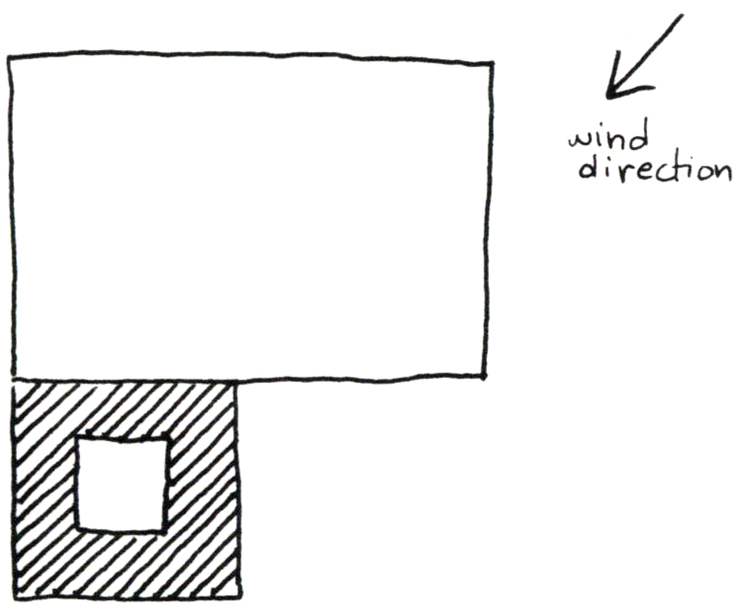

STEP 10b: Now you start creating lots, in groups of 5-10 lots at a time.

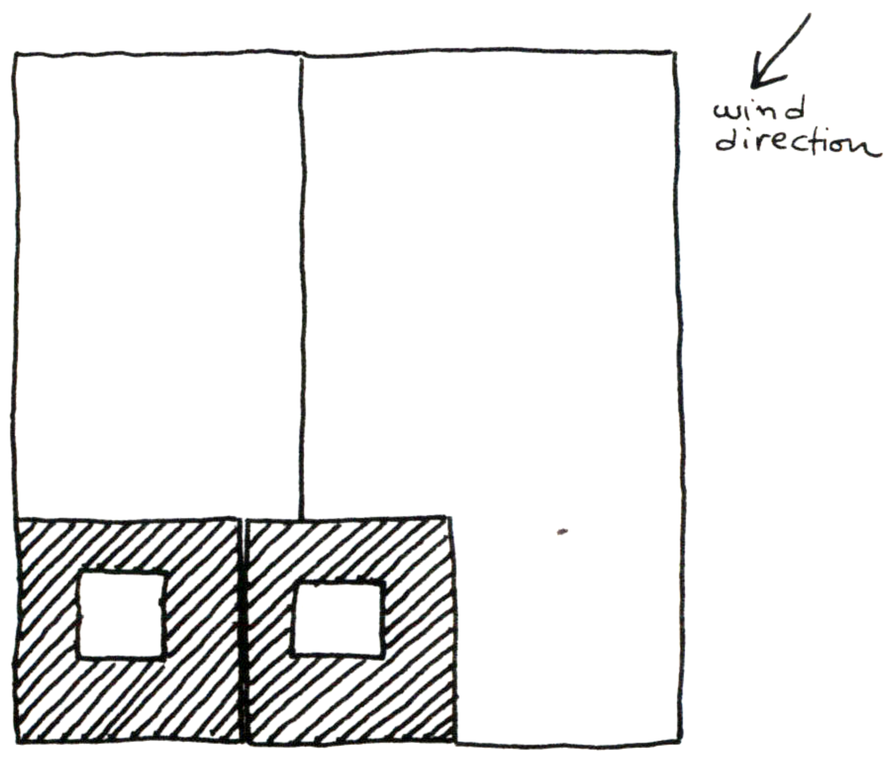
You do not lay out all the lots in the local area as one step. Together with the new lots a piece of street to give access to them will be laid out also. In cases where the street to provide access to the newly laid out lots has already been located, the lots laid out along it will have to pin it down and form it carefully.

STEP 10c: Now you place the first group of 5-10 lots, using the following principles:

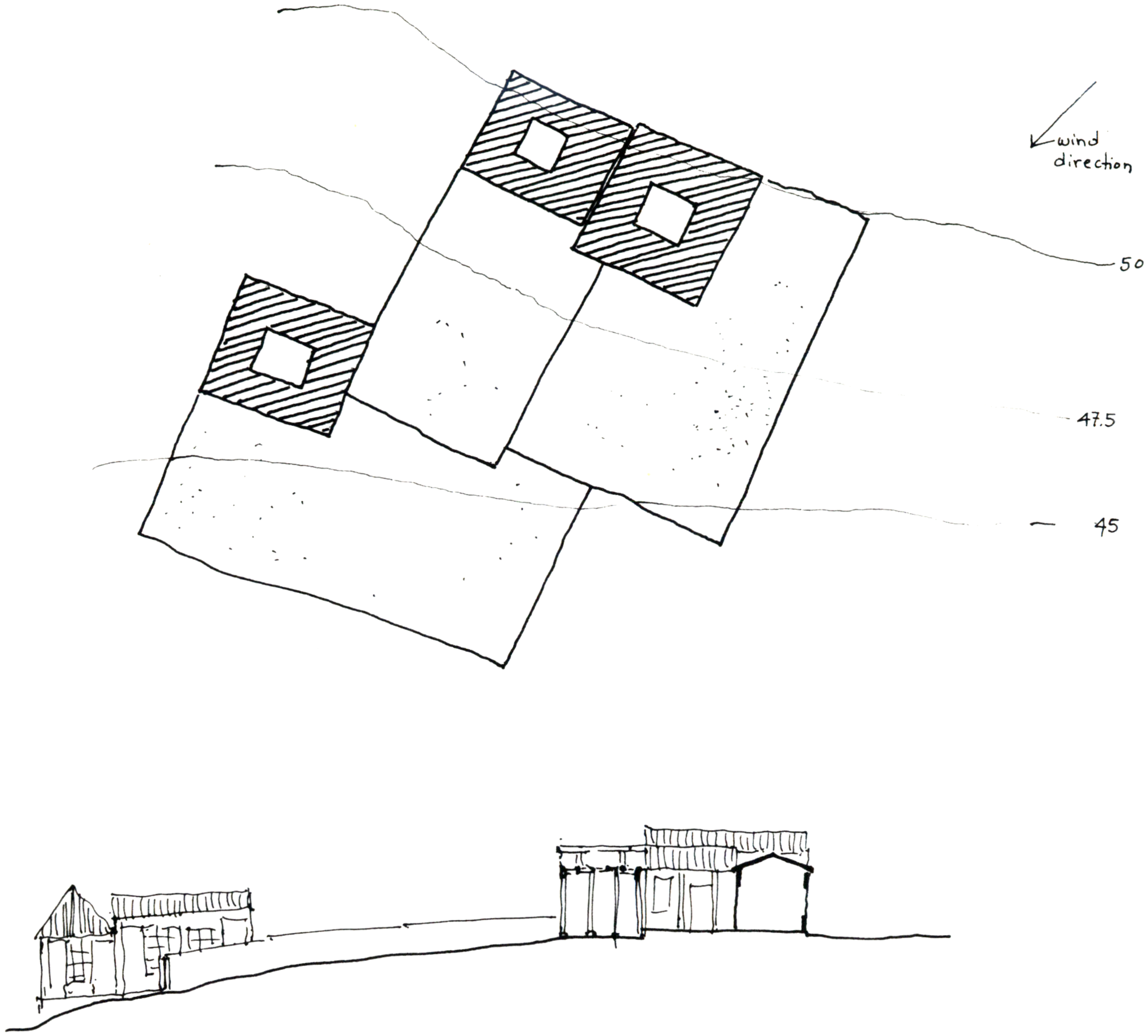
Each lot consists of two clearly defined entities; the entity of the house, arranged around a patio, and the entity of the garden. Both of them have compact and simple shapes, and usually they are rectangles. The area of the house is on the average about 120 $m^2$ and the area of the garden about 350 $m^2$. However, there is a wide range of variation concerning the size of the lots. There are two controlling factors which govern the location of the garden with respect to the house:

1. The wind direction: The garden is placed on that side (or sides) of the house that allows the wind to blow from the garden into the patio and the house, and the center of gravity of the garden and the center of gravity of the patio of the house thus forms a line that approximates the direction of the wind.




2. The slopes of the site: for houses that are being located on the slopes of the site, the location of the garden with respect to the house won't be guided by the direction of the wind, but by the slope: the higher part of the lot will be given to the house, with the garden being located on the lower parts of the site.




STEP 10d: The drawing, and legal specification of each lot, must contain both the house and the garden, clearly shown as separate entities.

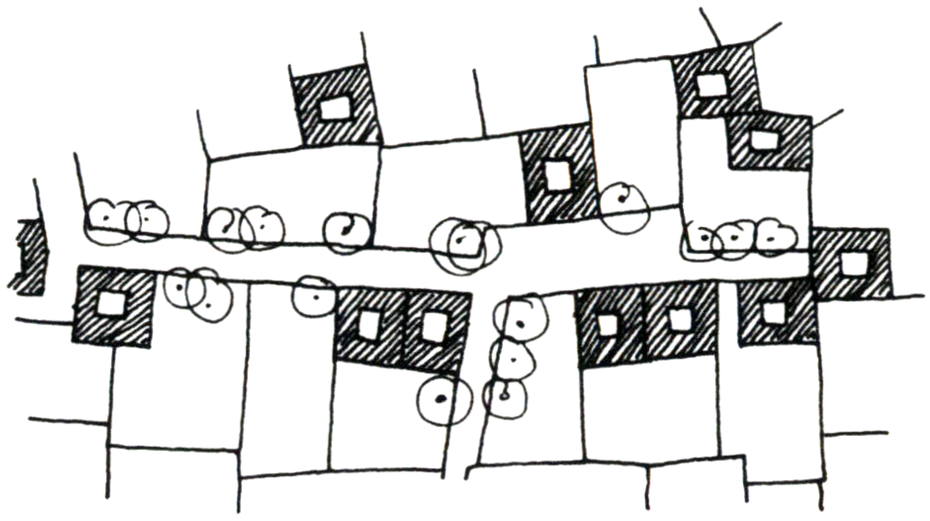
STEP 10e: Next, you place a segment of tertiary street, which gives access to these 5-10 lots.

In order to place this segment of tertiary street you have to bear in mind the following general rules about tertiary streets:

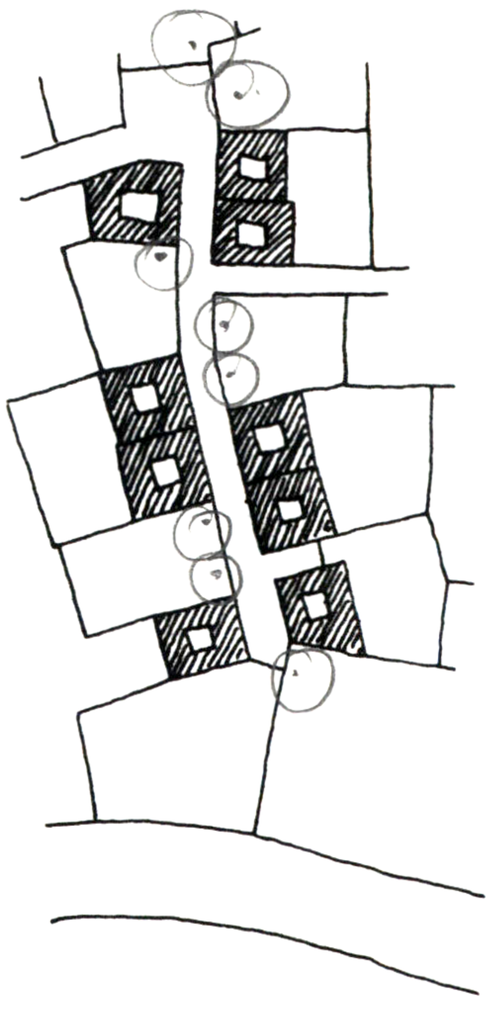
a. Each tertiary street consists of distinct smaller segments of street, connected together in such a way as to create a coherent whole with a clear structure. The structure of the tertiary street can be de-

scribed as follows: each tertiary street has its main segment, stem-like, that starts off the secondary street and extends deeply into the local area. Off the main segment of the tertiary street smaller segments, branch-like, ramify into different parts of the local area in order to provide access to all houses.

b. Along the tertiary streets various small local centers can emerge, a widening along the streets, or a small place at the meeting point of two smaller segments of street. These are places for children to play, or for people to sit under trees.



c. Car movement <u>between</u> neighborhoods never occurs along tertiary streets. Therefore, each tertiary street, regardless of its possible continuation into the next neighborhood or its termination within it, is a dead end for cars, and should be arranged in such a way as to provide for turning points for cars, usually in the form of a miniature T-street junction.



When a segment of the tertiary street is being placed and shaped, two conditions must guide the actual operation of shaping the segment:

a. The segment of the street, by itself, is a clear entity, with its own good shape, its own direction governed by the site configuration and by its intention to give direct access to the house volumes themselves rather than to their gardens. A segment of the street will be fully established through a sequence of steps; some lots in the beginning will hint at it, at its approximate location and shape, and then some other lots which will come later will pin it down, give it precise dimensions and shape.

b. The segment of the street is part of the whole tertiary street system and it has to contribute to the making of a well-structured and coherent tertiary street network in the local area. Therefore, when laid out, its connection with the existing segments of streets is very important. There is a hierarchical and sequential movement from the secondary street into the main stem of the tertiary street, then into a smaller street that branches off the main stem, and possibly into even smaller paths that ramify off this branch.

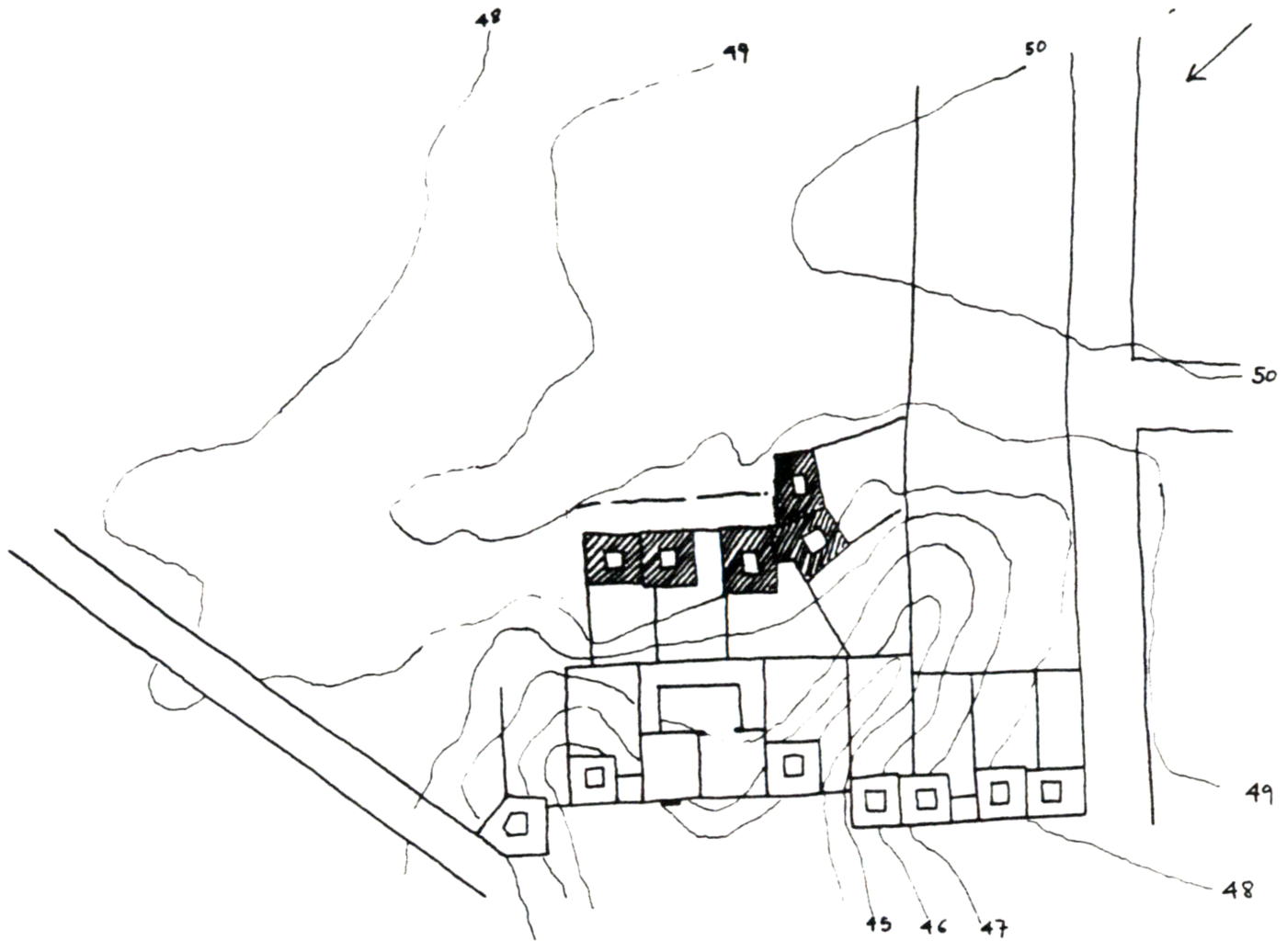
Each segment is placed in such a way as to meet these conditions as well as possible.

STEP 10f: Now you repeat the cycle of steps 10c, 10d, and 10e, over and over again, until the whole area is subdivided.

In order to explain this, we now illustrate a sequence of six cycles, which simulate the lot subdivision of area #1 that we have chosen to present as a detailed example, with the necessary explanations of details.

CYCLE 1

First group of lots. This particular part of the area was chosen to be subdivided first because of the rather irregular land configuration. The slope of the ground dominates the wind on the layout of these lots. First part of street is hinted at, not yet clearly nor fully defined.

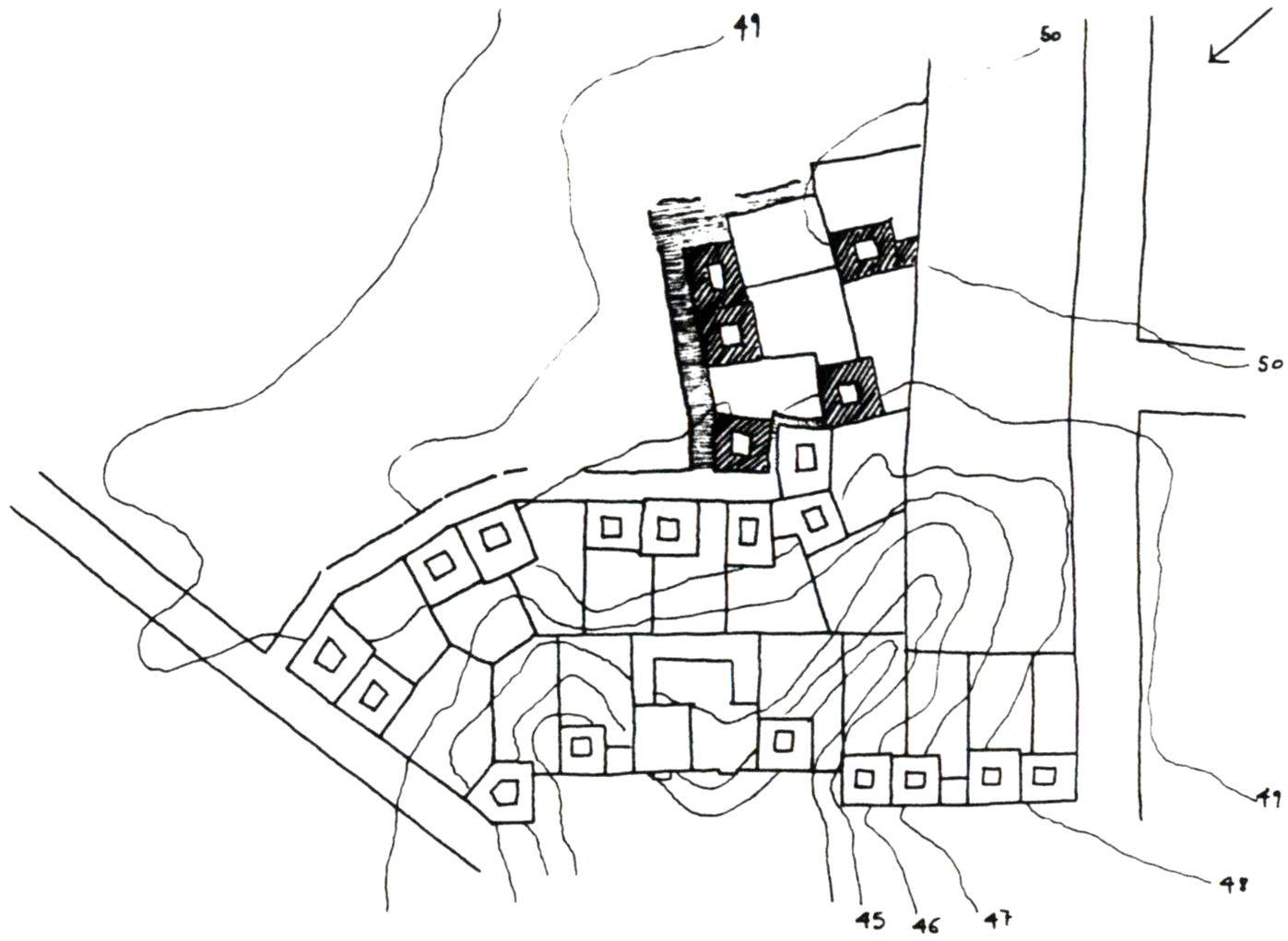



CYCLE 2

Second group of lots is laid out, again following the requirement about the slope. A new piece of street is laid out also. It is a continuation of the street located in the previous step, and it connects with the secondary street. These two parts of street will form the main stem of the tertiary street that will lead from the secondary street into this area.

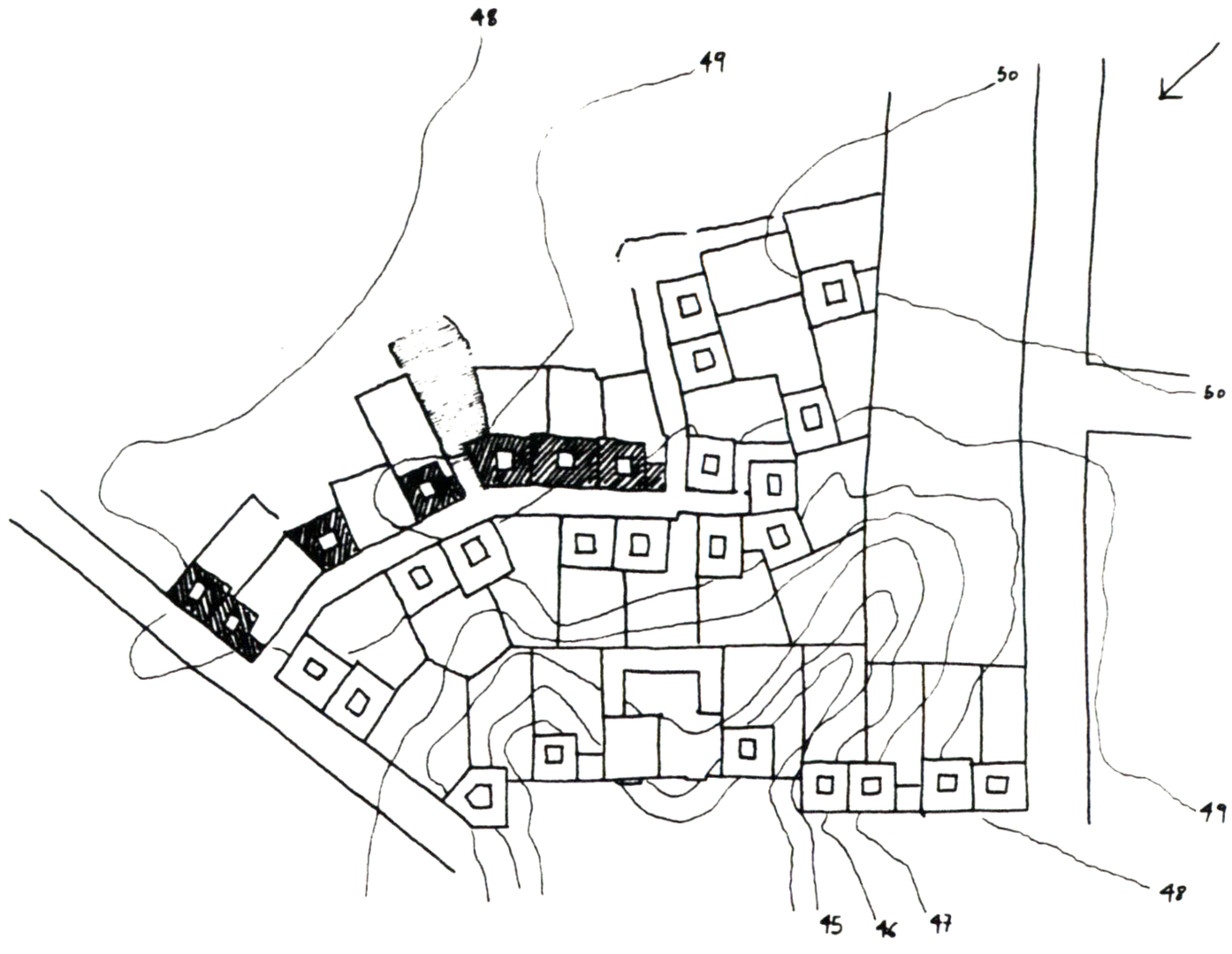
CYCLE 3

This group of lots lies on a flat piece of land, and therefore their layout is governed by the rule about the wind. The first ramification of the tertiary street is hinted at, with a small widening at its end suggested by the layout of that particular corner lot that forms it. Also a small alley in between two lots has been laid out to provide access to the lot at the back.




CYCLE 4

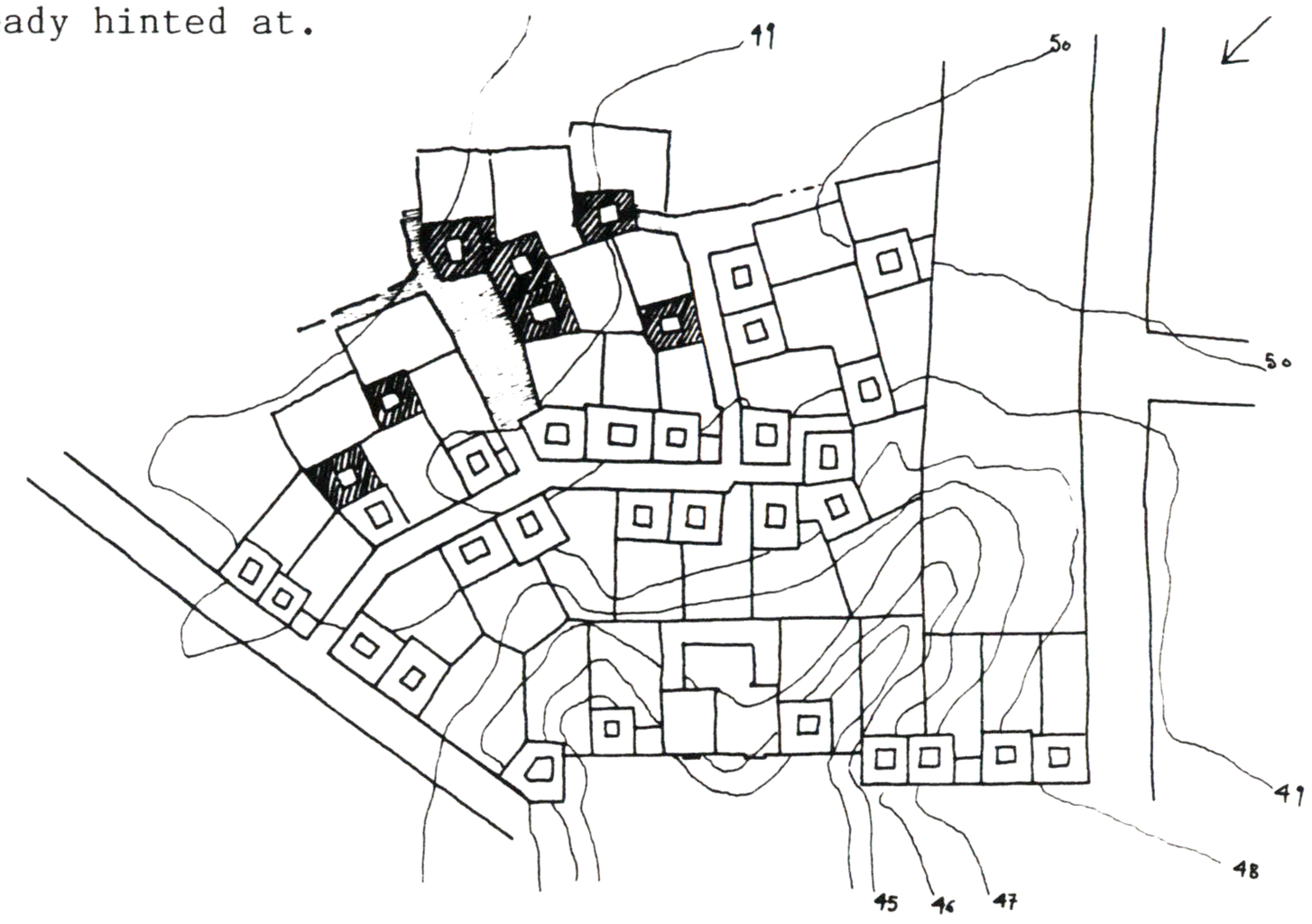
Lots are laid out now along the main stem of the tertiary street. Their precise layout will pin down the street, will give it its width and shape. A new branch of the tertiary street is hinted at to provide for the way into the unsubdivided part.



CYCLE 5

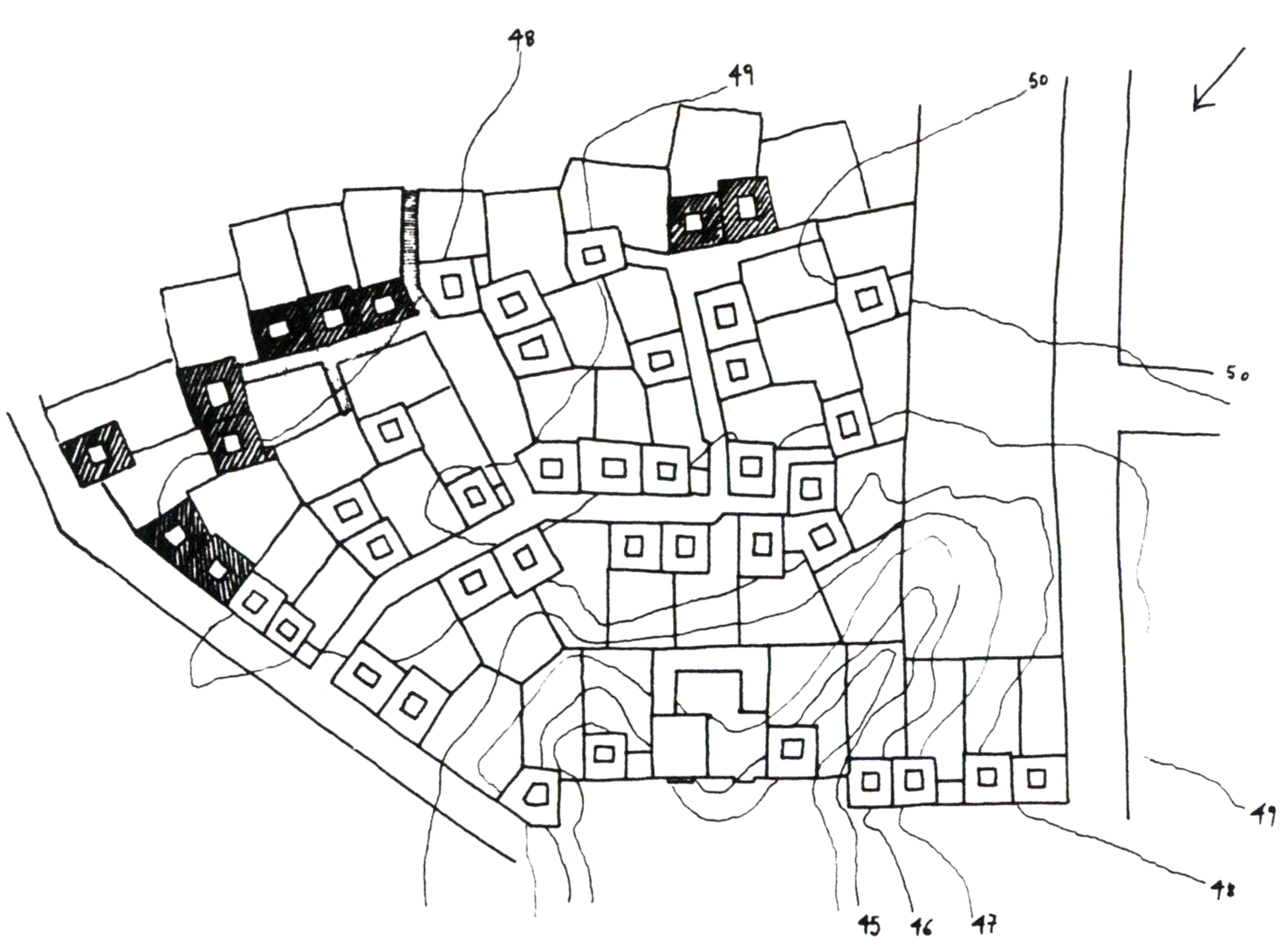
Most of the lots of this step are on a flat piece of land, and those which are on slopy land, the slope does not oppose the direction of the wind. Therefore all of them are laid out according to the direction of the wind.

The second ramification of the tertiary street is pinned down and it takes the form of a small square, which will continue to some smaller paths already hinted at.




CYCLE 6

The last lots of the area are laid out. They fill out unsubdivided land, and they pin down streets already hinted at before.

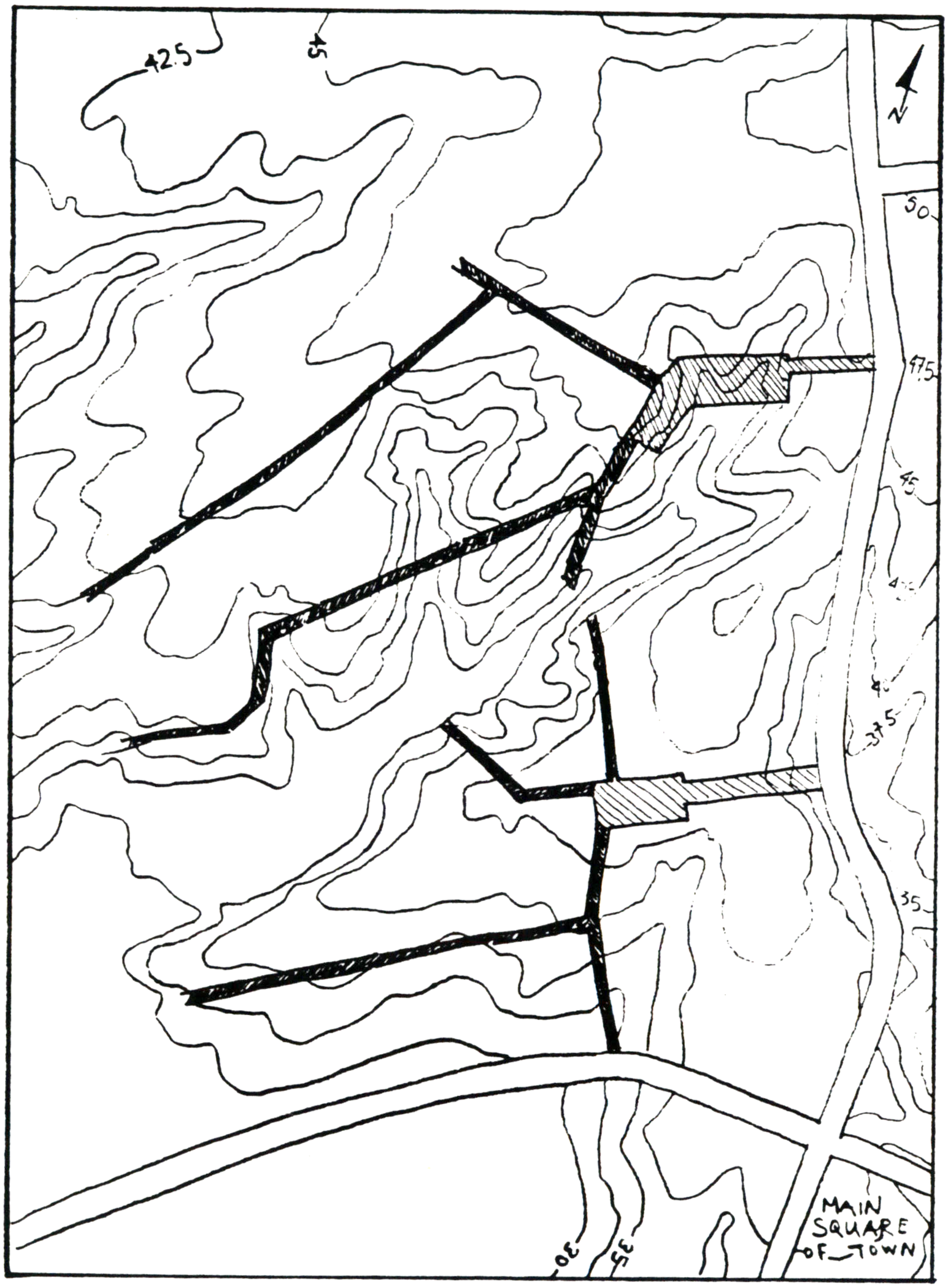


STEP 11: AFTER THE SUBDIVISION OF THE LOTS IN THE DIFFERENT AREAS OF THE NEIGHBORHOOD, YOU SHOULD SHAPE THE SECONDARY STREETS PRECISELY.

The secondary streets have been located earlier. Their direction and approximate width are known. However, their final precise shaping and formation cannot take place together with the subdivision of the lots. At this time you will have to give to the secondary street its exact width; it can vary from 7 to 10m, so that it will provide for a two-way lane for cars and for sidewalks. The width of the secondary street will be a function of its length, and it does not have to remain the same for its full length. It can narrow down when approaching its end, or a turning point. However, the change in the width of the secondary street should not be arbitrary. It will have to produce a street that consists of one or two or three parts that are easy to drive along, pleasant to walk, and produce a coherent street.

In some cases along a secondary street a small square, an intimate place might emerge. Its size and placement should be such that it does not compete with the main square of the neighborhood, but creates another small center in the neighborhood.

All of these will have to take place together with the lot subdivision along them, so that public space and house will form together a coherent whole.




The secondary streets as they were laid out in step 6.

The final formation of the secondary streets

STEP 12: PRODUCE A MAP OF THE NEIGHBORHOOD THAT CONTAINS ALL YOUR DECISIONS MADE ON THE SITE.

After you have completed your work on the site of laying out the neighborhood, it is necessary to make a precise recording of all the stakes put on the site. On the basis of this survey, you will make the final drawing of the neighborhood. You may need to make some minor changes or adjustments, but do not alter the major structure of the neighborhood in its major aspects. That will spoil the relationship of the layout of the neighborhood with the reality of the actual site.

In some cases it may be necessary to conduct the final steps of the layout process, which include the lot subdivision and location of smaller streets away from the site. However, in any case, all of the first six steps, which determine the overall structure of the neighborhood, will have to take place on the site.

# 6. PROVISION AND COST OF SERVICES

In accordance with the wishes expressed to us by ISA, we have defined a road pattern for the neighborhood which is reasonably economical in length, and therefore cost of services.

Of course, the cost of services would be smaller if the lots were smaller in absolute area, or narrower in frontage. However, for the reasons discussed in section 4, we consider these alternatives unacceptable for cultural, climatic, and economic reasons. Above all, it is necessary to bear in mind that the economic reason may have dramatic impact on the success or failure of the new town. It is essential that lots be attractive to newcomers, since the economic life of the town depends absolutely on a steady influx of new inhabitants. This will happen only if special conditions exist which make Guasare a favorable choice, and this requires that lots in Guasare be more attractive. We therefore consider it essential that lots be large (about 470 $m^2$ ) and close to square in shape.

Under these conditions, the street network we have defined creates a minimum possible average length of services per lot: about 12m per lot.

In order to save money and to reduce the interest cost of infrastructure, we propose the following four-step sequence for the provision of services:

1. Provision of water and sewer and electricity in the main and secondary streets. This will be done immediately after the initial subdivision of the neighborhood.

2. Provision of water, sewer and electricity in tertiary streets. This will be done step-by-step, according to the development which proceeds in different local areas, and the rate at which that development proceeds.
3. Paving of main and secondary streets, with provision of sidewalks where necessary.
4. Paving of tertiary streets.

# THE MAIN INFRASTRUCTURE OF THE NEIGHBORHOOD

Service lines along collector road

First increment of service lines in the neighborhood, along the main and secondary streets

Second increment of service lines in the neighborhood, along the tertiary streets

# CHAPTER TWO

## THE LAYOUT OF THE INDIVIDUAL HOUSES

# 1. THE PRINCIPLE OF INDIVIDUAL FAMILY CONTROL

## ASSUMPTIONS ABOUT THE PHYSICAL DESIGN OF HOUSES AND CONTROL OVER THE DESIGN

1. We assume that almost all families will have control over the lay-out of their own houses, and will therefore have charge of the design.
2. This process will be conducted within the framework of a set of rules which will be made available to every family. The family will use the rules to define the increment of construction they wish to build.
3. Available financing will be contingent on the use of these rules by the family, and on the conformity of the resulting house to this system of rules.
4. The rules will be consistent with all necessary aspects of Venezuelan climate and culture.
5. The way the rules will work will allow incremental growth of all houses, so that even in cases where financing requires slow growth, one room at a time, nevertheless the system of rules will guarantee that the house forms a coherent whole.
6. We assume that this layout process, and the use of the rules by the families, may require some small amount of assistance by the staff of the local builder's yard being operated under the control of Corpozulia.

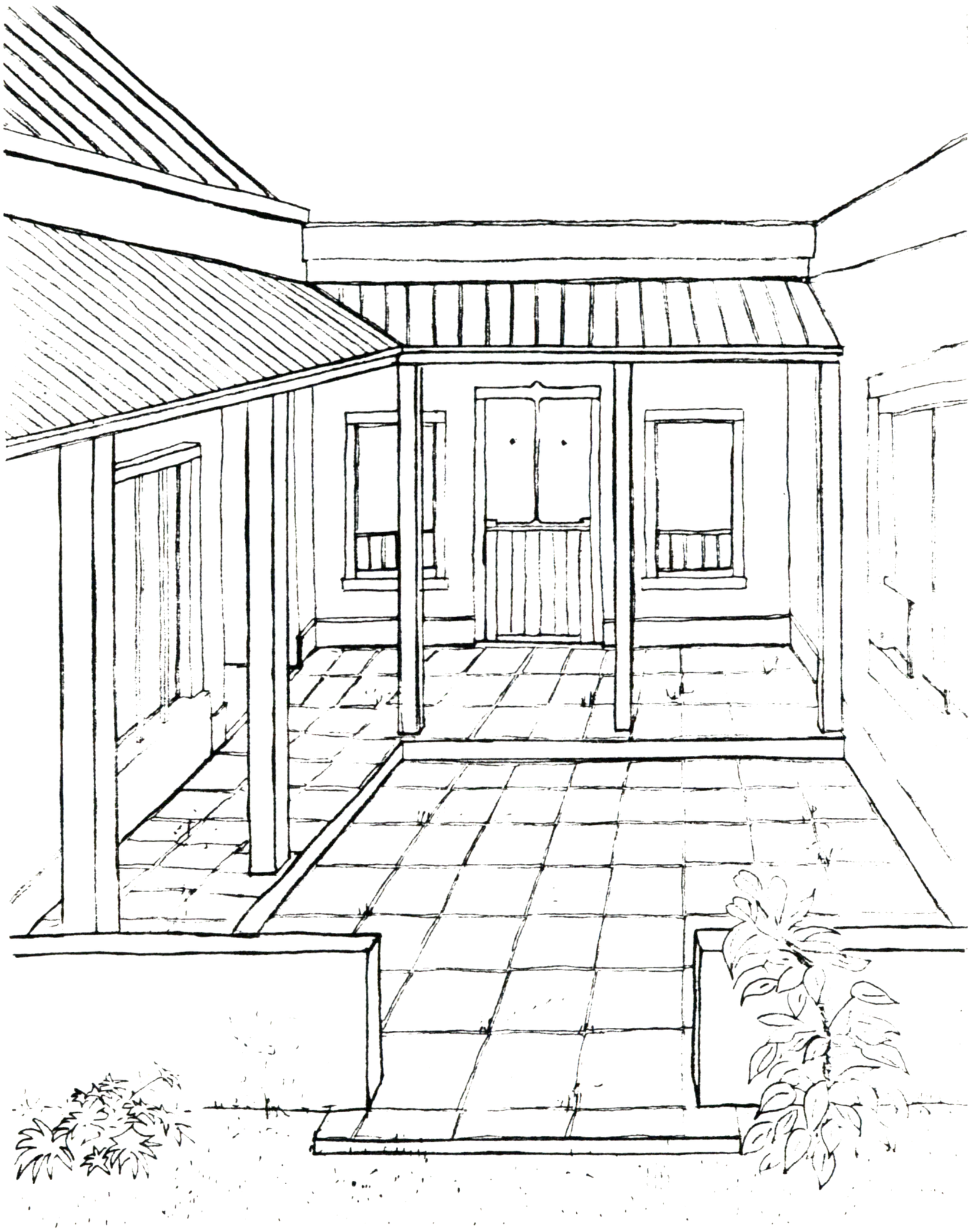
In order to stimulate the growth of houses, we propose that a few miners' houses be built, completely inside the neighborhood, at the beginning of the neighborhood's growth. This is consistent with the

principle agreed on in September 1982, namely, that miners' housing which is built without participation of users, will to some extent be mixed in with the other housing of the neighborhood.

