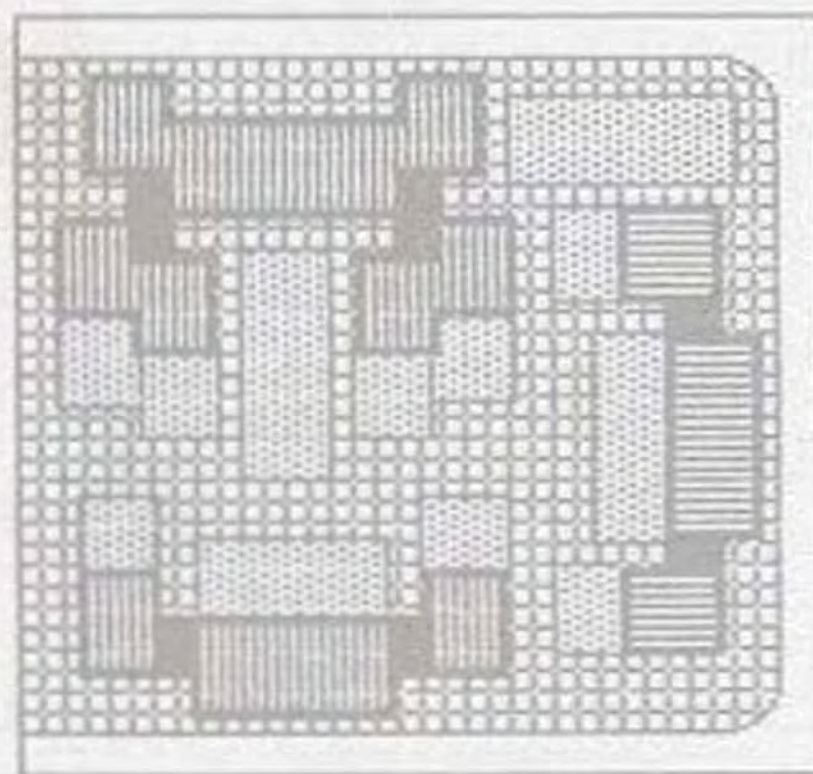
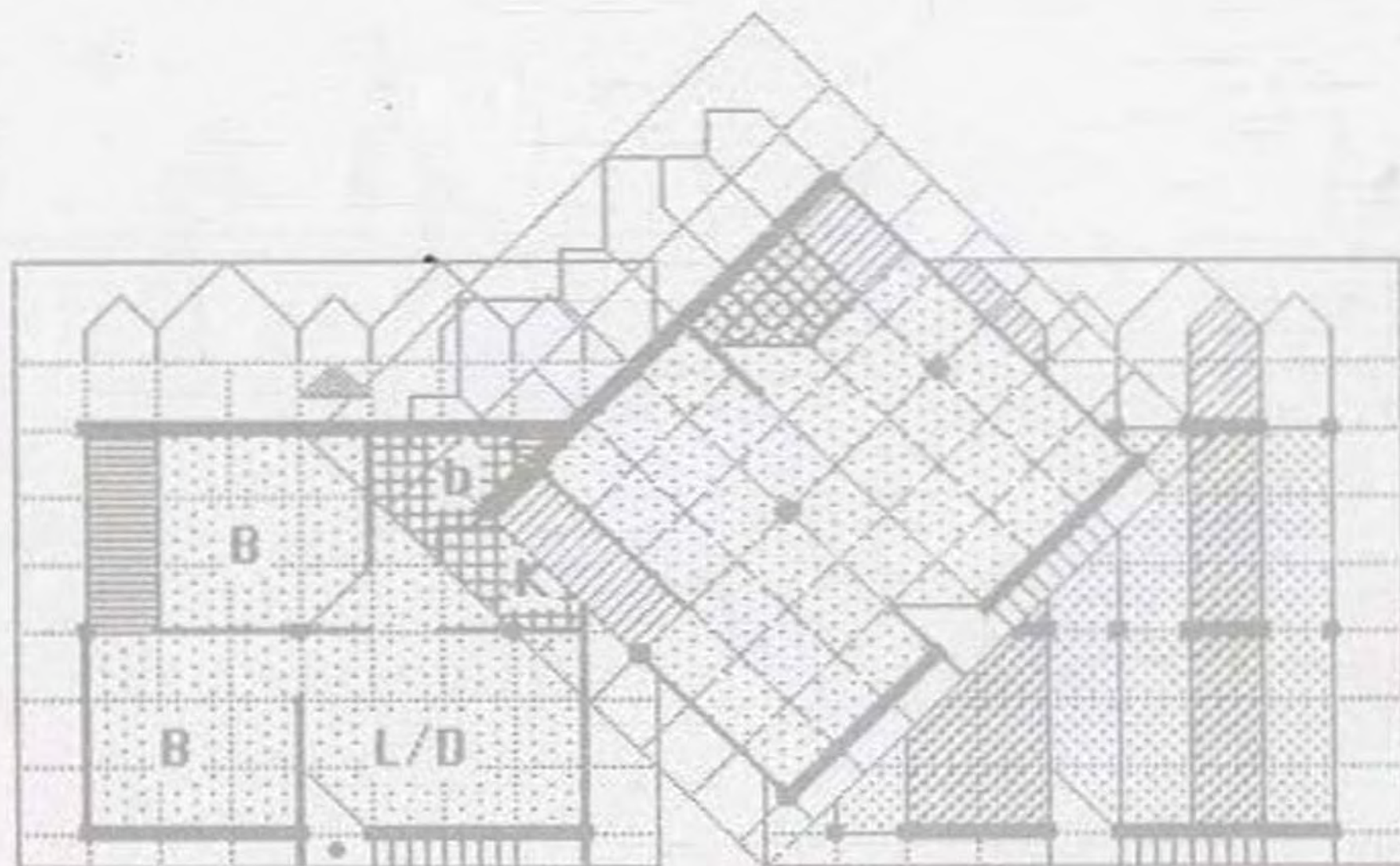


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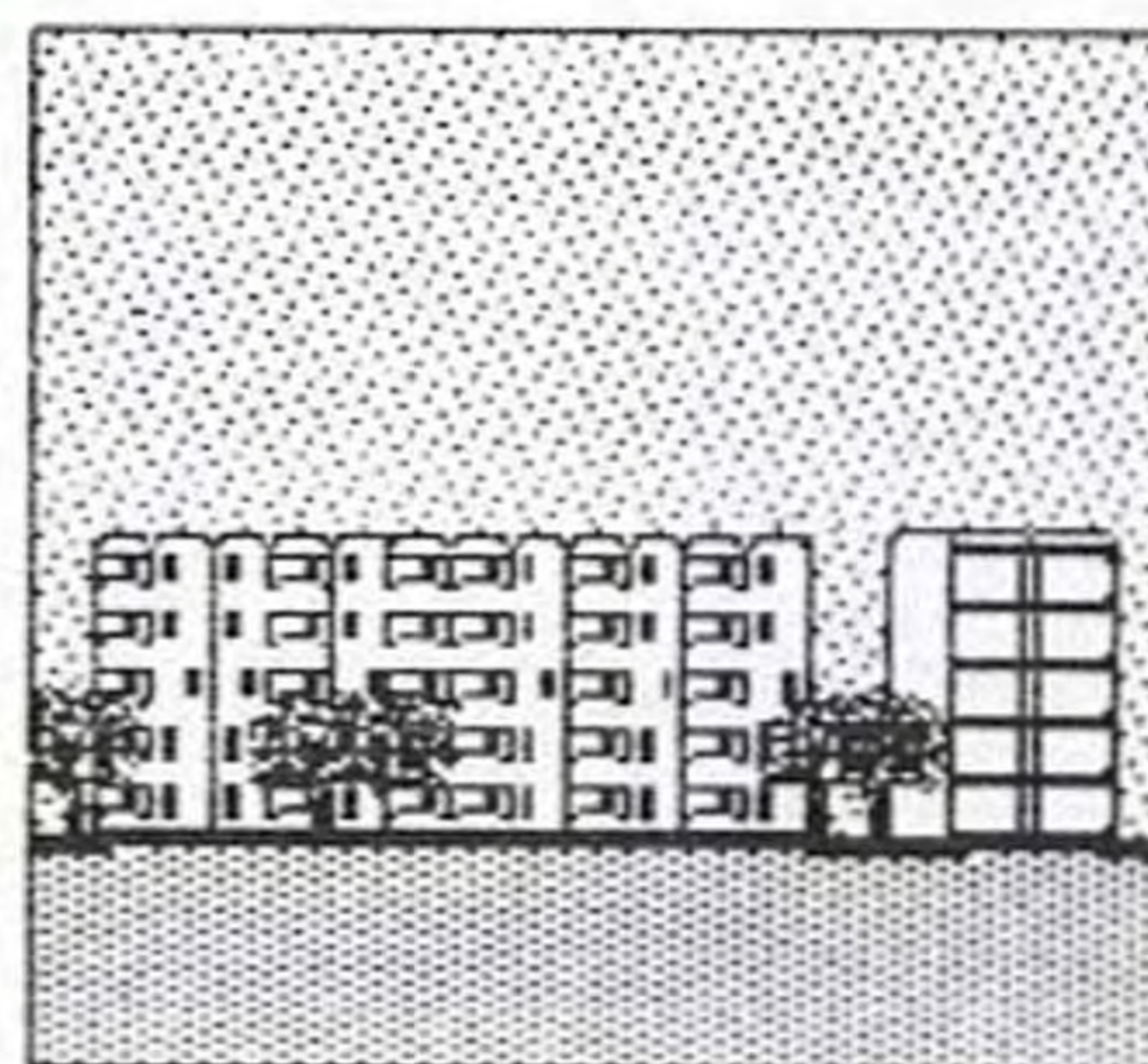
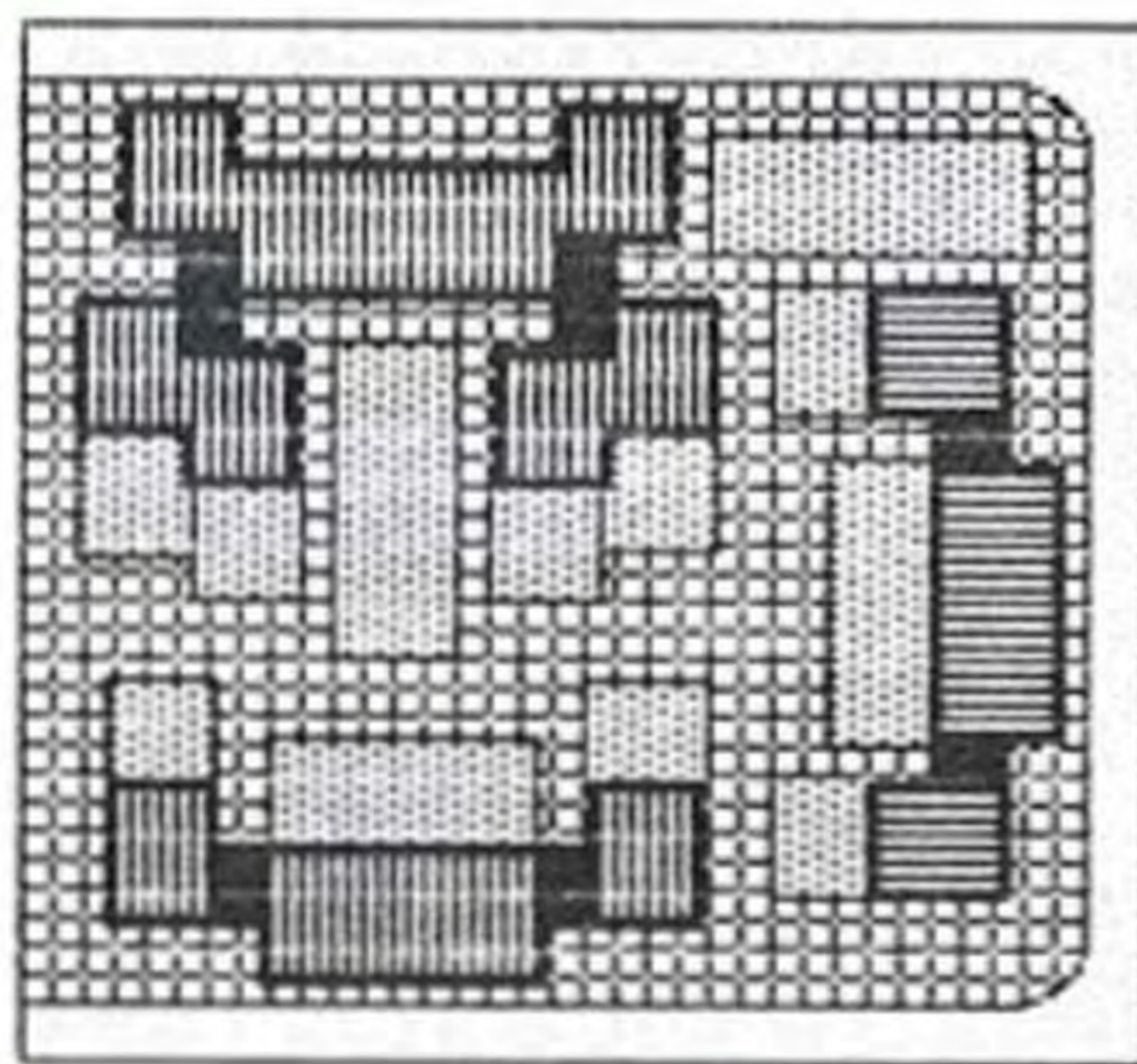
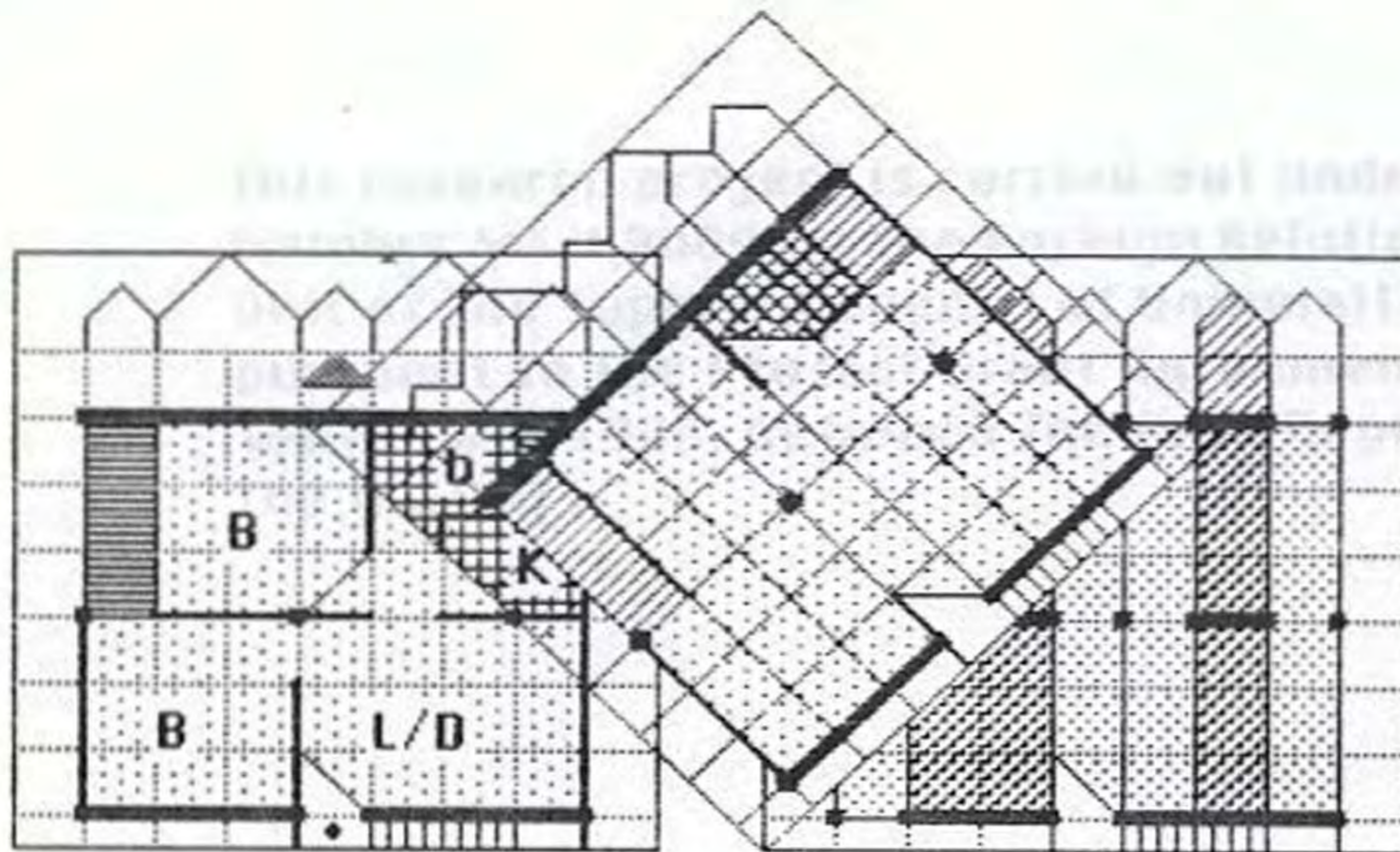
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FORMAL LOW COST HOUSING PROTOTYPES
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FINAL REPORT

FRCU GRANT NUMBER MS/89009
1991

ACKNOWLEDGEMENT

This research project is carried out under the Grant Number MS/89009 by the Foreign Relations Coordination Unit of The Supreme Council of Universities, Egypt, pursuant to The Project Grant Agreement, dated September 1980, between The Arab Republic of Egypt and the U.S.AID .

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**FORMAL LOW COST HOUSING PROTOTYPES - EGYPT : MONITORING, ASSESSMENT
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SUMMARY

Provision of housing for low income families is among the major concerns of the Ministry of Development, New Communities, Housing and Utilities, Egypt. The Ministry in collaboration with the two Egyptian principal investigators of this project developed seven low-cost housing prototypes comprising a variety of house units in medium rise walk ups. The conception of the low cost housing prototypes combines three key features namely: internal and external flexibility (order and modularity), structural simplicity and gradual development (the units are provided to the users partially finished & completion is left to the users, a process that depends on the actual needs and financial abilities of such users). Hundreds of thousands of the partially completed low cost housing prototypes are to be built during the present Egyptian five year plan, many of which are at their final stages of completion.

The experience marks a clear shift in formal housing policies towards decentralization and acceptance of the low income housing demand groups in housing provision.

The scale of the experiment and its sensitive objectives call for serious monitoring of its implementation, critical evaluation of its products and positive development of its constituents.

The objective of the present research work is precisely to attempt to undertake the three folds objective: to monitor, assess and develop the experiment of the low cost housing prototypes.

The research project is to extend over three years and the current initiation phase is to cover one year.

Phase one will focuss on three levels of action:

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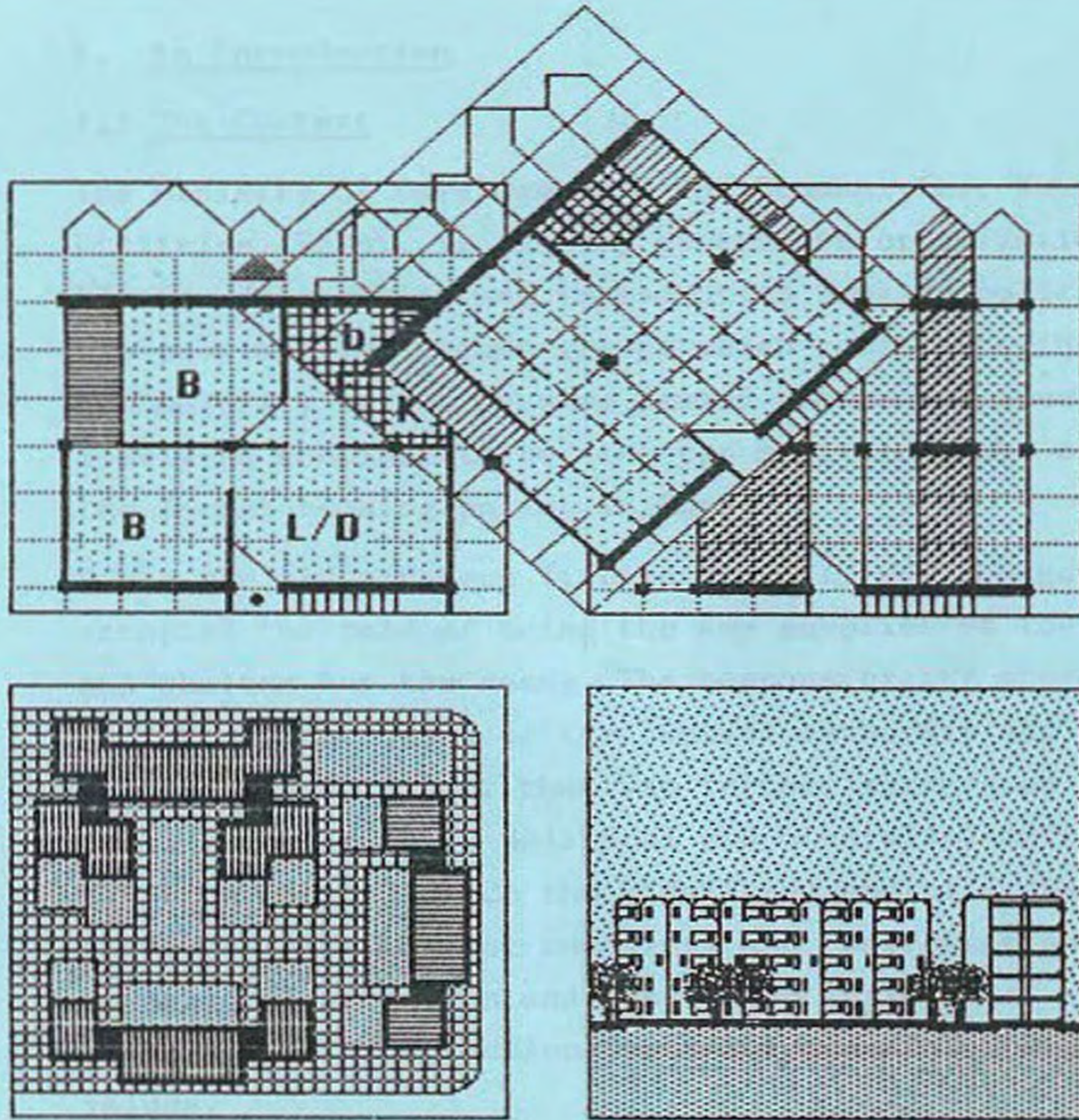
- The conceptual, methodical and operational frameworks.
- Data collection and data base establishment
- Preliminary problem identification



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1 - INTRODUCTION

1. An Introduction**1.1 The Context**

The Ministry of Development & New Communities, Housing and Utilities, Egypt, is the top government organization, responsible for delineating and implementing housing policies. Housing the poor and low income groups which constitute the overwhelming majority of the housing demand groups has been (and is likely to continue to be) the top most among the objectives of the formal housing policy in Egypt.

Since the mid nineteen fifties and till now the government accepted the role of being the key supplier of low cost housing and shelter for the needy. The responsibility proved colossal and beyond the means of the central authority and affiliated organizations. A fact that was further aggravated by the prevailing conditions (political and otherwise) affecting the Egyptian setting since the midsixties and till the early eighties including hot conflicts and confrontations, war economy, urbanization and population explosions, soaring building and construction costs & escalating urban land values.

The continuous growth of the gap between formal low cost housing supply and demand forced the acceptance of the role of the demand groups in housing provision. The shift in government policy was marked by the adoption of the ministry of housing and utilities of the partially completed low cost housing units as the formal prototypes, april 1987, which was used since in most new housing developments throughout the country during the past three years. Hundreds, thousands and even tens of thousands of housing units were planned, implemented and are to be completed shortly.

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The prototypes were commissioned by the Ministry of Development, and were developed by the principal investigators (Sayed Ettouney and Nasamat Abdel Kader) in close cooperation with the Minister of Development (Eng. Hasaballa El Kafrawi) who sponsored the conception and orchestrated its adoption, immense implementation.

The designs of the prototypes were based on two major sources: firstly: the collective critical analysis of Egyptian public housing types and the evolution of idealized versions of medium rise prototypes combining: simplicity, modularity, structural clarity, flexibility and efficiency (see Ettouney & Nasamat), secondly: the housing prototypes proposed for the development of low income families housing areas in one of Egypt's new towns: El Obour, which was the subject of a national competition, jointly supervised by the general organization for physical planning, Egypt and the GTZ German Technical Cooperation Agency.

The entry by the two principal investigators was awarded the top place and prize in the competition.

The formal partially completed low cost housing prototypes were hence the third phase of a design sequence.

The objectives behind the formal low cost housing prototypes were to develop efficient housing units in terms of functions, structures, components and details and to complete and finish the medium rise blocks externally, leaving the interiors of the dwelling units unfinished. The interior finishing which includes: building the partitions, internal walls, including the kitchen walls, flooring, plastering and painting etc - are to be left to the owners/ occupiers of the units.

The resulting cost-reduction is expected to exceed 25% to 30% of the completely finished units, a fact that will have an

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immense repercussion on the volume of housing supply and the number of families that can afford the low-cost partially completed units.

The seven low-cost partially completed housing prototypes, designs and tenders were collected in one volume (1987) that was widely circulated and used as basis for most formal public housing development since mid 1987 and till now.

The implementation of the prototypes covered the various aspects of housing and physical development in Egypt including: upgrading, comprehensive development and newly developed areas in existing as well as new settlements.

The importance of the experience in terms of conception, scale investments and results justifies close monitoring, assessment and continuous feed back and development.

A major challenge and rather difficult to undertake such responsibilities.

The present research project aims at covering part of the above challenge and will hence attempt to undertake the collective responsibility of monitoring, assessing and proposing technical modifications to enhance the prototypes, i.e. maximizing their merits and minimizing draw backs.

1.2. Objectives

The objectives of the present research project are neatly spelled out in its title, namely to: monitor, assess and develop the partially completed formal low cost housing prototypes experience in Egypt. The types are adopted by the Ministry of Development & New communities, Housing and Utilities, Egypt, since the mid Nineteen Eighties and till now. They were (and still are) the core of nearly all formal/ Government sponsored housing projects during the past three

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years.

Hundreds of thousands are at various stages of completion of these partially finished dwellings, organized in direct stair-access medium rise blocks. They are to be gradually completed by the users/owners according to their needs and financial abilities.

The experiment solely depended on the integrated volume "Development of low cost housing prototypes - conceptions and Execution Documents" Cairo, April 1987 which combines the conceptions, execution drawings and bills of quantities for the seven prototypes.

Since its publication and till now, no updating, critical review nor modifications (minor or major) were carried out. Piecemeal remedies for specific site problems or programme requirements were and are continuously putforward - but never amounted to a rigorous and comprehensive development of the conception and related execution documents.

The protofolio or the mother volume does not include, inspite of its size and extent of coverage, guidelines for site organization and spatial development. Neither it contains users manuals for completing their unfinished dwellings.

Furthermore no provision were made for climatic variability, and the questions of local identity and appearance were not adequately covered.

The scale of the experiment, in terms of investment and those affected, together with the extending influence of the policy merit: monitoring, assessment and development, hence the present work.

Many problems are expected to show with and post implementation, including:

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- technical problems related to:
 - the appropriate techniques of construction and building materials to be used in the various locations, and development settings.
 - the impact of the size of the project the types of contractors and quality of labour upon the selection of the appropriate techniques and materials for construction.
 - the impact of climatic conditions upon the design of the outer envelope (location and percentage of openings, appropriate materials, etc ..)
 - the economics of site organization, taking into consideration the size of projects and the economics of infrastructure networks serving the layout.
 - local physical determinents such as topography, environmental and climatic condition, socio-cultural factors and their impact upon the features of generated layouts.
 - Organizational problems related to:
 - scenarios for the interaction of individuals and intermediate bodies for the gradual completion of the unfinished flats.
 - the need for guidance from intermediate bodies in the implementation of the concept of gradual completion of households (e.g. the provision of catalogues and manuals to the users giving alternative internal designs for the unfinished flats & possible means of action or " do it yourself" schemes etc).
 - scenarios for provision of materials and components for the completion process.
 - Socio-Cultural problems related to:
 - the way the users visualize their roles and means of
-

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participation.

- the level and extent of participation the users are willing to undertake: eg. in decision making, in real action and implementation , etc).
- difficulties in communication with other users or intermediate bodies to undertake an active role in the participation process.

In order to address the previously highlighted problems in the present research project, it should be pointed up that some of the problems could be directly handled at the early stages of the study such as the technical problems, however the organizational and socio-cultural problems, cannot be dealt with at those early stages, since they depend on the actual presence of the actual users in order to obtain and correct data about the users and the problems encountered.

Since the present research project is to be spread over a three years period it is believed that the problems related to the organizational and socio-cultural aspects could well be tackled at later stages.

In the light of the above discourse, the objectives of the present work may be summarized as follows:-

- To monitor the experience
- To assess the performance of the prototypes
- To formulate guidelines for development of the prototypes.

1.3. Methodology

The present research programme is to span three years. It comprises two distinct phases. The first phase extends over one year and is marked by a relatively limited budget and a small team of researchers. The second phase is to span two years and will enjoy reasonable budget and man power.

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The methodology thought for the present work reflects by large the ambitious objectives on the one hand and the limitations of resources and research setting on the other.

The methodology focusses on the identification of the problem and the clear definition of its features and extents. The involvement of the principal investigators in the formulation of the conception and the initiation of the process sponsored by the Ministry of Development should facilitate the achievement of the prime purpose of phase 1 of the project, namely: to formulate and spell out the problems related to the implementation of the project.

Definition of the problem is a multi faceted drive, that involves, context definition and establishing data base regarding the frame-work and details of execution, which in turn should cover technical, organizational and setting related information.

Extensive exploitation of published reports and material and first hand information from public sector contracting companies should facilitate an early identification of the problem and its extents.

A dialectic between two levels of problem identification is to characterize the first phase, namely:

- The hypothetical problem identification, which is to be based on the experience (and follow up) of the key researchers with the issue in hand; and
- The actual problems that may be pointed out by the technocrats, contractors, professionals and users (if encountered).

Similarly the following phase is to be marked by constrasting theory and practice, the expected and actual performance together with the identification of the relative weighting of merits and short comings in terms of cost, acceptability and

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appearance of the prototypes and environs.

The methodology of the present work thus depends on rational analysis of the conception and its potentials and forecasting likely problems and constraints on the one hand and finding out the emerging actual implementation related problems on the other.

Assessment of the experience is a rather difficult task - as it requires time and the involvement of the users who are likely to emerge rather late, if judged by the time schedule of the present work.

In brief the methodology adopted by the present work is characterised by three distinct closely related features:

1. Rational sequence of actions: problem identification, objectives definition, scope and limitations, data base establishment, analysis, hypothesis and alternative remedies formulation, monitoring evaluation and feed back etc.
2. Exploitation of available resources and sources of information.
3. Dialectic manipulation of the problem and contrasting theory, conceptions and practice.

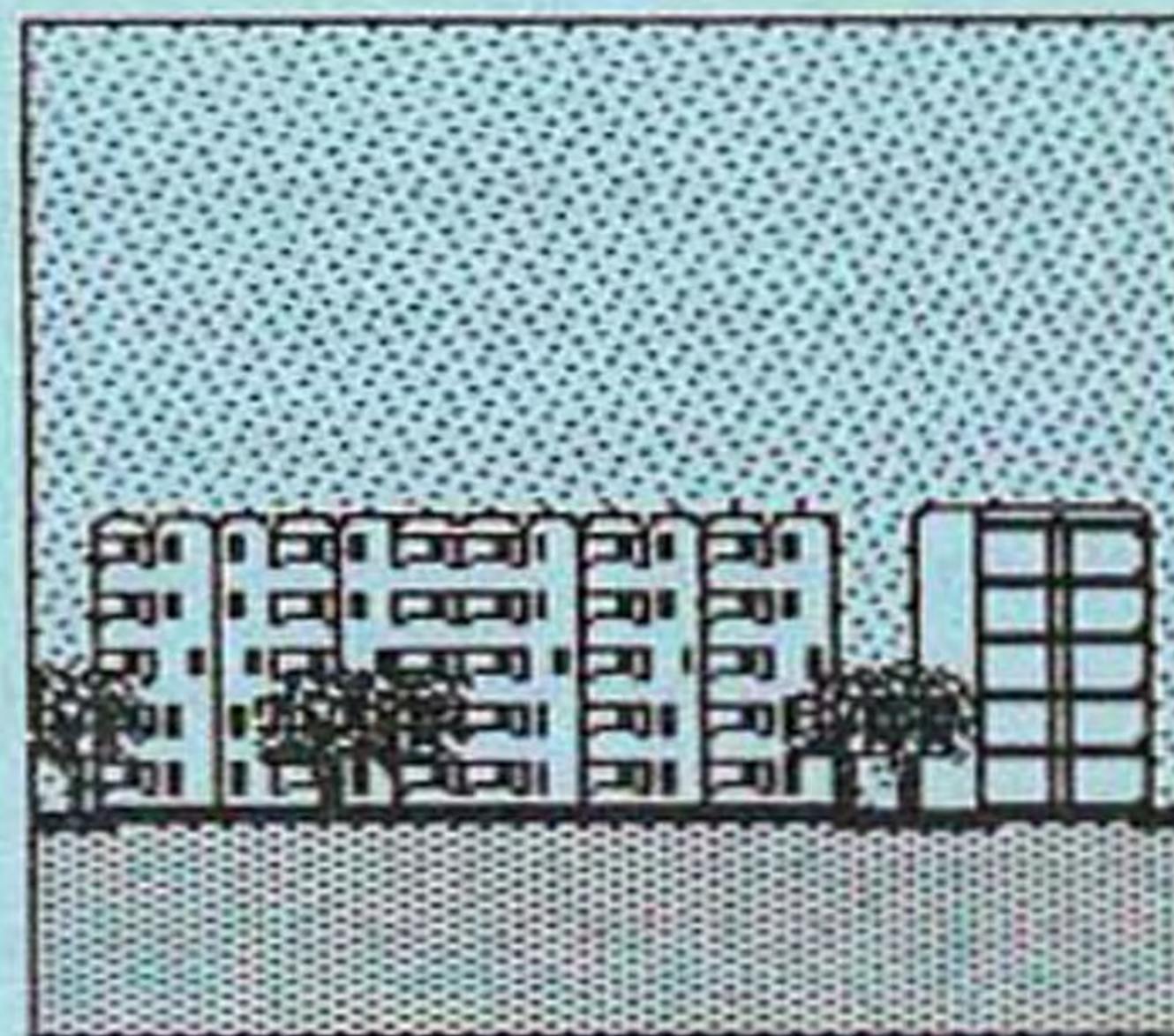
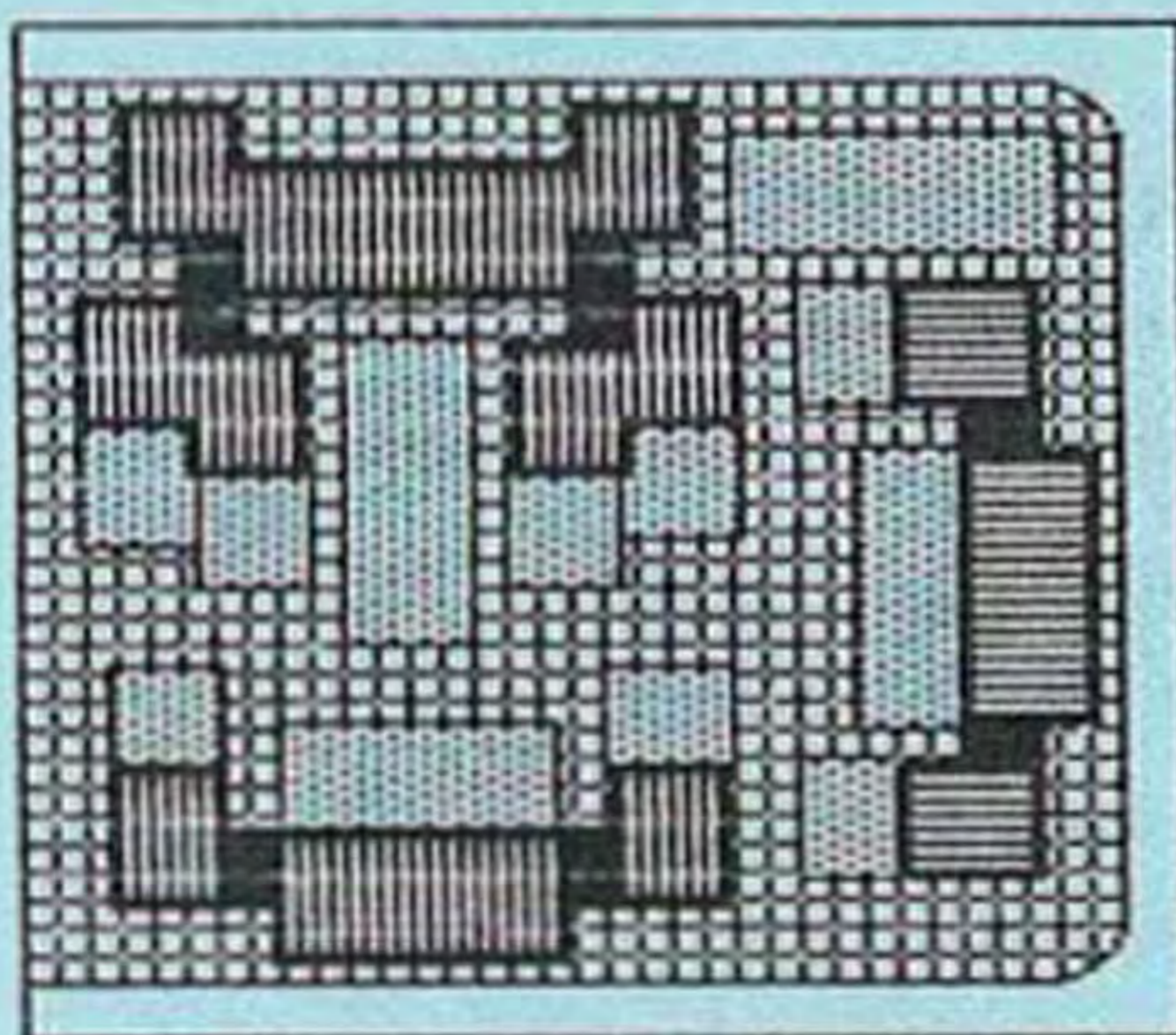
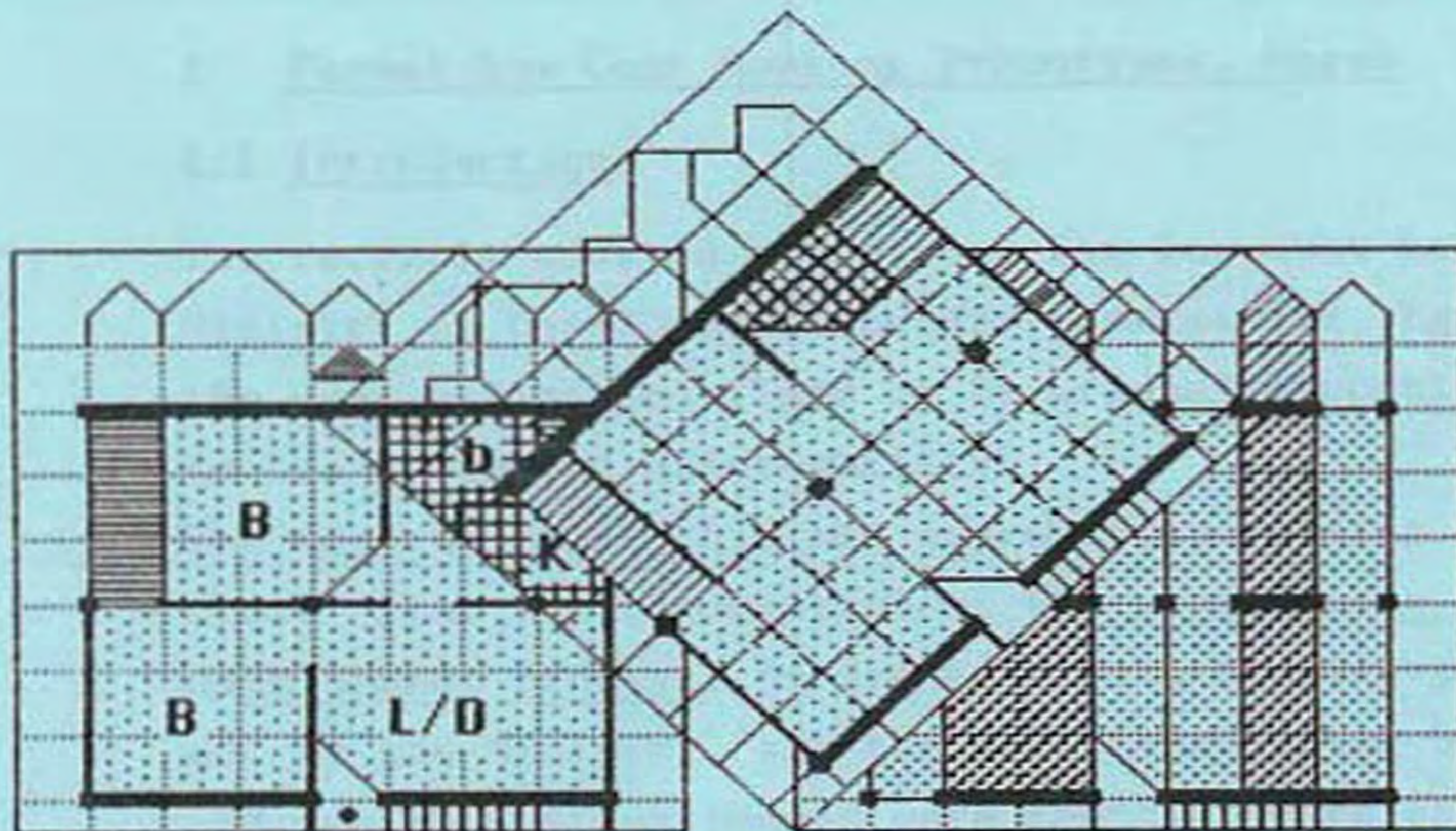
1.4 Structure of the present report

The present report is the final report in the first phase of the research project (duration one year). It comprises eight sections which follow an intentional sequence, namely:

- Summary
- Introduction (the present section) discussing the context and its problems, the research objectives and methodology, the logical structure of the report.
- Formal low cost housing prototypes, Egypt: presenting an overview of the types' conception, design criteria,

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- development and features.
- Data collection and analysis (Macro-context): dealing with the statistical display of the available information, and focussing on the size of the projects, their locations and related supply agencies. It also points out some of the expected problems.
 - An extensive survey, for further data collection and analysis (Micro context - case study), highlighting the various aspects of implementation problems (technical, economic and organizational).
 - Conclusions: summarizing the various types of problems deduced from data collection and analysis and proposing lines of action for the next phase of the research project.
 - Appendix 1: conceptual drawings of the seven formal low cost housing prototypes
 - Appendix 2: questionnaire format for the field survey.
 - Bibliography and selected references.



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FORMAL LOW COST HOUSING PROTOTYPES, EGYPT

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2. Formal Low Cost Housing Prototypes, Egypt**2.1 Introduction**

The recently adopted prototypes for low cost housing, by the Ministry of Development and New Communities, Egypt, present to the user unfinished flats to be gradually completed according to his needs and affordability.

The importance of this new approach to housing development stems from its recognition of the users' role in housing development process. In previous mass housing projects developed by the Ministry, all the decisions during both conceptual and implementation phases were restricted to central agencies. The users were only to occupy and use the completely finished flats.

Many research projects recommended to the Ministry of Development and New Communities to change the role of central bodies and limit it to the provision of sites, main infrastructure networks, & community facilities, leaving the other levels of development to the users & individuals (i.e. to decentralized processes of action). The studies referred to the active role of the individuals and small bodies expressed in the development of informal areas. The studies pointed out the positive aspects related to that inaccepted image of development. The positive aspects were mainly related to the capacity of individuals and small bodies to finance and manage the gradual development of informal housing areas.

The studies highlighted many scenarios for the possible collaboration of central institutions, intermediate bodies and individuals in the development process. The distribution of roles between the different parties may vary according to the type of development in hand:

- For completely finished flats in mass housing development: the role of the users and intermediate bodies is complete-

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ly rejected, all decisions and actions are taken by central agencies. The initial cost of the dwellings covers the gross cost of development.

- In the case of mass housing development providing unfinished flats (supports & outer skin): The role of the users and intermediate bodies is partially recognized. They will be responsible for the finance and actions to complete the dwellings. The initial cost of the unit is less than its final cost which makes it within reach of relatively larger demand group (i.e. income groups that were not able to afford the cost of completely finished units).
- In the case of core houses based on parcellization schemes, the role of the users and intermediate bodies is cleared and well recognized. The role of central bodies is limited to the provision of sites & infrastructure networks, services and a basic core unit within each plot. The initial cost of the dwelling is effectively minimized (which makes it more affordable for larger categories of low income groups).
- In the case of site and services schemes, the role of the users and intermediate bodies is maximized and the role of the central bodies is accordingly minimized. The central bodies are only responsible, for providing development & land infrastructure networks, services, leaving development actions related to the erection of housing units to the users and intermediate bodies. The development process thus gradually progresses according to the needs and resources of the users. As a result the initial costs of the serviced plot is minimized and larger categories of low income demand group can afford it.

The reaction of the Ministry of Development and New Communities Egypt to such development scenarios varied through the years.

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It shifted from the rejection of the concept of users participation to partial acceptance of such a participation within the framework of partially completed housing projects. The Ministry of Development recently adopted the development scenario suggesting prototypes of unfinished flats providing the users, the main structure (supports), the finished outer envelope & main technical networks (sanitary & electrical) and allowing the users to gradually complete the interiors of the dwellings (partitions and finishing materials) according to their needs and affordability. The attraction of this scenario for the Ministry of Development, Egypt was the result of two major aspects:

- to minimize the initial cost of the dwellings
- to enjoy the image of completed developments, inspite of the cost reduction.

As previously mentioned, the real value of the new strategy adopted by the Ministry relies in its recognition of the active role of individuals and intermediate bodies. The new strategy is a real breakthrough and ought to be monitored, assessed in order to maximize its benefits.

2.2. Formal Partially Completed Low Cost Housing Prototypes- A Profile

The prototypes were developed according to a set of closely related physical and non physical design criteria, including: Economic, Socio-Cultural, environmental, internal organization (flexibility and adaptability) & technical. The design of the prototypes benefited from the results and findings of earlier studies that reviewed, critically analysed existing (formal and informal) Egyptian dwellings and pointed out their distinct and common feature. Four studies did have a direct impact on the formulation and development of the low cost housing prototypes namely:

2 - FORMAL LOW COST HOUSING PROTOTYPES, EGYPT

- Nasamat Abdel-Kader, Support/Infill system, the Housing and construction Industry in Egypt, Cairo University/MIT, Tap Report, 1978.
- Nasamat Abdel-Kader, Sayed Ettouney, A SAR approach to the site, Housing and the construction Industry in Egypt, Cairo University/MIT, Tap report, 1979/1980.
- Nasamat Abdel-Kader, Sayed Ettouney, On the design and planning of Residential Areas, Dar El-Fata El Arabi, 1986.
- Nasamat Abdel-Kader, Sayed Ettouney, on Housing and Physical planning, Facto, Cairo, 1987.

The analysis of existing (contemporary) Egyptian dwellings clearly indicated distinct common features, including:

- the relationship between functional spaces and outer facades: there are usually two functional spaces between two opposite facades. This is mainly due to Egyptian building regulations calling for natural lighting and ventilation of all functional spaces.
- The average spans of functional spaces out-looking external facades: it has been noticed that for a given socio-cultural group of users, such spans are relatively constant.

The previous remarks helped the identification of abstract pattern to guide future dwelling designs. The abstract pattern is characterized by the fact that within the distance between two opposite facades, there are mainly two parallel location " zones " for functional spaces (using the SAR group terminology). These two parallel " zones " are flanked by "margins" allowing variations in the depths of functional spaces within the zones. The " zone distribution" pattern comprizing two "zones" flanked and separated by three " margins " is then subdivided into "sectors", each sector being a structural module occupying the whole depth of the dwelling (the distance between two opposite facades). Many alternative designs

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could be suggested for the sectors. Dwelling designs may thus be considered as a synthesizing action combining and organizing sectors.

Such a simple abstraction for the features of Egyptian dwellings is equally important when it comes to the selection of the best location for structural elements (supports), so that it would not clash with the variety of internal layouts for the dwellings (internal flexibility).

According to the previous analysis and abstraction, the best location of structural elements (supports) whether columns or bearing walls, were found to be located along the centre lines separating the sectors, the structural elements may occupy the whole depth taken by the zones and may equally be located on the boundaries of the margins. The margins themselves should be left free for a better flexibility of internal designs.

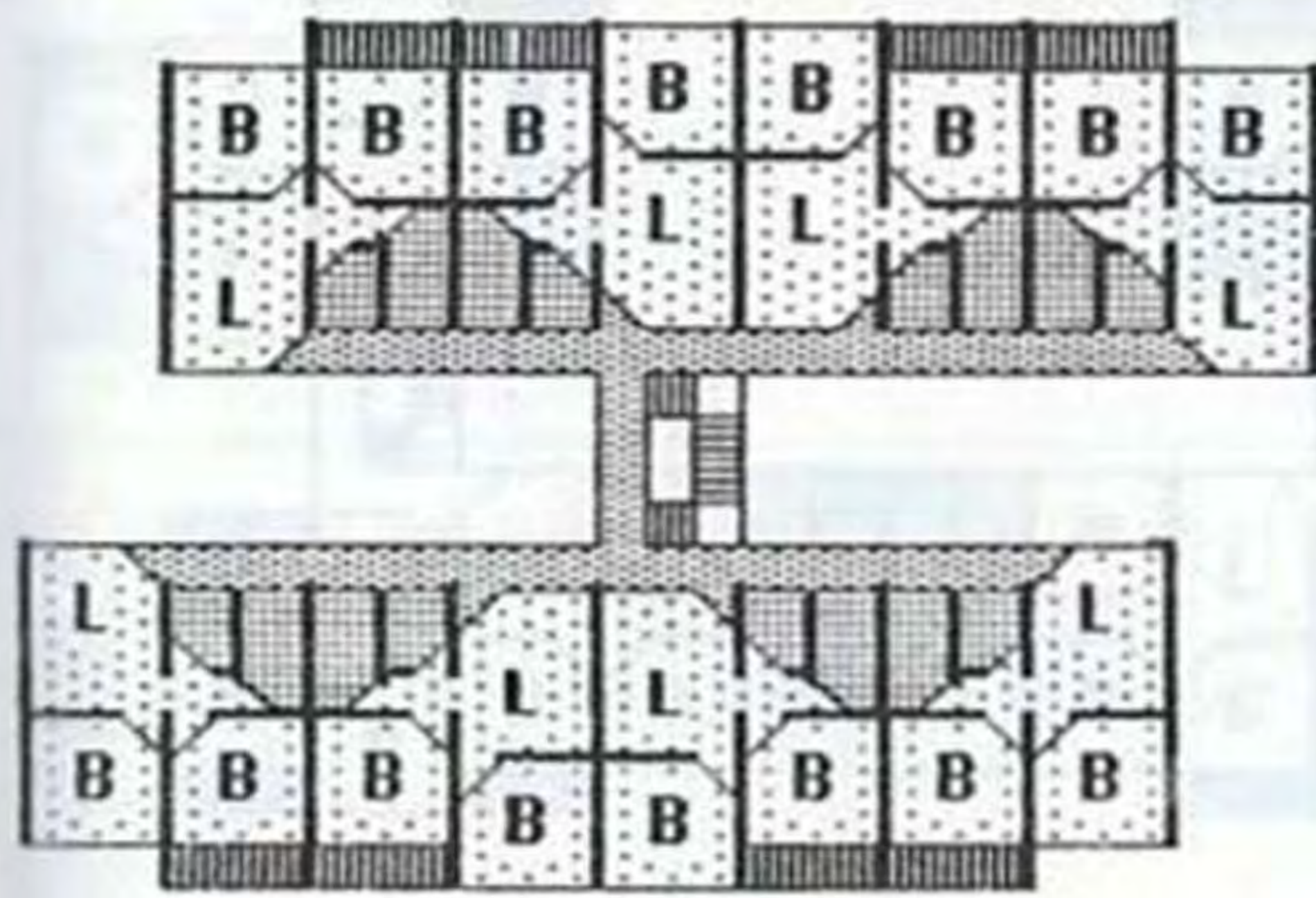
The formal partially completed low cost housing prototypes, commissioned by the Ministry of Development and New Communities, Housing and Utilities, Egypt, were based and developed within the framework of the "zone distribution" conception discussed above.

Seven low cost housing prototypes were generated using the same "zone distribution" patterns & the same location for structural elements "supports", See Figs, 1,2, & 3.

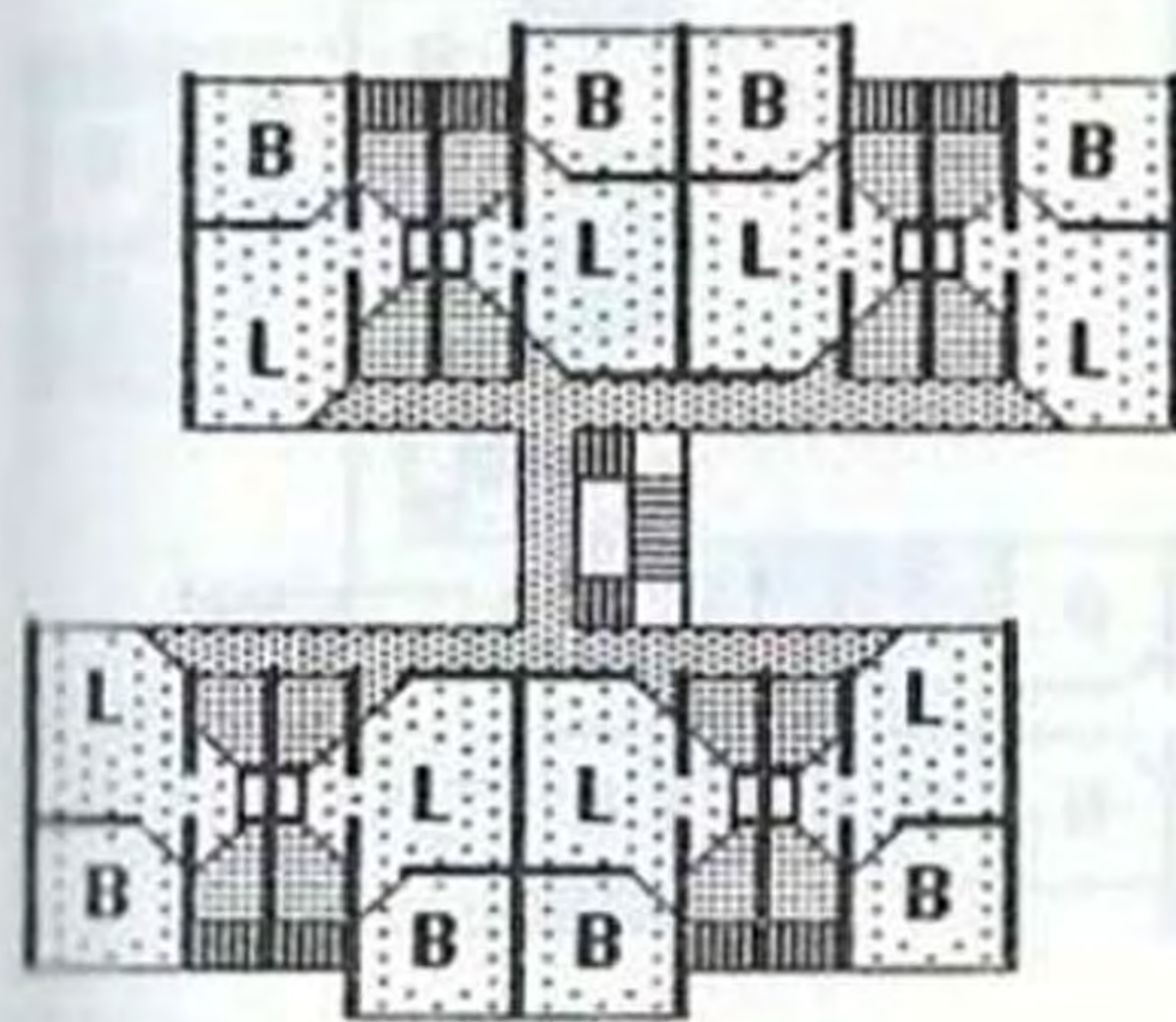
The following features were respected in the seven generated prototypes:

- The depth between the two opposite facades is constant and equal to 8.40 meters, allowing the accommodation of two opposite functional spaces and circulation element.
- The spans between structural elements (supports) and the width of the sectors is equal to 3.6 Fig. (3)

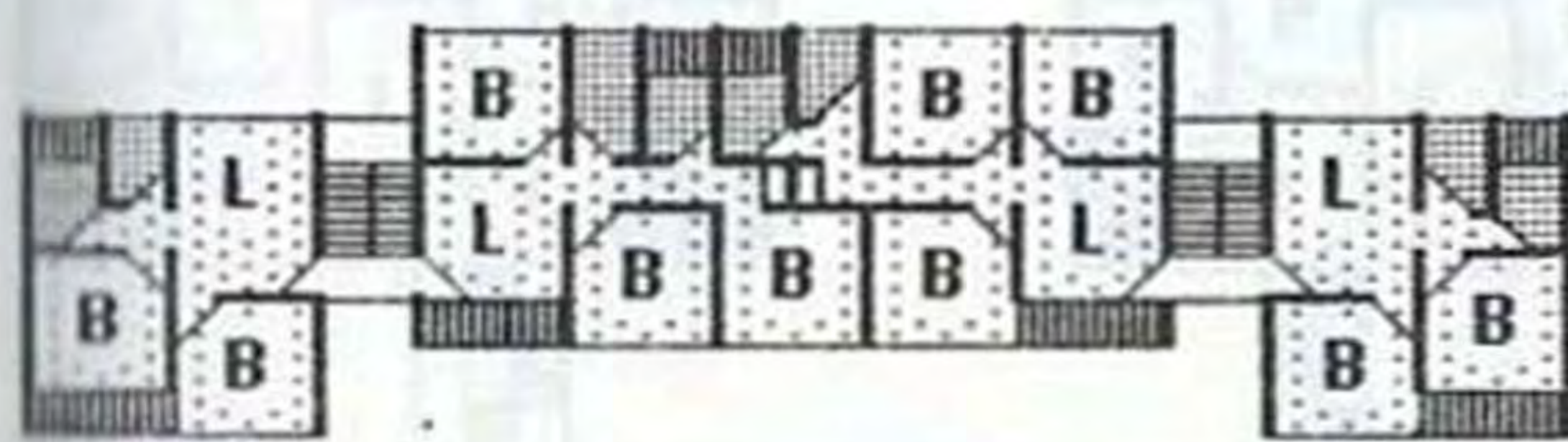
This regularity had a direct impact upon cost reduction, which will be indicated later.