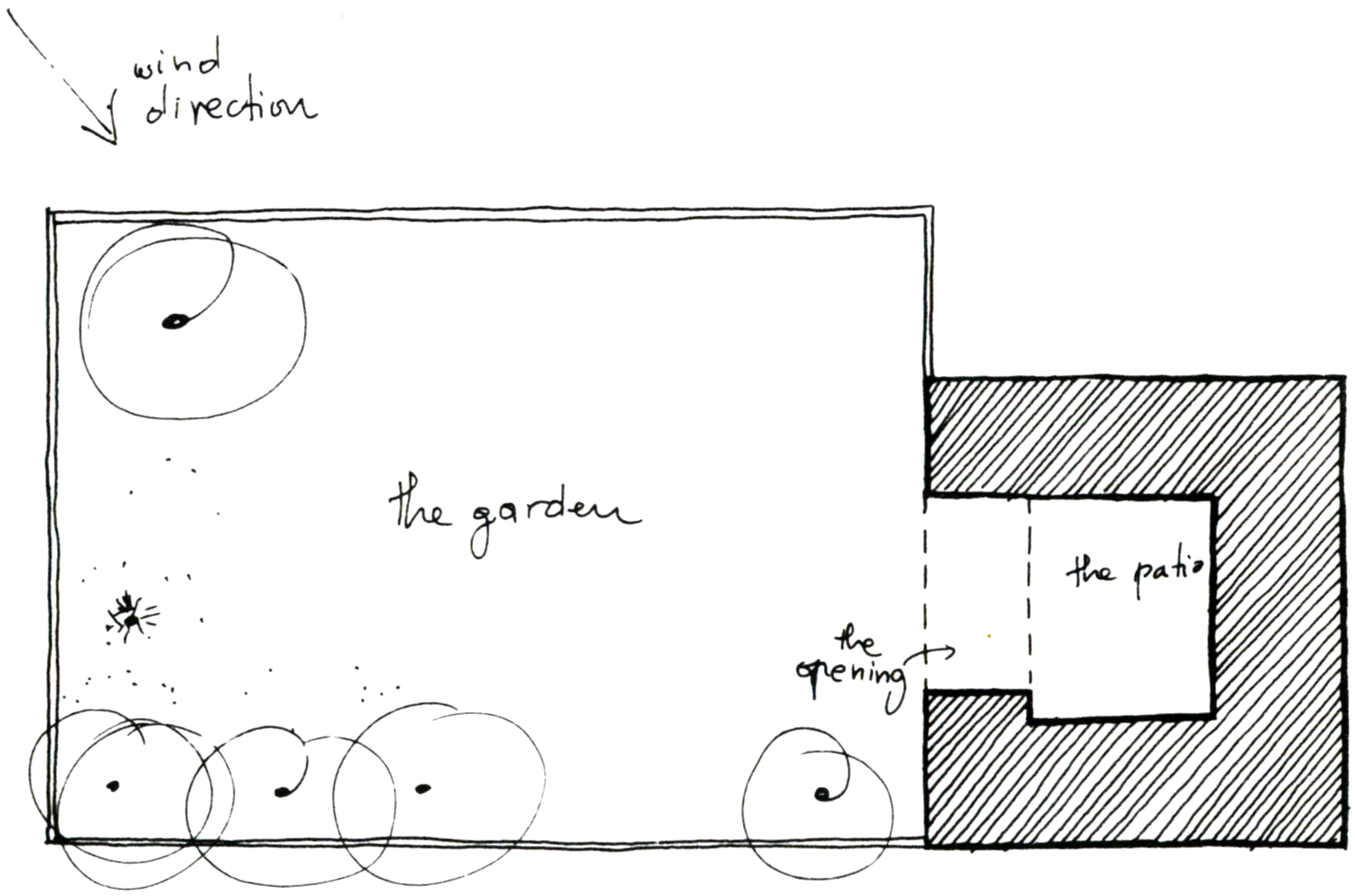
# 2. BASIC PRINCIPLES OF HOUSE ORGANIZATION

# HOUSE PATTERNS

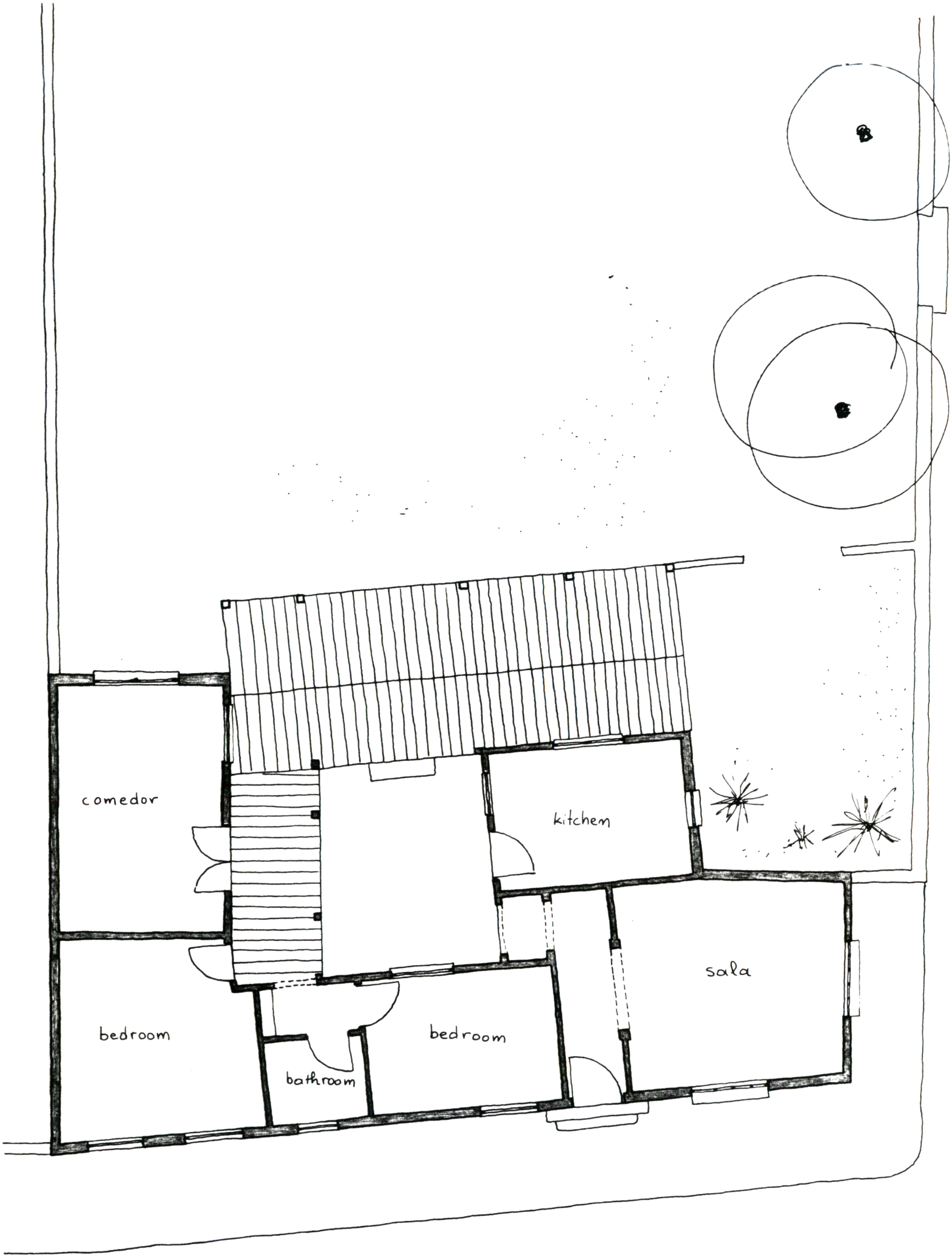
1. Each house has a patio at its center. The patio is the heart of the house, with all the rooms surrounding it and opening into it.



2. Every house has a main big garden, about two thirds the size of the lot. The garden has rectangular shape with many trees and plants.
3. The main garden and the patio are lined up in the direction of the wind so that the wind blows from the garden into the patio.
4. There is always an opening (kind of neck) in the volume of the house between the patio and the garden so that wind blows directly into the patio.



5. The patio is surrounded, at least partly, by a wide, porch-like veranda, 2 to 3 m wide.
6. In general, the house volume touches the street, if not all along its frontage, on its major part. This is especially important at the main and secondary streets, and on important street corners.
7. There is occasionally a porch on the front of the house. It is a small uncovered paved area that creates an area of transition between the street and the house entrance.
8. Each house has a formal sala for receiving guests. The sala is always located at the front of the house next to the main entrance.
9. Each house has a comedor for family gatherings, eating, etc. The comedor is the largest room of the house, located somewhere at the back of the house in direct relationship with the patio.
10. The kitchen of the house is one of the most private areas of the house, located at the back of the house, usually between the patio and the garden.
11. Most of the houses have an enramada in the garden. The enramada is often connected or attached to the volume of the house that stands between the patio and the garden. The enramada helps to attribute wholeness in the formation of the garden.


comedor
kitchen
bedroom
bathroom
bedroom
sala

12. The house is composed of distinct volumes, two, three or more depending on the house.
13. One of the volumes of the house has a slightly more obvious and more pronounced roof than the rest of the house. This is the part of the house that occupies the most important position. Usually it is the comedor.

14. The main circulation in the house happens through the patio. The main entrance into the house leads from the street or porch into the patio, and from there circulation is distributed into the different rooms and areas of the house.
15. The front door of the house is placed in such a way that passers-by can get a quick glimpse of the patio when the door is partly open.
16. The house provides for a variety of spaces with respect to feeling: from the brightest and lightest areas in the garden to the cool and

shadowy patio, to the dark and enclosed rooms. Also, from the most public areas of the house along the street, like the sala and the porch, to the most private rooms in the back of the house, between the patio and the garden, like the kitchen and the comedor.

17. There is a garden wall that separates one garden from the other and the garden from the street. The most important part of the garden wall is that which defines the boundary between the street and the garden.

# 3. THE RULES OF HOUSE LAYOUT

The following rules will be given to every family which buys land in Guasare. The planners and architects of CES and Proguasare will then help each family to use these rules to lay out a house for themselves, directly on their own lot, using stakes. Arrangements will be made for the house to be built according to the various financing packages, and construction procedures, described in chapter 3.

## THE LAYOUT OF YOUR HOUSE

### FIRST STEP: SIZE OF THE HOUSE

Before you start laying out your house on the ground you have to make a major decision concerning the size of the house. The size of the house you will lay out at this point is not determined by the available financing you have at your disposition. Since houses will grow incrementally in the following years, at this time you will lay out the house that suits your family needs and the house that you dream you will be able to complete in the following five years.

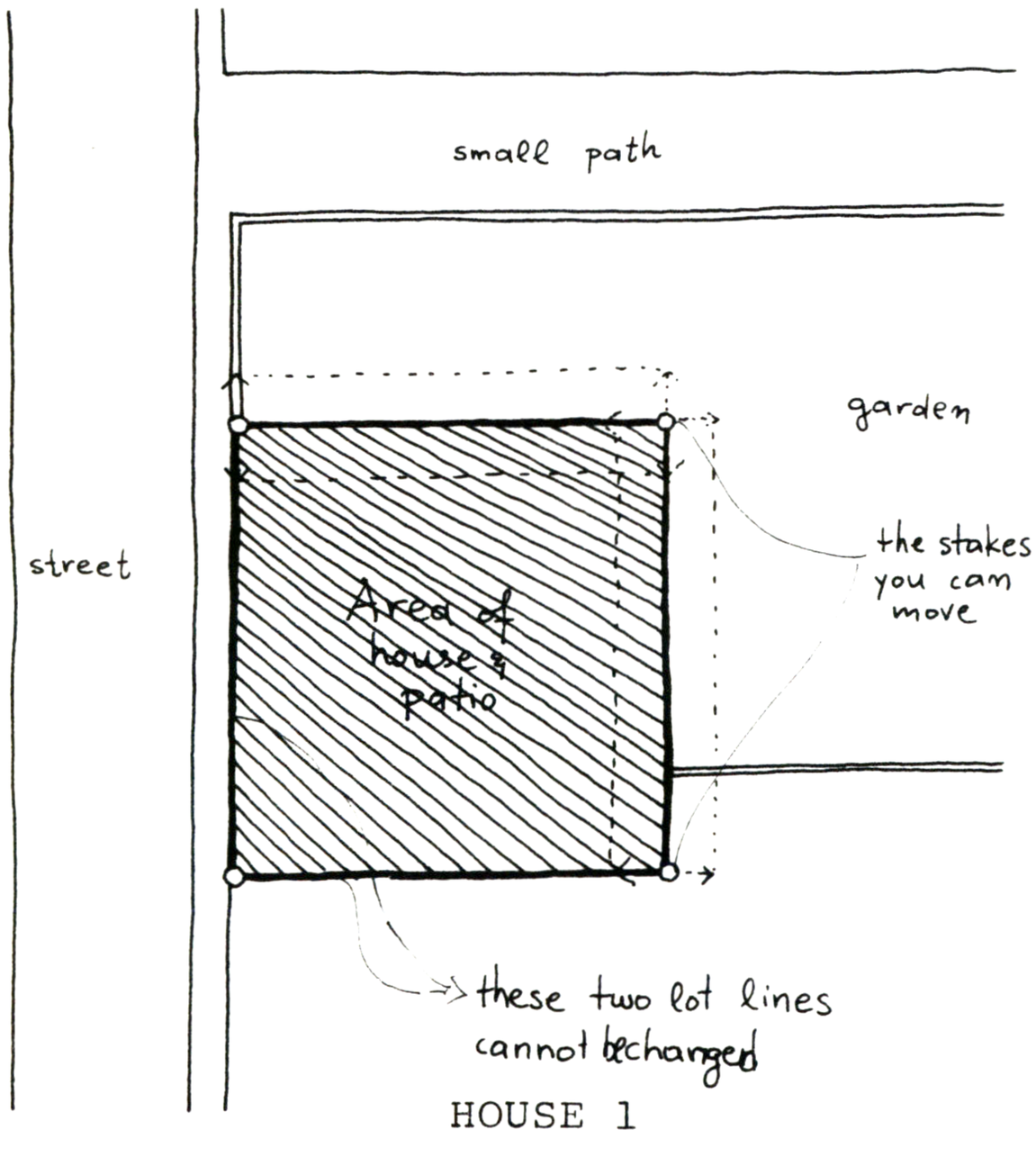
Now that you know your lot and the approximate amount of square meters that you want to build, you can start to lay out your house on the site. This means that you are going to shape each room on the ground. After each step, place stakes in the ground according to the instructions. This will help you to really understand how the house is going to be, how long and wide it will be, and how big each room will be. Do not hesitate to move the stakes until you are completely satisfied with each step. Only when you are sure that you like the house, that it is exactly as you want it, go on to the next step.

## SECOND STEP: THE LIMITS OF THE HOUSE

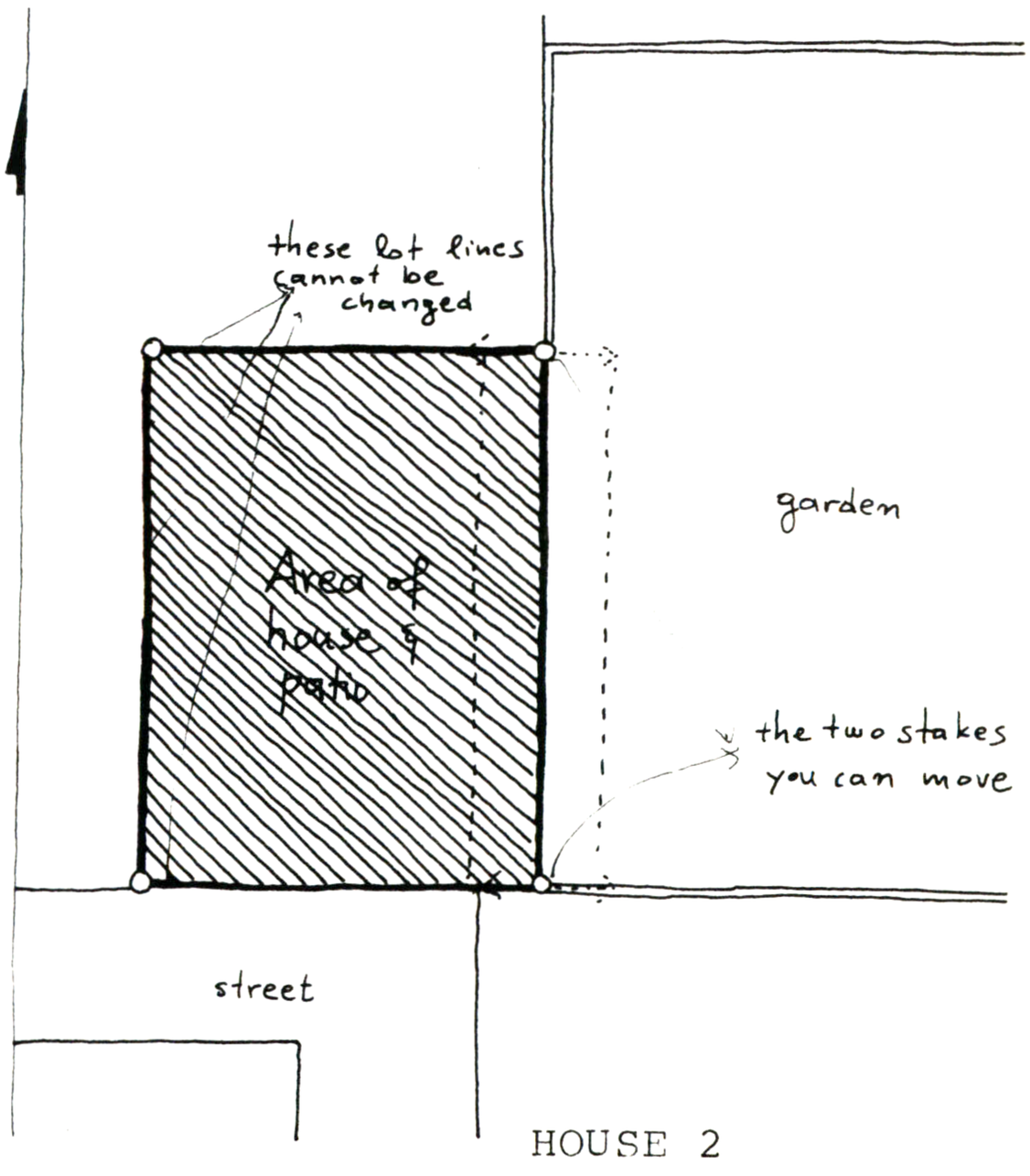
The limits of the area allocated for the house volume have already been defined as part of the lot subdivision process, and it has been incorporated into the legal specifications that define the boundaries of each lot. (See Steps 10.c and 10.d of the subdivision rules.)

At this point you will place the stakes in the corners of the rectangular area allocated for the building of the house according to the specifications of the legal document of your lot that you have received from Corpozulia. The size of the house area, that includes both house and patio, will vary between 10 x 10 m and 12 x 15 m.

In cases where the area specified as house area in the legal document is smaller or bigger than the size of the house you want to lay out, then you may adjust the house area. You will do so only by moving the stakes that define the boundary between your house and the garden. You are not allowed to move any of the other stakes from the positions as specified in the legal document.



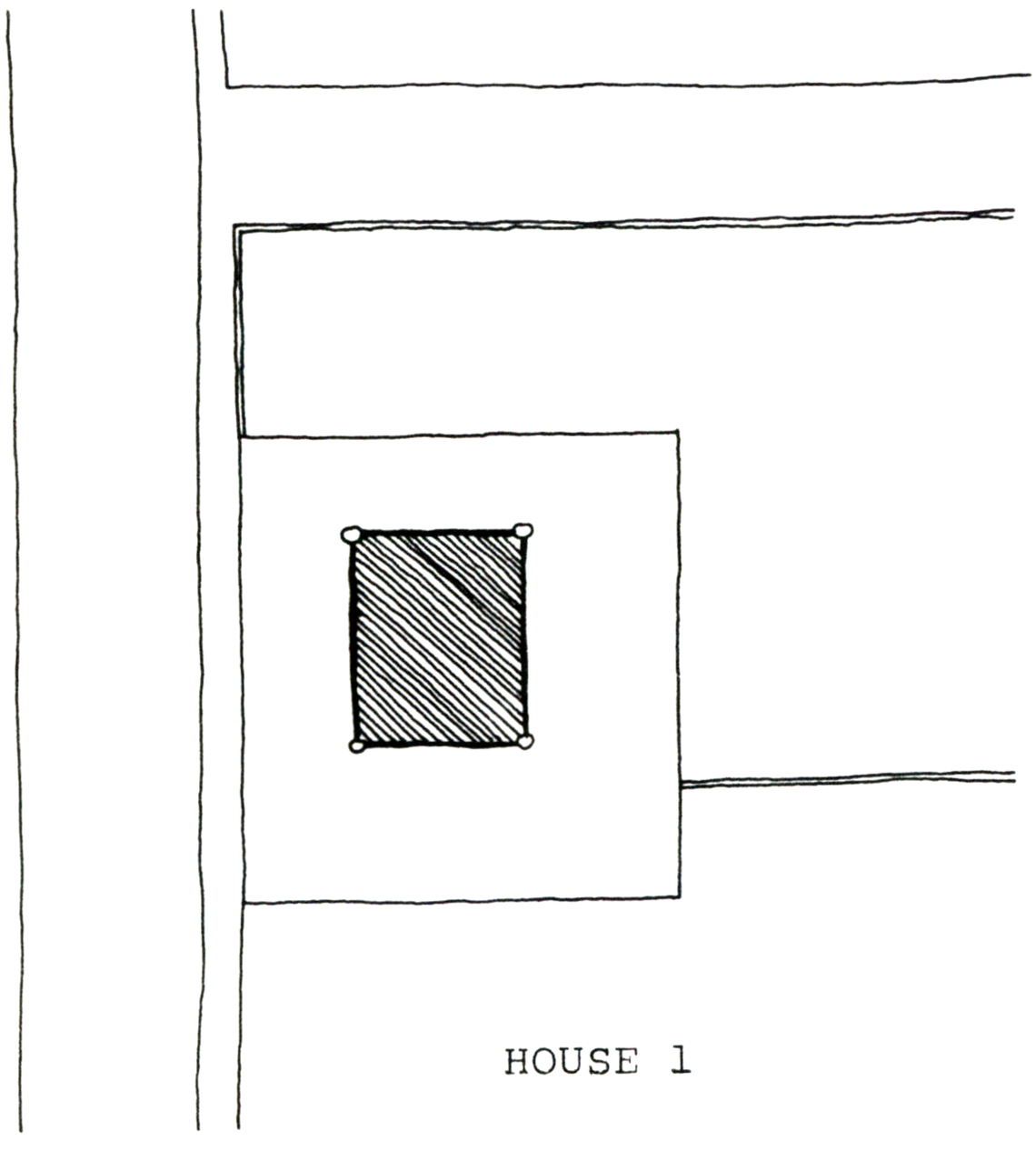

HOUSE 1



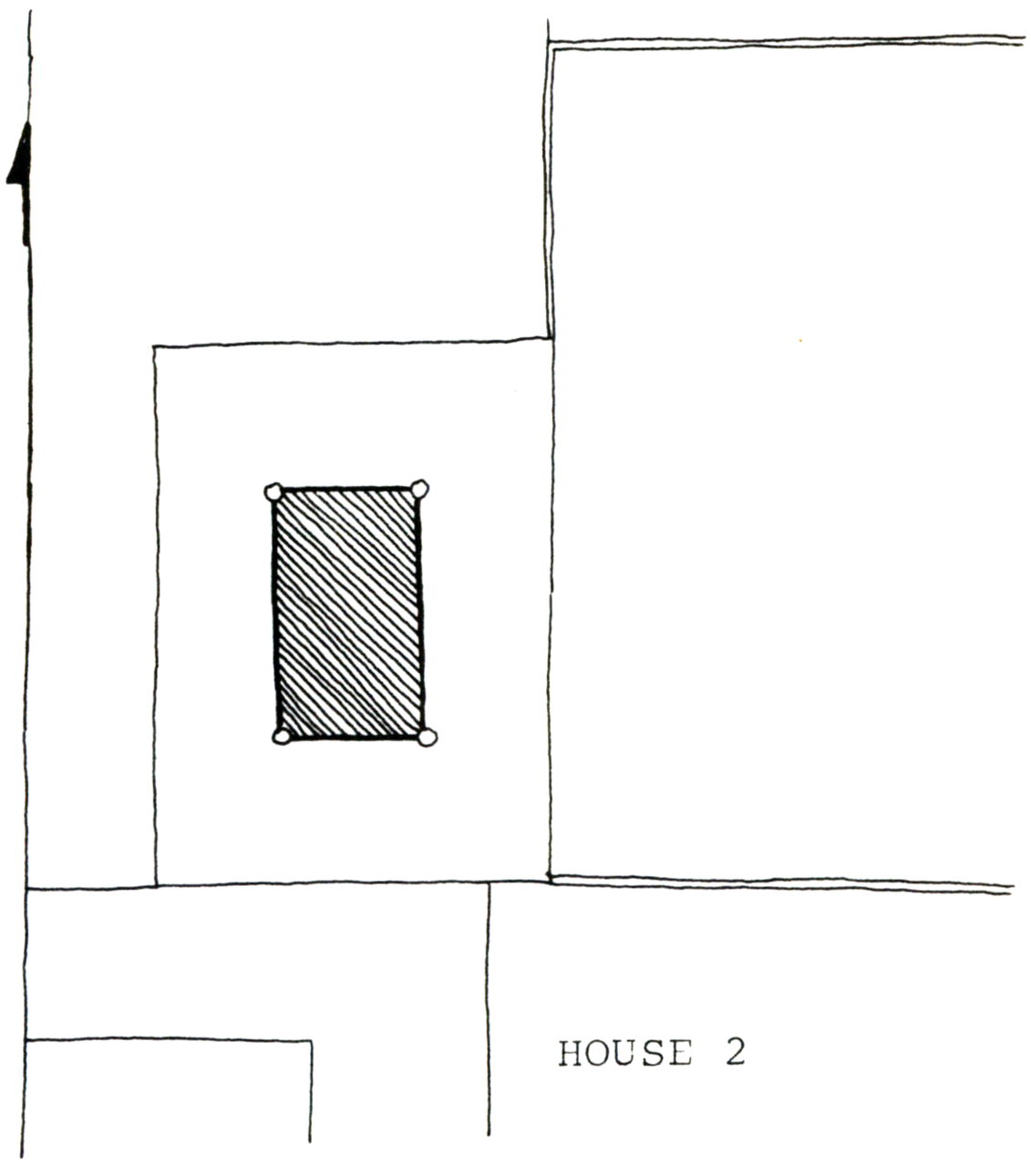

HOUSE 2

THIRD STEP: LAYOUT OF THE PATIO

1. The patio is an open space, not covered, located in the center of the house. It has a rectangular shape.
2. Its size varies from 18 $m^2$ to 23 $m^2$.
3. Once you have chosen the size, shape the patio on the ground by putting one stake on each corner of the patio and extending a thick rope along each side. This will help you to understand how big the patio is, and to shape it as you want it. Later, when the rooms of the house are laid out, you may have to readjust this first layout.



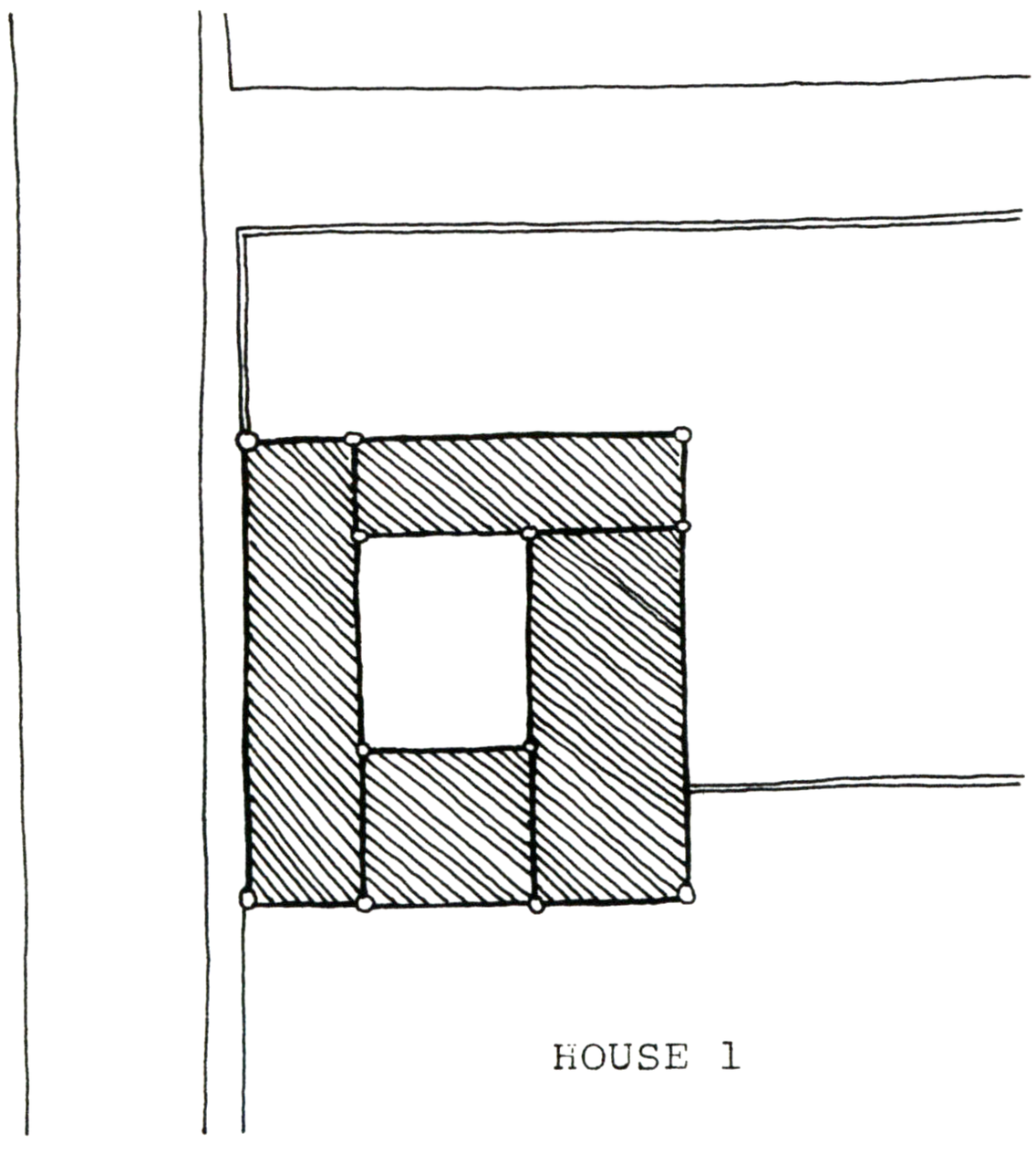
HOUSE 1



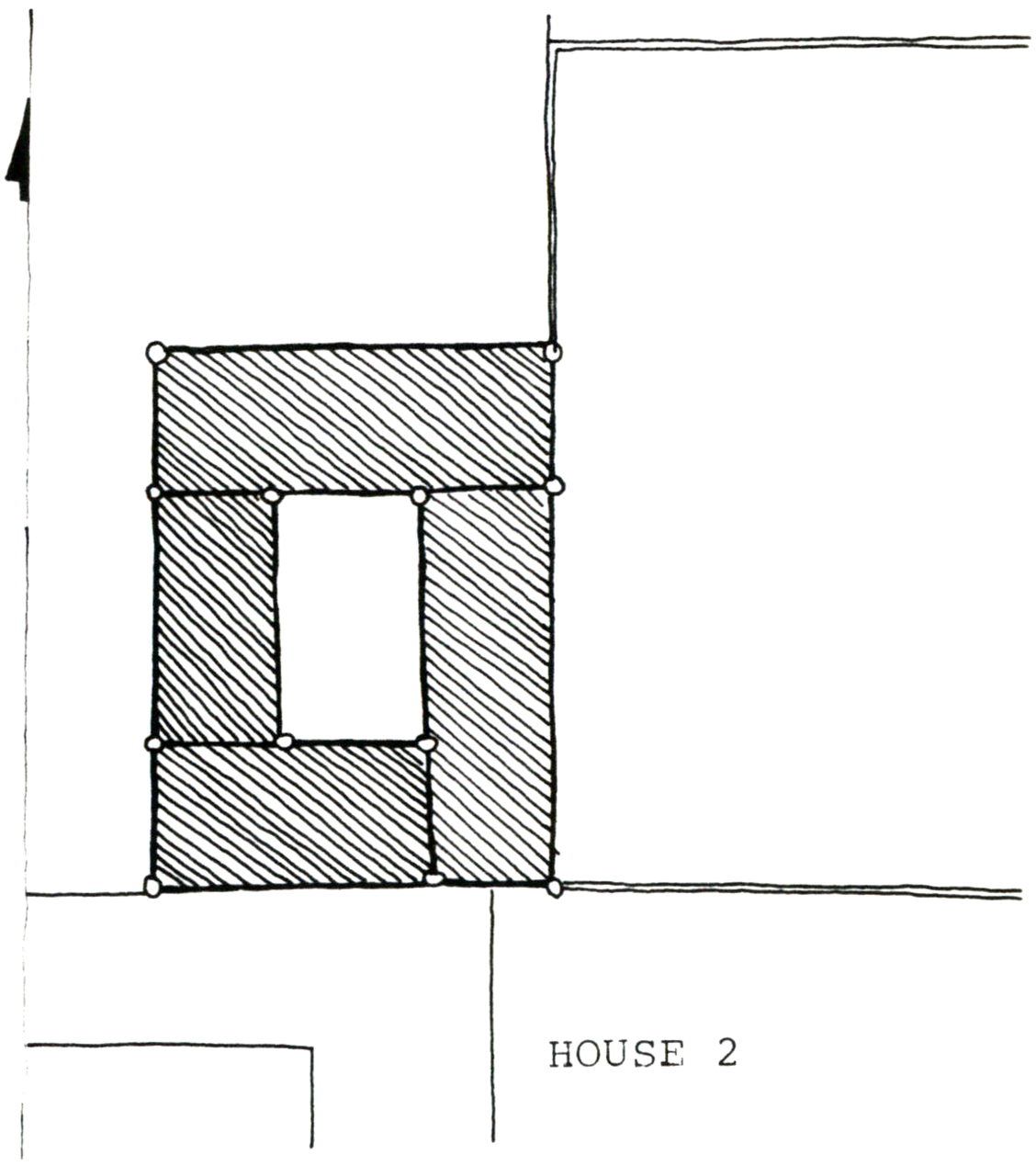
HOUSE 2

FOURTH STEP: LAYOUT OF THE WINGS

1. In laying out the patio, you have created four wings. All the rooms of the house will be built in these wings. Probably you will have to readjust these wings as you lay out the rooms.
2. The width of the wings varies from 2.6m to 4m.
3. One of these four wings should be wider than the others. This is the one where the biggest room of the house, the comedor, is located. This wing should have a good orientation, and face the breeze with a nice view into the patio or into the garden.



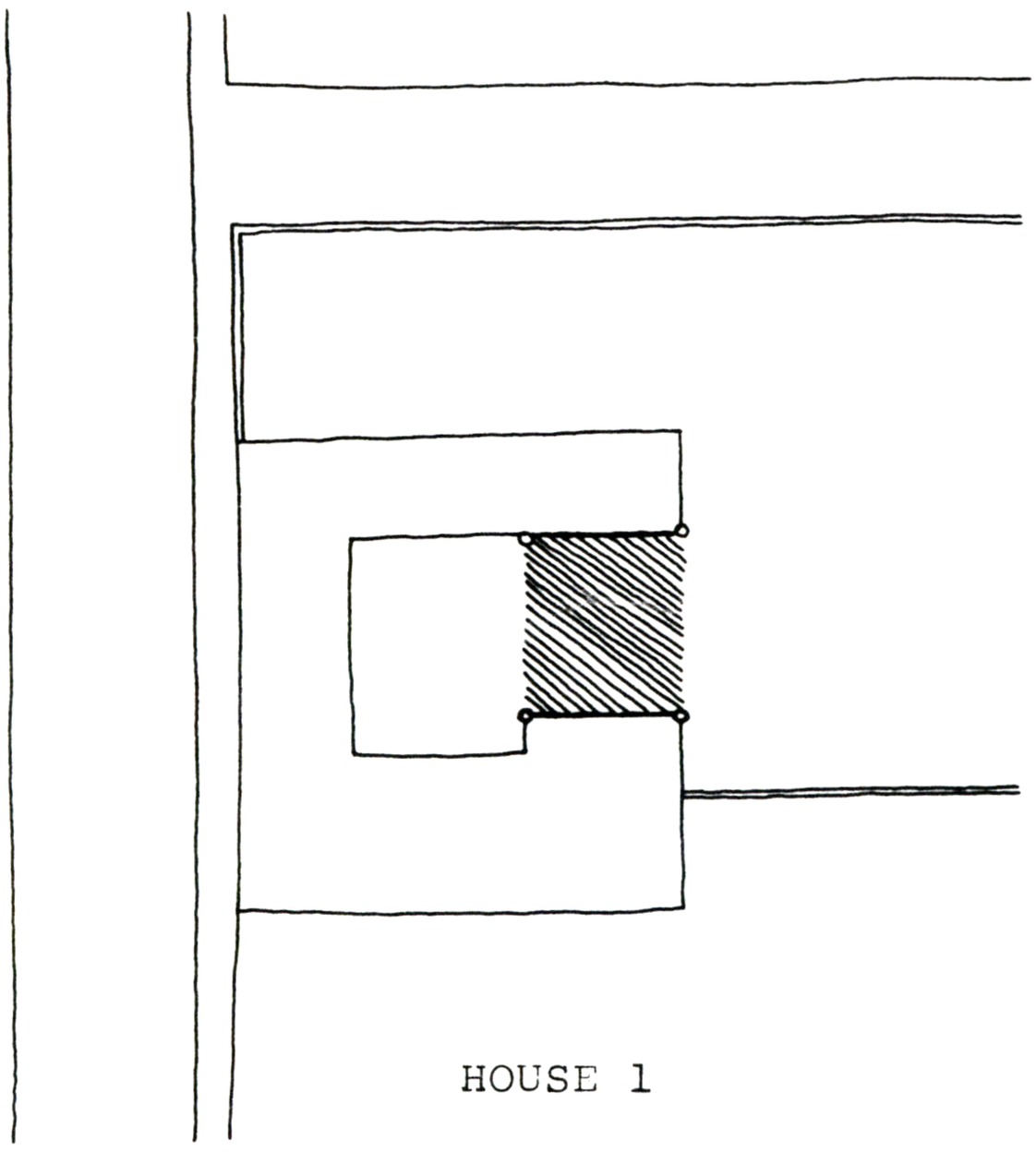
HOUSE 1



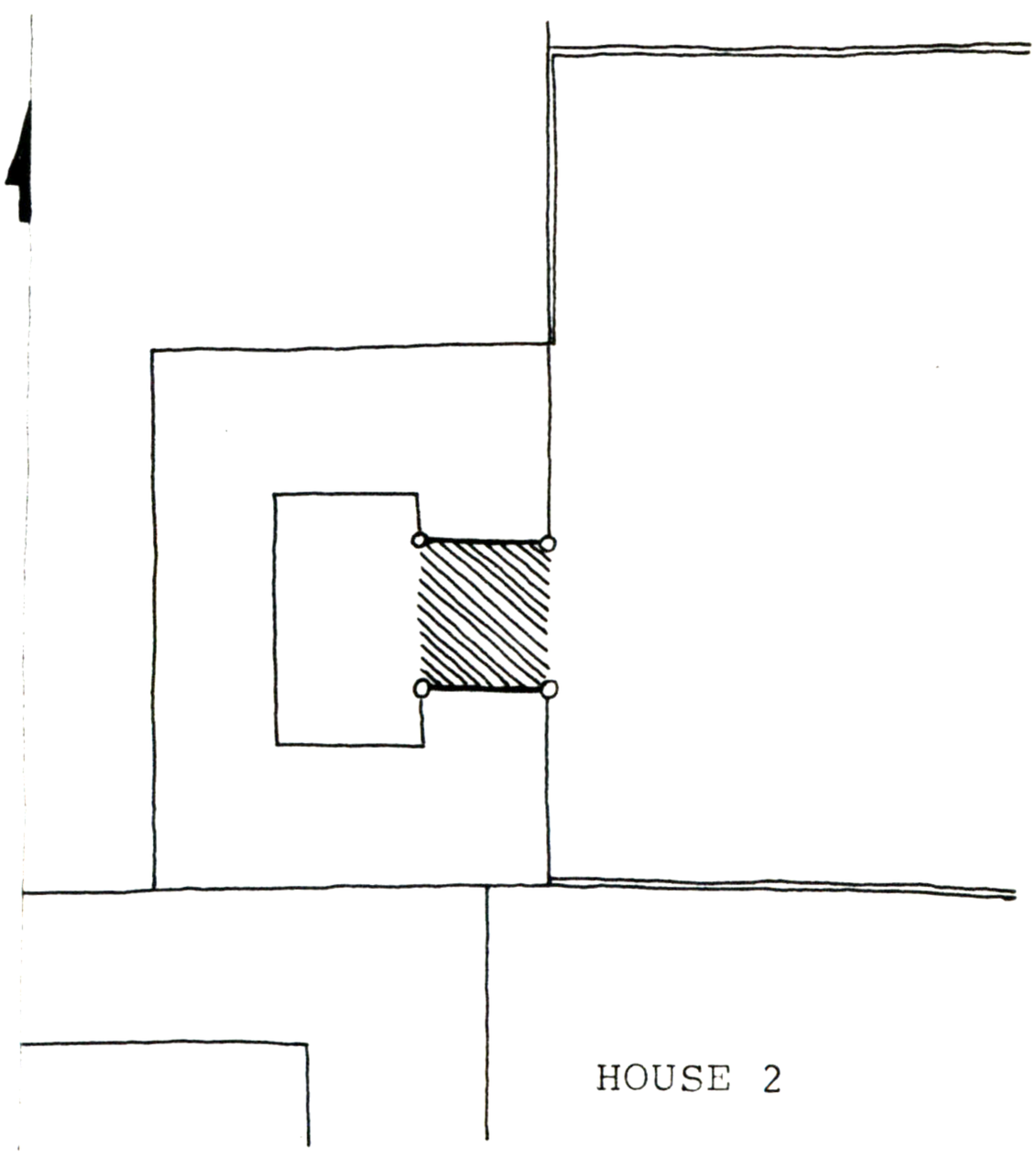
HOUSE 2

FIFTH STEP: LAYOUT OF THE OPENING

1. One side of the patio opens directly into the garden.
2. This opening is a transition space which connects the patio and the garden, and it will permit the wind to blow from the garden to the patio. It is located on the wing which is between the patio and the garden.
3. This opening can be covered or not (in most cases it is covered); it can be just a passage from the patio to the garden -- 2m wide is the minimum, or can be a more spacious area, as wide as the patio.
4. When the house is small, the opening can be on two sides. In this case, one of the openings is always covered to help to shape the patio.



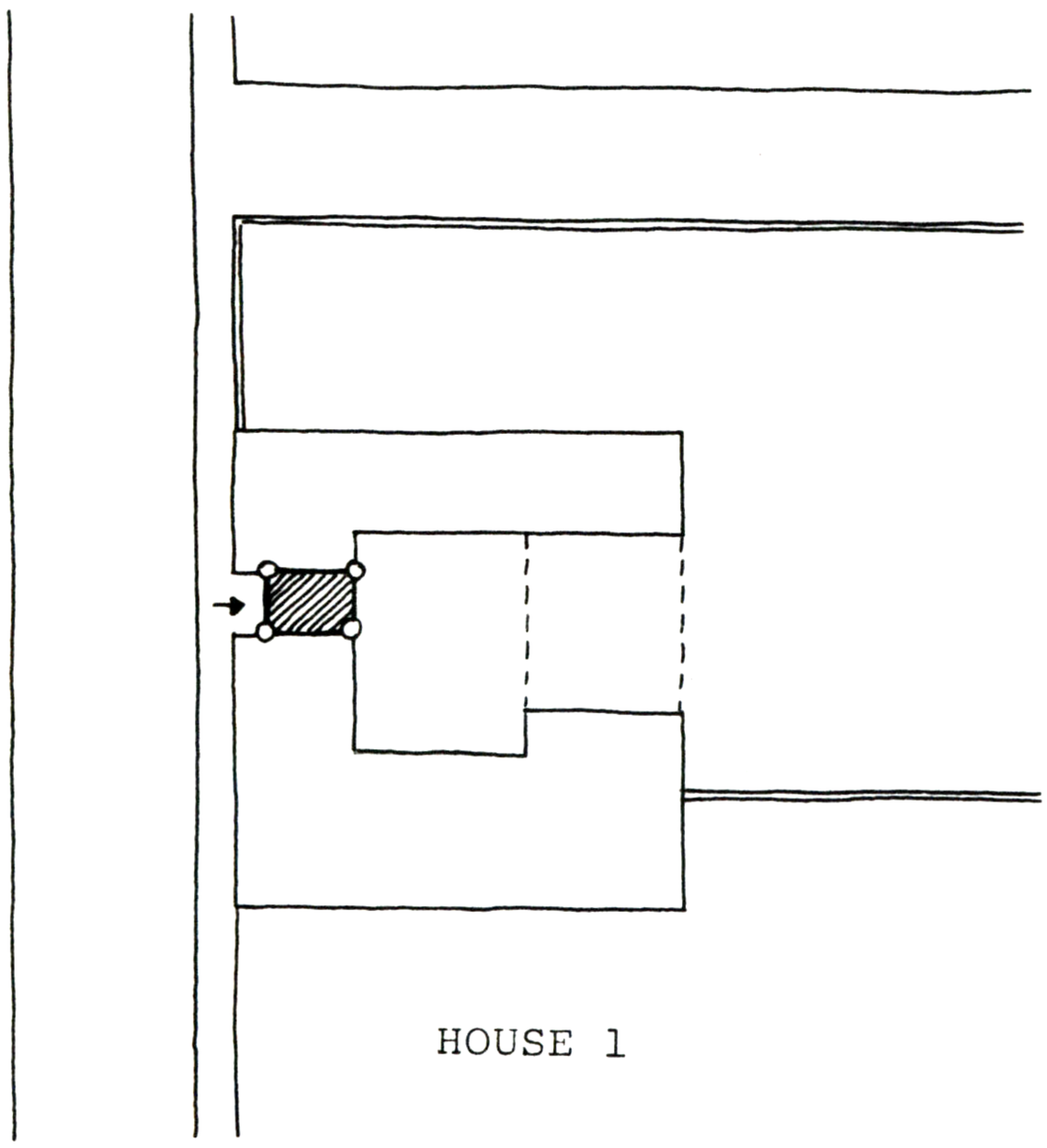
HOUSE 1



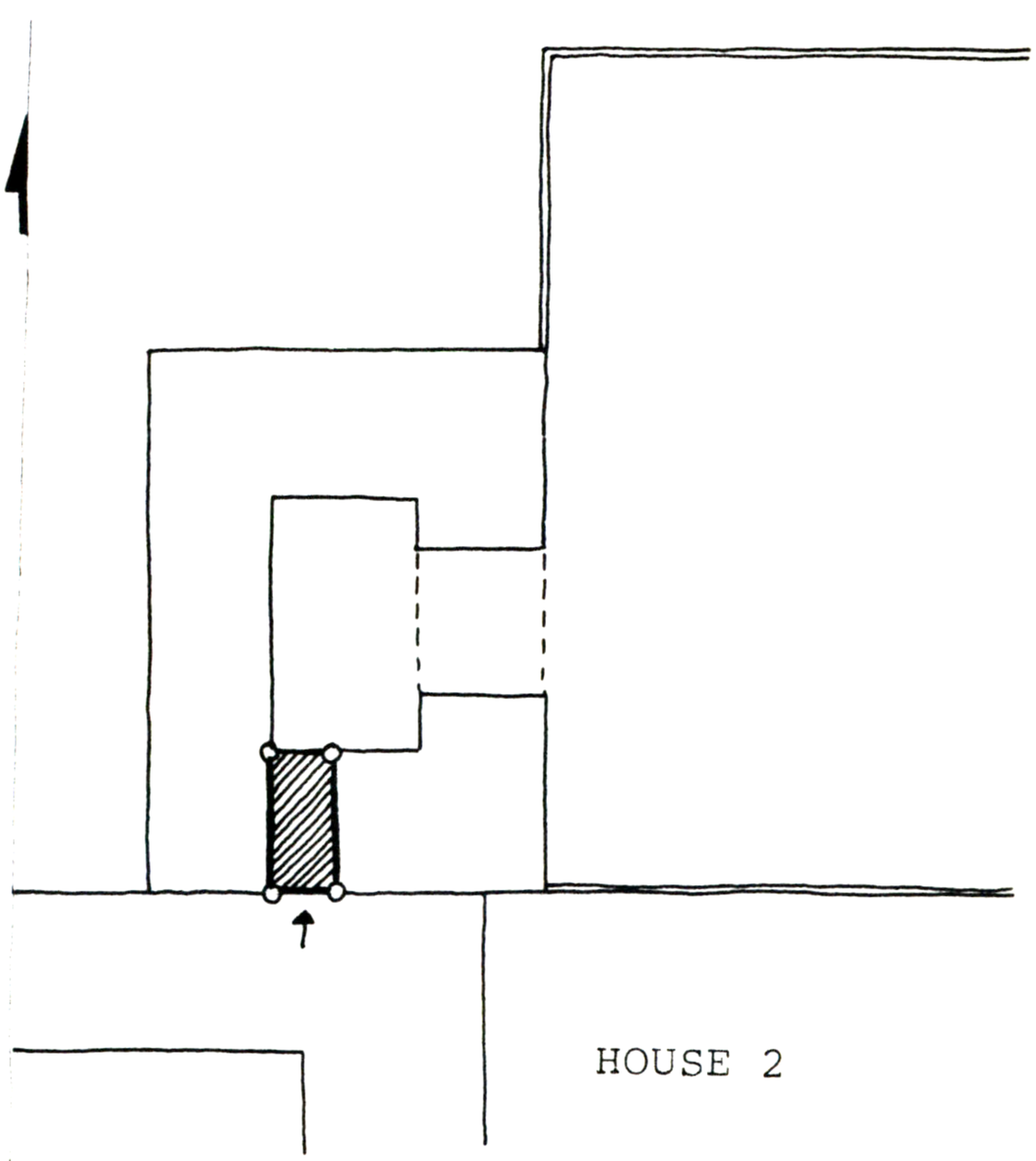
HOUSE 2

SIXTH STEP: LAYOUT OF THE ENTRANCE

1. The entrance room is always located on the main street.
2. The entrance room leads directly into the patio.
3. The entrance door may be recessed from the front wall in order to provide a transition, a porch, between the street and the entrance room.
4. The back door between the entrance room and the patio can be omitted so that the entrance room can take the form of a deep and small covered porch.
5. In many cases, provide a door or a simple opening which leads directly from the entrance room to the sala.
6. The width of the entrance room varies from 1.5m to 3m. Its length is given by the width of the wing.