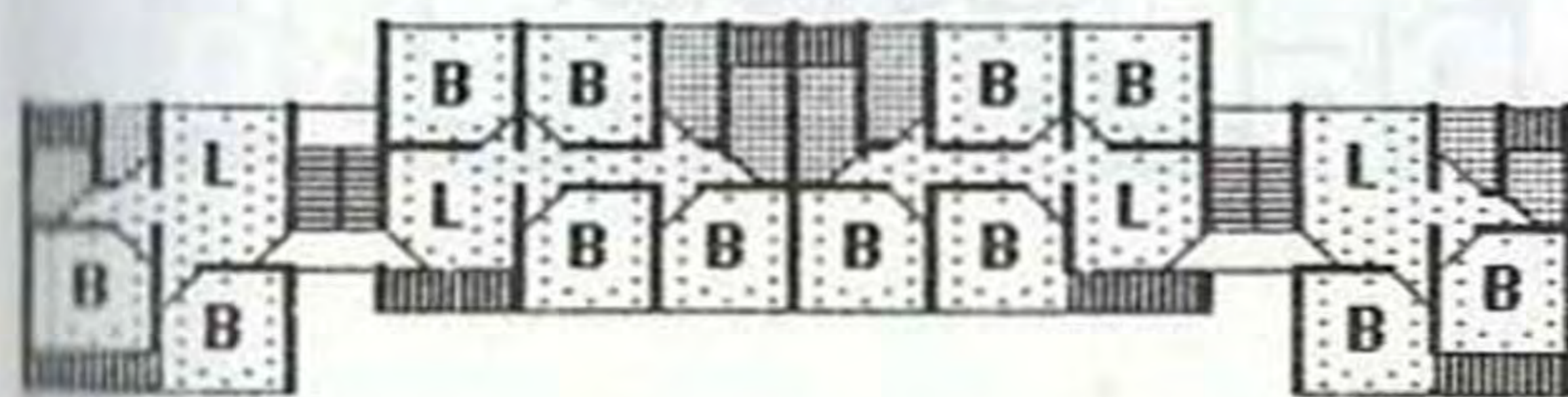
PROTOTYPE A



PROTOTYPE B

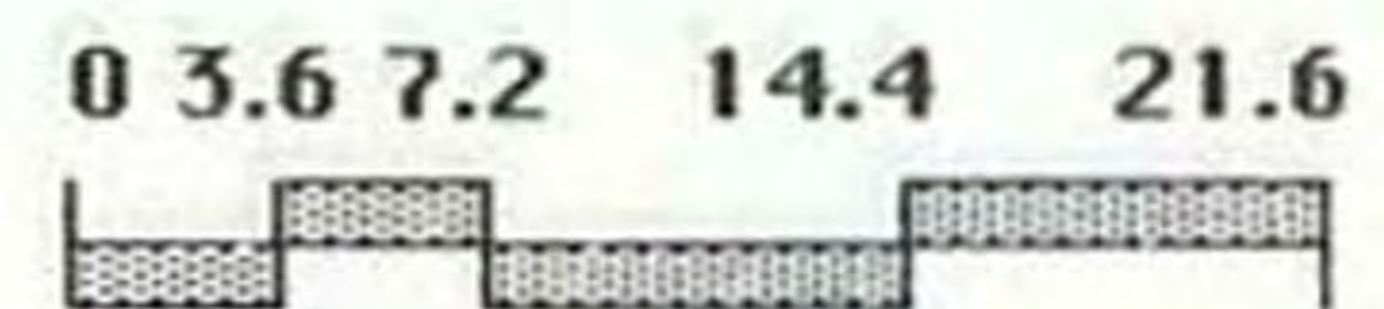


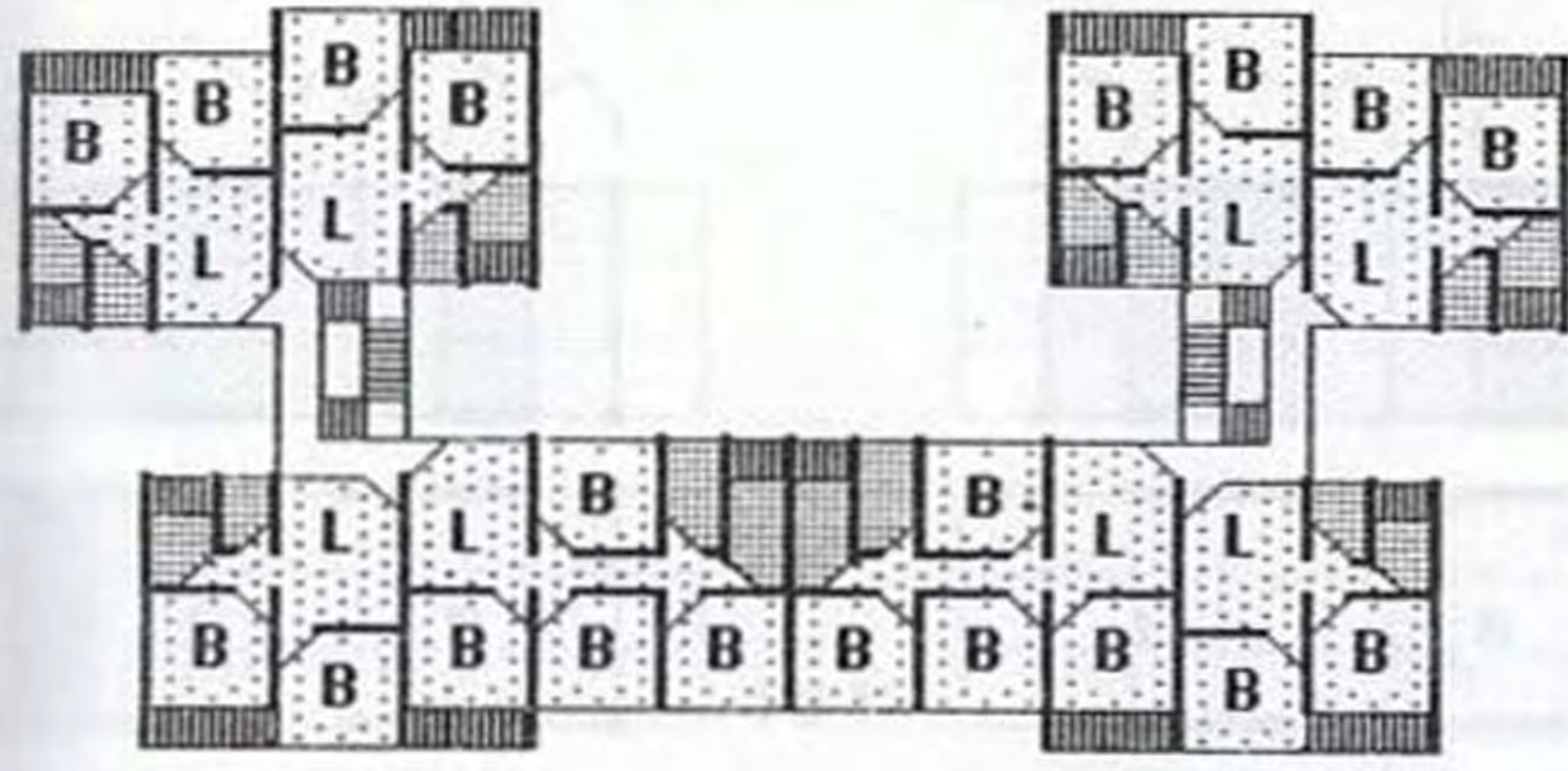
PROTOTYPE E



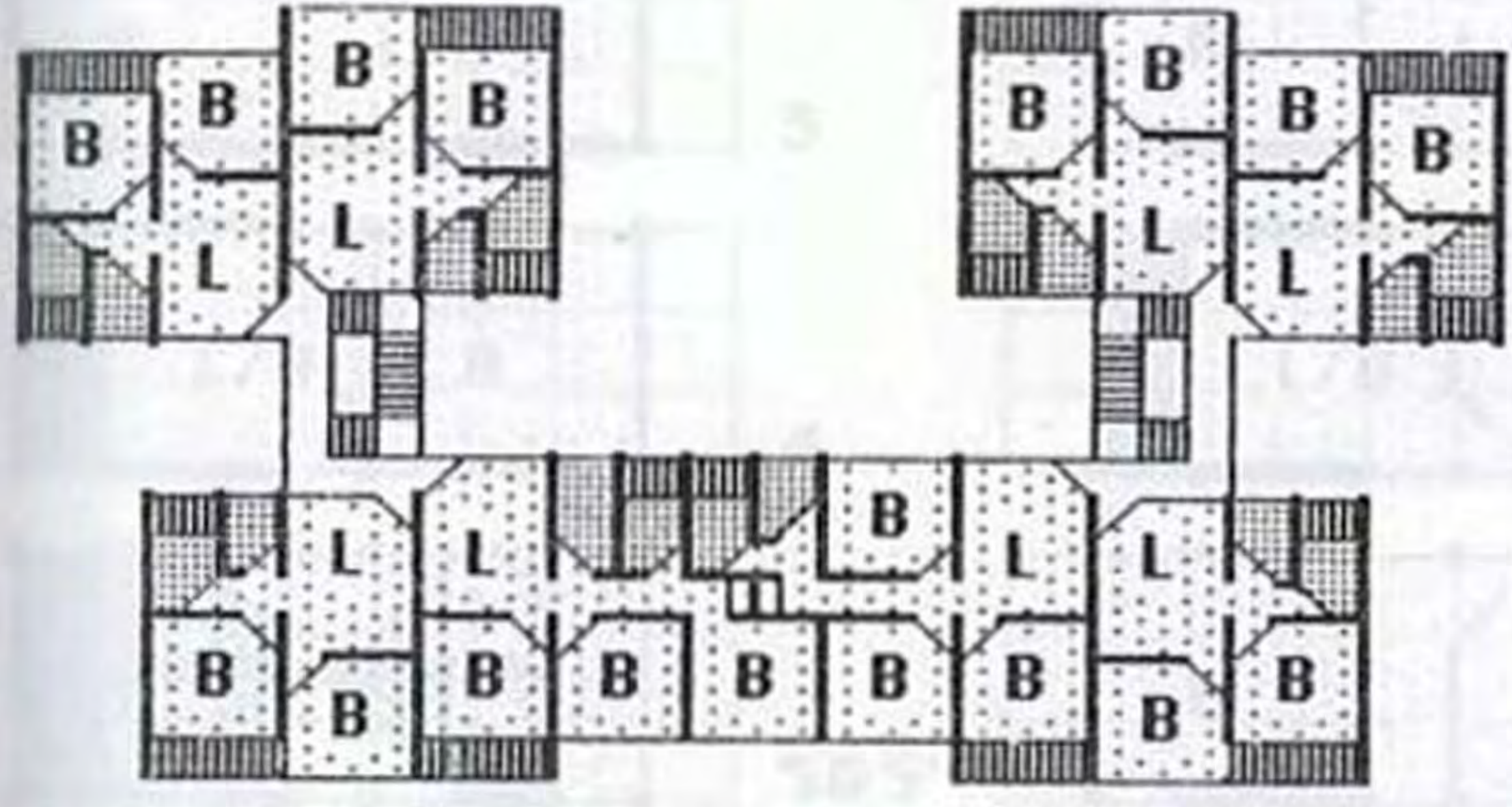
PROTOTYPE F

FIGURE (1) : FORMAL PARTIALLY COMPLETED LOW COST HOUSING PROTOTYPES : A , B , E & F .

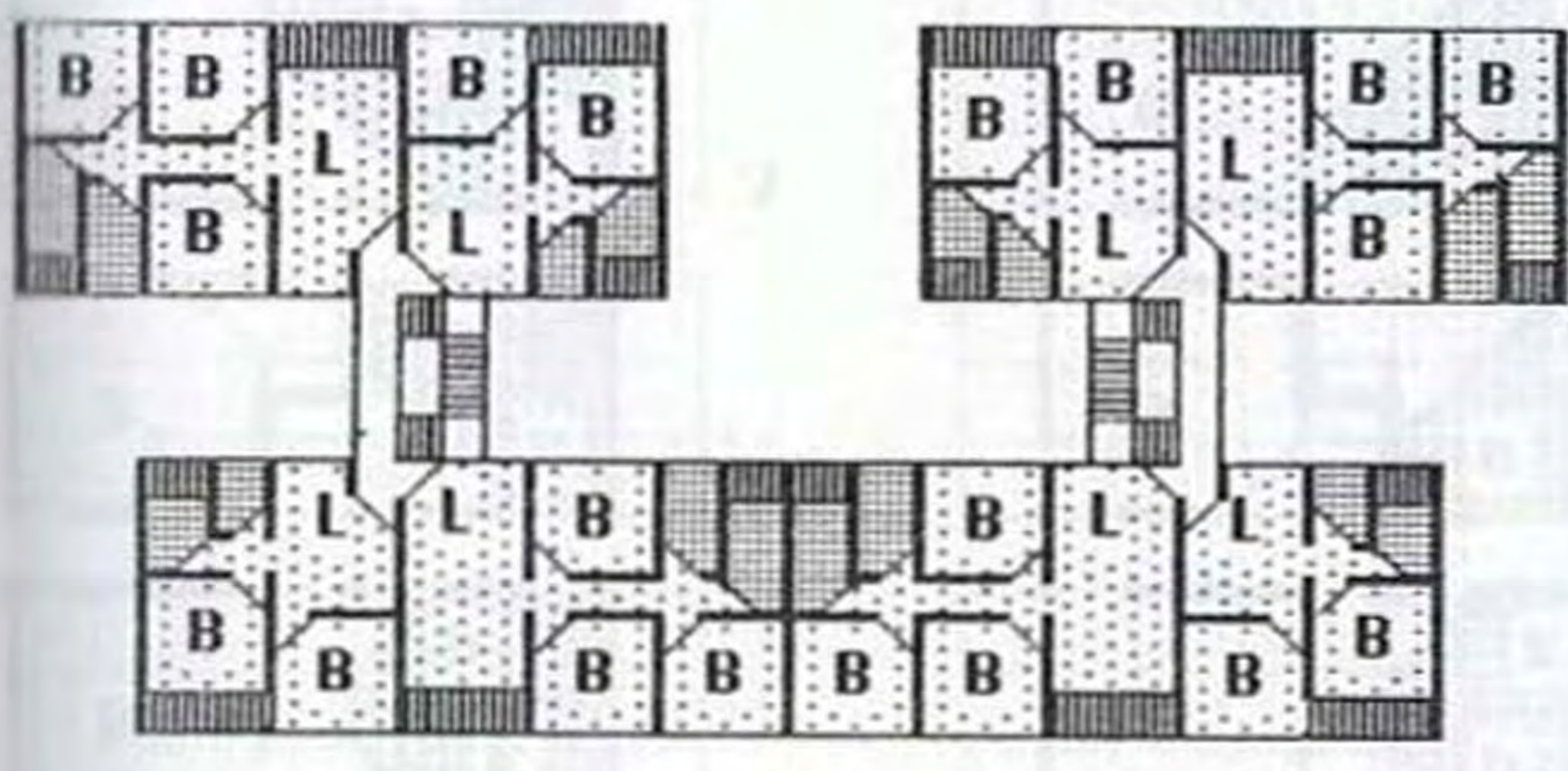




PROTOTYPE C

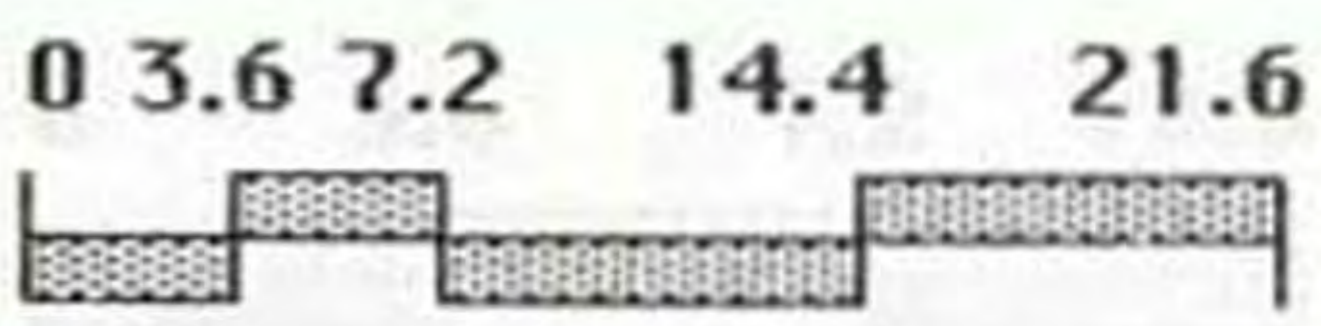


PROTOTYPE D



PROTOTYPE G

FIGURE (2) : FORMAL PARTIALLY COMPLETED LOW COST HOUSING PROTOTYPES : C, D & G .



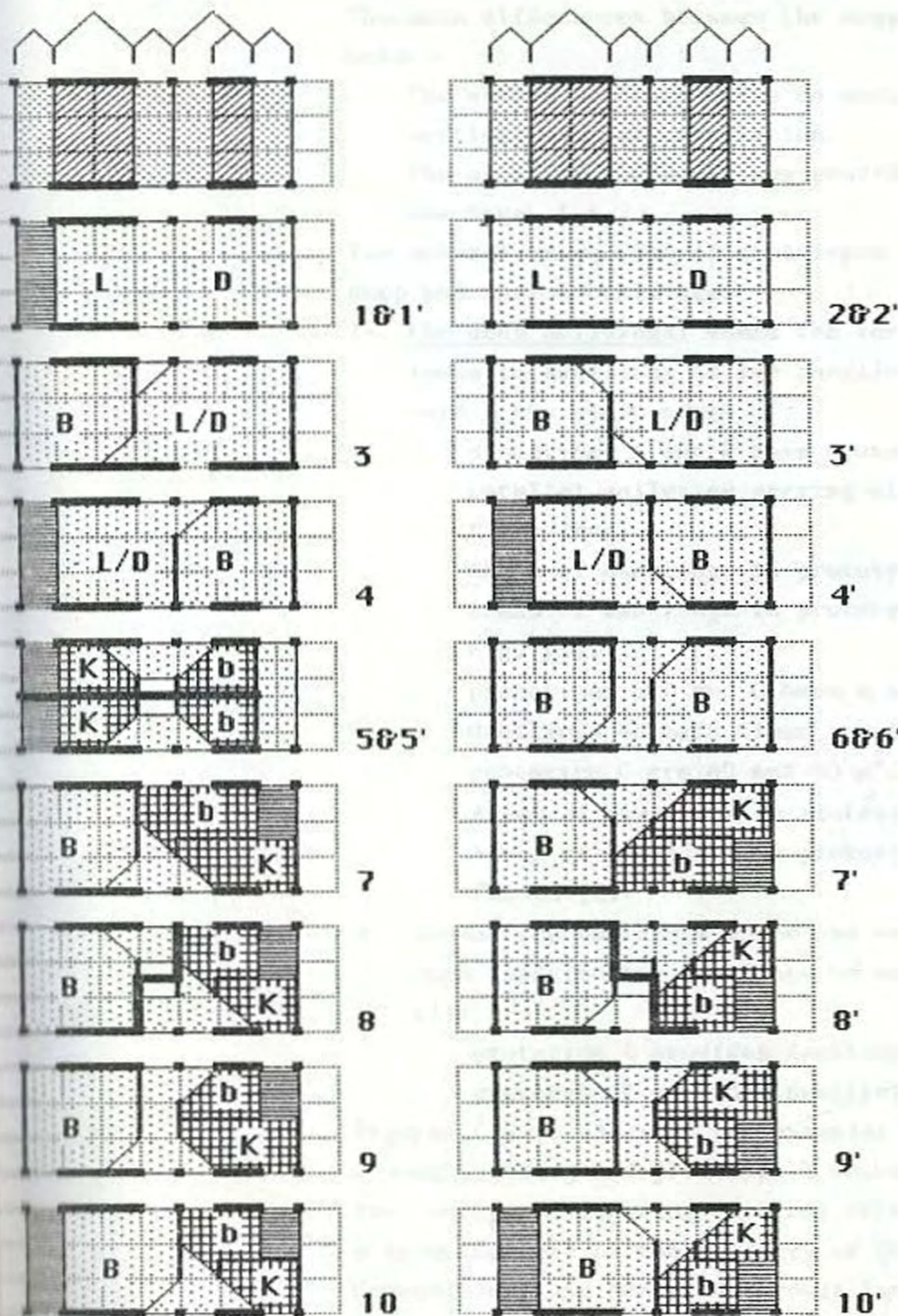


FIGURE (3) :

FORMAL LOW COST HOUSING PROTOTYPES. BASIC DESIGN SECTORS VARIATIONS ; THE KEY TO SPATIAL ORGANIZATION CONCEPTION .

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The main differences between the suggested prototypes were mainly:

- The number of house units on each floor served by the vertical core of circulation.
- The areas of the dwellings provided within each prototype. See Figs, 1 & 2.

Two general categories of prototypes were developed, namely: deep and narrow buildings.

1- the deep buildings: where the vertical core of circulation leads to dwellings in two parallel blocks, joined by the core (the stair case)

- prototypes A and B have a staircase leading to two parallel galleries serving eight dwellings on each floor level.

Areas of dwellings in prototype A are 45 m^2

Areas of dwellings in prototype B are 60 m^2

Fig. (1).

- prototypes C,D and G have a staircase serving four dwellings on each floor level. Areas fo dwellings in prototype C are 60 and 90 m^2 .

Areas of dwellings in prototype D are 60 and 75 m^2 .

Areas of dwellings in prototype G are 60 and 90 m^2 .

Figure (2).

2- the narrow buildings where the vertical core of circulation leads to two dwellings on each floor level, figure (1):

- prototype E provides dwellings of 60 and 90 m^2 .

- prototype F provides dwellings of 60 and 75 m^2 .

Figures (4 to 23) show two examples : prototype C which is a deep building and prototype E which is a narrow building.

The concept of lowering the cost of the prototypes, which is a prime concern of the Ministry of development and New Communities, was achieved through four key directions:

2 - FORMAL LOW COST HOUSING PROTOTYPES, EGYPT

- 1- the rationalization of structural systems
- 2- the provision of internally unfinished dwellings which are to be completed by the users.
- 3- the rationalization of layouts to minimize cost of infrastructure networks.
- 4- the rationalization of community facilities provision and the adoption of lower standards in the layouts.

As for the rationalization of structural system, it has been pointed up that the structural system in low cost housing represent 50 to 60% of the total cost of the dwelling. Such a percentage would even be higher in the case of unfinished flats. Accordingly, the decrease of costs related to the structural system is likely to have a considerable impact upon the overall cost. The approach to decreasing the cost of the structural system is achieved through the simplification and rationalization of such a system. The regularity in the distribution of structural elements (supports) entails minimization of errors in the execution process and encourage standardization of components, elements and even processes of action. For instance, having columns at standard spans in the two directions, helps having standard shuttering for the slabs, standard mesh for reinforcement, standard precut steel rods and so forth.

Different systems of construction could be used for any of the suggested prototypes according to the contextual determinants. For instance, some contracting firms would use table forms for the erection of the main structure, others would use tunnel forms or prefabricated bearing walls.

Figure (5 ,6,16 and 17).

The provision of internally unfinished dwellings, decreased the cost of the square meter by about 25%. Such a reduction in cost would allow lower housing demand groups to the new prototypes.

2 - FORMAL LOW COST HOUSING PROTOTYPES, EGYPT

The rationalization of layout arrangements was important to stress the fact that lowering the cost of the dwelling on the level of the prototypes is not enough if not supported by the rationalization of site organization. Poor site planning could increase developments costs on the level of infrastructure networks. Figures (14,15,22 and 23).

The adoption of minimum standards for community facilities in low cost housing developments marks the fourth front for effective cost reduction. This together with mixing housing and community facilities was advocated as effective means for lowering the costs. Mixed uses, minimum standards and efficient usage of the space between housing blocks was pointed out and presented as integral part of the conception of the new low cost houses prototypes. Selected community facilities were accommodated in the ground floors of the medium rise blocks of low cost partially completed housing units, these include retail facilities, primary and basic education schools, kindergartens, mosques, social welfare and public facilities etc. Figures 9 to 13, 19 to 21, show preliminary designs for community facilities integrated to house blocks.

From the above discourse it is clear that the low cost partially completed low cost housing prototypes, Egypt, were formulated and developed within the framework of selected design criteria including: Internal flexibility, external flexibility, contextual suitability and economic viability. The prototypes are promising in terms of conceptual framework, form and details and are likely to provide effective means for housing provision for an important sector of low cost housing demand groups, Egypt. This calls for continuous assessment and effective development, hence, the present research (which is a step towards such objectives).

LOCATION OF COLUMNS

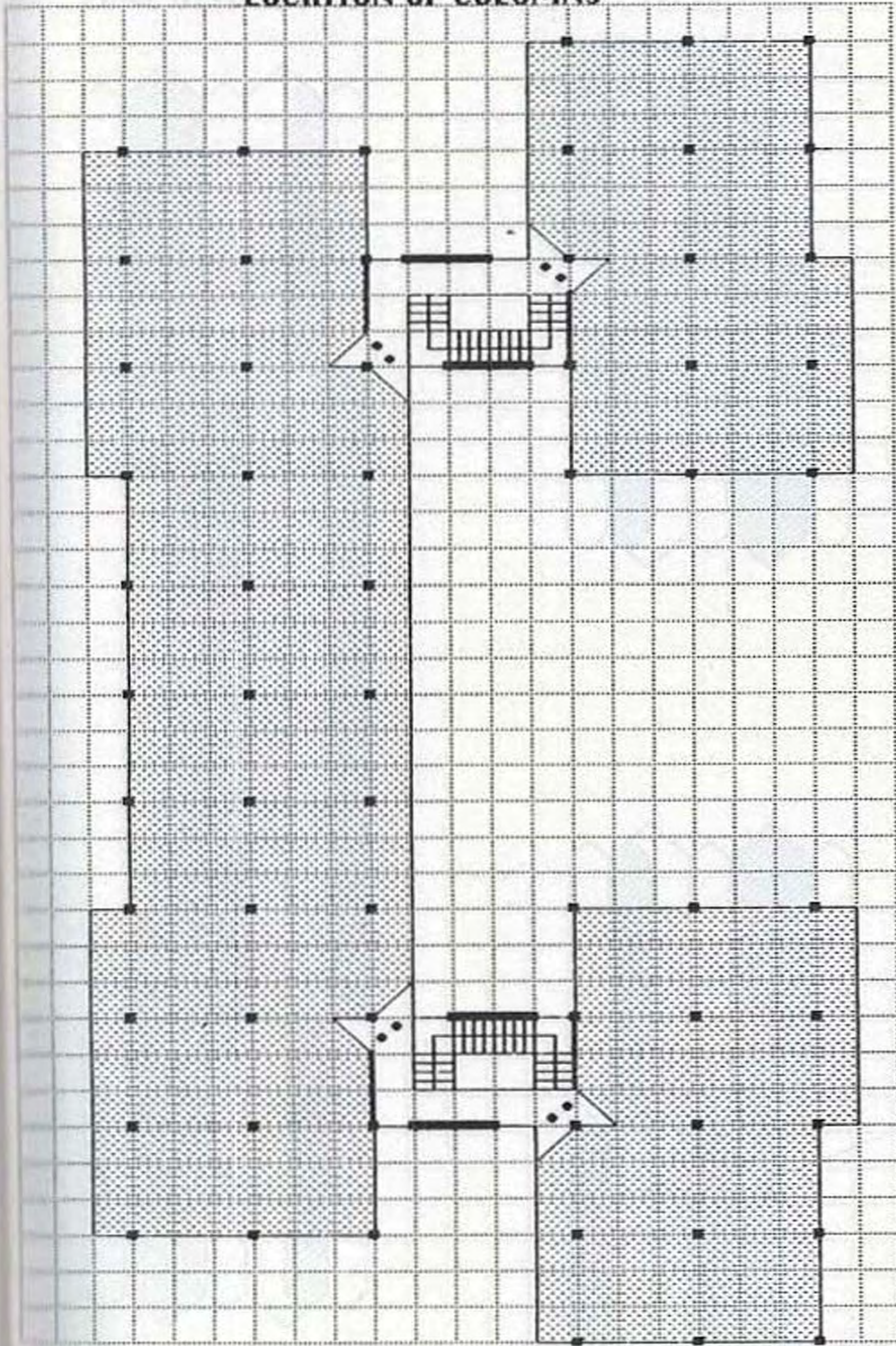


FIGURE (4) :

HOUSING PROTOTYPE (C),
LOCATION OF COLUMNS .



ZONE DISTRIBUTION

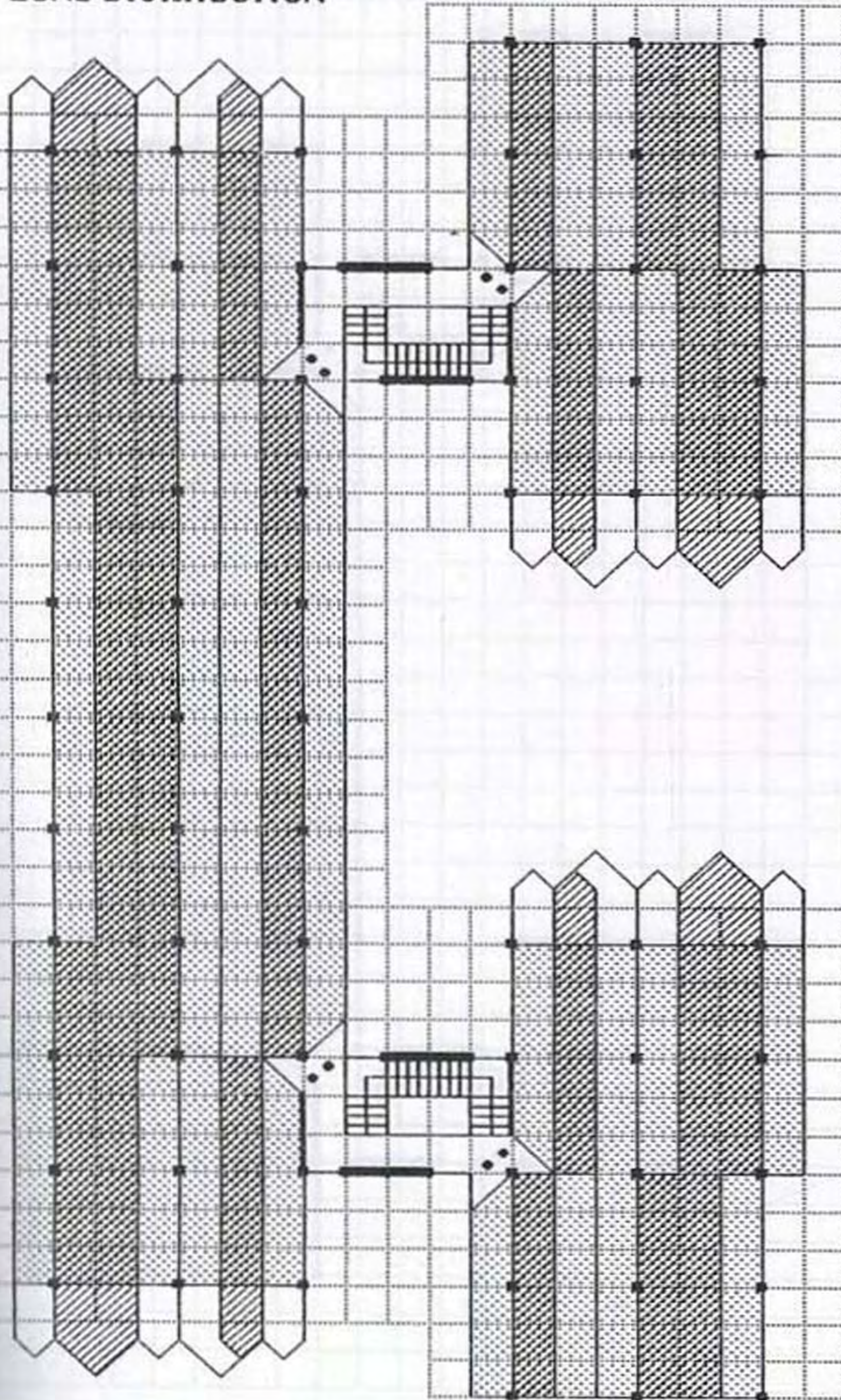
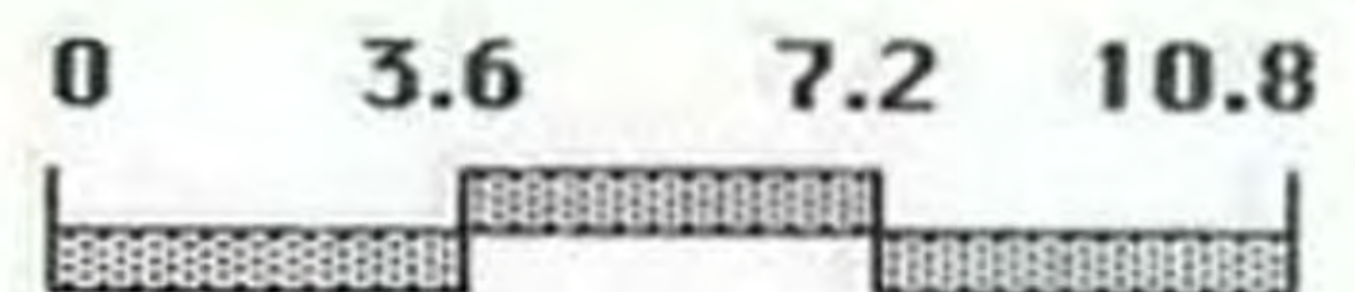


FIGURE (5) :

HOUSING PROTOTYPE (C),
CONCEPT OF ZONE
DISTRIBUTION.

FORMS
DO NOT INDICATED THAT
ELEMENTS ARE USED FOR
THE MAIN STRUCTURE



LOCATION OF SUPPORTS (BEARING ELEMENTS)

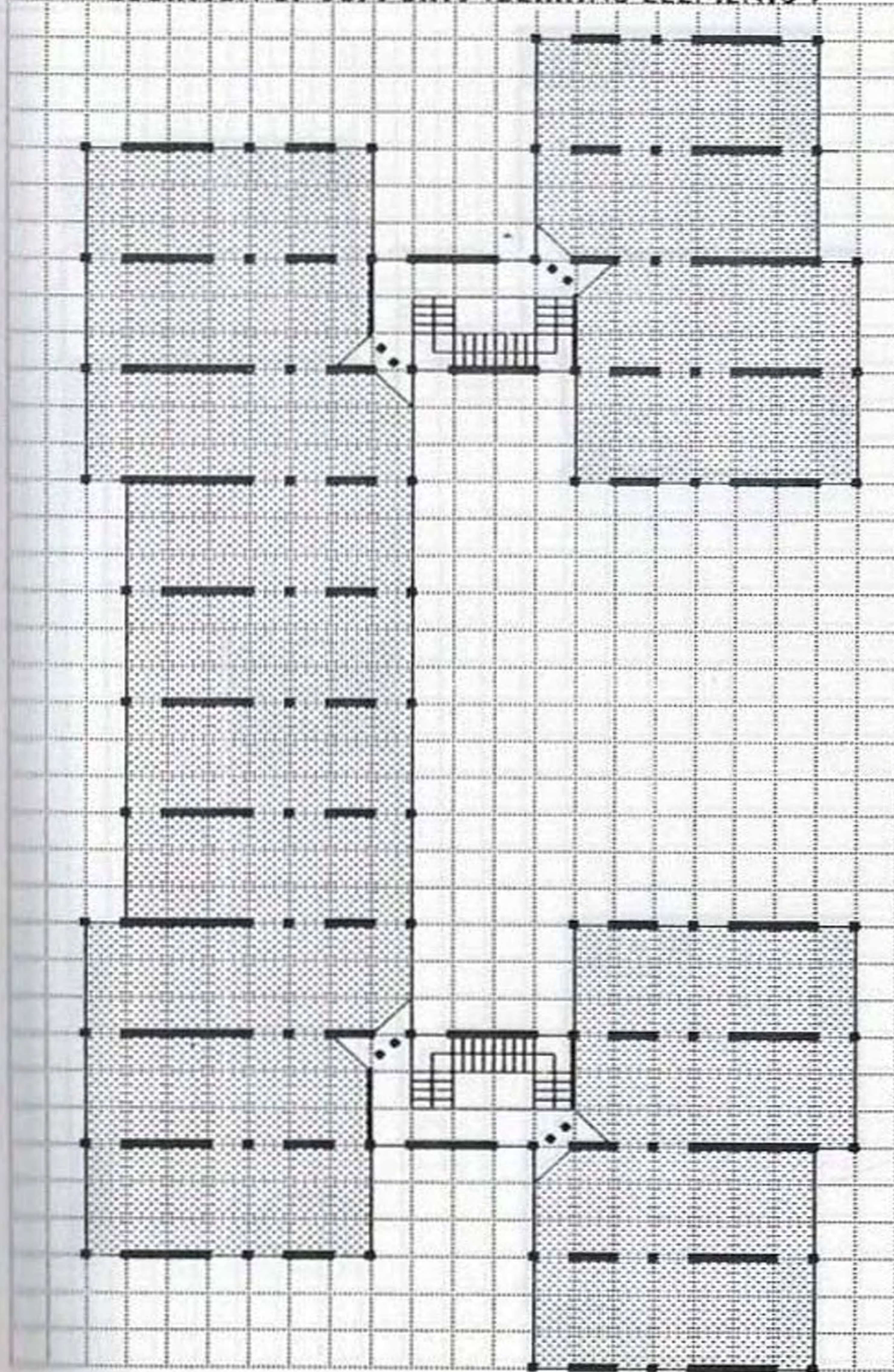


FIGURE (6) :

HOUSING PROTOTYPE (C),
LOCATION OF SUPPORTS
IN CASE TUNNEL FORMS
OR PREFABRICATED WALL
ELEMENTS ARE USED FOR
THE MAIN STRUCTURE .

LEGEND:

- 50 SQUARE METERS

- 90 SQUARE METERS

- 100 SQUARE METERS

- 150 SQUARE METERS

- 200 SQUARE METERS

- 250 SQUARE METERS

- 300 SQUARE METERS

- 350 SQUARE METERS

- 400 SQUARE METERS

- 450 SQUARE METERS

- 500 SQUARE METERS

- 550 SQUARE METERS

- 600 SQUARE METERS

- 650 SQUARE METERS

- 700 SQUARE METERS

- 750 SQUARE METERS

- 800 SQUARE METERS

- 850 SQUARE METERS

- 900 SQUARE METERS

- 950 SQUARE METERS

- 1000 SQUARE METERS

- 1050 SQUARE METERS

- 1100 SQUARE METERS

- 1150 SQUARE METERS

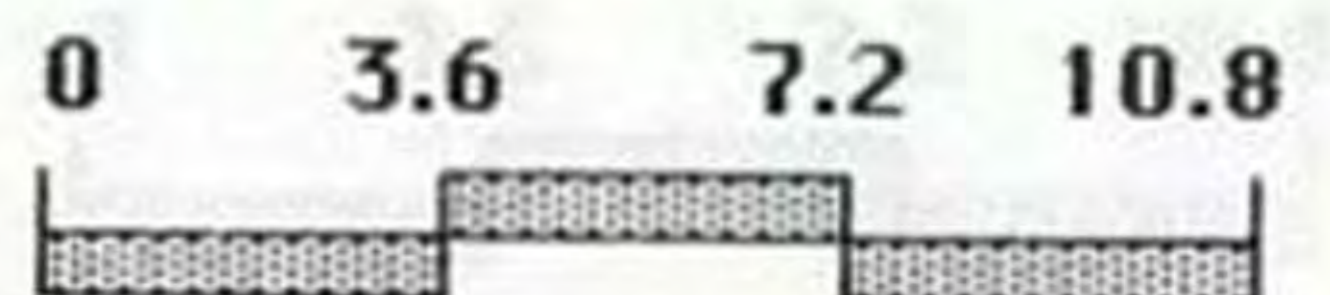
- 1200 SQUARE METERS

- 1250 SQUARE METERS

- 1300 SQUARE METERS

- 1350 SQUARE METERS

- 1400 SQUARE METERS



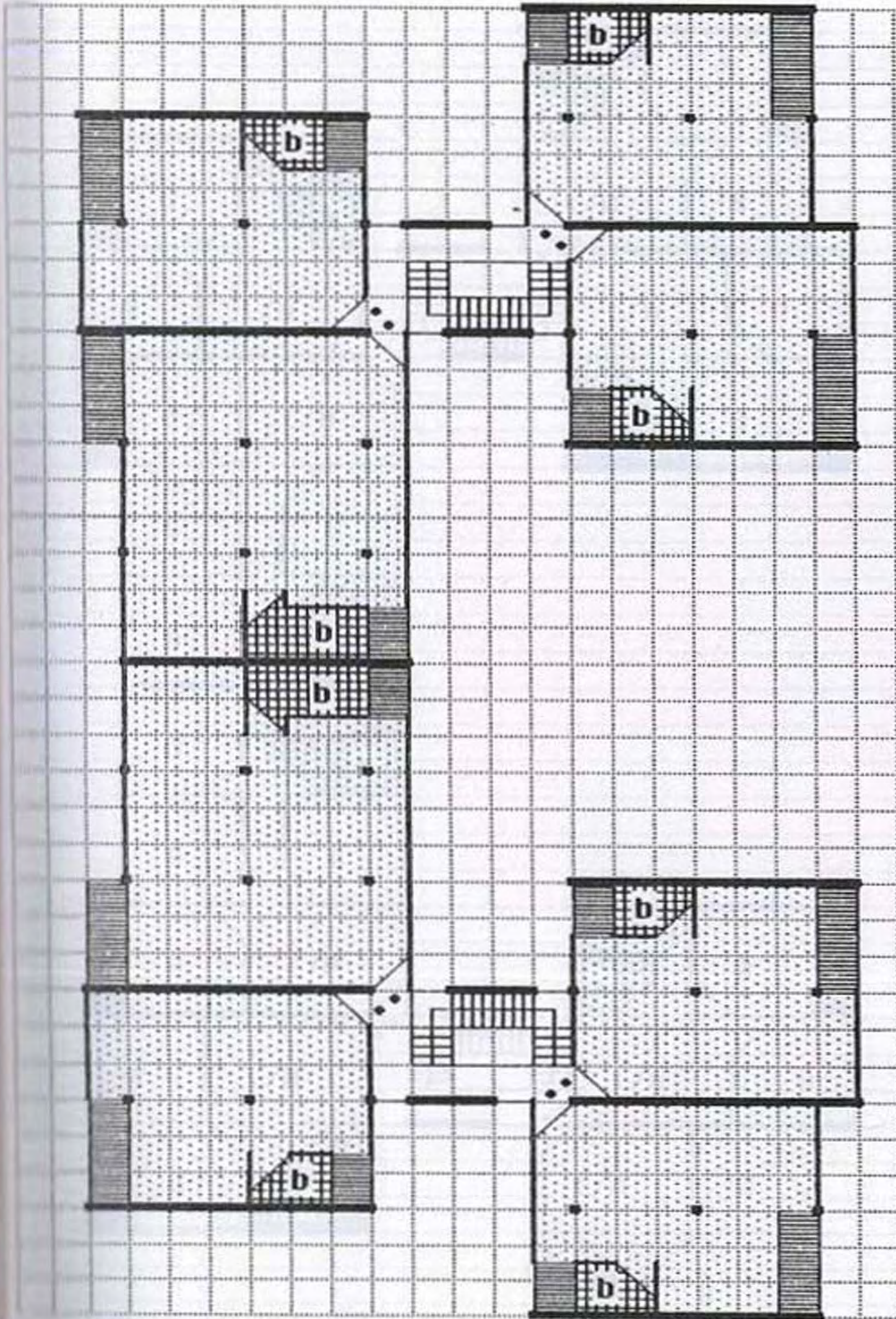


FIGURE (7) :

HOUSING PROTOTYPE (E),
PHASES OF DEVELOP -
MENT :

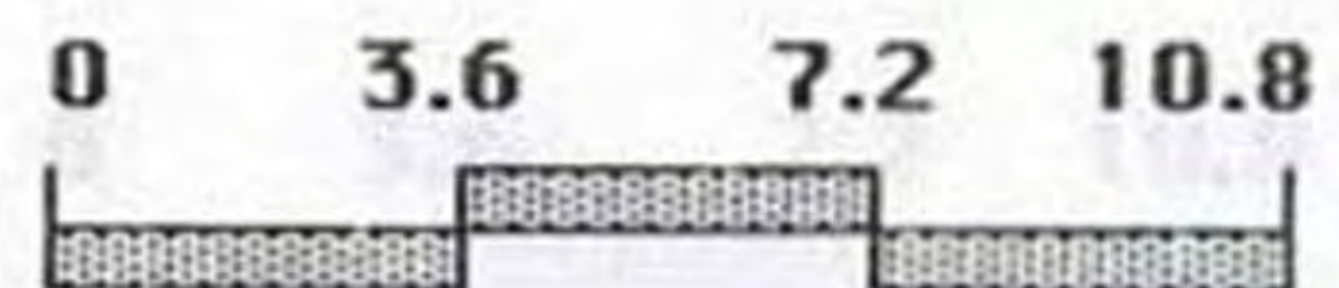
- INITIAL PHASE WITH
SUPPORTS, OUTER SKIN,
TECHNICAL INSTALLA-
TIONS .

AREAS OF DWELLINGS:

- 60 SQUARE METERS

- 90 SQUARE METERS

- 90 SQUARE METERS



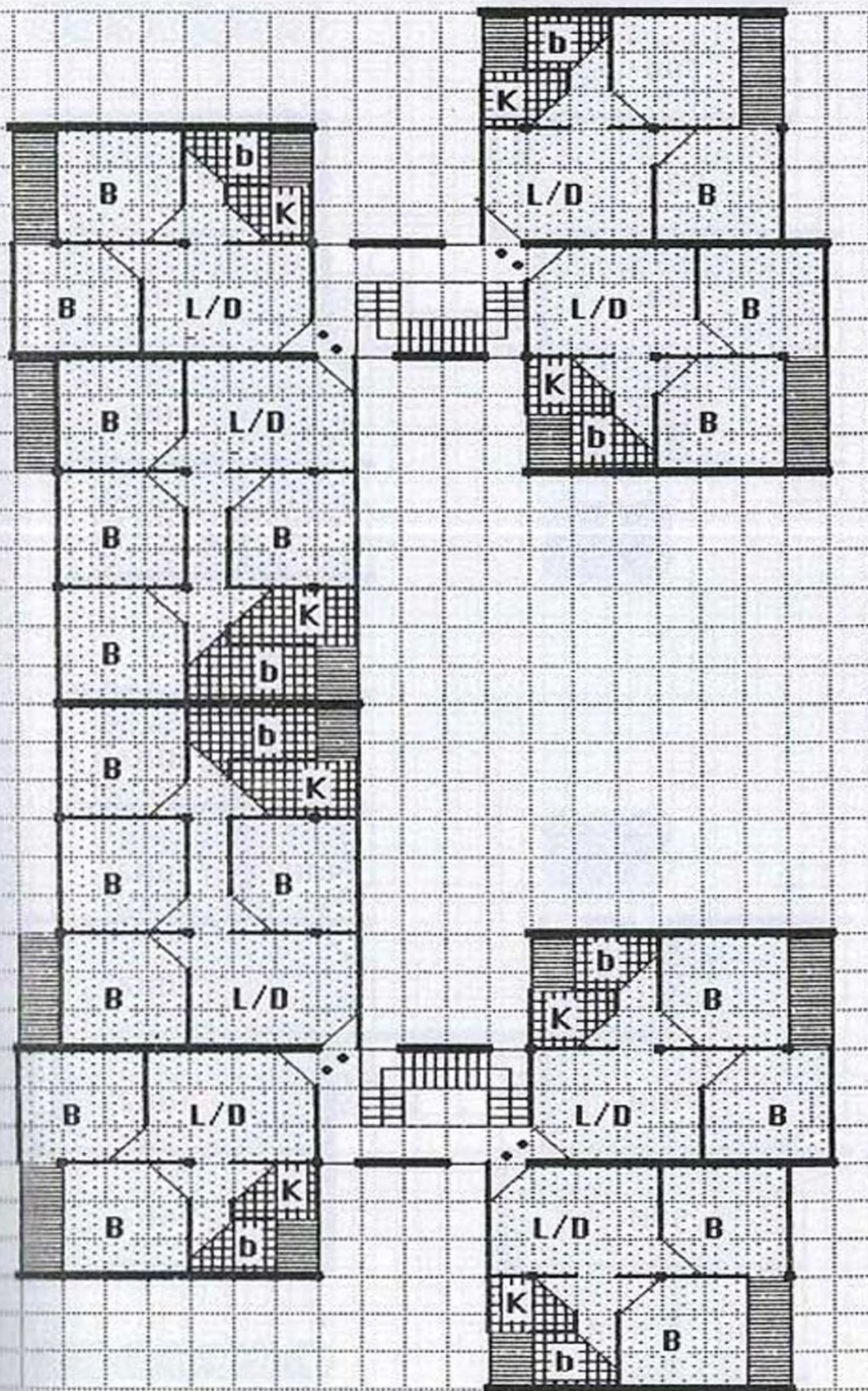


FIGURE (8) :

HOUSING PROTOTYPE (C),
PHASES OF DEVELOP -
MENT :

- FINAL PHASE LEFT TO
THE USER (INTERNAL
PARTITIONS AND
GRADUAL FINISHING).

AREAS OF DWELLINGS:

- 60 SQUARE METERS
- 90 SQUARE METERS



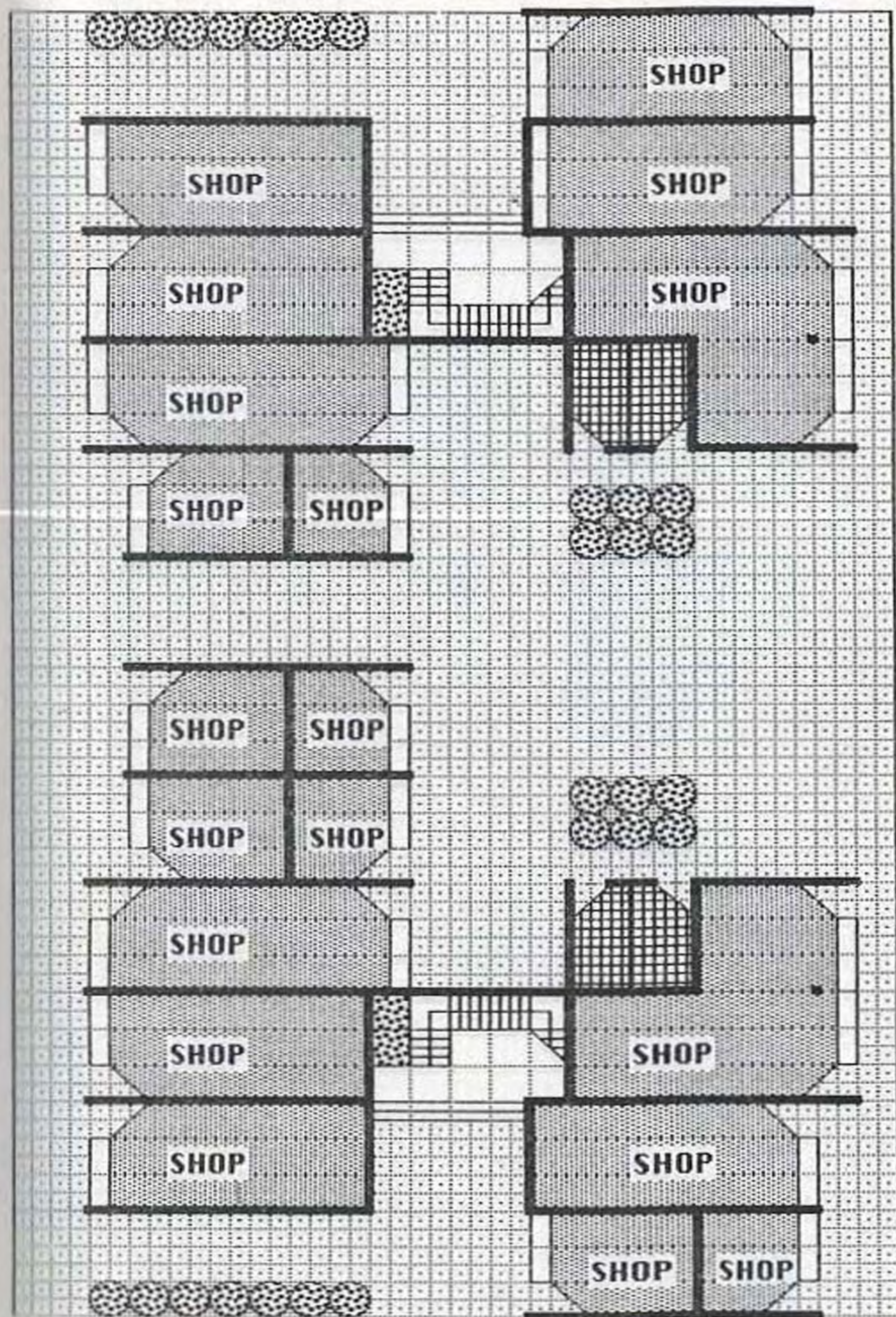
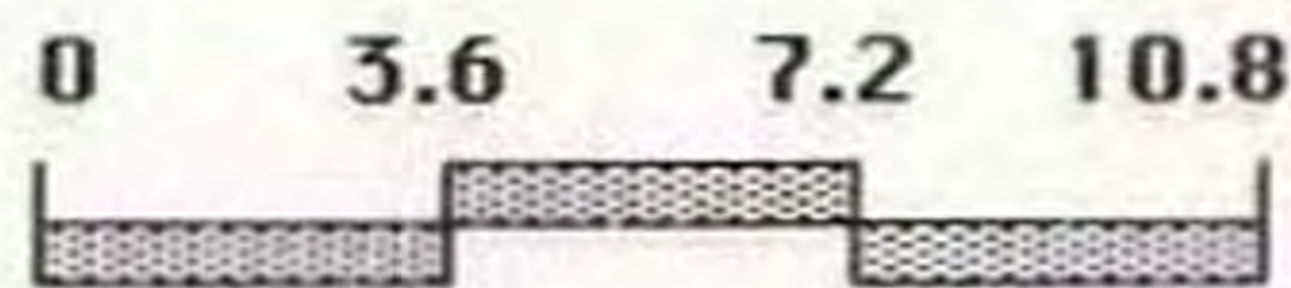


FIGURE (9) :

HOUSING PROTOTYPE (C),
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES .



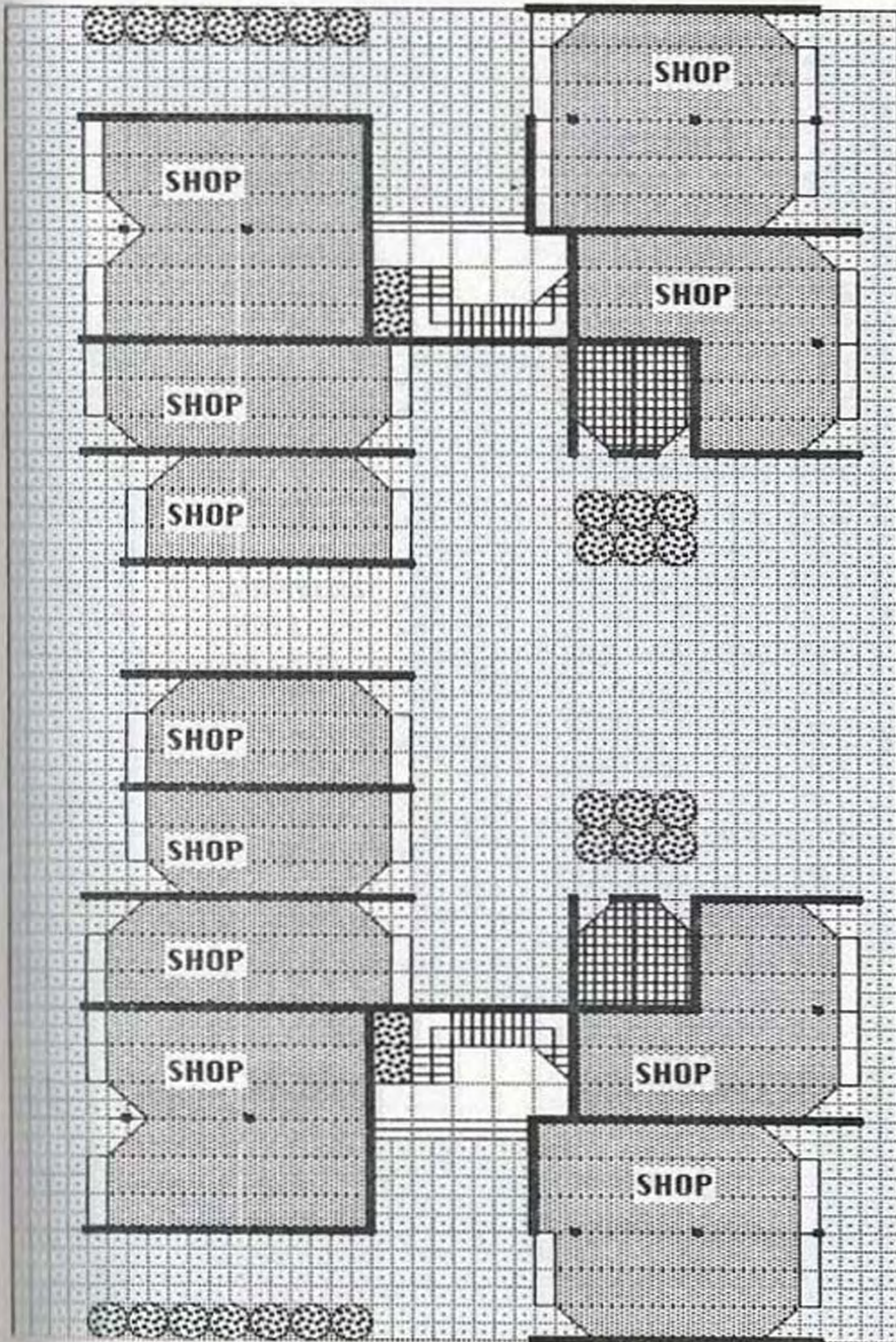
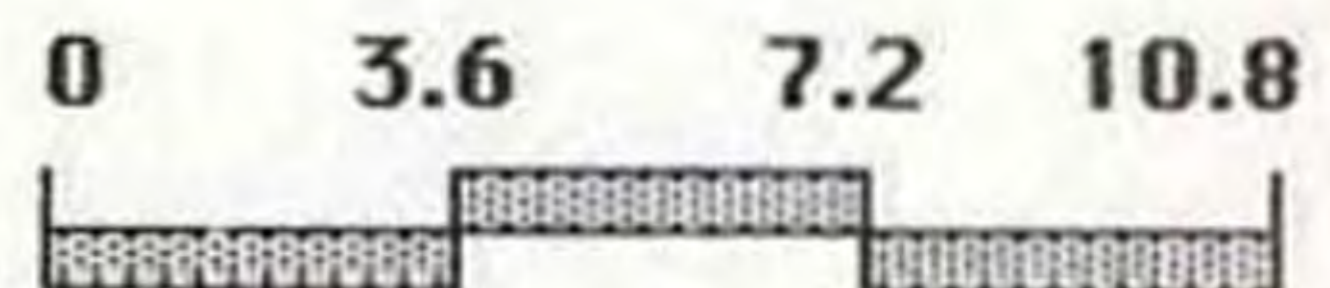


FIGURE (10):

HOUSING PROTOTYPE (C),
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES .