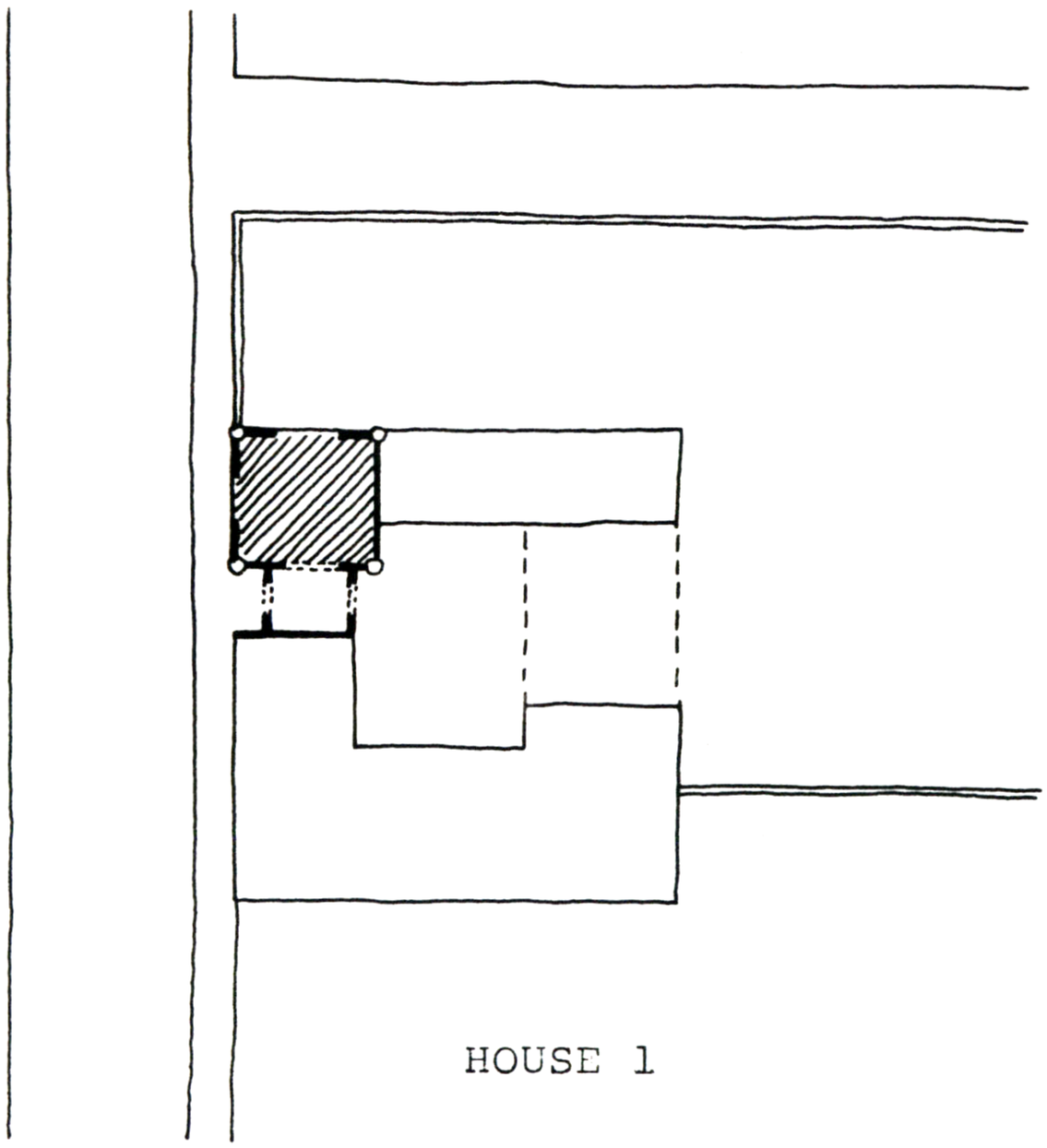
HOUSE 1



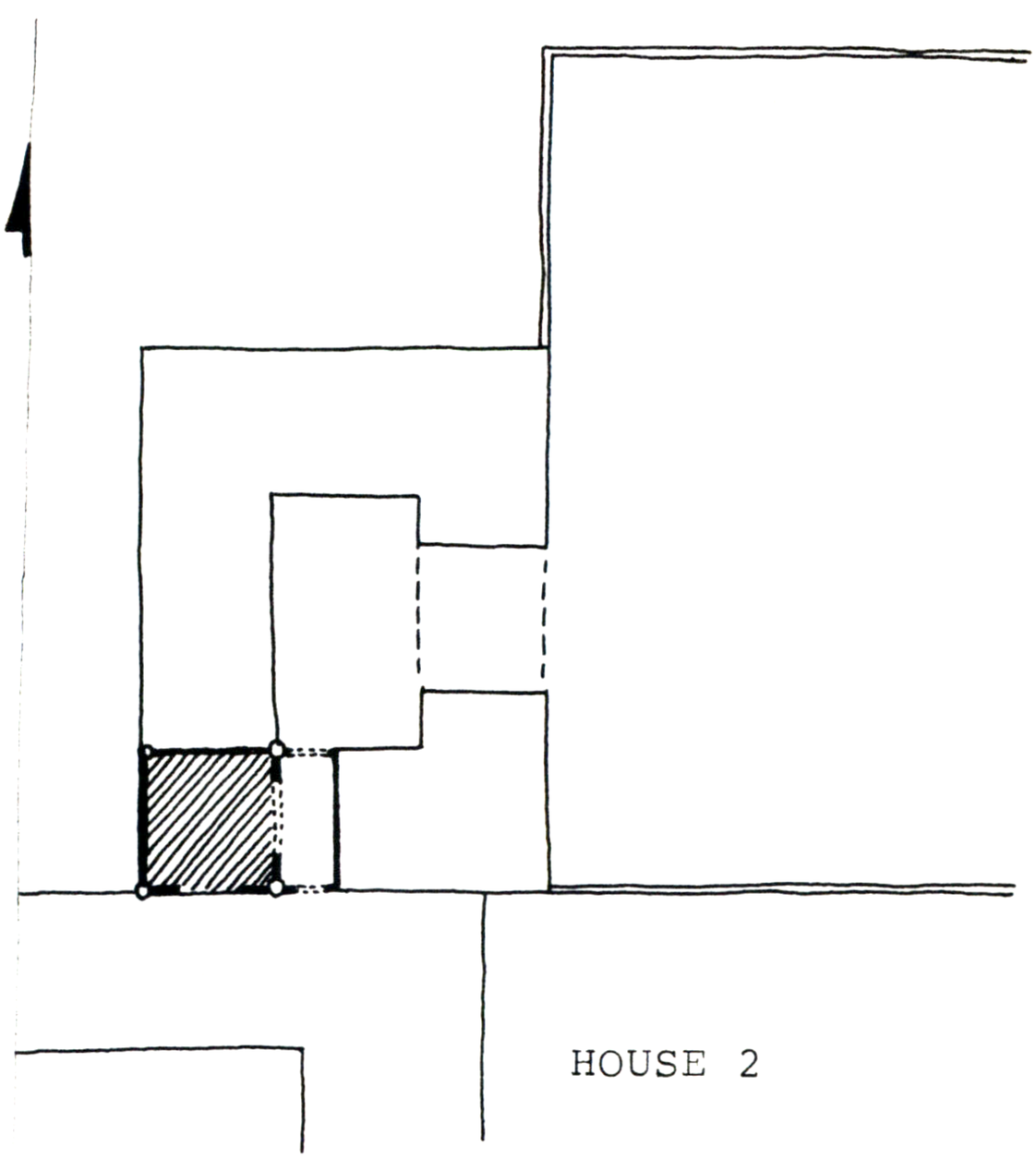
HOUSE 2

## SEVENTH STEP: LAYOUT OF THE SALA

1. The sala, the most public room of the house, is always on the street, next to the entrance.
2. The sala is located on one of the two corners of the built area, which faces the street. When the house faces a square or a widening along the street, the sala faces this widening.
3. Its size varies from 9 $m^2$ to 13 $m^2$.
4. Shape the sala on the ground; put in the stakes and the rope. Walk in this room until you become familiar with it, and don't hesitate to move the stakes until the sala is as you want it, until you feel comfortable in it.



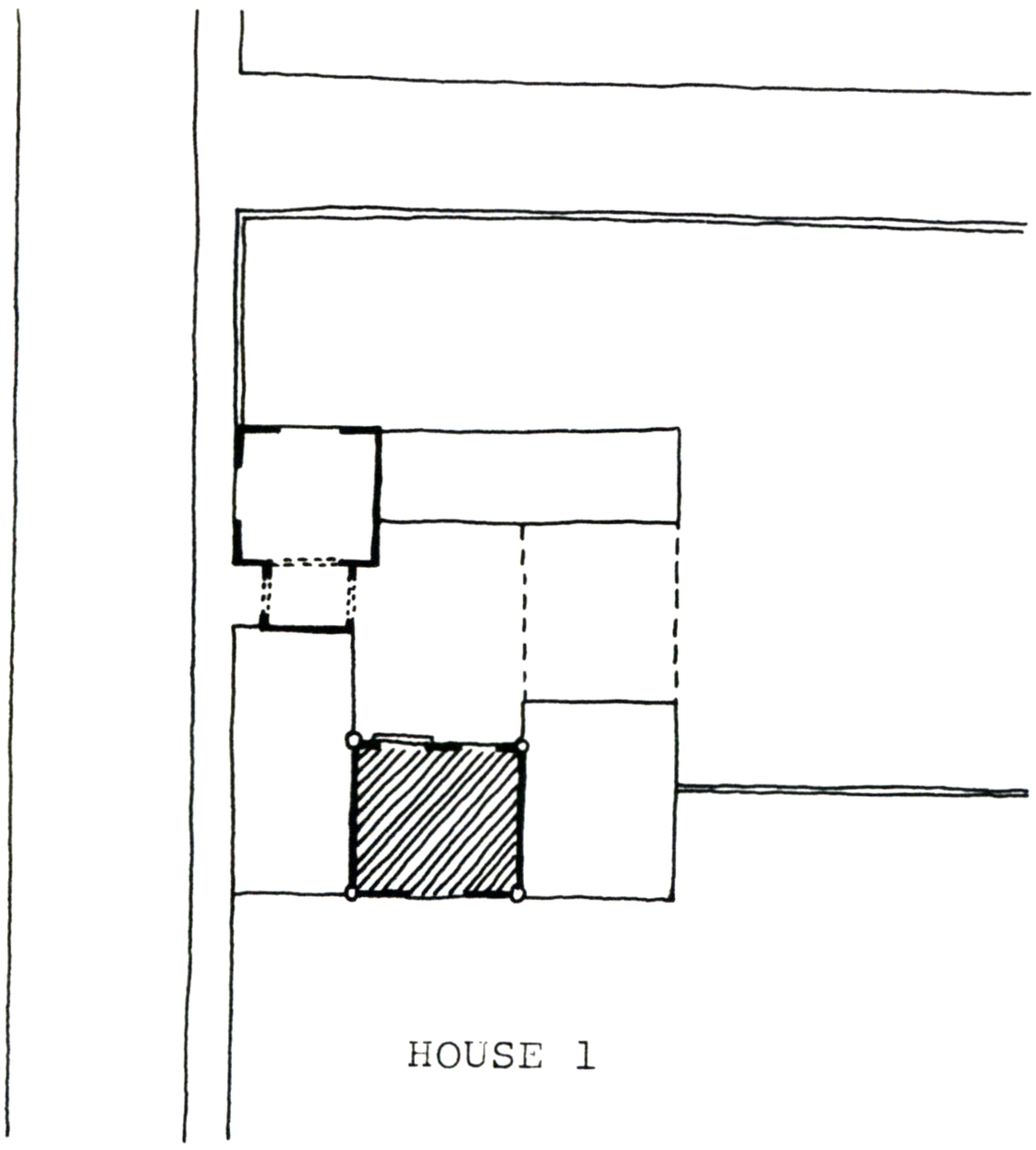
HOUSE 1



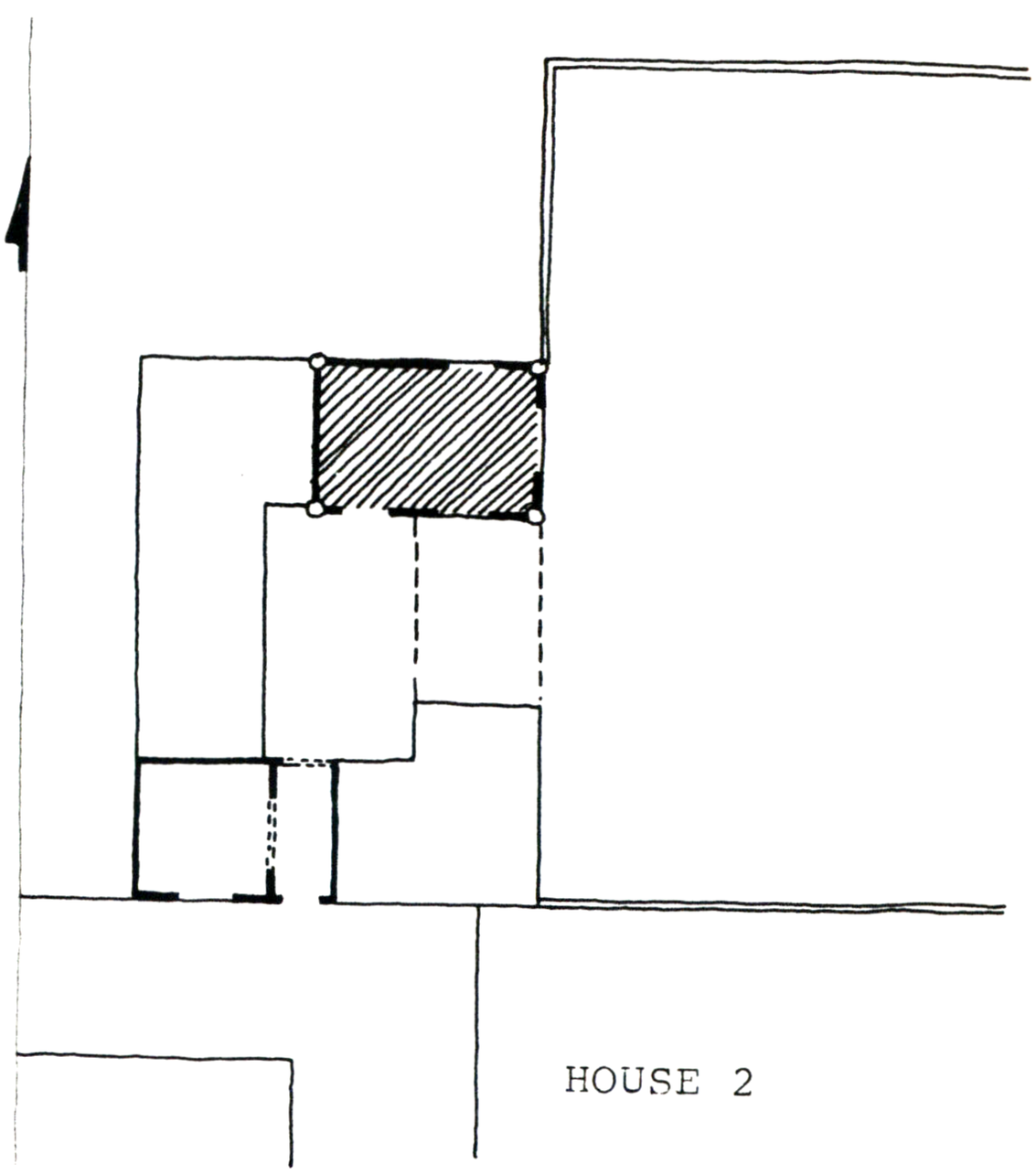
HOUSE 2

EIGHTH STEP: LAYOUT OF THE COMEDOR

1. The comedor is the room where the family get together. It is the biggest room of the house.
2. The comedor should be located on the widest wing of the house. In most cases it is pleasanter to have the comedor located either between the garden and the patio, or totally in the patio.
3. The comedor should have windows from two sides in order to provide a nice light and to allow cross ventilation.
4. Its size varies from $13m^2$ to $21m^2$.
5. Once you find the best spot to locate the comedor, place the stakes. Try to imagine how the room is going to be, walk through it, go back and forth from the comedor to the patio, move the stakes until you are satisfied.



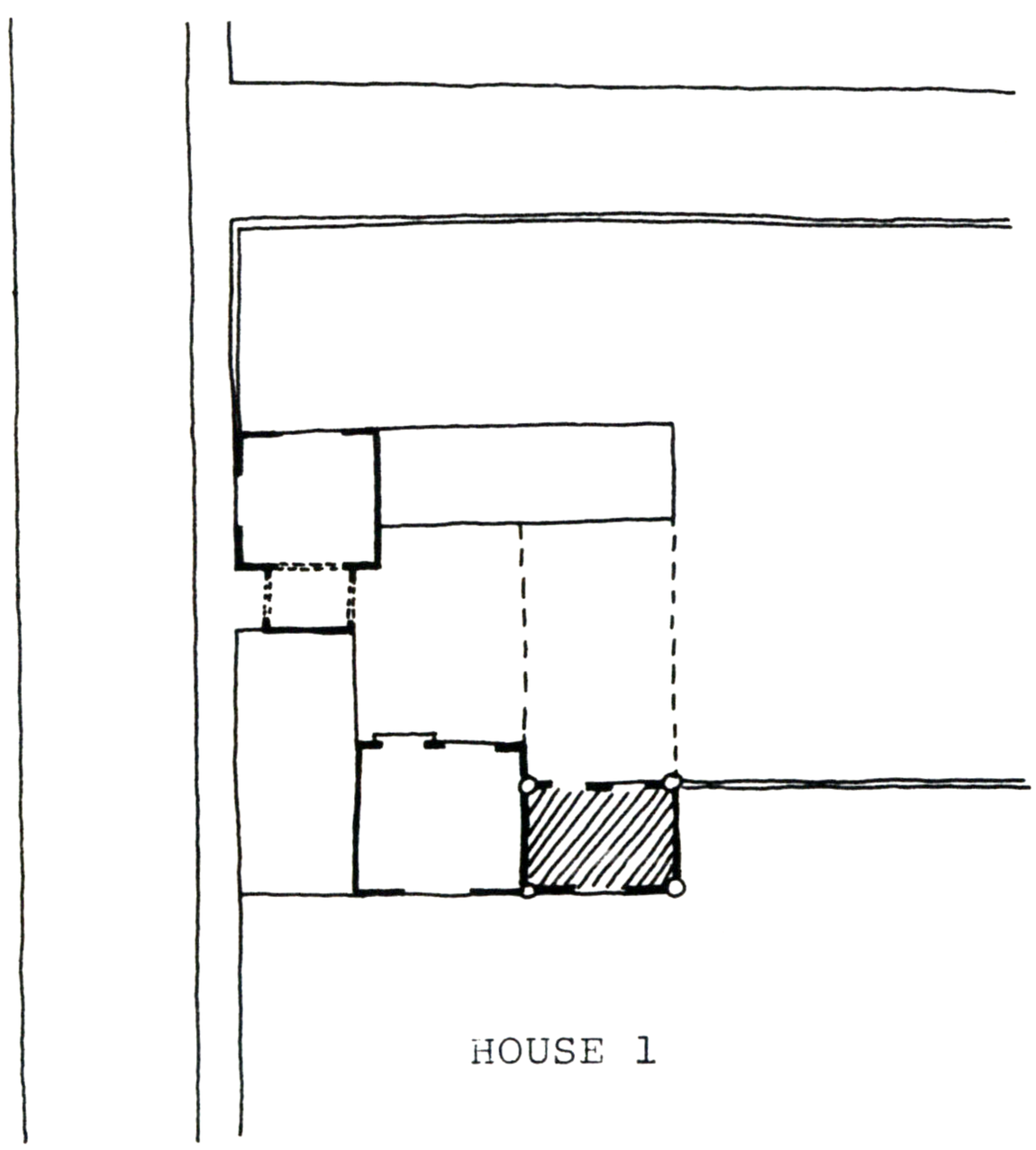
HOUSE 1



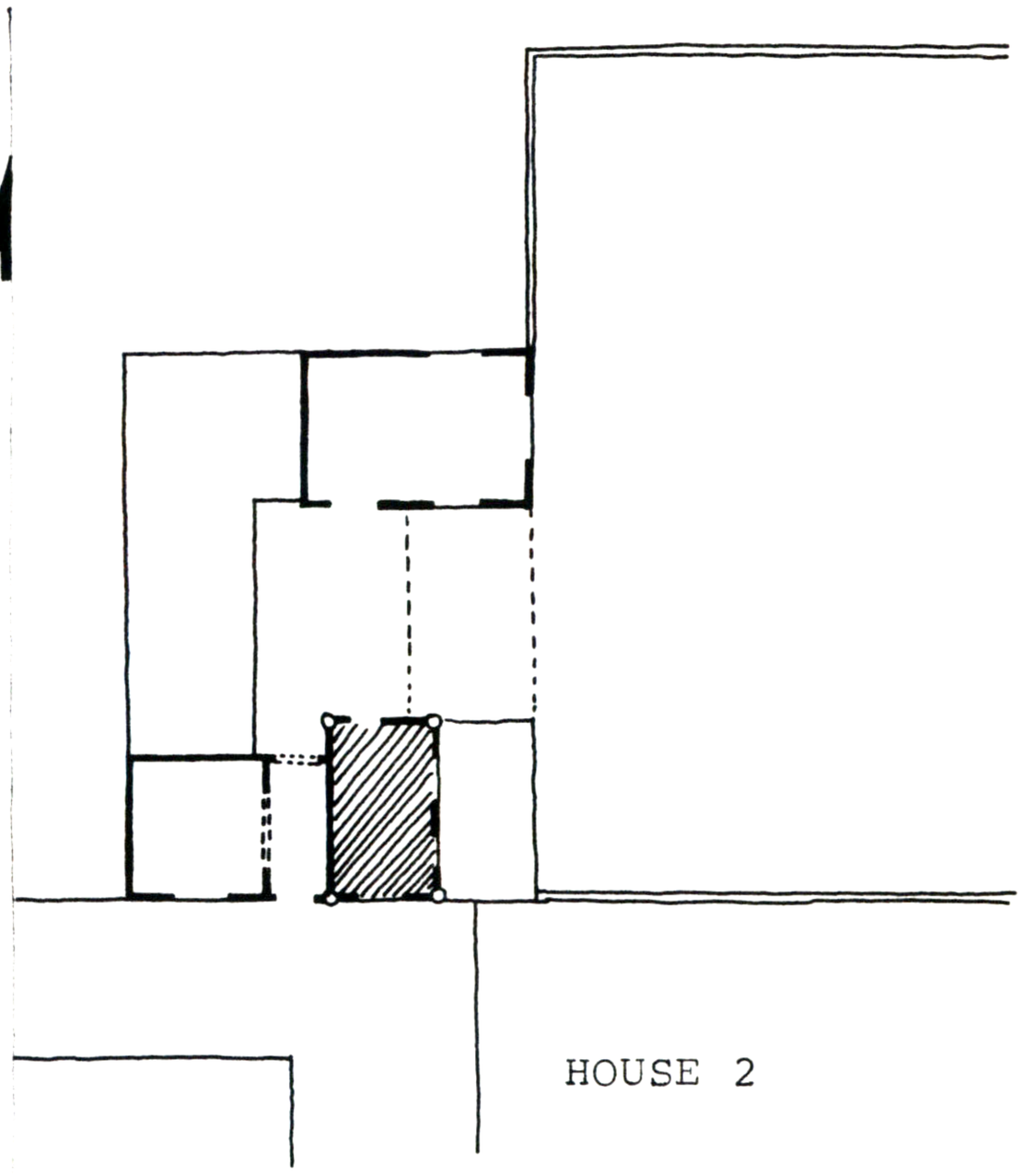
HOUSE 2

NINTH STEP: LAYOUT OF THE KITCHEN

1. The kitchen is one of the most private rooms of the house.
2. Either the kitchen is next to the comedor, or it is linked to the comedor by a veranda.
3. The kitchen should open onto the patio.
4. Its size varies from $9m^2$ to $13m^2$.



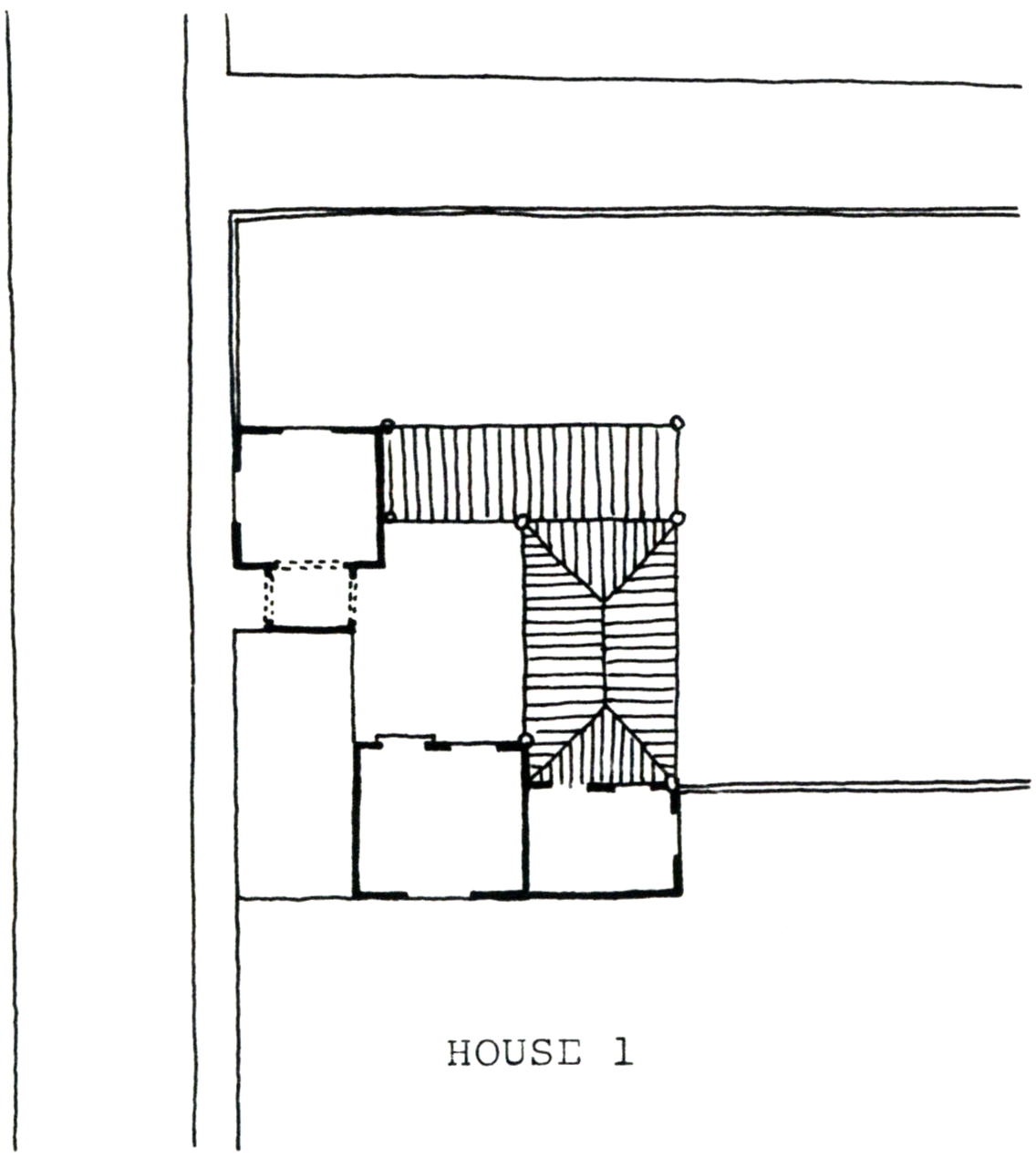
HOUSE 1



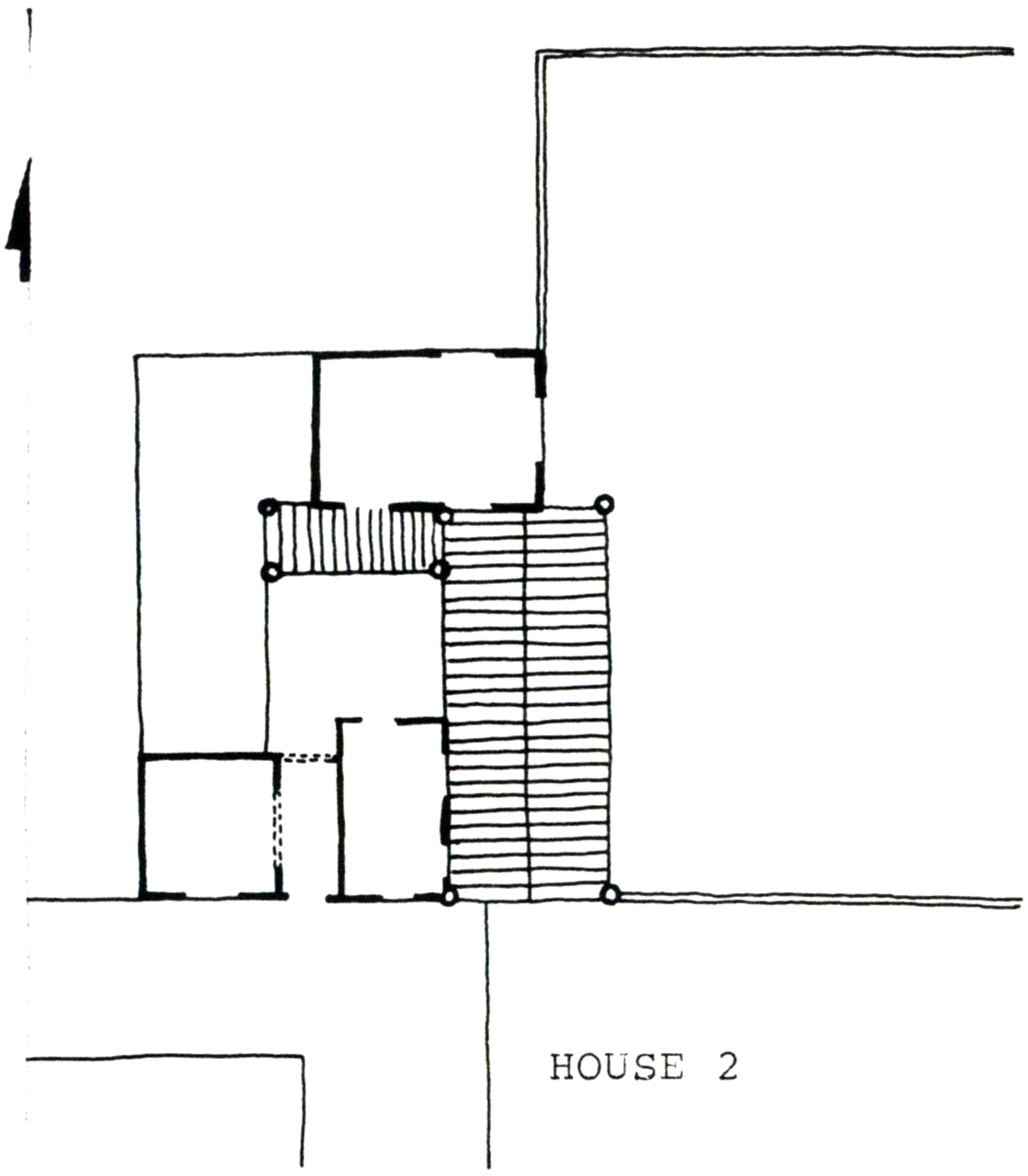
HOUSE 2

## TENTH STEP: LAYOUT OF THE VERANDAS

1. The verandas are covered open spaces where you can sit, have a drink, and they are also circulation spaces; the rooms open into them.
2. One of the verandas is very often located on the opening between the patio and the garden.
3. You can have a small veranda, 2m wide minimum, a place in the patio where it will be pleasant to sit protected from the sun. And you can have a more spacious veranda, to cook outside, for example. In this case the veranda is deeper than 3m.



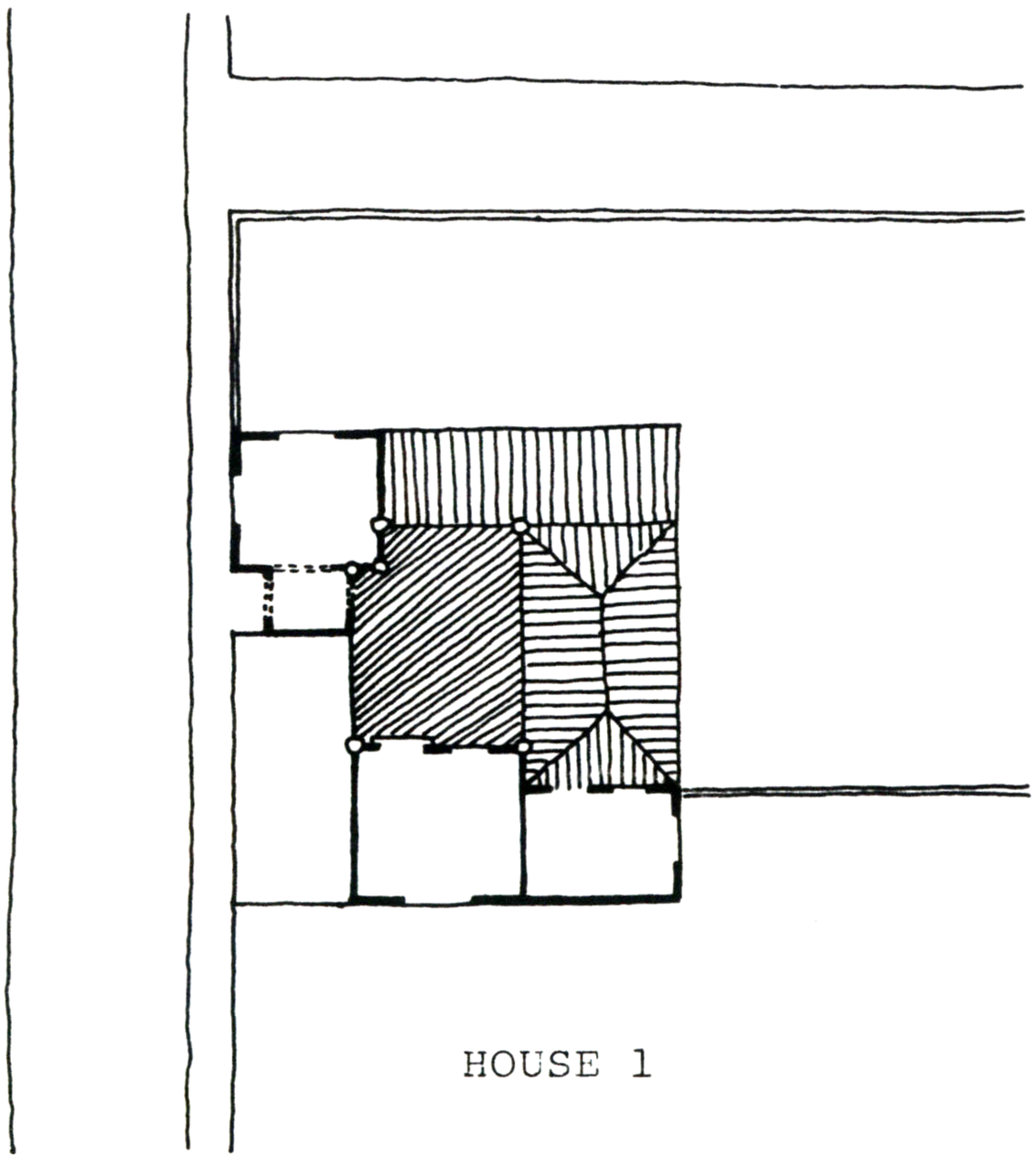
HOUSE 1



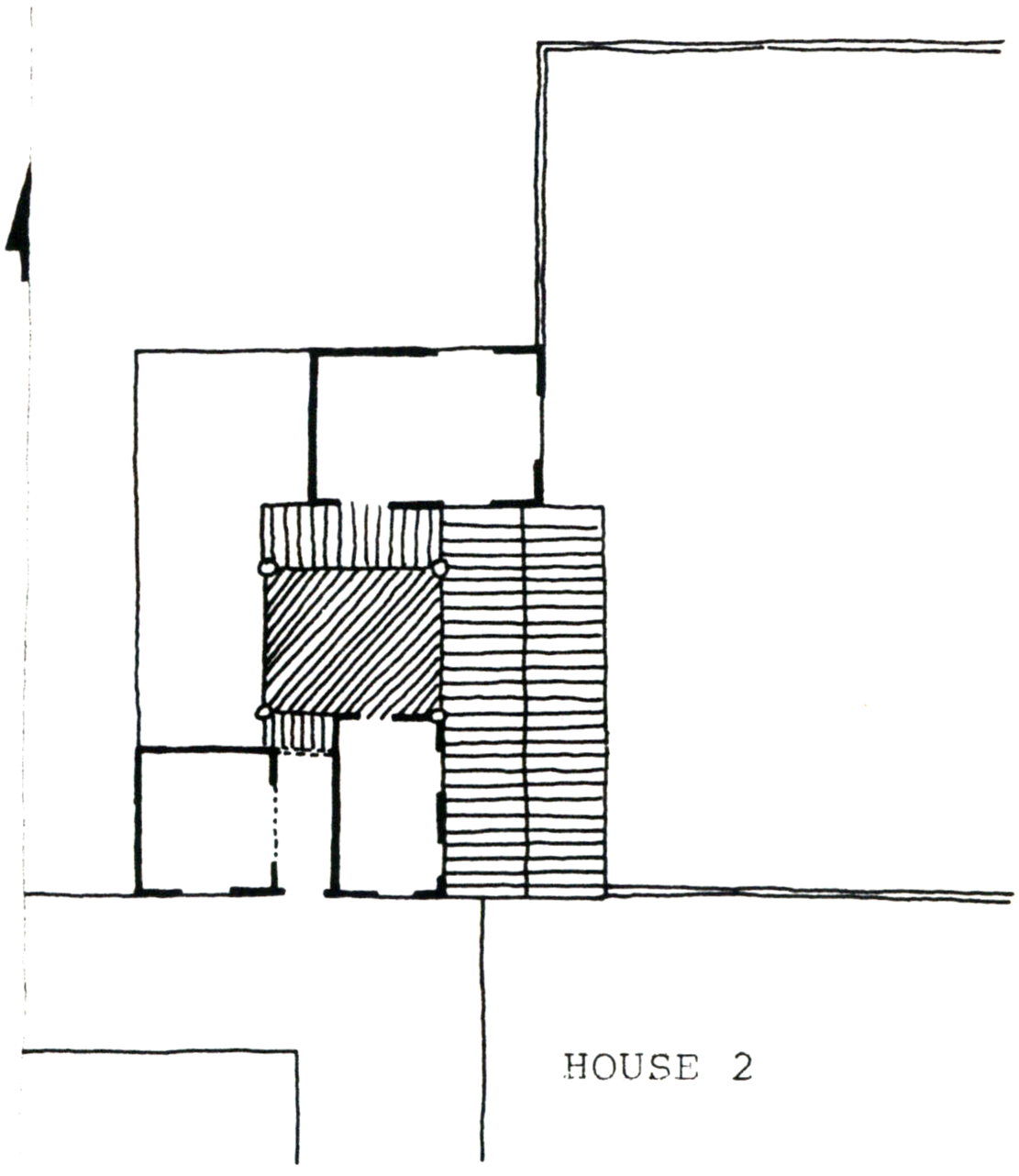
HOUSE 2

## ELEVENTH STEP: REFINEMENT OF THE PATIO

1. Now that you know where the main rooms and veranda are, you can shape the patio more precisely.
2. Some minor changes may be required by the layout of the other rooms. If so, move some stakes until everything fits together.



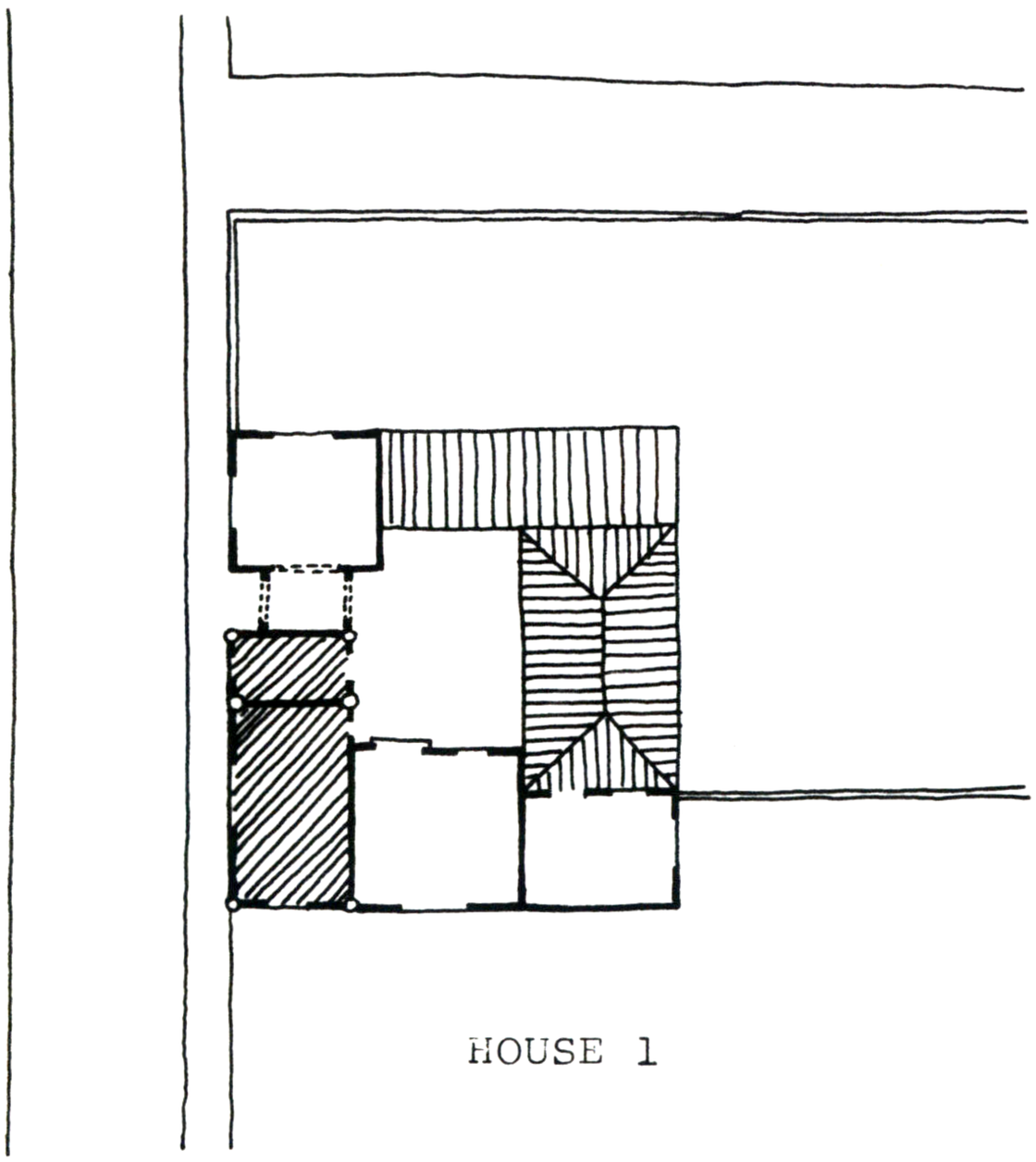
HOUSE 1



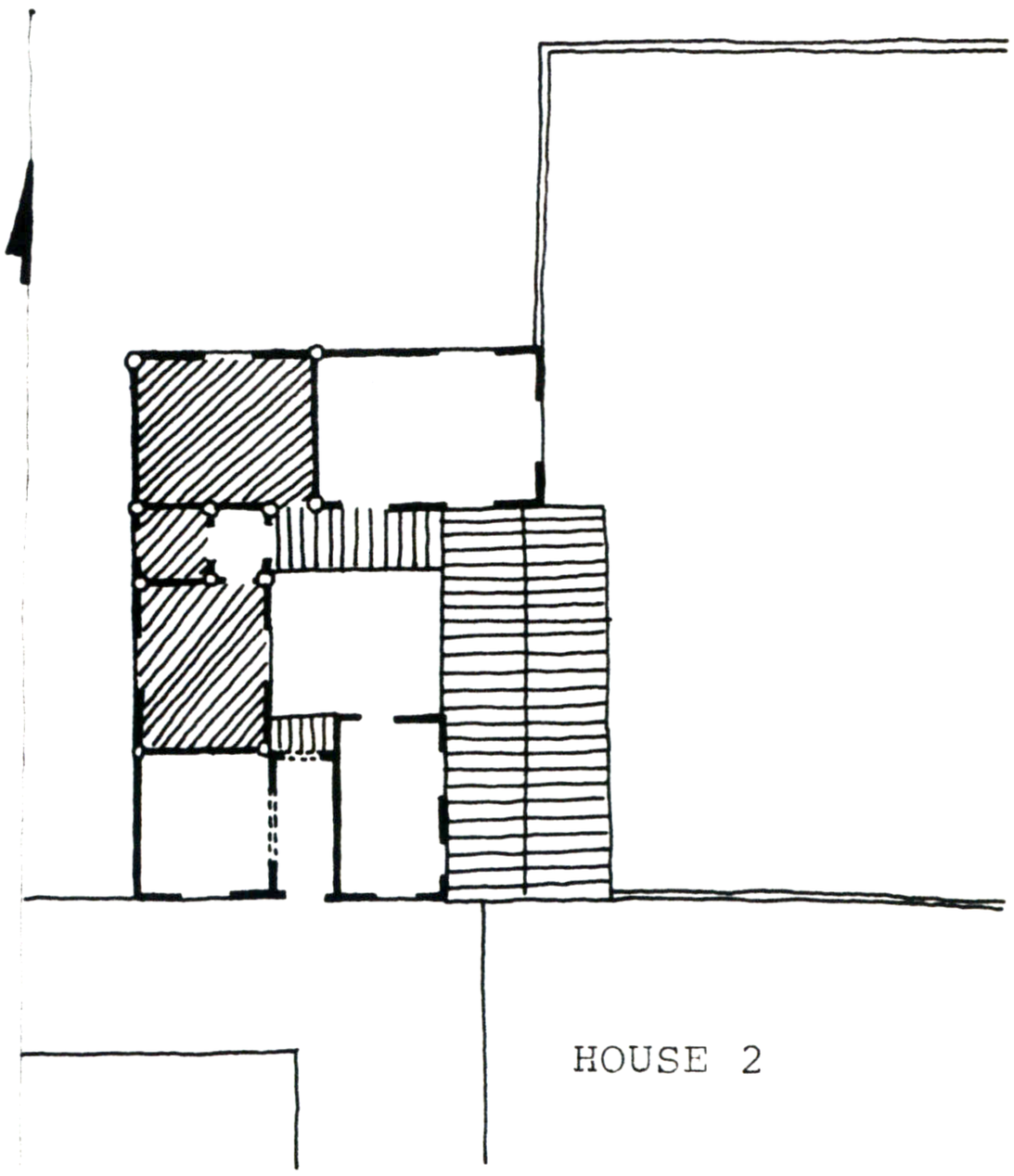
HOUSE 2

## TWELVTH STEP: LAYOUT OF THE BEDROOMS AND BATHROOM

1. In the wing or part of wing which is not yet laid out, you have to locate the bedrooms and bathroom.
2. Bedrooms: The bedrooms can open directly into the patio, or you can have a small transition space which will generally serve two bedrooms. This small corridor is about 1 m wide and 2 m to 2.50 m long. It does not have a front door to let in light and breeze. The size of the bedrooms varies from 8 $m^2$ to 13 $m^2$.
3. Bathroom: The bathroom is located next to the bedroom or between two bedrooms. The bathroom can open either into the patio or into the corridor. Its size is about 4 $m^2$.



HOUSE 1



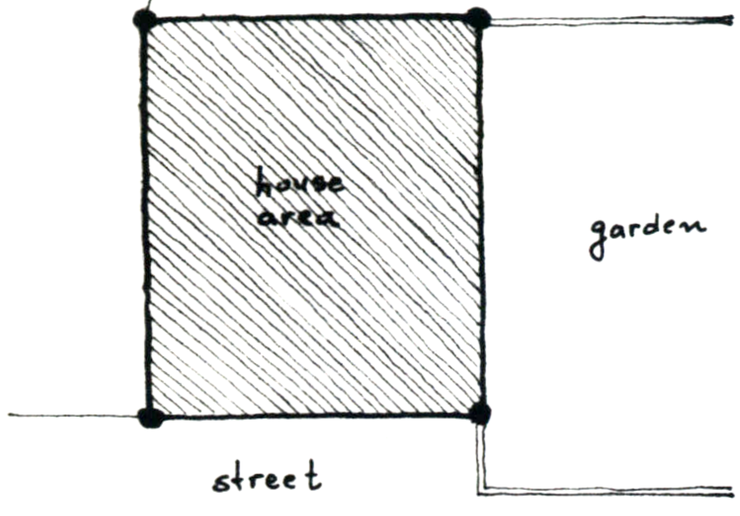
HOUSE 2

Now that all the rooms and open space are defined, go again into each room, try to experience the space. Walk from the entrance to the comedor, spend some time in the veranda, go into the kitchen, and so on. Move the stakes if necessary; see if every room corresponds to your wishes. You might have to make some improvements; for example, you might have to change slightly the length of a room until everything seems perfectly right. Be careful to keep the size of the house within the limit of square meters decided upon at the beginning.

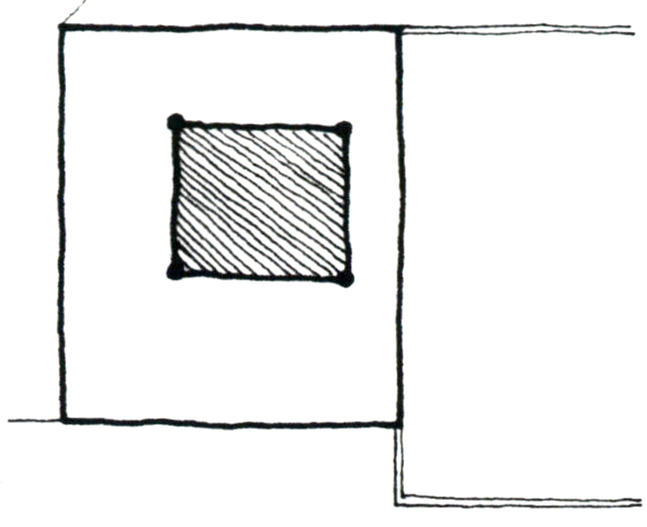
On the following two pages we show the sequence of steps of house layout for two more houses so as to make clear the variation of house layout that can be generated through the rules.