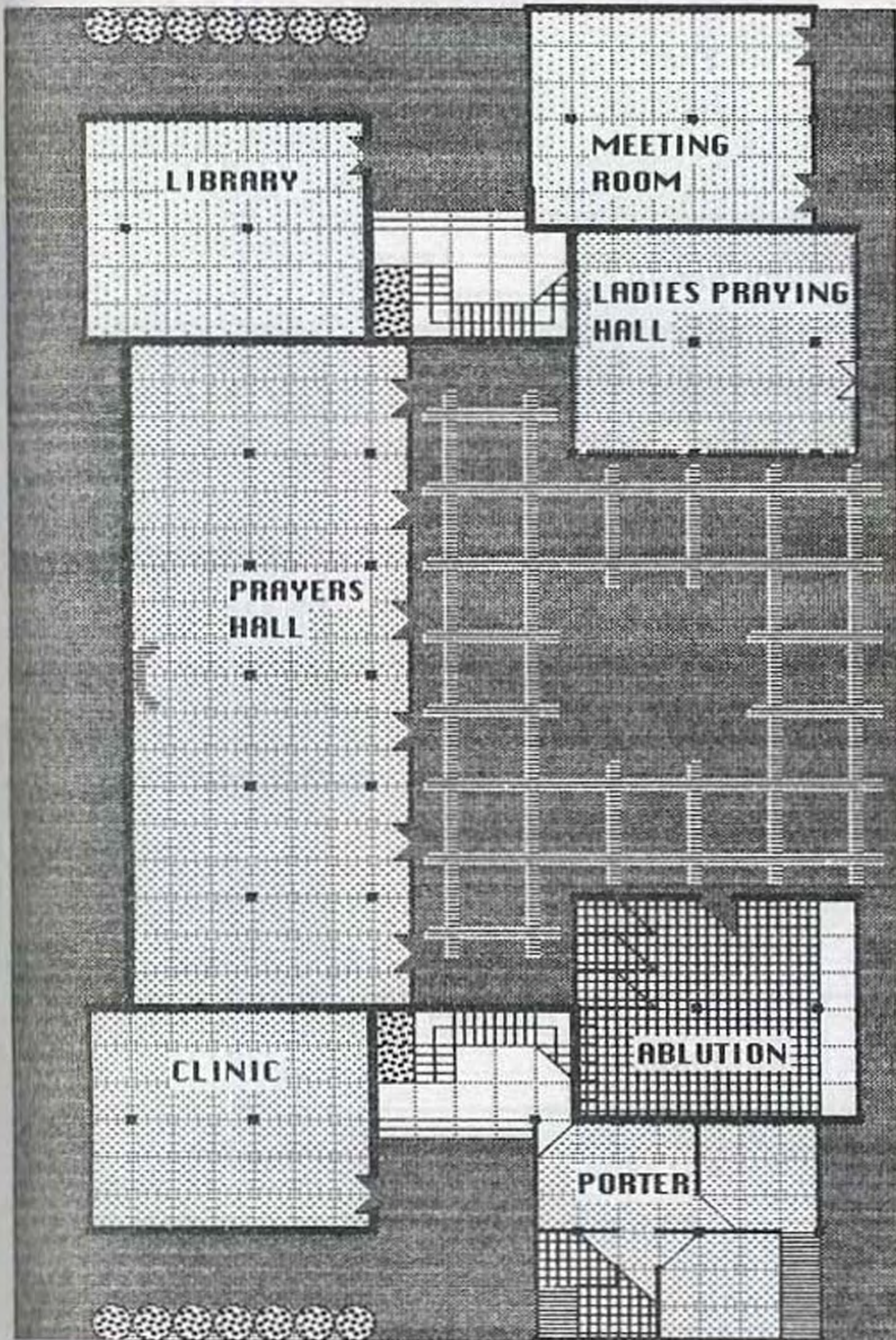
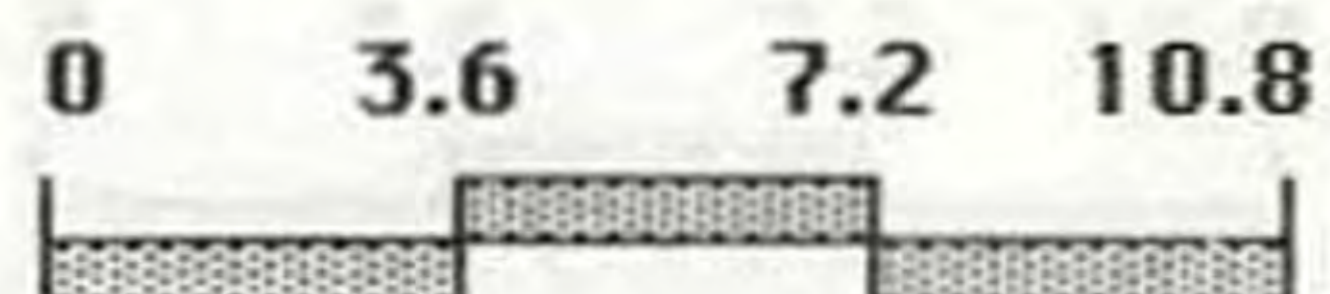


FIGURE (11):

HOUSING PROTOTYPE (C),
POSSIBLE USE OF THE
GROUND FLOOR FOR A
MOSQUE .



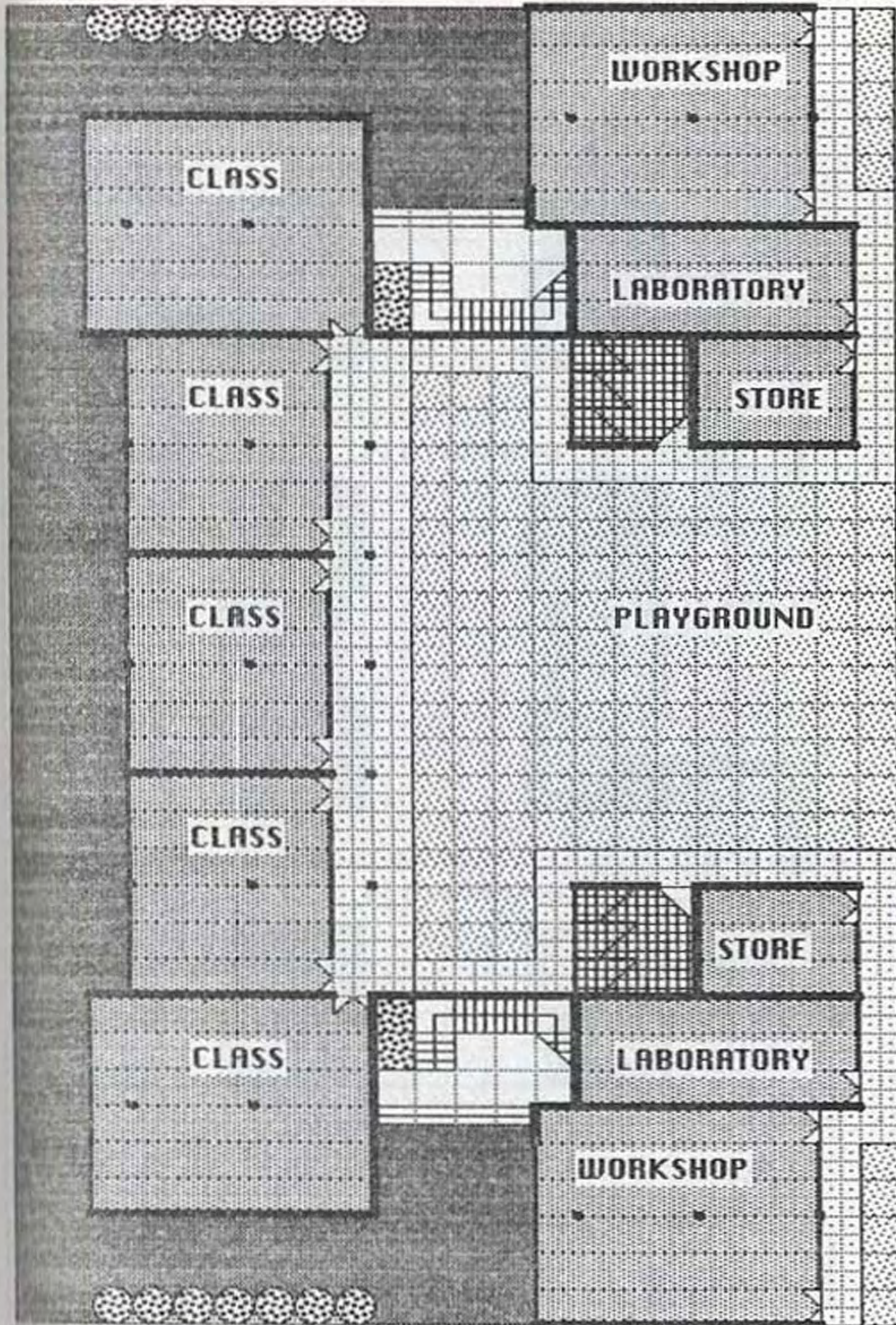


FIGURE (12):

HOUSING PROTOTYPE (C),
POSSIBLE USE OF THE
GROUND FLOOR FOR A
SCHOOL, (see next fig.)



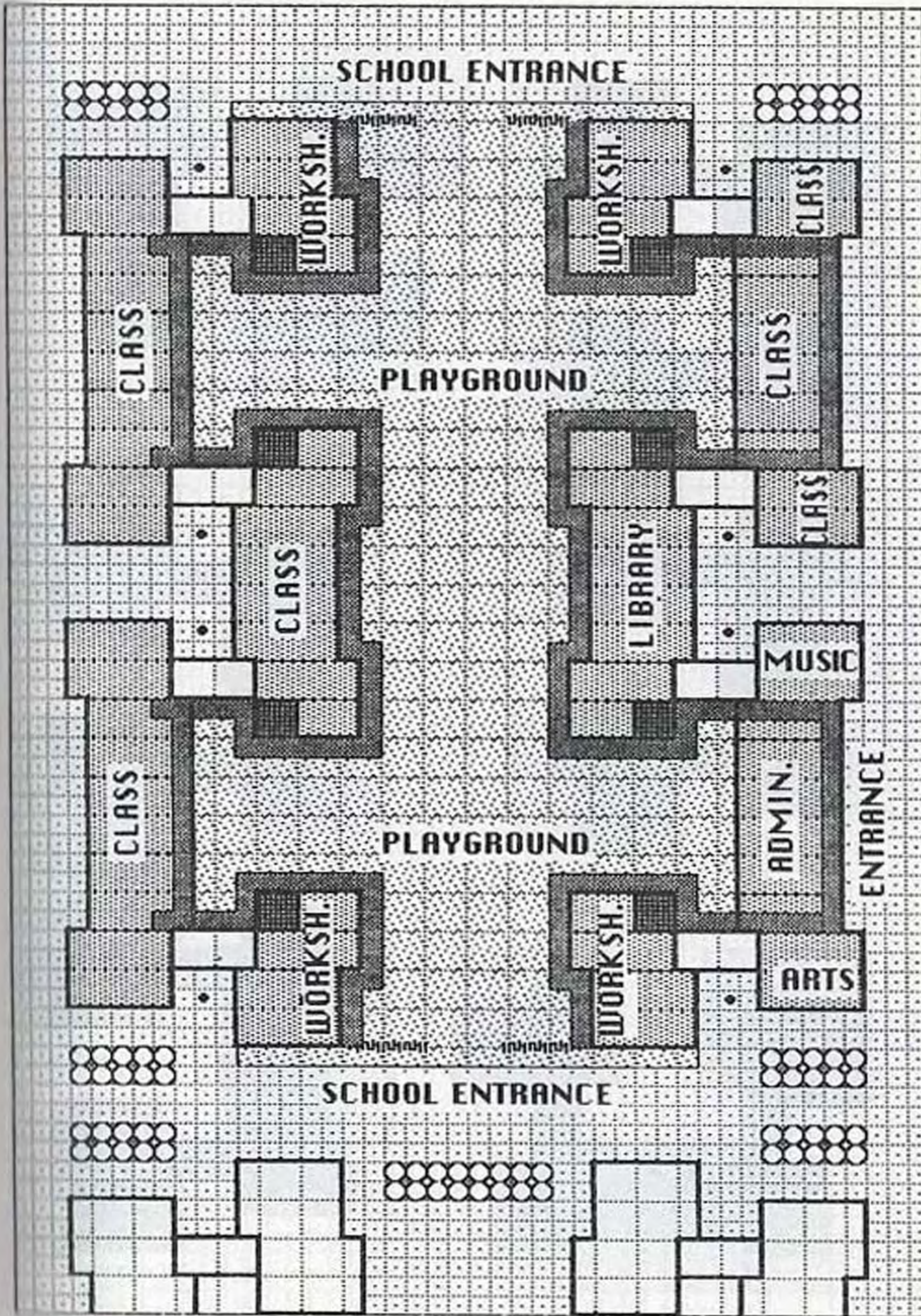
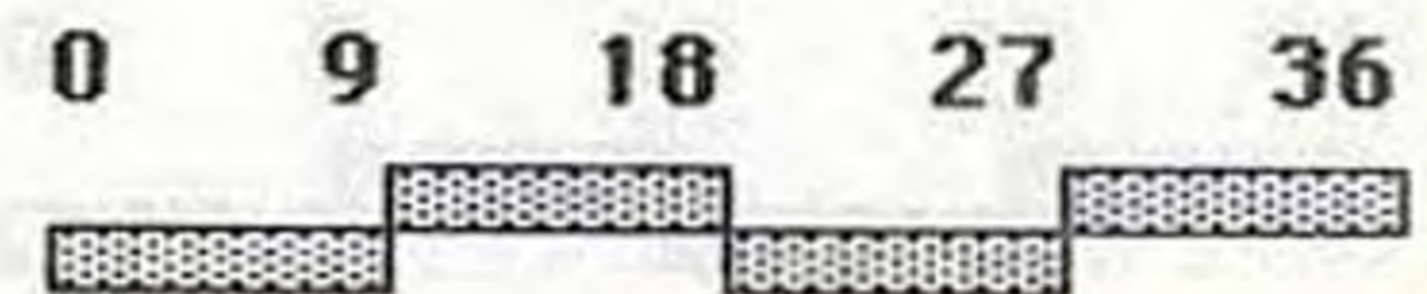


FIGURE (13):

HOUSING PROTOTYPE (C),
POSSIBLE USE OF THE
GROUND FLOOR OF FOUR
APARTMENT BLOCKS FOR
A SCHOOL .



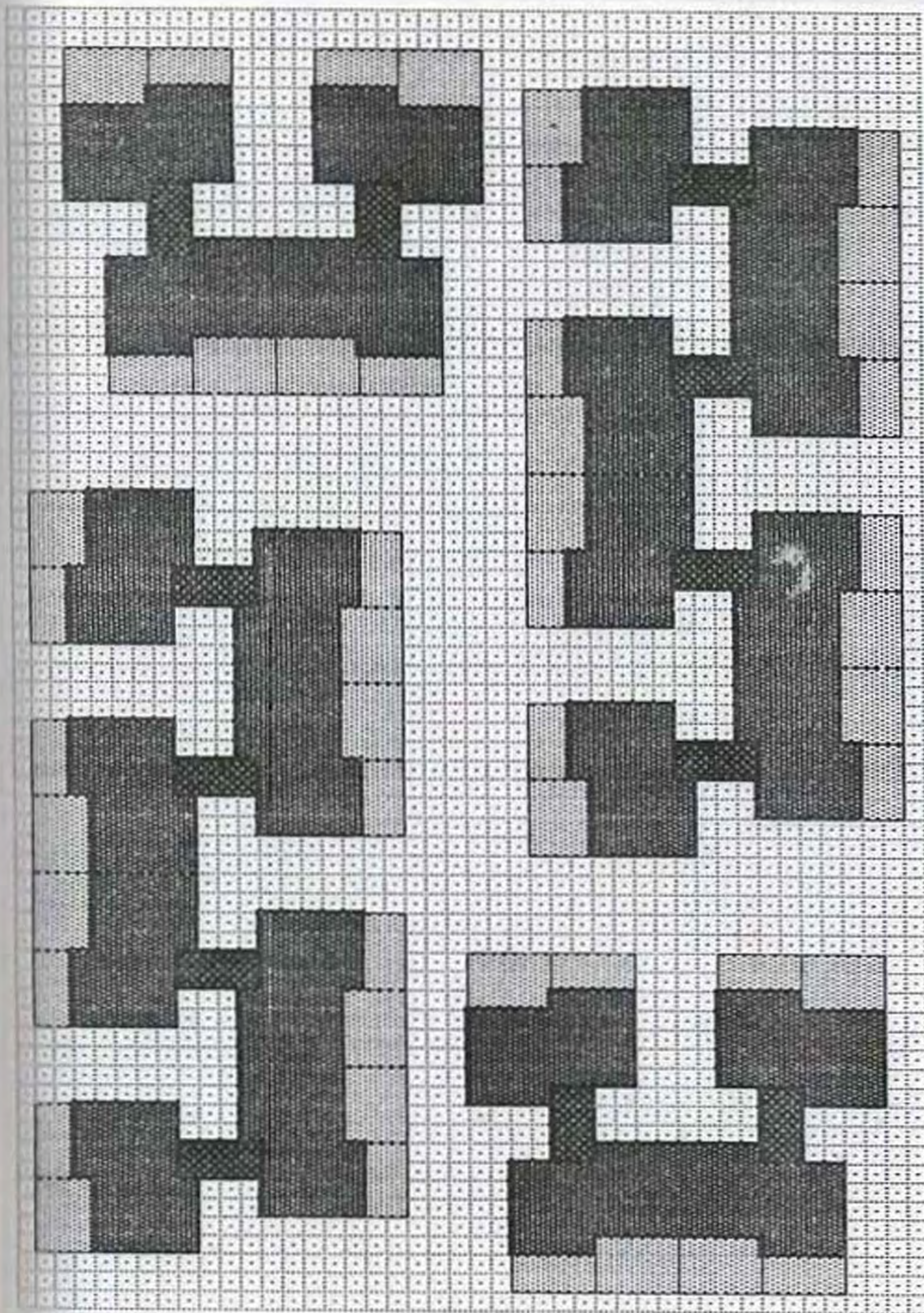
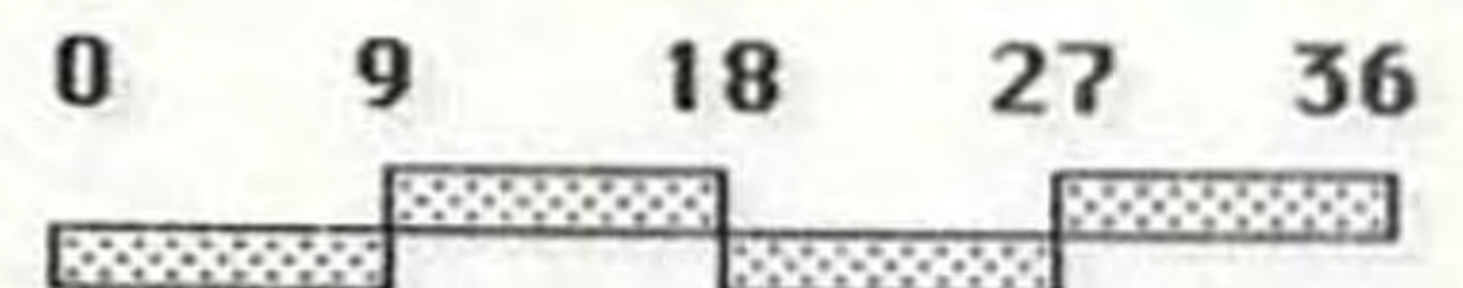


FIGURE (14):

HOUSING PROTOTYPE (C),
POSSIBLE ARRANGEMENT
FOR LAYOUTS.

... THE SHOWN FOR INFRA-
STRUCTURE NETWORKS
HELPING TO LOWER THEIR
COST .

- INFRASTRUCTURE
ROUTE
- DWELLINGS IN
DUELLINGS



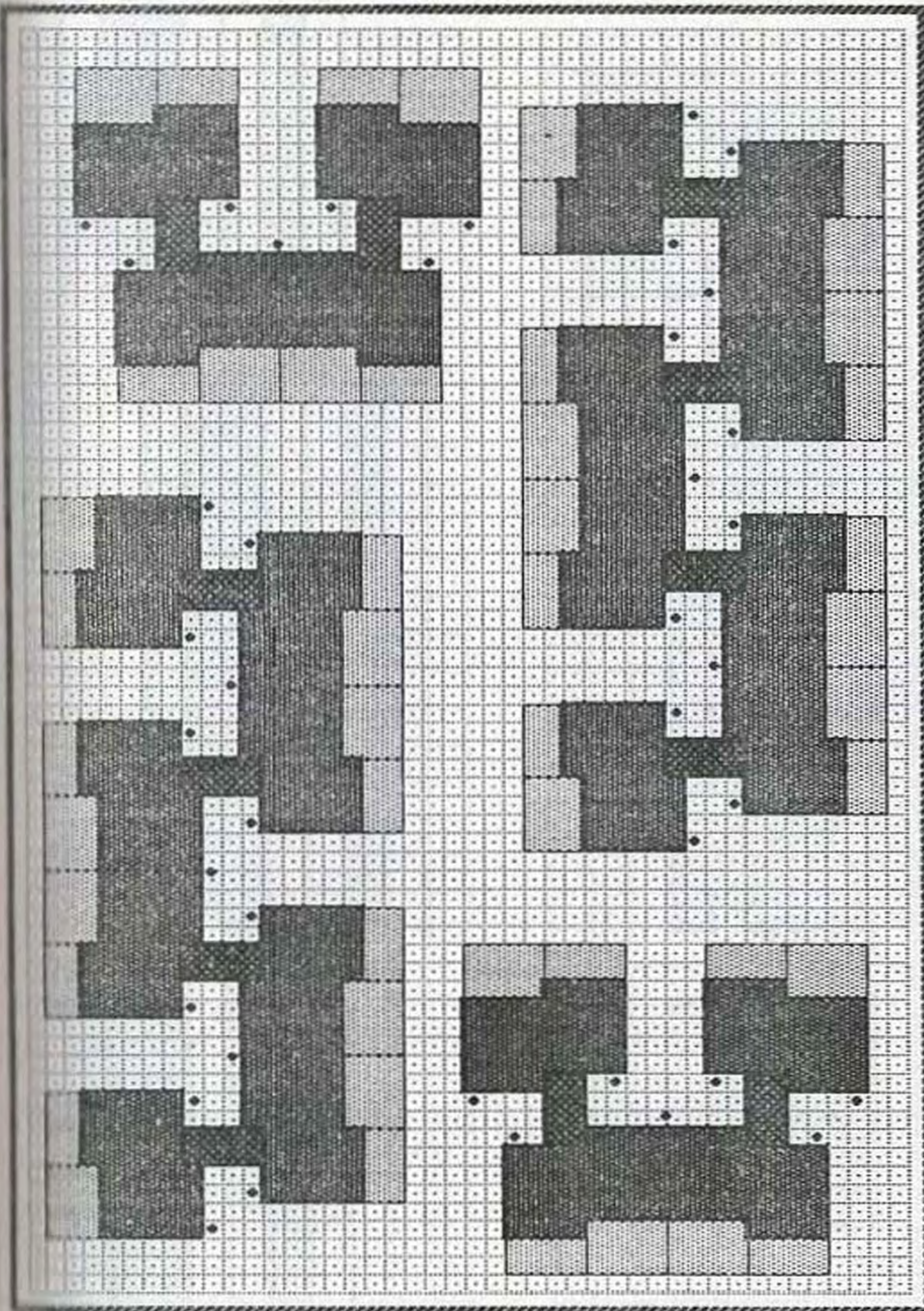
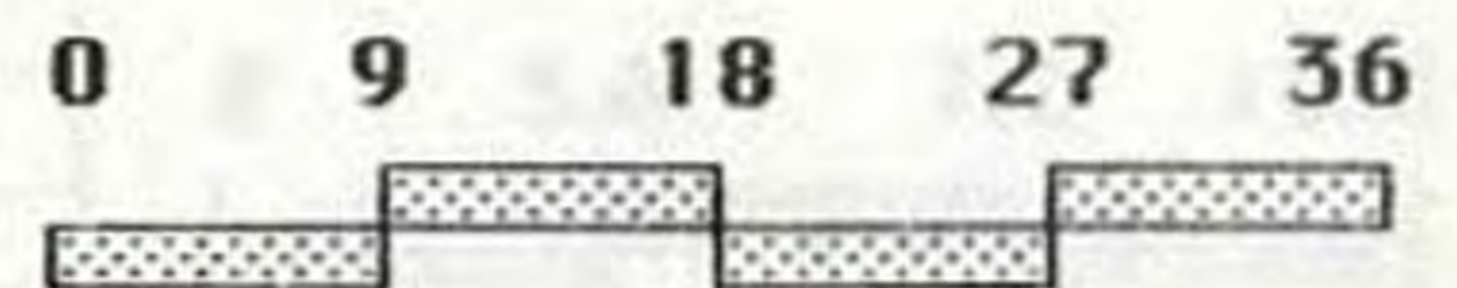


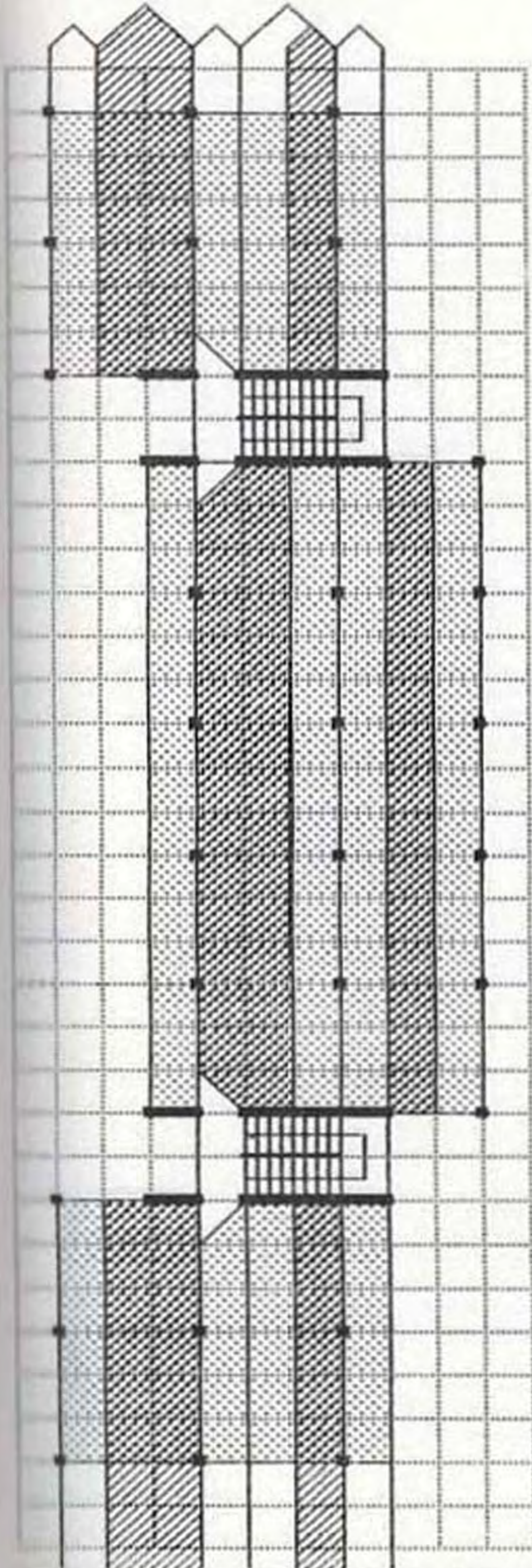
FIGURE (15):

HOUSING PROTOTYPE (C), POSSIBLE ARRANGEMENT FOR LAYOUTS SHOWING THE ROUTES FOR INFRASTRUCTURE NETWORKS HELPING TO LOWER THEIR COST .

- INFRASTRUCTURE ROUTE
- WETPOINTS IN DWELLINGS



ZONE DISTRIBUTION



LOCATION OF COLUMNS

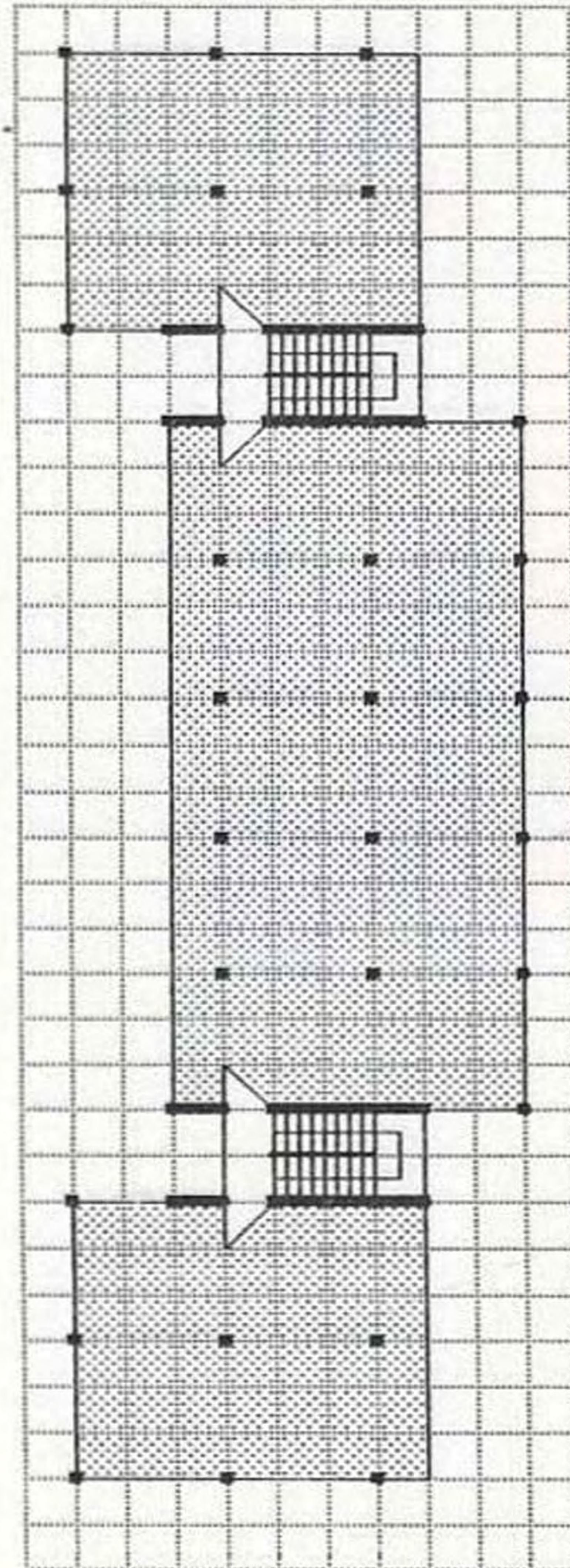
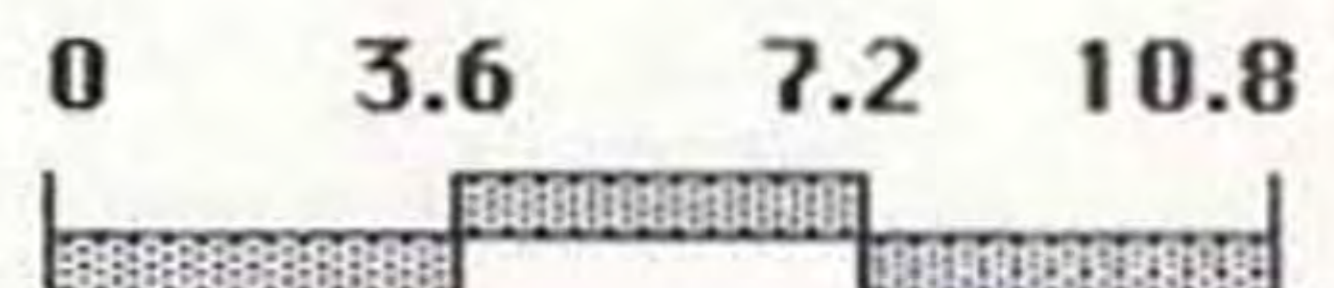
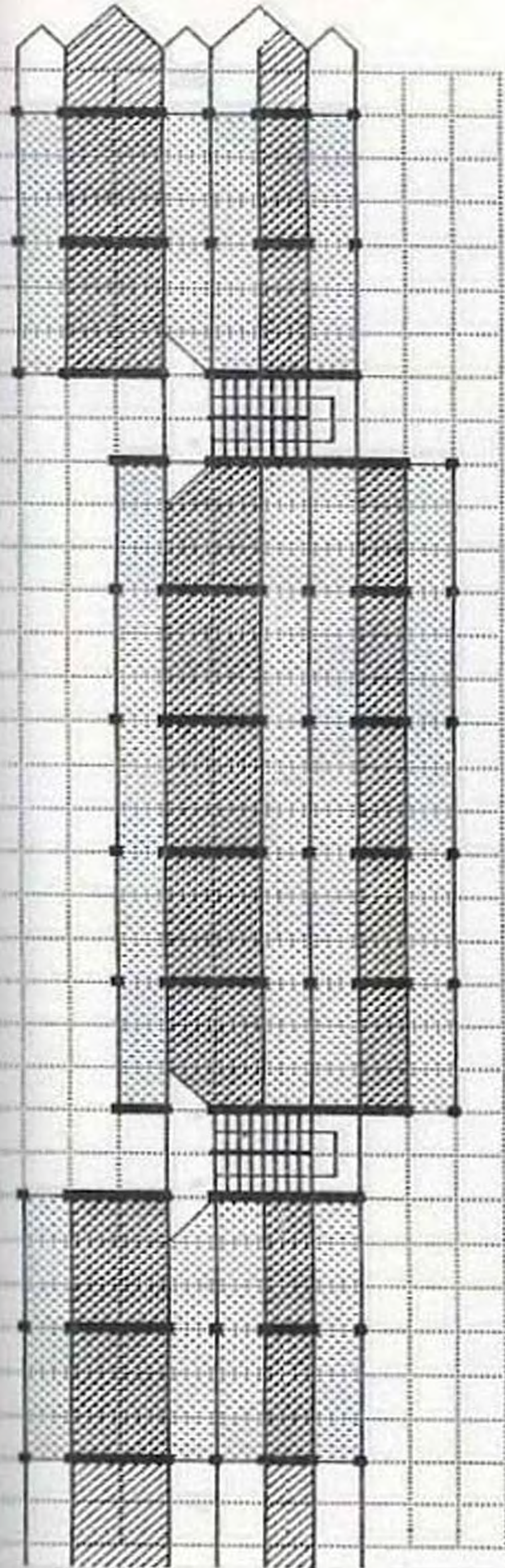


FIGURE (16):

HOUSING PROTOTYPE (E),
CONCEPT OF ZONE
DISTRIBUTION AND
LOCATION OF SUPPORTS
(COLUMNS).



INITIAL PHASE
ZONE DISTRIBUTION



FINAL PHASE
LOCATION OF BEARING WALLS

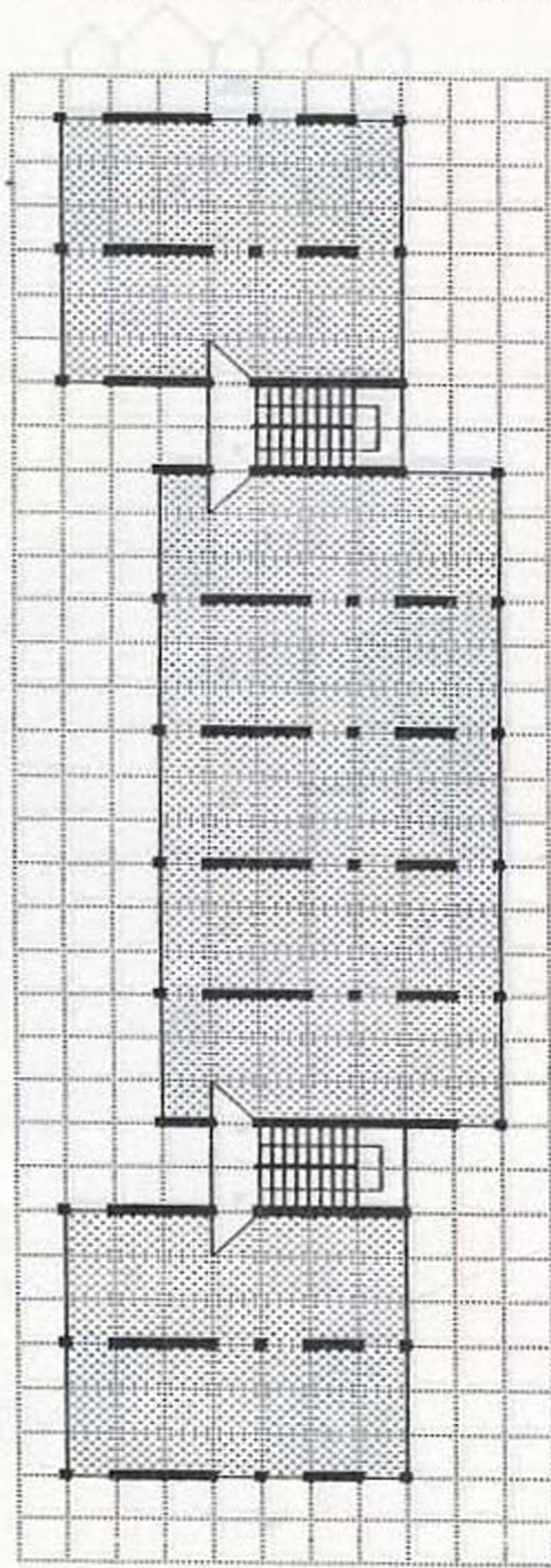
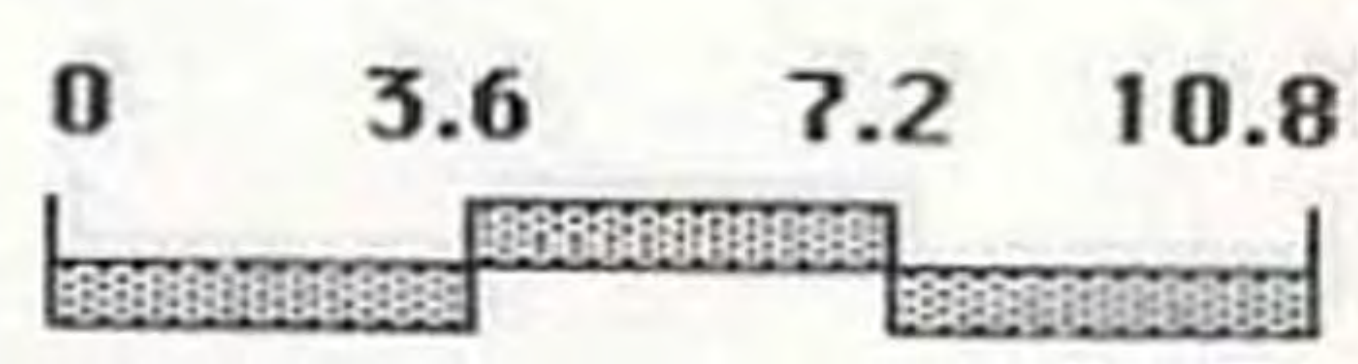


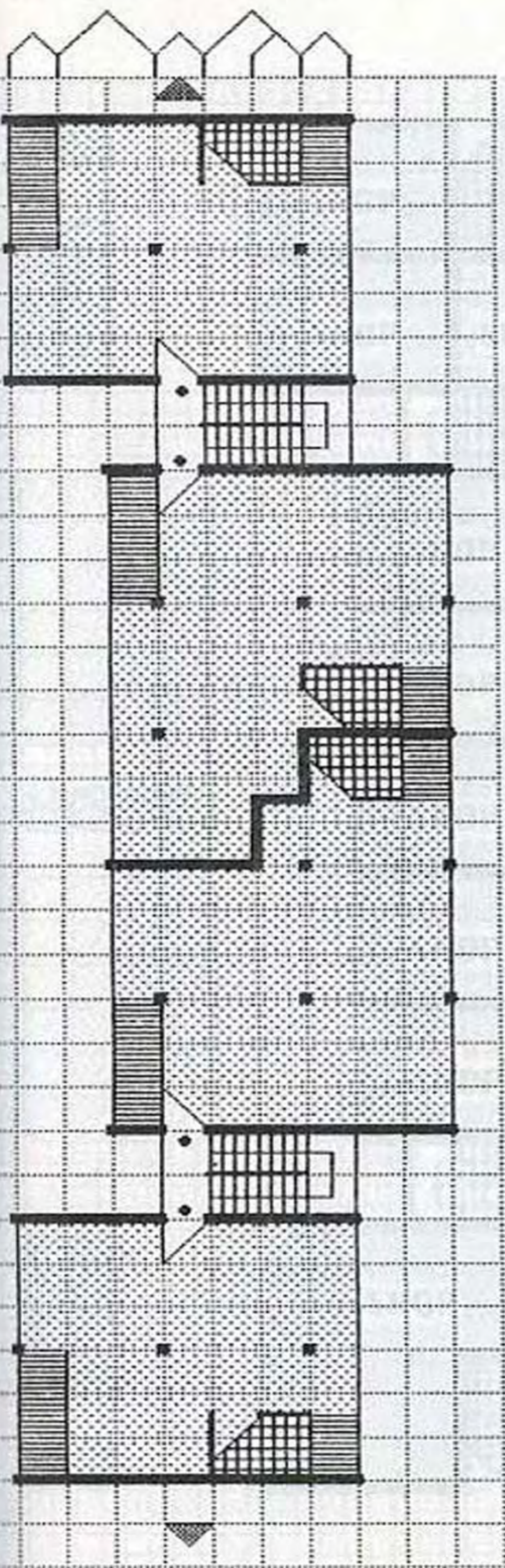
FIGURE (17) :

HOUSING PROTOTYPE (E),
CONCEPT OF ZONE
DISTRIBUTION AND
LOCATION OF SUPPORTS
(BEARING WALLS).

TECHNICAL INSTALLATION,
-FINAL PHASE LEFT IN
THE USE OF INTERNAL
PARTITIONS AND
GENERAL FINISHING.
AREAS OF DWELLINGS:
- 60 SQUARE METERS
- 25 SQUARE METERS



INITIAL PHASE OF DEVELOPMENT



FINAL PHASE OF DEVELOPMENT

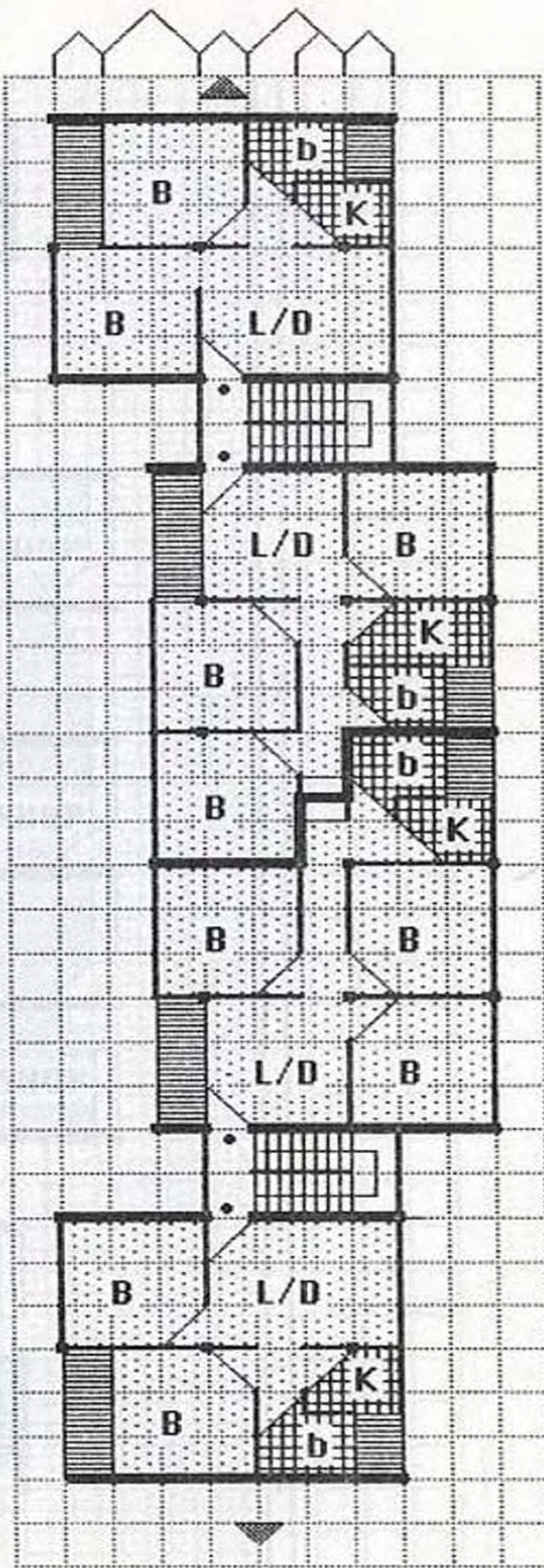
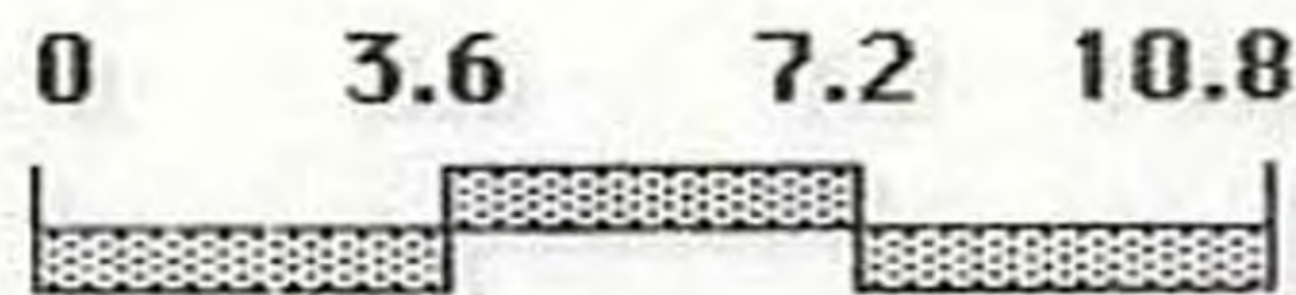


FIGURE (18) :

HOUSING PROTOTYPE (E). TWO PHASES OF DEVELOPMENT :

- INITIAL PHASE WITH SUPPORTS, OUTER SKIN, TECHNICAL INSTALLATIONS .
- FINAL PHASE LEFT TO THE USER (INTERNAL PARTITIONS AND GRADUAL FINISHING).

- AREAS OF DWELLINGS:**
- 60 SQUARE METERS
 - 75 SQUARE METERS



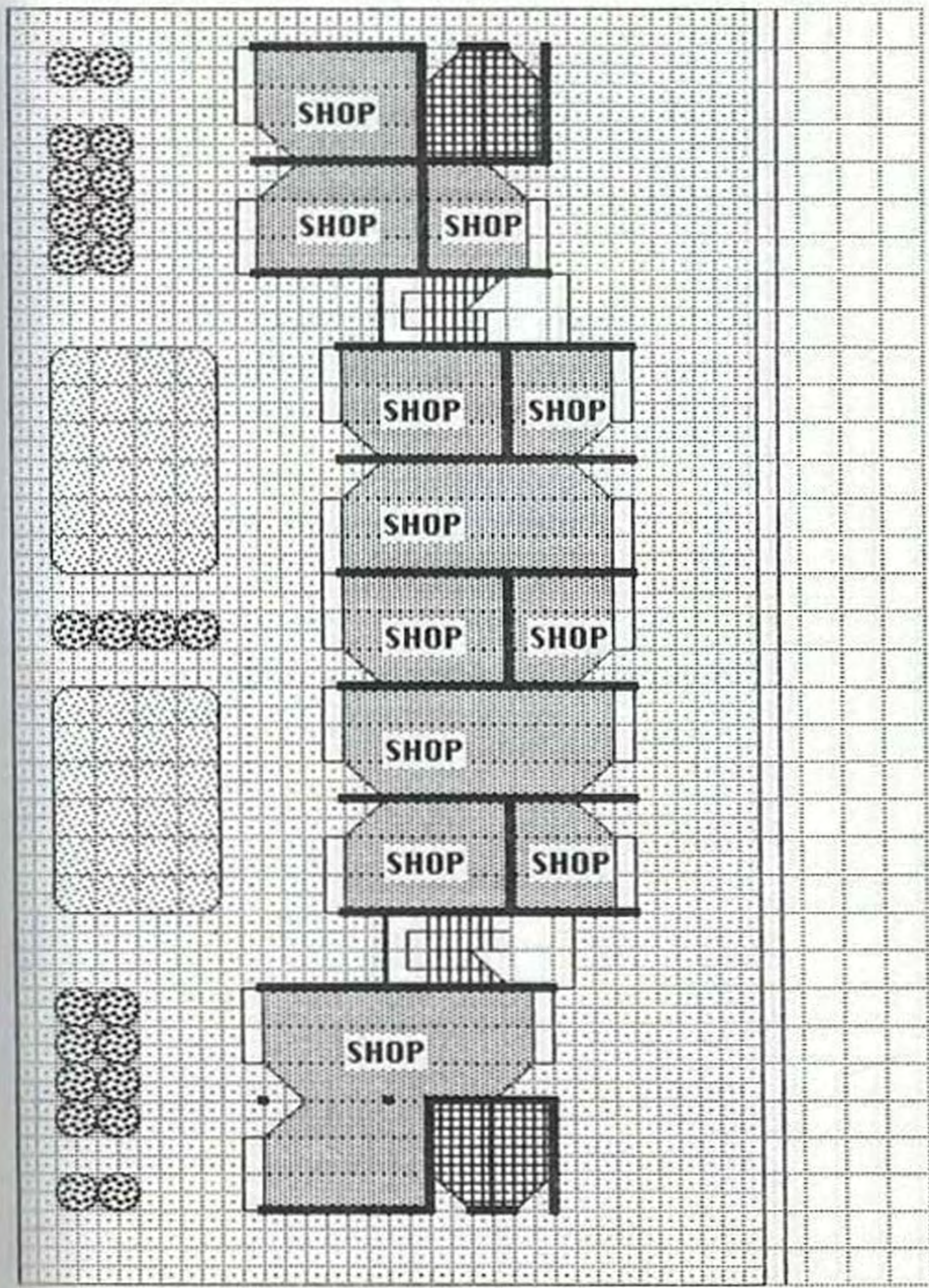
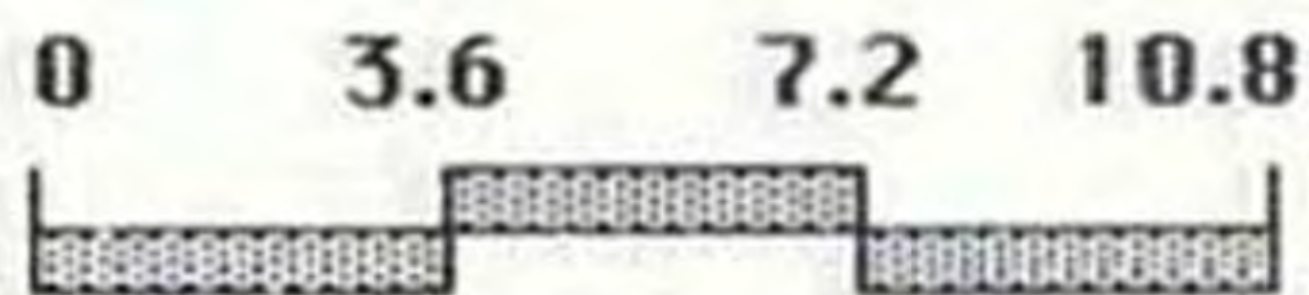


FIGURE (19) :

HOUSING PROTOTYPE (E),
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES .



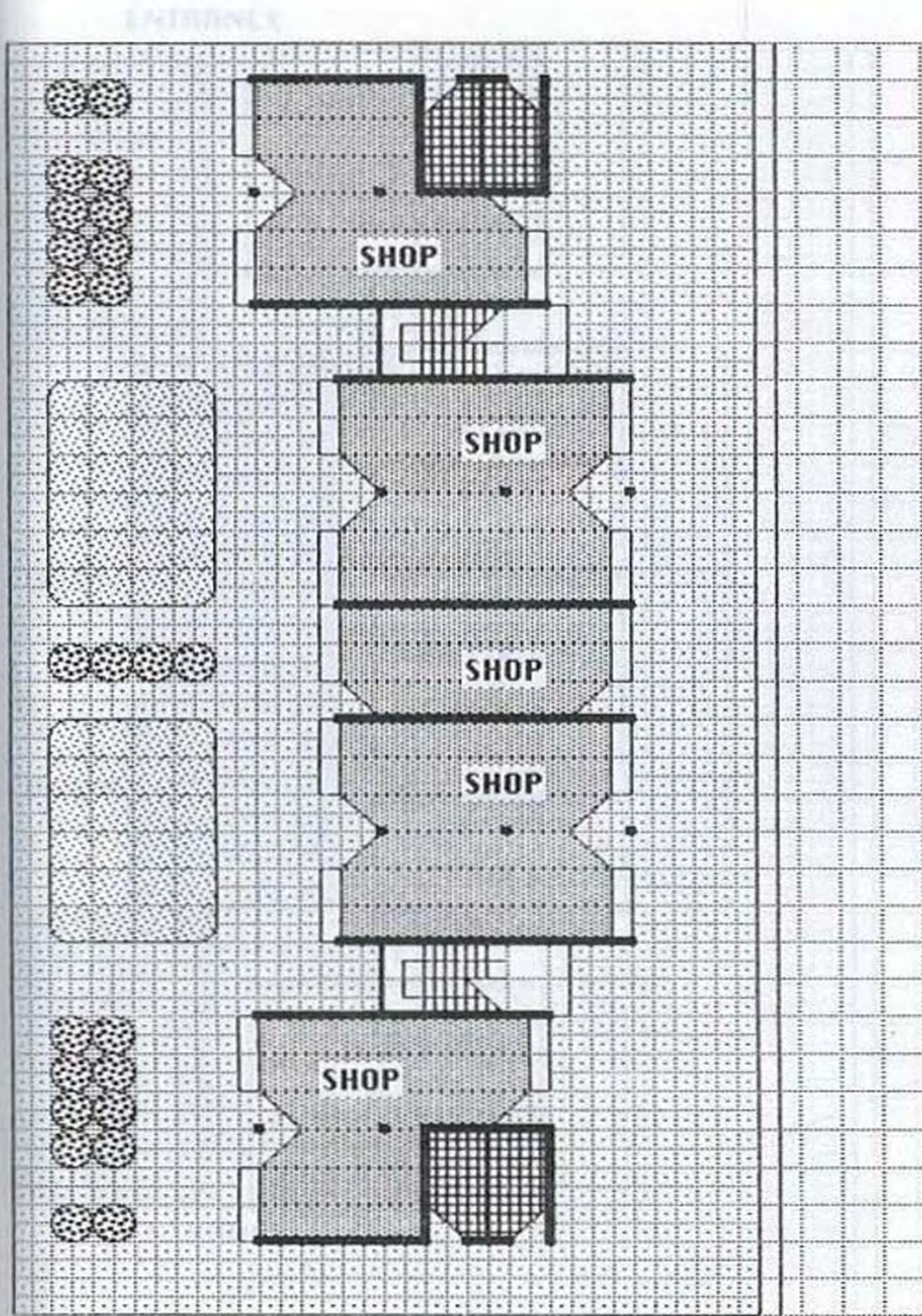


FIGURE (20) :

HOUSING PROTOTYPE (E),
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES .



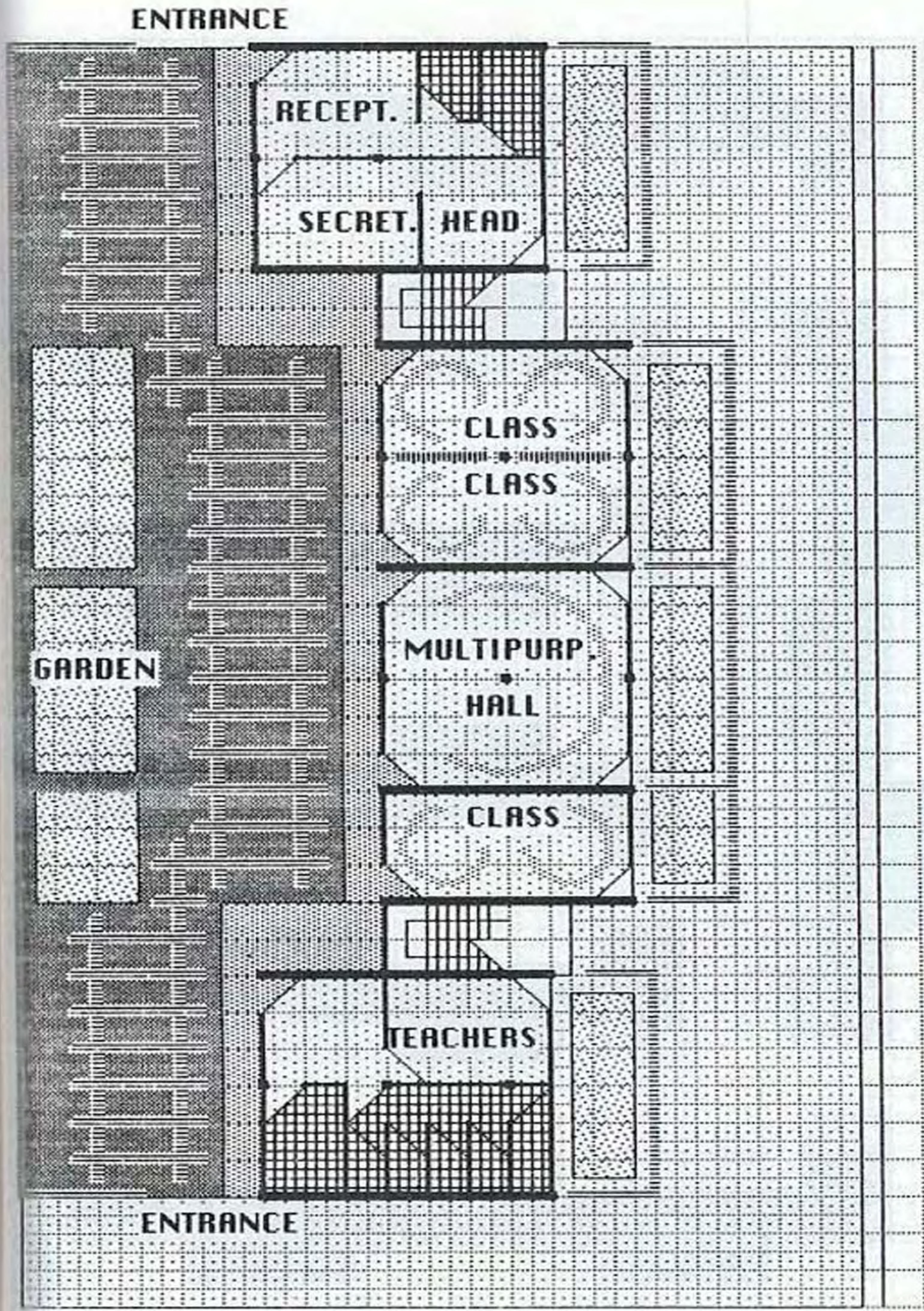
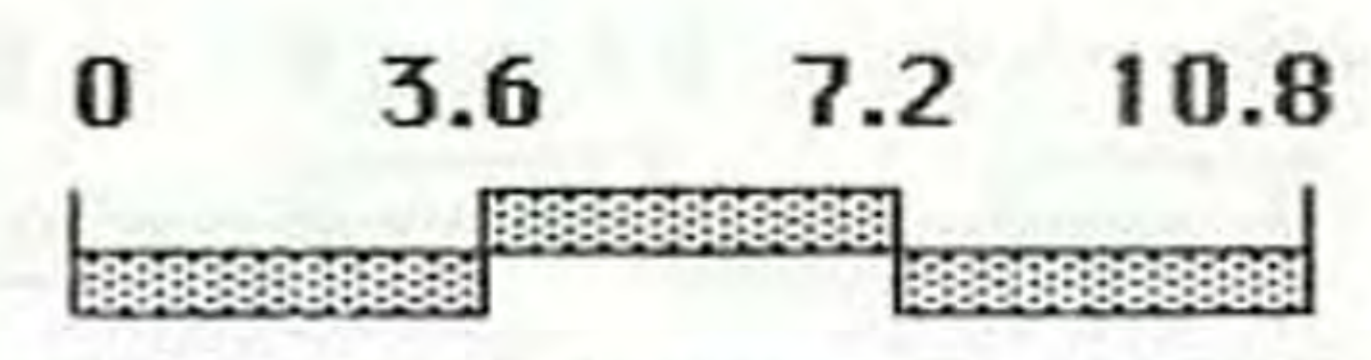


FIGURE (21) :

HOUSING PROTOTYPE (E),
POSSIBLE USE OF THE
GROUND FLOOR FOR A
KINDERGARTEN



FORMAL LOW COST HOUSING PROTOTYPES - EGYPT : MONITORING, ASSESSMENT AND DEVELOPMENT .

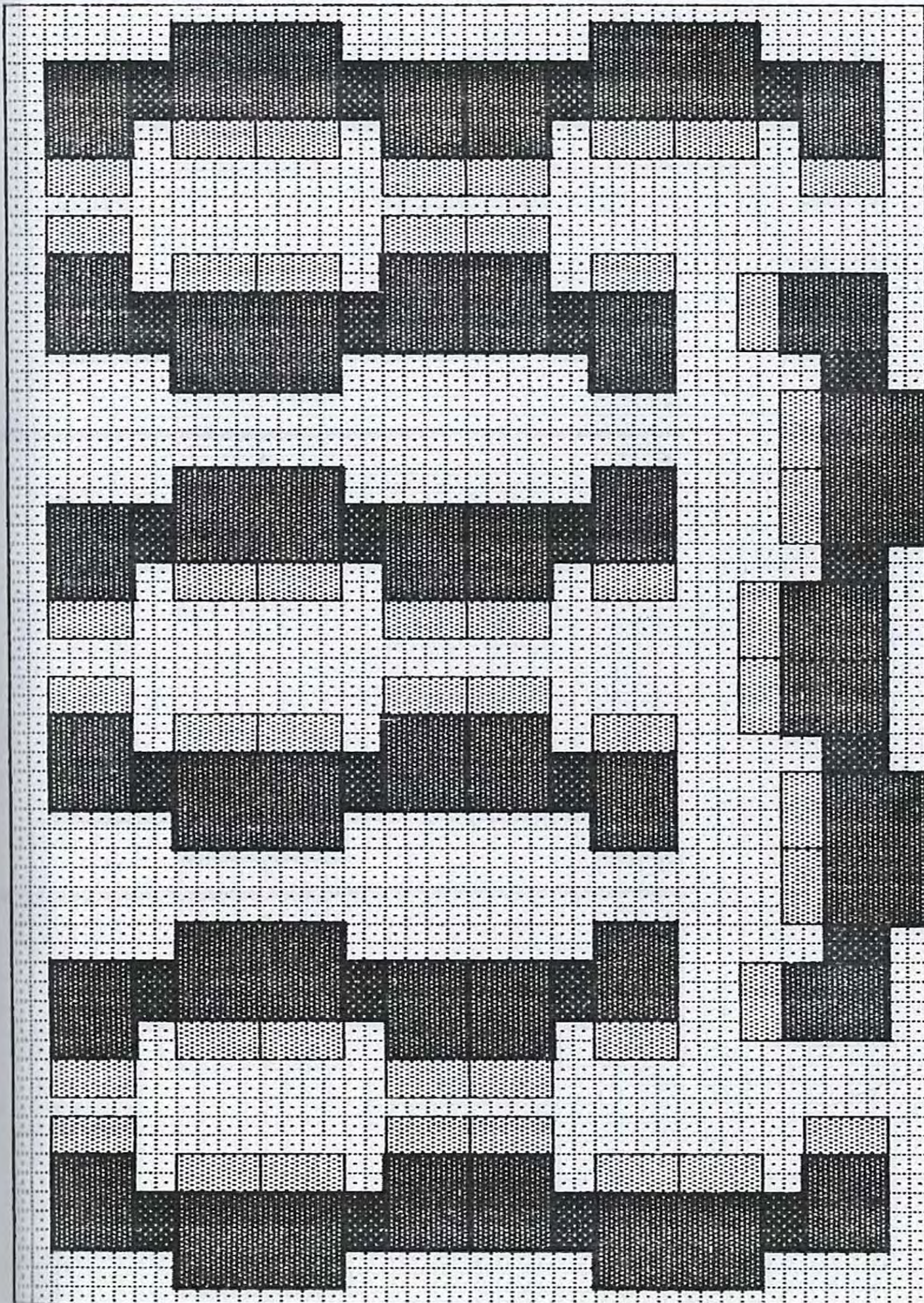


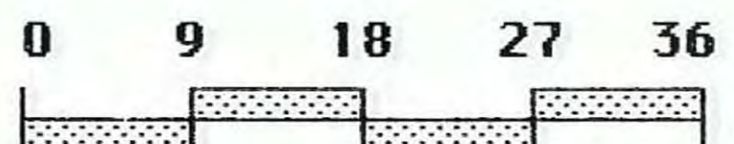
FIGURE (22):

HOUSING PROTOTYPE (E),
POSSIBLE ARRANGEMENT
FOR LAYOUTS .

... ROUTES FOR INFRA-
STRUCTURAL NETWORKS
HELPING TO LOWER THEIR
COST .

... INFRASTRUCTURE
ROUTE

... NETWORKS IN
BULKHEADS



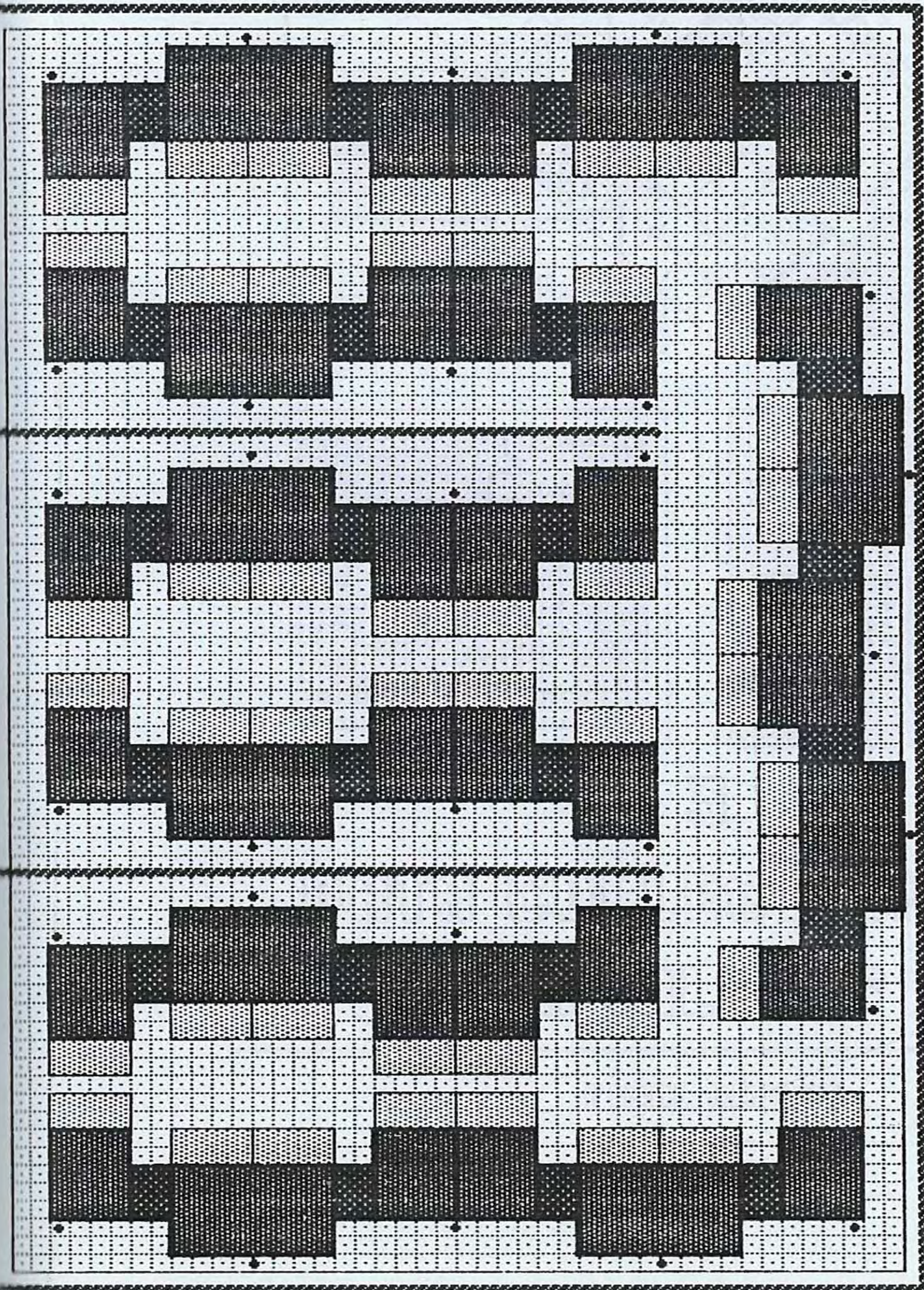


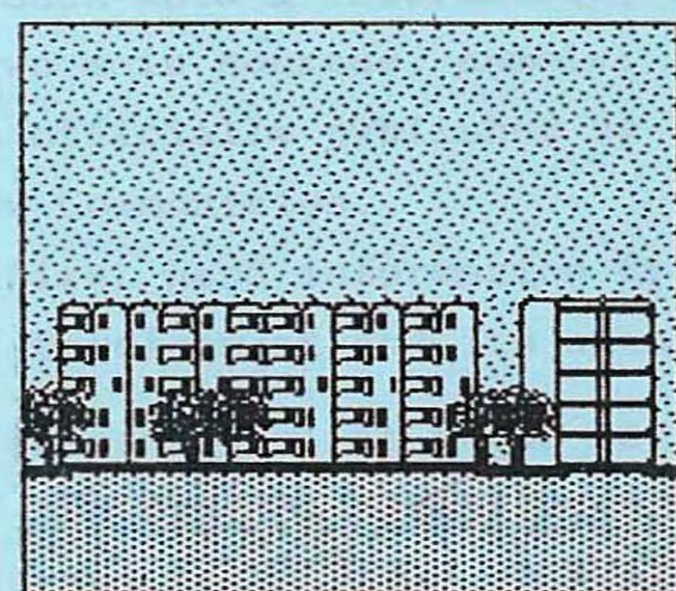
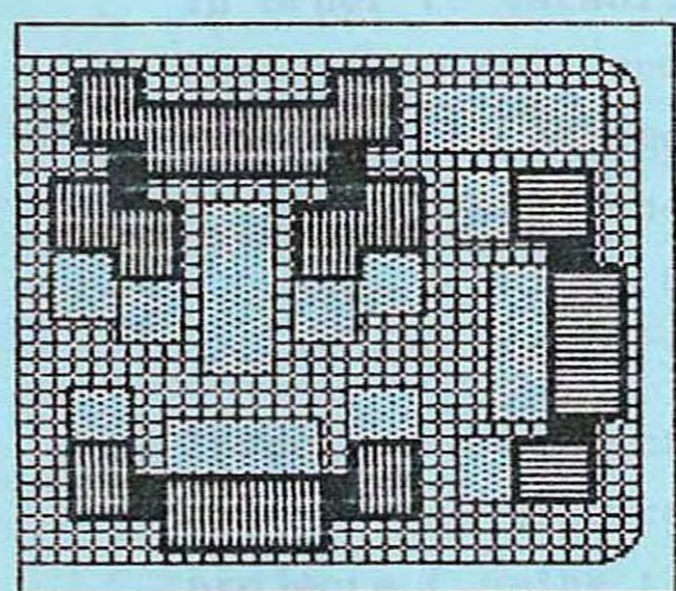
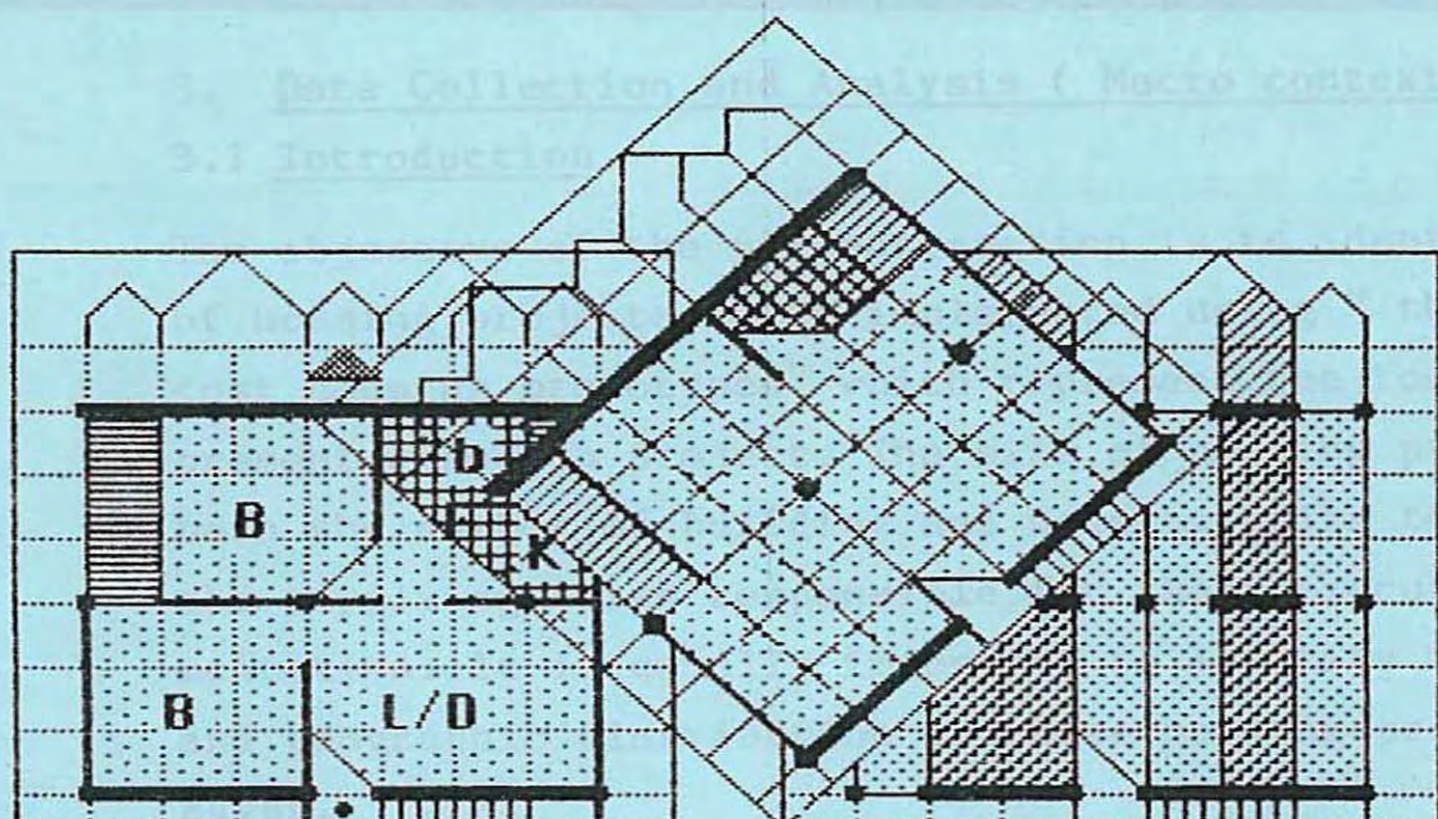
FIGURE (23):

HOUSING PROTOTYPE (E), POSSIBLE ARRANGEMENT FOR LAYOUTS SHOWING THE ROUTES FOR INFRASTRUCTURE NETWORKS HELPING TO LOWER THEIR COST .

- INFRASTRUCTURE ROUTE
- WETPOINTS IN DWELLINGS



3. Data Collection and Analysis (Macro content)
3.1 Introduction



3

DATA COLLECTION AND ANALYSIS

FINAL REPORT

1991

3 - DATA COLLECTION AND ANALYSIS (MACRO CONTEXT)

3. Data Collection and Analysis (Macro context)**3.1 Introduction**

The objective of the present section is to identify the size of housing projects to be implemented using " the formal low cost housing prototypes" which represent the focuss of the present r search project. The size of housing projects, covers both the number of building and housing units to be erected and the supply agencies responsible for their execution and implementation. It is equally important to identify the location and geographic distribution of those housing projects all over Egypt.

In order to establish such data & information, it has been decided to rely upon two main sources, namely:

- 1st, the documents officially published by the Ministry of Development and New Communities.
- 2nd, meetings and first hand information from key officials at the Ministry of Development and its agencies.

Through the collected information, it would be possible to draw a true picture of the spatial distribution of the housing projects (using the formal prototypes) as well as the supply agencies responsible for execution and implementation. A critical analysis of the available data would in turn help to highlight the nature and extents of the problems that are likely to be encountered and to meet the main objectives of the research project previously spelled out in the introduction. Accordingly, the present section mainly consists of two sub-sections:

- The first deals with the statistical display of the available information (mainly focussing on the size of the projects, location of the projects and the related supply agencies). It also discusses the results of the analysed data.

3 - DATA COLLECTION AND ANALYSIS (MACRO CONTEXT)

- the second points out expected problems, it also verifies research objectives and it identifies the scope of activities for the next phase of the project.

3.2 Project locations and supply agencies - An overview

Based on the information published by the Ministry of Development and New Communities and verified through many meetings with key personnel and officials in the Ministry and affiliated bodies:

It has been noticed that the data available on contracted housing units during the years 1987 - 1988 is rather significant and gives a good indication of the size and location of such projects. A total of about quarter a million housing units have been assigned to seven governmental supply agencies. Each of the seven agencies has the funds that allow financing the assigned housing schemes. The users or owners-to be would pay back the cost of their dwellings on a long term loan base. They normally start by installing an advance payment of the order of 20 to 25 percent of the units cost, which is followed by monthly installments representing some 25% of their income for a duration of 30 - 40 years at a low interest rate of 4%. The reason for spreading the responsibilities over seven different governmental supply agencies is rather logic as it allows effective exploitation of their collective resources, to meet the ambitious objective of building some quarter a million housing units within a short period of time (a five years plan or less).

The responsibilities of the seven agencies are spread all over Egypt, covering some 26 Egyptian Governorates. However, agencies shares and allocated projects vary considerably, as it will be discussed next.

3 - DATA COLLECTION AND ANALYSIS (MACRO CONTEXT)

The basic data covering the number of housing units contracted in the years 1987 - 1988 is illustrated in Table No. (1). It shows in its head row the names of the different governorates in an abbreviated format, as follows:

- 1- Cairo - Cairo
- 2- Guiza - Guiza
- 3- Alexandria - Alexan
- 4- Port Said - Port Said
- 5- Ismaileya - Ismail
- 6- Suez - Suez
- 7- Damietta - Damiet
- 8- Dakahleya - Dakahl
- 9- Gharbeya - Gharbe
- 10- Sharkeya - Sharke
- 11- Kafr Eshekh - Kafr/ Sh
- 12- Monefeya - Monofe
- 13- Kalyoubeya - Kalyob
- 14- Behera - Behera
- 15- Bani Sweif - Bani/S
- 16- Fayoum - Fayoum
- 17- Menya - Menya
- 18- Assiout - Assiout
- 19- Sohag - Sohag
- 20- Kena - Kena
- 21- Aswan - Aswan
- 22- New Valley - N. Valley
- 23- Red Sea - Red Sea
- 24- North Sinai - N. Sinai
- 25- South Sinai - S. Sinai
- 26- Marsa Matrouh - M. Matr

The first column shows the seven supply housing & development agencies, namely:

**SUPREME COUNCIL OF UNIVERSITIES, EGYPT .
FORMAL LOW COST HOUSING PROTOTYPES**

- DATA COLLECTION AND ANALYSIS (MACRO COMPONENT)

The Local Authorities (LA) are the main providers of housing in the urban areas. The Housing Companies (HC) are established by the Ministry of Development. The Housing Finance Companies (HFC) are established by the Housing and Building Administration (HBA) and the Housing Bank (HB). The Development and Housing Organizations (DHO) are established by the Ministry of Development. The Housing and Building Administration (HBA) is the main provider of housing in the urban areas. The Housing Companies (HC) are established by the Ministry of Development. The Housing Finance Companies (HFC) are established by the Housing and Building Administration (HBA) and the Housing Bank (HB). The Development and Housing Organizations (DHO) are established by the Ministry of Development. The Housing and Building Administration (HBA) is the main provider of housing in the urban areas. The Housing Companies (HC) are established by the Ministry of Development. The Housing Finance Companies (HFC) are established by the Housing and Building Administration (HBA) and the Housing Bank (HB). The Development and Housing Organizations (DHO) are established by the Ministry of Development.

GOVERNORATES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	TOTAL
LOCAL AUTHORITIES	25198	17380	18900	4200	1060	1200	670	3170	7580	3500	3600	1900	1000	2440	1280	1300	3000	2000	3940	2000	800	180	320	340	40	700	107643
HOUSING COMPANIES (PUBLIC)	11933	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11933
HOUSING FINANCE FUNDS	3820	920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4740
HOUSING & BUILDING COOP	32040	0	12000	0	0	1140	0	0	0	0	0	0	5632	0	2000	0	2080	0	0	0	0	0	500	0	0	0	38392
DEVELOPMENT & HOUSING BANK	3500	6260	0	1100	1300	0	1500	0	0	5000	0	0	0	700	0	0	0	0	0	0	200	0	0	450	0	0	20910
DEVELOPMENT ORGANIZATIONS	0	800	540	1950	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500	240	600	80	0	0	6014
KEY COMMUNITY AGENCIES	28476	2500	500	0	0	0	50	0	0	3000	0	1800	992	0	0	0	1220	0	0	0	0	0	0	0	0	0	30338
TOTAL	104962	28060	31940	7250	2700	2840	2220	3170	7580	11300	3600	2900	7624	3140	3280	1300	6300	2000	3040	2500	1500	870	1084	1390	120	1500	245170

TABLE (1) : DISTRIBUTION PER GOVERNORATE PER SUPPLY AGENCY

3 - DATA COLLECTION AND ANALYSIS (MACRO CONTEXT)

- The Local Authorities (Governorates).
- The Housing Companies (public sector) affiliated to the Ministry of Development and New Communities
- The Housing Finance Fund
- The Housing and Building Cooperatives
- The Development and Housing Bank
- The Development Organizations
- The New Communities Agencies

The numbers in the table express the volume of housing units to be provided in each governorate by each of the supply agencies.

The analysis of the information registered in the table is possible through the sequence of charts and diagrams illustrated in Figures (24 to 35) from which the following remarks may be pointed out:

1- The activities of the supply agencies:

- a- the role of some of the agencies is more eminent than others. For instance, the Local Authorities are responsible for most of the action in the governorates - about 43.9% of the total planned stock as seen in the pie diagram Figure (24).

The Housing and Building Cooperatives and the New Community Agencies come second in the size of their share of the planned units, they are responsible for some 22.6% and 15.7% of the units respectively. The Development and Housing Bank role (and share) is relatively limited, it is allocated a mere 8.3% of the units total. The shares of the rest of the supply agencies are even smaller by comparison.

- b- Some of the agencies shares are concentrated in certain governorates, for instance, as it can be seen in the chart Table (1), the Housing Companies (public sector) are confined to Cairo Governorate. The Housing Finance

3 - DATA COLLECTION AND ANALYSIS (MACRO CONTEXT)

Fund is similarly confined to two governorates namely, Cairo and Guiza. The Housing and Building Cooperatives are responsible for the provision programs in seven governorates, Figure (33). The Development and Housing Bank supply responsibilities cover ten governorates, Figure (34) while the Development organizations shares are spread over eleven governorates. The exception is the Local Authorities, whose supply logically cover all the localities (governorates), Figure (32).

- c- While some of the governorates are benefiting from the resources of most of the seven supply agencies, other governorates mostly benefit from one or two of the agencies. The pie diagram, Figure (25), shows that in Cairo Governorate the supply and implementation action is undertaken by all of the seven agencies. Three of them are responsible for the larger share (24.0% for the Local Authority, 30.5% for Housing and Building Cooperatives and 27.1% for New Community Agencies), the other agencies are contributing to the action but their shares are by far smaller.

In Guiza, the Local Authority is responsible for the larger part of action, 62.7%, see Figure (26). The Development and Housing Bank comes second, with a share of 22,3%. Three other supply agencies have relatively limited contributions.

In Alexandria, four out of the Seven Agencies, are taking a role in the supply and implementation action, see Figure (27). The Local Authority is responsible for 59.2% of the target and the Housing and Building Cooperatives share amounts to 37.6%. The Development Organizations and New Communities Organizations have slimmer roles.

2- The Location of the Low Cost Housing projects:

- a- The share of low cost housing development projects for
-

3 - DATA COLLECTION AND ANALYSIS (MACRO CONTEXT)

each governorate varies considerably, in terms of the total number of housing units to be erected as shown in the charts Figures (30) and (31). It is clear that the shares of the Northern governorates in terms of targets and planned numbers surpass the shares of the Southern governorate. This is closely related to housing deficiencies and regional population imbalance.

- b- A limited number of governorates are collectively absorbing most of the planned housing units.

The housing units to be built in the governorates of Cairo, Guiza and Alexandria represent some 65% of the total units to be completed during the course of the plan. The information presented in this section and which is registered in the chart Figures 24 to 35 are also presented in a map, Figure 36 .

This helps in illustrating the spatial distribution of the low cost housing projects, over Egypt.

3.3 Identifiacion of Problem Areas

The previous sub-section briefly pointed out the size of the housing projects to be erected within the current national development plan, using the formal low cost housing prototypes. It also illustrated the location of the projects over Egypt and highlighted the supply agencies, involved in the process (development, finance and implementation).

The problems to be encountered during and post implementation are likely to be the results of two key factors related to the features of the prototypes and the adopted policies for finance, allocation and execution.

The first factor is the contextual adaptability of the prototypes.

3 - DATA COLLECTION AND ANALYSIS (MACRO CONTEXT)

It was shown that the types will be used all over Egypt in different locations and development settings, the locations vary from the view points of climatic conditions, urban features and character, community needs and local cultures among other things.

The climatic conditions vary from the Mediterranean coastal climate in the North, via the inland transition climates (in the Delta and along the northern stretches of the Nile Valley) and to the distinct hot arid climates of the desert regions and their environs.

The prototypes are also to be located in existing cities as well as in newly developed settlements. The existing cities share some physical features but they considerably differ in terms of urban tissue, character and development determinants. The community needs and local cultures and related issues represent a major challenge to designers and planners and will in tur.. influence the success or otherwise of the new housing developments.

The prototypes are used with no consideration whatsoever to the above. No modifications were developed in response to cultural environmental and contextual variabilities. This is likely to seriously affect the performance of the completed units and their acceptance by the users, hence this factor is to underline most of the problems related to the prototypes (as basis for the formal housing policies in Egypt since 1987 and till now).

The second factor is the technical and organizational features of the prototypes and related development processes. It can be argued that this factor is closely related to the first factor as it combines some of the technical features of the prototypes (structural features, materials, components, and

3 - DATA COLLECTION AND ANALYSIS (MACRO CONTEXT)

finishes) on the one hand and the adopted site and project management policies on the other. The latter component is directly affected by the development context and features: physical and non physical (available labour force, contractors and other institutions etc).

The above-two factors are likely to influence the performance of the prototypes and will reflect on cost, execution efficiency and acceptability (by the users).

The two previous factors also support the directives and objectives of the present research project which were previously spelled out.

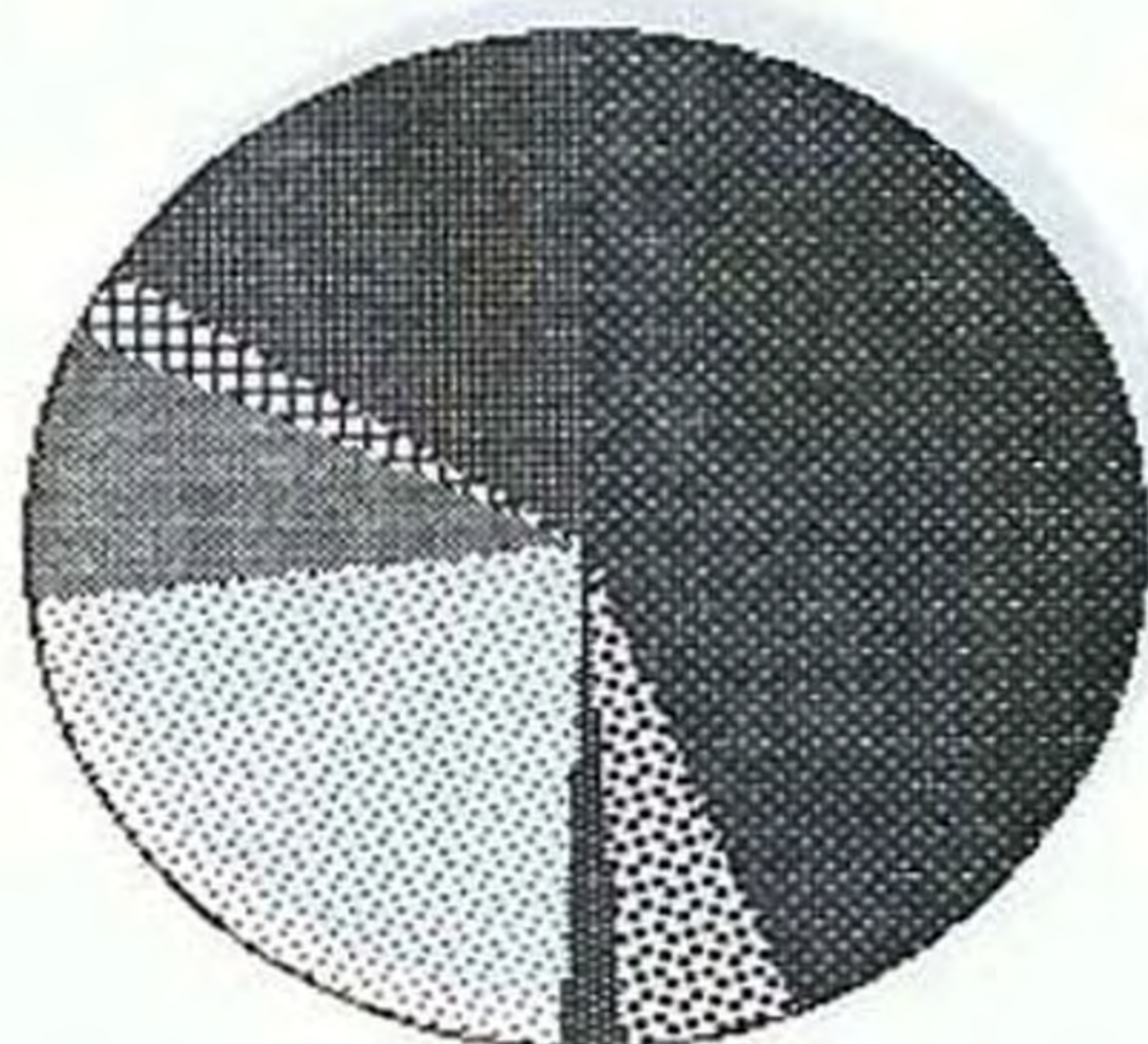
It seems important, in the light of the above to undertake a thorough field work to identify implementation problems and to assess the performance of the prototypes, in preparation for the next phase of the research programme.

This extensive survey was carried out and is highlighted next.



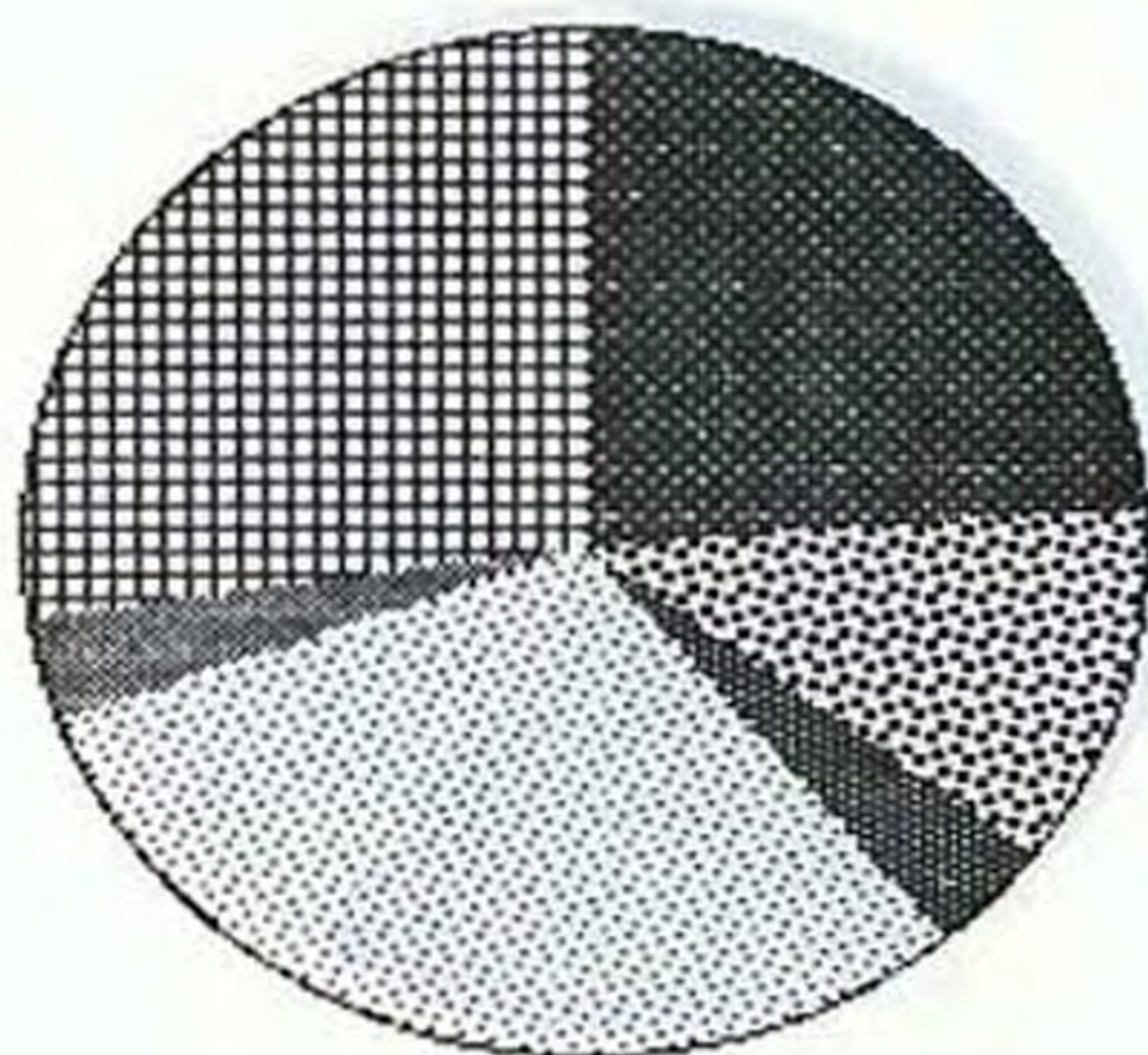
Supply Agency	Percentage
Private Housing Companies	24.5%
Government Housing Agencies	11.4%
Co-operative Housing Societies	10.2%
Other Housing Agencies	9.8%
Real Estate Companies	8.7%
Other Agencies	27.1%

FIG. (24) : SUPPLY AGENCIES FOR ALL GOVERNORATES



LOCAL AUTHORITIES	43.9%
HOUSING COMPANIES(PUBLIC)	4.9%
HOUSING FINANCE FUND	1.9%
HOUSING & BUILDING COOP	22.6%
DEVELOPMENT & HOUSING BANK	8.5%
DEVELOPMENT ORGANIZATIONS	2.5%
NEW COMMUNITY AGENCIES	15.7%

FIG. (25) : SUPPLY AGENCIES FOR CAIRO



LOCAL AUTHORITIES	24.0%
HOUSING COMPANIES(PUBLIC)	11.4%
HOUSING FINANCE FUND	3.6%
HOUSING & BUILDING COOP	30.5%
DEVELOPMENT & HOUSING BANK	3.3%
NEW COMMUNITY AGENCIES	27.1%

FIG. 26 : SUPPLY AGENCIES FOR GUIZA

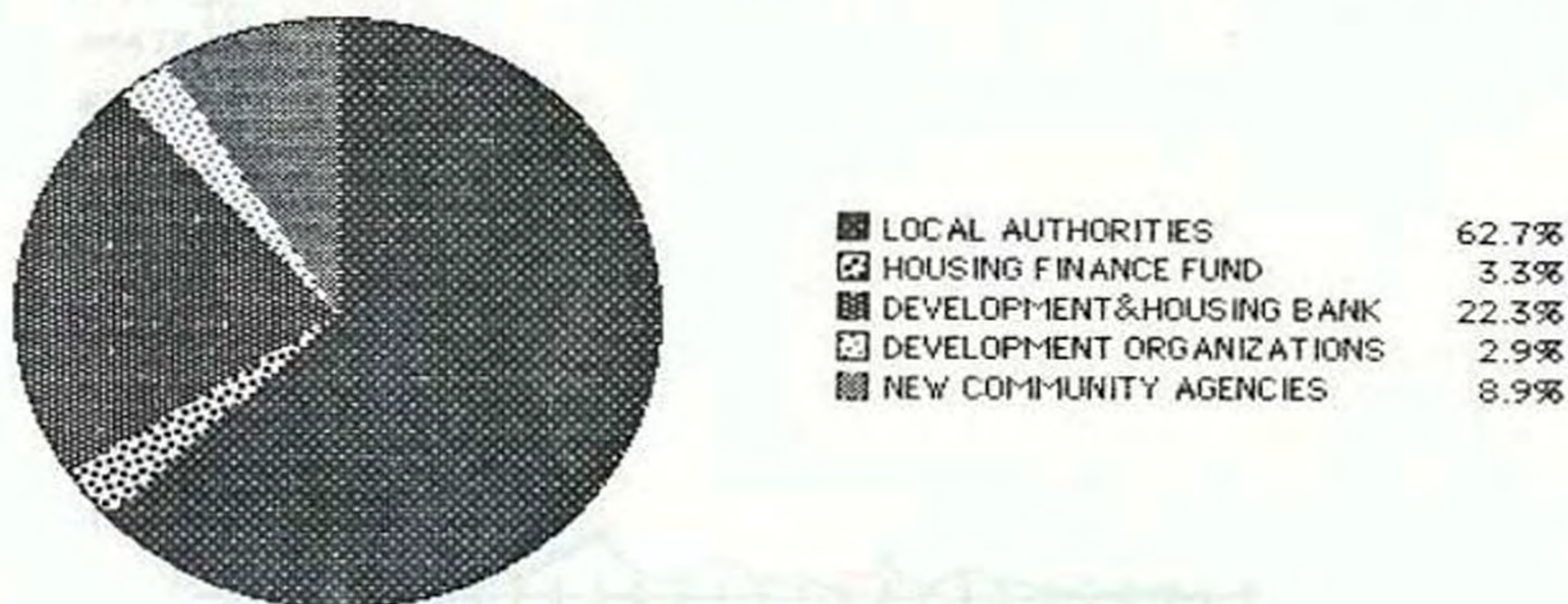


FIG. 27 : SUPPLY AGENCIES FOR ALEXANDRIA



FIG. 28 :
TOTAL HOUSING UNITS CONTRACTED IN 1987/88

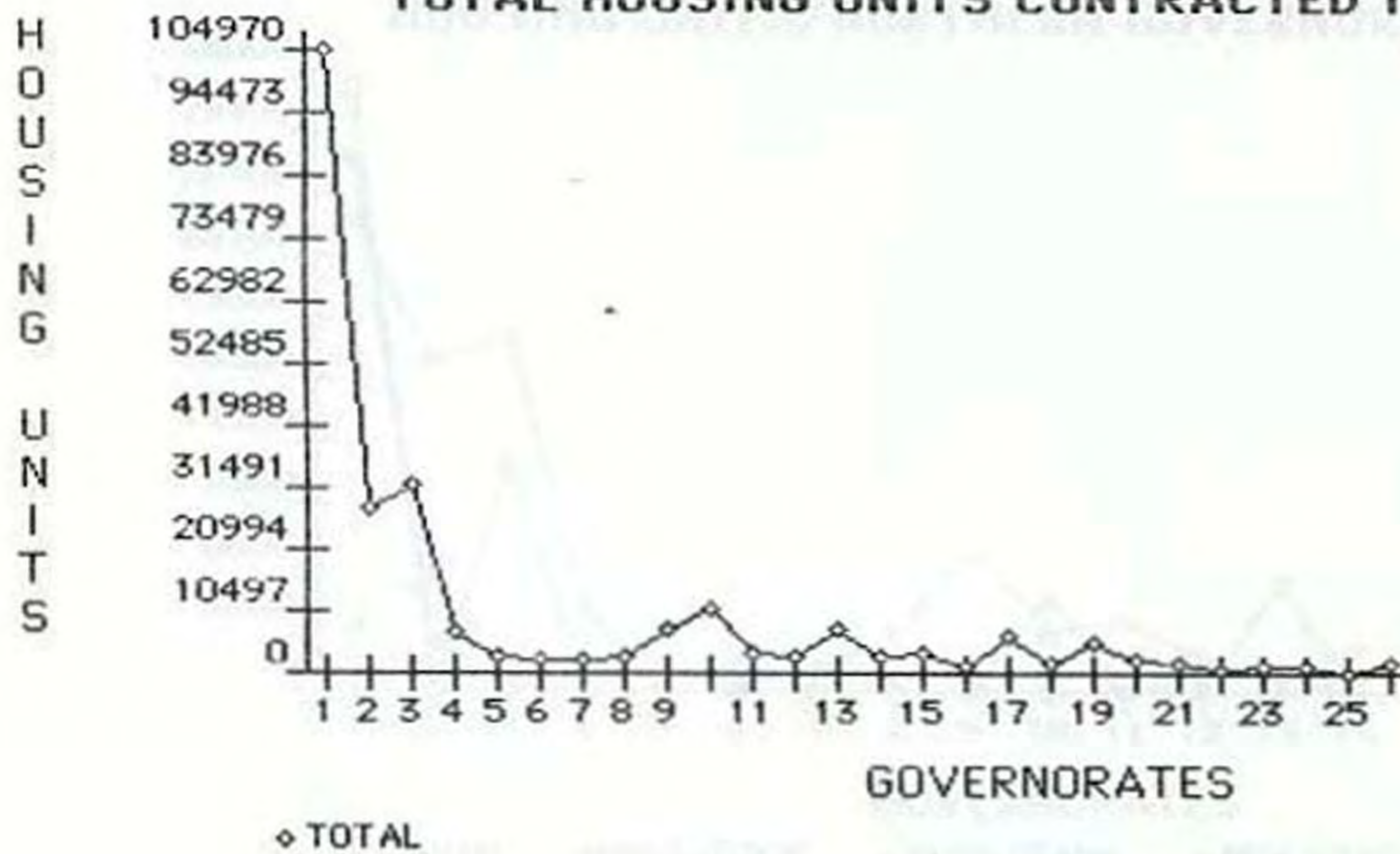


FIG. 29 :
HOUSING UNITS/ALL GOVERNORATES(87/88)