# OVERVIEW OF THE STEPS FOR LAYOUT OF HOUSE 3

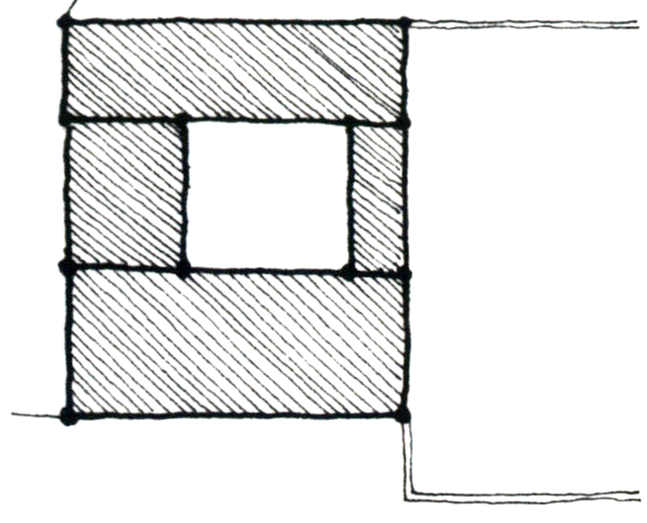
1. HOUSE BOUNDARIES



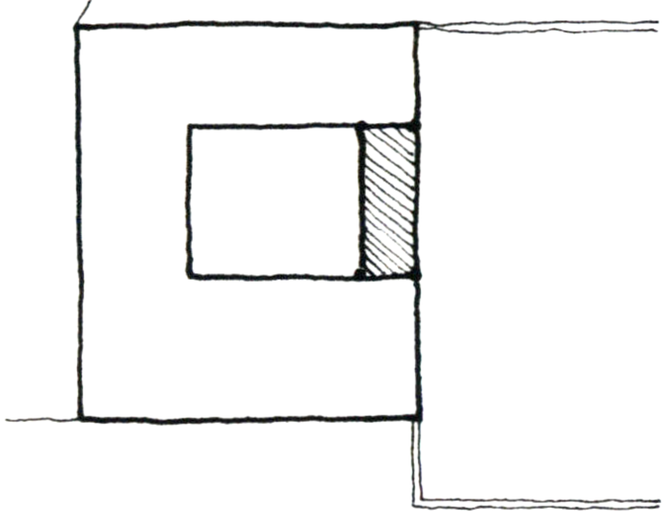

2. THE PATIO



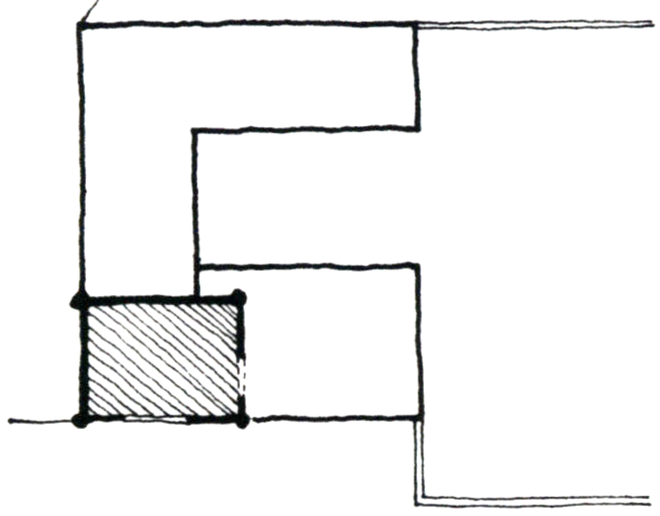
3. THE WINGS



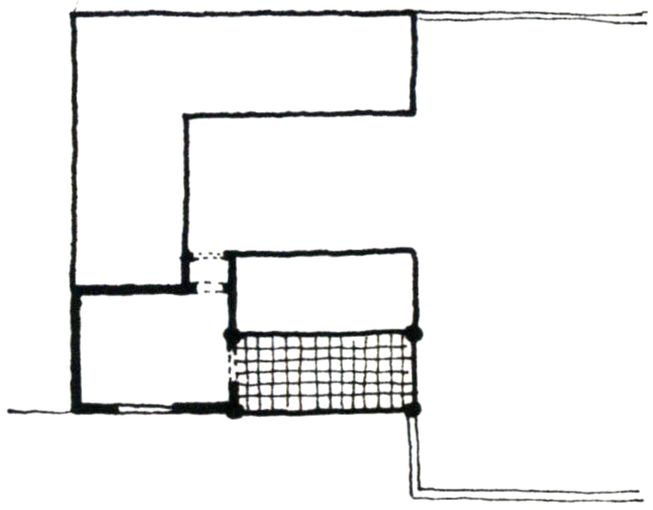
4. THE OPENING



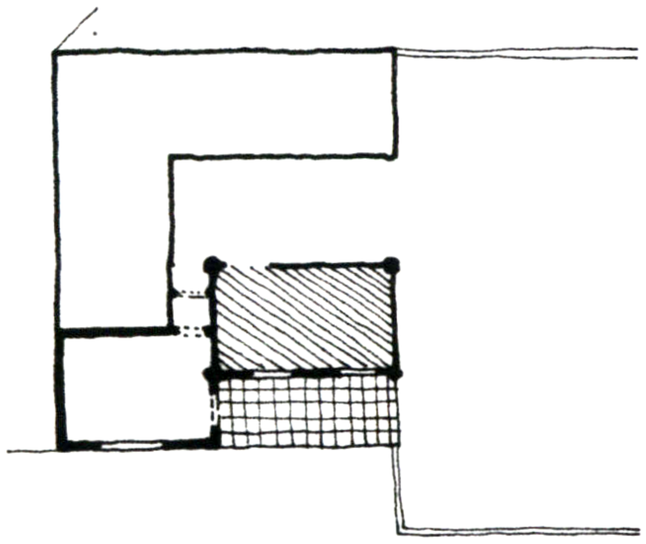
5. THE SALA



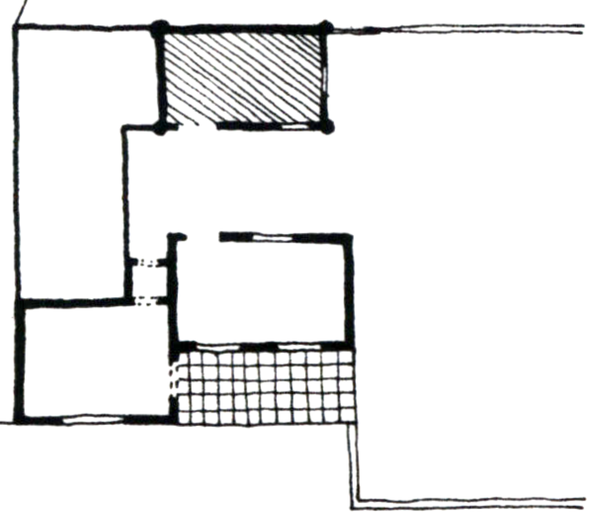
6. THE ENTRANCE



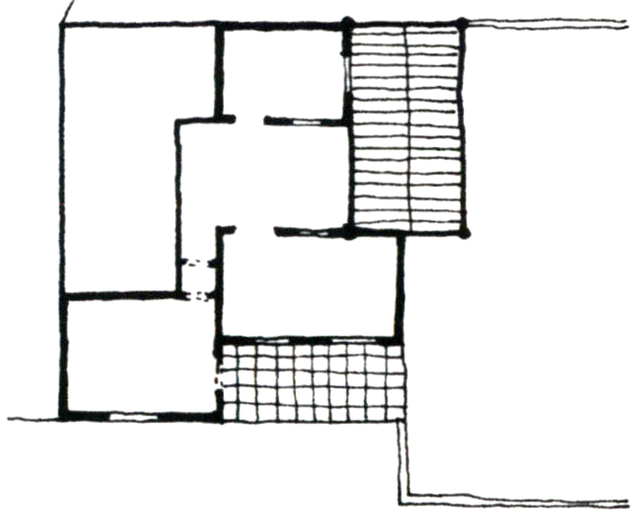
7. THE COMEDOR



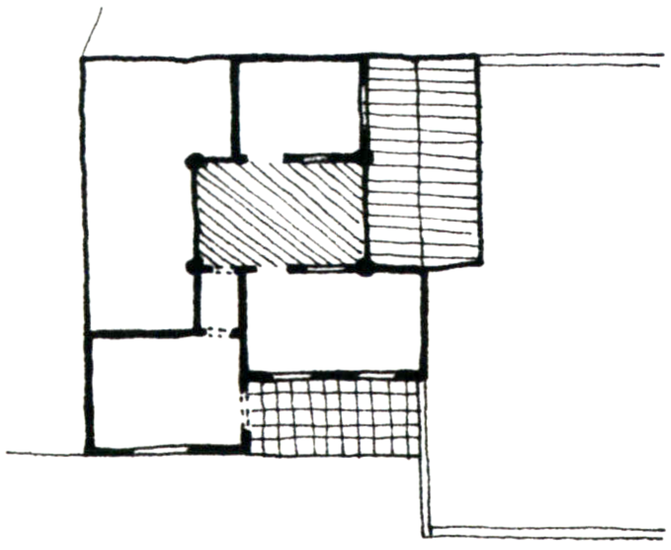
8. THE KITCHEN



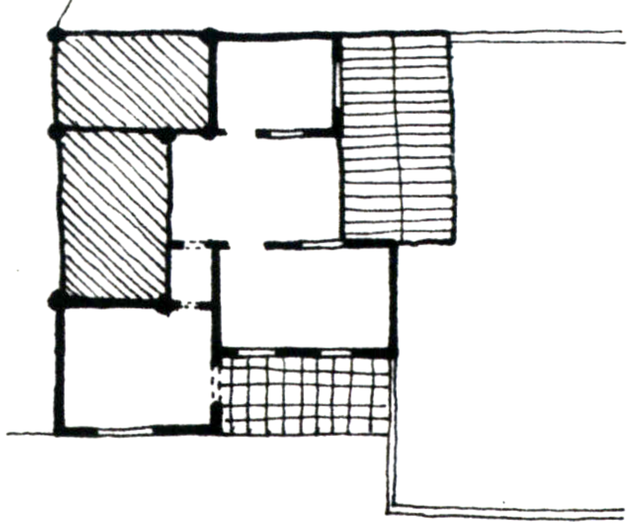
9. THE VERANDAS



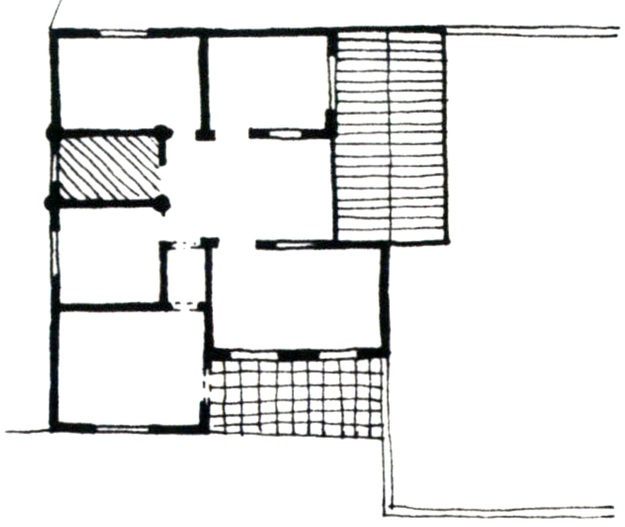
10. REFINEMENT OF PATIO



11. THE BEDROOMS

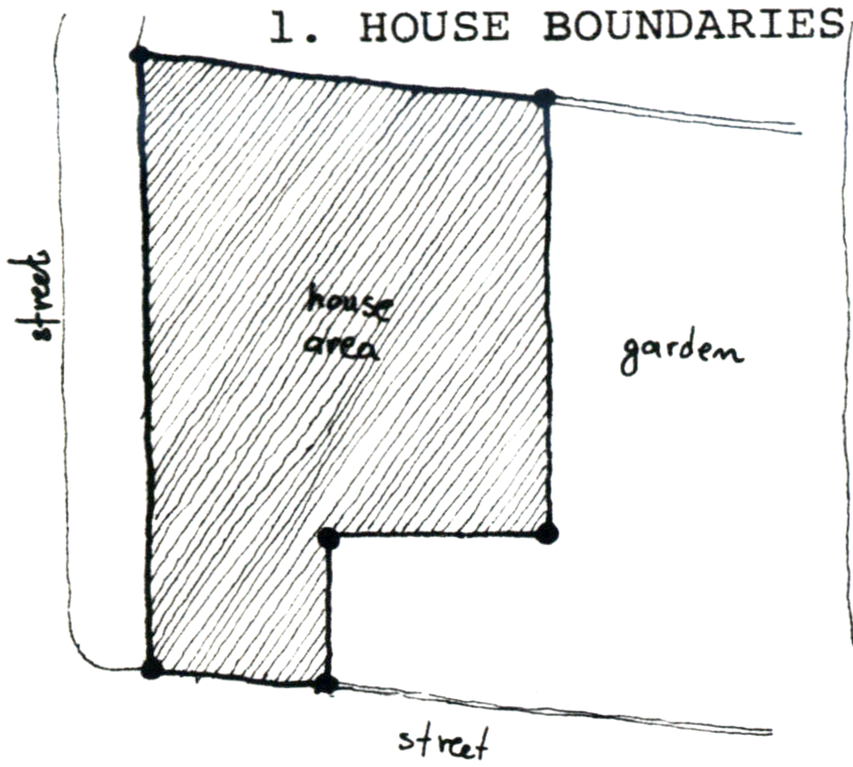


12. THE BATHROOM

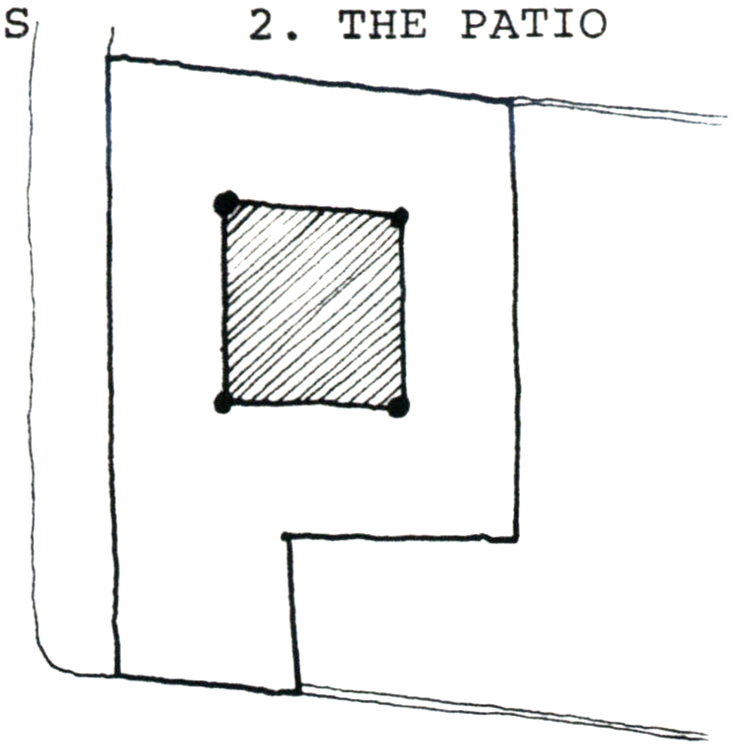


# OVERVIEW OF THE STEPS FOR LAYOUT OF HOUSE 4

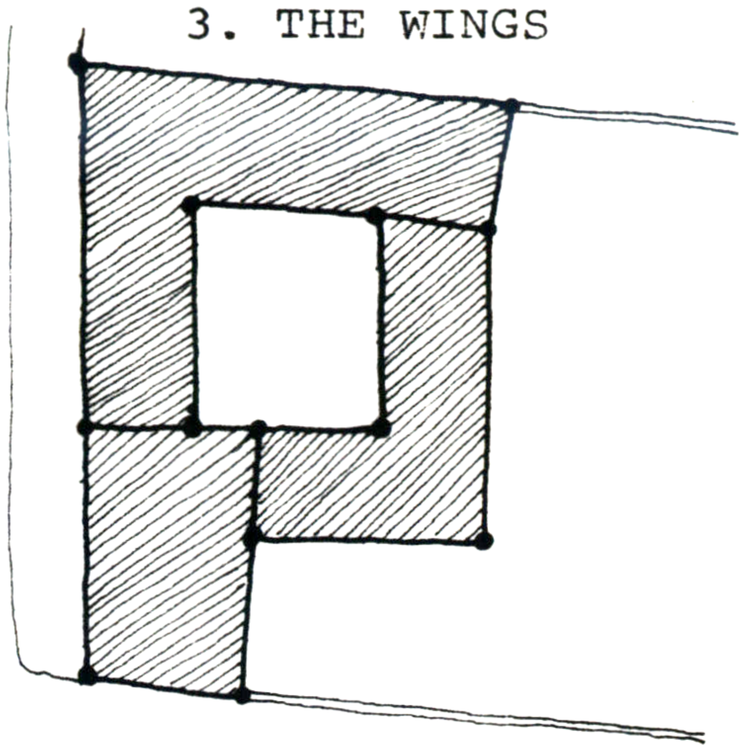
1. HOUSE BOUNDARIES



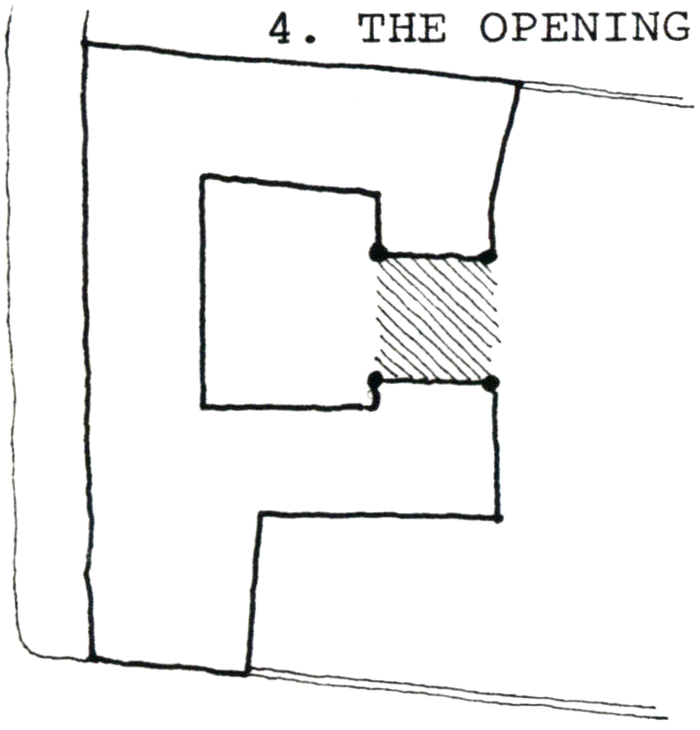

2. THE PATIO



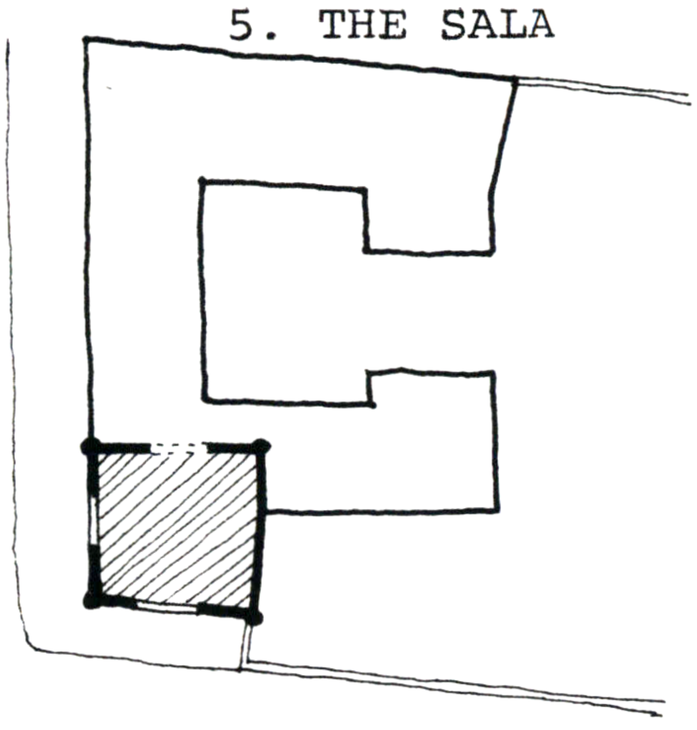
3. THE WINGS



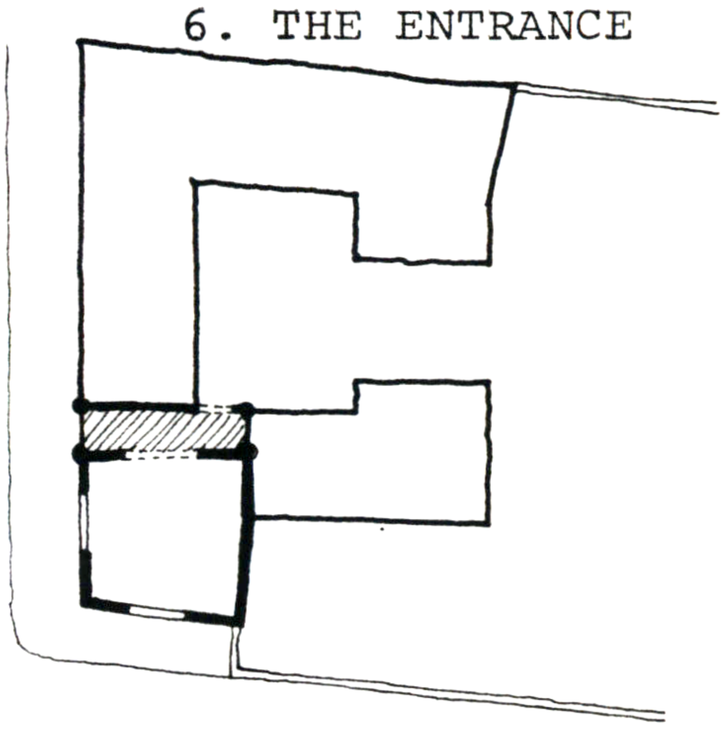
4. THE OPENING



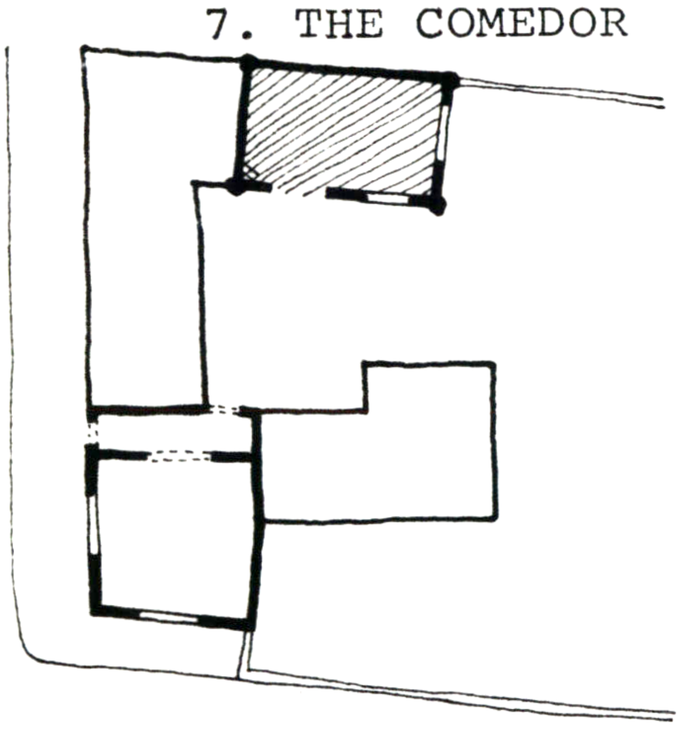
5. THE SALA



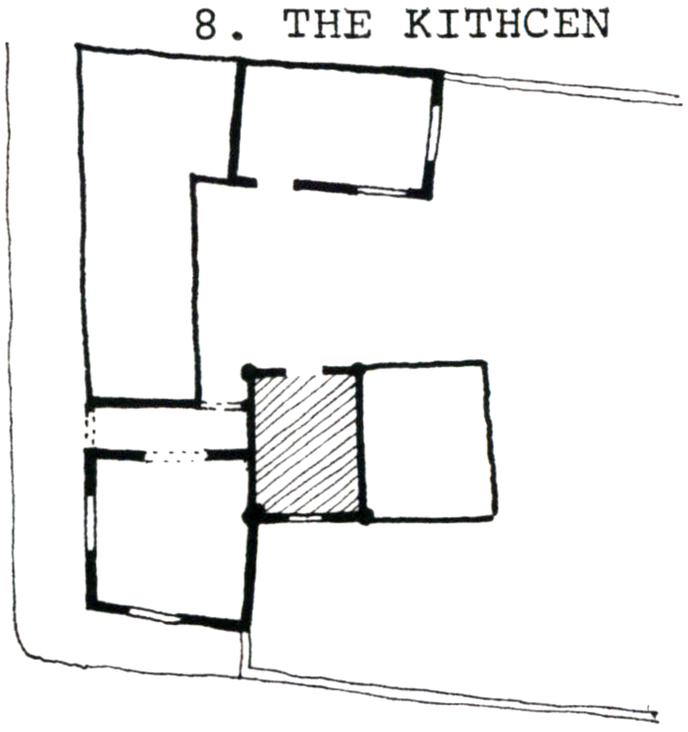
6. THE ENTRANCE



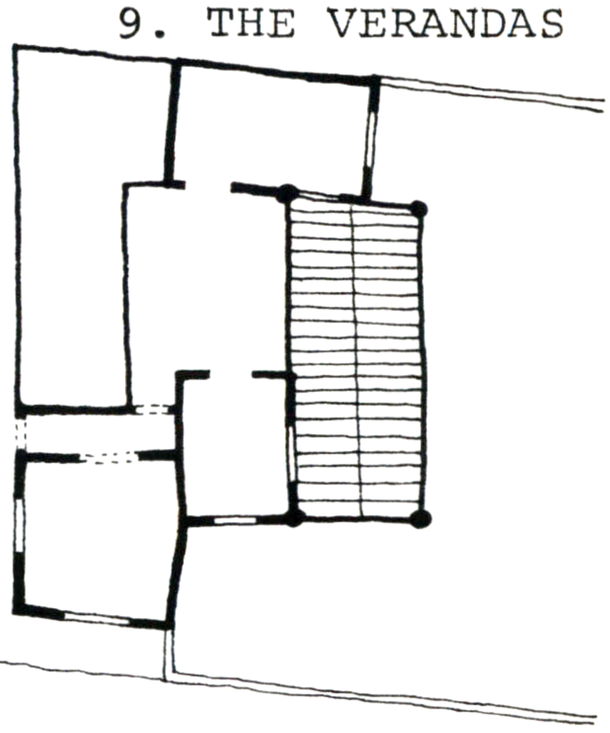
7. THE COMEDOR



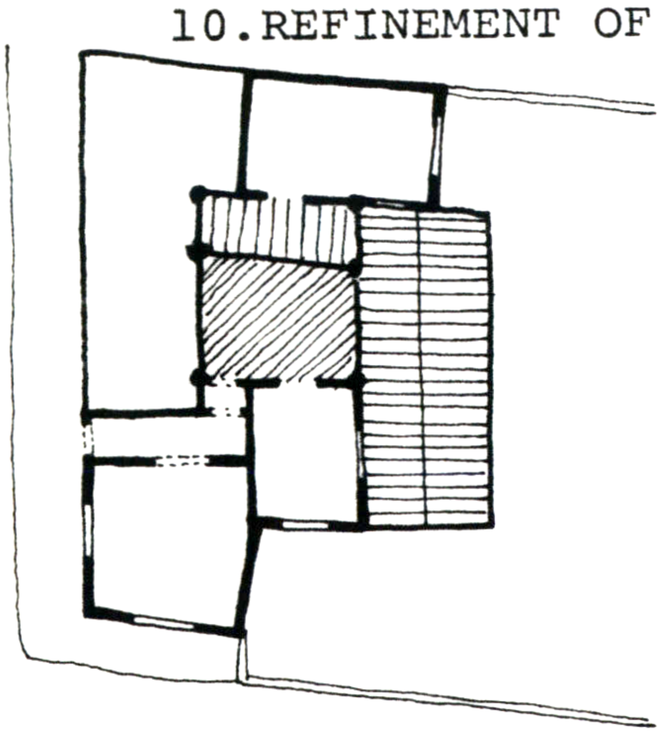
8. THE KITHCEN



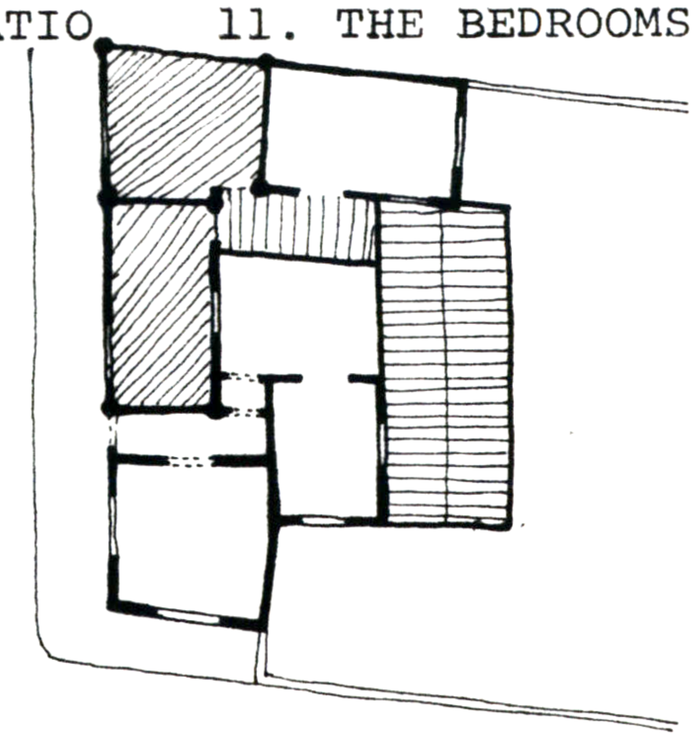
9. THE VERANDAS



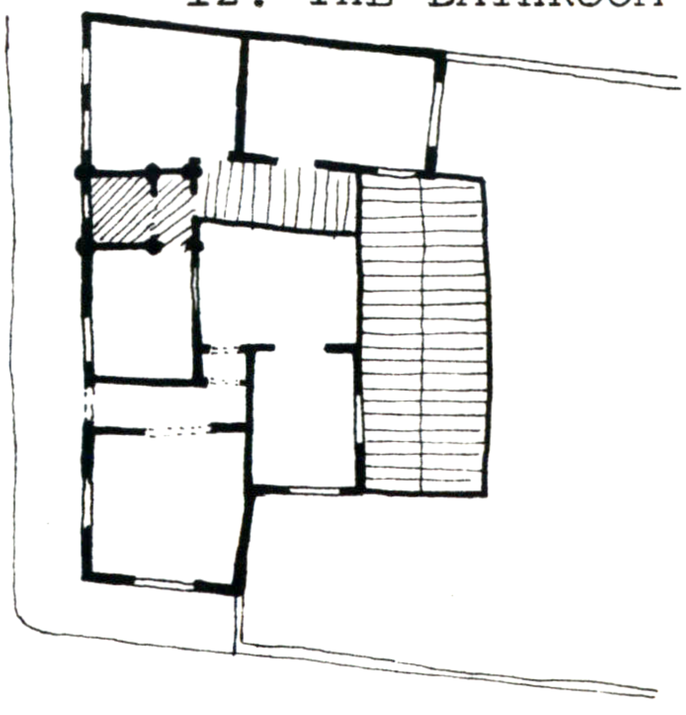
10. REFINEMENT OF PATIO



11. THE BEDROOMS



12. THE BATHROOM



# 4. THE VARIETY OF HOUSES

The process of layout we have defined will generate a wide variety of houses in the neighborhood. We hope that among these houses there will be a strong feeling that each family has put itself into the house, that it has shaped and embellished it with care and great concern.

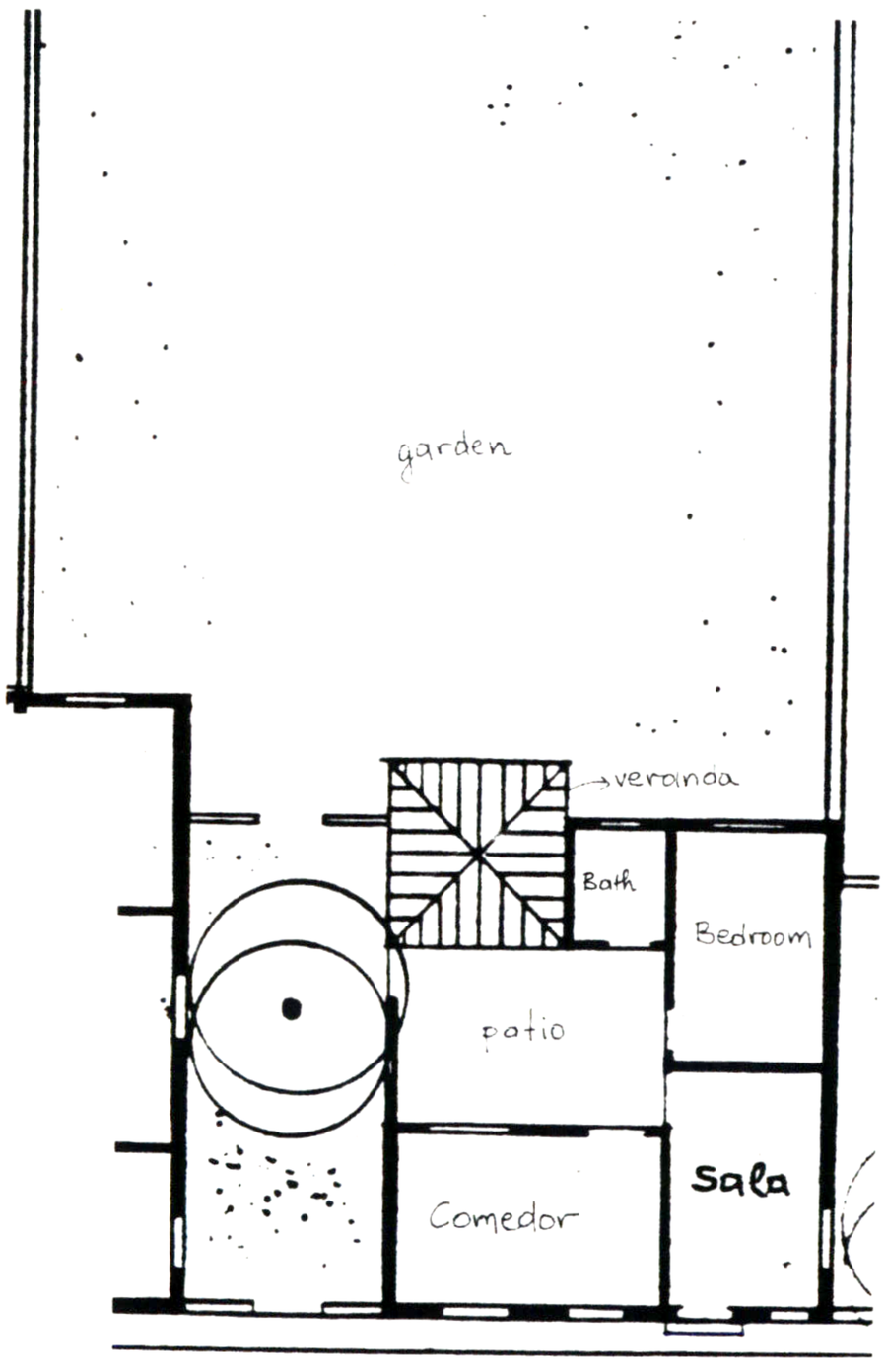
The variety among the houses is not something random that comes out of personal ideas and whims; it is more a set of variations on a main theme. There is a basic and profound similarity in all the houses. They have the same structure, the same organization, the same patterns incorporated into them, since each one of them responds to the same basic climatic and cultural considerations.

The variation from house to house is caused by three main factors:

1. The relationship between street-patio-garden. The relationship of these three elements differs in its specific details from house to house, even though the principle is always the same.
2. The financial situation of the family. As we shall see in chapter 3, financing programs will be created to assist the building of houses. Depending on the financing program that is available for the family, the family may be able to build a complete house from the beginning or follow the incremental construction of the house; the house will have different size and different rooms according to the means available.
3. The different use of the patterns and rules for the layout of the house by different families. Each family, by applying these rules and patterns to its own particular case, will attribute a different configuration to them with reference to its needs and aspirations.

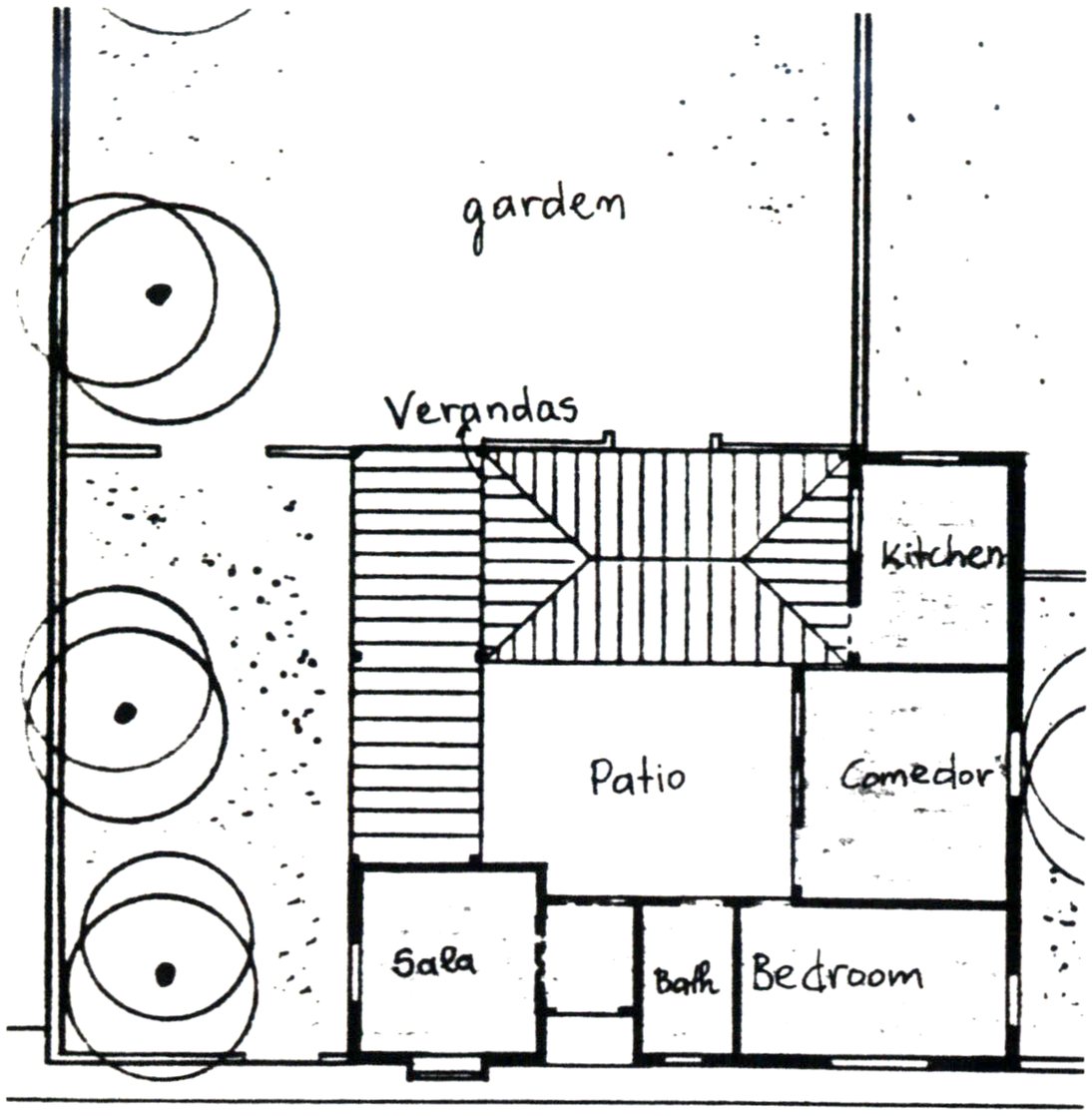
It is very important to realize that this variety among the houses does not arise because we wish to make things different. It is a variety that emanates from the needs of the site and from the needs of each individual family, but at the same time respects the coherency and harmony of the neighborhood.

The rules of the house layout process allow for different house sizes and different distributions of the total square meters of the house in its rooms. The following plans are an example of different house sizes:



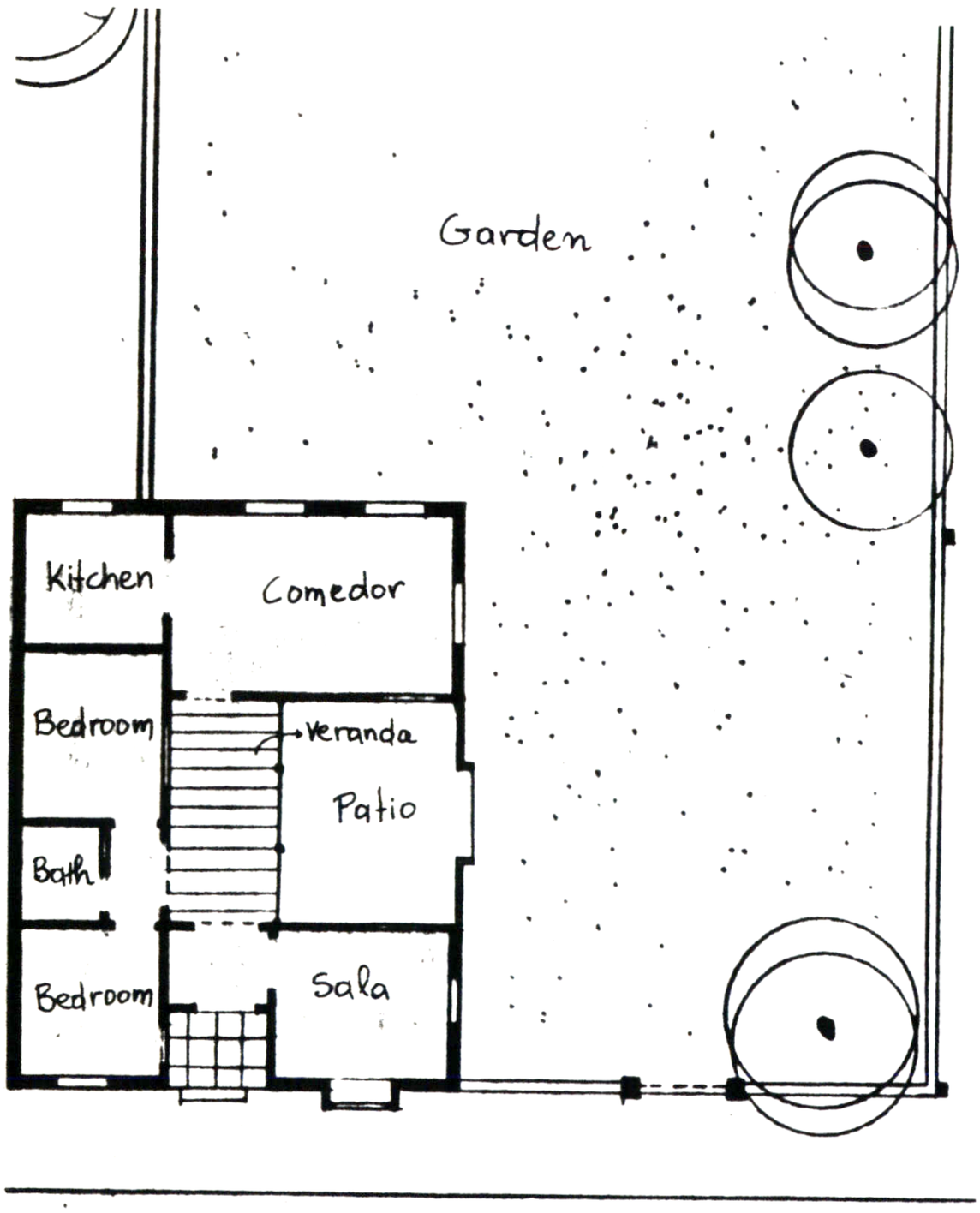

HOUSE OF 38,3 $m^2$

| | | |
|---|---|---|
| PATIO | 3,00 x 4,5m | 13,50 $m^2$ |
| SALA | 2,80 x 4,2m | 11,76 $m^2$ |
| COMEDOR | 3,00 x 4,3m | 12,90 $m^2$ |
| VERANDA | 3,00 x 3,0m | 9,00 $m^2$ |
| BEDROOM | 2,80 x 3,8m | 10,64 $m^2$ |
| BATH | 2,00 x 1,50m | 3,00 $m^2$ |



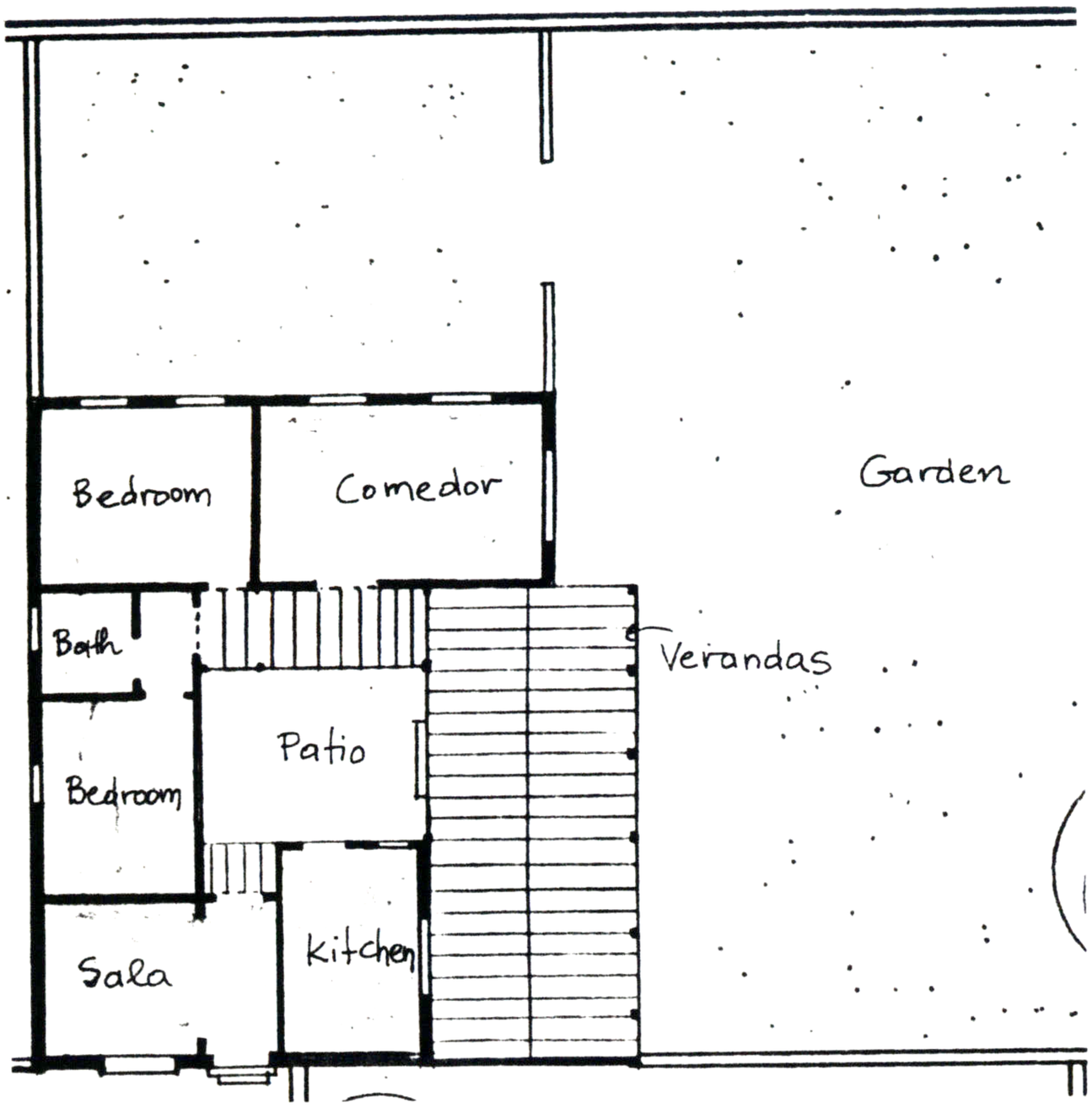

HOUSE OF 55 $m^2$

| | | |
|---|---|---|
| PATIO | 4,0 x 5,2m | 20,80$m^2$ |
| SALA | 3,0 x 3,2m | 9,60$m^2$ |
| ENTRANCE | 2,0 x 1,6m | 3,20$m^2$ |
| COMEDOR | 4,0 x 3,6m | 14,40$m^2$ |
| VERANDA | 3,6 x 6,2m | 22,35$m^2$ |
| VERANDA | 2,2 x 7,4m | 16,28$m^2$ |
| KITCHEN | 2,6 x 3,6m | 9,36$m^2$ |
| BEDROOM | 2,8 x 4,8m | 13,44$m^2$ |
| BATH | 1,8 x 2,8m | 5,00$m^2$ |




HOUSE OF 67,8 $m^2$

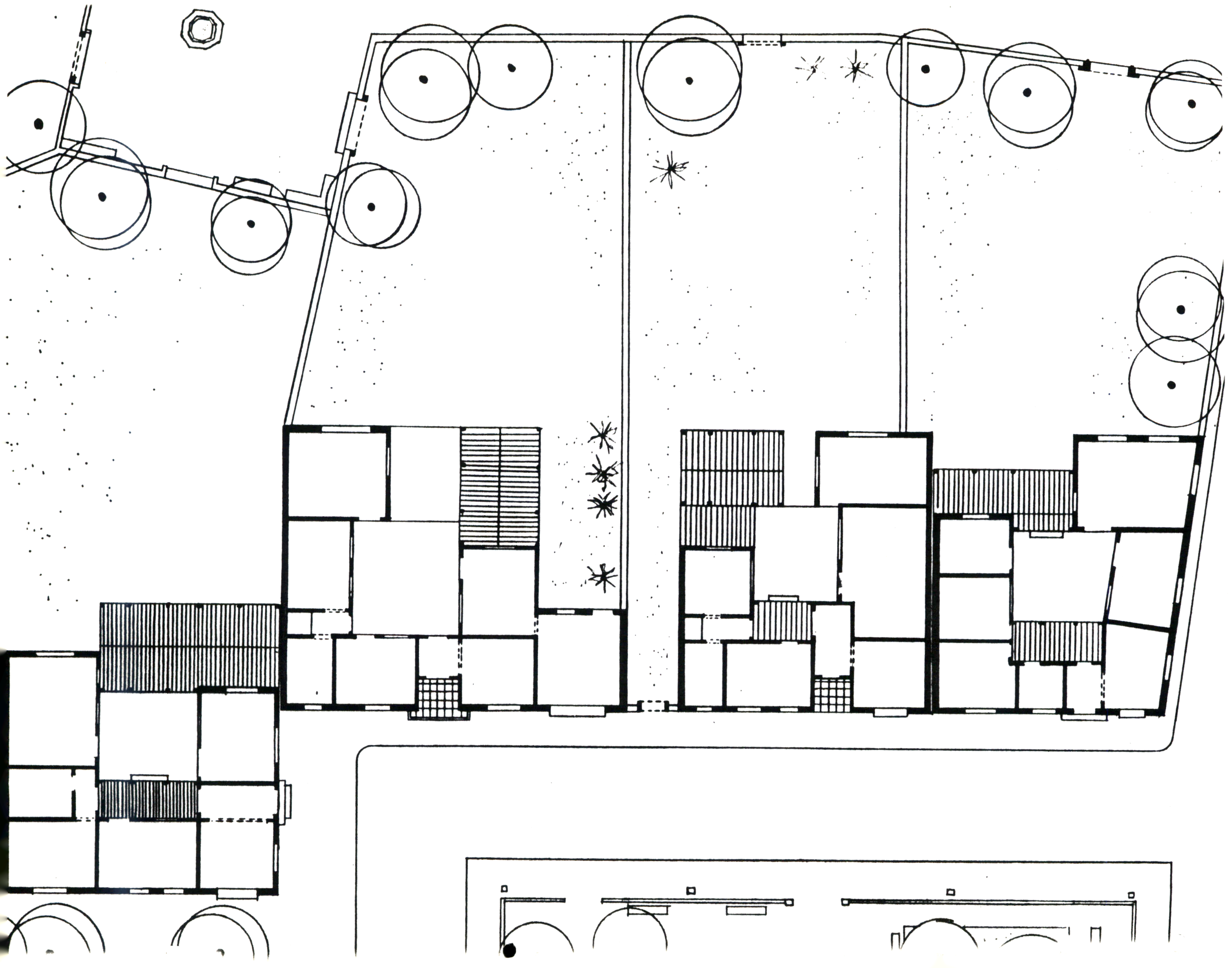
| | | |
|---|---|---|
| PATIO | 3,6 x 4,4m | 15,84$m^2$ |
| SALA | 3,0 x 3,0m | 9,00$m^2$ |
| ENTRANCE | 2,0 x 1,6m | 3,20$m^2$ |
| COMEDOR | 4,0 x 6,0m | 24,00$m^2$ |
| VERANDA | 2,0 x 4,4m | 8,80$m^2$ |
| KITCHEN | 3,0 x 2,6m | 7,80$m^2$ |
| BEDROOM | 3,0 x 2,8m | 8,40$m^2$ |
| BEDROOM | 3,0 x 3,4m | 10,20$m^2$ |
| BATH | 2,0 x 1,6m | 3,2$m^2$ |




HOUSE OF 73,8 $m^2$

| | | |
|---|---|---|
| PATIO | 3,5 x 4,4m | 15,75$m^2$ |
| SALA | 3,0 x 3,0m | 9,00$m^2$ |
| ENTRANCE | 3,0 x 1,4m | 4,2$m^2$ |
| COMEDOR | 3,6 x 5,6m | 20,16$m^2$ |
| VERANDA | 4,0 x 9,0m | 36,00$m^2$ |
| VERANDA | 1,6 x 4,0m | 6,40$m^2$ |
| KITCHEN | 4,0 x 2,6m | 10,40$m^2$ |

The houses are also diffferent, according to the different sites and lots which are available, and according to the different dreams and aspirations of the different families.



Comedor

Kitchen

Sala

Bedroom

Bedroom

Bedroom

kitchen

Comedor

Bedroom

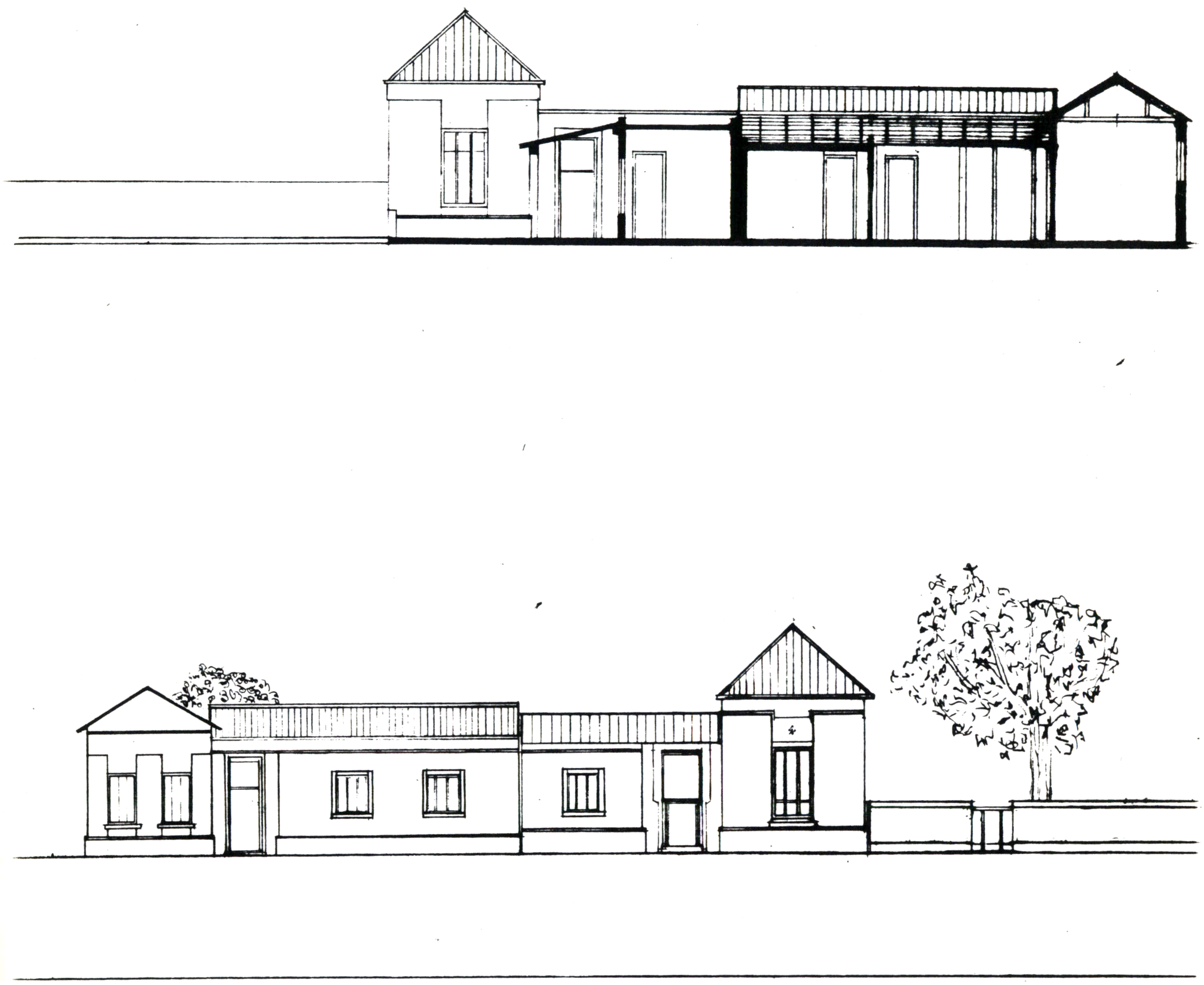
Bedroom

Sala

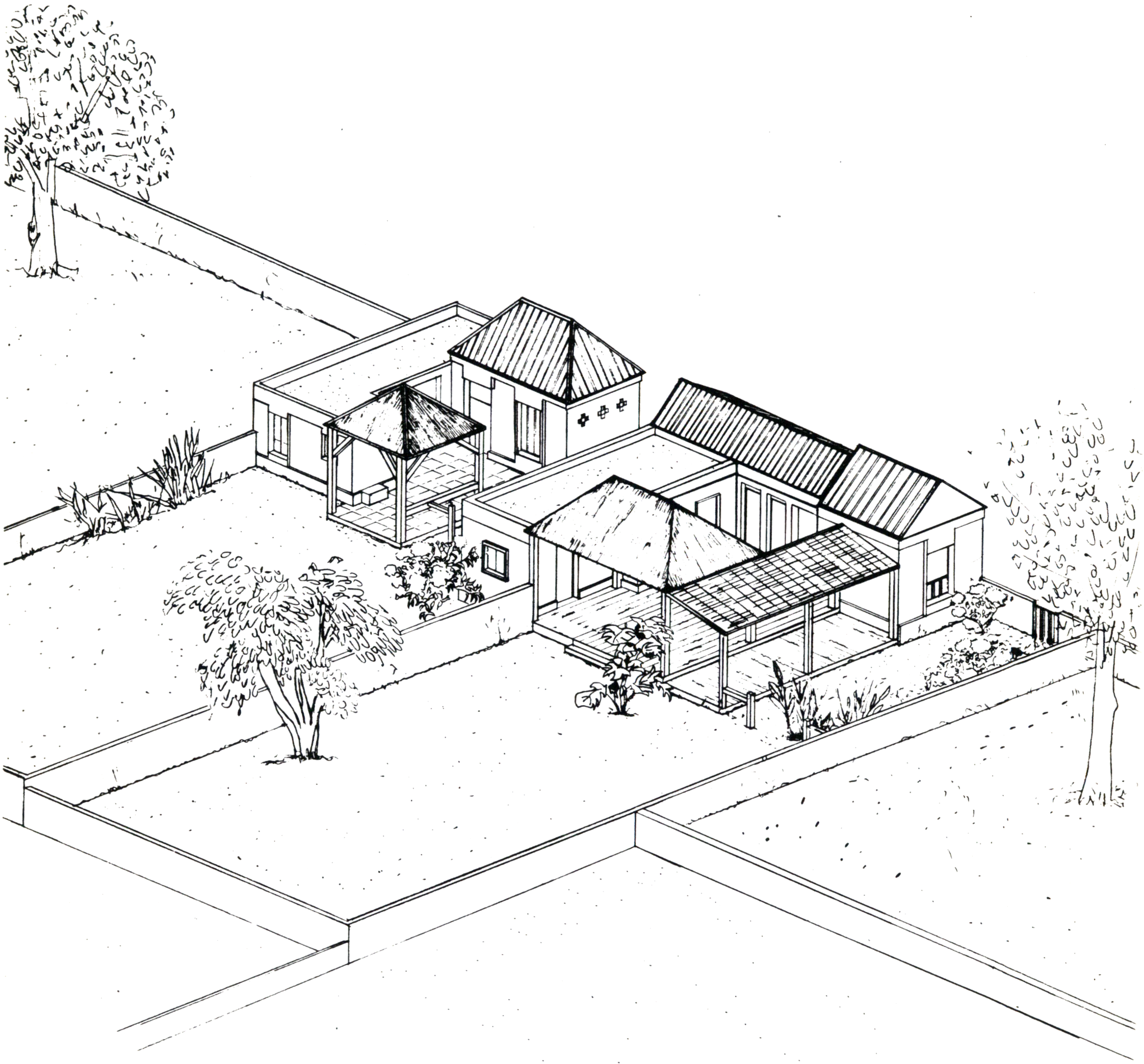
a

a

0 1 2 3 4 5



0 1 2 3 4 5



a

Comedor

Sala

kitchen

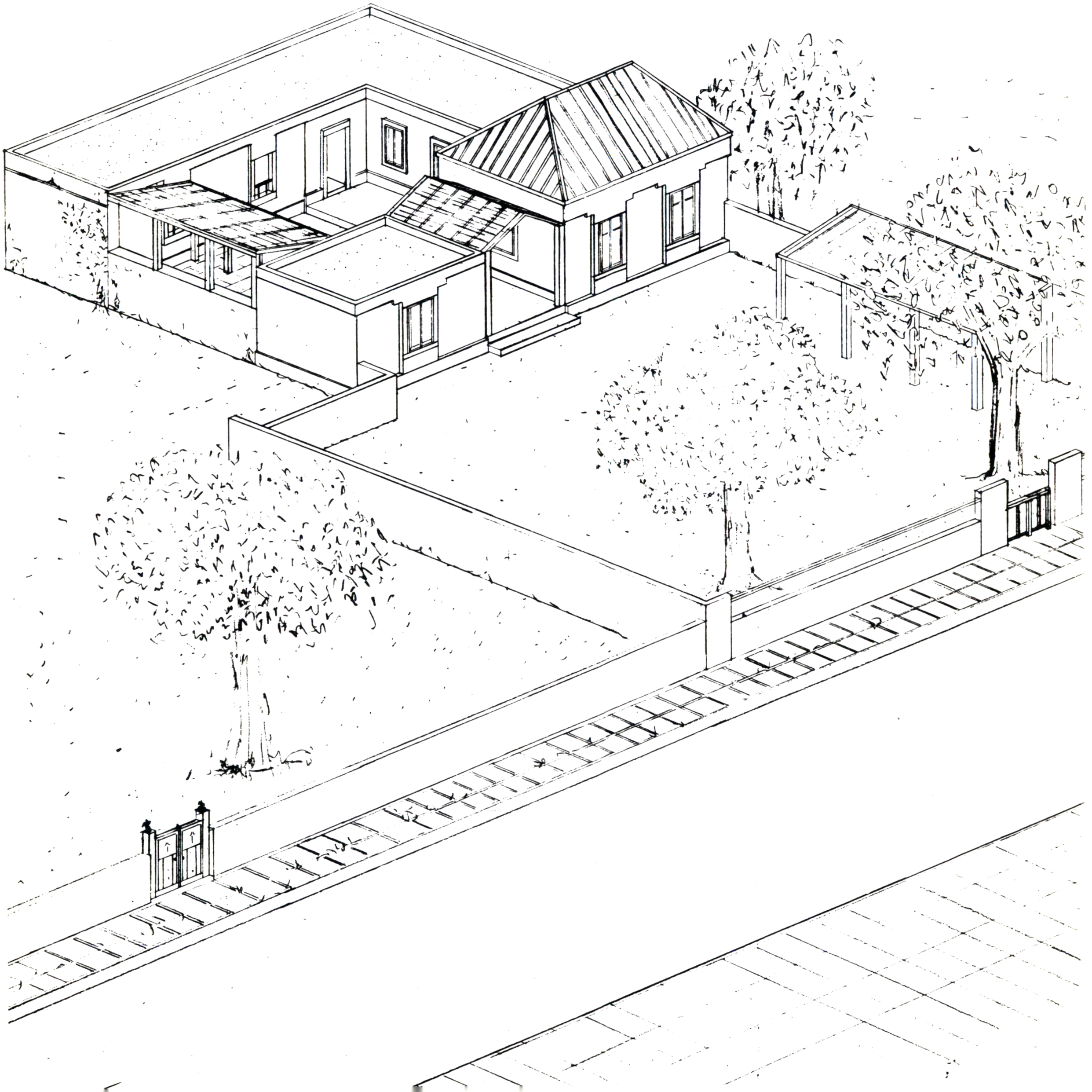
Bedroom

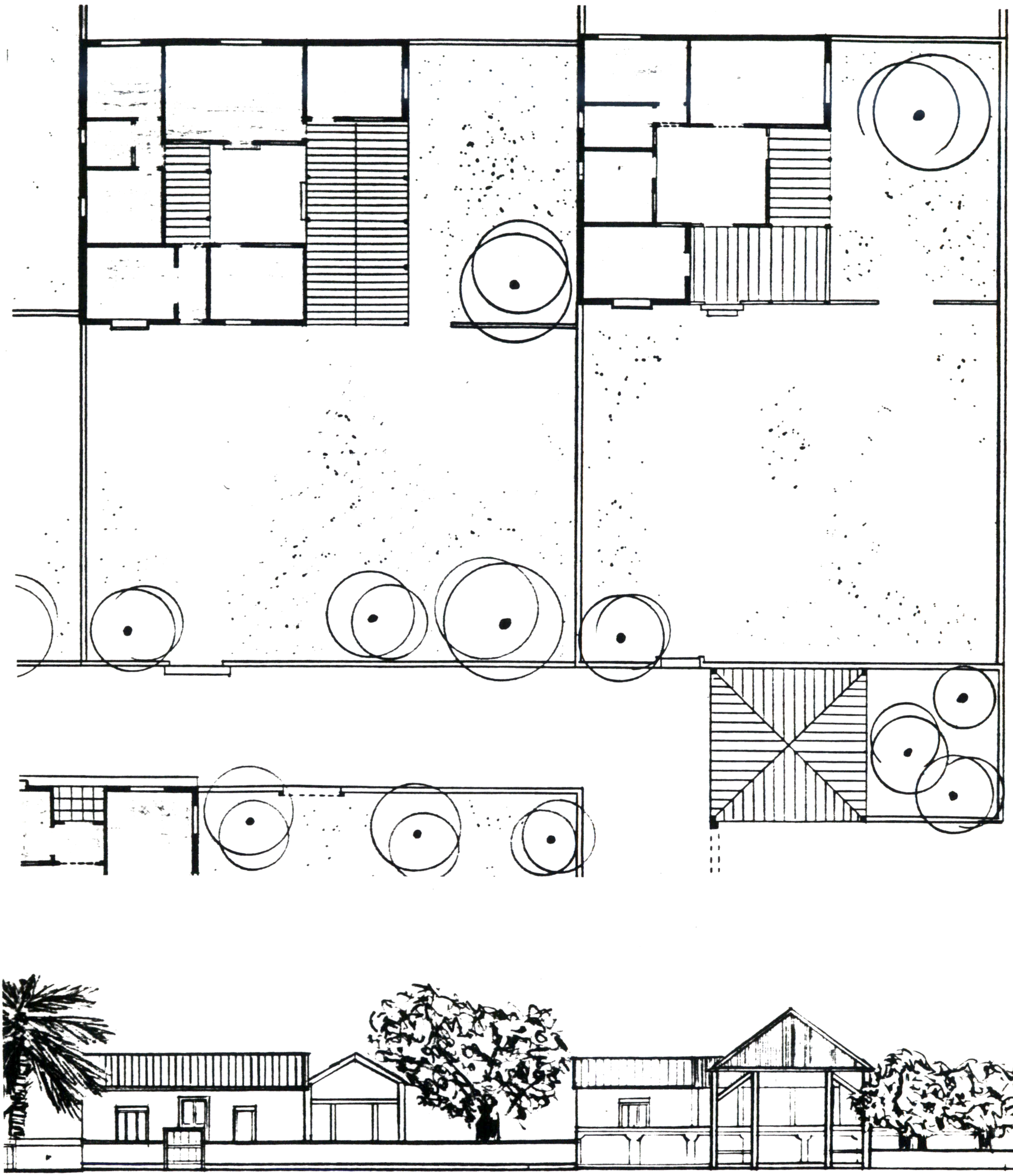
Bedroom

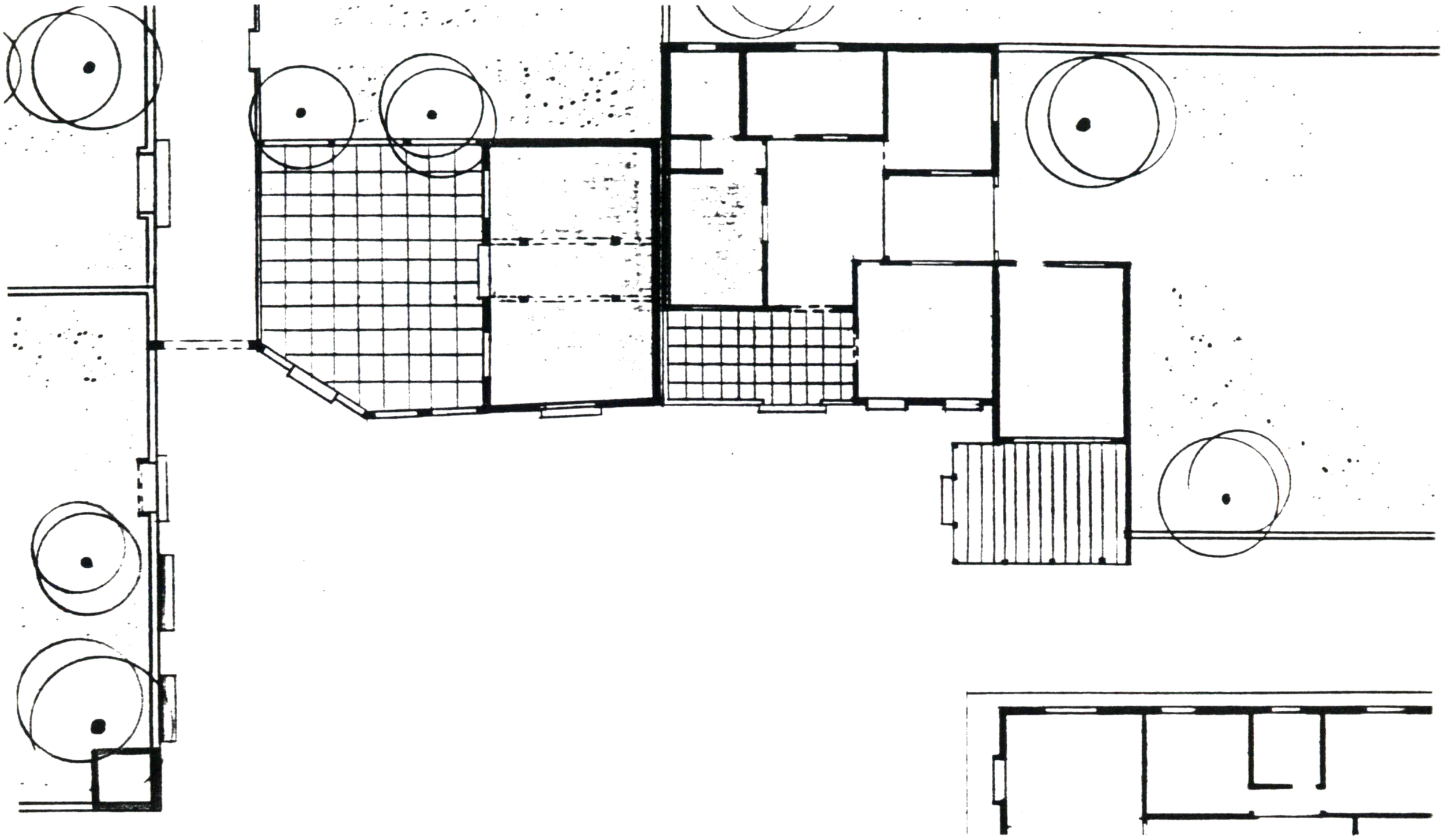
Bedroom

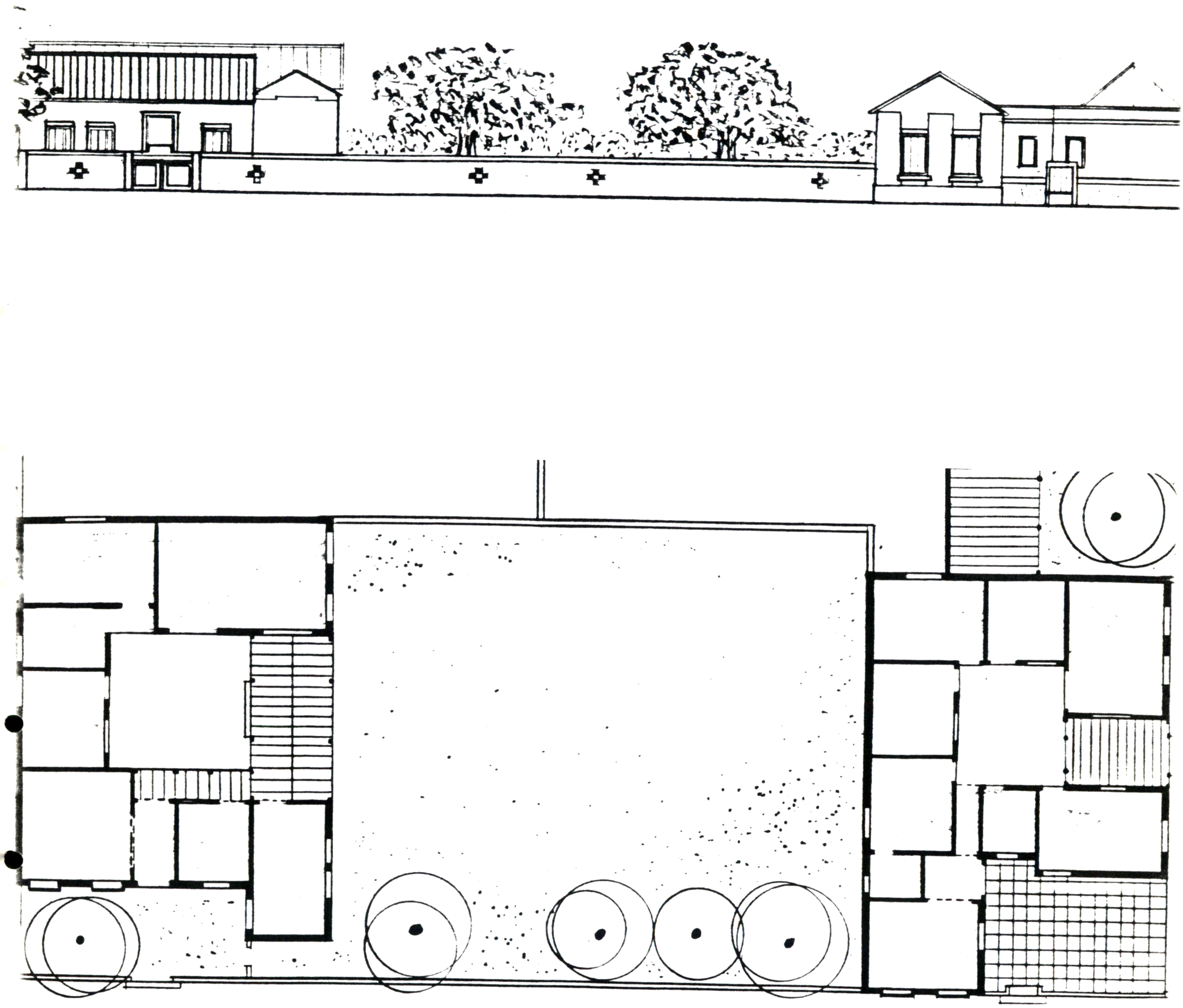
a

0 1 2 3 4 5









# 5. FIXED HOUSING FOR THE MINERS

It is clear from everything which has been said so far that our intention in this project is to provide a form of housing which is deeply controlled by the users and inhabitants of the houses, and to avoid as thoroughly as possible the type of modern construction in which the individuality and uniqueness of different families are not respected.

However, at the same time, it is necessary to pay attention to certain relities. In the case of Guasare new town, the town is, in essence, being built by the corporation of Carbozulia to house their mine workers. In discussion with the top managers of Carbozulia, we have found out that in very many cases, the miners will be hired from a long distance, and that they will agree to work or not according to the quality of housing which is made available to them

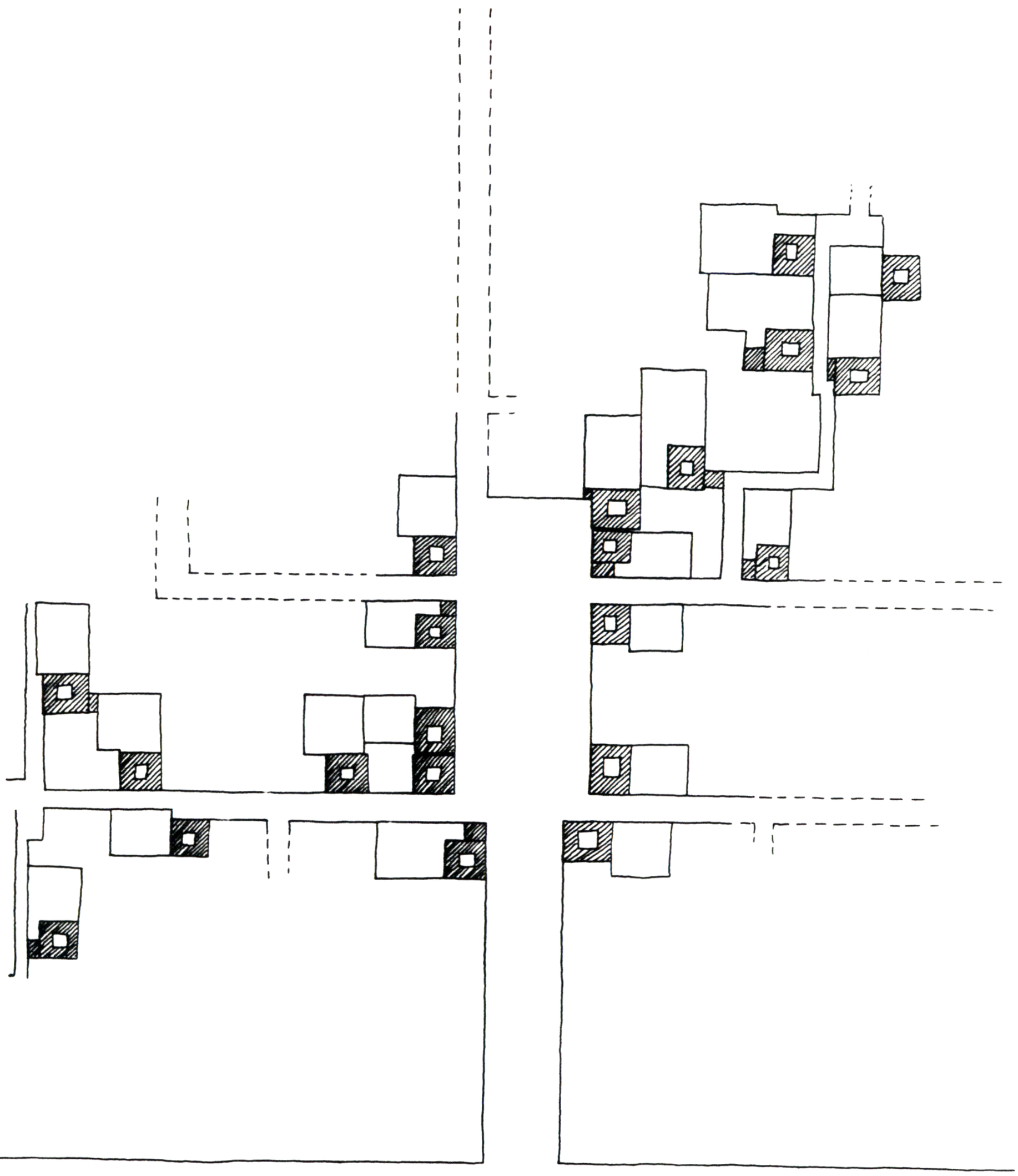
It is therefore necessary, from the point of view of Carbozulia, to build considerable numbers of mine-workers' houses in which the family cannot play a role in the design of the houses because the houses must be designed and built before the miners appear in Guasare.

Of course, the miners' housing, which lines the collector roads of the new town, will fulfill this requirement. However, since it is clear that many miners may wish to live inside the neighborhoods, not outside them, we have also agreed to build some percentage of miners' houses inside the neighborhoods mixed in with the other houses created by the neighborhood process.

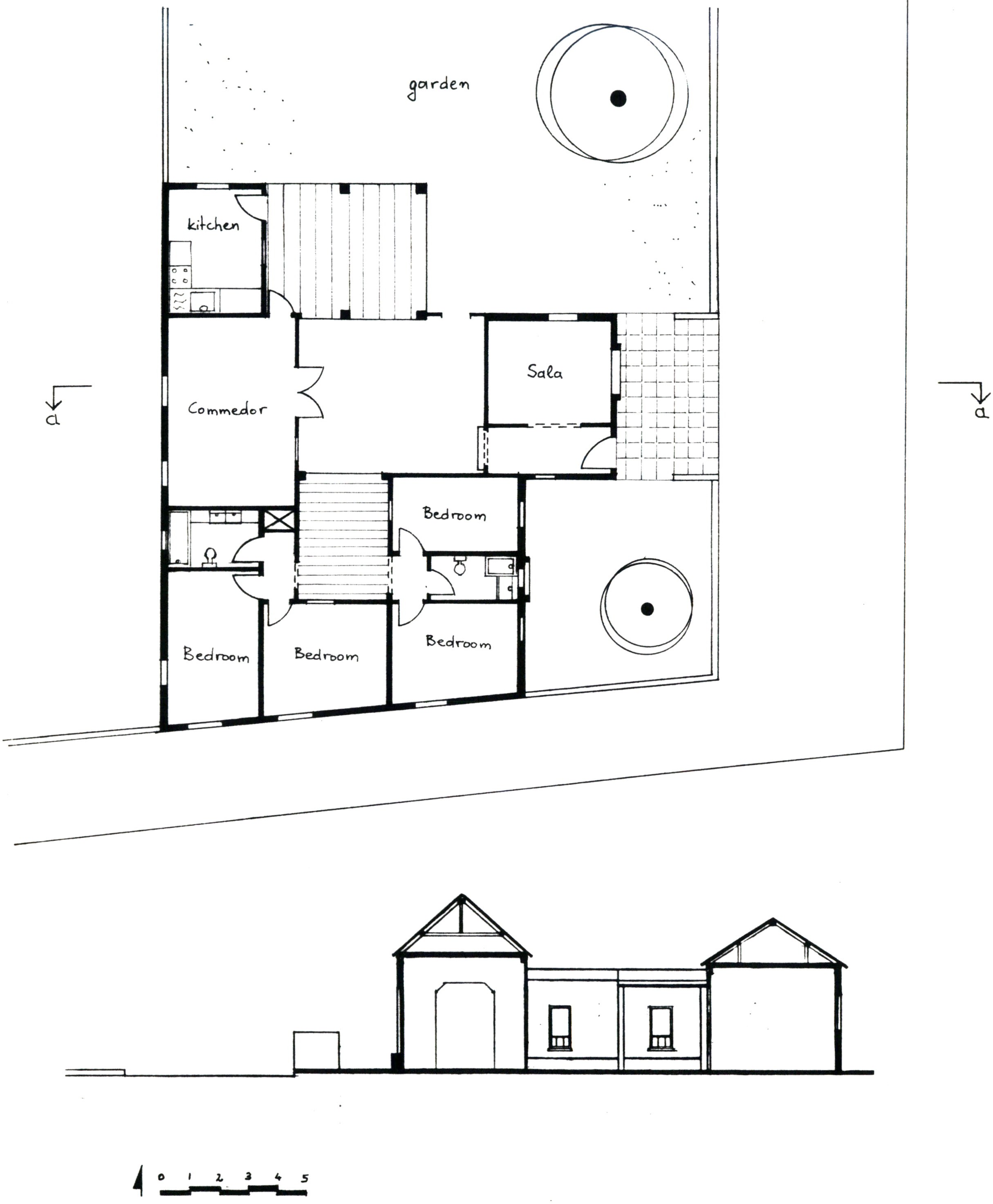
In these cases, since the family cannot be identified ahead of time, we propose to use a few fixed designs which are capable of fitting various conditions of street and topographic orientation. These houses

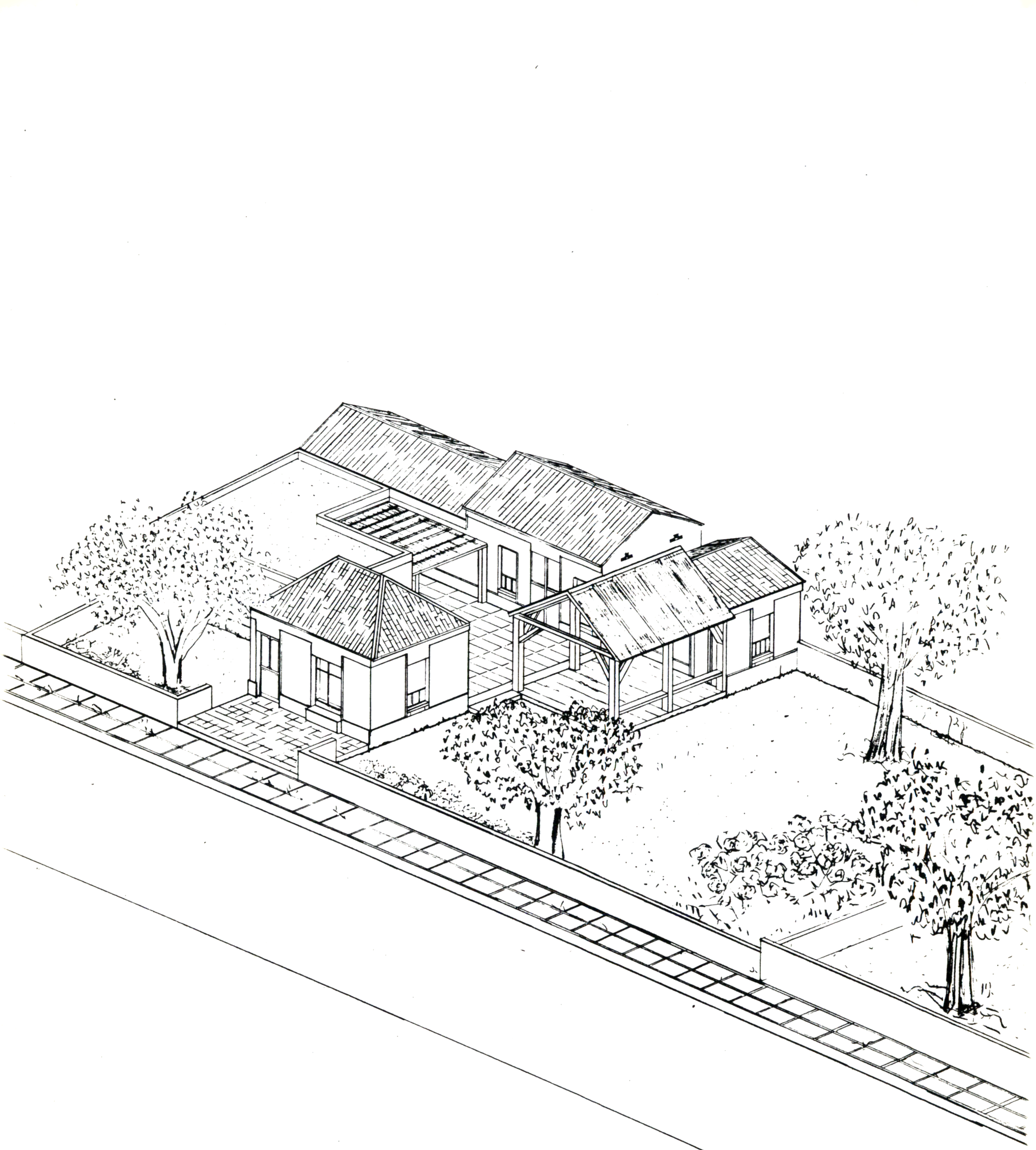
will be built right away, as soon as the neighborhood infrastructue is complete, and they will then form a kind of fixed core around which the other houses of the neighborhood will slowly grow.

MINERS' HOUSING IN THE NEIGHBORHOOD



# A 4-BEDROOM HOUSE OF 140m$^2$





TWO 3-BEDROOM HOUSES FOR MINERS; ONE OF $92m^2$, THE OTHER OF $130m^2$

# 6. THE POSSIBILITY OF PIECEMEAL GROWTH

We have made the assumption that only about 25 per cent of the houses in each neighborhood will be built from the beginning as complete houses. These houses will belong to miners' families and to certain other families with monthly income more than Bs.3000. This assumption is based on Echenique's analysis of income distribution in the population of Guasare.

The remaining 75 per cent of the houses in each neighborhood will grow incrementally because of the limited amount of money available to each family for house construction. These 75 per cent of the houses will belong mainly to families with less than Bs.3000 monthly income.

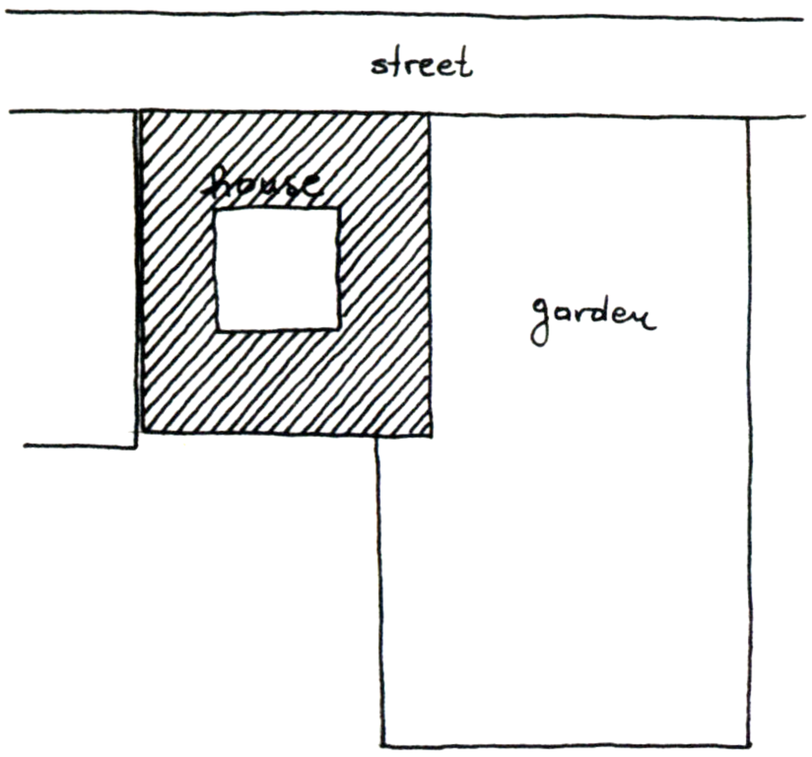
The rate of the incremental growth of the house will depend on the financial situation of each family. However, the financing programs proposed in chapter 3 provide the possibility for each family to build the first increment of the house of about 20 x 30 $m^2$ through a subsidy from Corpozulia as soon as arrangements about land ownership have been completed, and a second increment varying between 15 x 35 $m^2$ through a financing program of loans from INAVI or through credit for materials from Corpozulia. Through these programs, families will have the opportunity to build an initial house of about 35 to 65 $m^2$ within one or two years. The growth of the houses beyond this point will depend mostly on the savings of each family and on the money available yearly from each one of them for house construction. It seems that probably the overall pace of growth of the houses in the neighborhood will slow down after the completion of the first two increments.

Houses which will be built incrementally will have the same structure and the same layout principles as houses built complete from the beginning. The structure of the house that we have proposed, beyond being adapted to the cultural and climatic needs of this Venezuelan area, gives the possibility of its incremental construction while keeping its structure apparent and intact at each step. The increments of construction for each house will have to be chosen in such a way as not to violate the structure of the house but to enhance it at each step of the construction.

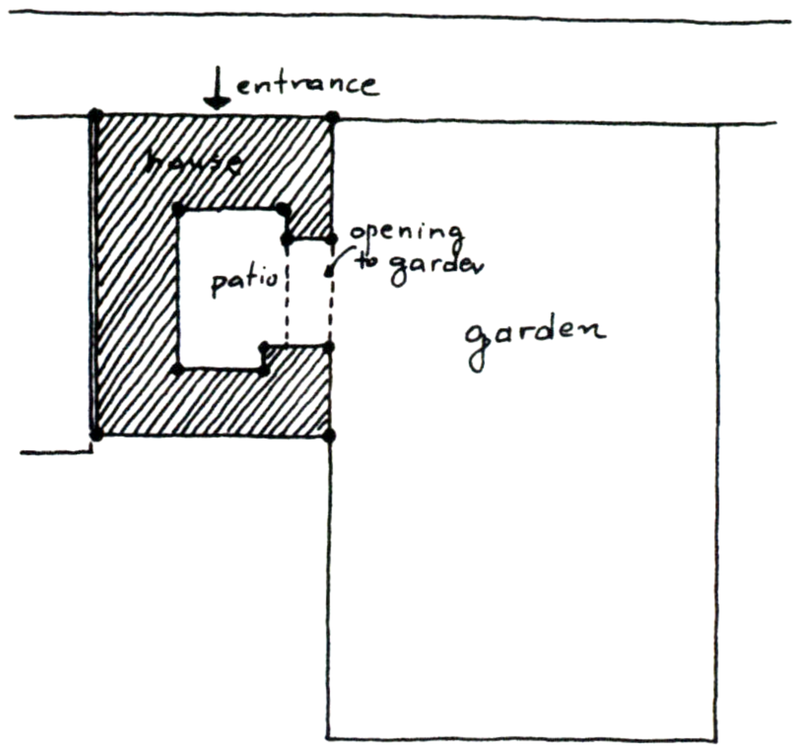
The families who will intend to build their house incrementally won't have to go through a detailed layout of the whole house in its complete form. Before they start the construction of the first increment they will have to accomplish the following things on the site:

1. Layout and precise staking of the area of the lot allotted to the house, already indicated at the time of subdivision.
2. Layout and staking of the patio at the center of the house.
3. Layout of the wings that surround the patio where the rooms of the house will be built.
4. The area of the opening in the wings that will connect the patio with the garden.
5. The approximate location of the entrance to the house.

While these decisions are being made, the family should bear in mind the size of the house that they need when completed.




As in subdivision




Lay-out by the family

Before each increment of construction starts, a precise layout of the increment must take place on the site, according to the patterns and organization of the Guasare house described in sections 2 and 3 of this chapter.

The size of the increments of construction will vary in size depending on the available financing and on the needs of the family. The location of the increment in the buildable area of the house is very important, since each increment will have to contribute the most to the formation of the patio, and some of them to the formation of the street.

The first increment of the house, which in most cases will include two rooms and some covered open space, will have to contribute to the formation of the street. At least part of this first increment of

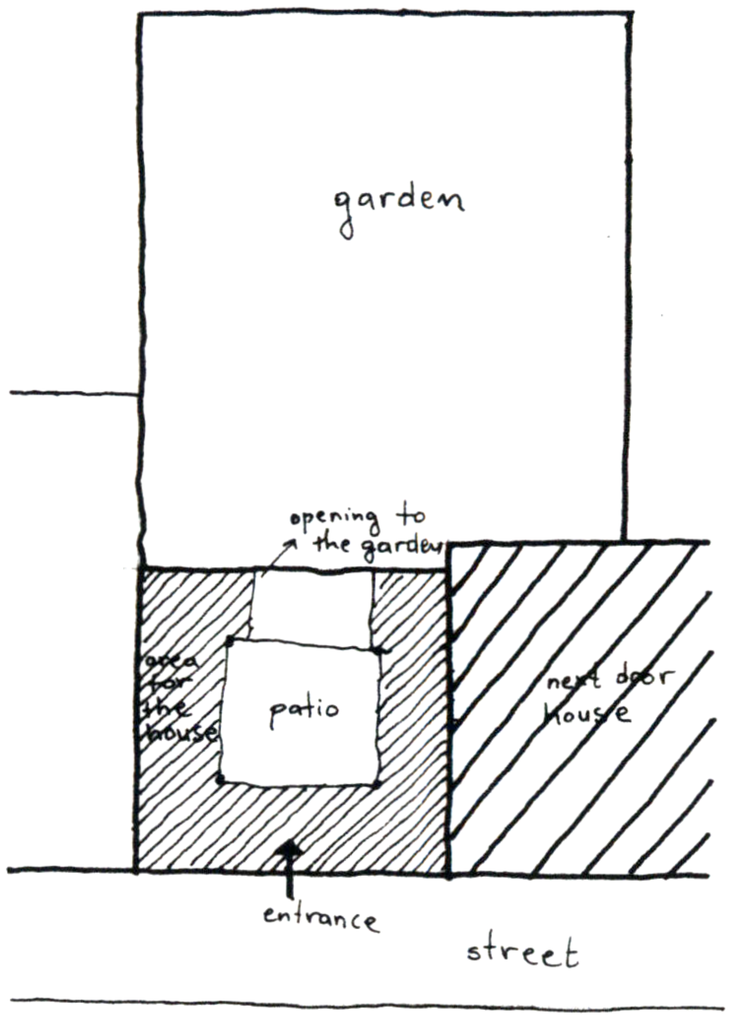
construction will have to be placed on the wing of the house between the patio and the street. Beyond this, the first increment will have to start the formation of the patio.

With the second increment of the house, the patio will have to be pinned down and defined to a considerable degree, though not fully developed and completed. At this stage the use of covered open spaces will strongly help the formation of the patio.