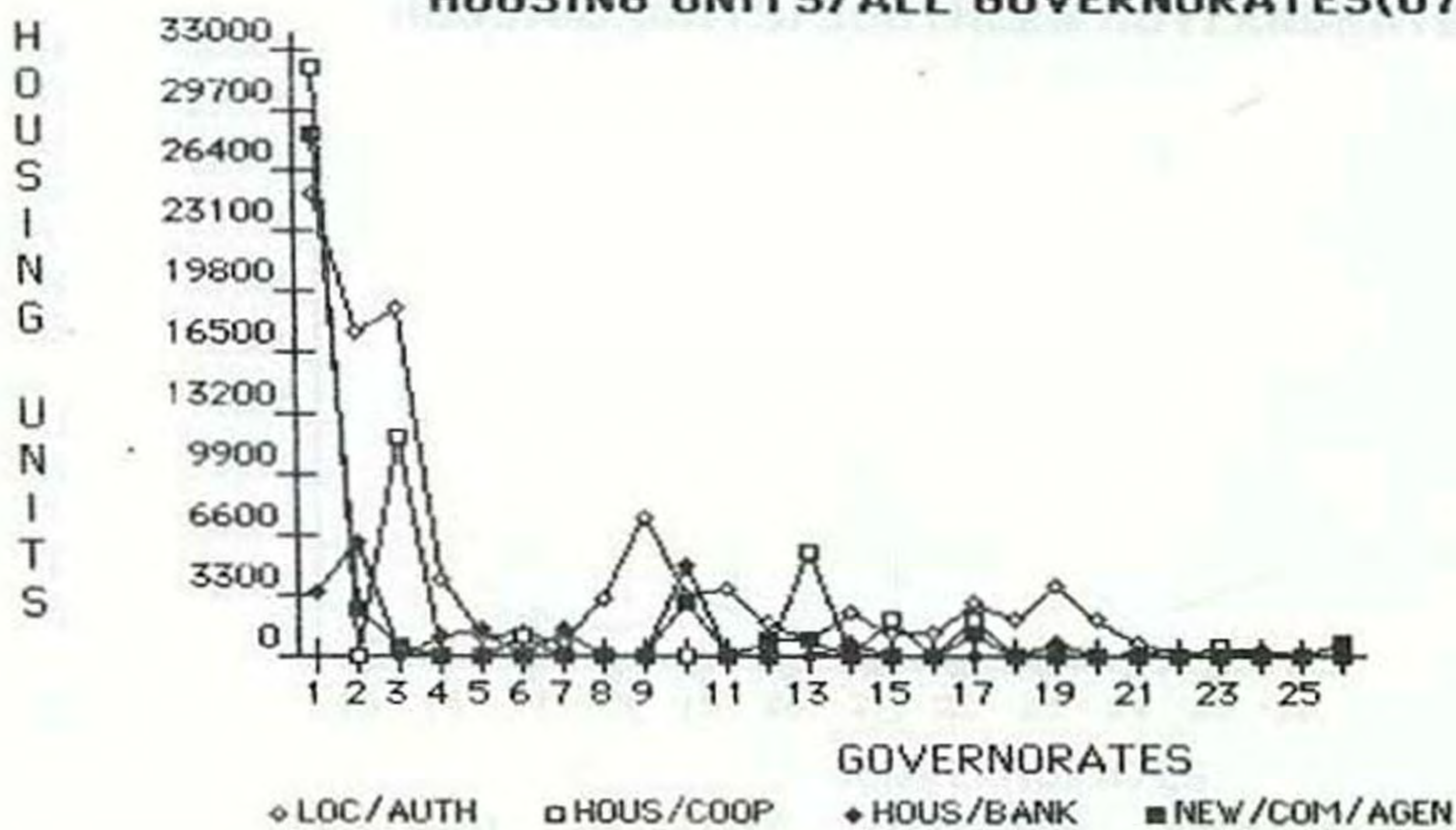


FIG. 30 :
HOUSING UNITS/NORTHERN GOVERNORATES 87/88

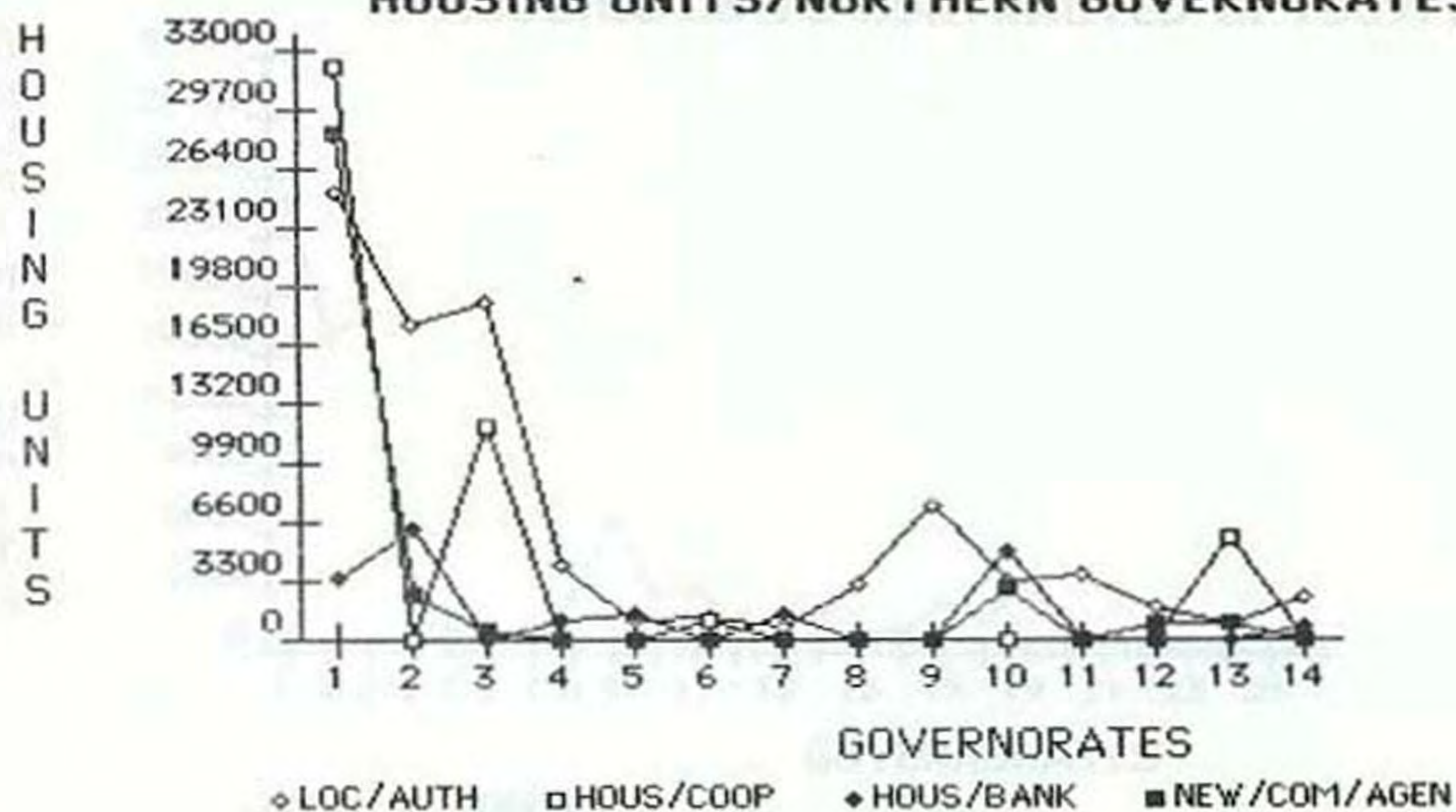


FIG. 31 :
HOUSING UNITS/SOUTHERN GOVERNORATES 87/88

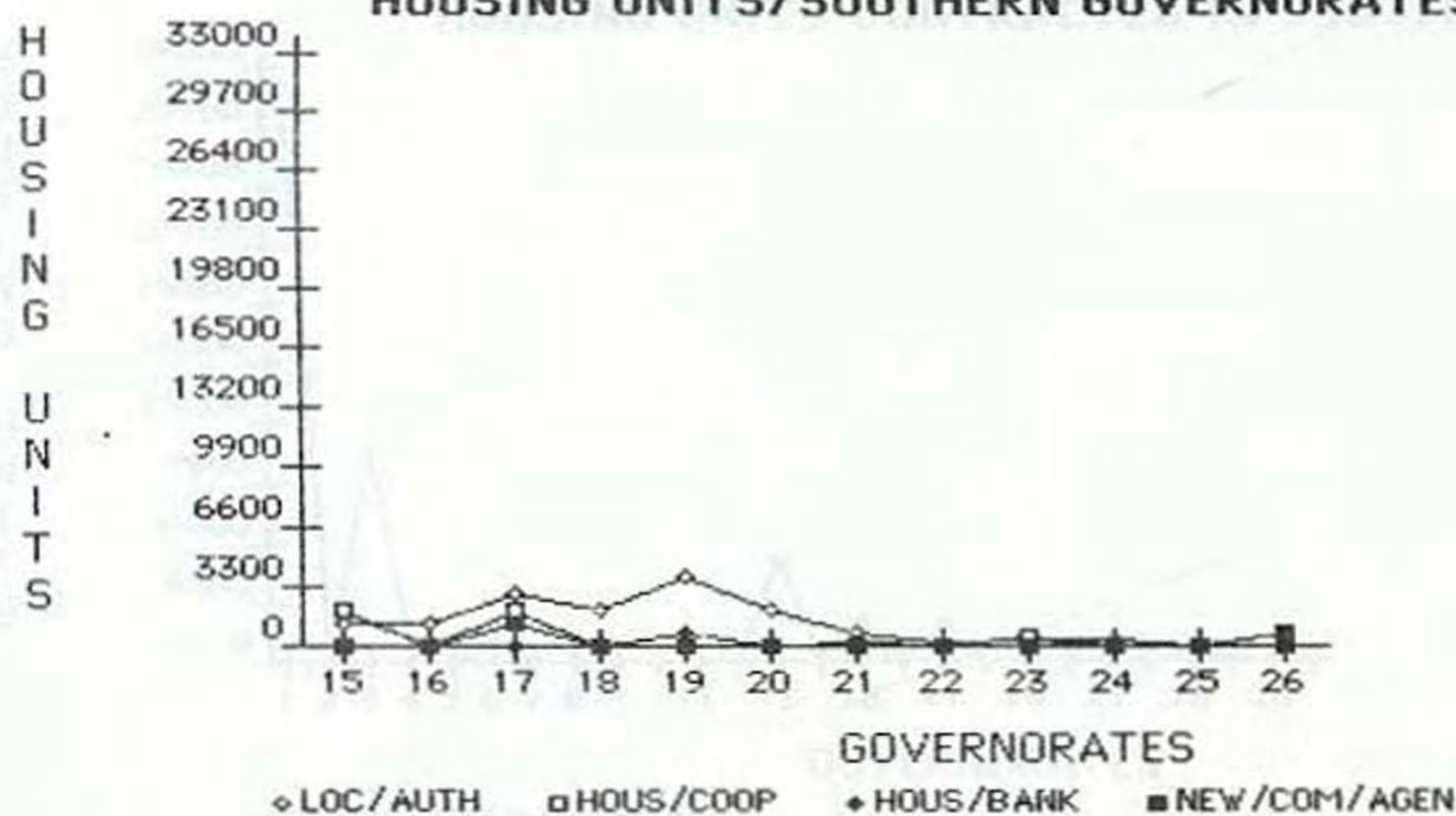


FIG. 32 :
HOUSING UNITS CONTRACTED IN 1987/88

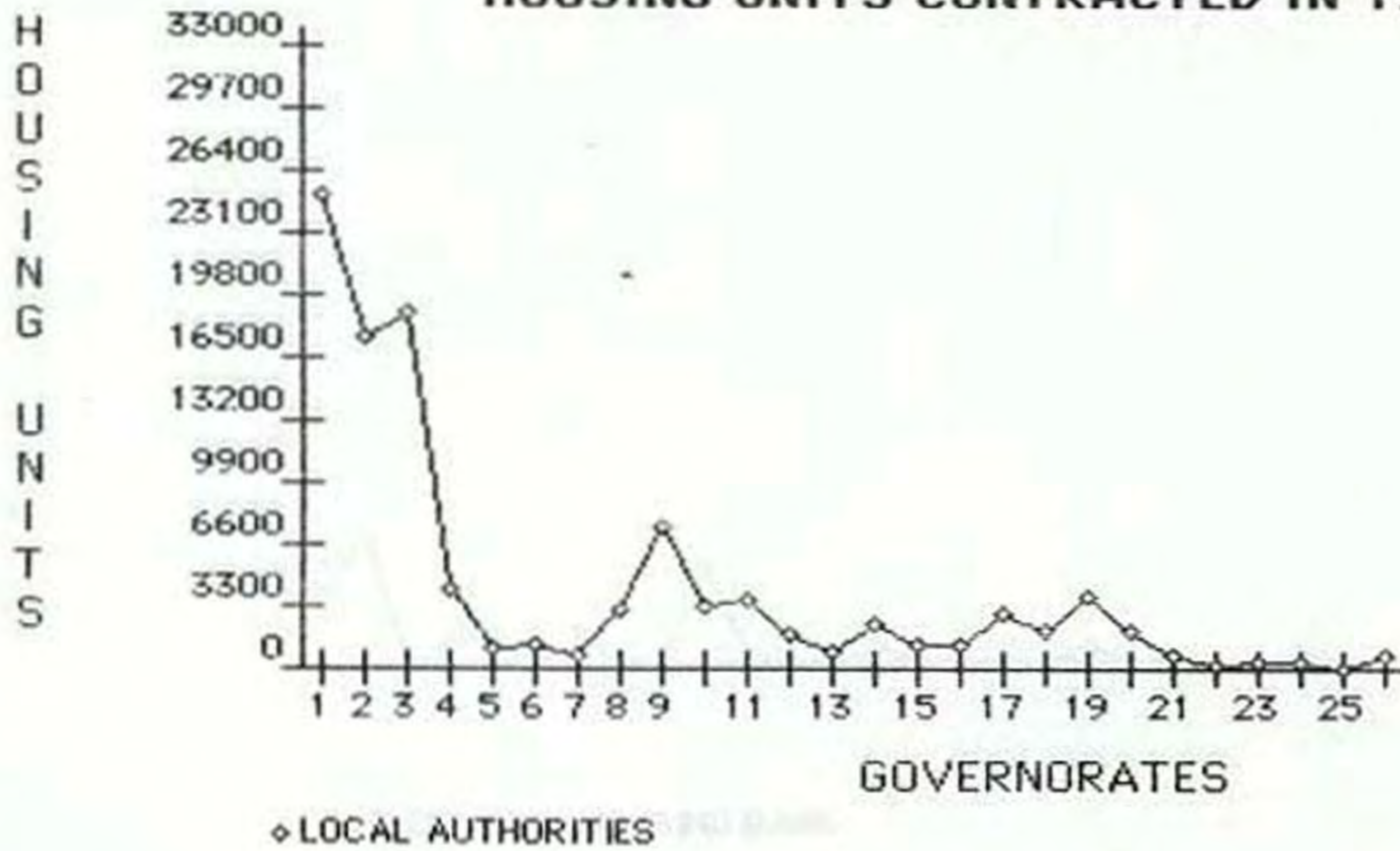


FIG. 33 :
HOUSING UNITS CONTRACTED IN 1987/88

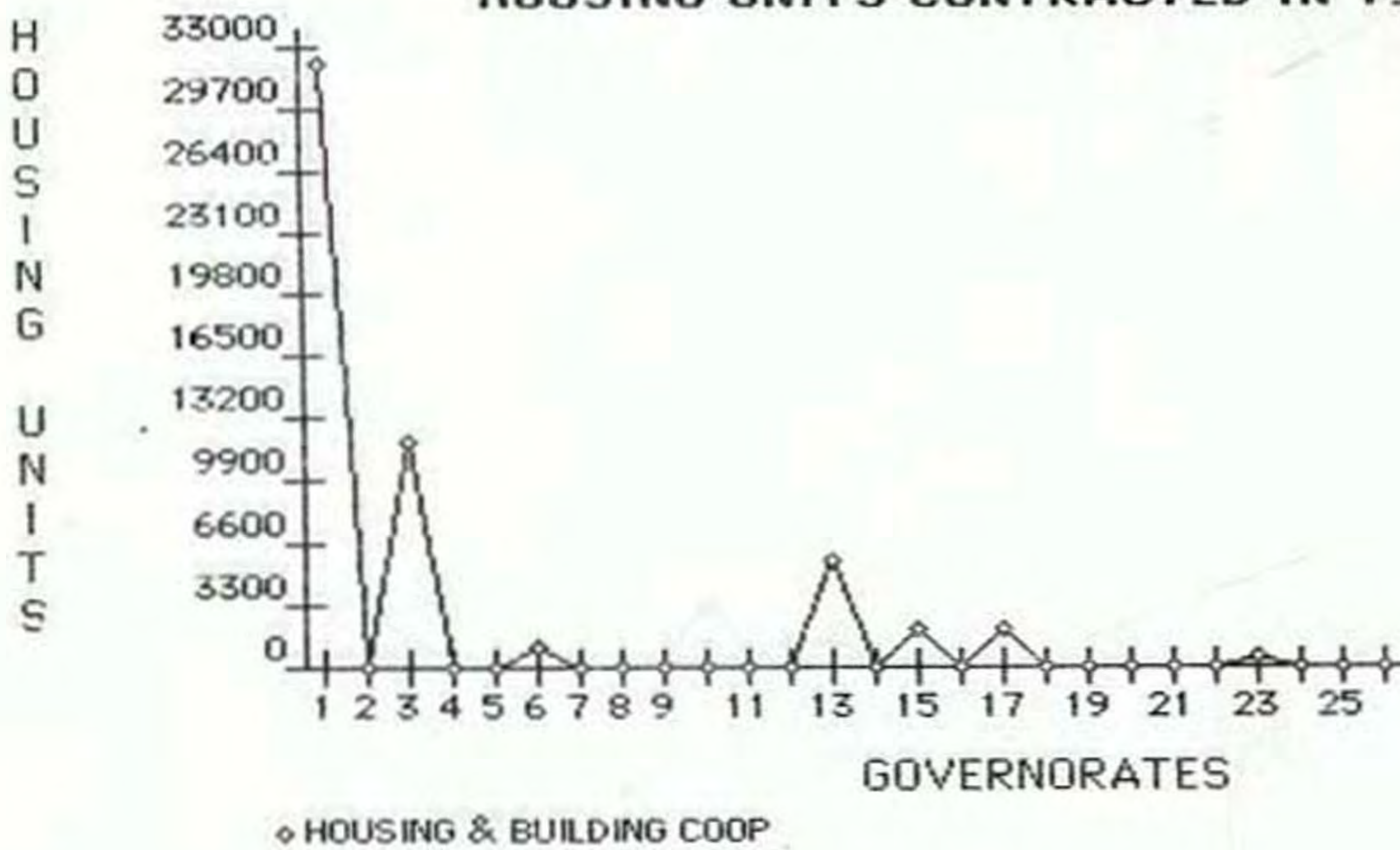


FIG. 34 | :
HOUSING UNITS CONTRACTED IN 1987/88

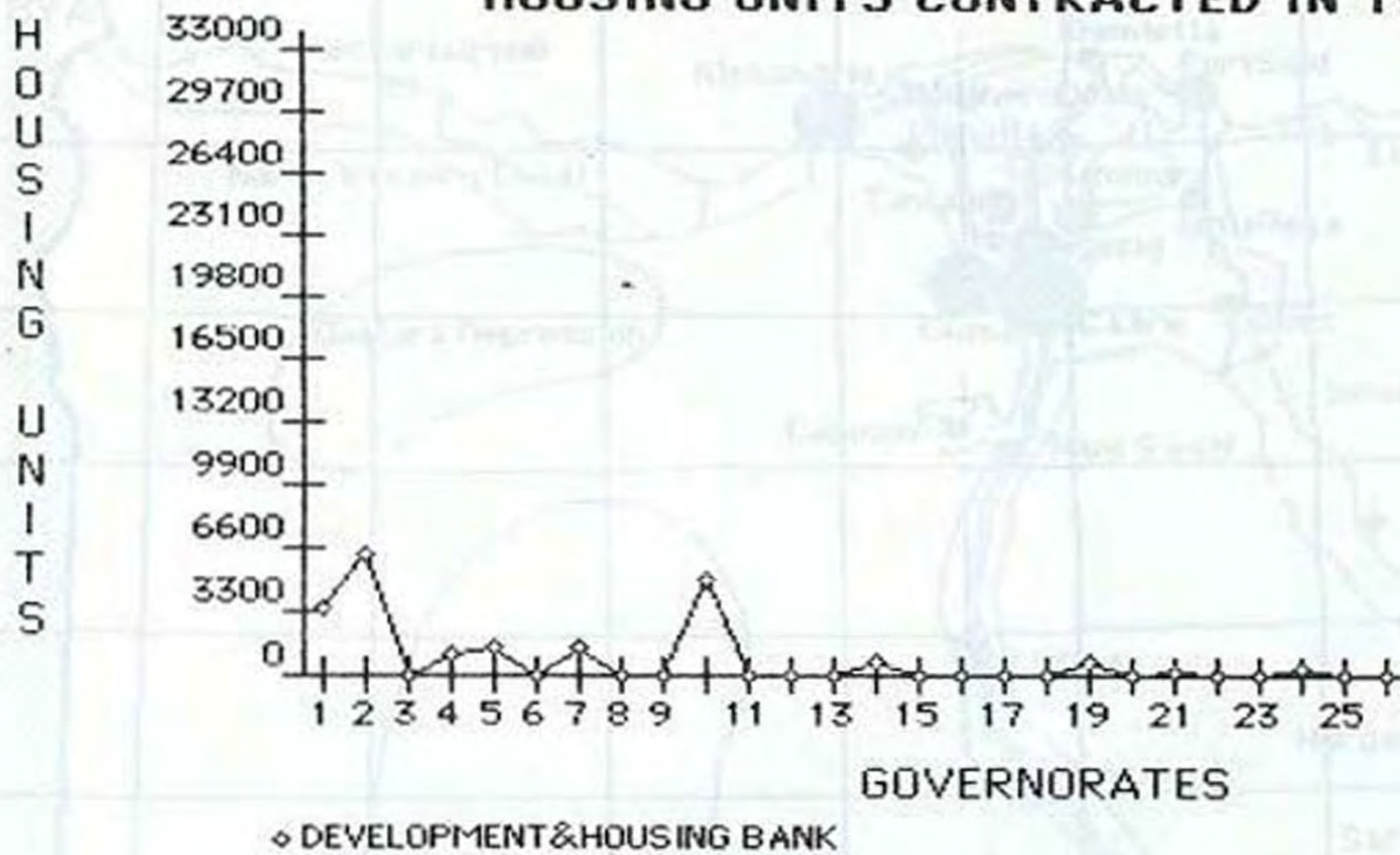


FIG. 35 | :
HOUSING UNITS CONTRACTED IN 1987/88

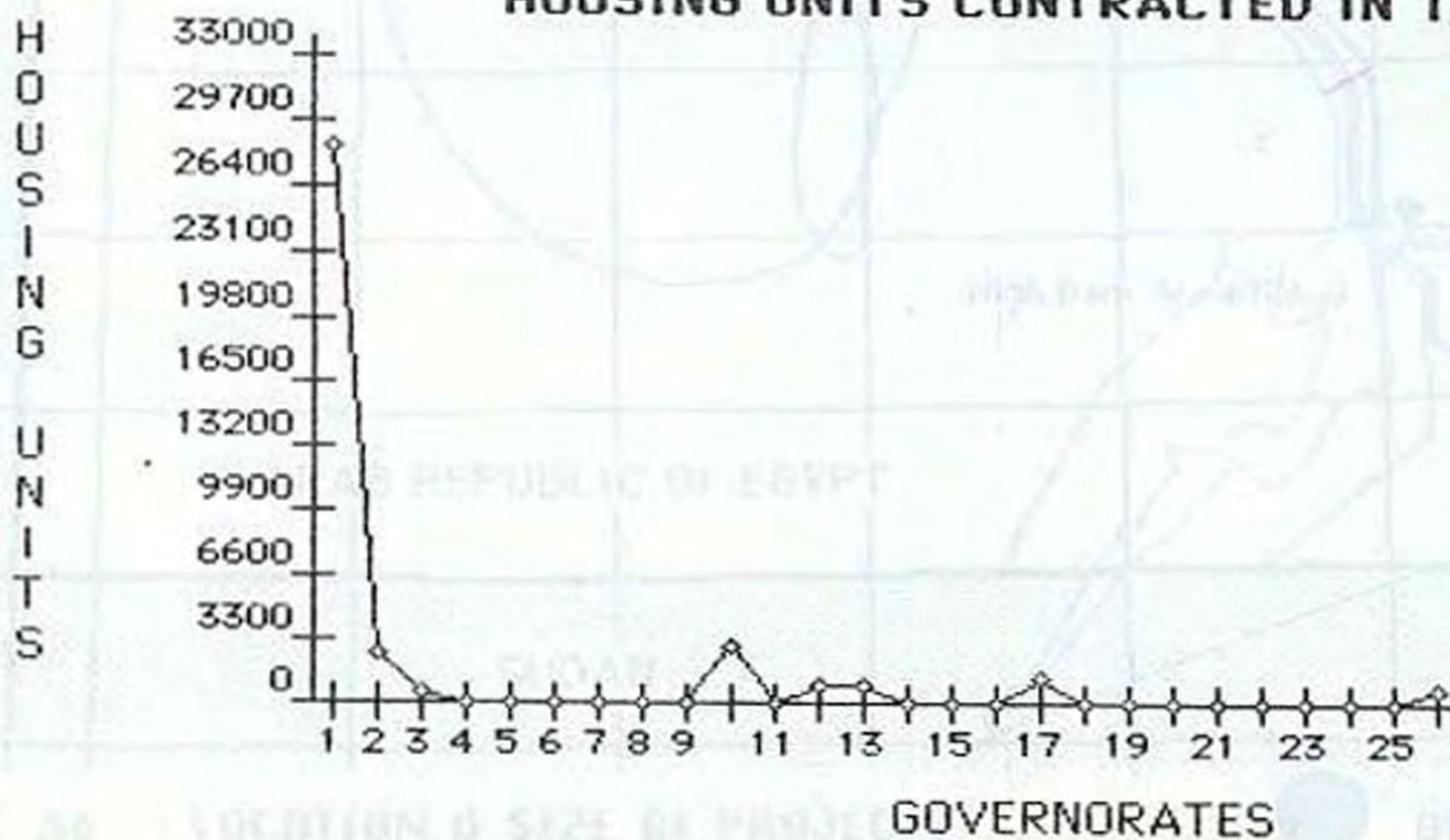


FIG. 36

LOCATION & SIZE OF PROJECTS USING NEW COMMUNITY AGENCIES HOUSING PROTOTYPES CONTRACTED IN 1987-1988

GOVERNORATES

○ OVER 100 000 UNITS
 ● 29 000 TO 92 000 UNITS
 ● 5 000 TO 12 000 UNITS
 ● LESS THAN 5 000 UNITS

FORMAL LOW COST HOUSING PROTOTYPES - EGYPT : MONITORING, ASSESSMENT AND DEVELOPMENT .
 PROGRESS REPORT 2 - NOVEMBER 1991

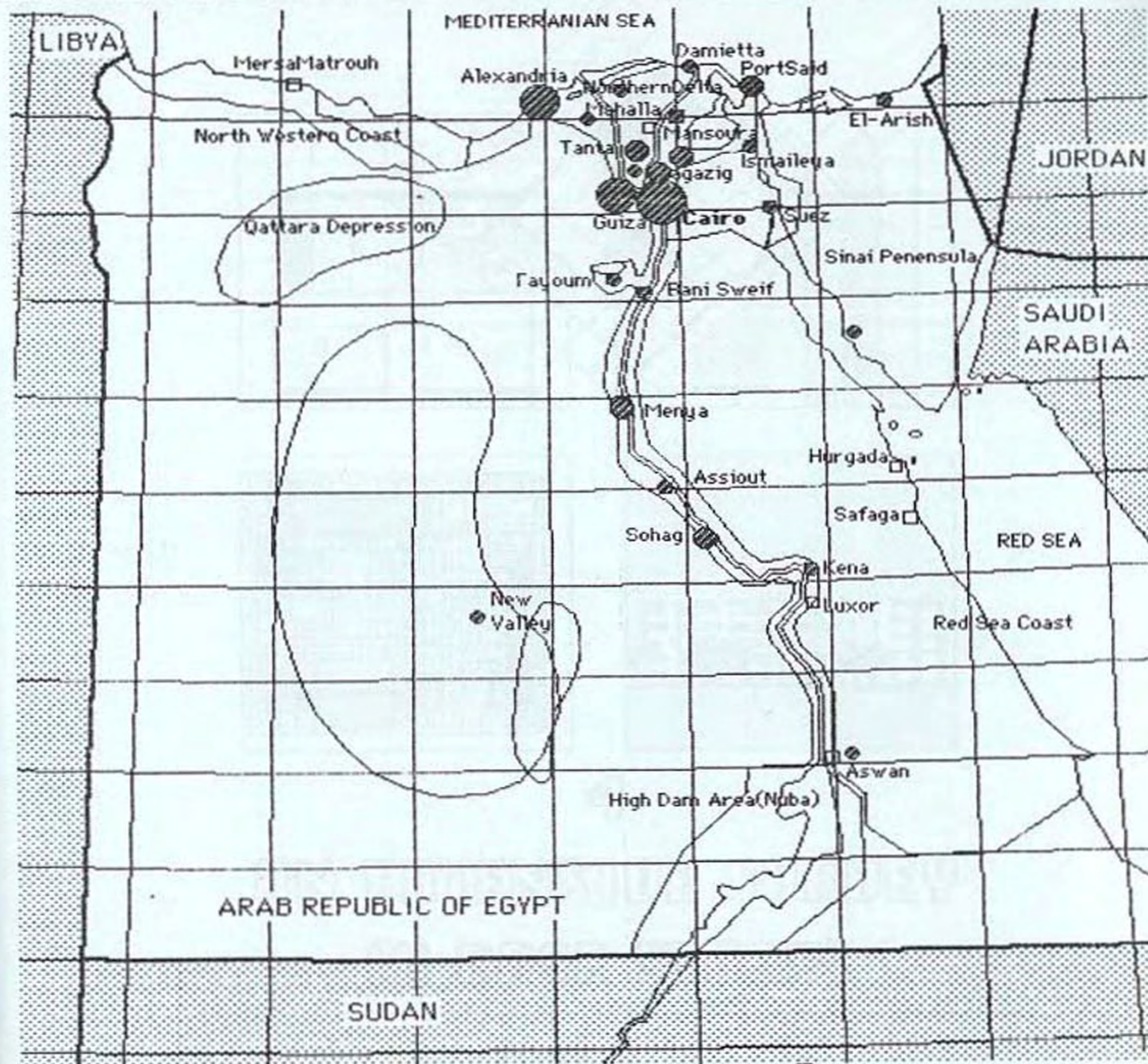
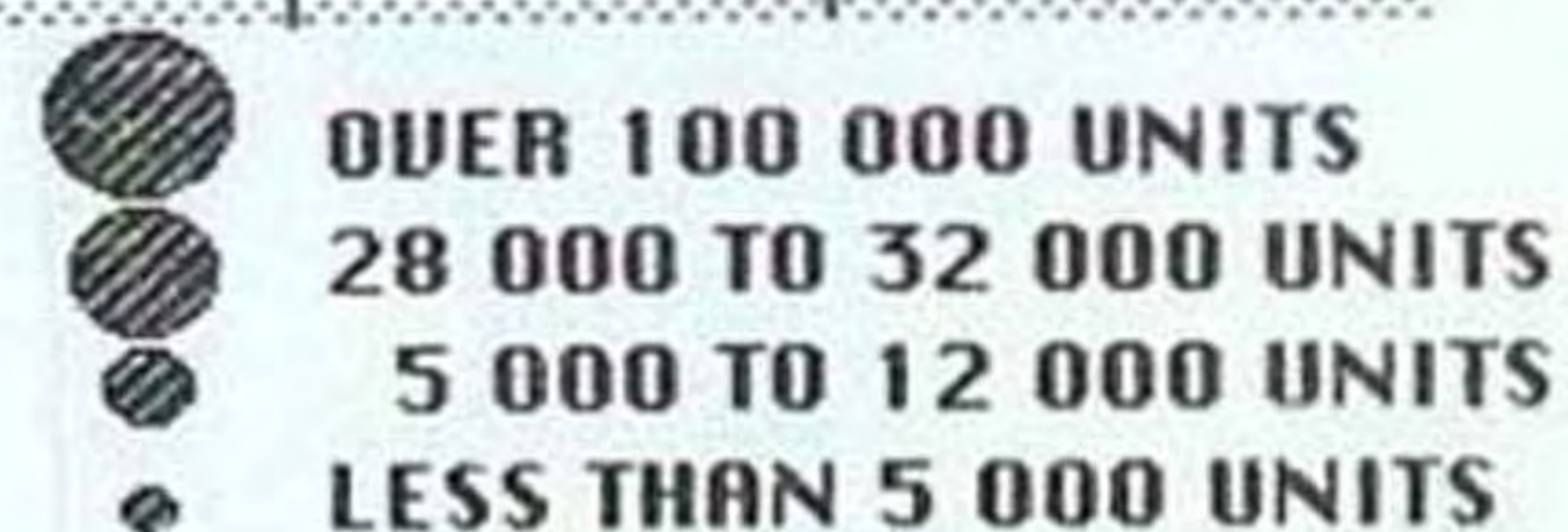
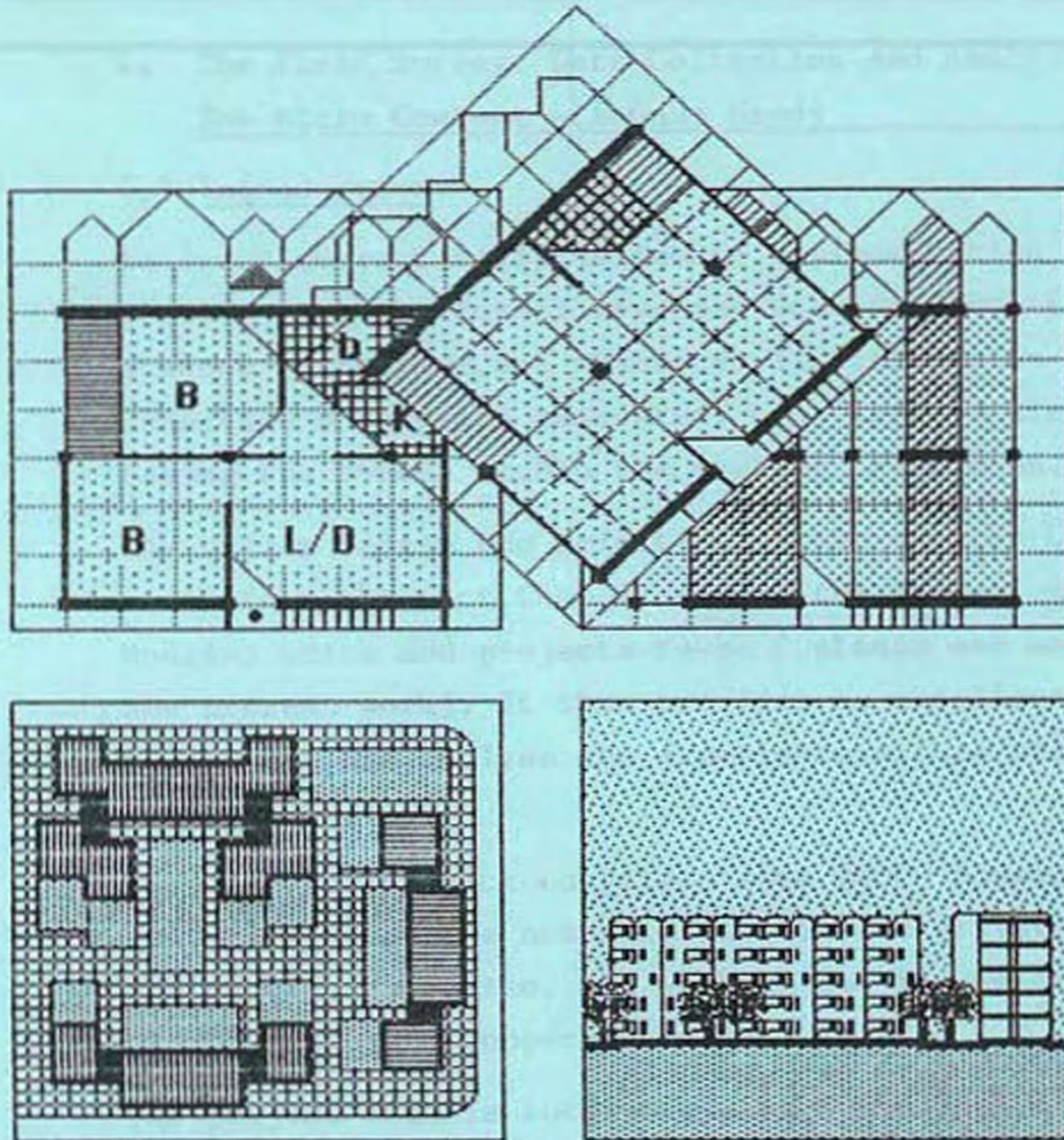


FIG. 36 : LOCATION & SIZE OF PROJECTS USING FORMAL LOW COST HOUSING PROTOTYPES CONTRACTED IN 1987-1988





4

AN EXTENSIVE SURVEY (A CASE STUDY)

FINAL REPORT

1991

4 - THE FIELD SURVEY (THE MICRO CONTEXT - A CASE STUDY)

4. The Field Survey: Data Collection and Analysis.
The Micro Context - A Case Study

4.1 Introduction:

In order to rationally delineate implementation - related problems for the formal low-cost housing prototypes, it is planned (with time and resources limitations in mind) to undertake a detailed case study of a large scale project (using the types) within the greater Cairo area.

The wisdom behind the selection of the greater Cairo area stems from the fact that it enjoys the largest share of housing units and projects-to-be (please see section 3 of the present work). It thus provides an excellent opportunity to monitor and analyse the experience within the indicated limitations.

The selected project comprises some 20000 housing units and is implemented by a number of public and private sectors contracting companies, all working for the General organization for Housing Cooperatives.

The project site is located to the South-East of Cairo's urban mass, on the Mokattam hills middle plateau.

The collected data will cover selected aspects of the development. It will focuss on environmental, technical, economic and organizational aspects rather than socio cultural and community related issues. This is due to the nature of the current phase of the project which is still under construction and the prospective users are yet to be involved.

4.2 General Description of the Project

The project is planned on an area of 220 acres and is to provide some 20604 dwellings. Some 19 contracting companies are involved in the construction process. Only two housing

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prototypes are used in this project, one of them is the low cost housing prototype "D". The case study will focus on the information related to the low-cost housing prototype "D" since it represents one of the seven housing prototypes studied in the present research project. As shown on table (2), 13 contracting companies will build 202 buildings of the prototype "D" providing some 9696 dwellings (about 50% of the total number of dwellings for the whole project). All contracting companies are working for the General Organization of Housing Cooperatives (one of the main suppliers of low income families dwellings, as illustrated previously in 3.2)

4.3 Present Status of the Project:

The project is progressing according to planned schedules. The allocation of dwellings to users will start in September 1991 and the final handing over of dwellings will follow some 12 months later. The selected photographs Figures (37 to 40) show that the buildings are at different stages of completion, which allows a fair assessment of the experiment specially in terms of: technical problems, economic problems, and organizational problems.

4.4 Method for Data Collection

The collected data is the outcome of two main sources of information:

- a- first hand information from contractors: direct contacts were established with the contracting companies involved in construction works, in order to have the exact figures on cost, work schedules, together with hints about technical or organizational problems.
- b- questionnaires and field surveys: the questionnaire was directed to supervising engineers and architects to enquire about technical and organizational problems encountered

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CONTRACTING COMPANIES :

COMPANY NAME	No(BUILDINGS)	No(DWELLINGS)
GAM'EYA FOR CONSTRUCTION	14	672
EL'ARABEYA GENERAL	17	816
EDWARD	13	624
ATLAS	—	—
EL'SA'ID	15	720
EL'NIL FOR BRIDGES	5	240
EL'BAHR-EL'AHMAR	—	—
EL'DELTA	—	—
EL'NASR	—	—
EL'GIZA	16	768
SPEECO	24	1152
EL'KAHERA	9	432
SOBHY HUSSEIN	18	864
ALEXANDRIA	12	576
ROLAN	25	1200
EL'CANAL GENERAL	—	—
EL'WADI	—	—
EL'ABD	14	672
EL'MAHMOUDEYA	20	960
TOTAL	202	9696

TABLE (2) : CONTRACTING COMPANIES RESPONSIBLE FOR THE
IMPLEMENTATION OF THE MOKATTAM PROJECT .

4 - THE FIELD SURVEY (THE MICRO CONTEXT - A CASE STUDY)

on the site. The field survey was essential to highlight the real progress of the project and the performance of the prototype used.

4.5 Questionnaire Structure and Concept

In order to have a coherent registration of information, and subsequently to allow rational analysis of collected data, the questionnaire directed to supervising engineers and architects in the field comprised five main sections:

- the first section focusses on the basic data, namely: the name of the contracting company, the housing prototypes used & the number of dwellings to be erected.
- the second section shifts to the organizational aspects, including: the type of clients, expected users, marketing mechanisms, means for allocating the dwellings, means for getting in contact with the expected clients /users.
- the third section covers the financial aspects such as: the real cost of the square meter, the expected selling cost for the square meter, the cost of infrastructure, the recognition of problems leading to the escalation of construction costs.
- the fourth section covers the technical information including the methods of construction used, the types of modifications undertaken during implementation as regard:
 - materials
 - specifications
 - plans
 - elevation
 - technical installations.
- The fifth section invites personal remarks and further elaborations to be added by the questioned person, to highlight the technical advantages and disadvantages of

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the prototype according to his experience.

A copy of the questionnaire is presented in Appendix (2), as well as a sample of a completed form.

4.6 The Questionnaire Analysis:

The questionnaire proved to be successful inspite of the time and technical limitations. The questions were easily understood and answered by the project supervisors.

The analysis of the replies and reactions allowed the formulation of a clear picture about the types of problems encountered.

A brief outline of selected aspects is highlighted below

- the questions related to the organizational aspects; showed the following, general pattern trends
 - the dwellings are allocated through the General Organization of Housing Cooperatives (GOHCO).
 - the organization could allocate the units both to professional syndicate members, and to the general public through advertisements in the local daily newspapers.
 - priority of dwelling allocation is decided on the details of demographic & social factors including: Marital Status (flats are allocated to newly married couples without much concern about home-work geographic relation).
 - the clients/users are not usually known at the early stages of the project development and hence they do not participate in any decision making process related to the design and implementation work.
- the questions related to the economic aspects;

pinpointed the following:

- the cost of the square meter of partially finished dwellings varied between 130 and 165 L.E. and the

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distribution of the cost for the different works is approximately as follows:

- foundations: 14%
- main structure (R.C. skeleton) 37%
- partial finishing walls, plaster, fenestration, technical installations etc. 49%
- the cost of the completely finished square meter was estimated to be of the order of 225 to 235 L.E.
- the proposed marketing-cost for the partially finished dwellings is ranging between 180 L.E. for the square meter of the larger dwellings and 203 L.E. for the square meter of smaller dwellings (as stated in an advertisement in the official newspapers).
- The questions related to technical aspects showed the following information:
 - Traditional methods of construction were invariably used for the erection of all the sites reviewed, contracting company avoided the use of beamless slabs, and all adopted the concept of columns, beams and slabs.
 - The nature of the site and its relatively severe topography has not been taken into consideration at the early stages of layout development. Accordingly, problems arised when the relatively long buildings were located across the contour lines.
 - The rock soil at the Mokattam plateau area did not help reducing the foundation costs.
 - As for the modifications suggested to the initial concept, and related execution drawings, the following remarks have been registered:

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- No modifications on the plans were observed
- some modifications were registered for the elevations including: the contracting companies did not respect the suggested staggering of the openings in subsequent floors. All openings were aligned and respected the same order in all floors. The contracting companies changed the form and proportions of the windows indicated in the implementation drawings (narrow and elongated). They used the traditional standard types of windows (almost square in proportions) giving the same area of openings. The contracting companies did not try to execute the suggested details for balconies and roof parapets although the suggested details would not add to the cost.
- Some of the suggested materials in the specifications sheets have been exchanged by others of the same cost for reasons of availability in the market of the contracting companies.
- The questions related to the technical views and remarks of the supervisors
pointed out the following:
 - technical advantages:
 - The rational distribution of columns in the conceptual and executional drawings (located at equal intervals in the two directions of the plans) allowed the easy demarkation of the buildings in site.
 - The rational design of the system of construction (equal bays, standard reinforcement for repetitive spans, etc..) helped to speed up the time of erection and to decrease cost.

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- The rational design of the system of construction helped saving in materials usually resulting from the lack of standardization of used elements.
- The partially finished dwelling would encourage the users to suggest the internal arrangements most suitable for their dwellings (internal flexibility).
- Technical disadvantages
 - The type of soil at the Mokattam area East Cairo and the improper location of buildings as regard to site topography created problems that strongly affected cost.
 - Some supervisors pointed out the chaos that would occur when the users start to incrementally complete the internal finishing of their dwellings.
 - Some supervisors beleived that the users would have preferred a better finishing for some of the items that are presented at the early phase, specially bathrooms and wet areas.

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Fig.(37):The Mokattam Project; construction methods & stages (1)

4 - THE FIELD SURVEY (THE MICRO CONTEXT - A CASE STUDY)



Fig.(38):The Mokattam Project; construction methods & stages (2)

4 - THE FIELD SURVEY (THE MICRO CONTEXT - A CASE STUDY)

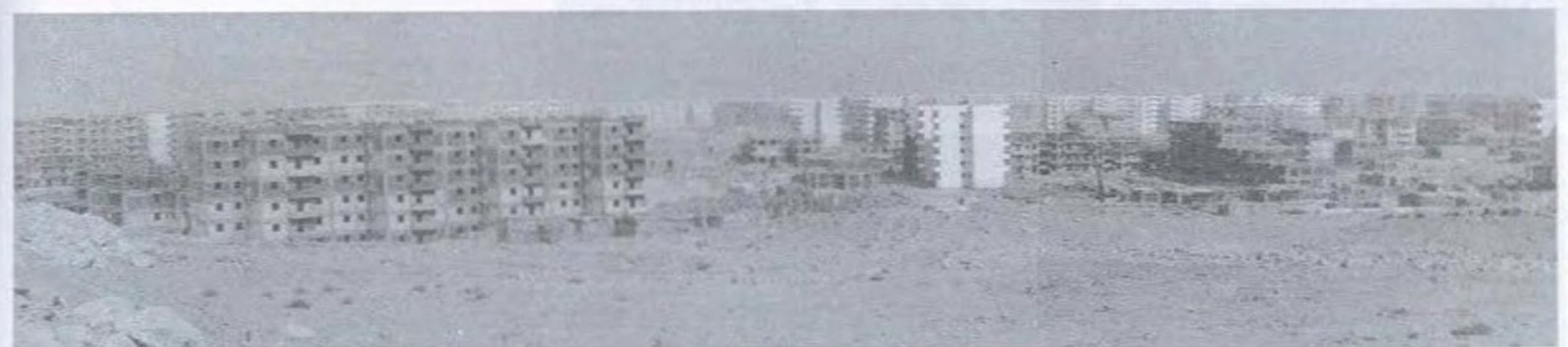


Fig.(39):The Mokattam Project; panoramic views of the project

4 - THE FIELD SURVEY (THE MICRO CONTEXT - A CASE STUDY)



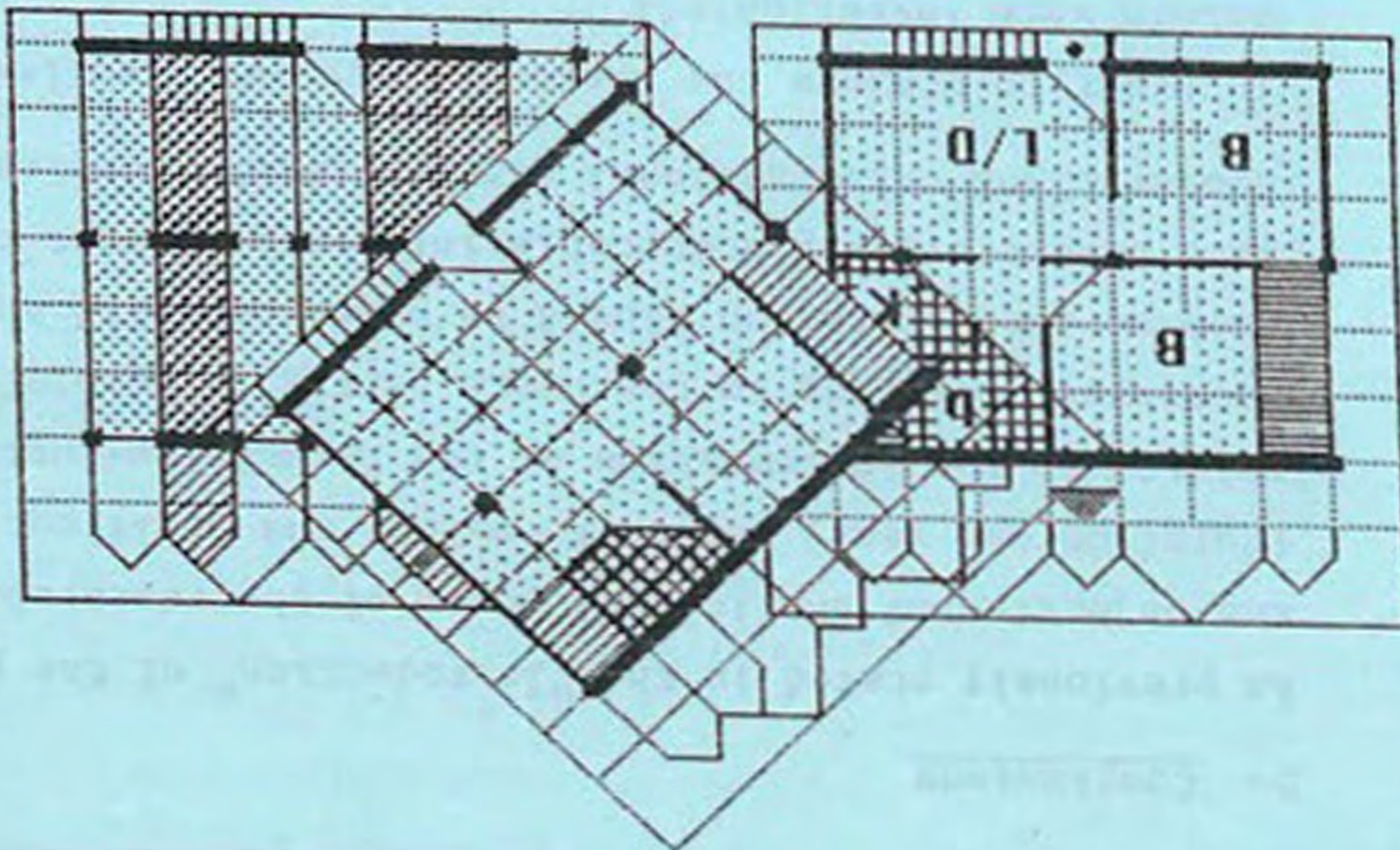
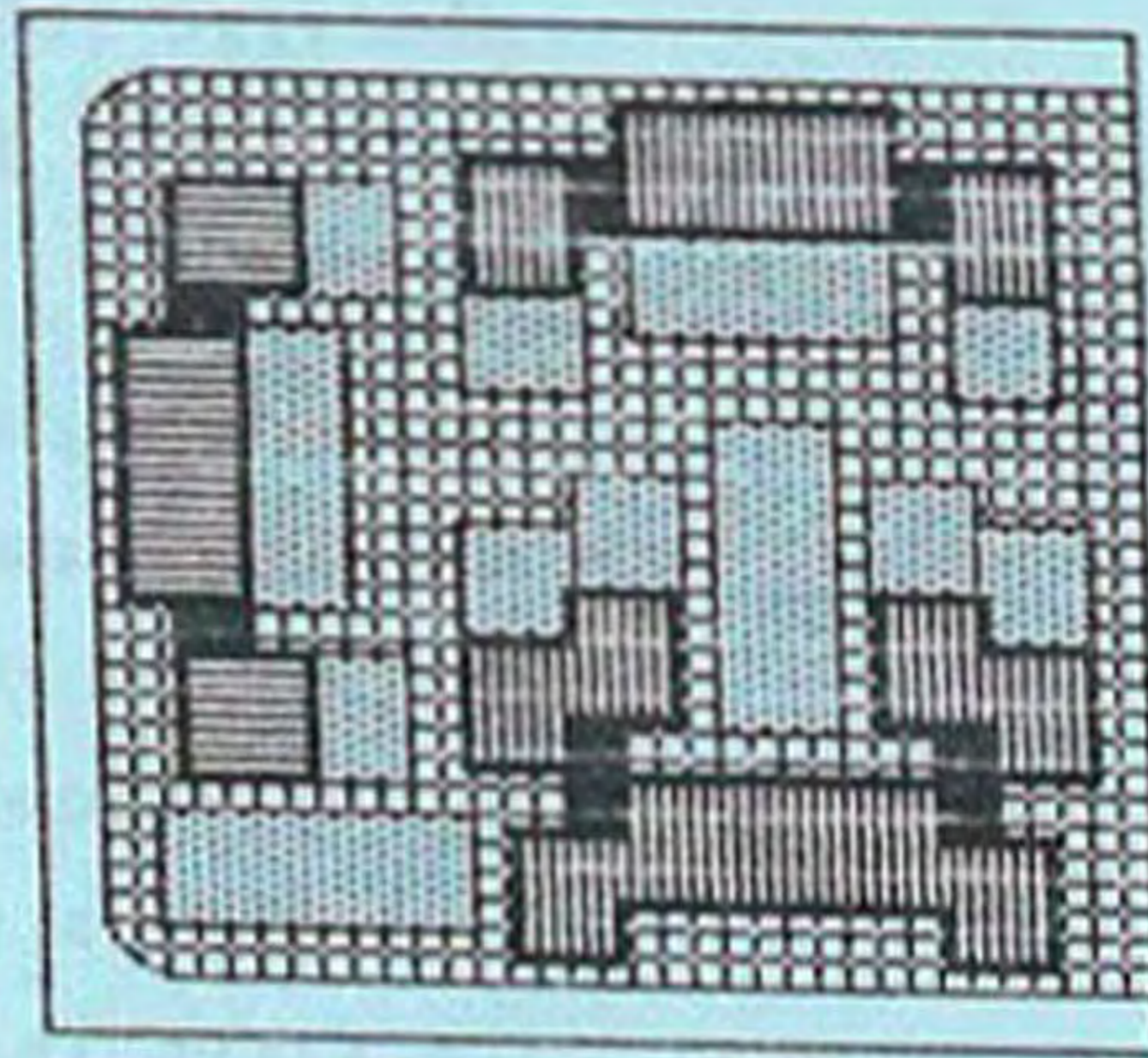
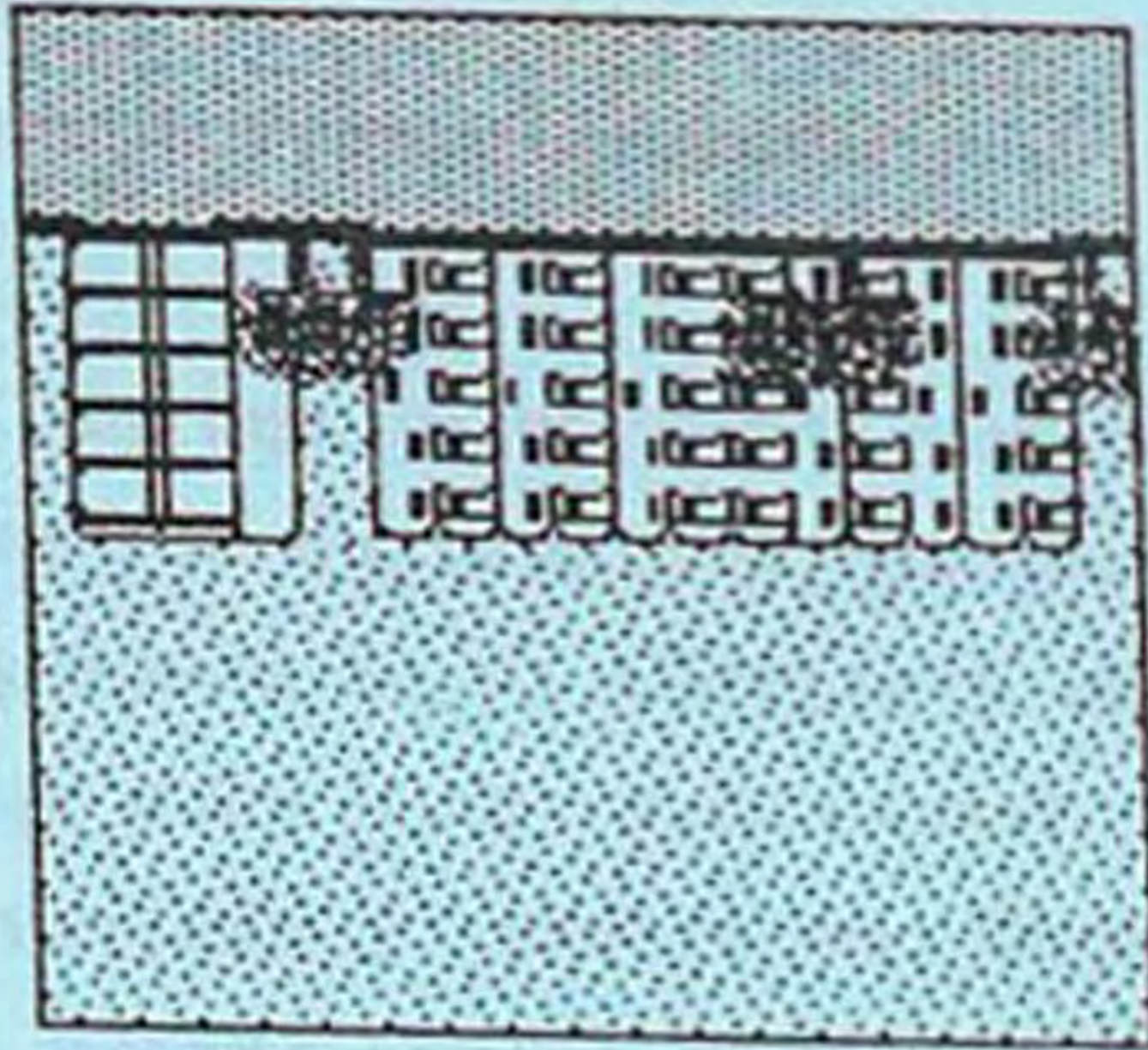
Fig.(40):The Mokattam Project; facade treatments and variations

1991

FINAL REPORT

CONCLUSIONS

5



5 - CONCLUSIONS

5- Conclusions

As previously stated in the "Introduction" of the present work, the objective of the initial phase of the research project (duration one year) was to formulate and spell out the problems related to the implementation of the formal low-cost housing prototypes offering to the users partially completed dwellings. Problem identification should be based on solid and realistic data base providing acceptable information about the technical, economic and organizational aspects of the housing projects.

In order to achieve the stated objectives, two levels of information were investigated:

- The first level (the macro level) relied upon documented data showing the extent of application of the formally adopted prototypes. Such data showed the volume of the dwellings to be erected, the bodies and agencies involved in financing and implementing the projects and the location of the projects throughout Egypt.
- The second level (the micro level) adressed more specific implementation data and was based on a detailed field survey for one of the housing projects in the process of implementation.

The two levels of data collection proved usefull in highlighting the types of problems already encountered or likely to arise in the forseable future.

The data collection related to the macro level gave information about the size of projects to be erected, their location and the supply agencies involved in the process. Such information was indicative of the types of problems to be encountered, including:

- Problems related to the contextual adaptability of the pro-

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types: the location of the projects dramatically varies from the view points of climatic conditions, urban features and character, community needs and local cultures. The prototypes are used with no consideration what-so-ever to the above. No modifications were developed in response to cultural, environmental and contextual variabilities.

- Problems related to technical and organizational aspects of the implementation process (structural features, materials, components, finishes, available labour force, contractors, institutions, etc...). The suggested prototypes did not address technical and organizational problems resulting from variations in the types of institutions dealing with the implementation phase.

The data collection related to the micro level highlighted key information about the real problems encountered during the implementation phase. A field survey of large scale housing project using the formal low cost housing prototypes helped the recognition of a number of detailed implementation related problems. The questionnaire directed to site supervisors (civil engineers and architects) proved beneficial to the current investigation pointed out the following problems areas:

- From the technical point of view, the relatively severe topography of the site created many problems, as it was not taken into consideration at the early stages of layout developments. Furthermore, the type of soil, (rocky and swelling clay combined) increased the foundation costs and reflected on the total per square metre cost.
- From the organizational point of view, the absence of adequate supervision allowed the execution companies to change many features and details in the facades (shape & location of openings) without any valuable reason (technical or economic). In the same time doubts were aired regarding

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the chaos that might occur when the users start to incrementally complete the internal finishing of their dwellings. Mechanisms for dwelling allocation to the users are rather absent.

- From the economic point of view, it is quite obvious that the unfinished dwellings are some 25 to 30 % less expensive than the finished units. However, the price of the dwelling is still far beyond the affordability of the target users . It seems that low-cost formal dwellings are more suitable and affordable by the middle income groups. A fact that calls for a dramatic review of the adopted housing policies.

From the collected and analysed data, it seems that the types of problems encountered vary considerably in terms of level and nature. Some are rather political and hence calling for a review of the policy encouraging large scale application of the proposed prototypes since the target users (or demand groups) are not clearly identified. Other problems are easier to deal with since they are related to technical and organizational aspects.

As for the more complex problems (the politically oriented), they deserve to be highlighted here in, although they are clearly outside the scope of the present research project.

- The cost of the unfinished dwelling is ranging between 9000 and 13000 L.E., according to its total area. Economic studies showed that the cost of a dwelling should not exceed four times the annual income of the family, if the monthly payments of the state loan installments can be met. This applies even to the favourable conditions allowing the loans to be settled over 30 -40 years (at an unrealistic heavily subsidised interest rate of 4%). Such calculations mean that the families that can afford the partially completed dwellings should have an annual income of 2200 to

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3200 L.E. According to the Egyptian formal statistics, such an income characterizes the middle income families and not the needy families whose annual income ranges between 800 and 1500 L.E. and represent 70% of Egyptian families.

- The recently announced intentions of the Ministry of Housing, Egypt, regarding the designation of the task of completing and finishing of the low-cost housing units to public-sector contractions companies, further complicates the issue of suitability and the affordability of the partially completed dwellings to the target demand group. The logic behind the new directives was simply put as to protect the users from the high costs of incremental completion of the housing units. This means that the initial cost of the flats will jump up to some 12000 to 17000 L.E., a cost only affordable to an income group with an annual income of 3000 to 4200 L.E. i.e. a categorical abandonment of the objectives behind the policy, in terms of the target demand group and the utilization of the users potentials. The above clearly calls for a revision of the housing policy and related prototypes in order to clearly identify the target group of users for whom the dwellings are to be built and the appropriateness of the prototypes to the purpose.

As for the other types of identified problems (technical, economic and organizational) the next phase of the research project will attempt to formulate the guidelines to deal with and overcome them.

The next phase of the research project thus aims at the formulation of a comprehensive framework for the development of low-cost housing prototypes to avoid the problems encountered during the execution of the pioneering stage comprising thousands of those housing units.

5 - CONCLUSIONS

The comprehensive framework and related guidelines are to cover: conceptual designs, needed variations and contextual variability together with means of improving allocation of the housing units to target groups. The objective of the next phase can thus be rephrased as follows: to attempt to improve the performance of low-cost partially completed housing prototypes and to readdress the policies, conceptions and assumptions underlying them.

It is almost five years since the introduction of the concept and its formal application. A period that witnessed many changes in the local financial and monetary context (the shift towards open and free market economy, the diminishing role of the public sector, the floating national currency etc). This calls for a careful examination of the formal housing policy and the closely related supply and demand groups and in turn to critically examine the ambitious low-cost partially completed housing prototypes conception and programmes.

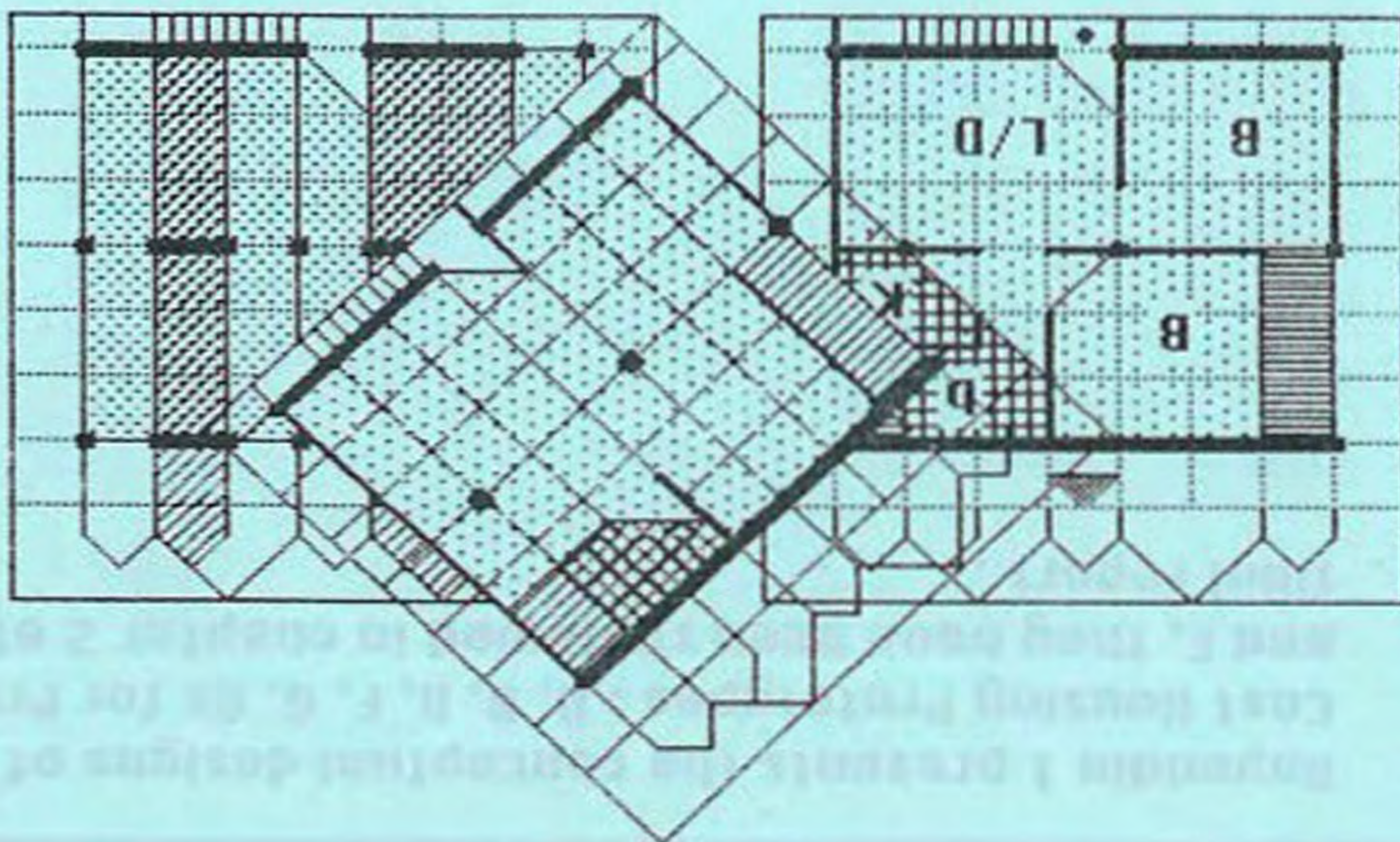
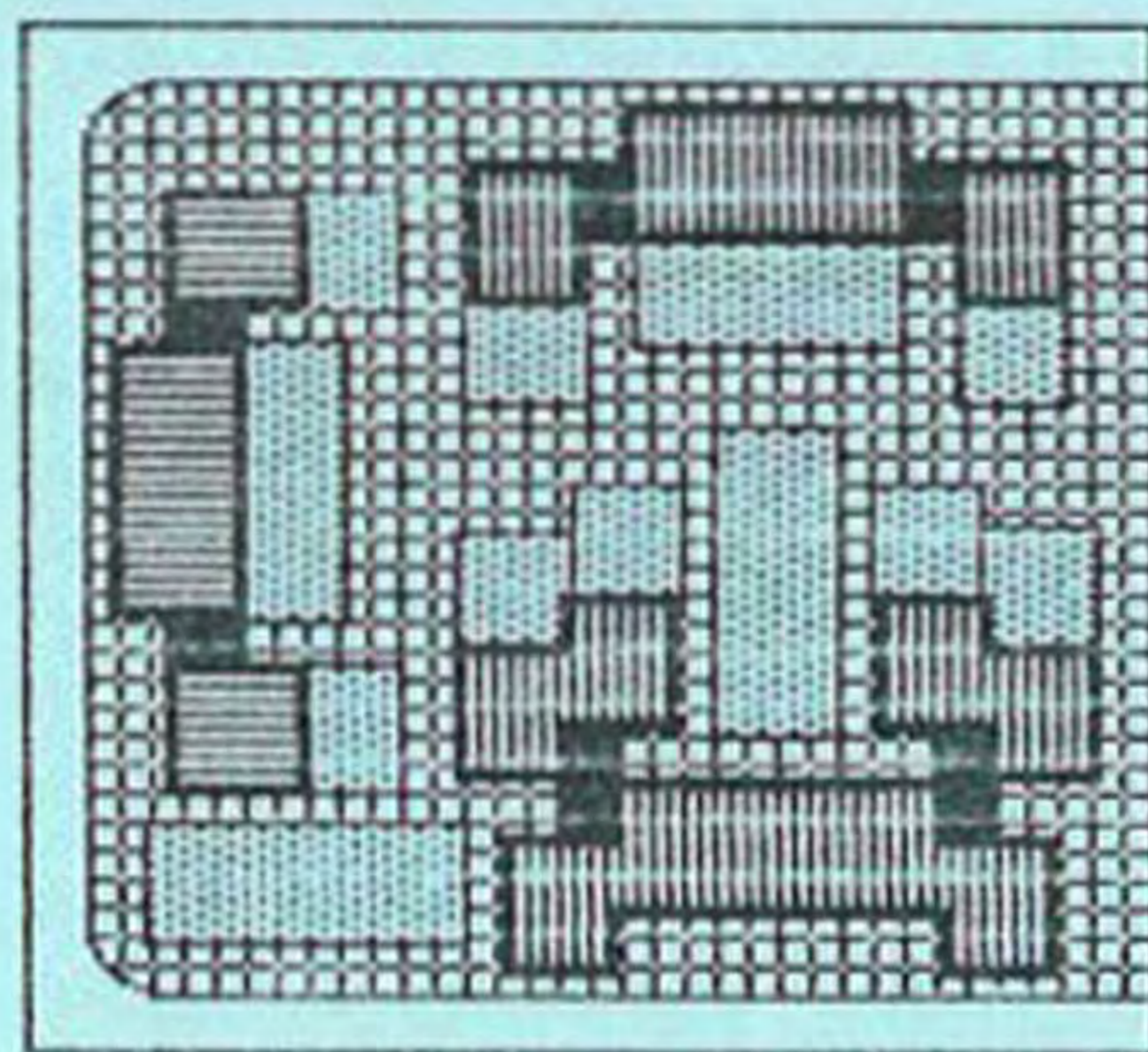
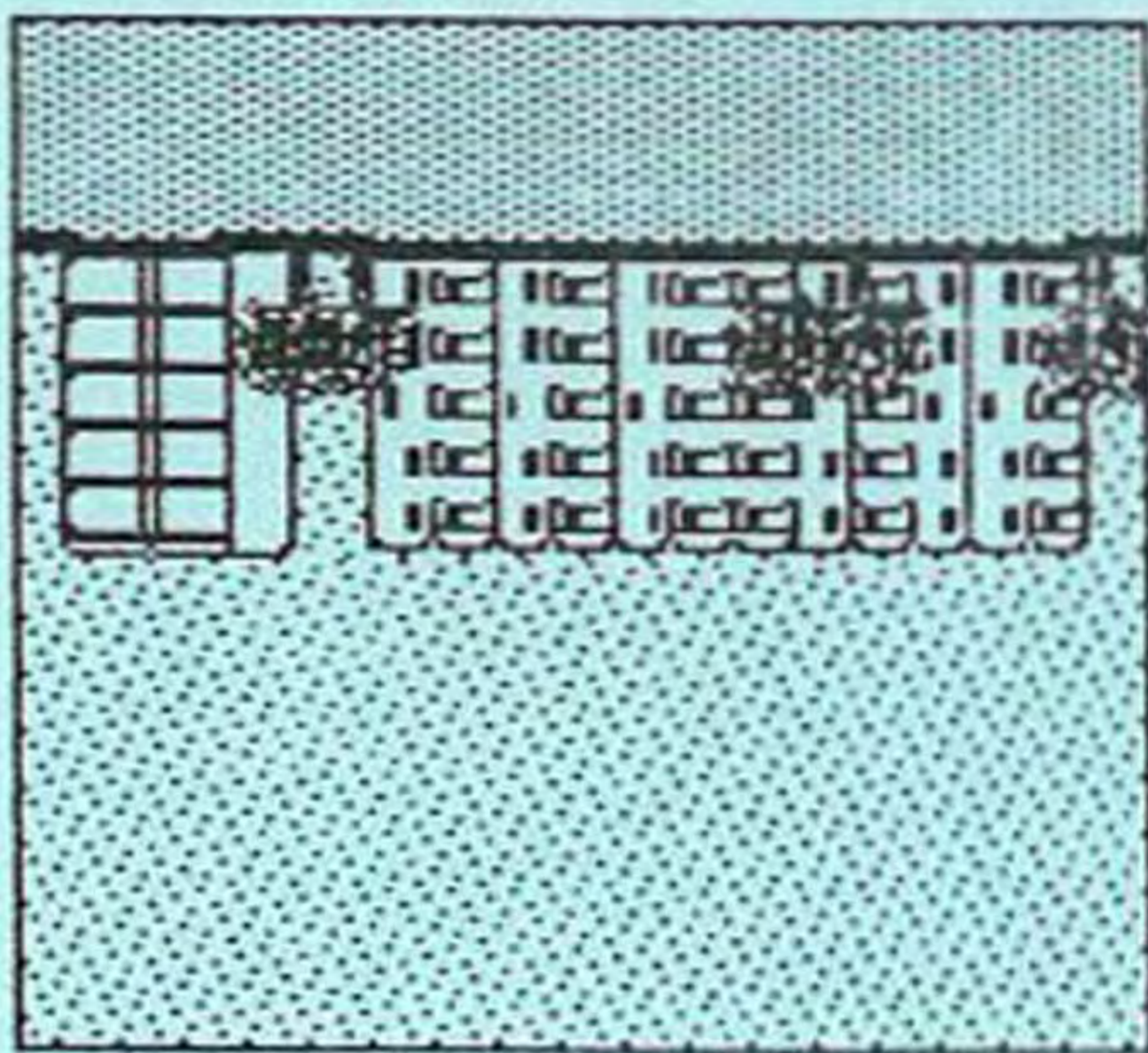
The objectives of the following phase of the research programme are rather ambitious (with time and resources limitations in mind). The work carried out during the preliminary phase, the clear definition of the information sources and the involved institutions together with the experience of the research team (who initiated and developed the prototypes) will collectively ensure the achievement of the goals behind the proposed research programme, the benefits of which will hopefully extend to the various levels of most agencies and involved groups of the Egyptian low-cost housing context.

1991

FINAL REPORT

CONCEPTUAL DRAWINGS OF THE SEVEN PROTOTYPES

APPENDIX 1 :



APPENDIX 1

Appendix 1 presents the conceptual designs of Formal Low Cost Housing Prototypes : A, B, D, F, G. As for Prototypes C and E, they have been reviewed in chapter 2 of the present final report .