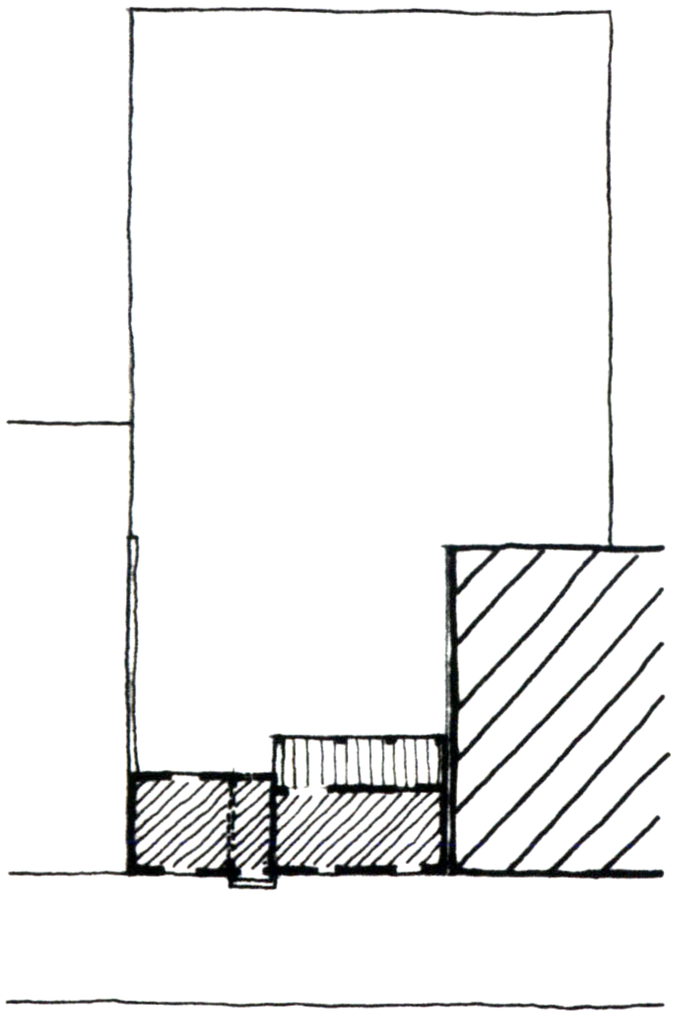
The following examples show the sequence of construction increments for different houses of different sizes. The contribution of each construction increment to the whole house is best shown in these examples:

# THE INCREMENTAL GROWTH OF A HOUSE OF 40sq.mt.

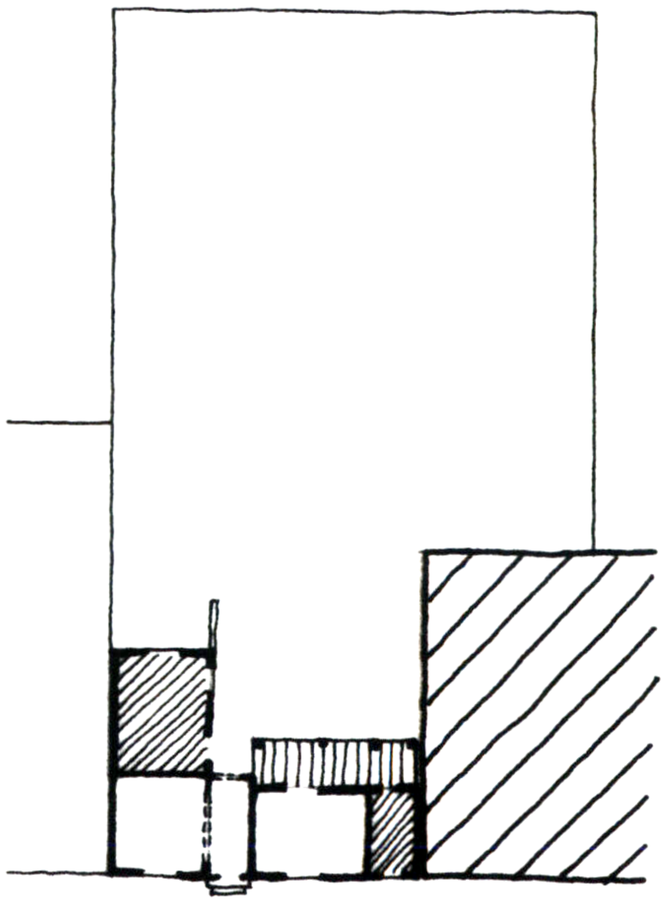
## THE INITIAL LAYOUT



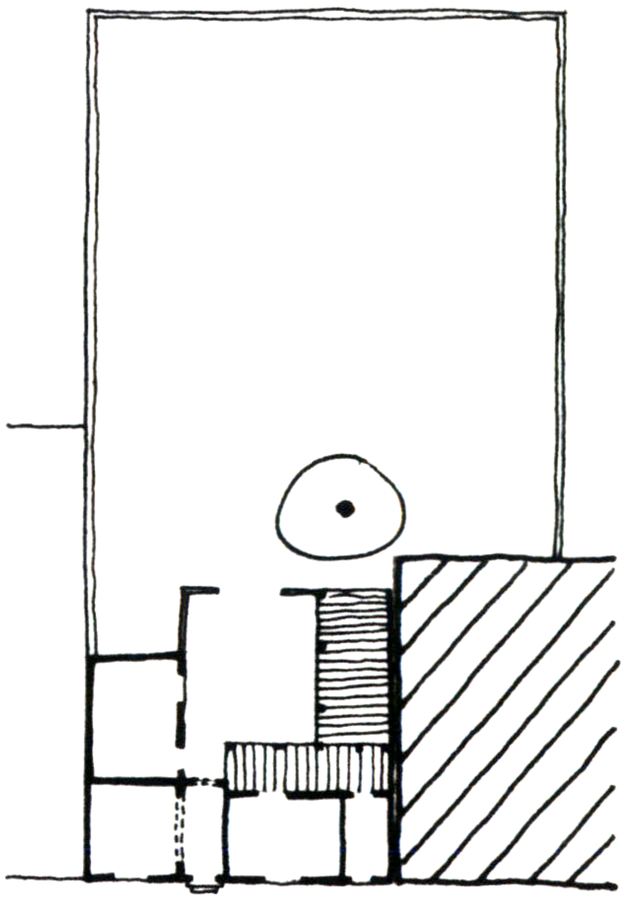

**FIRST INCREMENT**
2 rooms
entrance
veranda
34sq.mt.



**SECOND INCREMENT**
1 room 12sq.mt
interior wall

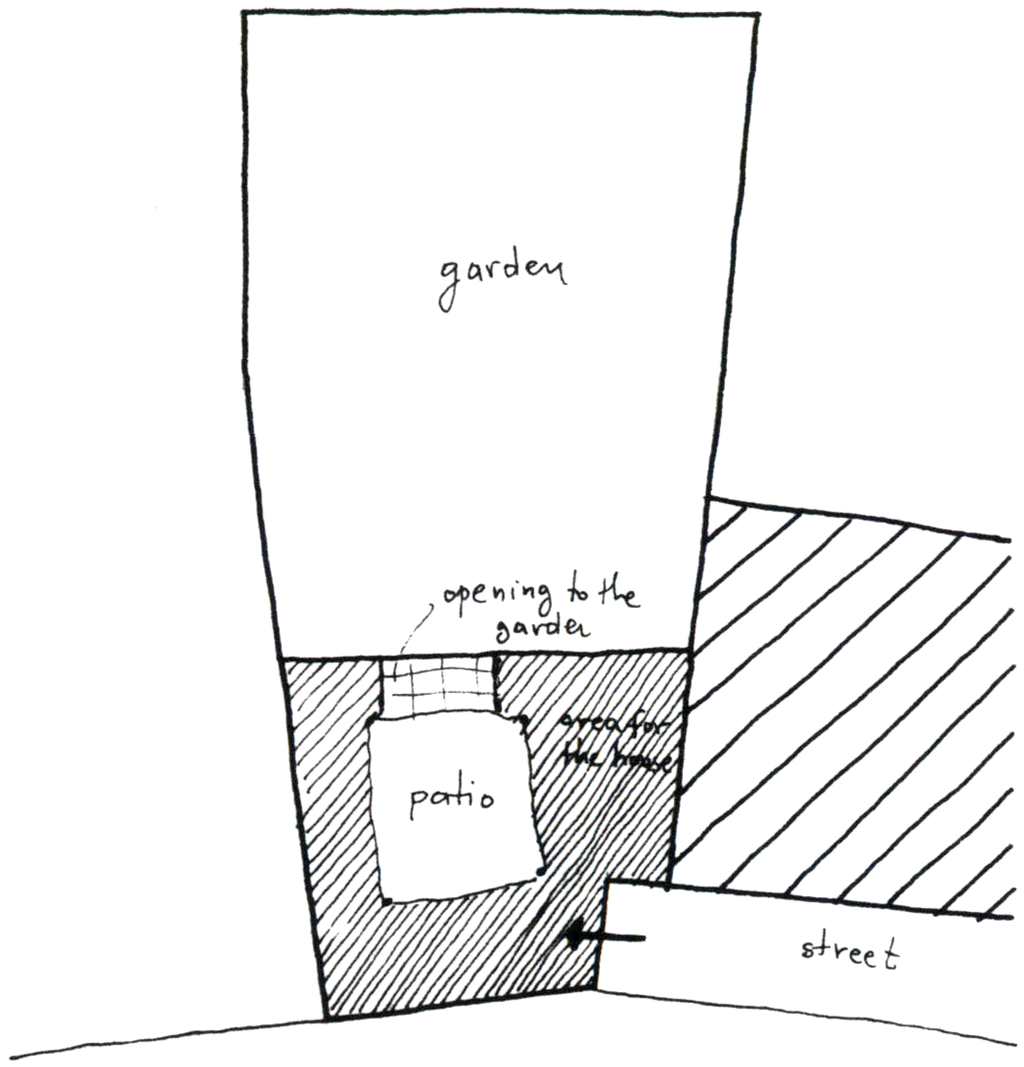


**THIRD INCREMENT**
veranda
garden wall

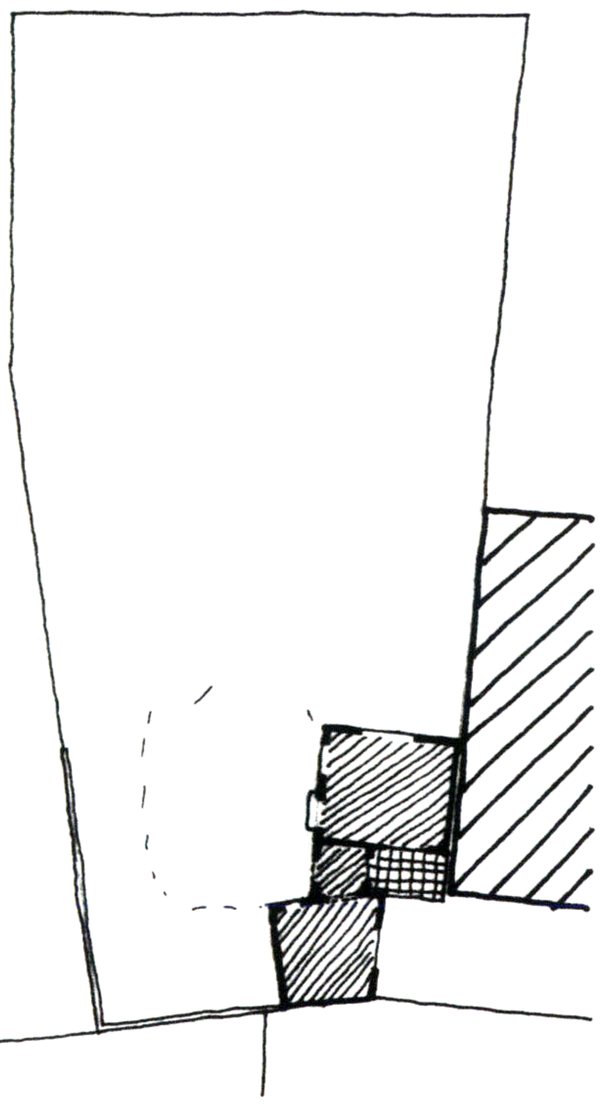


# THE INCREMENTAL GROWTH OF A HOUSE OF 50sq.mt.

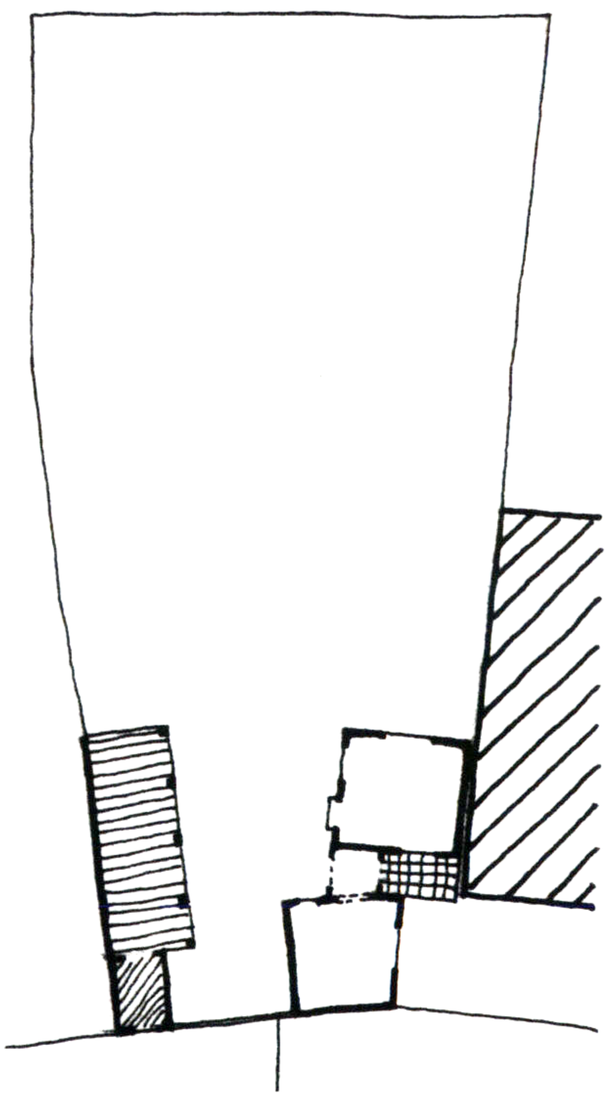
## THE INITIAL LAYOUT



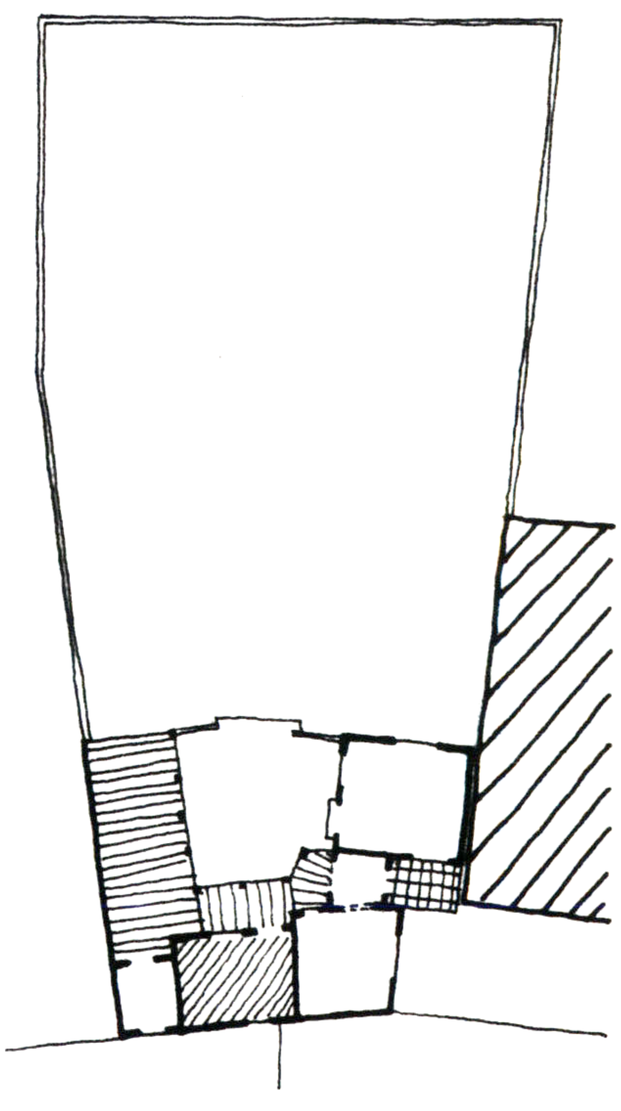

**FIRST INCREMENT**
2 rooms
entrance 39sq.mt
front porch



**SECOND INCREMENT**
bathroom 4sq.mt
veranda

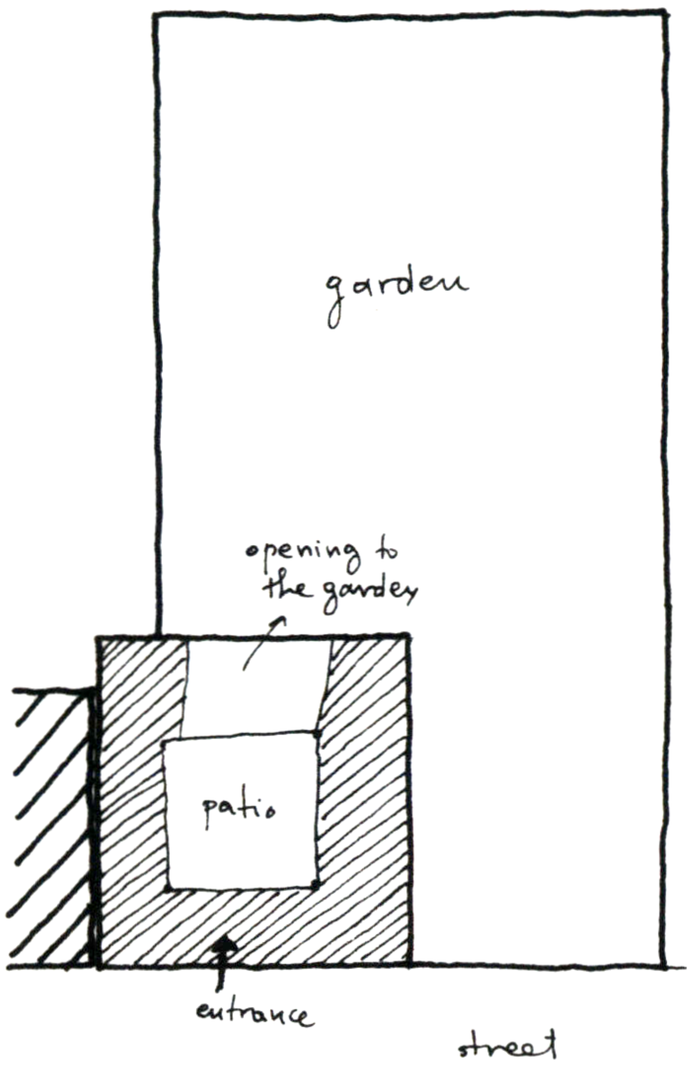


**THIRD INCREMENT**
1 room 12sq.mt
veranda
garden wall

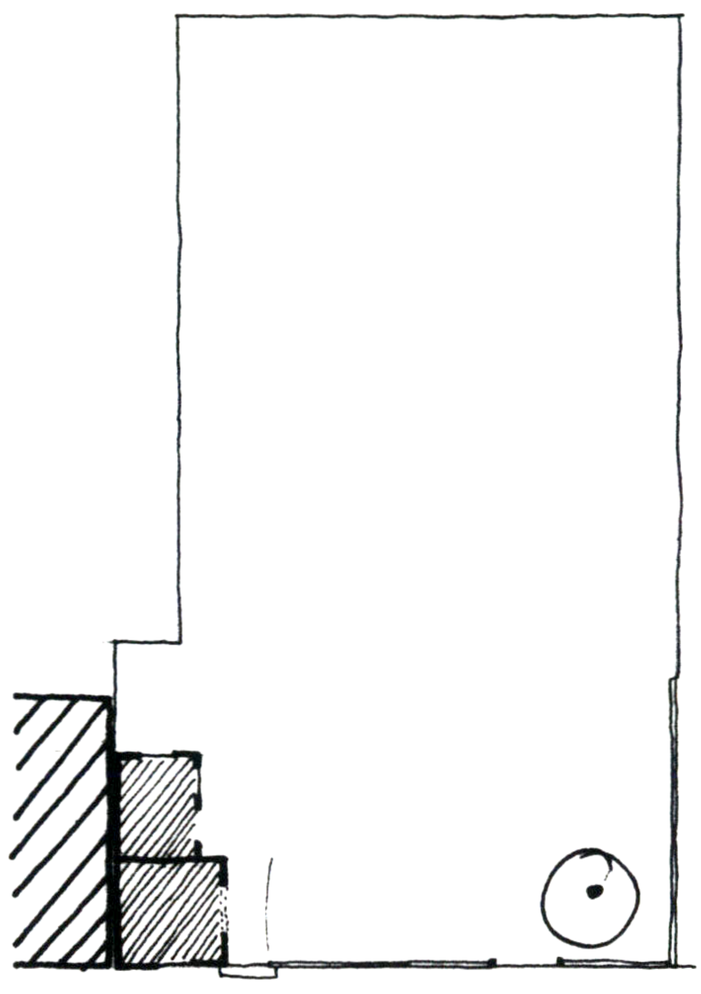


# THE INCREMENTAL GROWTH OF A HOUSE OF 60sq.mt

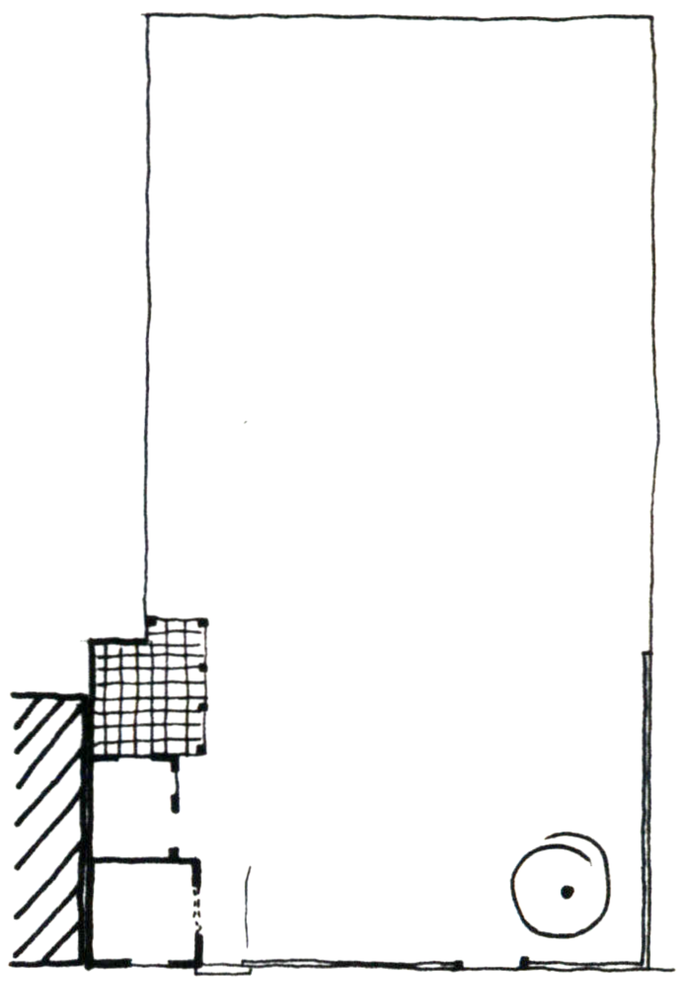
## INITIAL LAYOUT



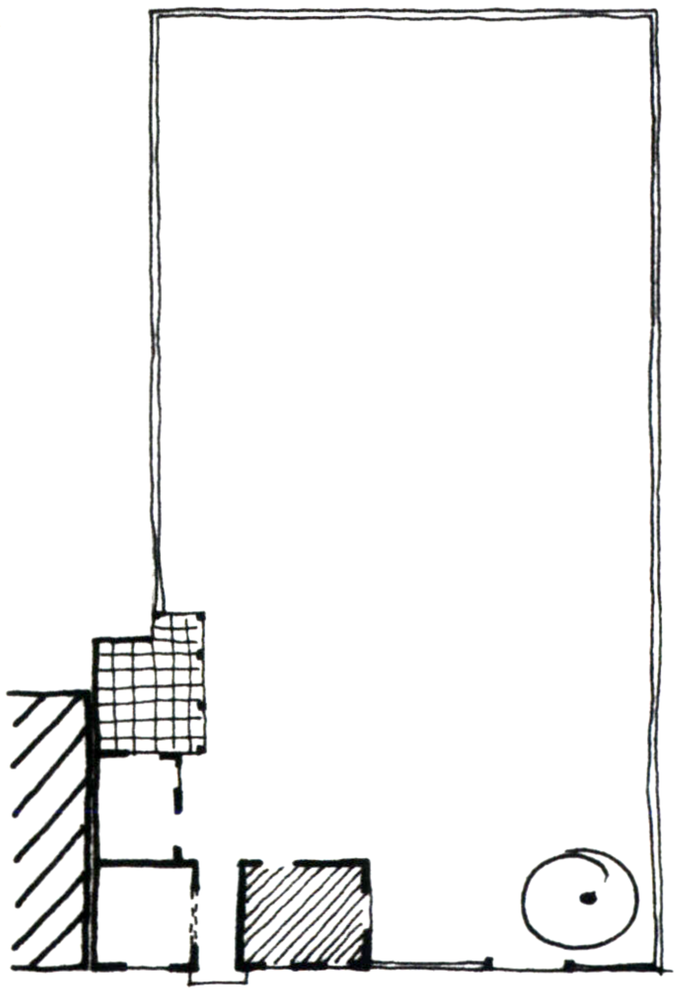

## FIRST INCREMENT
2 rooms 24sq.mt.
front garden wall



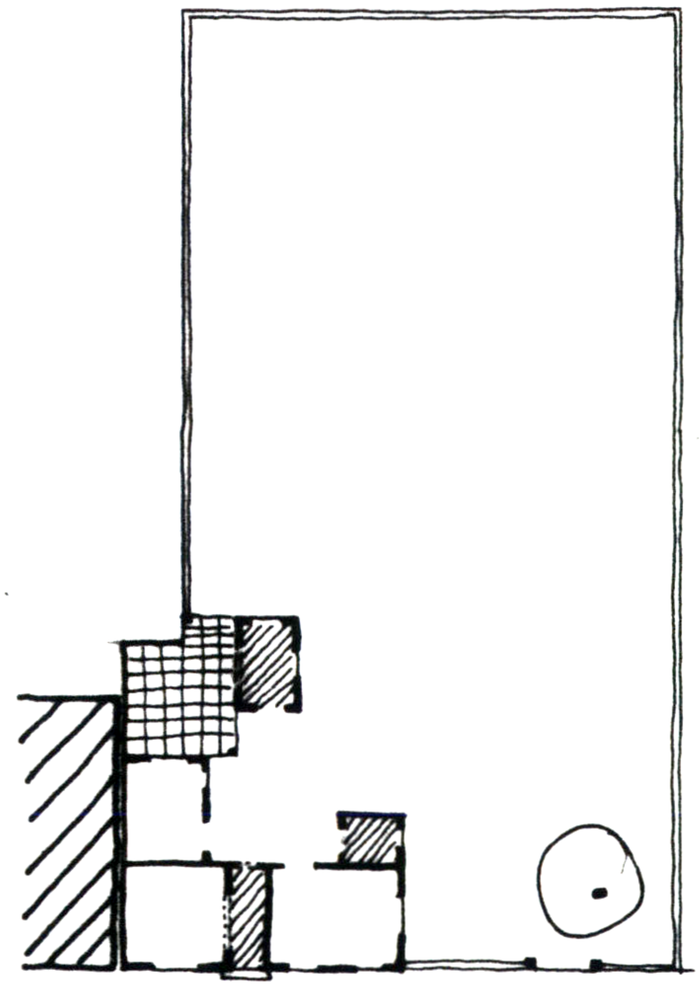
## SECOND INCREMENT
veranda



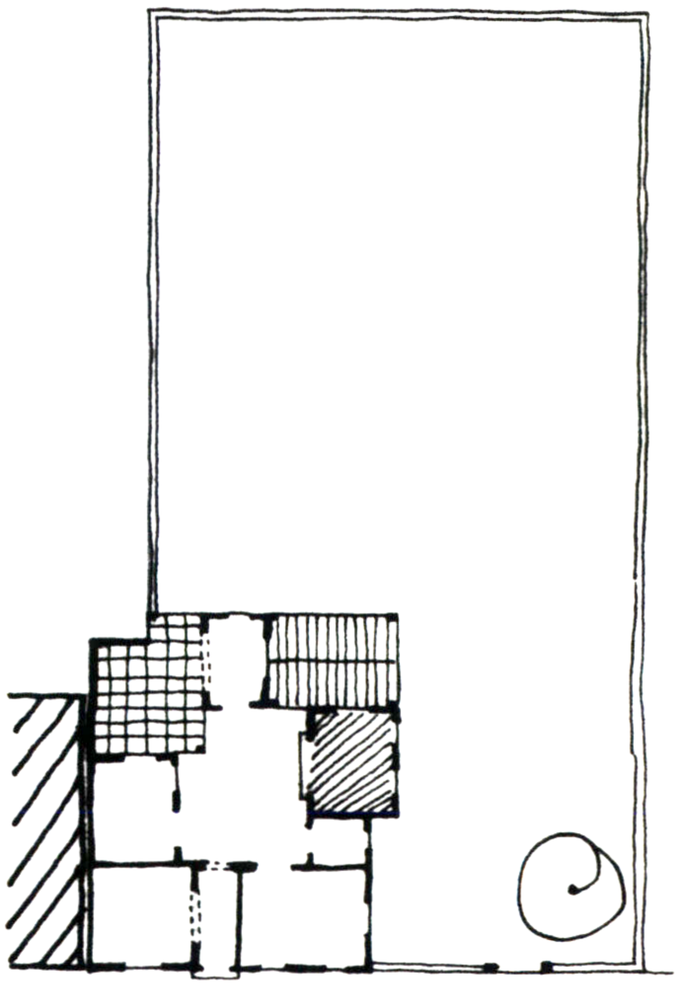
## THIRD INCREMENT
1 room 15sq.mt
garden wall



## FOURTH INCREMENT
1 small room
entrance 12sq.mt
bathroom

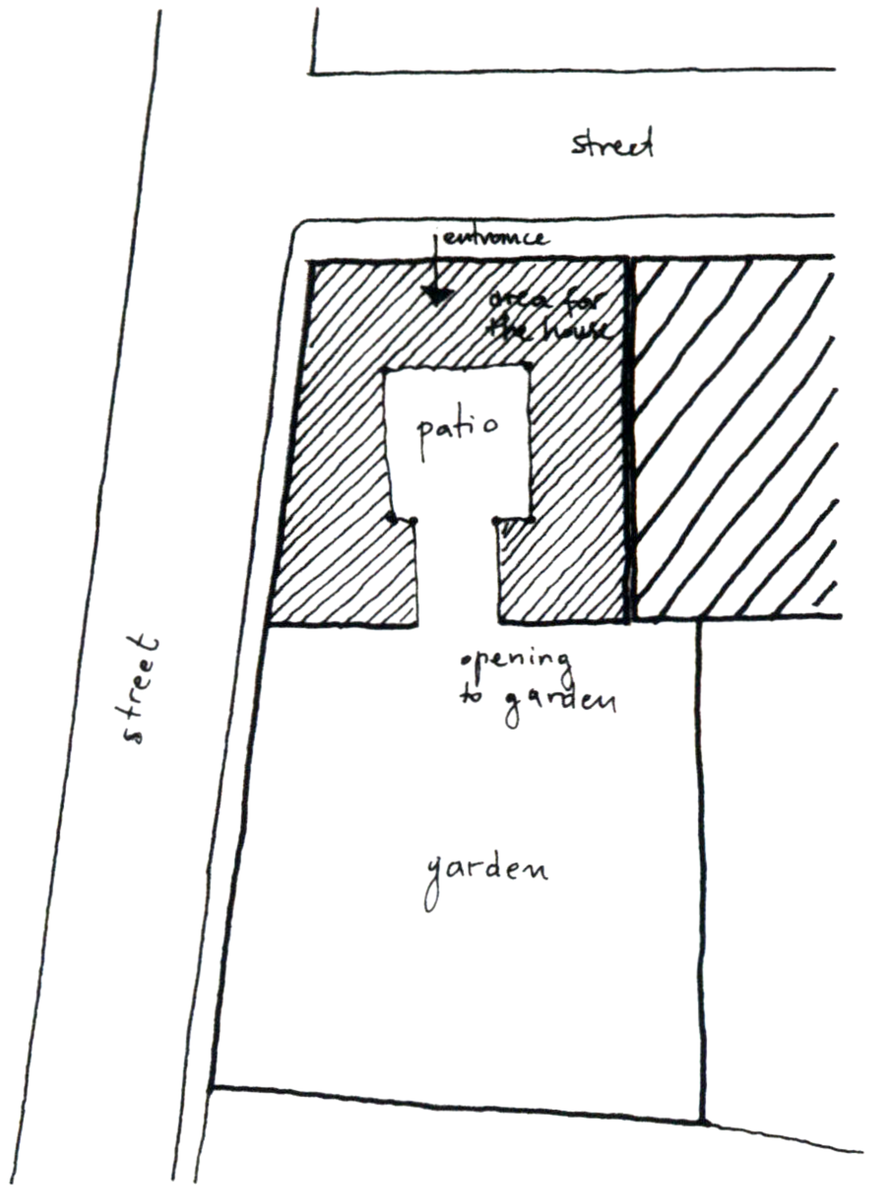


## FIFTH INCREMENT
1 room 11sq.mt
veranda

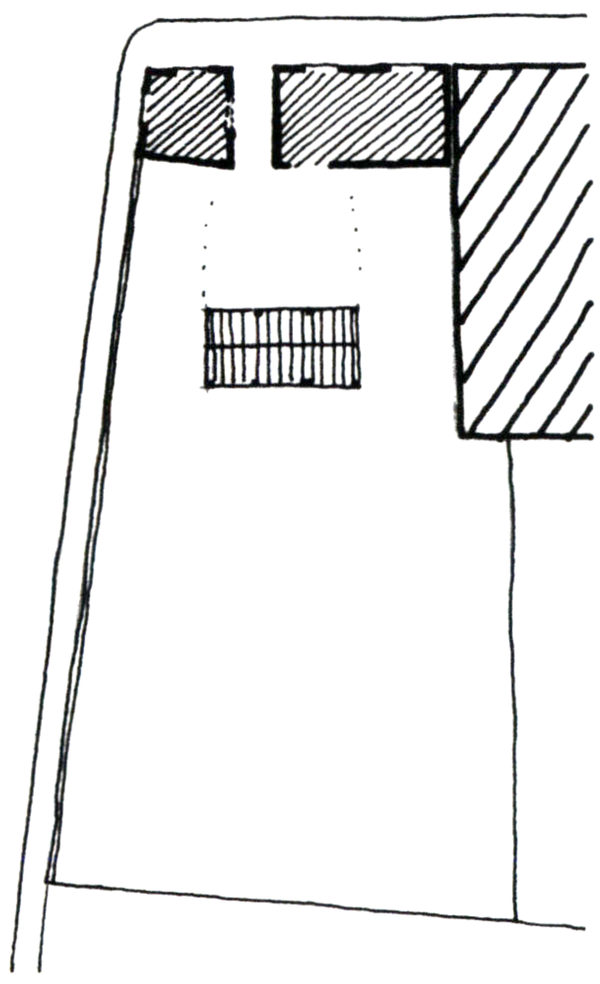


# THE INCREMENTAL GROWTH OF A HOUSE OF 70sq.mt.

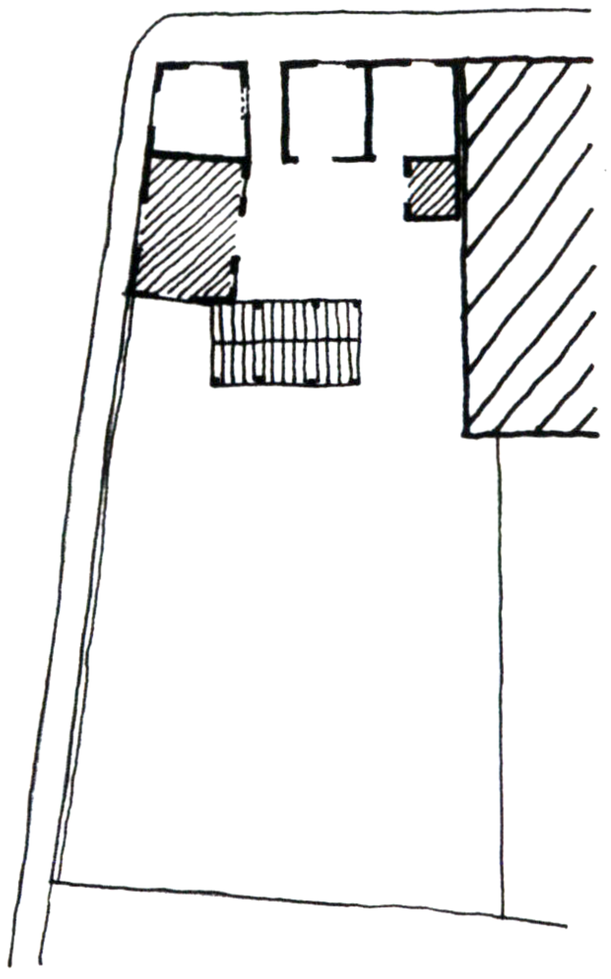
## THE INITIAL LAYOUT



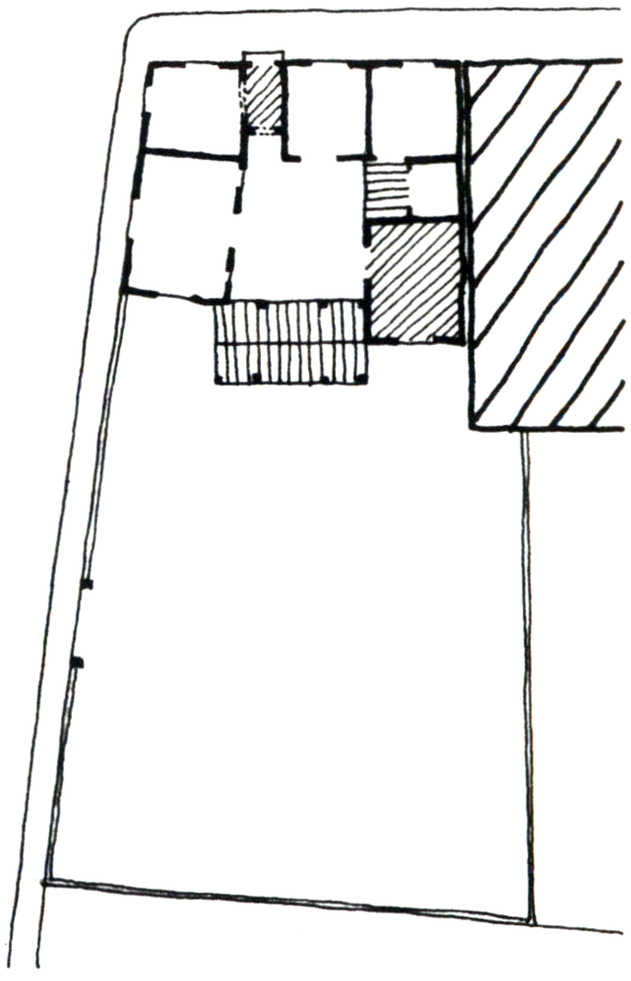

**FIRST INCREMENT**
2 rooms 31sq.mt
veranda
garden wall along street



**SECOND INCREMENT**
1 room 19sq.mt
bathroom 4 sq.mt
interior wall to subdivide big room

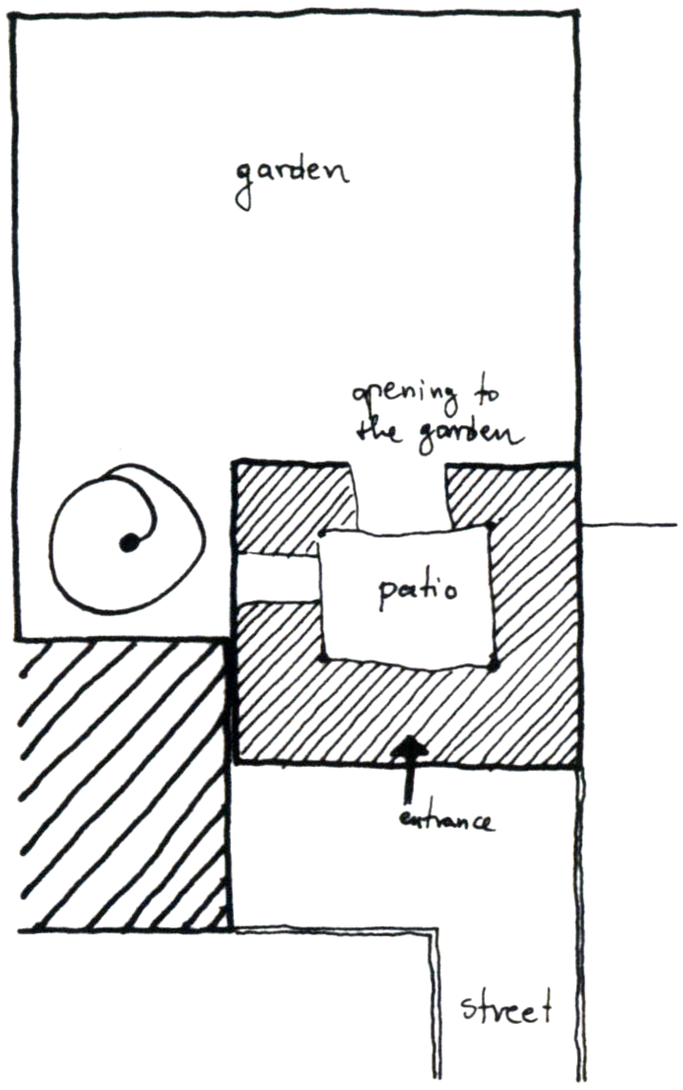


**THIRD INCREMENT**
1 room 12sq.mt
entrance 3 sq.mt
garden wall



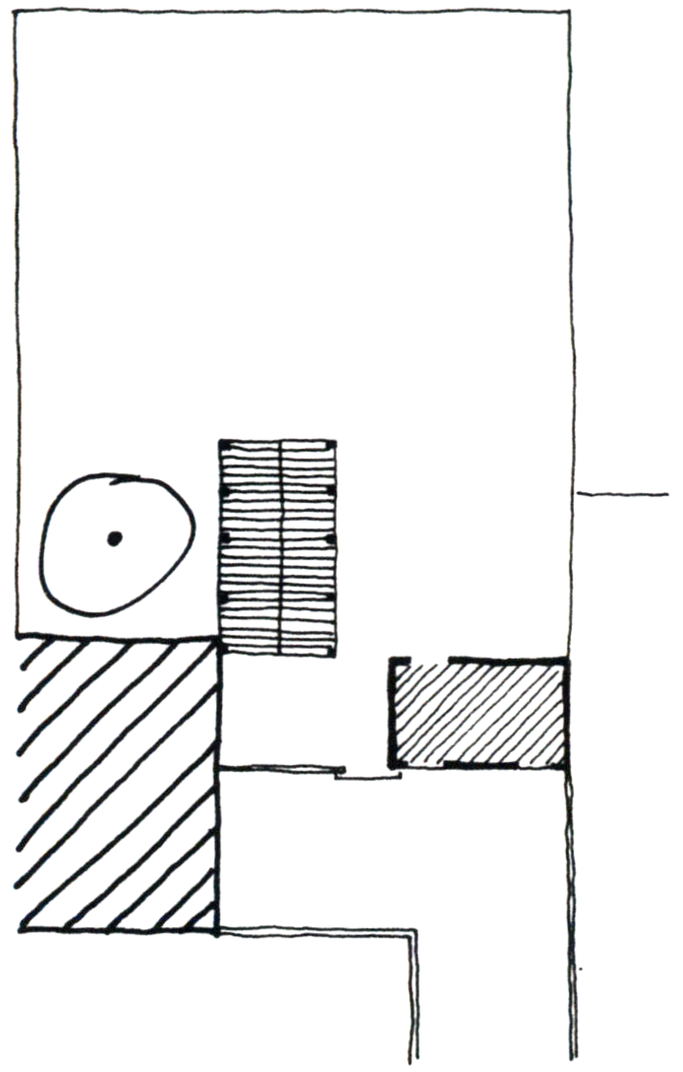
# THE INCREMENTAL GROWTH OF A HOUSE OF 75sq.mt.

## INITIAL LAYOUT



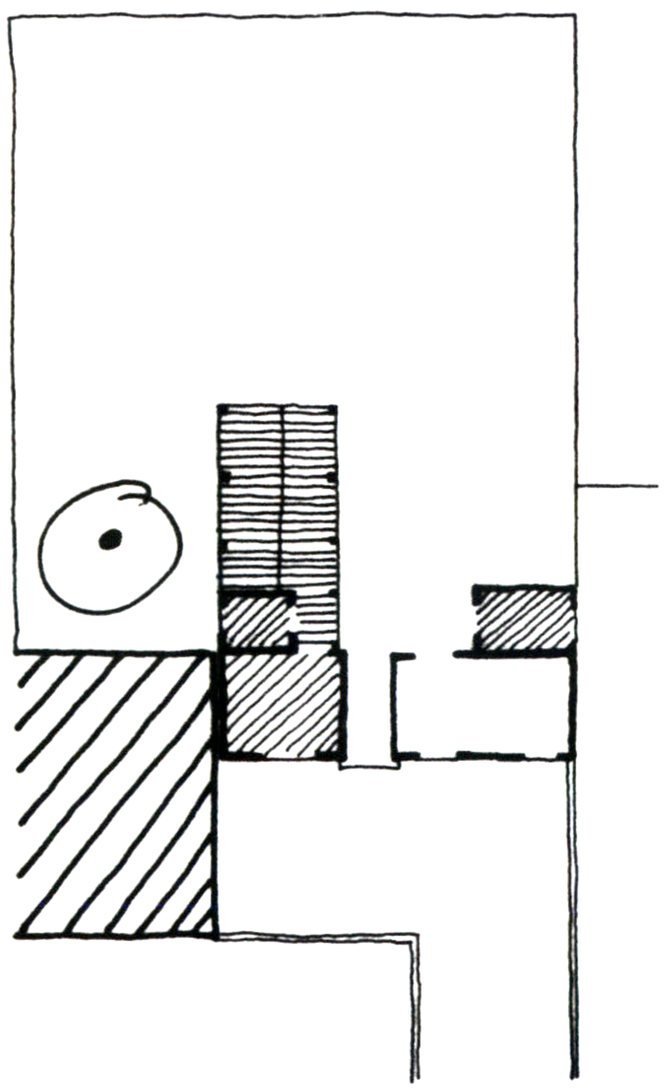

## FIRST INCREMENT

1 room 22sq.mt.
veranda



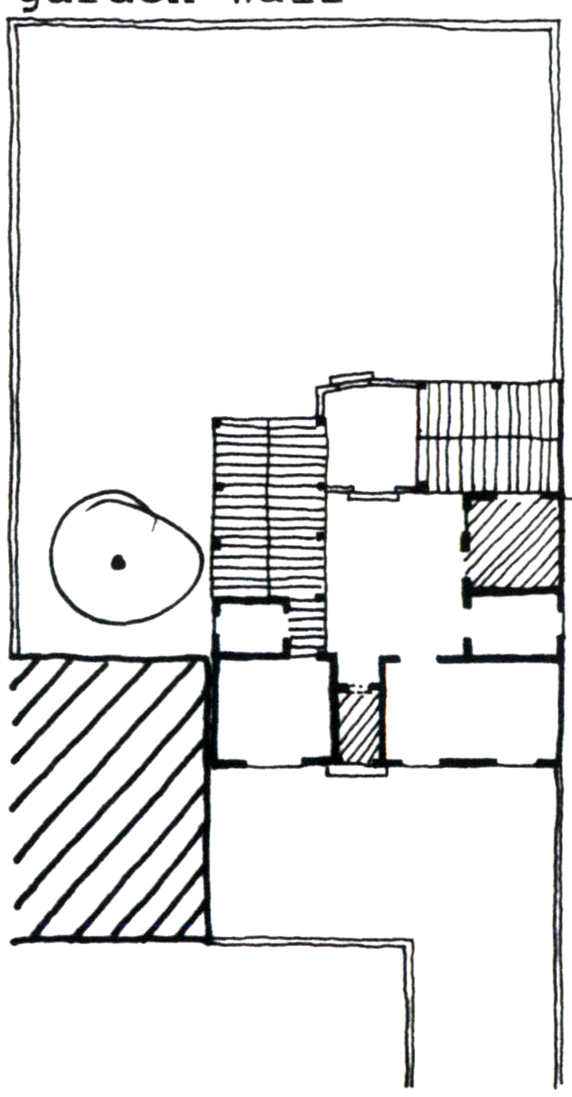
## SECOND INCREMENT

2 rooms 23sq.mt
bathroom 5sq.mt



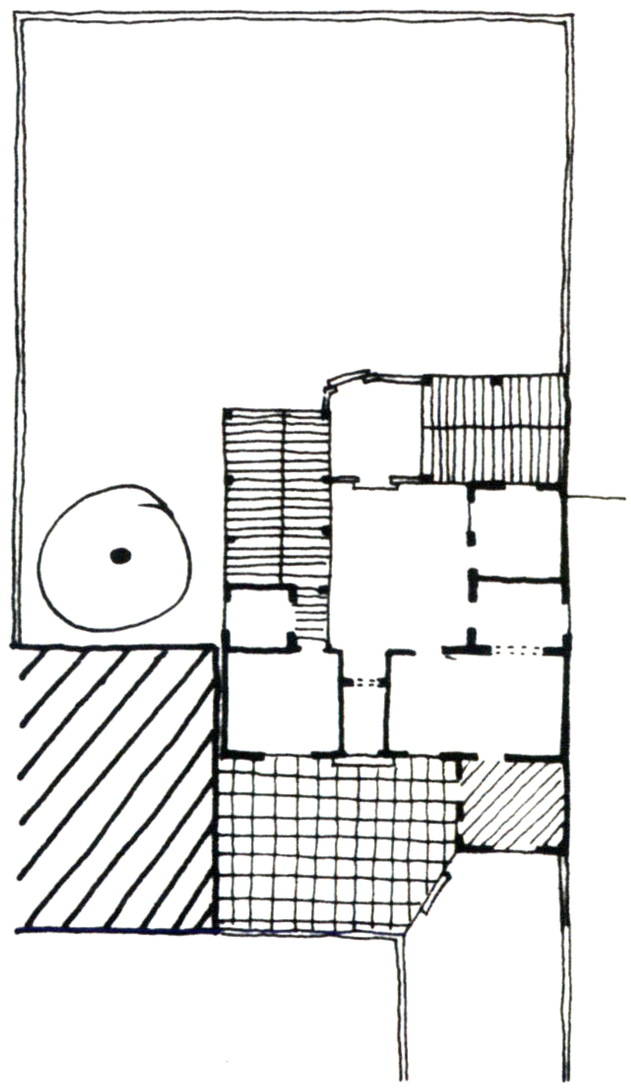
## THIRD INCREMENT

1 room 12sq.mt
veranda
entrance 4sq.mt
low walls in patio
garden wall



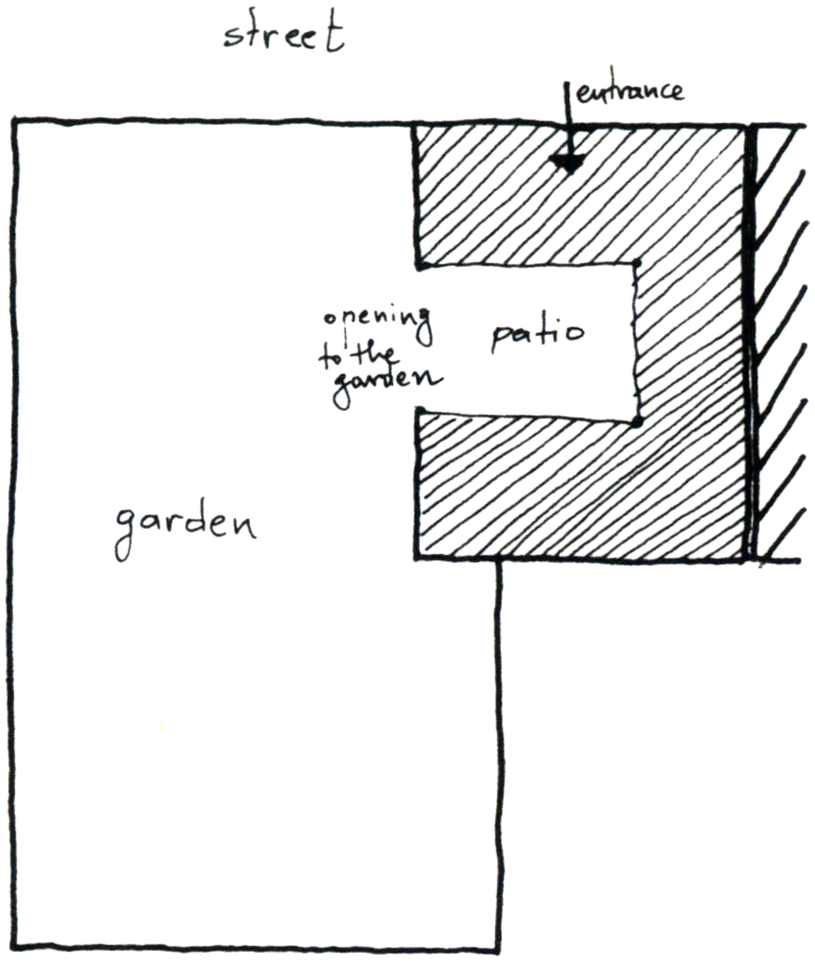
## FOURTH INCREMENT

1 room 11sq.mt
front porch
small interior
wall rearrangements



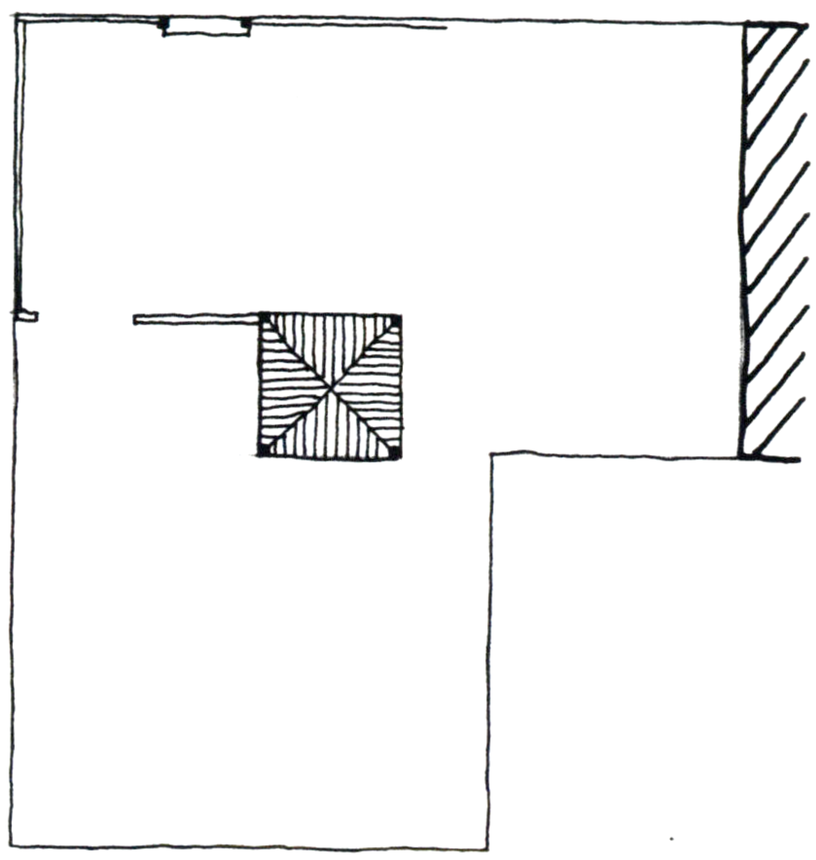
# THE INCREMENTAL GROWTH OF A HOUSE OF 90sq.mt

## THE INITIAL LAYOUT



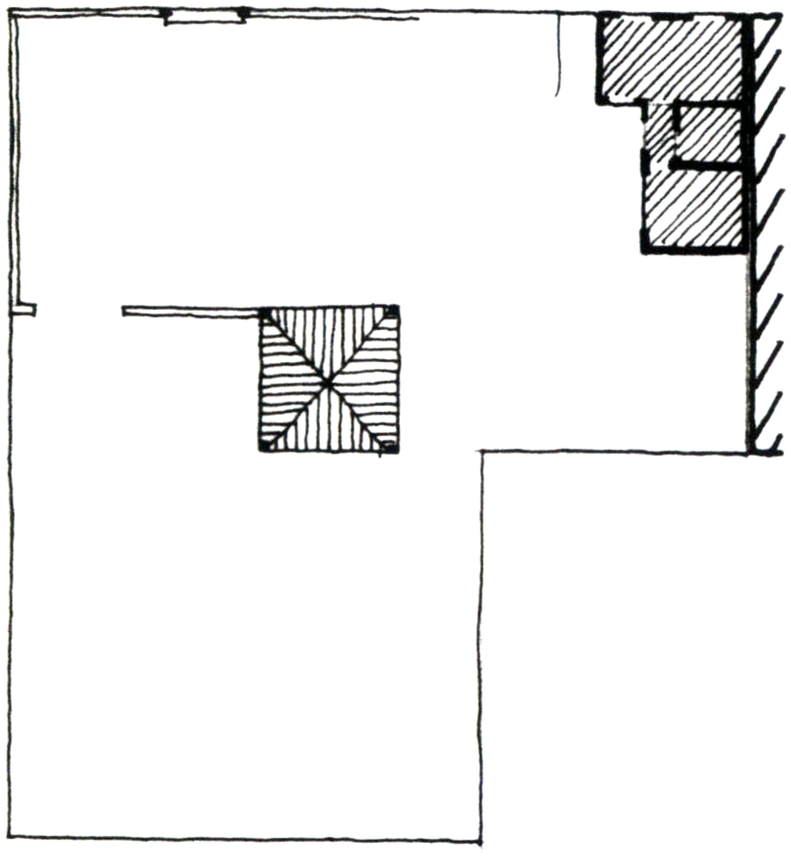

## FIRST INCREMENT

enramada in the garden
front garden wall & gate



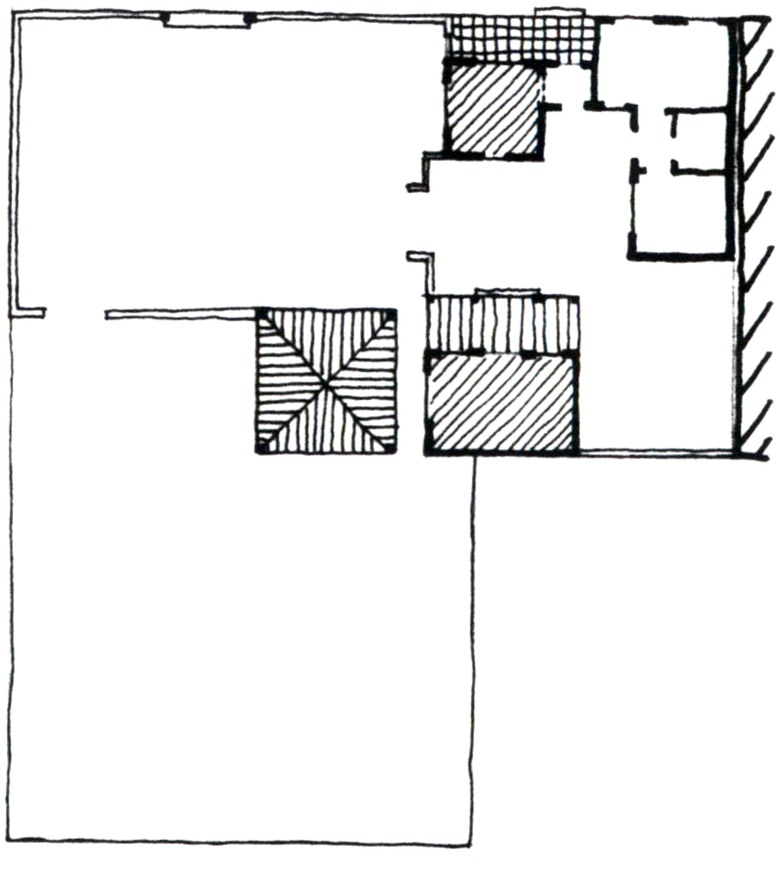
## SECOND INCREMENT

2 rooms
bathroom 33sq.mt



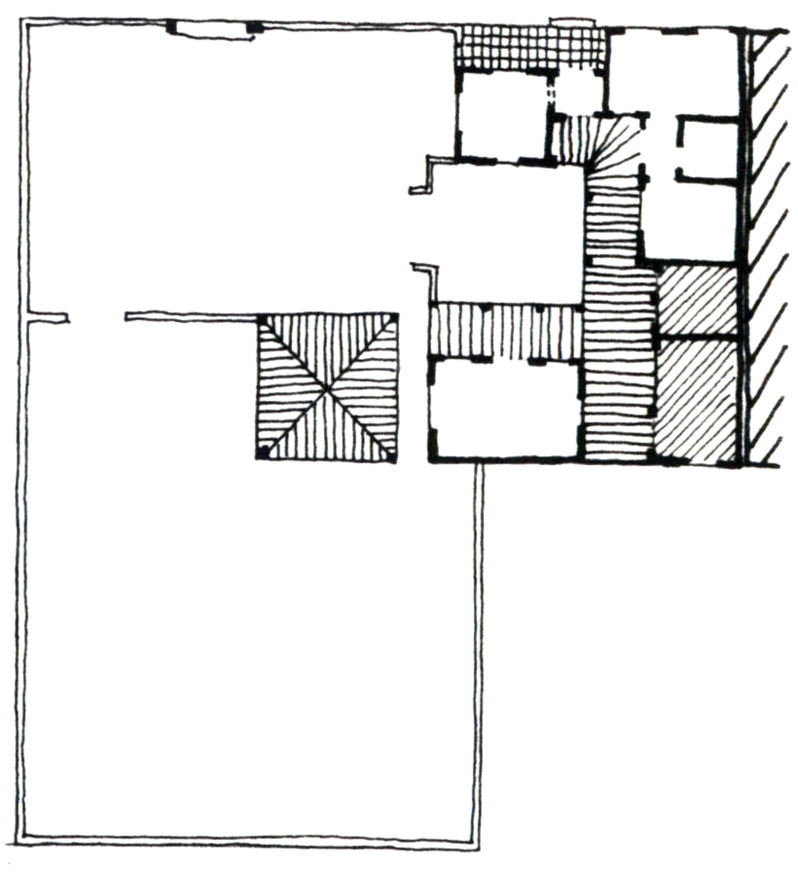
## THIRD INCREMENT

2 rooms
entrance 35sq.mt
veranda



## FOURTH INCREMENT

2 rooms 21sq.mt
veranda
garden wall



# CHAPTER THREE

# FINANCING AND ADMINISTRATON

# 1. THE ECONOMIC CONDITION OF THE FAMILIES IN THE NEIGHBORHOOD

We have defined neighborhoods which have a population of approximately 200 families.

These families belong to a variety of different income groups. Some are paid workers of the Carbozulia mine, others will have relatively well-paid work of secondary employment; others will be looking for work, or working temporarily, and will have marginal incomes.

Analysis of similar situations in Venezuela and Colombia has given us a reasonably accurate estimate of the distribution of incomes we may expect among different families in the neighborhood, and also of the rate at which these families, of different income groups, may be expected to build increments onto their houses.

Some of these results are taken from George Vernez's work in squatter settlements in Colombia. Others are taken from the simulations done by Echenique's group for the Guasara project. Of course, these figures are only estimates. As Echenique emphasizes, the final rate of spending for different families will depend on the level of subsidies which are available. Nevertheless, the following figures are important because they do give a clear overview of the type of situation we may expect among the inhabitants of Guasare new town.

According to Echenique's projections, the income distribution in Guasare after the first five years will be:

| | | |
|---|---|---|
| Bs. 0-1000 | 230 families | 26.39% |
| Bs.1000-2000 | 359 families | 41.17% |
| Bs.2000-4000 | 278 families | 31.88% |
| more than Bs.4000 | 5 families | 0.57% |

The income distribution in a single neighborhood of 200 houses will therefore be as follows:

| | |
|---|---|
| Bs. 0-1000 | 53 fmailies |
| Bs.1000-2000 | 82 families |
| Bs.2000-3000 | 30 families |
| Bs.3000-4000 | 35 families |

The income distribution among the families will influence growth of the houses. George Vernez, in his study of squatter settlements in Colombia* in 1970, observed the incremental construction of houses, and came up with the following figures:

| Phase of Constructon | First | Second | Third | Fourth or more |
|---|---|---|---|---|
| Average area built ( $m^2$) | 17.8 | 13.9 | 10.5 | 11.9 |
| Time elapsed from preceding phase (years) | - | $2\frac{1}{4}$ | $1\frac{1}{4}$ | 1 |

Based on the proposed financing programs for the construction of houses and on the figures observed by Vernez regarding the incremental growth of squatter settlement houses, the growth of the houses in Guasare, in the different income ranges, will be the following:

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*George Vernez, Bogota's Settlements; An Opportunity for Metropolitan Development, Doctoral Dissertatin, U. C. Berkeley, 1973.

| STAGES OF GROWTH | | | | | |
|---|---|---|---|---|---|
| FAMILY INCOME | Construction increment | First increment ($m^2$) | Second increment ($m^2$) | Third increment ($m^2$) | Fourth increment or more ($m^2$) |
| | Time elapsed from preceding increment | - | $1\frac{1}{2}$ - $2\frac{1}{2}$ years | 1 - $1\frac{1}{2}$ years | 1 year |
| Bs. 0-1000 | | 20 - 30 | 15 - 20 | 8 - 10 | 10 |
| Bs.1000-2000 | | 20 - 30 | 18 - 25 | 12 - 15 | 12 |
| Bs.2000-3000 | | 20 - 30 | 30 - 35 | 18 - 20 | 15 |
| Bs.3000-4000 | | 60 - 80 | 20 - 40 | | |

# 2. FINANCING PROGRAMS

In view of the fact that the different families in Guasare have relatively low capacity to pay for construction--whether they are paying back loans, or paying for construction increments directly--it will be necessary to provide an unusually wide spectrum of different financing programs to meet their needs.

Very roughly, we believe that these financing programs must cover the following range of cases:

1. Loans for construction of complete dwellings, in which families are not involved in the design (miners).
2. Loans for construction of complete dwellings where families are involved in the design.
3. Loans for construction of first increments of houses, for families who cannot afford (or qualify for) a full construction loan for a complete house.
4. Loans for construction of subsequent increments, for families who have built a partial house, or for families who wish to enlarge their houses.
5. Loans of materials for families who wish to build houses, or increments of houses, by themselves or with their friends.
6. Loans for improvements in the streets, which are necessary to create the full neighborhood character of Guasare.

In order to be practical, we feel that it is necessary to develop these financing programs in a way which fits in directly with present-day Venezuelan financing programs. We have therefore laid out on the following pages a definition of six financing programs, which are as far as possible consistent with present-day practice in Venezuela.

1. Financing for the miners' houses

Corpozulia will finance the construction of about 20 houses for miners' families in each neighborhood; these 20 houses will be the first building increment to initiate the development of the neighborhood.

Corpozulia will be the actual developer of this housing project, and therefore it will have to make an initial investment of about Bs.2.400.000 per neighborhood.

The financial obligation of the miners residing in these houses towards Corpozulia will have either the form of rent or the form of monthly payments towards the amortization of the total cost of the house, depending on the form of tenure agreed upon between the miner and Corpozulia.

2. Financing of a complete house

We propose that INAVI initiate and direct a new financing program in Guasare, under which each family with a monthly income of more than Bs.3000 will have the opportunity to build a complete house of 60-80$m^2$ in one step. This is quite similar to many programs which INAVI provides today. However, the major advantage of this program, and its difference from all other programs that have been directed by INAVI in the past, is the fact that families will lay out their own houses, and will therefore have the opportunity to build a house that fits their needs and fulfills their dreams, not a standardized prefabricated house.

Each family eligible for this program will have the opportunity

to take a construction loan from INAVI in an amount between Bs.60.000 and Bs.80.000. The amount of the loan to be given to the different eligible families will not be the same. The exact amount of each loan will be decided only after the layout of the house has been completed on the site, and will depend on the size and configuration of the house. The loan will be given to the family on the condition that the house will be built by the professional construction company appointed by Proguasare or INAVI to carry out the housing development of the neighborhood (see section 3).

The loan will be given in draws, following specific construction operations, and a new draw will be issued by INAVI only upon completion of the previous building operation. The draws of the loan will be given directly to the construction company, who will administer the distribution of the loan to the different building operations.

It is estimated that about 20-30 families from each neighborhood will have the possibility to benefit from this program. This number makes it profitable and economically feasible for a big construction company to undertake the construction of these houses.

In accordance with INAVI practice, these loans should be given with an interest rate of 7%-8%, and an amortization time of 20-30 years.

3. Financing program for the construction of the first increment of the house.

We propose that Corpozulia assist all families with a monthly income less than Bs.3000 to carry out construction of the first increment of their house. We propose that this assistance take the form of a subsidy of Bs.16000 to be given by Corpozulia to the eligible families of each neighborhood.

The subsidy will be given to the family on the condition that this money has to be used only for the construction of the first increment of the house, which will vary from 20-30 $m^2$ . In order to control this, the subsidy will be given in the form of materials to be bought from the builder's yard, and in the form of paid labor for the builder or contractor hired by the family.

This program will be addressed to about 150 families in each neighborhood, and will demand an initial investment by Corpozulia of about Bs.2.400.000 per neighborhood. The importance of this program lies first of all in the fact that with such a medium size investment by Corpozulia 150 new houses in each neighborhood will start being built rather early in the development process and quickly; and second, that only the existence of this program will make feasible the adoption of the "Programa de Créditos Populares" by INAVI, which is addressed only to the extension of existing houses (see below).

4. "Programa de Creditos Populares" for the construction of the second increment of the house.

This is one of the current programs of INAVI, used for the extension and improvement of houses in the consolidated barrios of Venezuela. We propose that INAVI operate one of these programs specifically for the housing development in the neighborhoods of the town of Guasare, using the same conditions that apply for other barrios.

The constraint on this program lies in the fact that it can be used only for the extension of an already existing house, i.e., for the construction of the second or third increment of a house. This means that the appropriate functioning of this program is contingent upon the existence of the subsidy program described in the previous section, which is needed to cover the expenses for the construction of the first increment of each house.

All families with a monthly income from Bs.900 to Bs.4000 will be eligible for this program. The credit given under this program is a loan of Bs.5000-Bs.20000, with a low interest rate (4%-5%), to be amortized in a period of 5-20 years.

The loan will be given in the form of materials to be purchased from the builder's yard, and in the form of labor paid to the builder or contractor hired by the family, and on the condition that the first house increment has been already completed. This loan will cover the expenses for the construction of 25-35 $m^2$ of house, which will possibly comprise one to two rooms, and some covered outdoor space.

It is estimated that some 120-130 families in each neighborhood will be able to participate in this program. INAVI will therefore have to make an initial investment of about Bs.2.500.000 per neighborhood.

5. Credit for materials for the poorest families

This is a small financing program, directed by Corpozulia, to assist the very poor families in the construction of a small second increment to their houses. The existence of this program is rather important, since it is addressed to the very poor families, those which the "Programa de Creditos Populares" by INAVI does not include in its program.

This program will be addressed only to families with less than Bs.900 monthly income, and it will offer the opportunity for these families to obtain credit for materials to be purchased exclusively from the builder's yard. The maximum credit to be given under this program will be Bs.9000, enough to build 15 $m^2$ of house, and it will be given upon completion of the first increment of the house.

The credit for materials will take the form of a low-interest loan 2%-4%, to be amortized in a period of 5-10 years.

There will be an average of about 50 families in each neighborhood that will be eligible for this program. That requires an investment by Corpozulia of about Bs.450.000 per neighborhood.

6. Financing program for the creation and improvement of streets

This is a small but rather important financing program. The importance of this program lies in the fact that it will provide the means for the families to finish, improve and ornament the front of their houses and their garden walls. As we have observed, this is an essential feature of Venezuelan culture.

This financing program, which must be initiated and directed by Corpozulia, will give each family with a monthly income of less than Bs.4000 a subsidy of about Bs.5000.

The money will be given to each family on the condition that it will be spent for the following building and finishing oeprations:

- construction of the front garden wall that faces the street, with the garden door or gate, and its finishing with small ornaments or details (20-70 $m^2$ of wall, at a unit price of Bs.65/ $m^2$);
- making of ornaments over the main entrance door and over important front windows, and making of the cornice at the base of the roof (unit price Bs.450/house);
- painting of the front of the house (20-40 $m^2$ of painting, at a unit price of Bs.35/ $m^2$);
- finishing and paving of the front porch, or paving of a sidewalk along the front of the house (10-20 $m^2$ of paving, at a unit price of Bs.45/ $m^2$);
- planting of trees along the front garden wall, on the side

of the garden, to provide for shading areas along the streets and paths (2-6 trees per house)

The subsidy should not be given to the family in the form of cash, but in the form of materials appropriate for the above-mentioned construction operations and finishing. Also, the amount of the subsidy will differ from family to family, depending on the quantity of each of the above-mentioned items that their house includes.

The subsidy for all these operations, except for the painting, will be given once, when the first increment of the house has been completed.

The subsidy for the painting of the front of the house will take the form of a free paint program, to be used by the family every time a new increment is added to the house. This program will operate continuously for the first five years of the development of the neighborhood.

It is estimated that about 200 families of each neighborhood will be eligible for the subsidy for improvements. The investment needed for this program is approximately Bs.1.000.000 per neighborhood.

# FINANCING PROGRAMS FOR HOUSING CONSTRUCTION

| | FINANCING PROGRAMS FOR THE CONSTRUCTION OF A HOUSE | | | FINANCING PROGRAMS FOR THE PIECEMEAL DEVELOPMENT OF A HOUSE | | FINANCING PROGRAM FOR THE CREATION OF STREETS |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| | FINANCING FOR THE CONSTRUCTION OF HOUSES FOR THE MINERS' FAMILIES | FINANCING FOR THE CONSTRUCTION OF A COMPLETE HOUSE | FINANCING FOR THE CONSTRUCTION OF THE FIRST INCREMENT OF THE HOUSE | CREDITOS POPULARES FOR THE CONSTRUCTION OF THE SECOND INCREMENT OF THE HOUSE | CREDIT FOR MATERIALS FOR THE SECOND INCREMENT OF THE HOUSE | FINANCING FOR THE IMPROVEMENT AND EMBELLISHMENT OF THE STREETS |
| THE PROGRAM WILL FINANCE IN TOTAL THE FOLLOWING NUMBER OF HOUSES IN EACH NEIGHBORHOOD | 20-30 houses | 20-30 houses | 150 houses | 120-140 houses | 40-60 houses | 200 families |
| MAX. AMOUNT OF LOAN OFFERED BY THE PROGRAM TO EACH FAMILY | Bs. 120.000 | Bs. 80.000 | Bs. 16.000 | Bs.20.000 | Bs. 9.000 | Bs.5.000 |
| AVERAGE AREA OF HOUSE TO BE BUILT WITH THE LOAN | $120m^2$ of house | $80m^2$ of house | $20-30m^2$ of house | $25-35m^2$ of house | $15-20m^2$ of house | $40m^2$ of garden wall, $30m^2$ of painting, $20m^2$ of paving. |
| FAMILIES ELIGIBLE TO THE PROGRAM | All miner's families living in the neighborhood | Families with more than Bs.3000 per month. | Families with less than Bs.3000 per month | Families with monthly income between Bs.900 and Bs.3000 | Families with less than Bs.900 per month | All families in the neighborhood |
| AGENCY SPONSORING THE PROGRAM | Loan from Carbozulia | Loan from INAVI | Subsidy from Corpozulia | Loan from INAVI | Loan from Corpozulia | Subsidy from Corpozulia |
| TOTAL INVESTMENT NEEDED FROM THE AGENCY FOR ONE NEIGHBORHOOD | Bs. 2.400.000-Bs.3.600.000 | Bs.1.600.000-Bs.2.400.000 | Bs.2.400.000 | Bs.2.400.000-Bs.2.800.000 | Bs.360.000-Bs.540.000 | Bs.1.000.000 |

# 3. MODES OF CONSTRUCTION

We shall now describe the general approach to construction which must be taken in the neighborhood to accomplish the great variety of housing types which have been described so far.

In this section we must distinguish between what is theoretical and what is practical. We begin by describing the theoretical.

Theoretically, it would be desirable to have a system of production in which houses are built, in part by self help, and in part by a network of small contractors building houses one or two at a time for individual families. This combination would be ideal because it provides a low-cost system which is highly flexible, and capable of an enormous amount of individual attention. The houses are then built according to the individual needs of the families, and costs are kept low.

In practice, however, this ideal is difficult to attain, especially in the Guasare region.

There are two reasons. First, methods of self help need to be highly sophisticated in order to work efficiently. There is not sufficient experience with such programs in Venezula, and a large-scale attempt of this kind would probably fail.

Second, the large number of small constractors needed for the second half of the "theoretical" program does not exist in Guasare. At the moment there is a small population in the region with relatively little construction experience. Although there will be more and more families and small firms with construction ability as the town grows,

will take several years before this capability exists in sufficient quantities.

As a practical solution to the problem, we therefore propose to begin with a highly organized system of construction management, which then gradually gives way to an increasing percentage of construction managed by the "theoretical" system which we have just described.

The highly organized system that we propose will consist of a single major construction company, or public construction consortium, which undertakes responsibility for large parts of the construction. In detail, this company or consortium will have the following responsibilities:

a. The construction of all 20-30 houses for miners' families within the neighborhood, of 120 $m^2$ each, financed by Carbozulia. The design and construction of these houses will be based on 4-6 archetypal house plans, and on a set of construction details the same for all houses.

b. The construction of 20-30 houses for non-miners' families, of 60-80 $m^2$ each, financed by INAVI. The construction of these houses will be based on the layouts made on the site by the families, and on a set of construction details the same for all houses.

c. The construction of the first house increments, of about 30 $m^2$ each, built with Corpozulia's subsidy, based on layout made on the site by the family.

d. The construction of a small percentage of the second house increments of about 25-35 $m^2$ each, financed by the "Programa de Creditos

contractors and self help, it is essential that the construction system itself--the physical construction methods and details--be designed to permit all these different types of construction management to coexist. This will require the following specific conditions:

1. All houses will be built according to the same system of details, in general use within the neighborhood, approved by the local building department, and compatible with materials sold through the neighborhood's builder's yard.
2. Probably this system of construction will be based on the use of concrete block or brick.
3. The system of construction will be simple enough so that families can also use it for themselves wherever they wish to become involved directly in the construction process.
4. The components necessary for this type of construction will be available, on easy credit terms, at the neighborhood builder's yard, in accordance with the financing schemes defined in section 2.
5. The system of construction will allow for certain portions which are labor intensive, so that they allow helpful and beautiful details to be built into the houses without unusual extra costs.

It is also necessary that the negotiations and agreements which form the construction consortium, at the beginning of the construction, explicitly contain the clear understanding that large-scale construction will be gradually phased out and replaced by small-scale local construction and self help. It is necessary that this system of phasing out be

made absolutely explicit, so that the momentum of the large-scale construction does not simply carry forward and prevent the healthy emergence of the smaller scale construction firms.

We believe that the neighborhood builder's yards will also need to be subsidized by Corpozulia or Proguasare, so that they are incorporated from the outset as an essential part of the construction process.

# 4. THE BUILDER'S YARD

The builder's yard of each neighborhood will be responsible for accomplishing the following two tasks:

1. Organization of the layout process for all non-miner's houses, an average of about 180 houses, and participation in the layout process of each house together with the family.
2. Administraton and organization of the construction process for all houses built with self-help or by small contractors.

A detailed description of these tasks follows:

1. Organization and structure of the layout process

The layout of each house will be guided by the set of rules defined in chapter 3. The staff of the builder's yard will be responsible for providing each incoming family which is ready to lay out their house with this set of rules, and for explaining the set of rules to them.

The layout process will take place on the actual site where the house will be built. The family will be responsible for completing the layout, and the architect of the neighborhood builder's yard will assist the family in this task. The architect will spend one or two days with each family on the site for the layout of the complete house.

After the layout has been completed on the site, the architect will have to make a rough drawing of the house, a one-line drawing at 1:100 scale, which will be a precise representation of the layout made on the site. The drawing will have to specify shape and size

of different rooms and open spaces, and connections among them.

The architect and the family will agree that this is the house that the family will build on this site. If the house is to be built incrementally, the family will also have to identify the building increments according to which the construction of the house will progress. If the house is to be built all at once by the construction company, the builder's yard architect will be responsible for providing the plan of this house to the company. After these matters have been clarified and agreed upon between the family and the architect, the family will immediately be granted the permit to start construction.

2. Organization of the construction process by the builder's yard

The builder's yard will be responsible for organizing and providing the necessary means for the construction of houses built either by the family itself or by a small contractor. In order to accomplish this task, the builder's yard will have to undertake the following activities.

a. Purchase of building materials in bulk. The purchase of the large quantity of building materials will be made in order to cover the needs of the financing programs of INAVI and Corpozulia. INAVI and Corpozulia will directly finance the purchase of building materials, so that the builder's yard will be able to cover the needs of their programs.

b. Distribution of building materials to the families. The builder's yard will be responsible for allocating and distribut-

ing materials to the families, according to the needs of the families. Materials will be given to the family upon presentation of the agreements between the family and INAVI or Corpozulia concerning the financing program in which the family participates.

c. Provision and renting of tools. The builder's yard will be equipped with the necessary building machinery and tools so that it can provide these for the families either free of charge or on a rental basis.

d. Technical advice and assistance. The people of the builder's yard will help the families and the small contractors in the construction of the houses. This will take the following forms:

- provision and explanation of a set of basic and simple construction details to be used for all houses;
- description and explanation of the sequence of building operations;
- participation in the actual building of the house on at least three separate occasions: the first at the foundation, the second at the time openings on the walls are placed, and the third at the beginning of the construction of the roof.

The operation of the builder's yard will be under the responsibility and authority of "Proguasare," the development company for the town of Guasare, as proposed by ISA.

The cost of administration per year, per neighborhood, should not

exceed 5 per cent of its annual cost of construction. On this basis, it is estimated that the average cost of administration per year for each neighborhood should not exceed U.S. $24,000. This amount of money can pay for the annual services of two people working full time at a monthly salary of U.S. $1,000.

Proguasare will organize administration in a decentralized fashion. Each neighborhood will administer its construction and overall production process by itself, through its local builder's yard. Therefore, Proguasare will operate a separate builder's yard in each neighborhood. Each yard should be located close to the center of the neighborhood along a main vehicular road, with a lot of storage space for construction materials and a small office. The builder's yard will be run and managed by two people, one of whom, we recommend, should be an architect, preferably a member of the ISA team, trained for one year by CES.

# 5. OVERVIEW OF THE GROWTH PROCESS

In order to grasp the implications of the financing, administration and construction methods defined in the last sections, we end this chapter with a short overview of the actual growth process we may expect in a typical neighborhood.

After one year of development

The first buildings to be built in the neighborhood are the 15-20 houses for the miners. The houses for the miners will be located in groups of 3 or 4 along main and secondary streets.

Next, the location of the houses to be designed by families and built complete is critical, since their contribution to the formation of streets and public places is more concentrated and substantial. These houses should therefore be built in places critical for the definition of streets and squares; they should be located on the corners formed by the secondary streets; and they should pin down the main square and street, or they should be located on the smaller squares and places along the secondary streets.

During the first stage of the development of the neighborhood, houses to be built incrementally will be located along the main and secondary streets, on those lots standing between the complete houses. The first increments of these houses will have to be located along the street so that they contribute to the formation of the street.

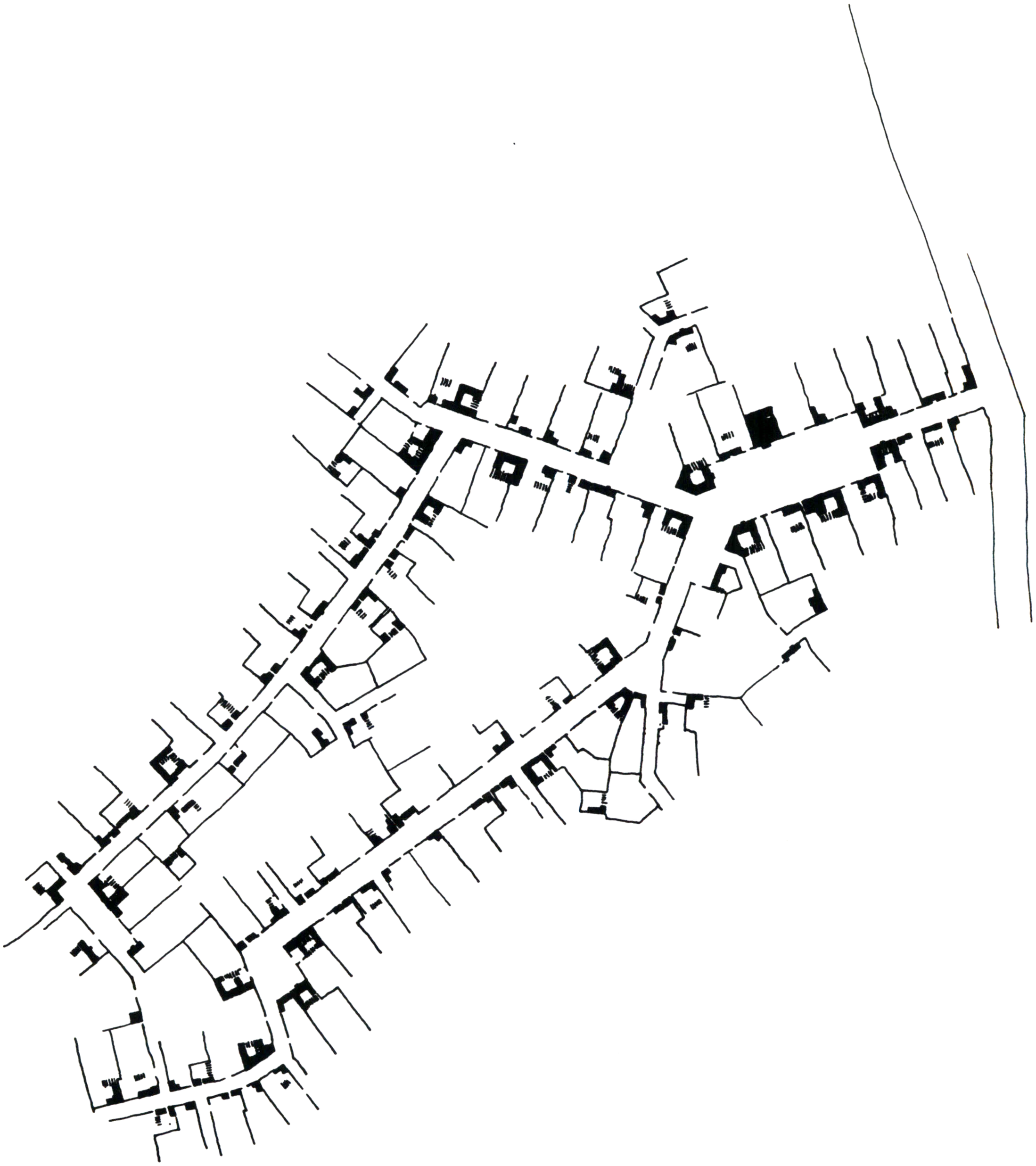
Garden walls of those houses which stand between the street and the private lot should be encouraged at this first stage of development. The subsidy program for "the embellishment and construction of streets" will help enormously to accomplish the construction of the garden walls

along the streets.

The planting of trees along the garden walls of the houses will have to be one of the first things that the family must take care of, even before any construction of the house increment starts taking place.

The pavement of the main street and square will have been completed within the first year of the neighborhood development, while the secondary streets will have received at least the first coat of their pavement.

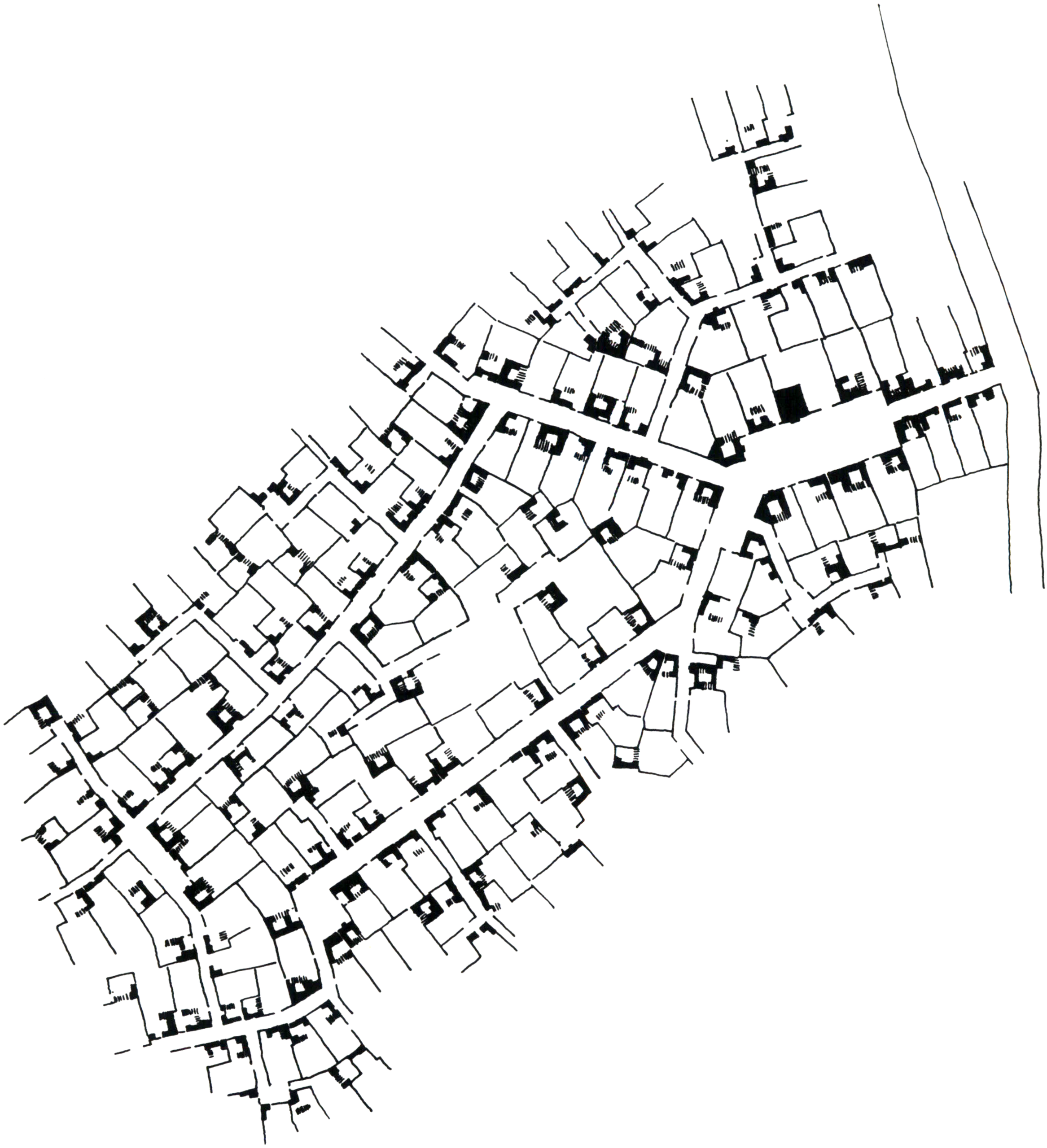
The main square will be paved, planted with trees, equipped with the necessary street furniture and lighting posts.

AFTER THE FIRST YEAR OF DEVELOPMENT

After two and a half years of development

After two and a half years of development, the neighborhood will have about 40-50% of its construction volume completed. Some houses will be completed, most of the houses will have their second increment already built, and only a few of them will be in the initial stage of construction. Probably there will still be a handful of undeveloped lots.

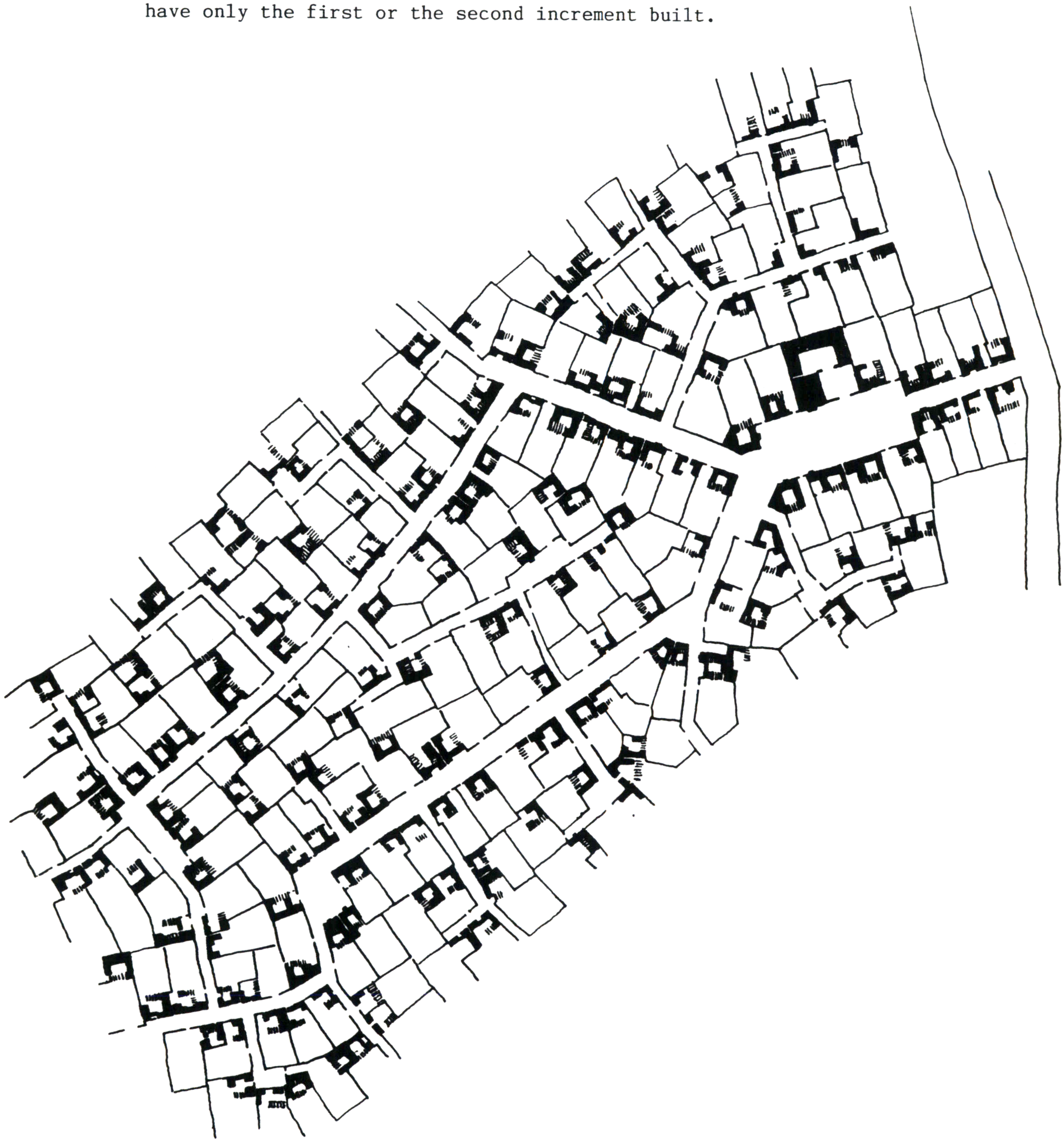
At this time most of the tertiary streets of the neighborhood will be clearly defined and formed. The secondary streets and the small squares along them will be fully paved, while the tertiary streets may still be undergoing paving. The streets will be embellished with small gates at their starting points, with some benches and fountains and trees where there is a widening or a small place formed along them.

AFTER TWO AND A HALF YEARS OF DEVELOPMENT



After five years of development

After five years of development the neighborhood will have about 80% of its construction volume completed. Most of the houses will be complete in their form, with the patio fully developed; some will still have only the first or the second increment built.



# CHAPTER FOUR

# CONSTRUCTION AND EMBELLISHMENT OF STREETS

# 1. THE FUNCTIONAL CHARACTERISTICS OF THE STREETS

The off-beat, syncopated subdivision of lots which has been described in chapter 1 must be supplemented by a very particular vision of the streets.

In modern subdivision and urban developments, streets have become impersonal, too wide, dangerous, and unpleasant. Certainly they do not have the pleasant, heart-filled character which is necessary to provide the backbone of social life in the neighborhood, which is, in fact, their major function.

The character of the streets in the neighborhood may be summarized by the following specifications:

1. First, all internal streets are relatively narrow.
2. There are three or four main streets, with a maximum width of 7 to 10 m.
3. The minor streets, which provide access to most of the houses, are 5 to 6 m wide. This is intentionally narrow. It permits access by car, but strongly restricts movement of cars, so that high speeds are impossible, the streets are safe, and they will tend to be dominated by pedestrians, and be pedestrian in feeling.
4. There is no explicit provision for parking. Gross over-provision of parking has destroyed residential areas in most parts of the world. Experience shows that adequate on-street parking, even on very narrow streets, can provide quite enough space, and the resulting congestion is absolutely insignificant, given the low volume of traffic. In fact, it even tends to create a further atmosphere of safety by slowing things down.

5. There is no distinction between sidewalks and street pavement. The narrow street, whether it is paved or unpaved, is intended to mix pedestrian traffic with very slow-moving cars and parked cars.
6. This attitude toward the streets is also fundamental to the Latin American--and specifically to the Venezuelan--free and relaxed attitude toward the car, in which the car goes everywhere, can become the center of a conversation, singing, or a shared beer... but it encourages this modern, free-and-easy attitude toward the car without allowing the car to dominate the streets and make them empty of pedestrians.

# 2. THE VISION OF THE STREETS

Beyond these specifications, which describe the physical and functional nature of the neighborhood streets in gross terms, we must now concentrate on the vision of the streets, which will ultimately give the neighborhood its character.