LOCATION OF COLUMNS

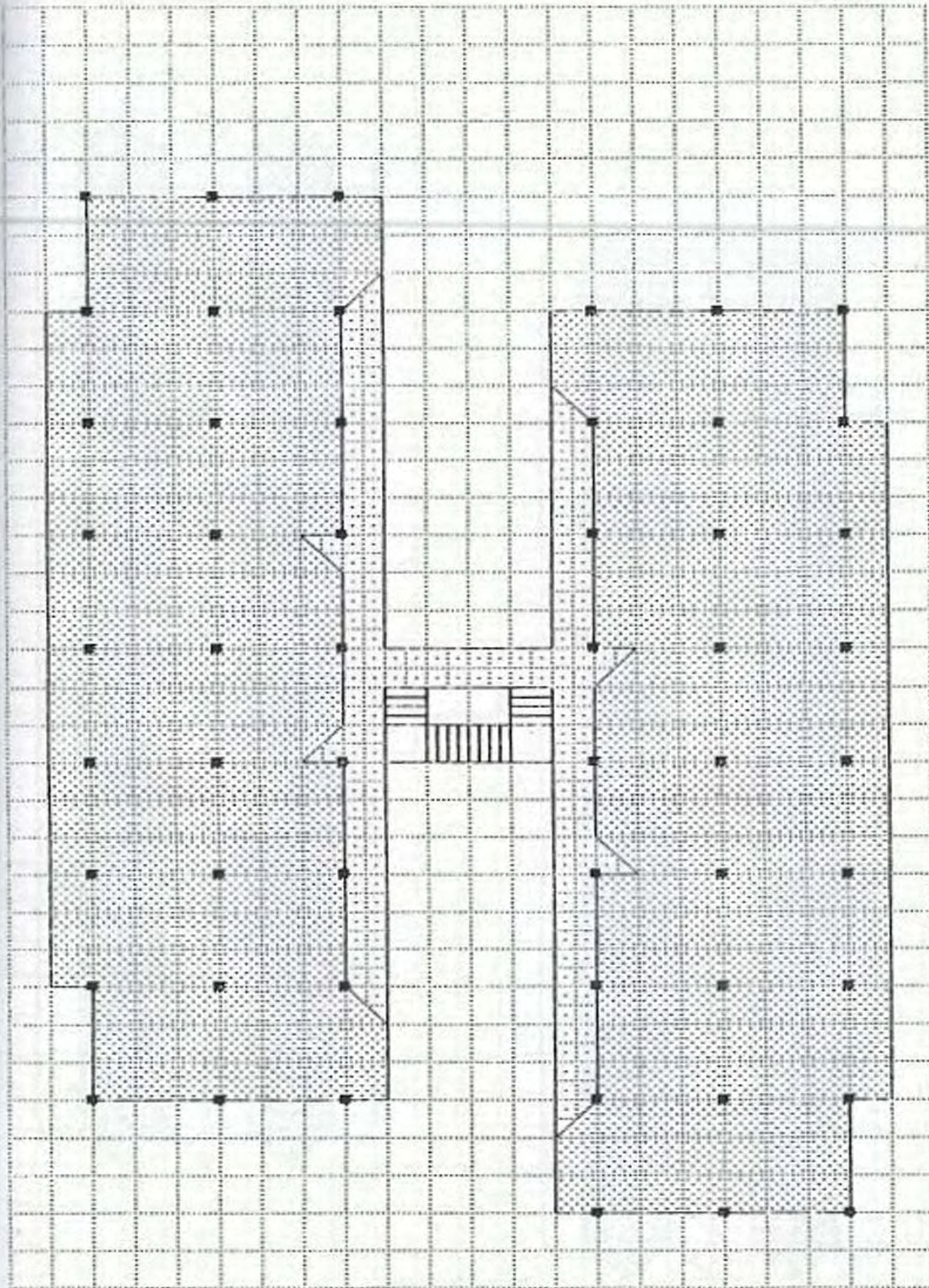
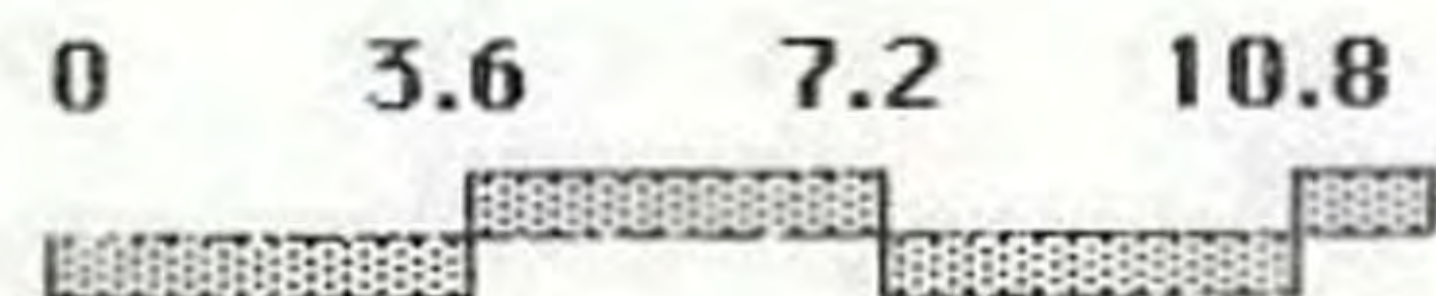
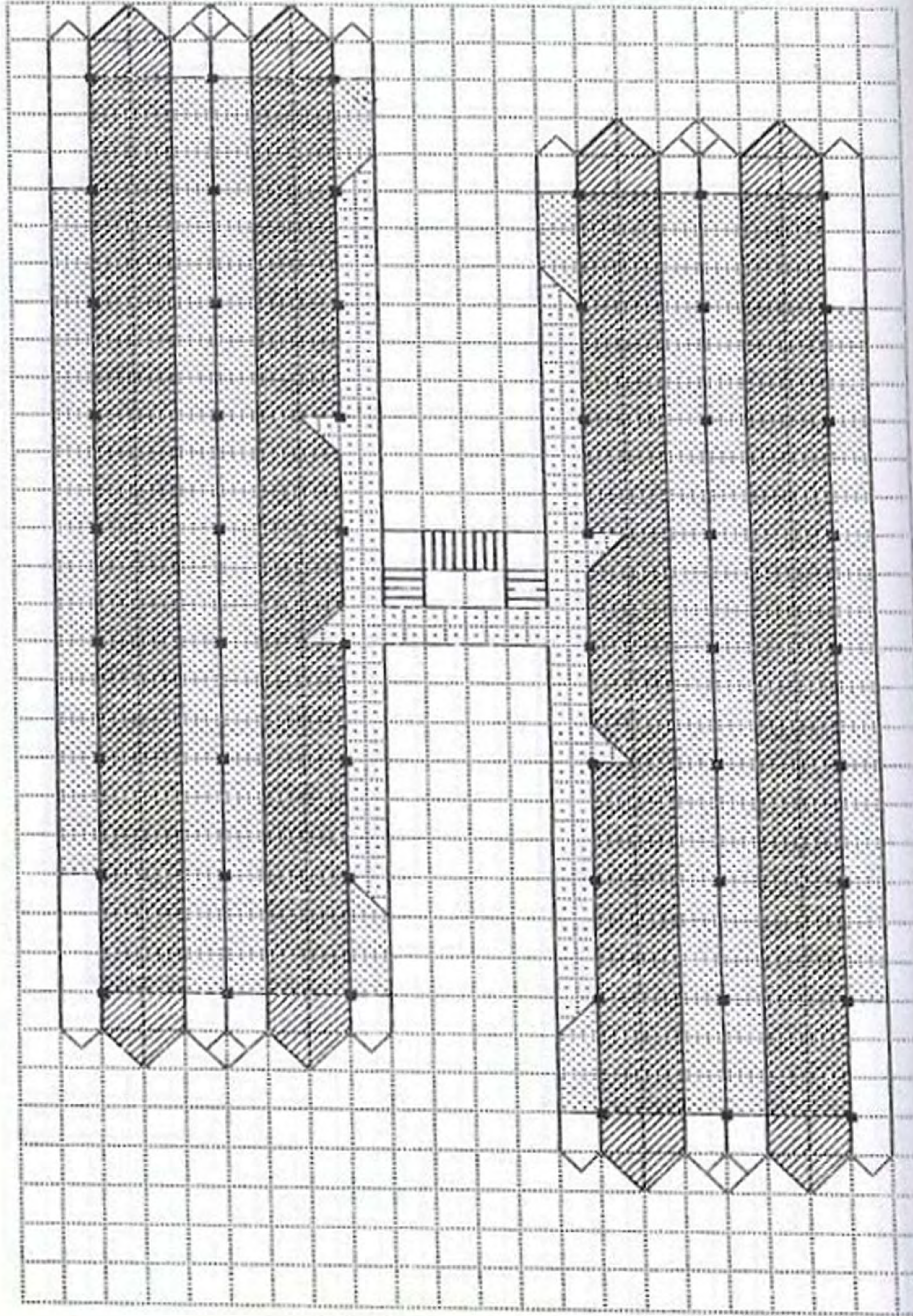
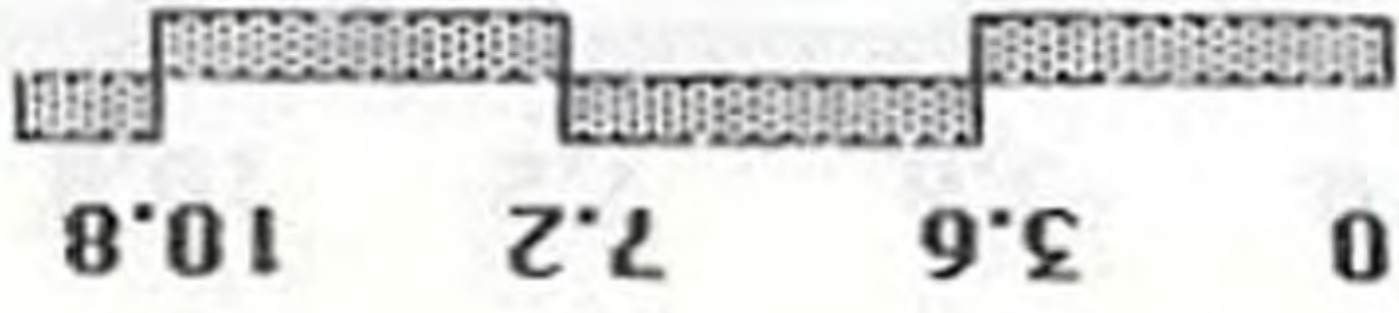


FIGURE (41) :

HOUSING PROTOTYPE (A),
LOCATION OF COLUMNS.





ZONE DISTRIBUTION

HOUSING PROTOTYPE (A),
CONCEPT OF ZONE
DISTRIBUTION.

FIGURE (42) :

APPENDIX

SUPREME COUNCIL OF UNIVERSITIES, EGYPT .
 FRCU - GRANT NUMBER MS / 89009
 NORMAL LOW COST HOUSING PROTOTYPES - EGYPT : MONITORING, ASSESSMENT
 AND DEVELOPMENT .
 FINAL REPORT - 1991

LOCATION OF SUPPORTS

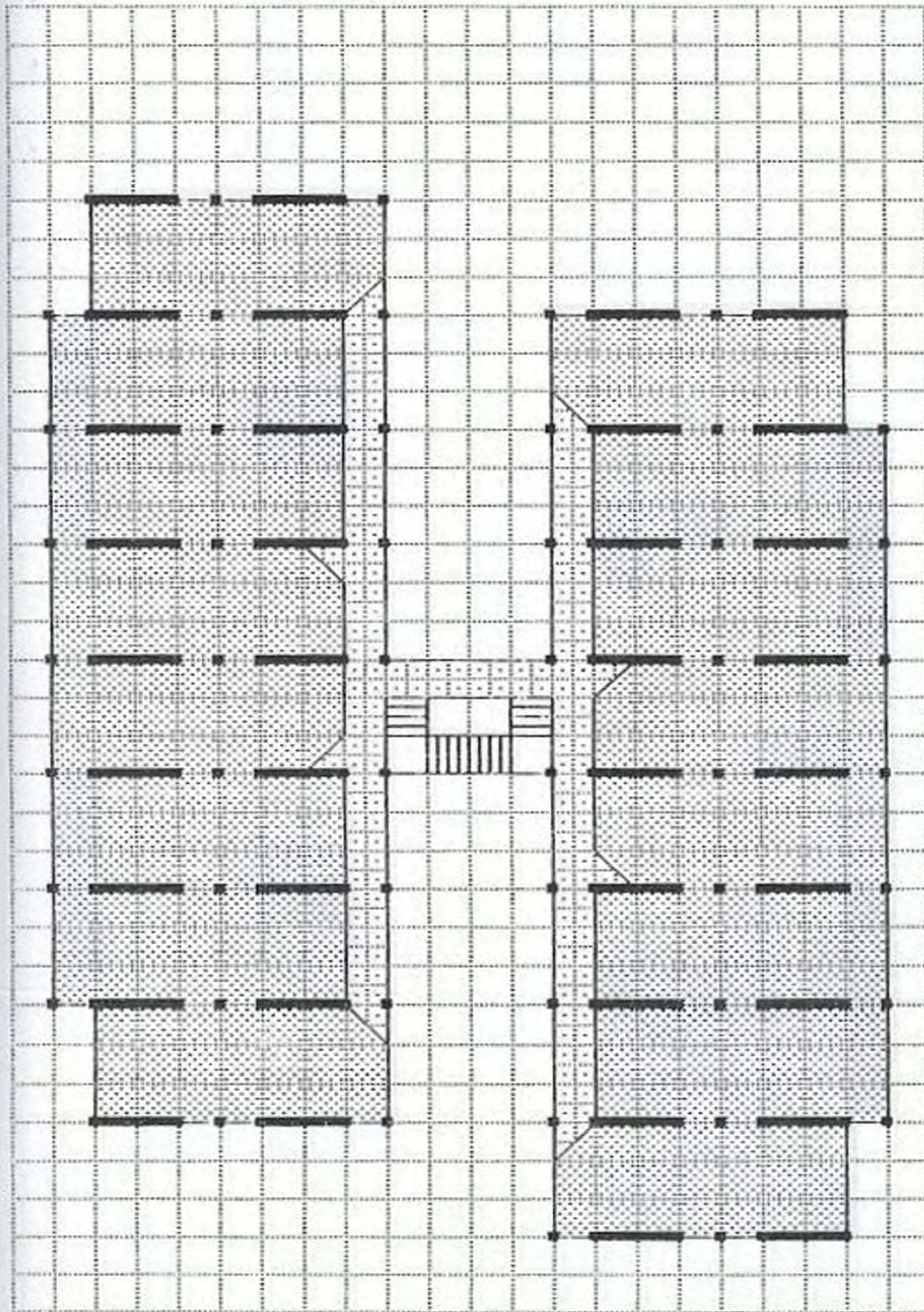
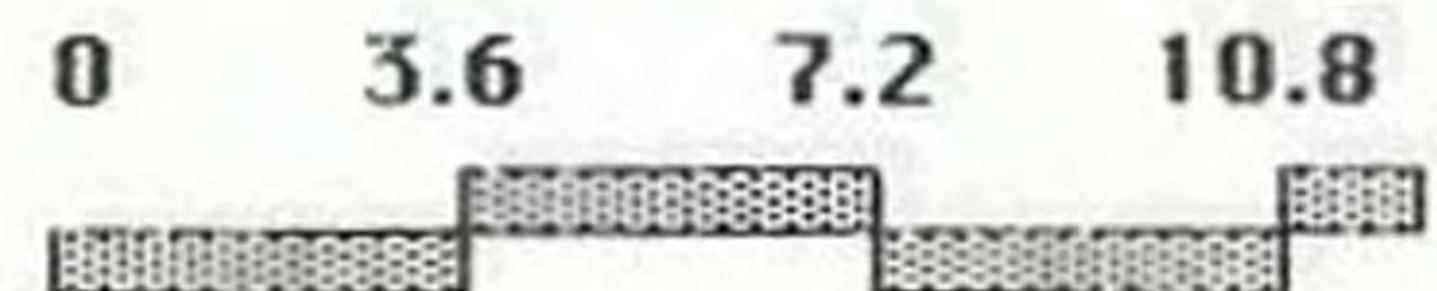


FIGURE (43) :

HOUSING PROTOTYPE (A),
LOCATION OF SUPPORTS
IN CASE TUNNEL FORMS
OR PREFABRICATED WALL
ELEMENTS ARE USED FOR
THE MAIN STRUCTURE.



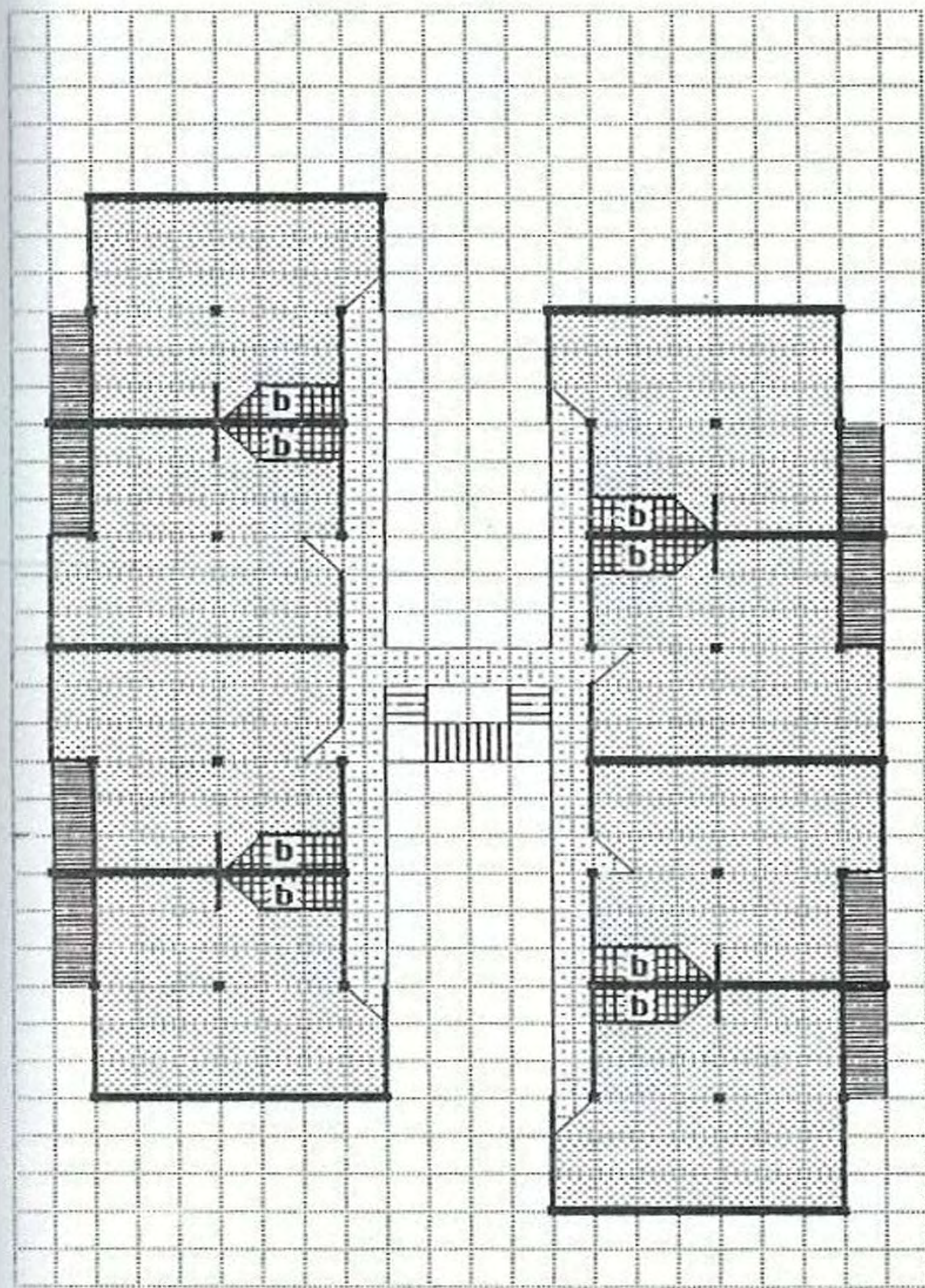
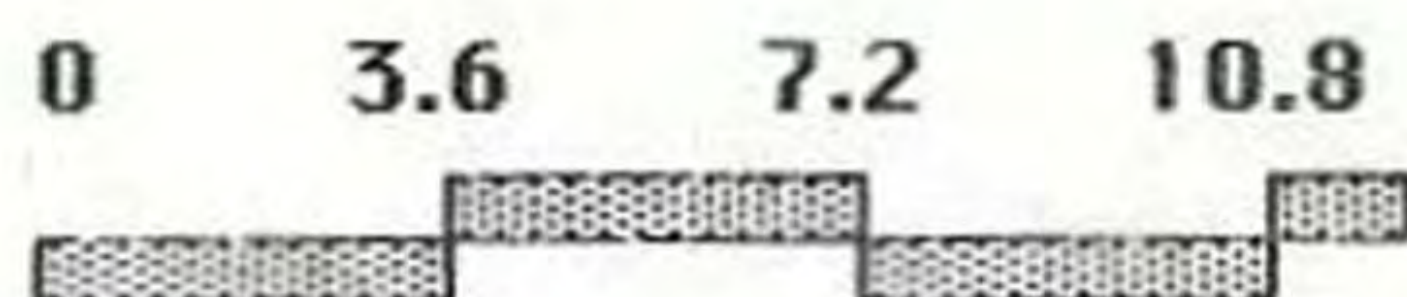


FIGURE (44) :

HOUSING PROTOTYPE (A),
PHASES OF DEVELOP-
MENT:

- INITIAL PHASE WITH
SUPPORTS, OUTER SKIN,
TECHNICAL INSTALLA-
TIONS.

AREAS OF DWELLINGS:
- 60 SQUARE METERS



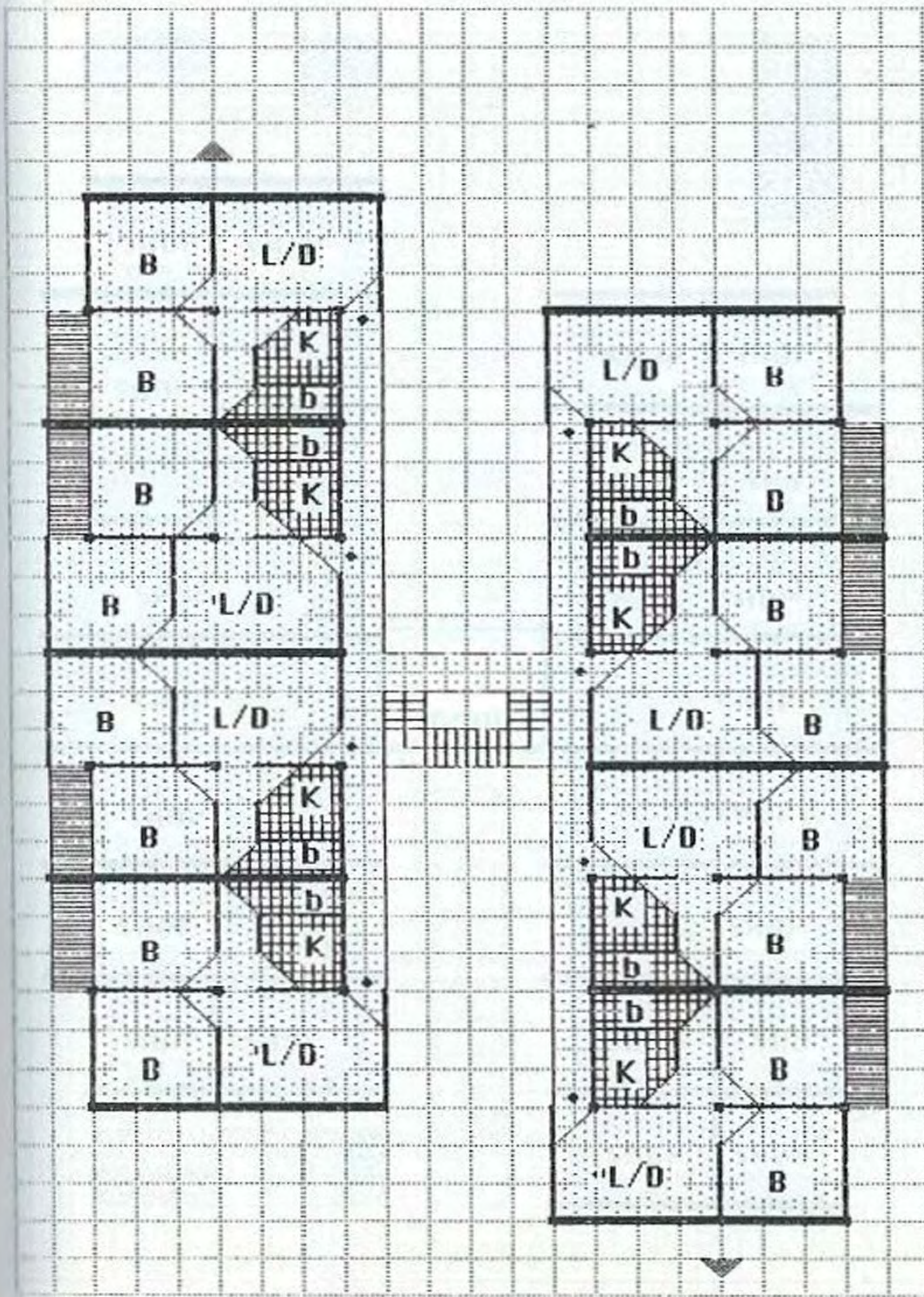

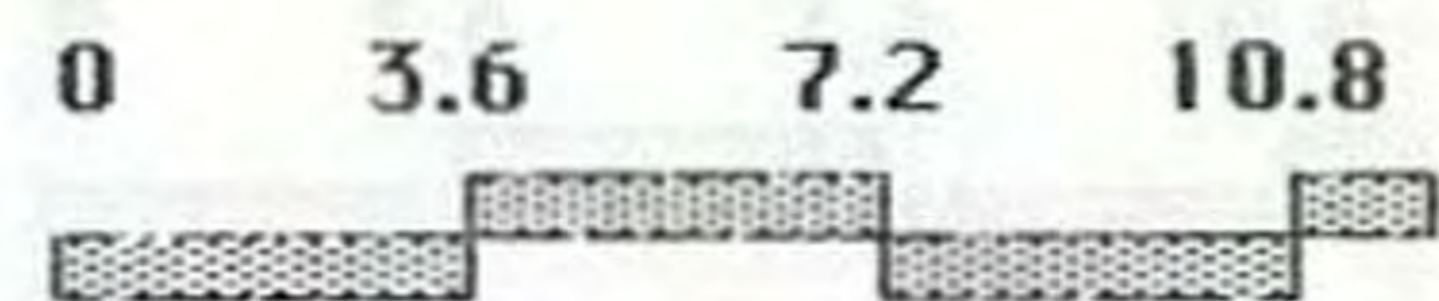


FIGURE (45) :

HOUSING PROTOTYPE (A),
 PHASES OF DEVELOP-
 MENT : 
 - FINAL PHASE LEFT TO
 THE USER (INTERNAL
 PARTITIONS AND
 GRADUAL FINISHING)

AREAS OF DWELLINGS :
 - 60 SQUARE METERS



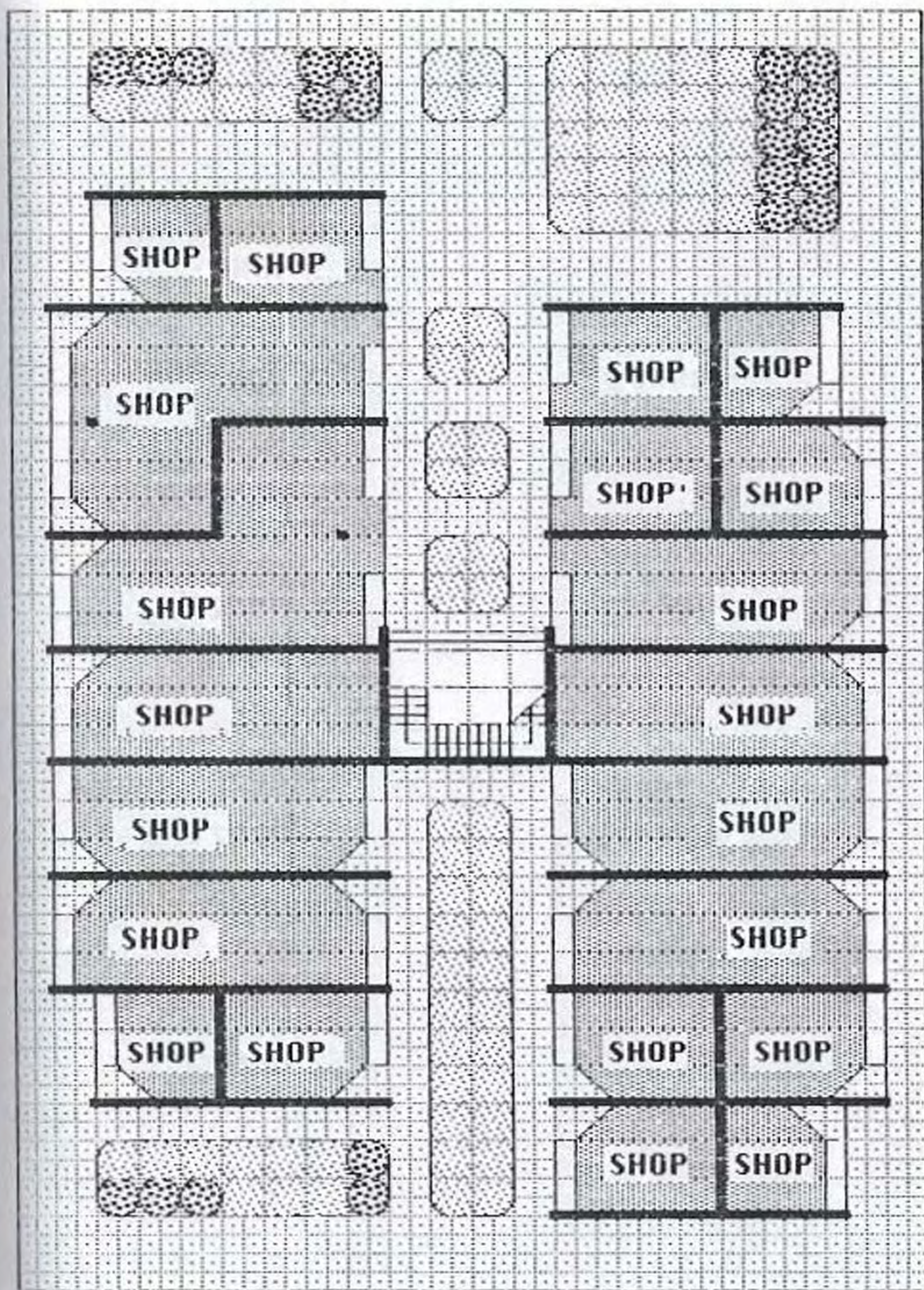
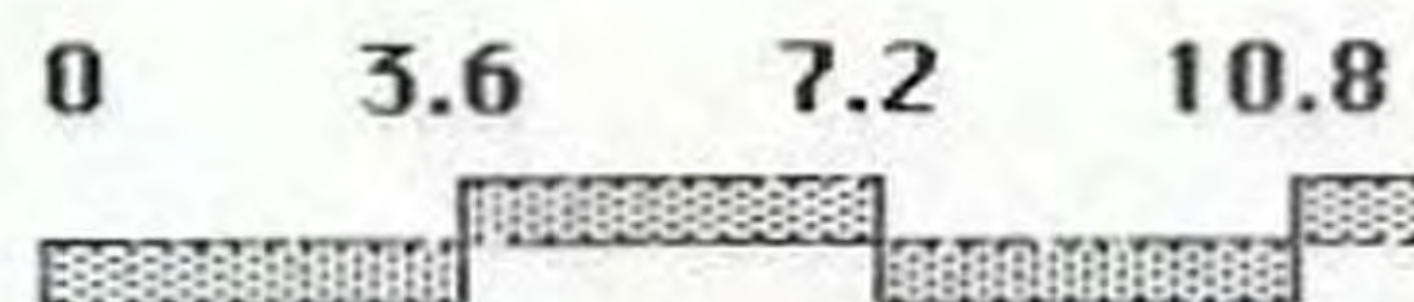


FIGURE (46) :

HOUSING PROTOTYPE (A) ,
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES



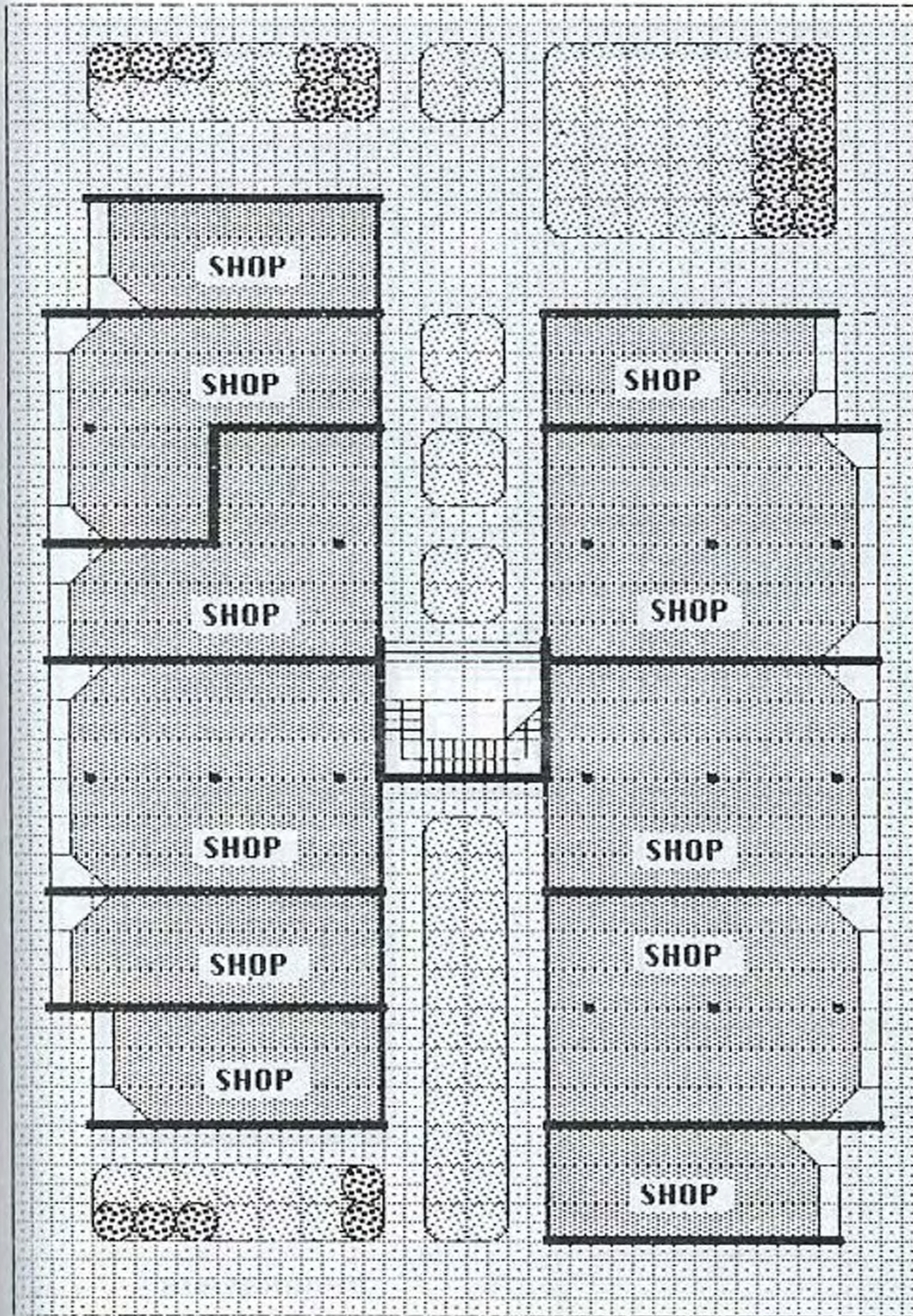
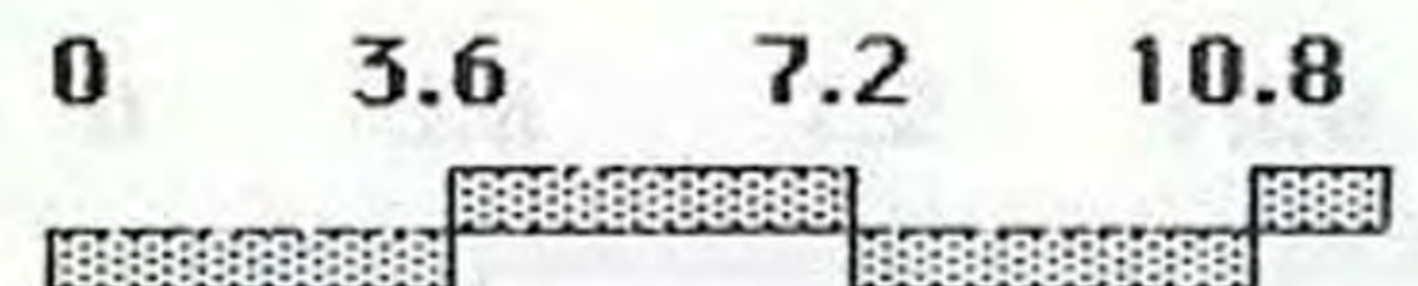


FIGURE (47) :

HOUSING PROTOTYPE (A),
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES.



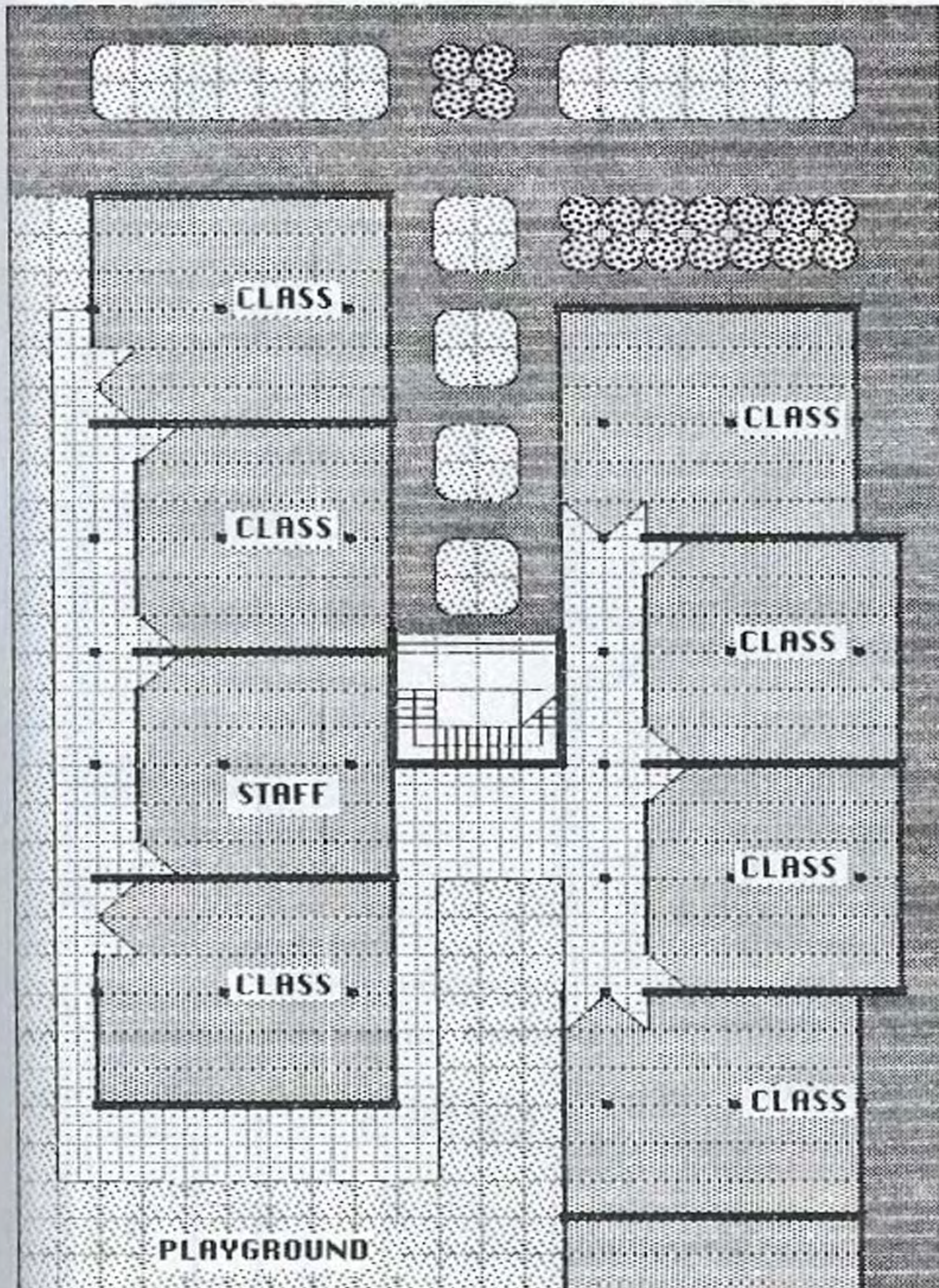


FIGURE (48) :

HOUSING PROTOTYPE (A),
POSSIBLE USE OF THE
GROUND FLOOR FOR A
SCHOOL, (See next fig.)



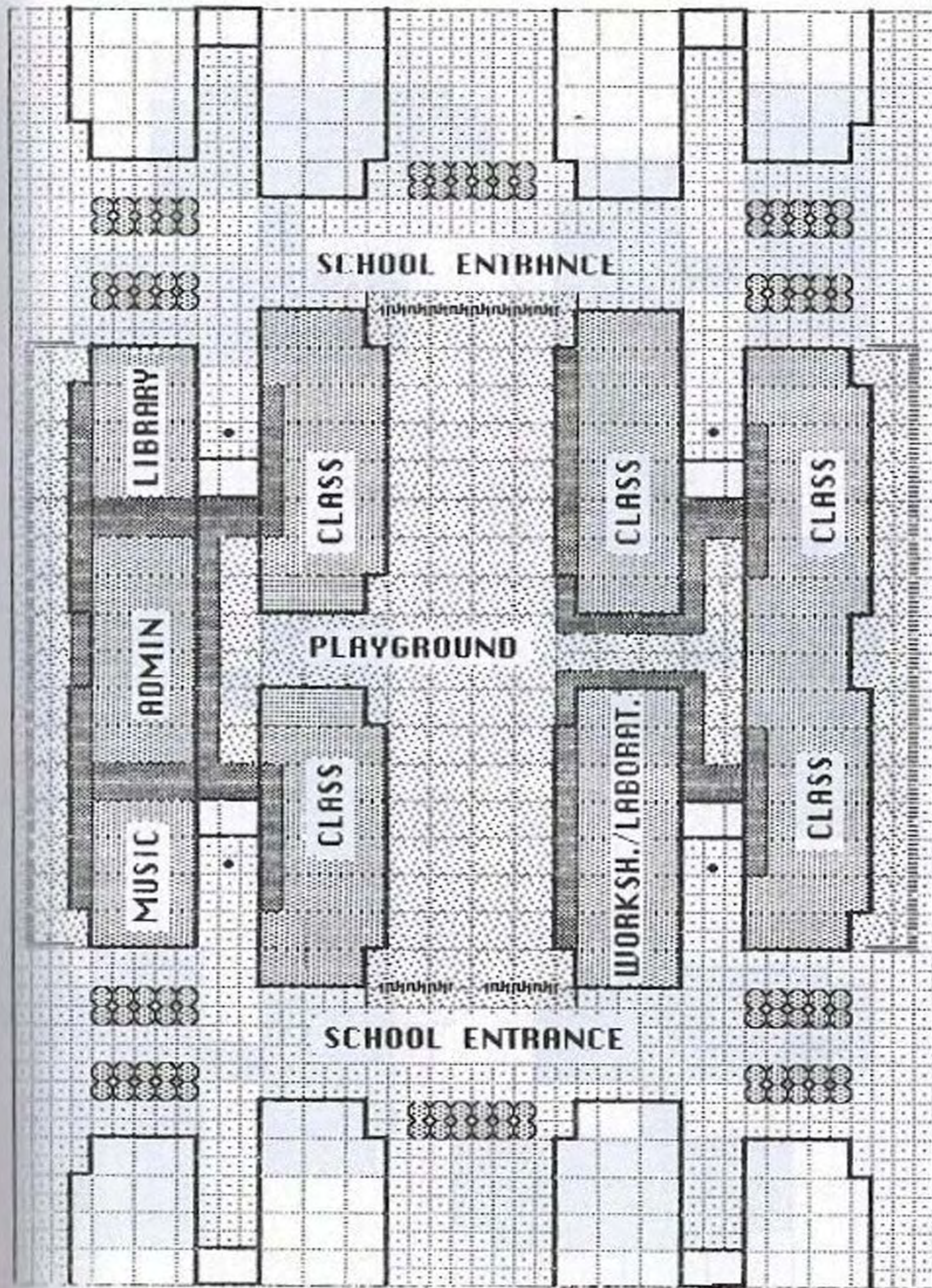
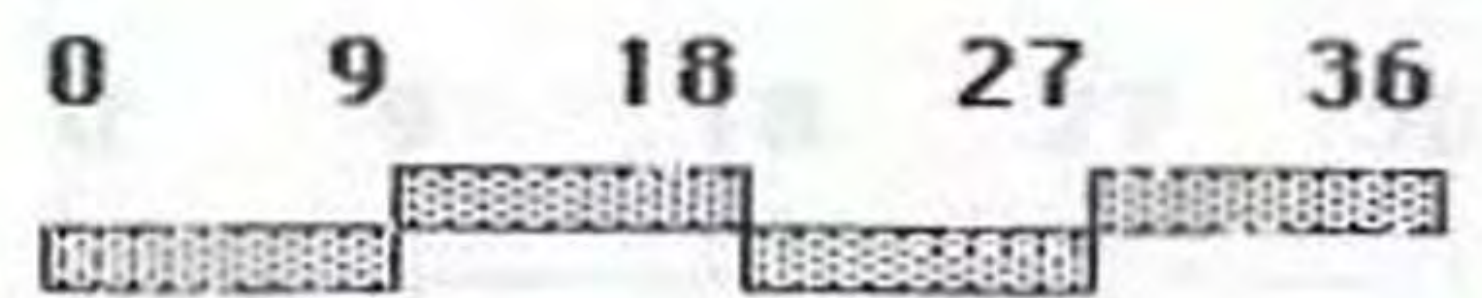


FIGURE (49) :

HOUSING PROTOTYPE (A),
POSSIBLE USE OF THE
GROUND FLOOR OF FOUR
APARTMENT BLOCKS FOR
A SCHOOL .



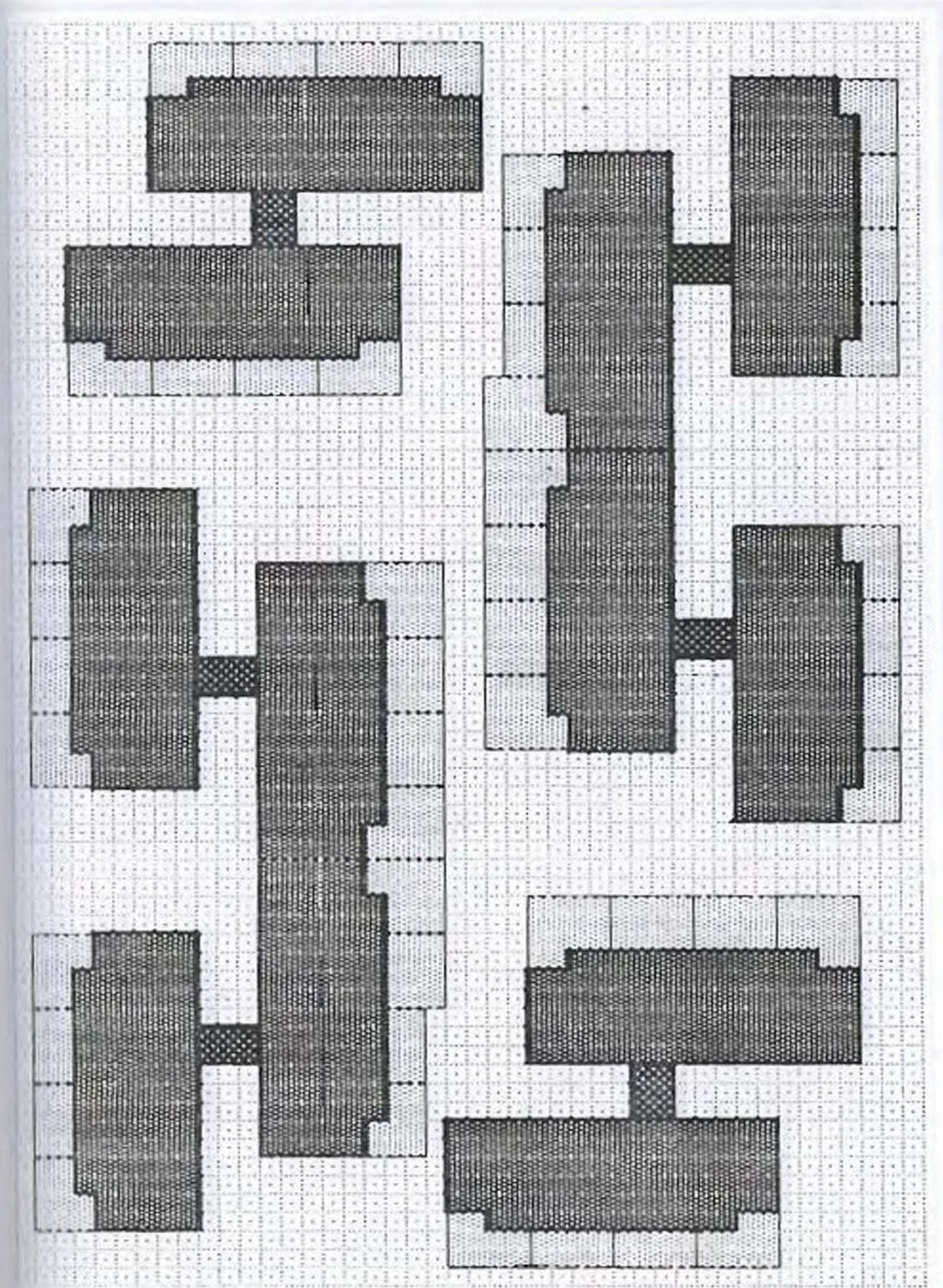
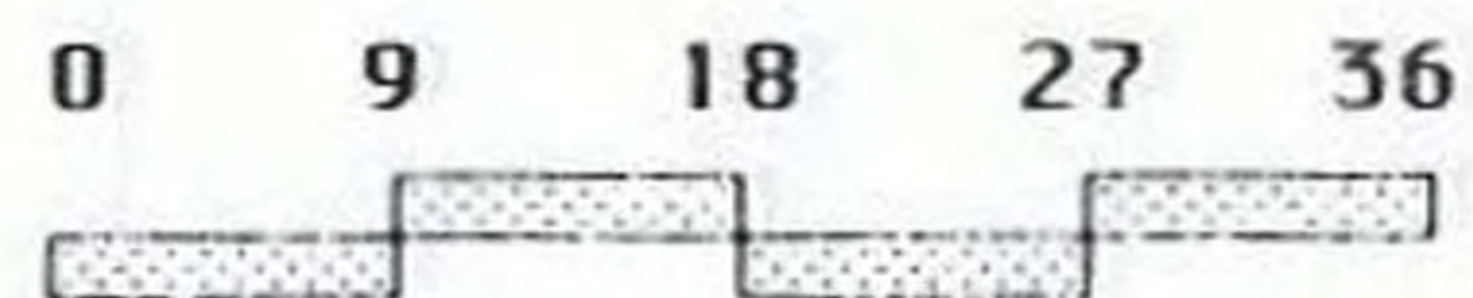


FIGURE (50) :

HOUSING PROTOTYPE (A),
HOUSING PROTOTYPE (A),
POSSIBLE ARRANGEMENT
FOR LAYOUTS

STRUCTURE NETWORKS
HELPING TO LOWER THEIR
COST

- INFRASTRUCTURE ROUTE
- FOOTPRINTS IN BUILDINGS



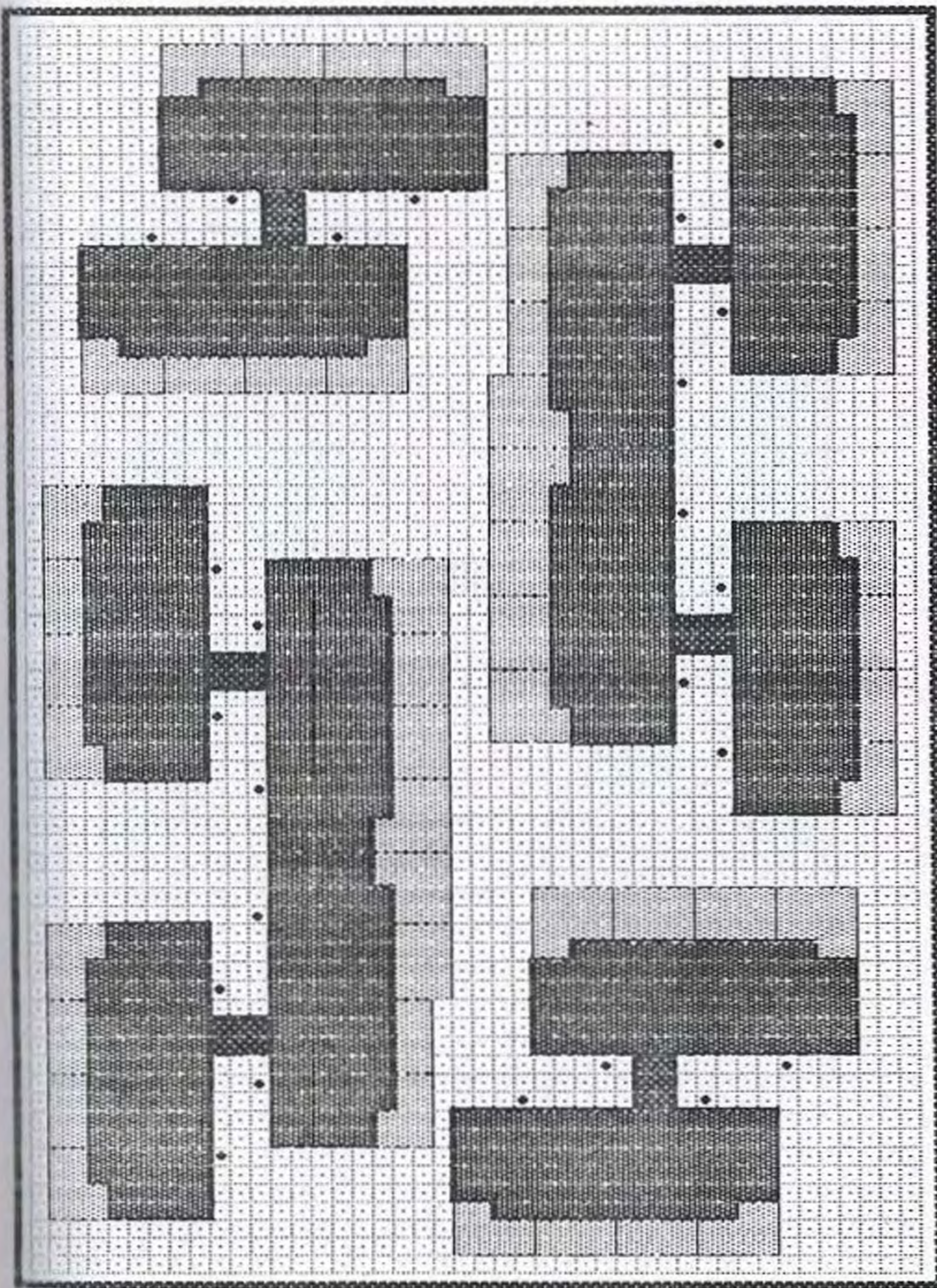
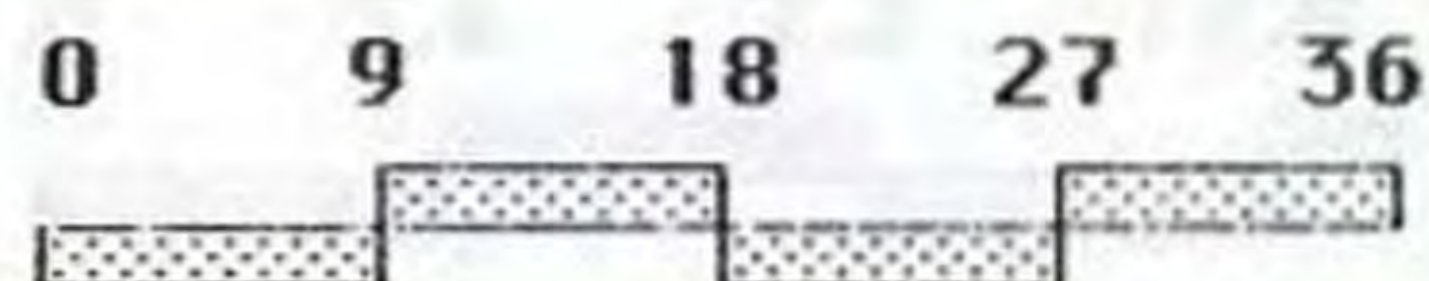


FIGURE (51) :

HOUSING PROTOTYPE (A),
POSSIBLE ARRANGEMENT
FOR LAYOUTS SHOWING
THE ROUTES FOR INFRA-
STRUCTURE NETWORKS
HELPING TO LOWER THEIR
COST .

- INFRASTRUCTURE
ROUTE
- WETPOINTS IN
DWELLINGS



LOCATION OF COLUMNS.

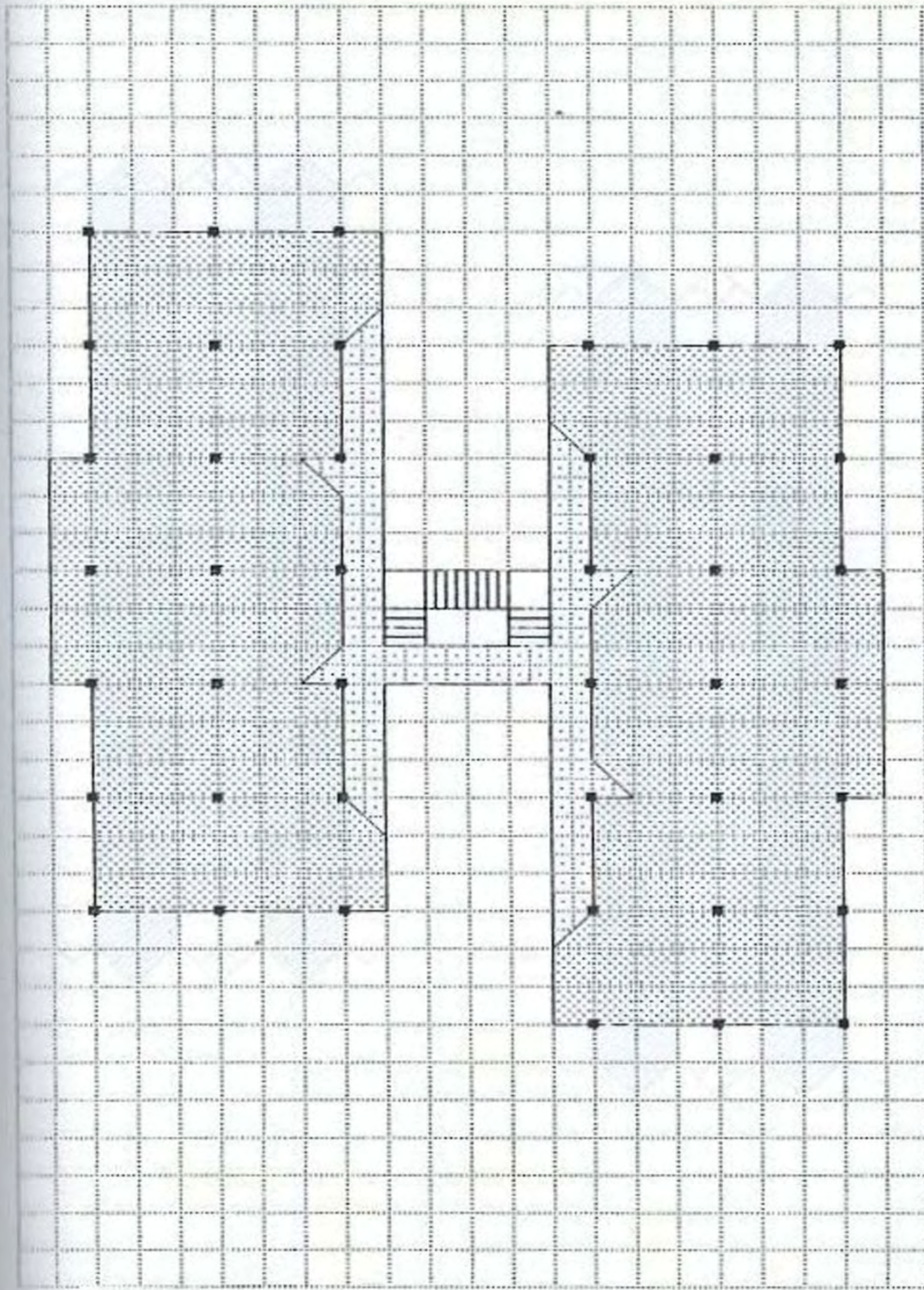
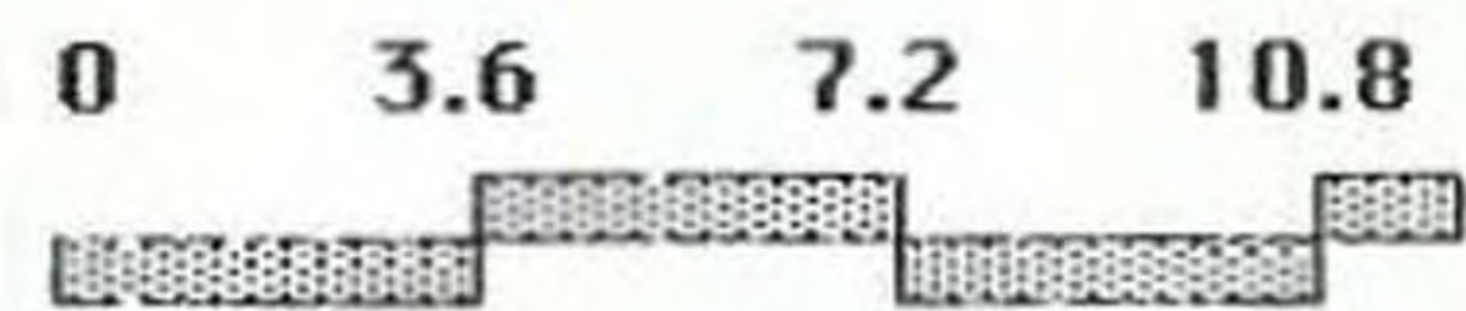


FIGURE (52) :

HOUSING PROTOTYPE (B)
LOCATION OF COLUMNS.