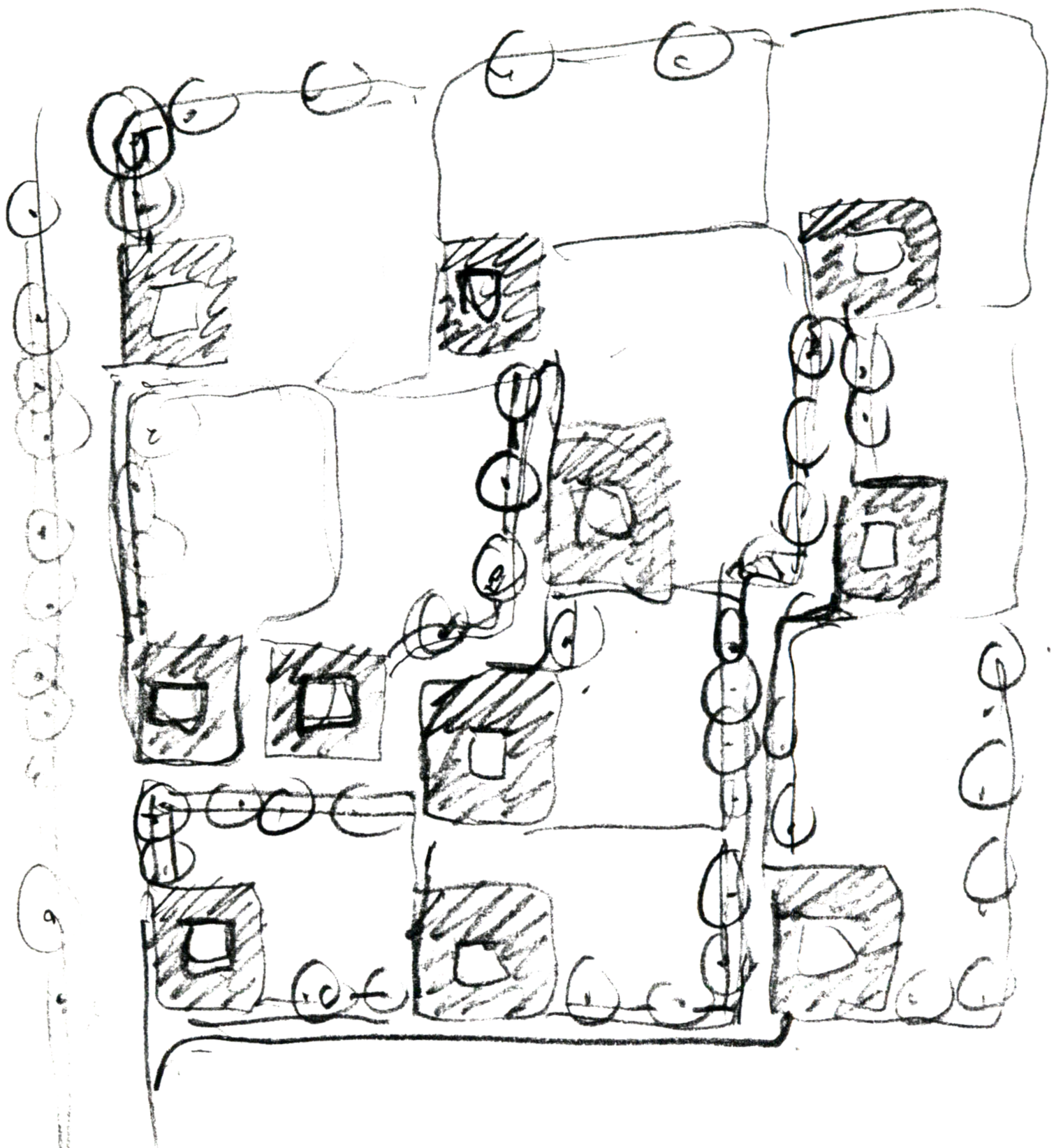
The streets are dominated by the following features:

1. Long walls between houses, so that the street is an enclosed and pleasant place.
2. Trees planted along these walls, behind them, hanging over into the street, and giving shade and softness.
3. House fronts appearing in the long walls, from time to time, so that house fronts form about two-thirds of the total frontage of the streets.
4. All house fronts opening onto the street.
5. Visions of front entrances with small courtyards visible beyond, and gardens opening out beyond these courtyards.
6. Ornamented facades of houses helping to form the street.
7. Brightly painted house fronts using the wonderful bright colors of the Zulia region.

All these aspects of the street, which are so necessary to make them come alive, are subsidized by a special program of subsidies, which has already been described in chapter 3. Thus the walls between houses, which help to form the street, the trees planted along these walls, the ornaments on the house facades, and free paint for each family are all provided by the central administration of the town under the direction

of Proguasare.

A vision of Guasare with these features:



100 houses, all with gardens, banana trees, etc.

The houses are brightly colored, painted with wonderful Maracucho flair.

Streets feel created by plants, trees, etc. of front gardens.

There are walls, so front gardens which create streets are partly hidden, but enough open to create life in the street.

Streets are also positive spaces for working on cars, sitting out, children playing, etc.

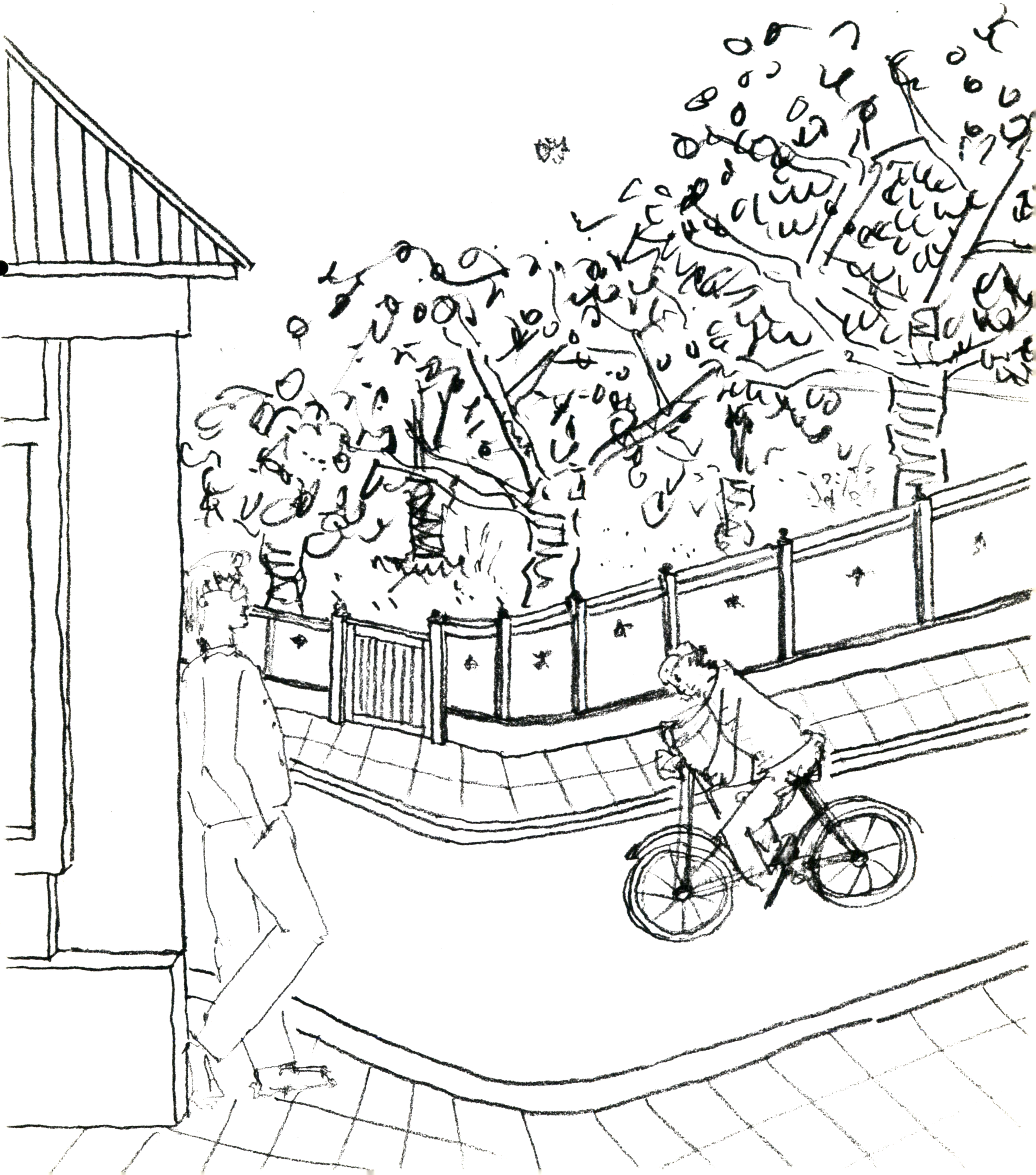
Each house enters into a courtyard, which is an internal patio, as in Pompeii.

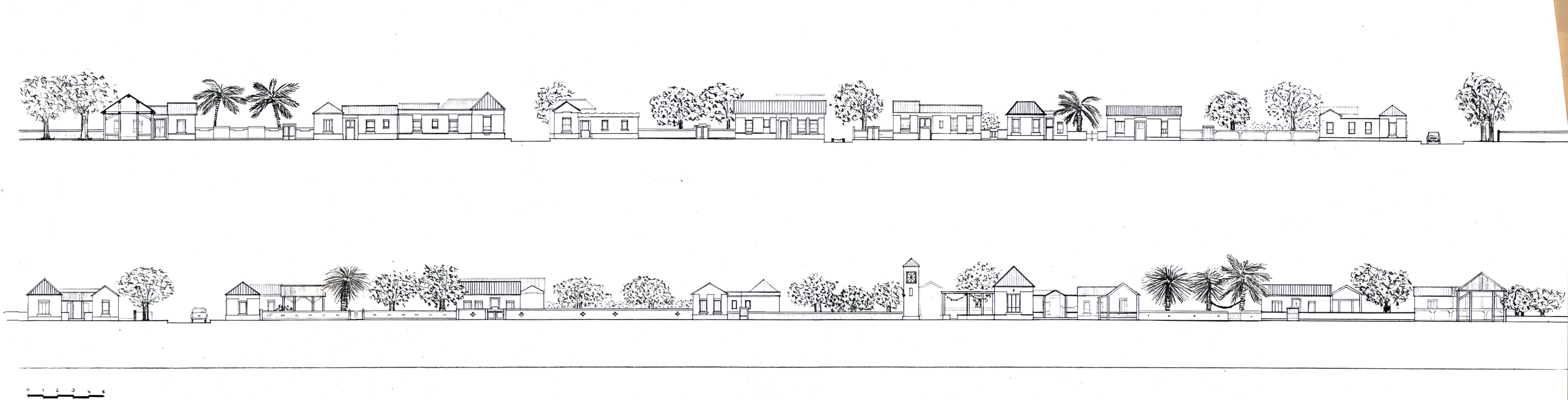
Beyond the internal patio is a mysterious opening into the garden beyond, which has profuse vegetation.

Each house is placed in relation to its lot so as to have the cool breeze blowing through it.

Streets are all relatively small in scale.

A SMALL STREET WITH ITS TREES AND LONG WALLS

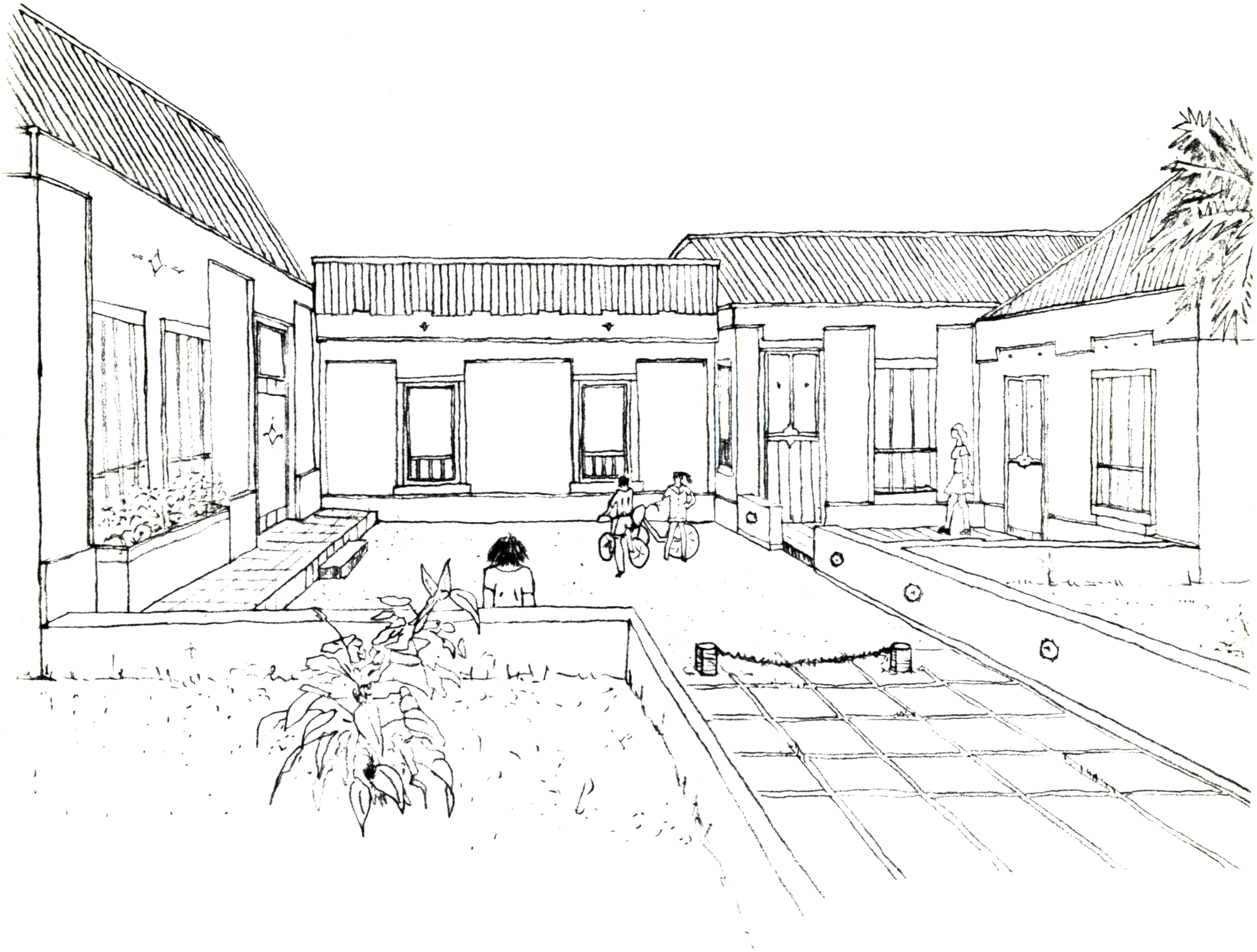





STREET ELEVATION

# 3. CREATION OF POSITIVE SPACE IN THE STREETS

# A TINY PUBLIC PLACE SHARED BY THREE HOUSES

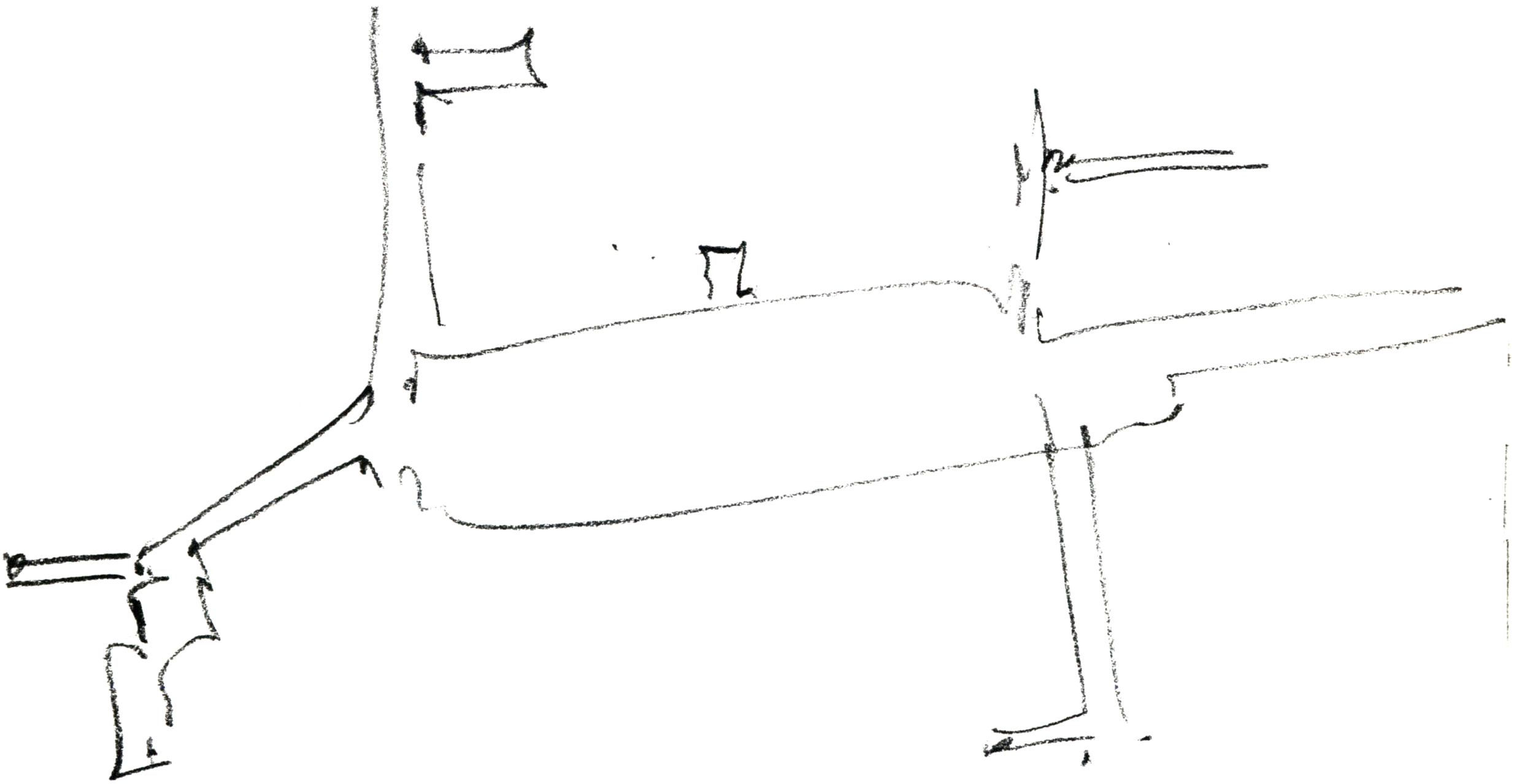


In order for the streets to succeed beyond the vision which has been described in section 2, it is necessary that every part of every street be positive, in the character of its space.

This concept has been described in some detail in the pattern language, under the pattern Positive outdoor space (pattern #106, pages 516-523). We shall now summarize this character in the specific detail required by the streets of a neighborhood.

First, it requires that the entire street system be built up of a sequence of spaces, each one of which is perceived and felt as a whole entity in itself. We may also describe this feature by saying that each part of the sequence is a space which is recognizable as a "center."

Diagramatically, we may show this idea in the following way:



This shows how the entire street system of the neighborhood is made up of a sequence of positive spaces, or centers.

In order to achieve this character, it is necessary that the planning administrators pay specific attention to the character of these centers at the same time that the individual houses are being designed.

In short, our experience shows that it is an absolute rule that this positive character of outdoor public space cannot be created as a plan, or in plan form, at the time of the original subdivision of lots. It is a detailed act of design and construction which must go hand in hand with the actual design and construction of individual buildings.

We may summarize this point in the following phrase: <u>In order to succeed in the creation of positive outdoor space in the street system, each center must be designed and built with the same care that individual houses are designed and built</u>. The individual centers of the street system are the physical counterpart, in the public realm, of what the houses themselves are in the private realm... and they must be made with the same care and concern for the subtleties of their physical design and construction.

Each one of these centers will be created incrementally, from the building increments around its edges. Each building increment, around the edge, and other building elements, like walls, gates, trees, paving, will contribute in a definite way to the formation of the specific center they belong to. The building increments which come early in the development of the center will hint at its formation; others which come later will strengthn it, and the rest will complete it.

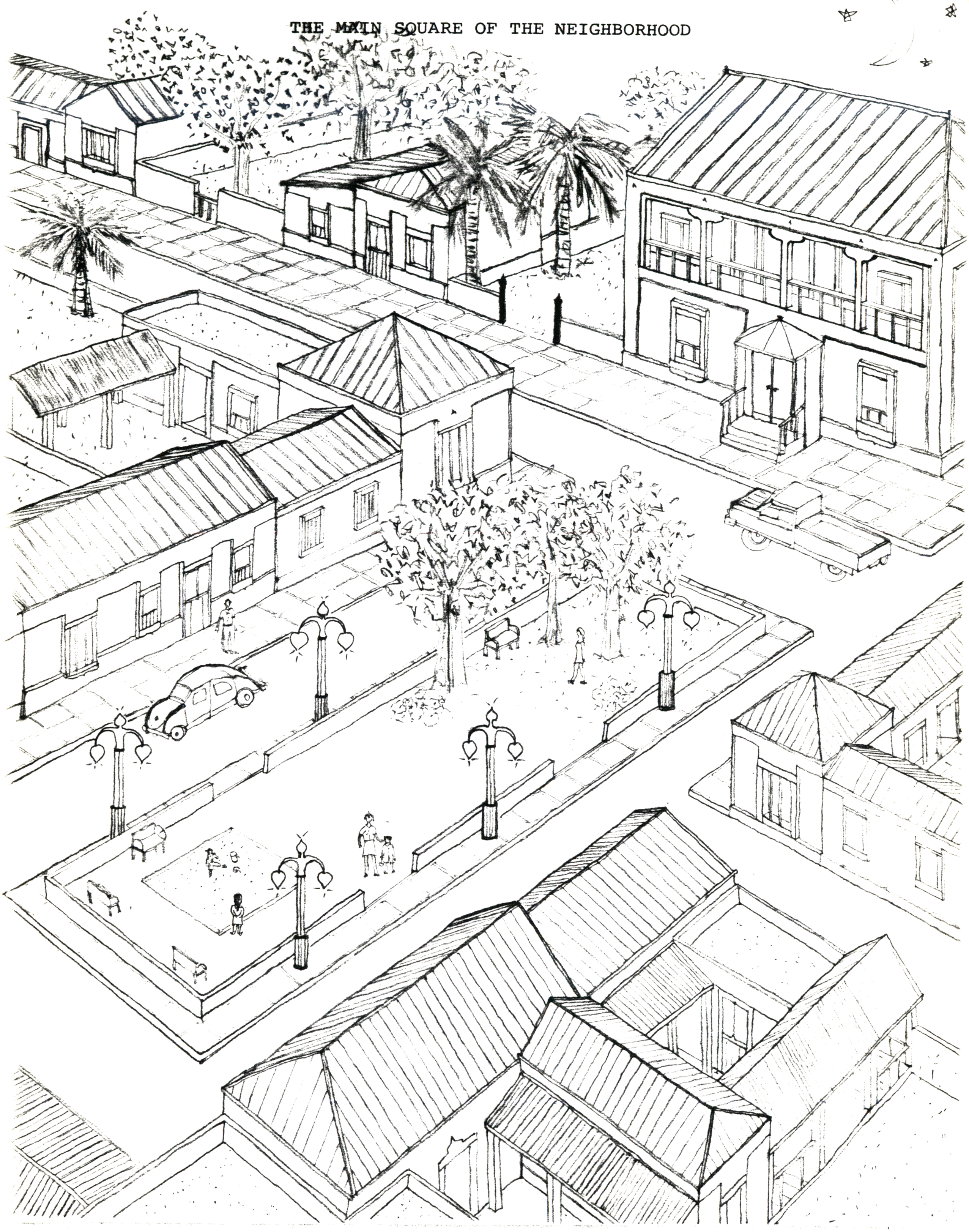
THE STREETS OF THE NEIGHBORHOOD AS A SEQUENCE OF POSITIVE SPACES

The main square of the neighborhood, probably the biggest center in it, and the focal point of all activities, will be established early in the development of the neighborhood. The first houses in the neighborhood will be built around it, and especially at the points which pin down its corners and the places where the secondary streets start. By the time the first increments of the houses that face the street are built, the square will be established as a place with a positive shape.

The main square will not be fully established as a center until the public building of the neighborhood is built there since this building will give the main square its scale and its feeling of publicness. The construction of the wide sidewalks in front of the houses, the paving of the square and the trees, lights and benches in it will also be among the most important increments to be built, since without them the square will not really exist as the main center and the most public and alive place in the neighborhood.

A secondary street of the neighborhood is made of sections of street, each one of them rather long and straight. The making of one of these individual sections of a secondary street, each of which is a center, is very important in the process of the development of the neighborhood. The formation of a center along a secondary street will start with the first house increments to be built along this part. This part of the street will be pinned down and established as a center after about 70% of the houses have their first house increment along the street almost completed, and the front garden wall built. Another important feature of a section of a secondary street is the system of points where smaller

# THE MAIN SQUARE OF THE NEIGHBORHOOD



streets start off from it; they are spots of activity, smaller centers which open off the bigger center. These points will be developed rather early in the development of the secondary street, even before the smaller streets are fully formed. They are points of repose along the street, with gates that emphasize the beginning of the smaller street, and with some intense lighting and small sitting places.

The smaller streets and paths are made of secitons of streets which are much shorter than the secondary streets: each one of them adapts its direction to the configuration of the site and the layout of the lots in a more relaxed way than the secondary streets. A section of a smaller street which is a center, with its distinct beginning and end, will be made through the following steps:

a. It will have to connect with the previously established street section of a secondary or of a smaller street in such a way that a natural continuation of the street network is established, and also so that this new part of the smaller street will be a distinct entity of urban space. This will be made through a change of direction, or through a change in the width of the street, or through both of them.

b. The first houses to be built along a part of a smaller street should pin down the beginning of the street taking into consideration the parameters described above.

c. Since a part of a secondary street is rather short, 3-5 houses along each side, its making is a matter of a short period of time. Garden walls will contribute to the formation of these parts of the small streets as much as buildings themselves. Therefore, they should be

# A GATE AT THE INTERSECTION OF A SMALL WITH A SECONDARY STREET

one of the first increments of the houses to be built.

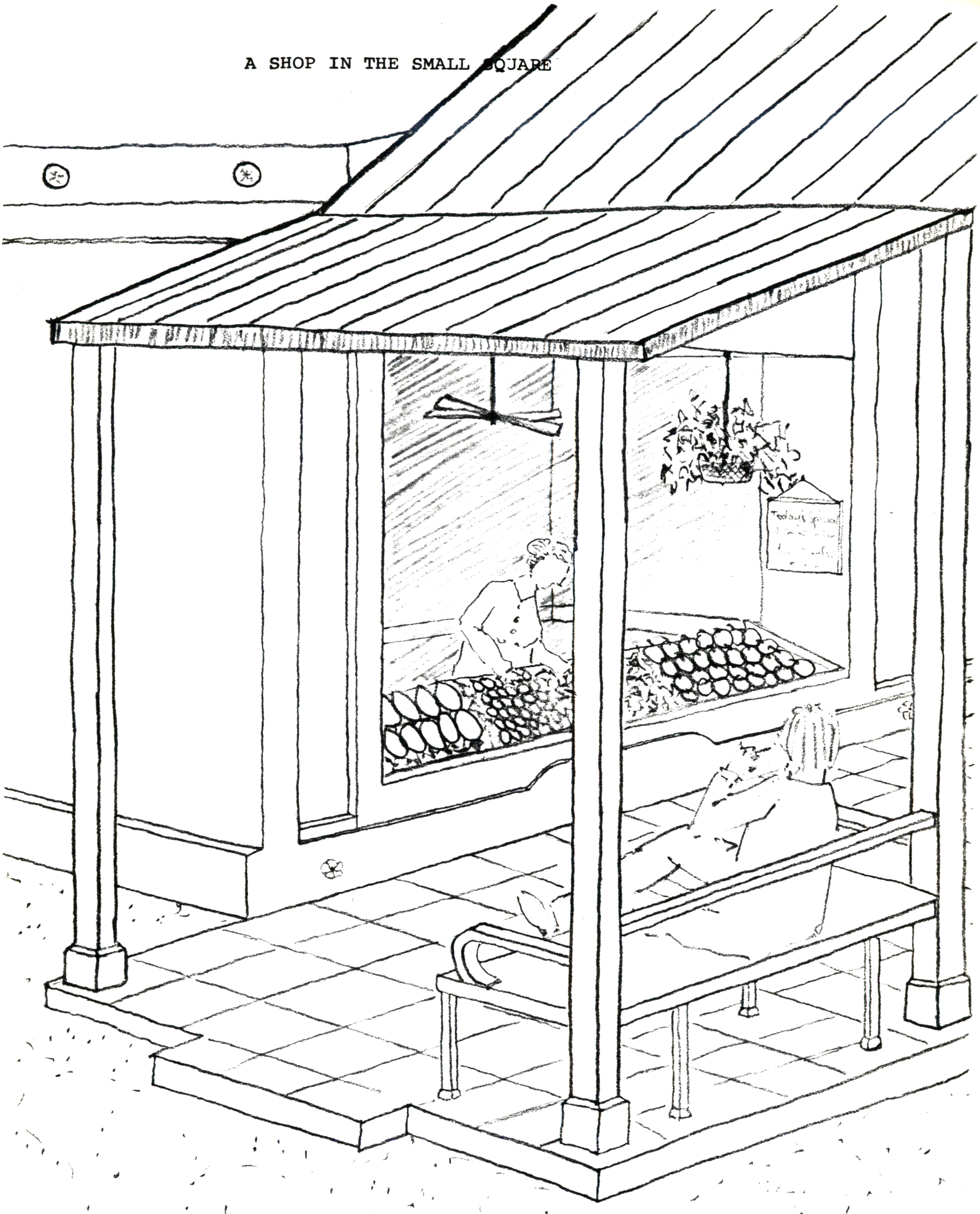
d. A part of a smaller street will have to adapt its formation to the configuration of the site. An unexpected change in the slope on the site might suggest the building of some steps that could function as a small sitting area in the street, or if the slope is pronounced, or if there is a change in the view, this might imply the end of this part of the smaller street, and the beginning of a new part of street in a different direction.

What makes any one part of a street a true center is the fact that the part is distinct, with its beginning, its end, its direction and width, and at the same time its feeling of belonging to a larger network of streets. A part of a street cannot be a center unless it has a positive shape. The positiveness of the shape is a function of the relationship between its length, its width, its changes of direction, and its position in the whole hierarchy of the neighborhood's street structure.

Small squares will be created along the secondary and smaller streets. They will usually come in between two distinct sections of street, and they are part of the street network. Their shape is defined to a large degree by the direction of the streets that merge into them, so that the square forms a natural continuation of the street network. It is a place of repose, a place to linger. Its size will vary depending on the hierarchy of the street along which the square will be created. A small square along a secondary street is larger than a small square along the smaller streets and paths. The formation of a small square depends mainly on the building of 3-5 houses and their garden walls

around it. By the time the first increments of these houses are built, together with their front garden walls, the small squares will become real places. However, for a small square to become a livable place for sitting and gathering, or for children to play, some further consideration has to be given to them. Trees, benches, pavement, a small shop with a covered front veranda for shade, a small water pond or fountain are things that will contribute to the making of quiet and intimate, alive small squares.

A SHOP IN THE SMALL SQUARE



# 4. DECORATION AND ORNAMENT OF INDIVIDUAL HOUSES

The beauty of each individual street and square in the neighborhood is the outcome of the care and love with which each house front, each garden wall, each door and window, have been made. Each one of these elements contributes strongly to the making of a public place which is alive and which has a strong individual character that emanates from the acts of building of the people who live around it.

The building of each house, and the making of each one of its elements and details have to be full-hearted. They should be guided by a clear intention to make the house beautiful in itself and harmonious with what exists around it. Venezuelan tradition has manifested this attitude in many neighborhoods in Maracaibo. The embellishment and ornament and color in each house have contributed immensely to the intimate and warm feeeling of these places. And it is this element and this attitude towards building that must manifest themselves in the construction process of the Guasare houses.

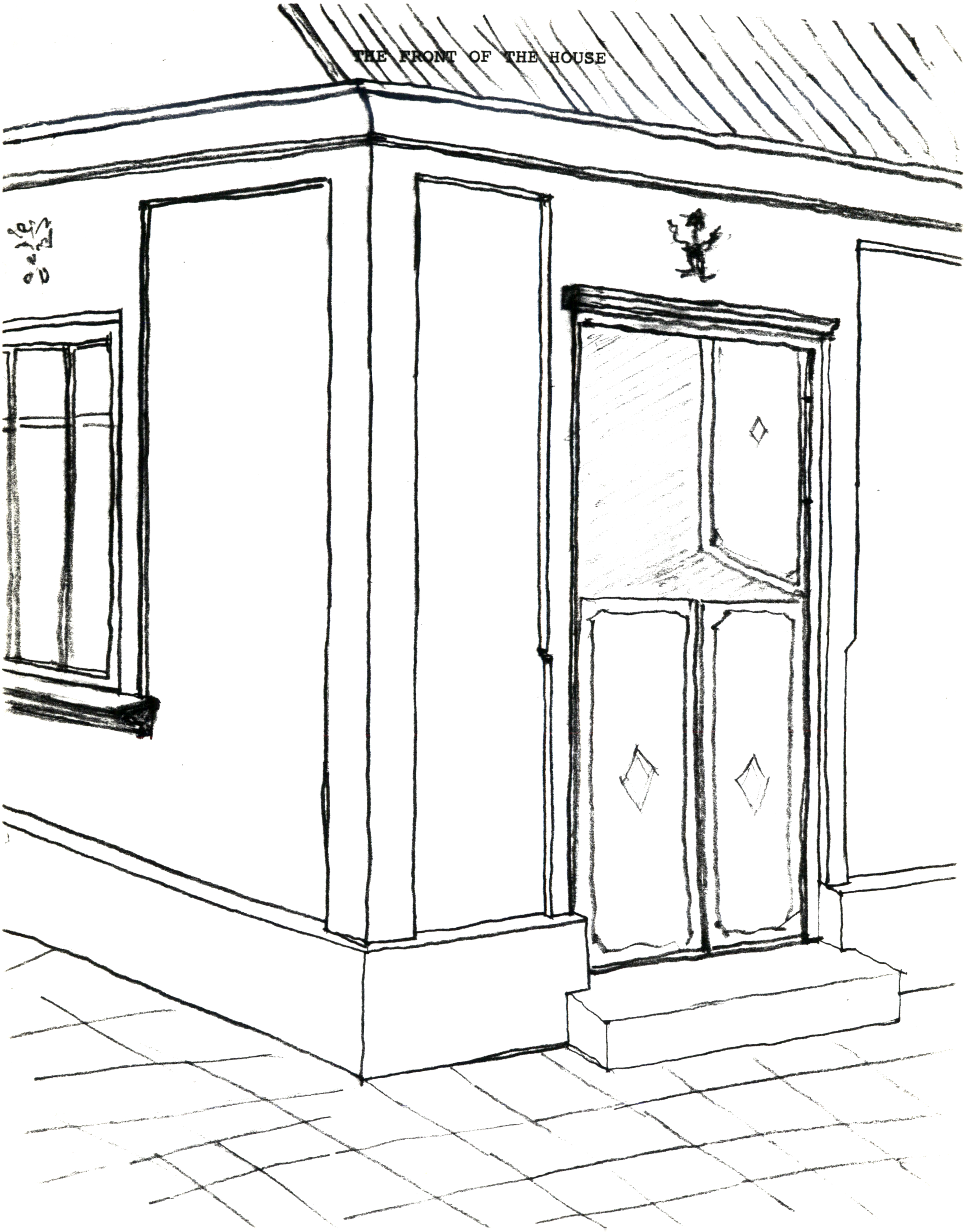
On the following pages we will outline briefly those elements of the house which will give a final but important touch to the making of streets and squares which are alive and personal in feeling.

## THE FRONT OF THE HOUSE

The front of the Guasare house has a strong character. The sala, with its large vertical windows, the tall and elaborate entrance door, the high roof parapet exemplifies some of the dominant features which make the Guasare house.

The front facade of the house is articulated with great care. A pronounced base in each house, simple boundaries around the entrance door and the windows, small ornaments on top of the important openings and on the parapet make each house unique. And above all these features comes the color that emphasizes the articulation of the facade through the interplay of two contrasting colors, one strong and bright, the other light.

THE FRONT OF THE HOUSE



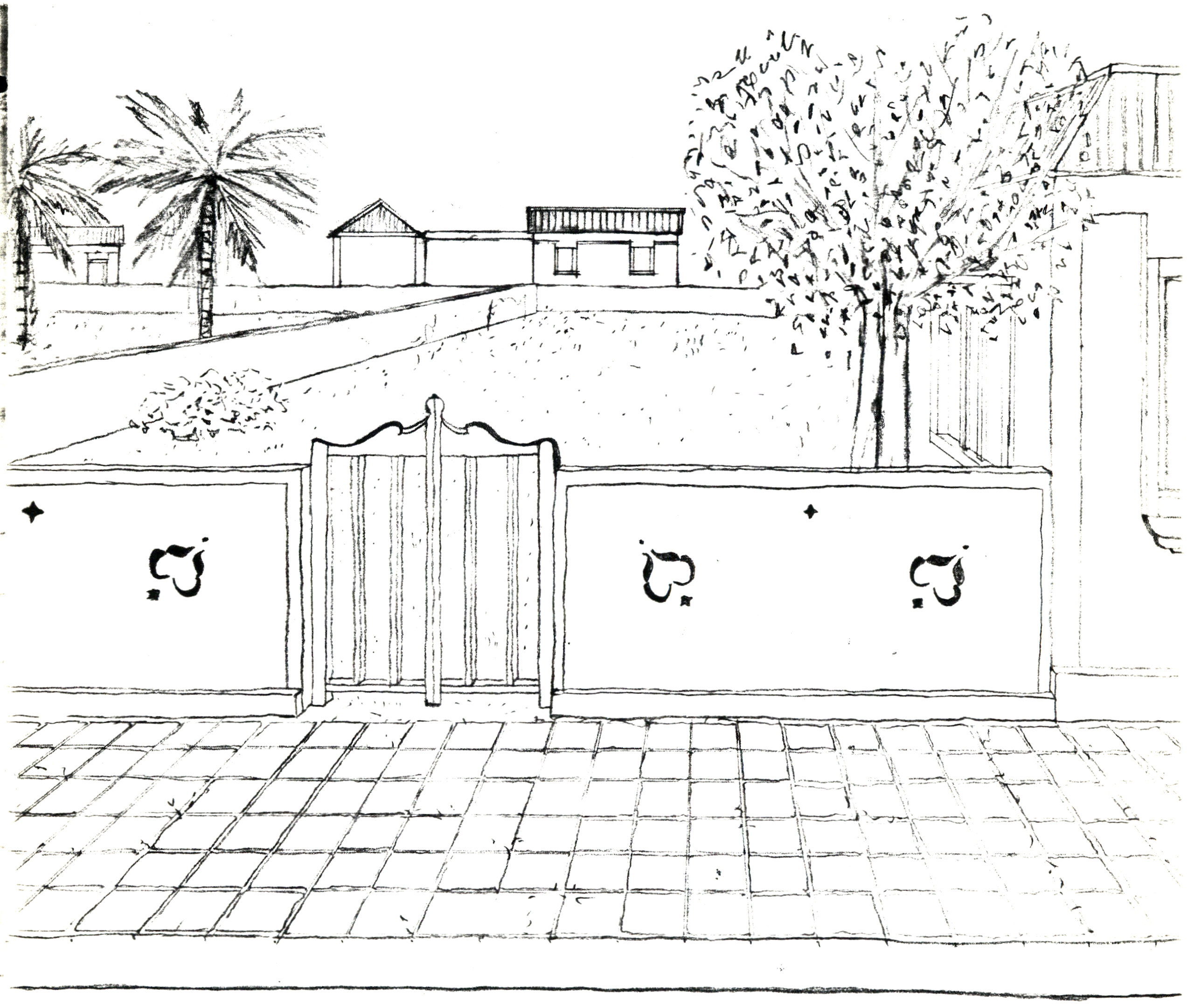
FRONT GARDEN WALL

The front of the lot is always enclosed by a wall, the house forming a part of this wall. In particular, the closed wall will help to create positive urban space in the street.

The front garden wall is punctured at certain points with openings, like the porch, or the main entrance and the secondary entrance. The wall does not have to be made of block from bottom to top; it may be half height, and the top may be a wooden fence. It is important, however, to create the feeling of a continuous wall which helps to shape the street.

The wall may be plastered and painted. Also, next to the wall, there will be trees which grow with their crowns extending over the street, giving the street more enclosure, shade, and a distinctness of its own.

# THE GARDEN WALL



TREES ON PRIVATE SPACE FOR PUBLIC USE

Kevin Lynch has observed that trees in public areas (on streets) are not taken care of very well, but that trees on private ground are better cared for. It seems that the most important factor for trees to grow well in this area is their proper watering, which families tend to do for their own trees. The observation of housing areas in and around Maracaibo shows a sea of trees in private gardens between empty streets without trees.

In order for trees on private land to be effective in creating public space, they have to be planted close to the front wall, inside the lot, in such a way that the crowns can contribute to the public area, enclosing the street and giving it shape.

This seems to be a very common feature, which can be observed, for example, in Santa Lucia, Maracaibo, from the top of the church.

ORNAMENTS

Ornamentation on houses, mainly on the front of the house and on the front garden walls, is a common feature of Venezuelan culture. One can often see front walls being plastered first, before other walls, even painted before other walls have been plastered, and with some ornament over the main entrance.

The essential point of ornamentation is to emphasize functional as well as spatial centers, important elements of the facade, like the front entrance or the front windows, but also floors and ceilings inside the rooms, and columns of the patio.

In the houses of Maracaibo and its surroundings, we can find ornaments around the main door, and parapets on the top of the front wall. Also a large variety of ornaments can be found made with open stones for ventilation, placed high in the walls. Porch floors sometimes have tiles, and columns have simple bases and capitals.

One of the most impressive ornaments, functionally as well as spatially, occurs in the ceilings of older houses, where traditional roof tiles together with wooden supports make a beautiful ornament, and at the same time create very efficient ventilation by letting the hot air out without letting the rain in.

Ornamentation is not merely a matter of beautification; it is a matter of emphasizing the main centers in the house.

COLOR

Color is an essential element of the Venezuelan cultural tradition. There seem to be two factors which make the application of color to houses very beautiful.

Careful observation shows that the most pleasant and harmonious colors on houses are obtained when the larger area of the wall has a light color, and the smaller parts, like the window frames and the door, have a darker color. The other way around does not work as well. Imagine, for example, a house facade with two colors, white and dark brown. If the main area of the facade is dark brown and the door and window frames are white, the house facade as a whole is very dark and unpleasant. If, however, the main area or the wall is painted white and the door and window frames are painted dark brown, then the house feels light and beautiful. This rule is applied in the successfully painted houses.

Secondly, beautiful color is often created by color contrast. This simply means that opposites on the color circle are applied on one house facade, as for example, blue with yellow, red with green, etc.

There are many beautifully painted houses in Venezuela where one can observe the use of both factors at the same time: light color on the main area of the facade and darker color on the smaller areas like the window frames together with color contrast, like a very light whitish yellow on the facade and a darker blue on the door and the window frames.

Although there are many other observations which one can make about the colored facades of Venezuelan houses, and about practices which make house facades beautiful, the simple application and combination of

these two rules will tend to produce a pleasantly painted house facade.

Since the beauty of the front facade is very important in Venezuelan culture, each house may have color on the facade, many perhaps following the two rules described above.

# CHAPTER FIVE

# CONTRACT FOR IMPLEMENTATION

The proposal for housing and neighborhood development which has been presented in the preceding pages will require very careful implementation. It is obvious, both from the instructions we have been given by ISA and Corpozulia, and from the philosophy expressed in the principles which guide these pages, that the process of house growth and neighborhood development we have defined is intended to be self-sufficient. It is intended, therefore, that this process be a Venezuelan process, operated by Venezuelans, for their own benefit.

However, the process is unfamiliar, and in certain respects complex. We believe that it will be necessary that we ourselves play a role in this development in order to guarantee the practical implementation of the steps necessary to make it succeed.

According to the projected growth, Guasare will reach its target population in about twenty years, by the late 1990's. We believe that the CES will need to play a role in this development for about the first five years. During this five-year period, we propose to manage the practical steps necessary for success in such a way that gradually, during the five years, the process becomes more and more autonomous. If we start work in 1984, then by 1989 the process will be completely autonomous, and entirely in the hands of the local Venezuelan officials from Guasare, from Proguasare, from Corpozulia, and from Carbozulia.

For the sake of concreteness, and in order that the practical issues are clearly understood, we shall now define the outline of the type of agreement between Corpozulia and CES which will be necessary

in order to let us take the next steps in carrying forward this program of development.

## AGREEMENT

### 1. BACKGROUND

This agreement between CORPOZULIA (or possibly PROGUASARE), henceforward to be known as the Client, and the CENTER FOR ENVIRONMENTAL STRUCTURE (henceforward to be known as the Construction Manager), will provide conditions under which CES will manage the construction of the first two neighborhoods of GUASARE new town, according to the general principles already stated in this plan.

### 2. TASKS

The tasks to be completed by CES will include the following:

A. Layout of neighborhoods and lot subdivision for the first two neighborhoods. This will be done on site in Guasare and then surveyed.

B. Establish a local office in Maracaibo/Guasare, staffed by Venezuelans, who will be trained on the job, and will be capable of carrying on the work after CES leaves the project.

C. Negotiate with Venezuelan construction companies, and construction managers to set up a construction management system for the construction of infrastructure and houses in the neighborhoods.

D. Define construction details for the houses to be built in Guasare. This work will include full-scale mockups of new details, materials, and negotiation with manufacturers to produce any necessary new components.

E. Establish a workshop in Guasare in which these full-scale construction details can be developed.

F. Develop details of the house layout process with tests done with Venezuelan families to perfect the details of the house layout process.

G. Negotiate with officials of Corpozulia and INAVI for the loan arrangements necessary for construction of the first neighborhoods.

H. Set up a builder's yard in the first two neighborhoods, with materials supply and technical help necessary for construction of self-help components of the housing in the neighborhoods.

I. Work closely with officials of Carbozulia to arrange various details of the program.

J. Lay out the houses of the first two neighborhoods.

K. In view of comments made by Managers of Carbozulia, it is possible that it may be desirable for CES to develop and build a third neighborhood of an entirely different economic character for the managers of the mine, since officials of Carbozulia have privately expressed the opinion that the neighborhood layout would be more suitable for managers than the houses along collector roads.

L. In order to avoid a schizophrenia between the architecture of the miners' housing and the housing of the neighborhoods, it may also be desirable for this program to be set up jointly, between CES and Samper in Colombia, with very strong cooperation between the two teams, and some shared work or responsibilities. However, this matter has not yet been discussed at all between CES and Samper.

M. Actual management of all construction in the neighborhoods during the first three to five years.

It should be emphasized that after preliminary negotiation with construction companies in Venezuela, it may be desirable to set up an independent construction management system. In this case, CES will take responsibility for hiring the managers of this system, training them, and working with them during the first few years of production.

N. CES involvement will cease only at that moment when the first two neighborhoods are at a very high level of completion. Since some houses will develop gradually and may require five to seven years for completion, a gradual sloping off of CES involvement is needed, with some participation even after five years.

The intention of this contract will be to give CES a very high level of responsibility in managing the process. This will require a high level of confidence from Corpozulia, and a rather free hand for CES in making basic decisions about management, within the scope of the two neighborhoods.

3. COST

The total cost of this program will be on the order of about one million dollars. The budget has not been calculated in any detail at all, but this figure is provided in order to give Corpozulia an early estimate for use in planning for the next stage.

This price works out at about $3,000 per house, which is too high for a steady state cost, but appropriate for a first stage cost. The high cost is created by the necessity of a joint office in Venezuela and California, and by the high cost of travel and communication.

It is intended that the management system which will produce later neighborhoods, in the steady state, after the initial training period by CES, and after CES leaves the project, will run about $1,500 per house.

4. CONDITIONS

It should be understood that the type of conditions which are envisaged by both parties consist of a continued presence of CES in Maracaibo and Guasare over a period of three to five years. In this respect it must be understood that the very restrictive conditions imposed by the previous contract will make proper development of the next phase completely impractical.

In particular it is necessary to guarnatee the following points:

A. That CES has sufficient funds to maintain and staff an office in Venezuela for the duration of this contract.

B. That airplane tickets and long distance telephone calls are freely available within the terms of the contract, so that whatever necessary communication between California and Venezuela can take place freely, and whenever necessary, without any complications.

C. That payment of all bills must be absolutely prompt, according to contract. Since the previous contract experience makes it clear

that Corpozulia may have difficulty living up to this type of agreement, some new arrangement in which funds are deposited in some escrow account, ahead of time, will be necessary.

D. There must be a small group within Corpozulia itself or within Proguasare which is absolutely committed to the implementation of the principles described in this report. In the present contract there has been something of a one-sided situation, in which CES has been called upon to undertake the necessary work, with reasonable support from ISA, but without any clear-cut advocate group in Maracaibo actively pushing for implementation of these principles. We have accepted this as a condition which was perhaps inevitable in the first phase of such a project. However, in order for the project to succeed in its main implementary phase, we would need a guarantee, and a practical demonstration, of a strong change in this condition.

These four conditions may be summarized in the following fifth condition:

E. Successful implementation of this project requires a state of absolute trust between the members of Corpozulia who are directly involved, and the members of CES. This trust must exist at a genuine human level, and must extend itself not only to actual behavior of individuals and professional conduct, but also to the wording of the contract itself. The present contract was written in a language based on mistrust. Once again, we accepted this condition temporarily, since there had, until then, been no basis for trust established. However, we must emphasize deeply that the

project itself in its practical phase cannot succeed under these kinds of conditions. The project will be very difficult and will succeed only if it is based on serious intention by a small group of people in Venezuela who have the stamina and the power to see it through.

Once these five conditions exist, there can then be a genuine partnership between CES and Proguasare, in which financial and contractual conditions take a secondary role to the development of a successful work effort. We recognize that these conditions may sound abstract, and that they may also violate certain habits which have been established in the upper echelons of Corpozulia. However, our experience in other international projects shows clearly that these conditions are absolutely necessary. If they are not met, then it is fruitless to begin the project, since absence of these conditions will certainly cause the project to fail.

We wish to emphasize our sincere belief that this project is too difficult to be done under "normal" conditions, and can succeed only if genuine trust exists at the deepest possible level, and if, as a corollary, the four conditions stated above can be met, directly and openly, with understanding, and as required.

Since the directors of ISA or Proguasare themselves may not have the power to meet these conditions, we wish to emphasize that these conditions must be discussed at the highest level and understood and acted upon by top management of Corpozulia.