ZONE DISTRIBUTION

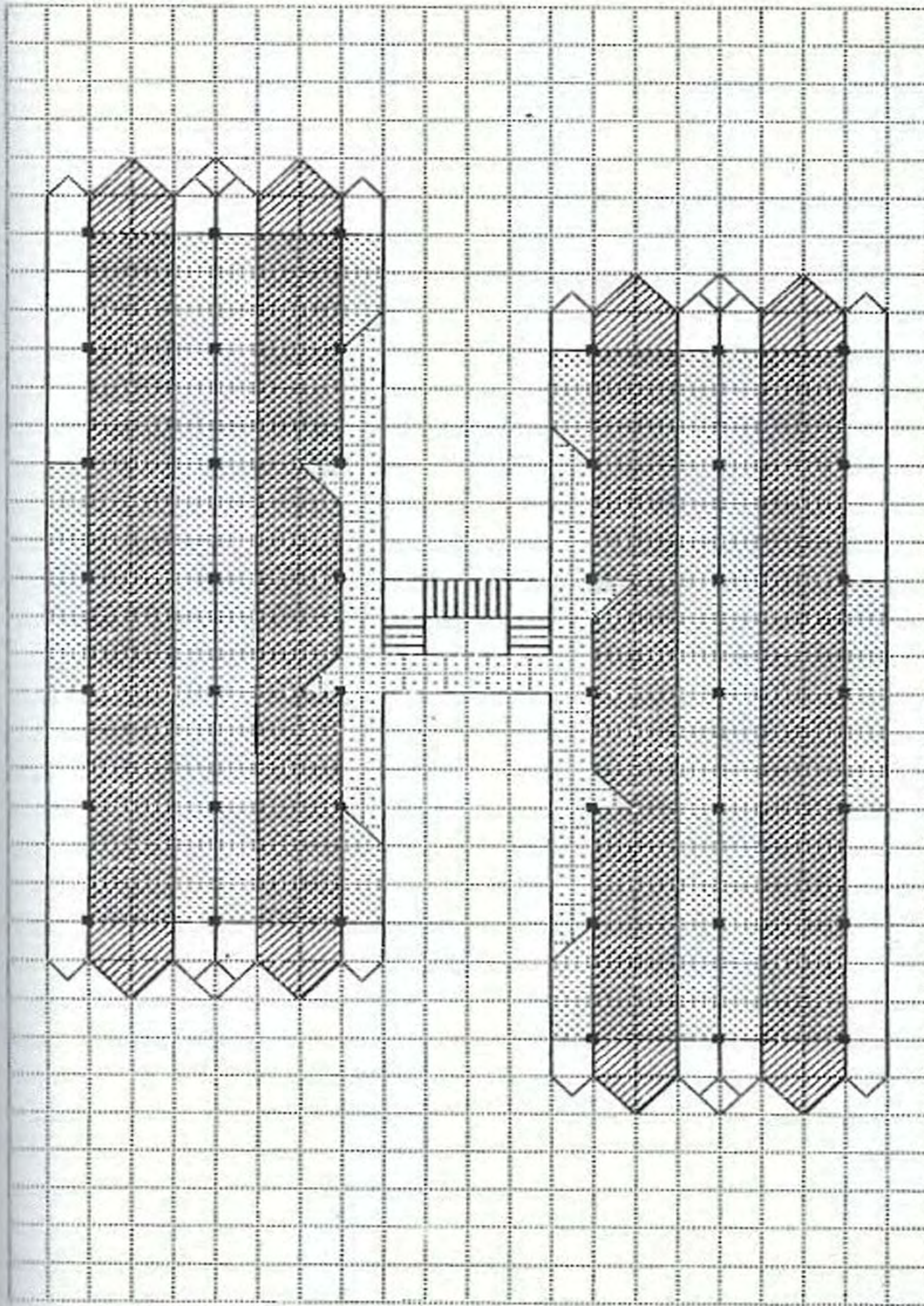
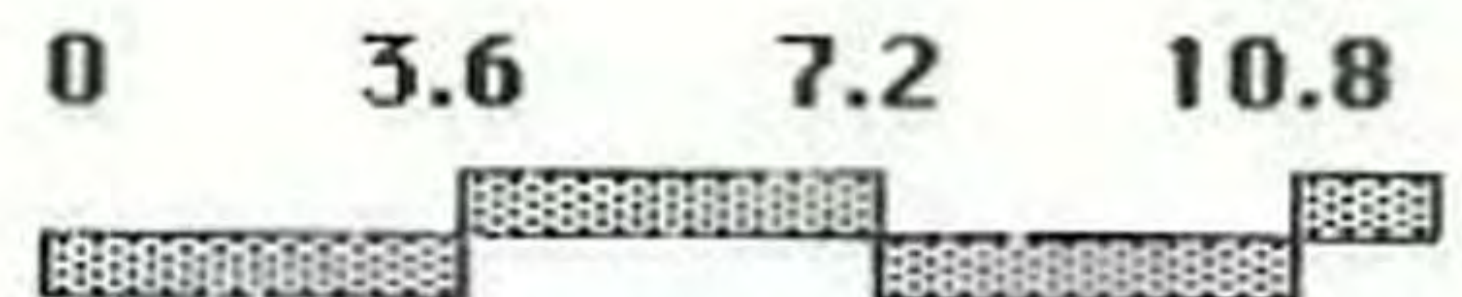


FIGURE (53) :

HOUSING PROTOTYPE (B)
CONCEPT OF ZONE
DISTRIBUTION.



LOCATION OF SUPPORTS

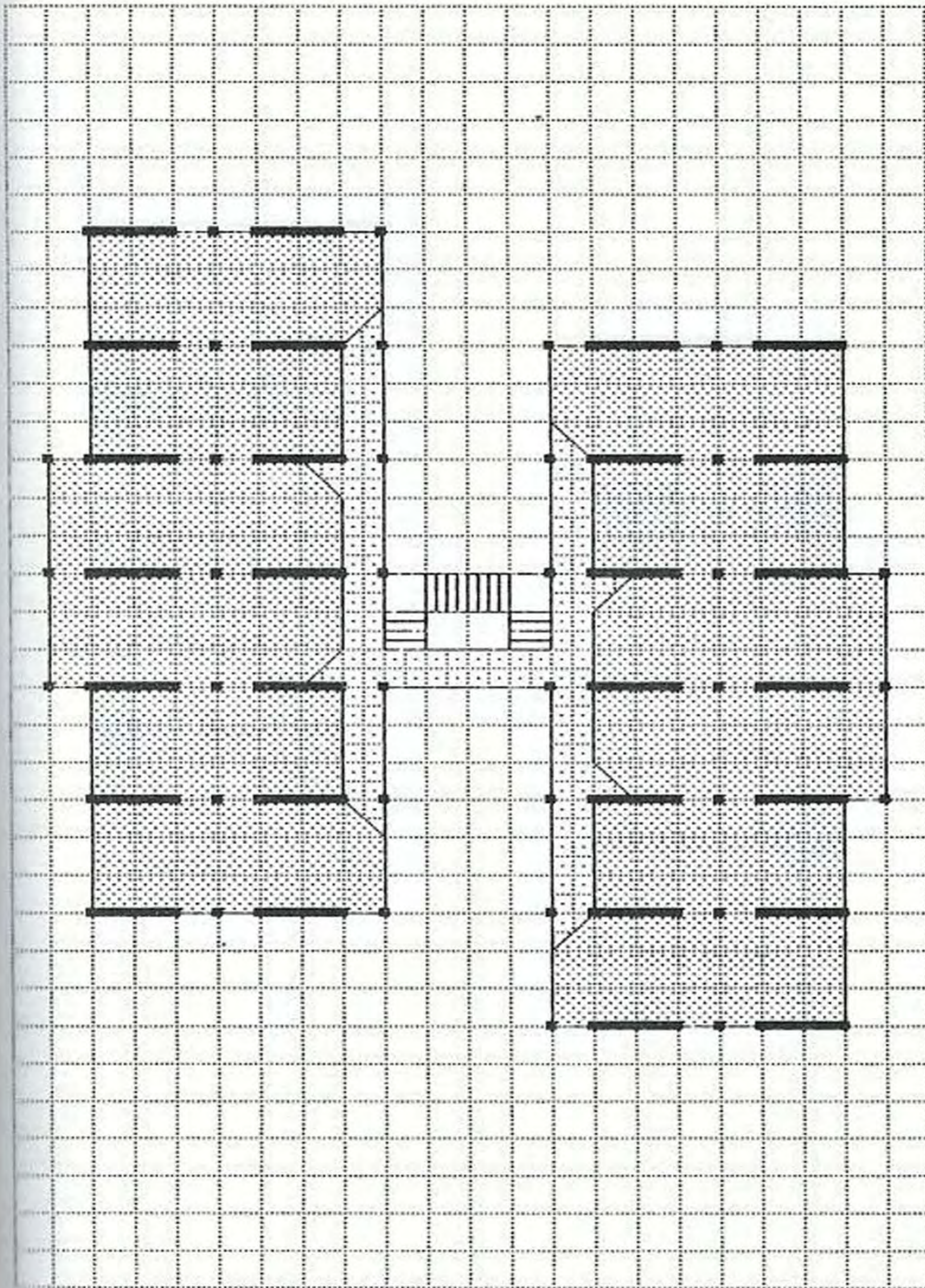
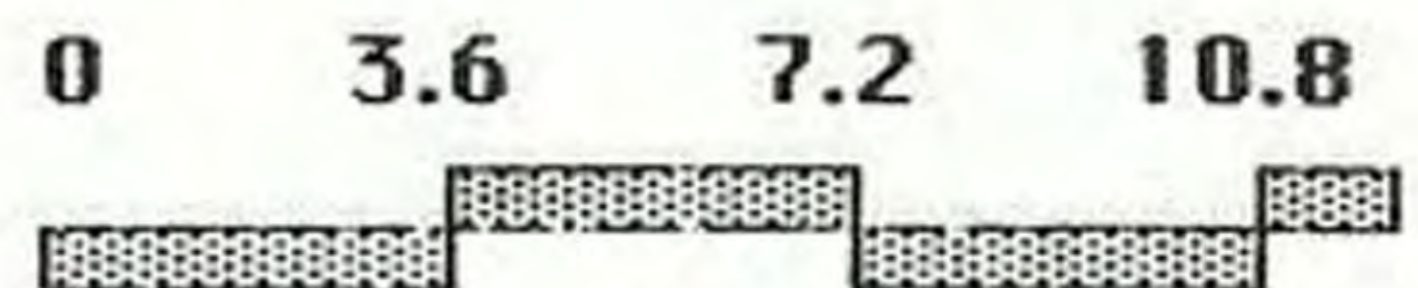


FIGURE (54) :

HOUSING PROTOTYPE (B)
LOCATION OF SUPPORTS
IN CASE TUNNEL FORMS
OR PREFABRICATED WALL
ELEMENTS ARE USED FOR
THE MAIN STRUCTURE.



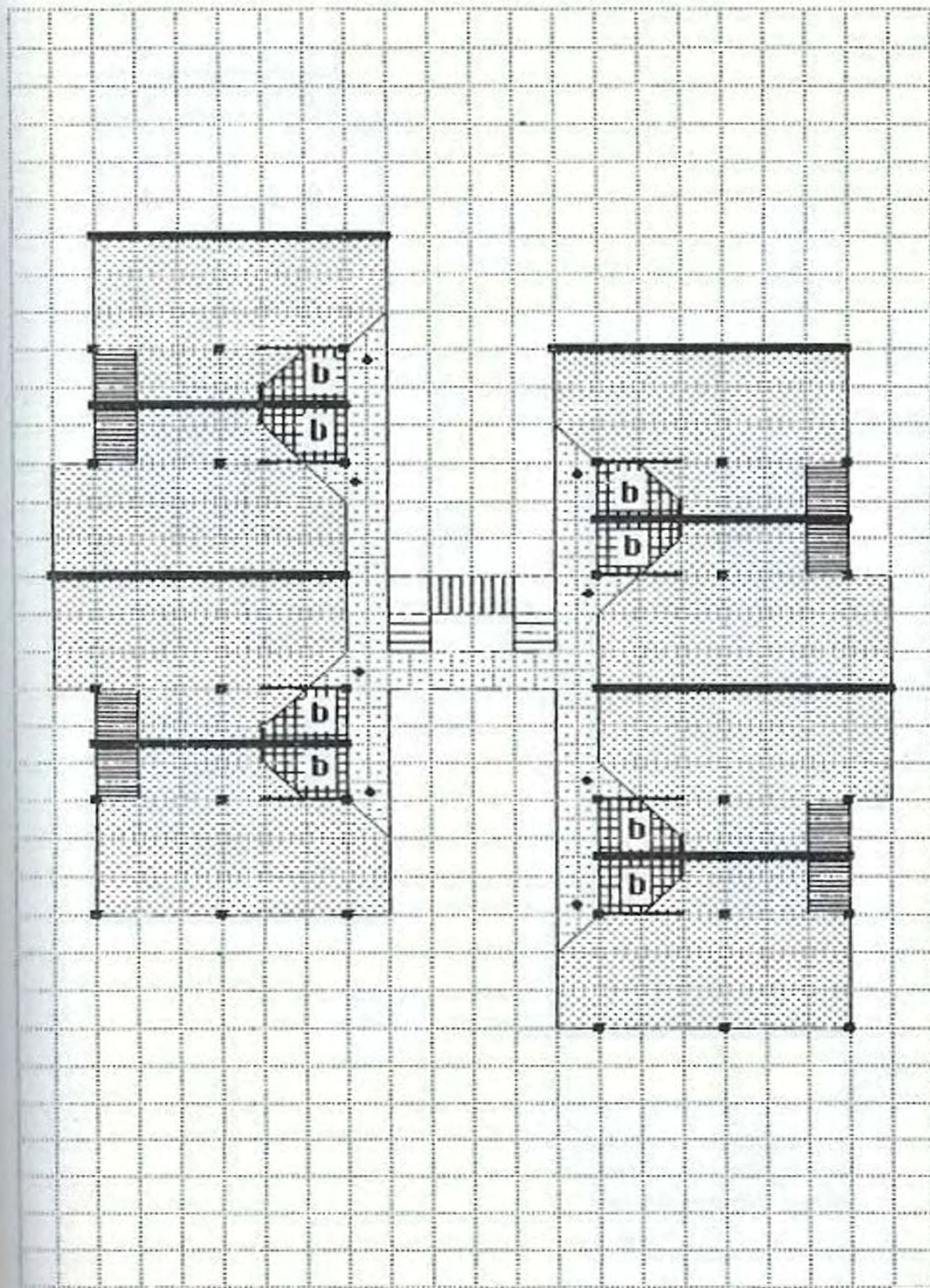
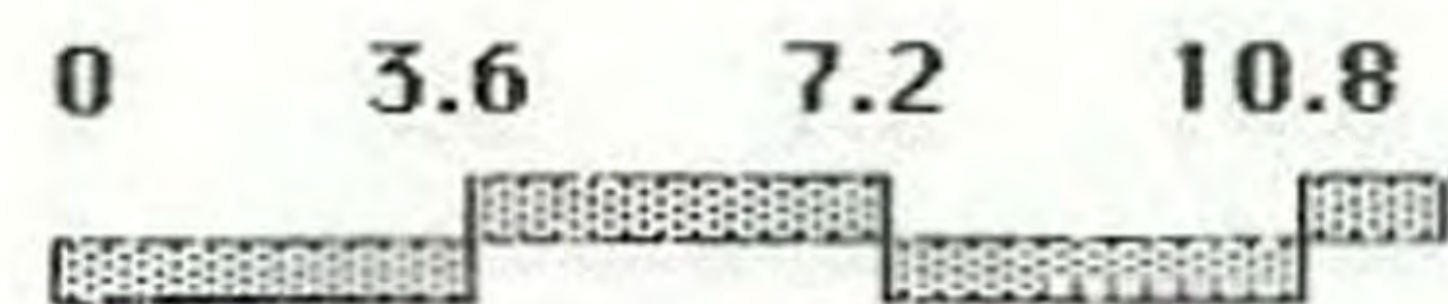


FIGURE (55) :

HOUSING PROTOTYPE (B),
PHASES OF DEVELOP-
MENT:

- INITIAL PHASE WITH
SUPPORTS, OUTER SKIN,
TECHNICAL INSTALA-
TIONS.

AREAS OF DWELLINGS:
- 45 SQUARE METERS



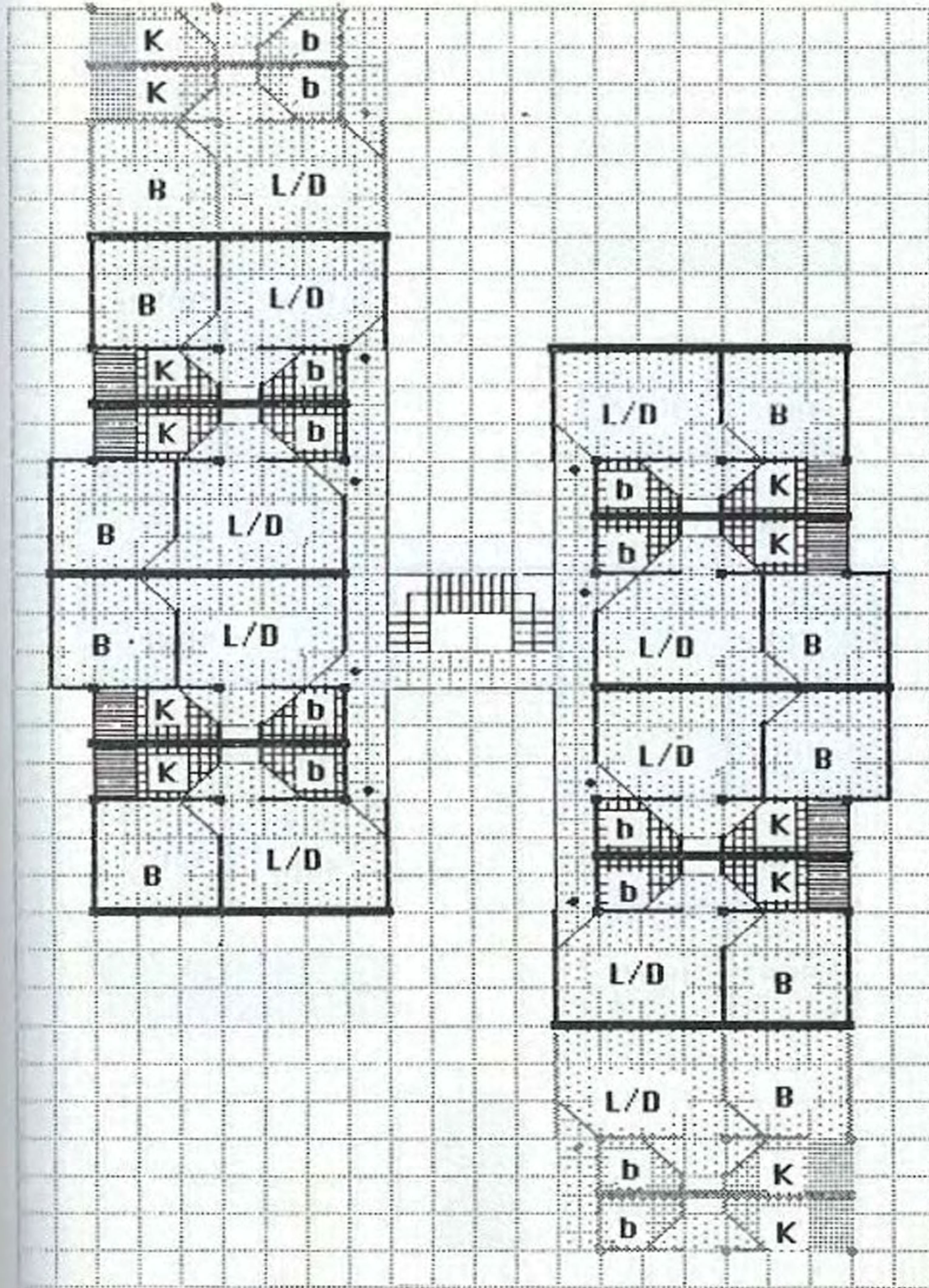
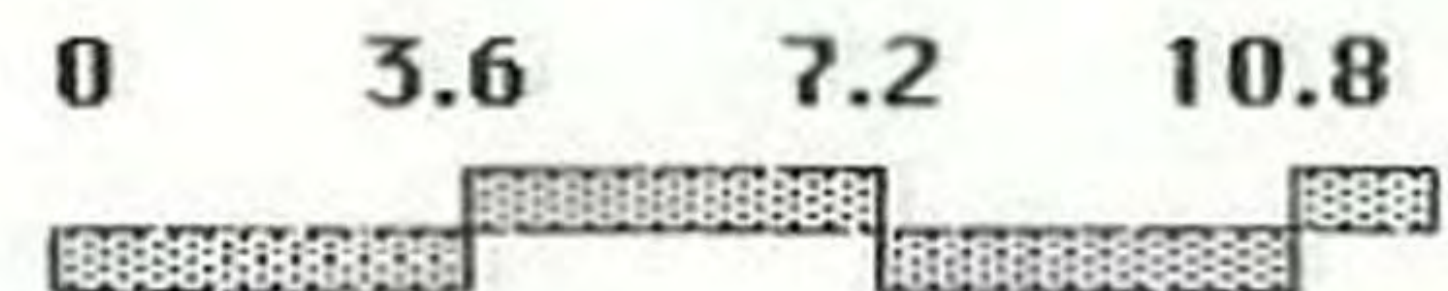


FIGURE (56) :

HOUSING PROTOTYPE (B),
PHASES OF DEVELOP-
MENT:

- FINAL PHASE LEFT TO
THE USER (INTERNAL
PARTITIONS AND
GRADUAL FINISHING)

AREAS OF DWELLINGS:
- 45 SQUARE METERS



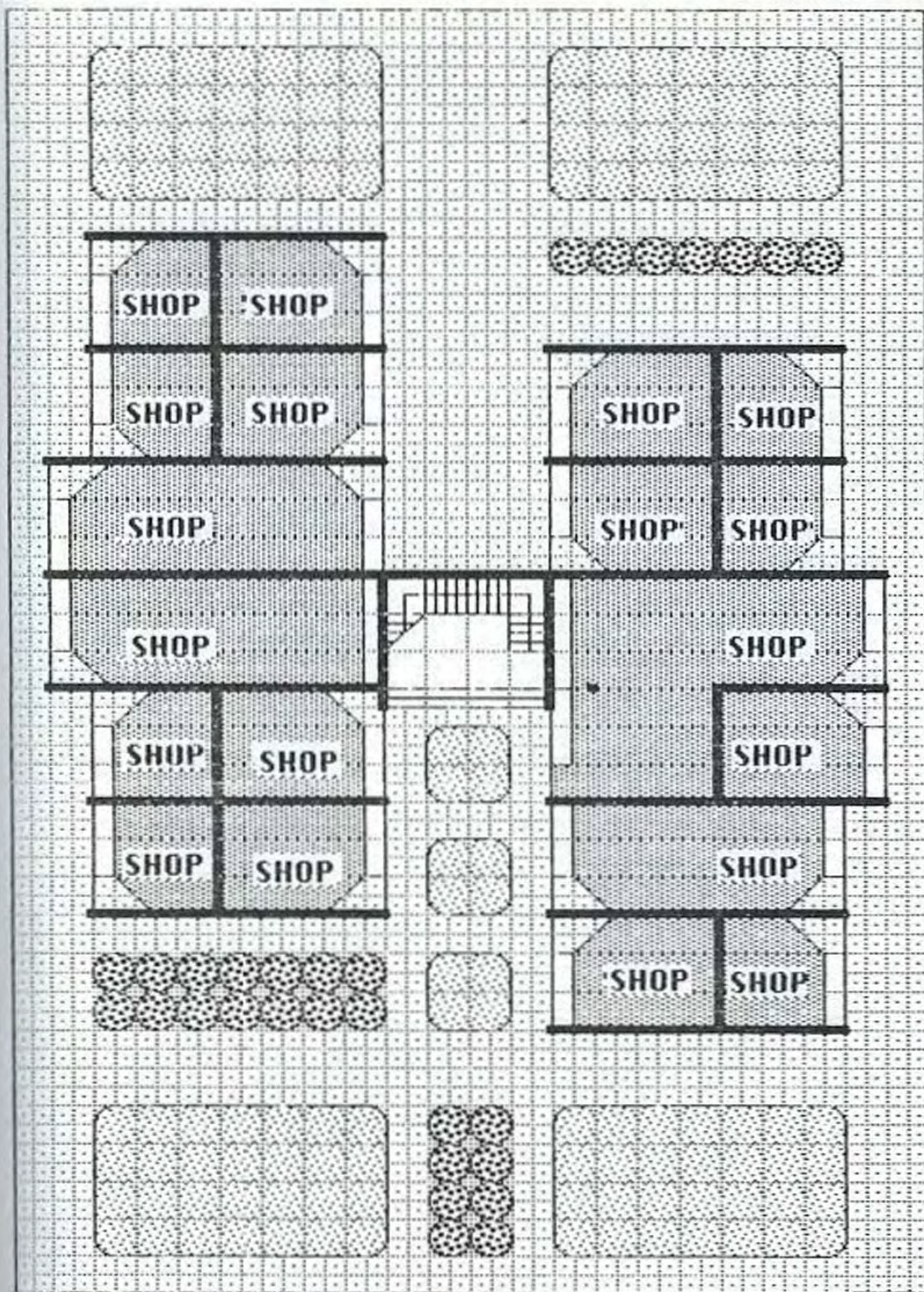
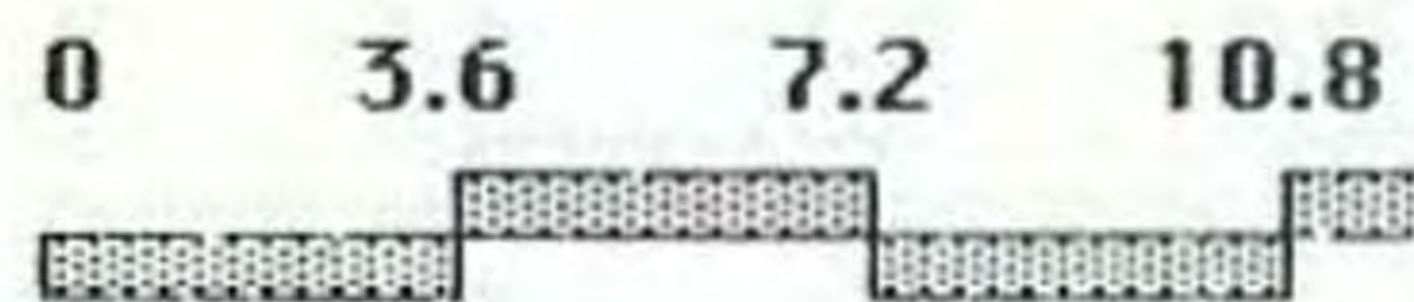


FIGURE (57) :

HOUSING PROTOTYPE (B) ,
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES.



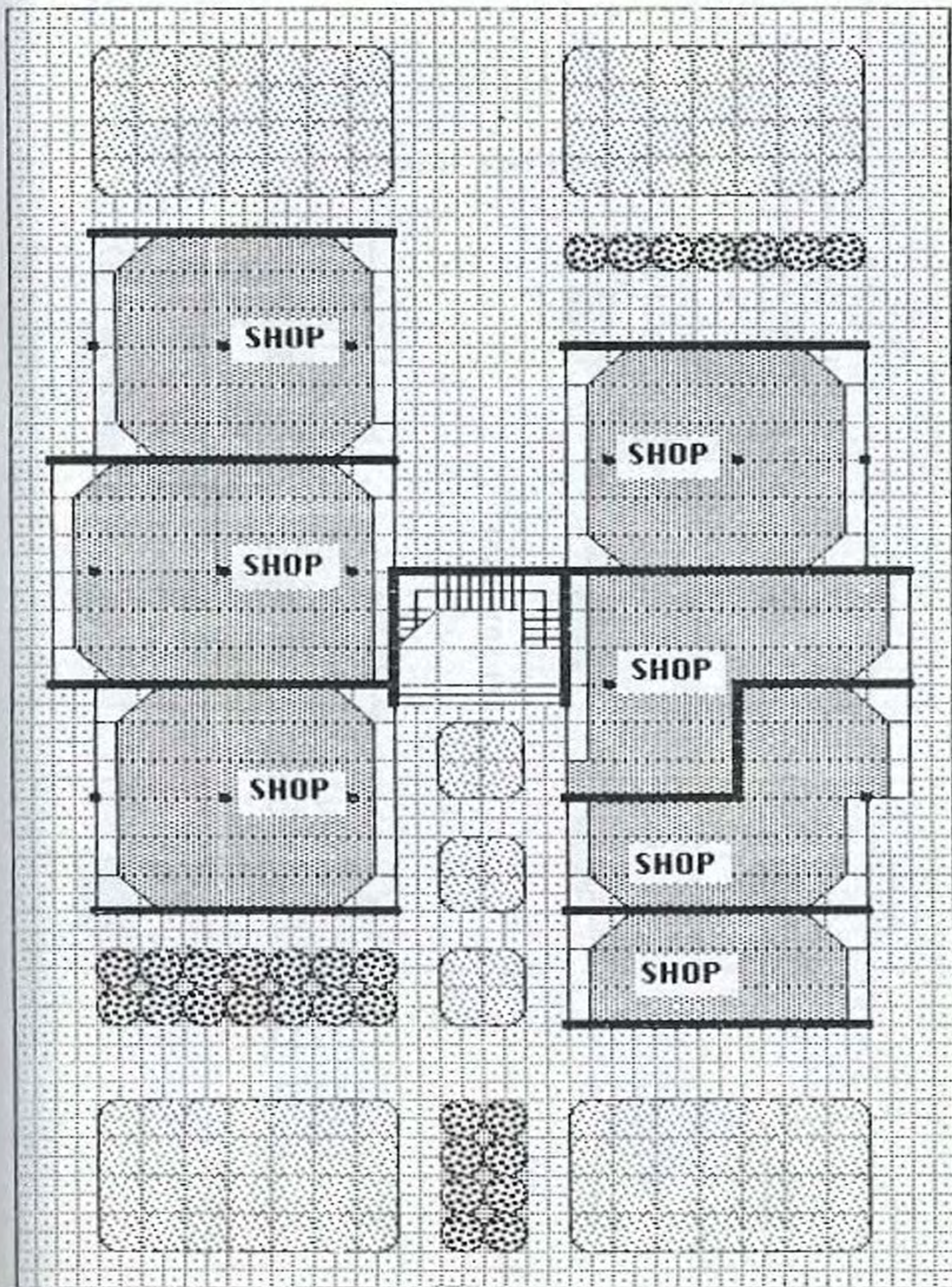
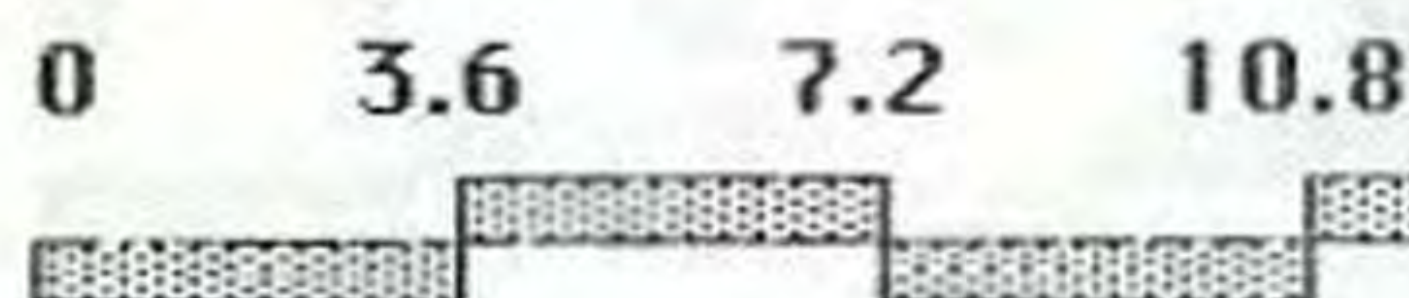


FIGURE (58) :

HOUSING PROTOTYPE (B),
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES.



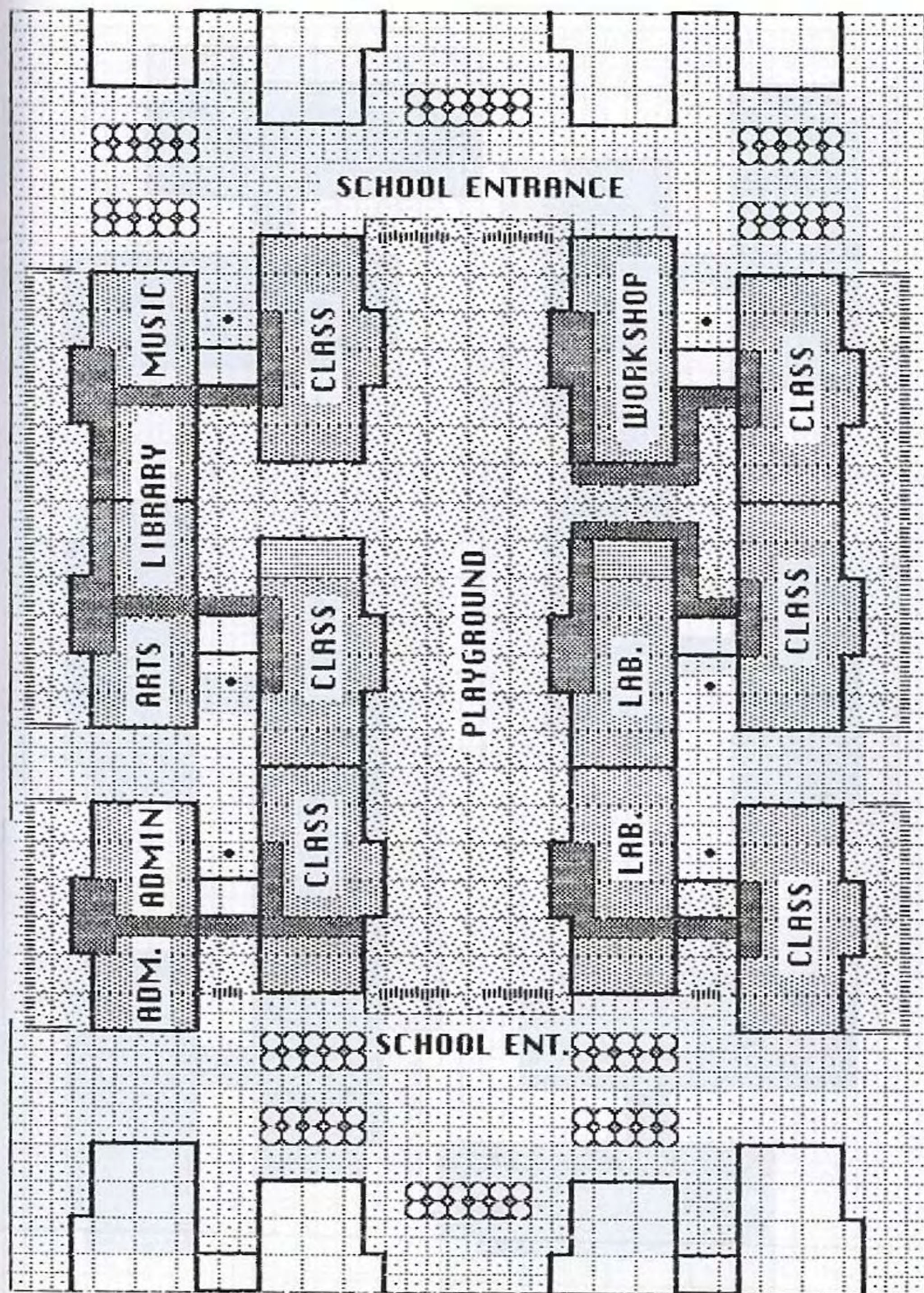
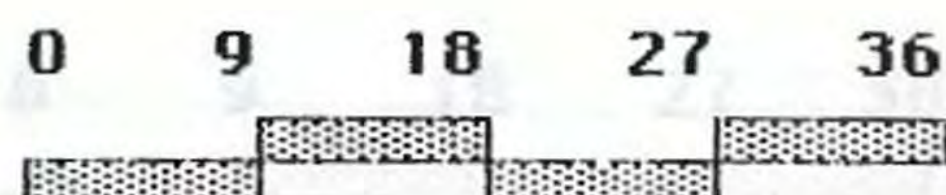


FIGURE (59) :

HOUSING PROTOTYPE (B),
POSSIBLE USE OF THE
GROUND FLOOR OF SIX
APARTMENT BLOCKS FOR
A SCHOOL



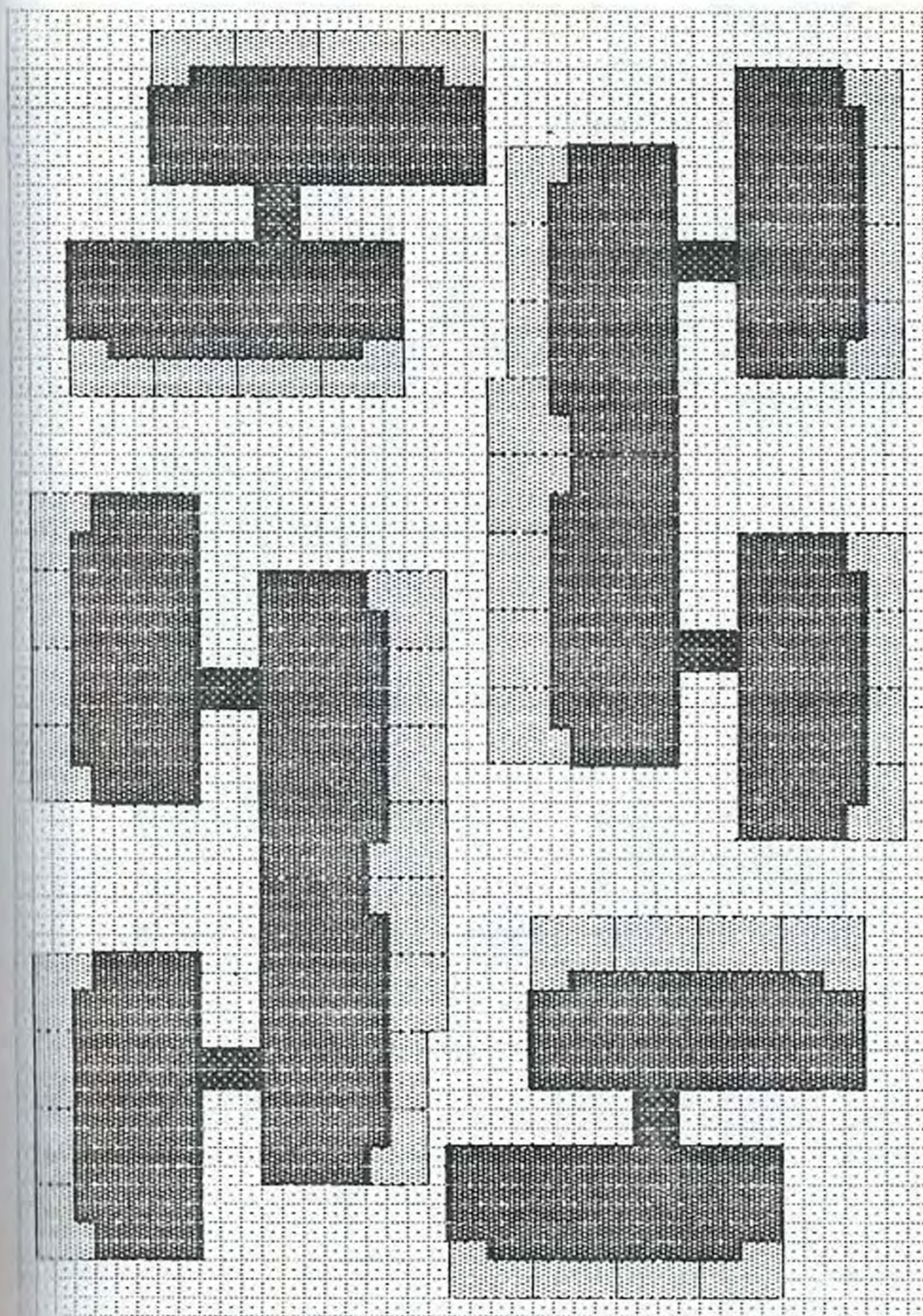
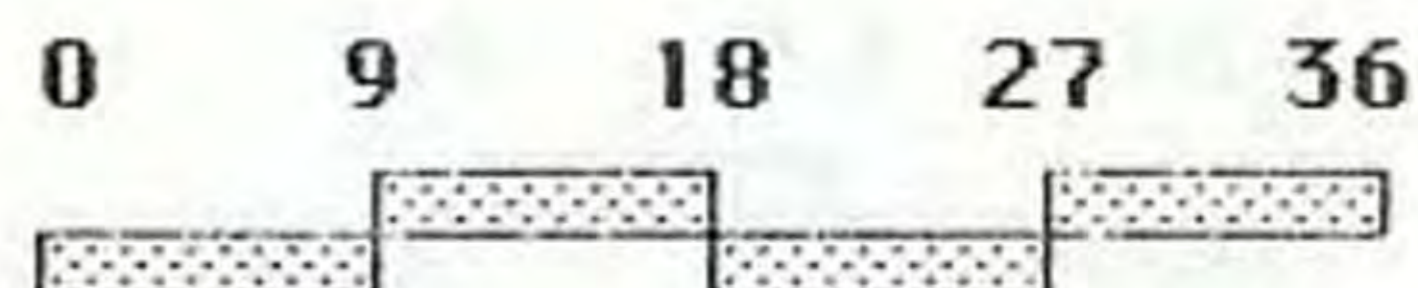


FIGURE (60) :

HOUSING PROTOTYPE (B),
POSSIBLE ARRANGEMENT
FOR LAYOUTS



LOCATION OF COLUMNS.

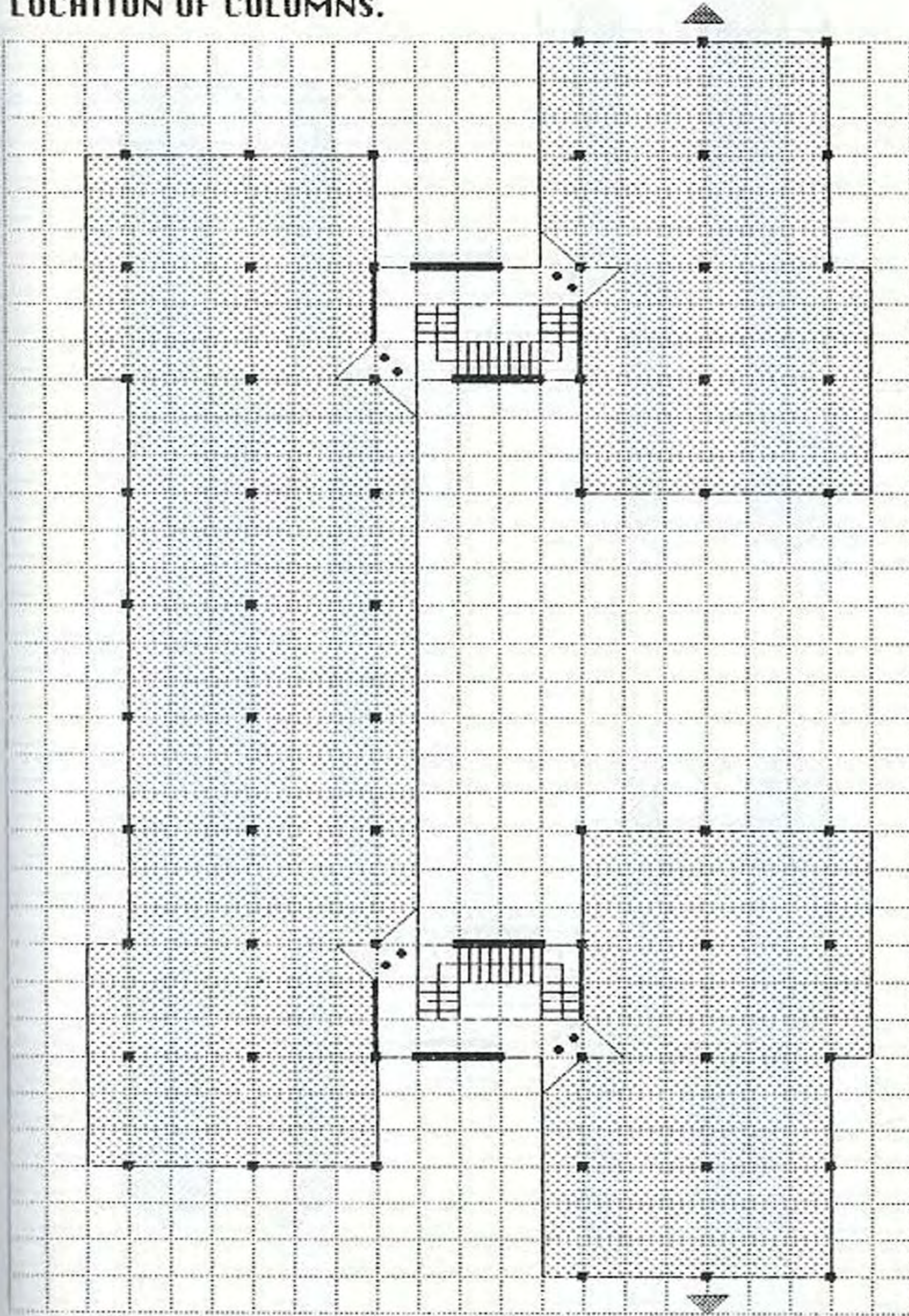
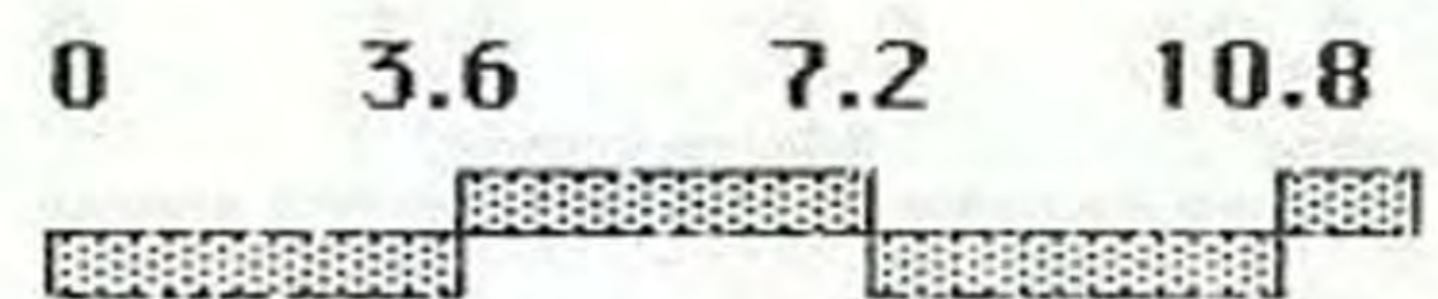


FIGURE (61) :

HOUSING PROTOTYPE (D),
LOCATION OF COLUMNS.



ZONE DISTRIBUTION

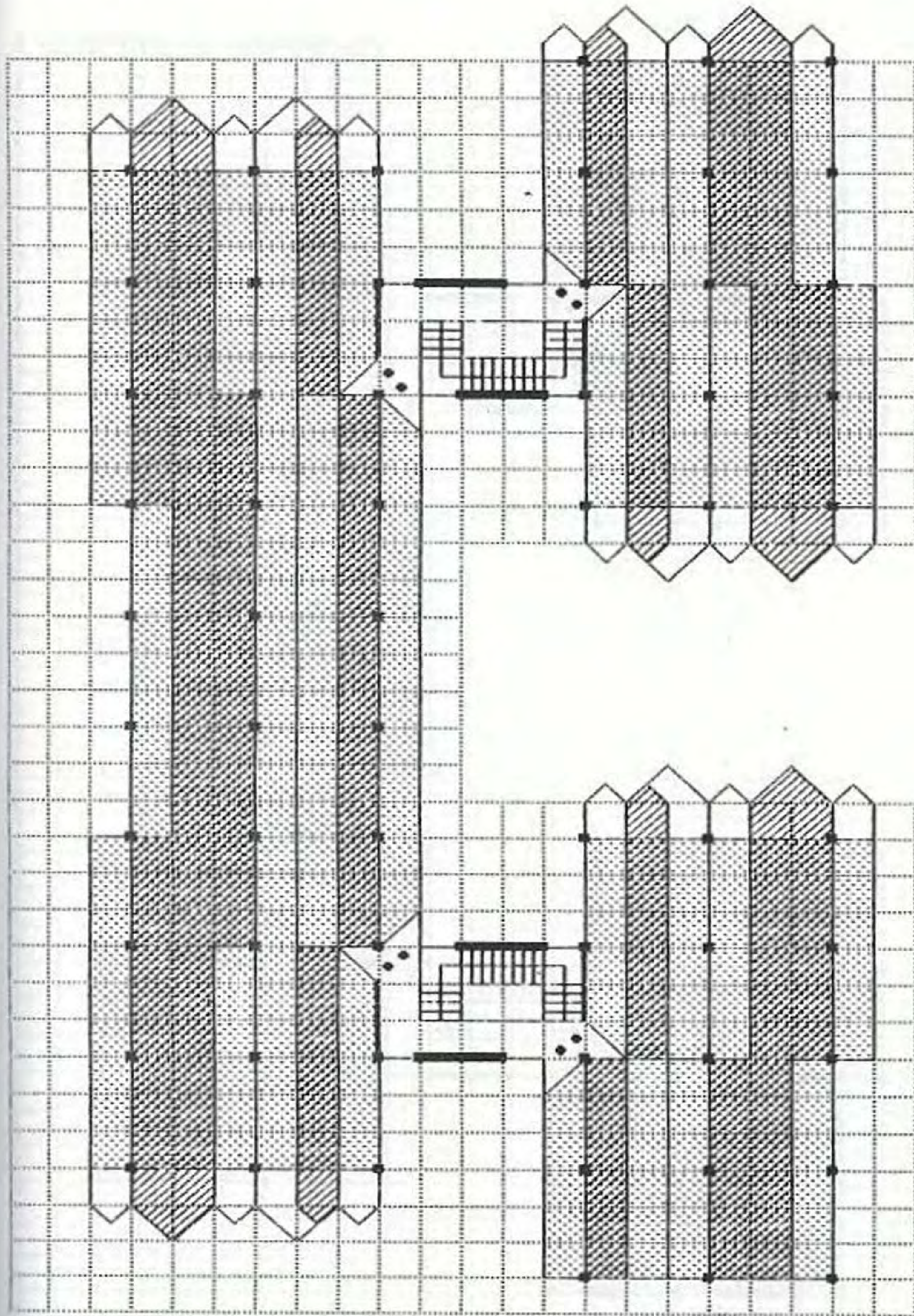
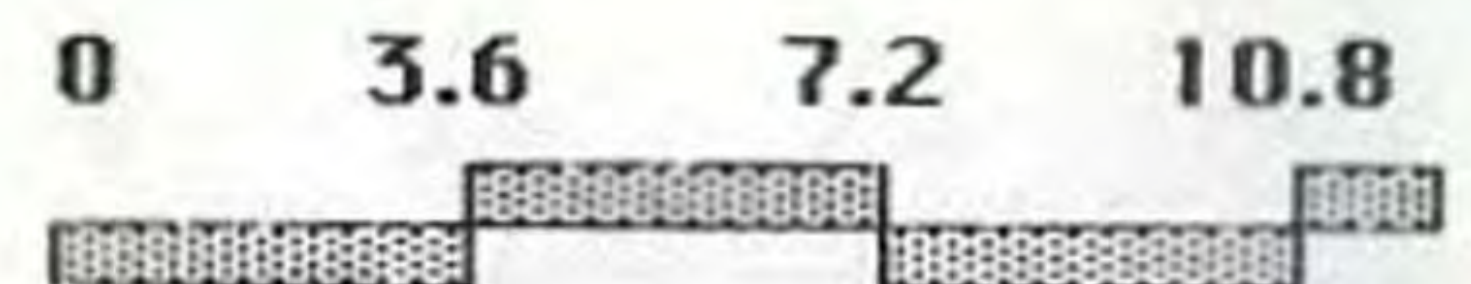


FIGURE (62) :

HOUSING PROTOTYPE (D),
CONCEPT OF ZONE
DISTRIBUTION.



LOCATION OF SUPPORTS

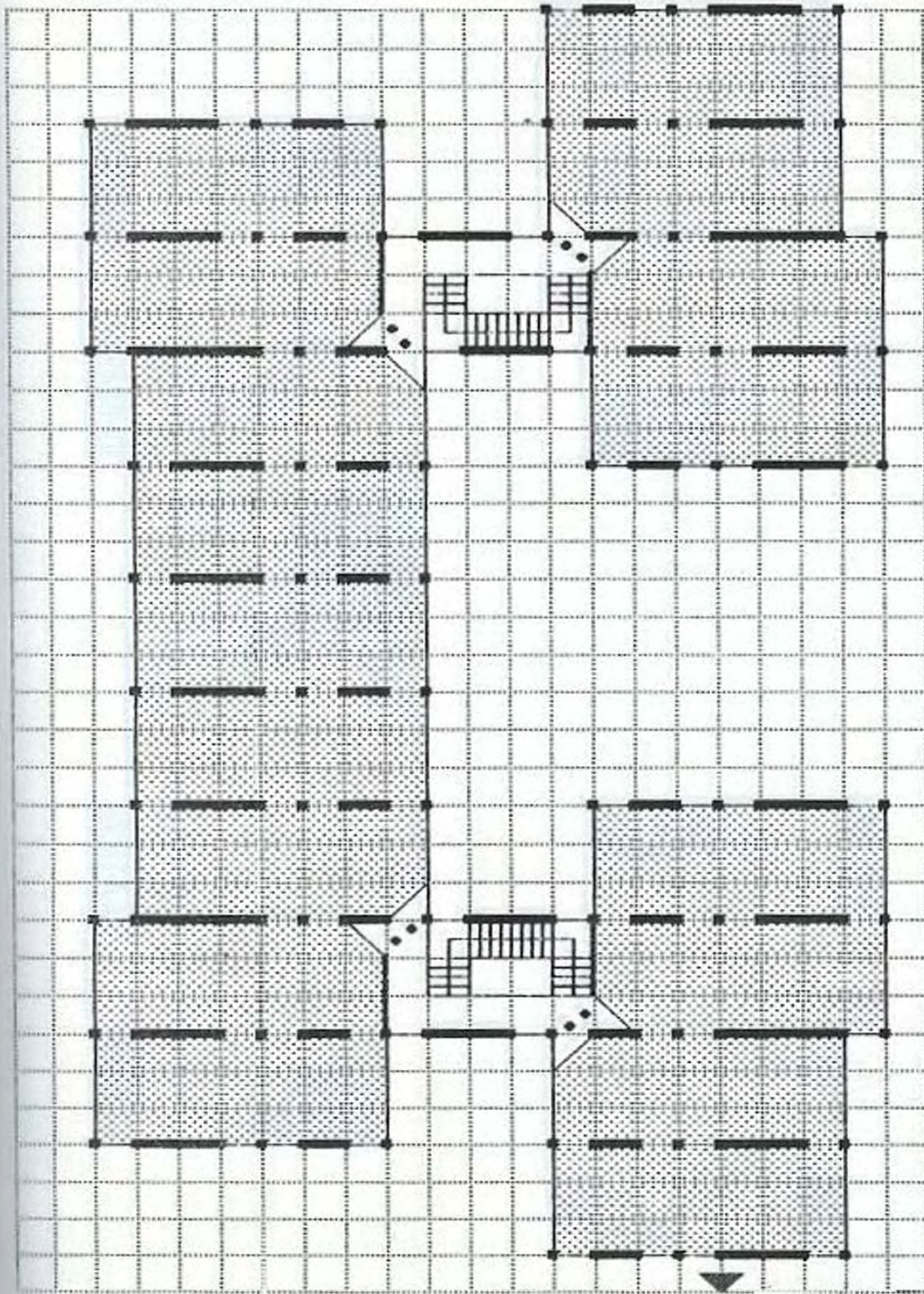
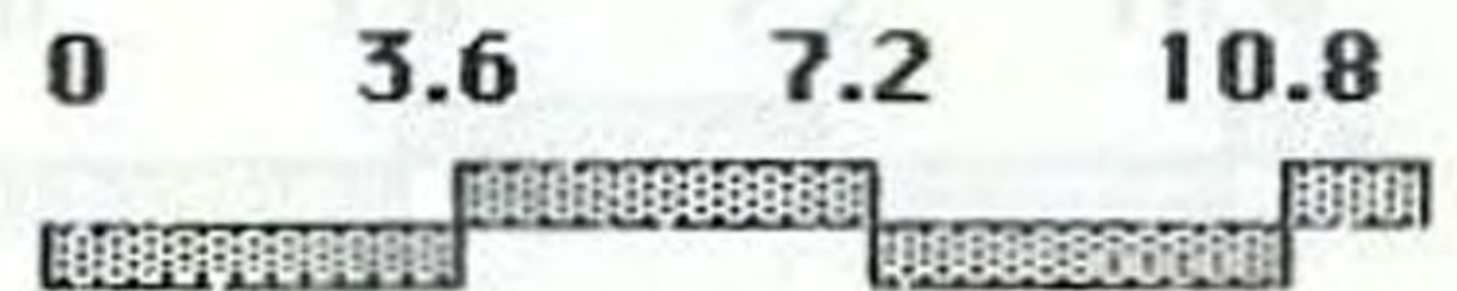


FIGURE (63) :

HOUSING PROTOTYPE (D),
LOCATION OF SUPPORTS
IN CASE TUNNEL FORMS
OR PREFABRICATED WALL
ELEMENTS ARE USED FOR
THE MAIN STRUCTURE.

1:100
1:100
1:100



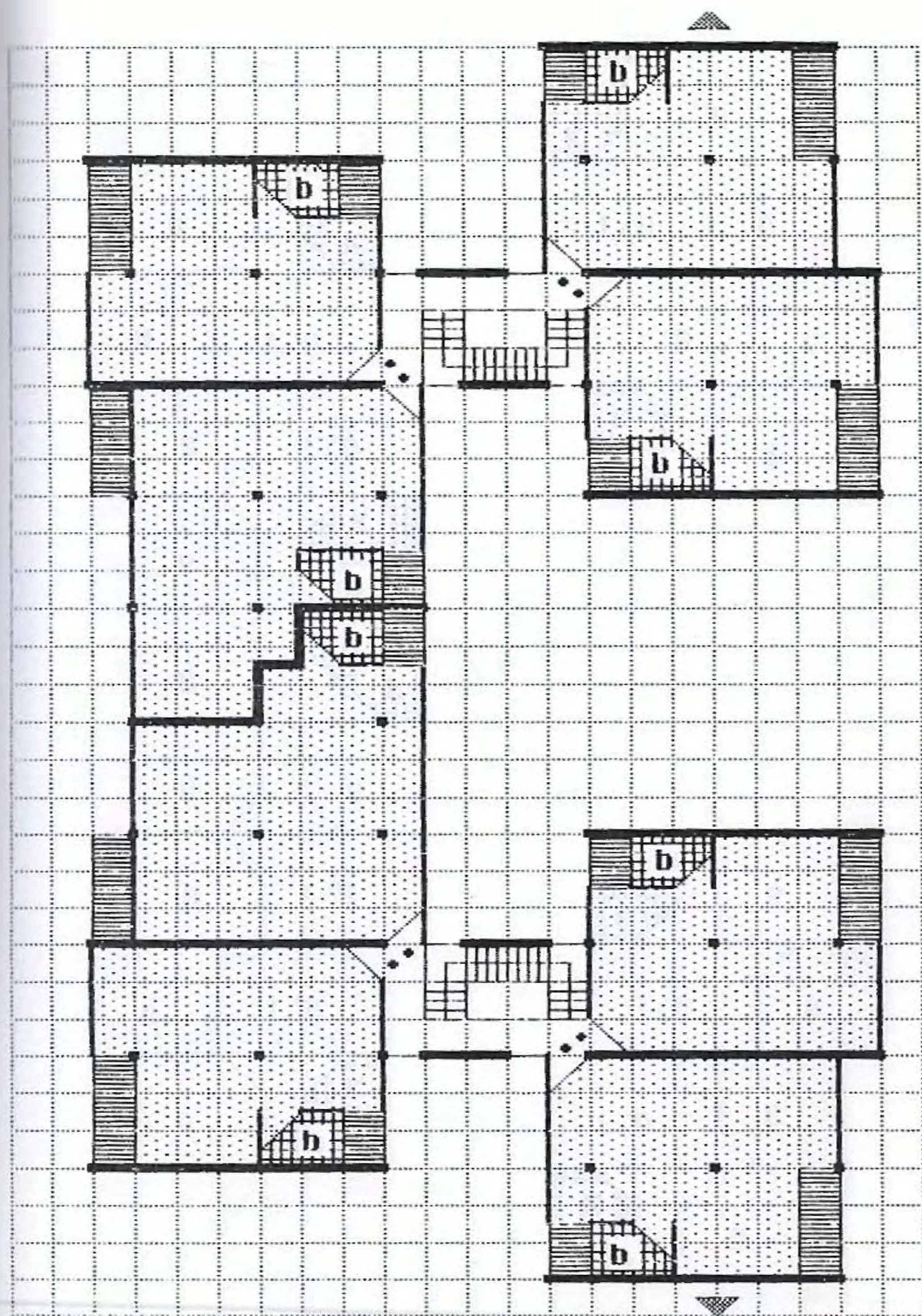


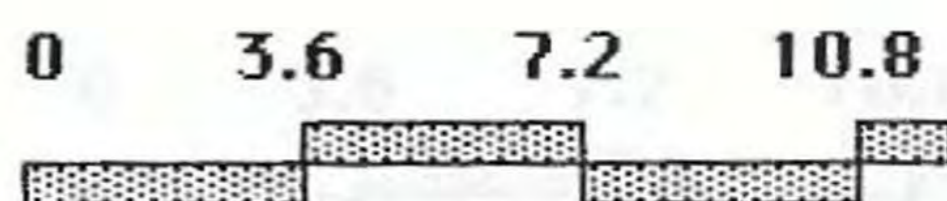
FIGURE (64) :

HOUSING PROTOTYPE (D),
PHASES OF DEVELOP-
MENT:

- INITIAL PHASE WITH
SUPPORTS, OUTER SKIN,
TECHNICAL INSTALLA-
TIONS.

AREAS OF DWELLINGS:

- 60 SQUARE METERS
- 75 SQUARE METERS



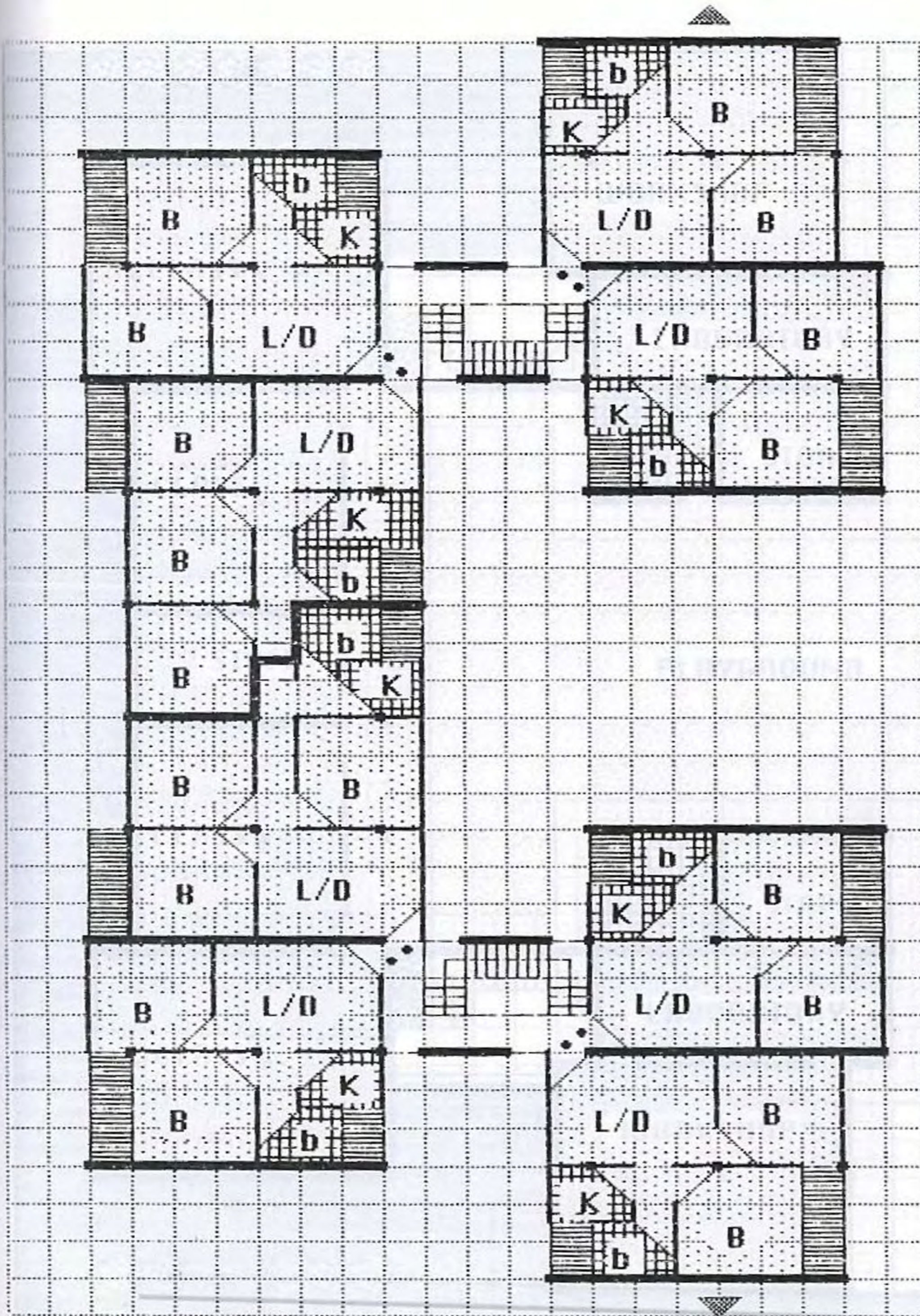


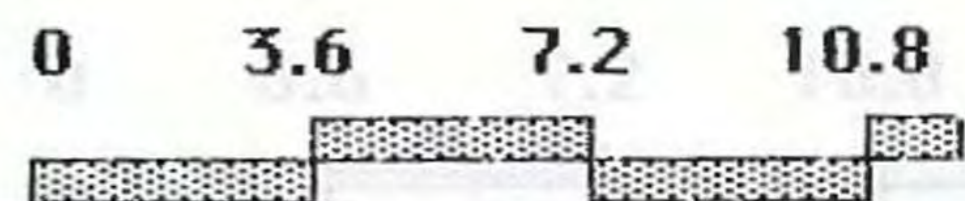
FIGURE (65) :

HOUSING PROTOTYPE (D),
PHASES OF DEVELOP-
MENT :

- FINAL PHASE LEFT TO THE USER (INTERNAL PARTITIONS AND GRADUAL FINISHING)

AREAS OF DWELLING :

- 60 SQUARE METERS
- 75 SQUARE METERS



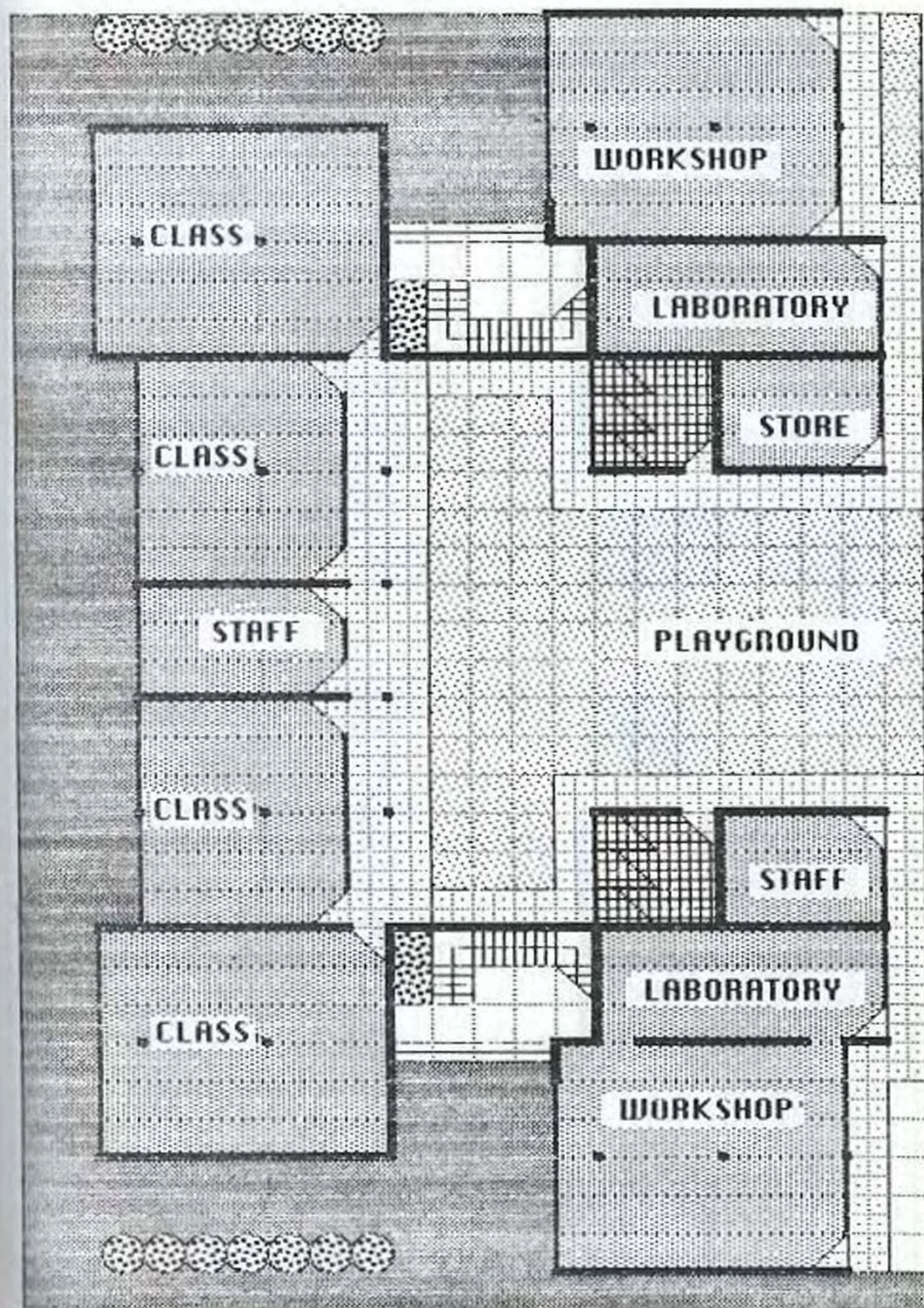
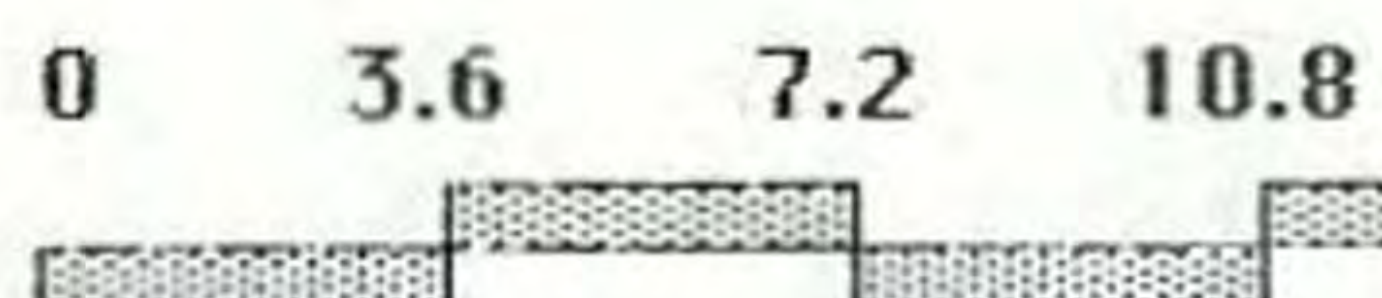


FIGURE (66) :

HOUSING PROTOTYPE (D).
POSSIBLE USE OF THE
GROUND FLOOR FOR A
SCHOOL, (See next fig.)



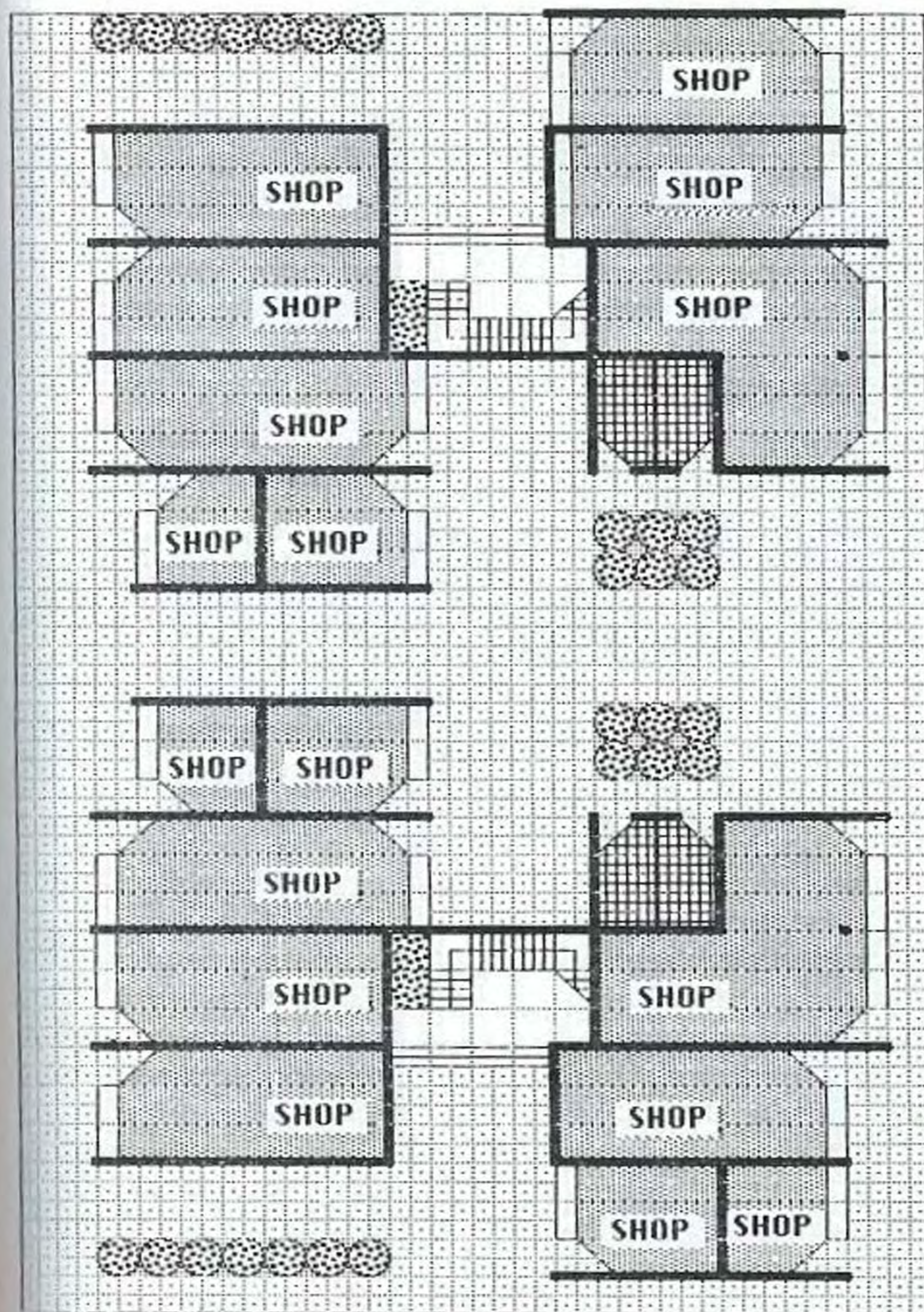
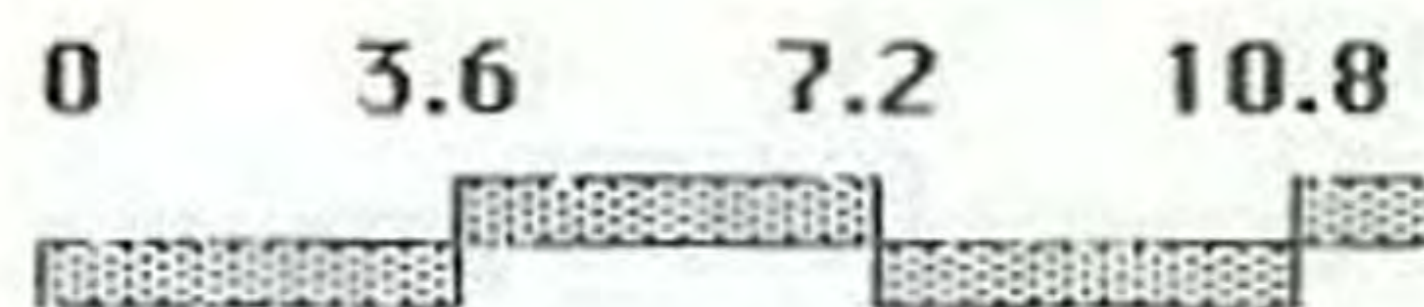


FIGURE (67) :

HOUSING PROTOTYPE (D) ,
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES.



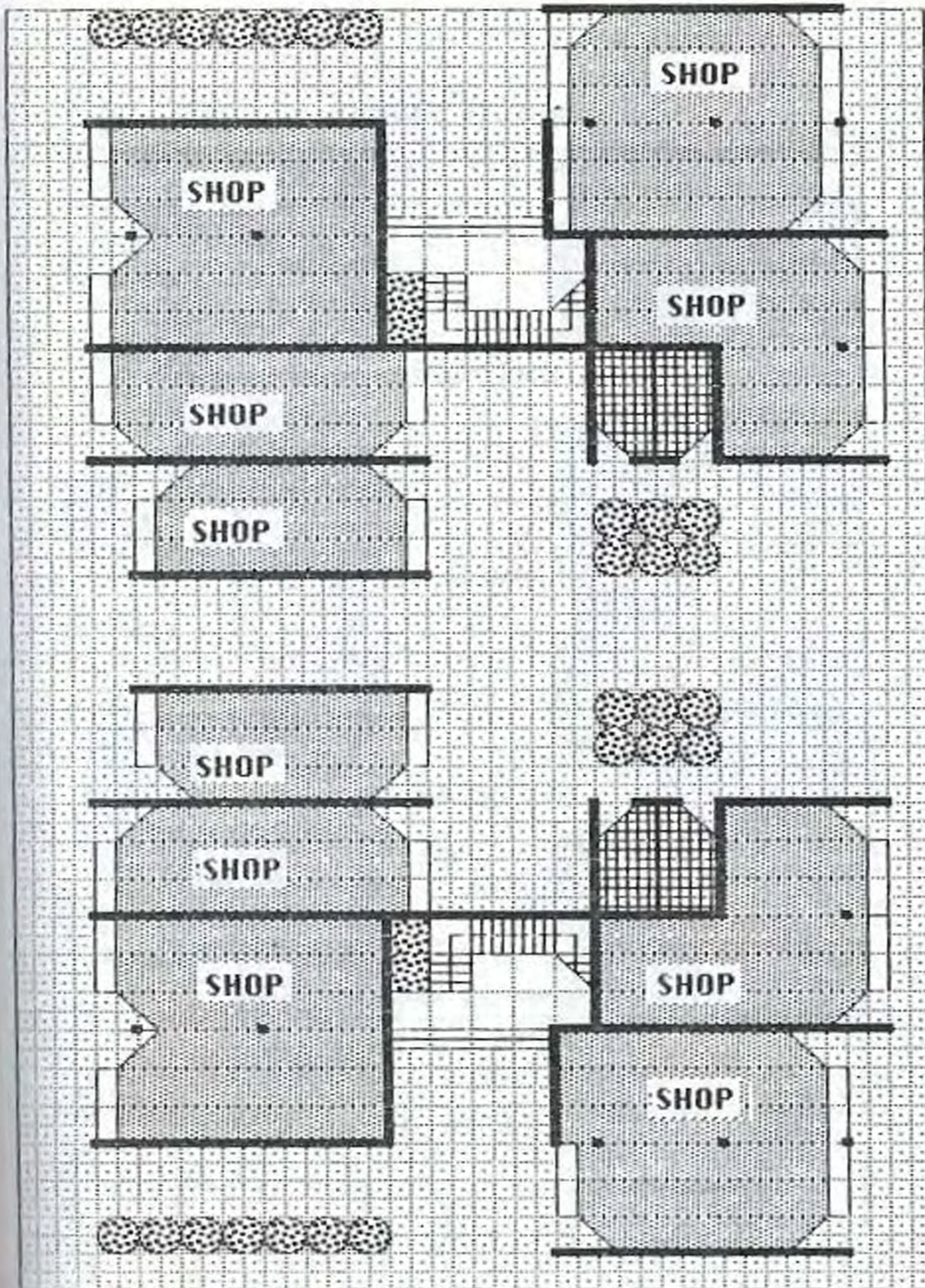
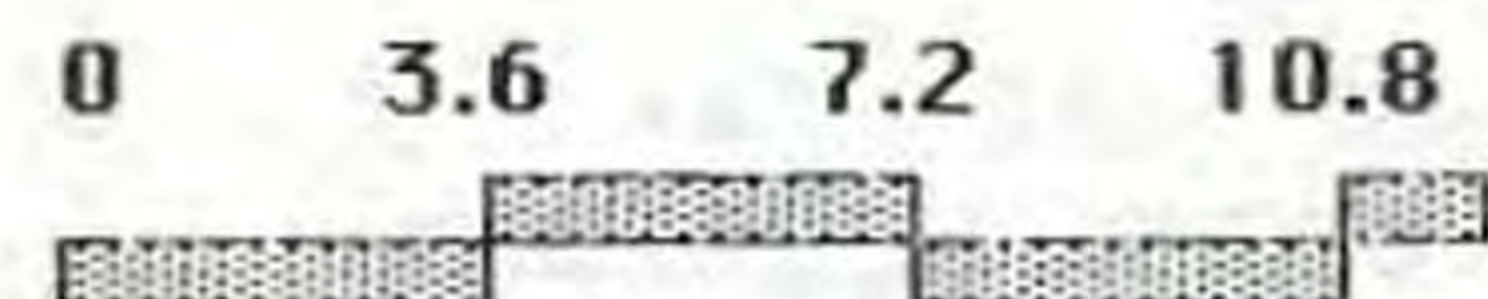


FIGURE (68) :

HOUSING PROTOTYPE (D),
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES.



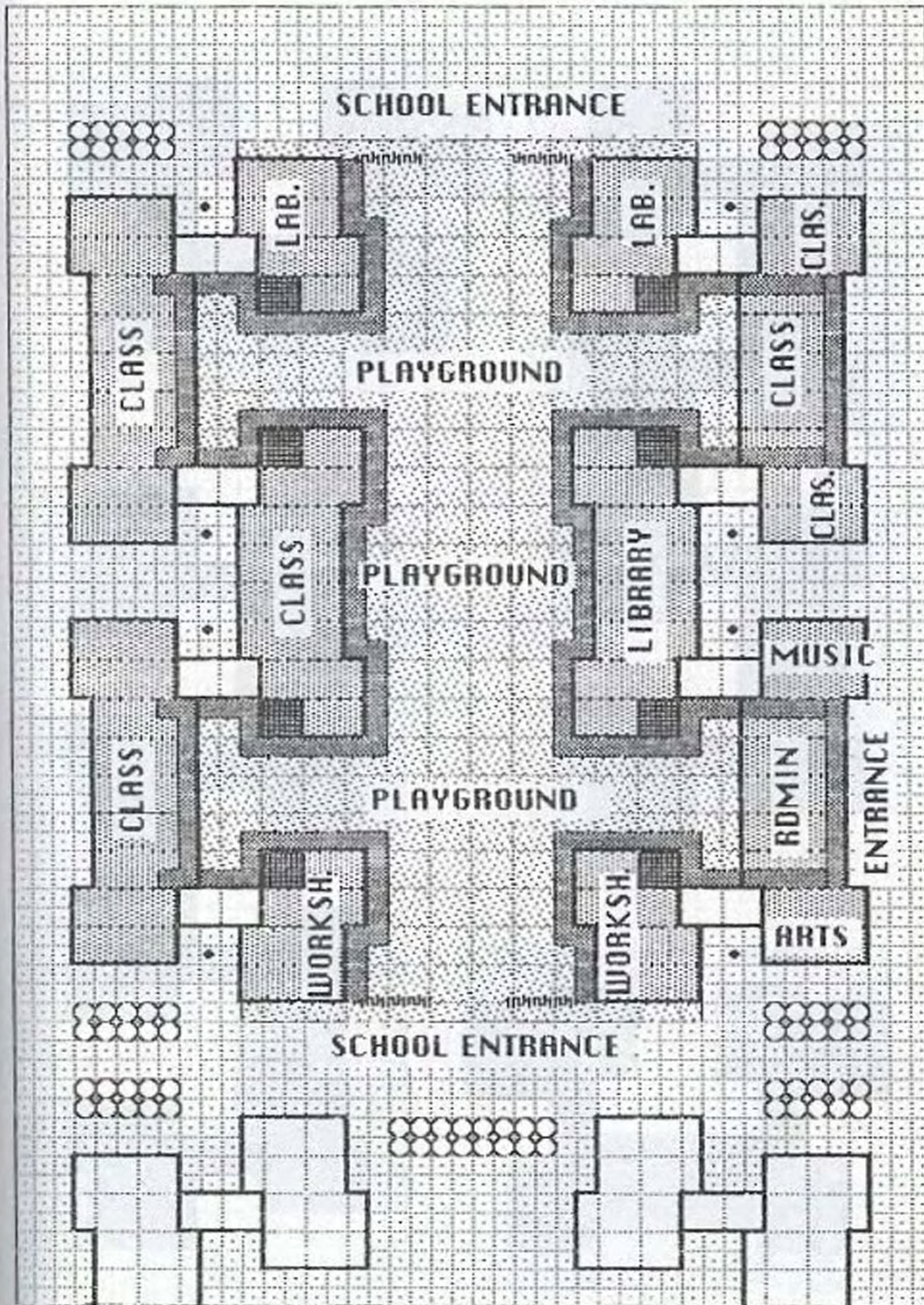
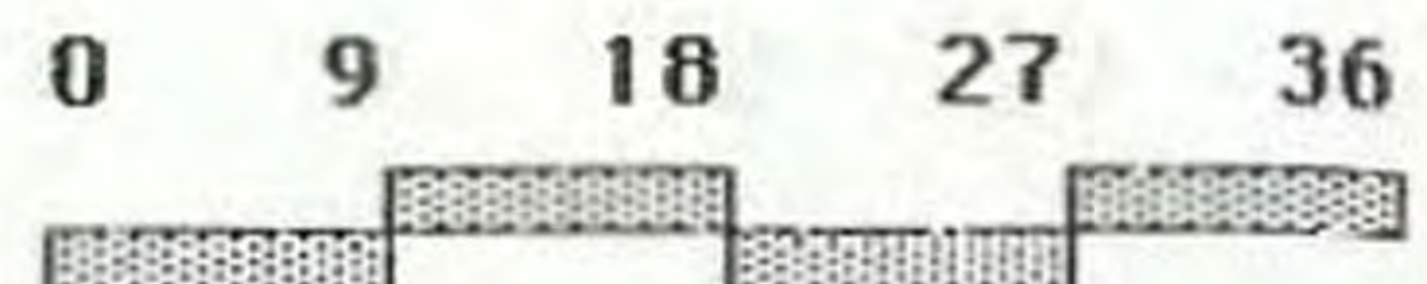


FIGURE (69) :

HOUSING PROTOTYPE (D),
POSSIBLE USE OF THE
GROUND FLOOR OF FOUR
APARTMENT BLOCKS FOR
A SCHOOL .



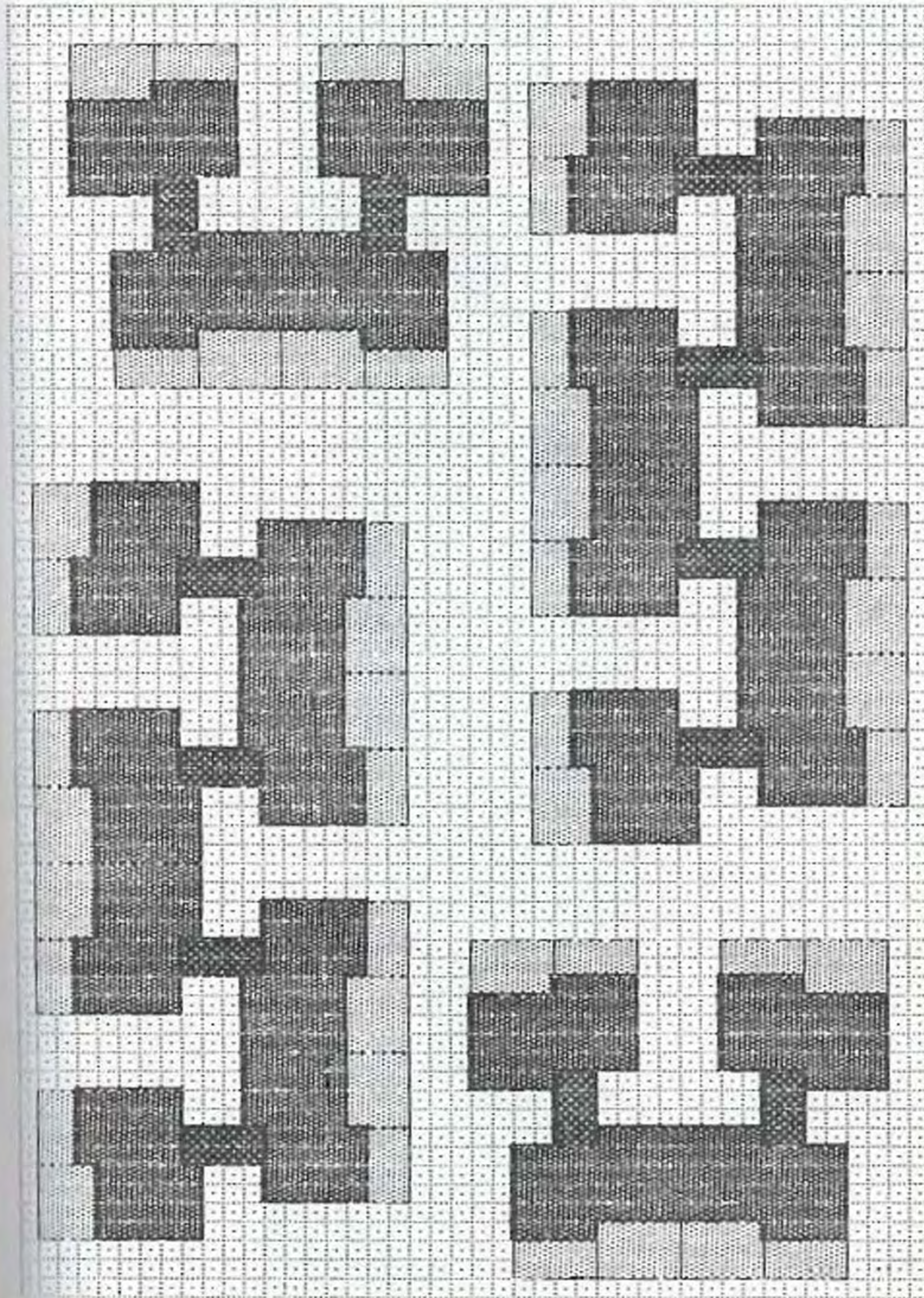
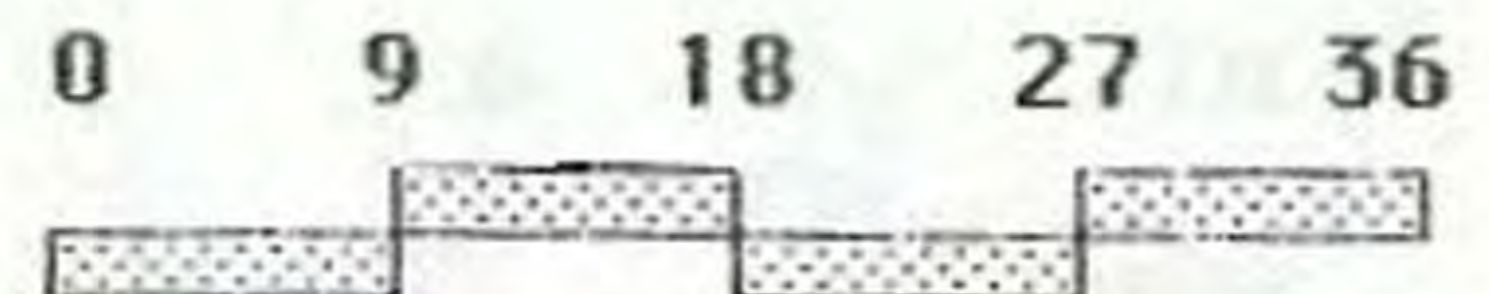


FIGURE (70) :

HOUSING PROTOTYPE (D),
POSSIBLE ARRANGEMENT
FOR LAYOUTS



LOCATION OF COLUMNS.

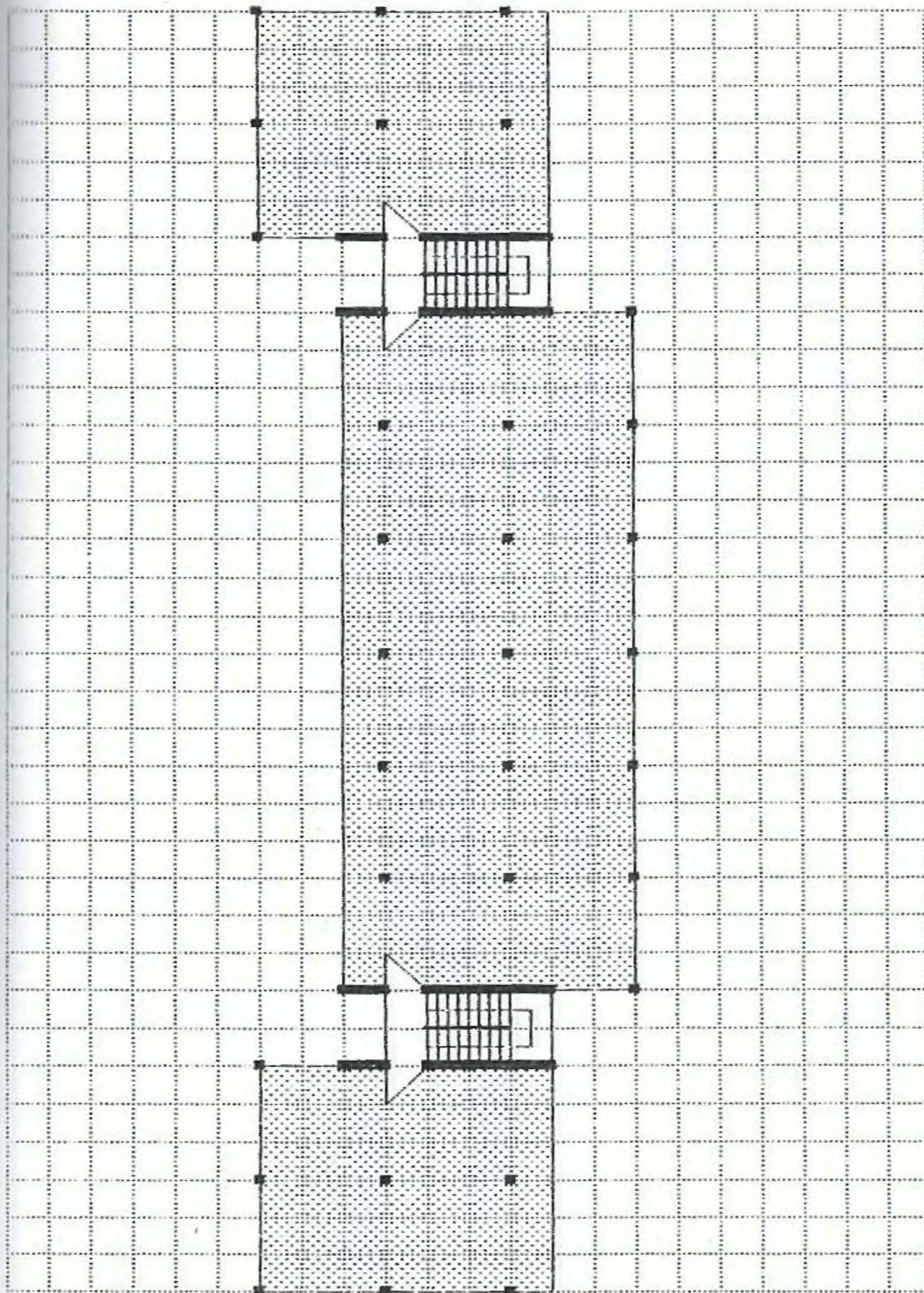
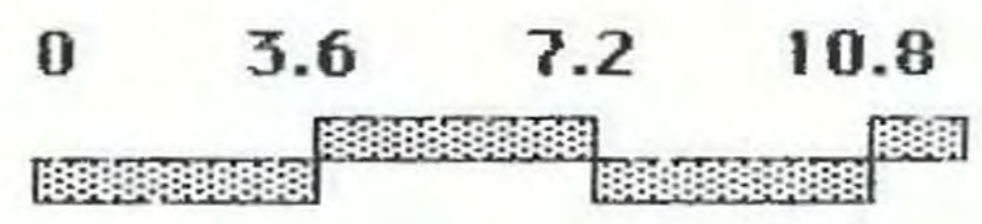


FIGURE (71) :

HOUSING PROTOTYPE (F),
LOCATION OF COLUMNS.



ZONE DISTRIBUTION

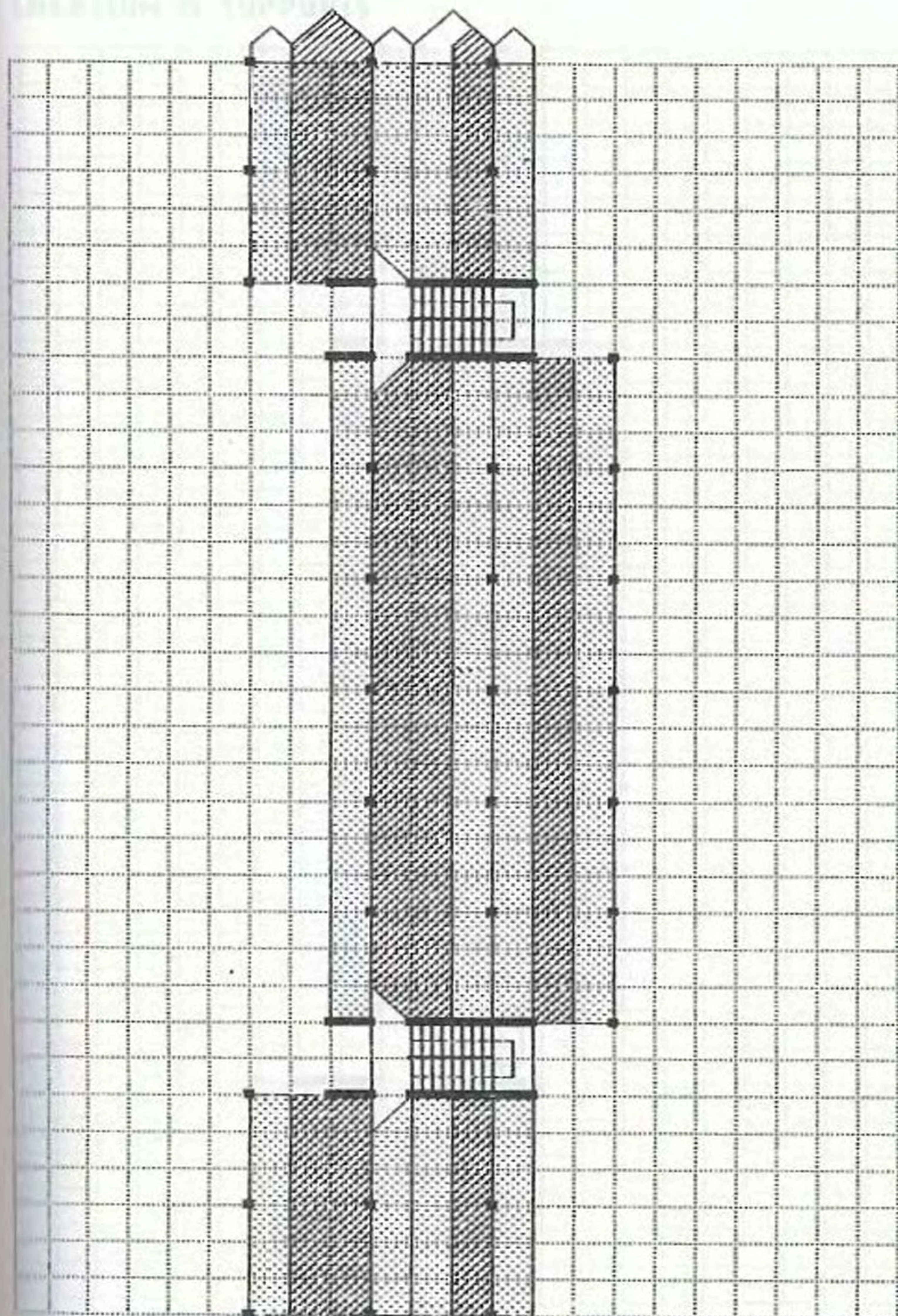
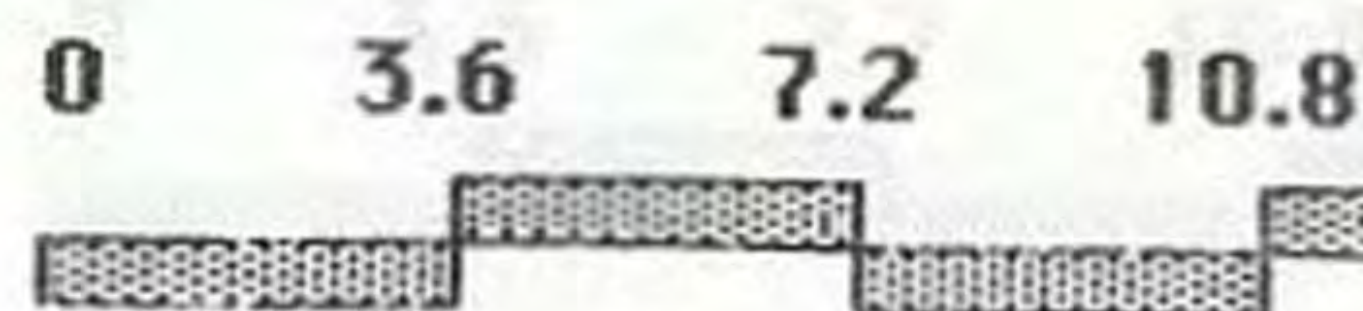


FIGURE (72) :

HOUSING PROTOTYPE (F),
CONCEPT OF ZONE
DISTRIBUTION.



LOCATION OF SUPPORTS

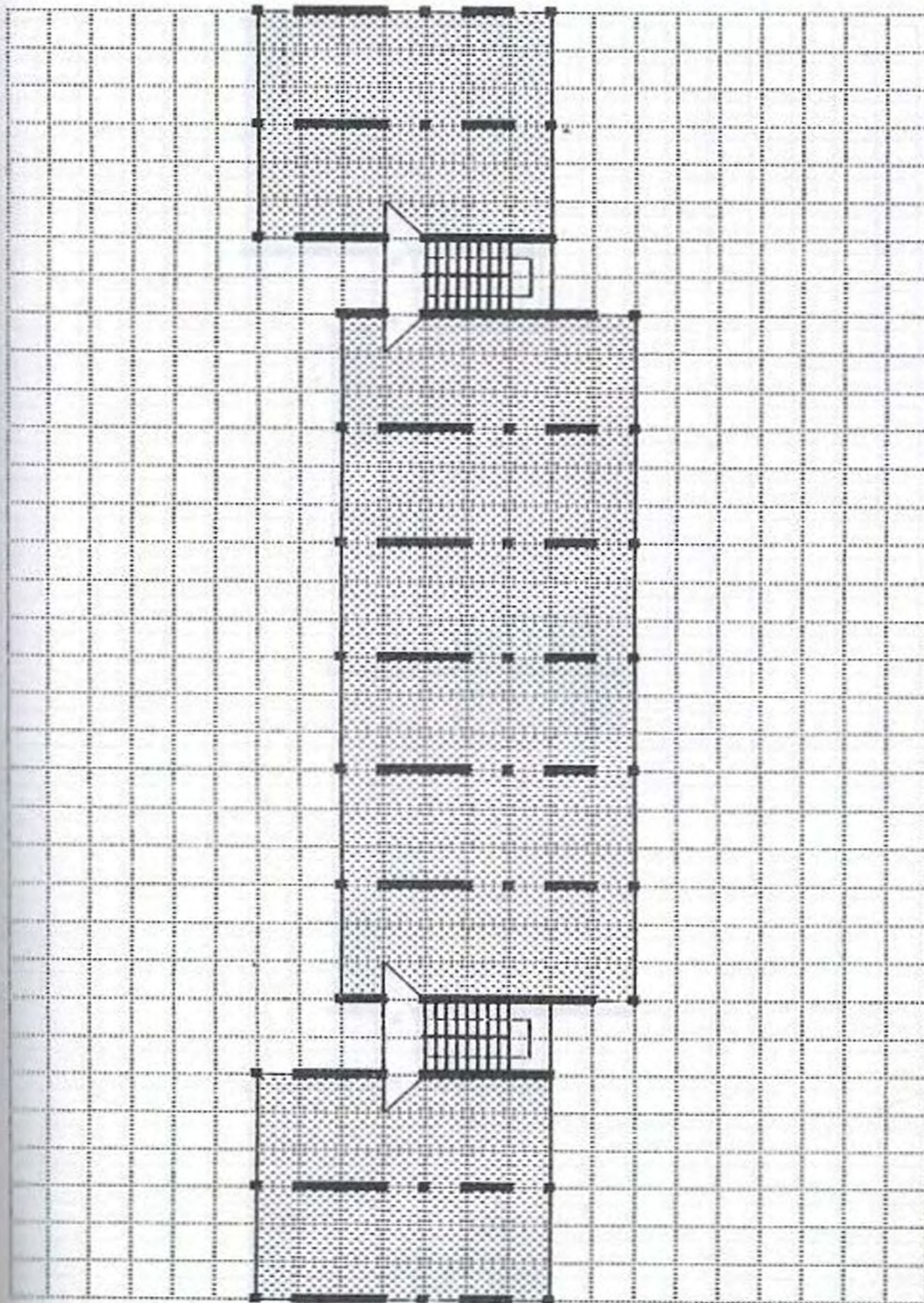
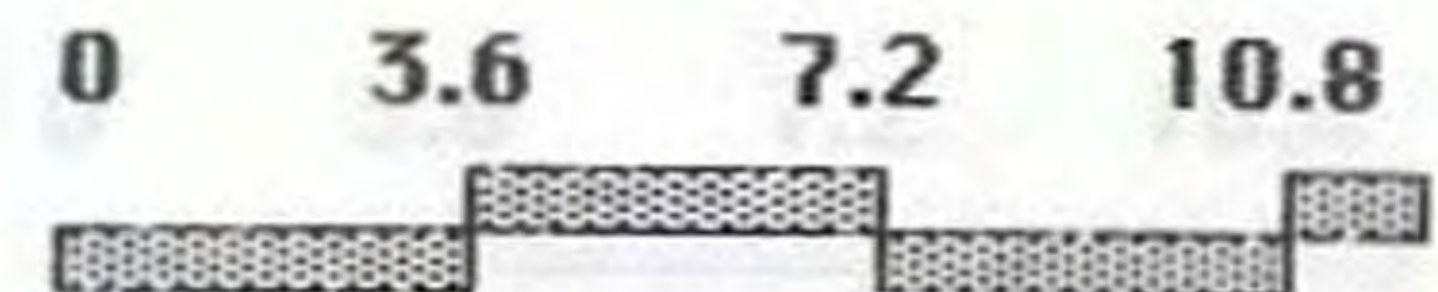


FIGURE (73) :

HOUSING PROTOTYPE (F),
LOCATION OF SUPPORTS
IN CASE TUNNEL FORMS
OR PREFABRICATED WALL
ELEMENTS ARE USED FOR
THE MAIN STRUCTURE.

LEGEND:
SQUARES OF 3.6 SQUARE METERS
SQUARES OF 7.2 SQUARE METERS



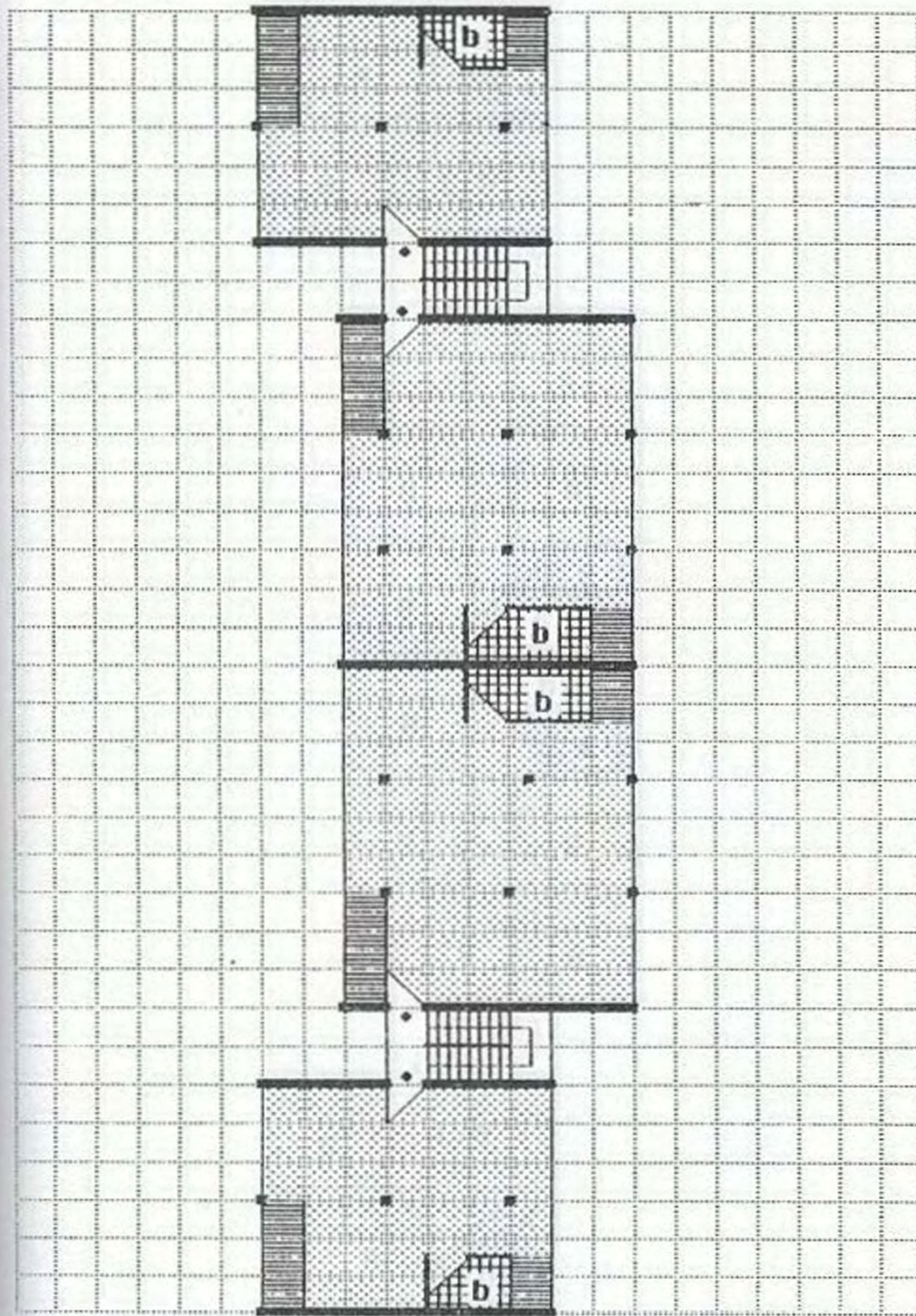


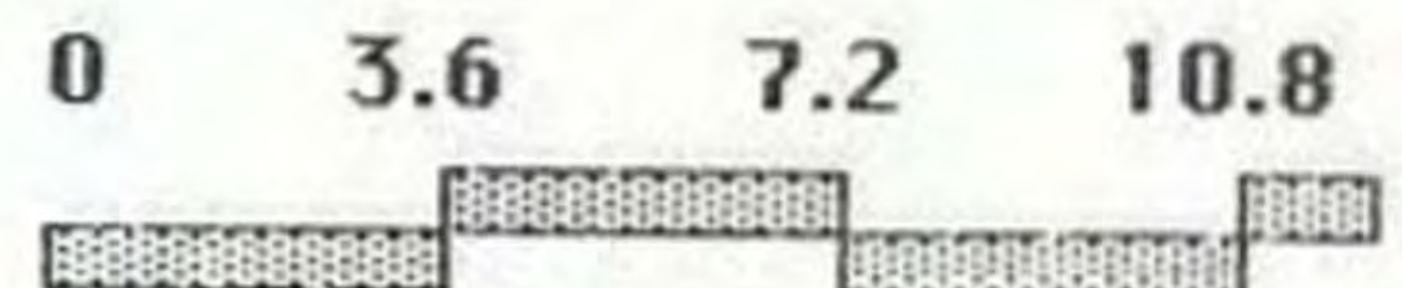
FIGURE (74) :

HOUSING PROTOTYPE (F),
PHASES OF DEVELOP-
MENT:

- INITIAL PHASE WITH
SUPPORTS, OUTER SKIN,
TECHNICAL INSTALLA-
TIONS.

AREAS OF DWELLINGS :

- 60 SQUARE METERS
- 90 SQUARE METERS



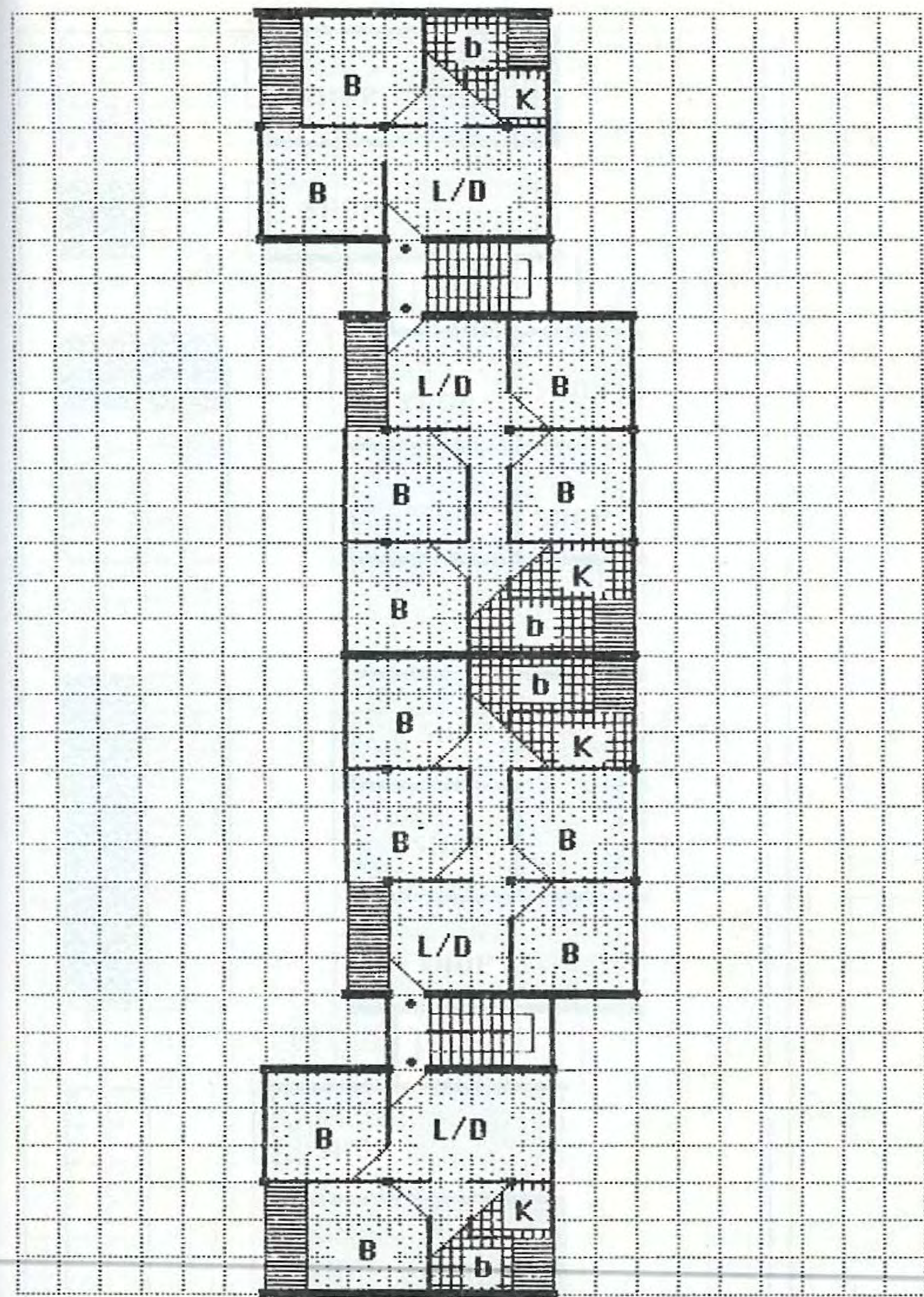


FIGURE (75) :

HOUSING PROTOTYPE (F),
PHASES OF DEVELOP-
MENT :

- FINAL PHASE LEFT TO
THE USER (INTERNAL
PARTITIONS AND
GRADUAL FINISHING).

AREAS OF DWELLINGS :

- 60 SQUARE METERS
- 90 SQUARE METERS



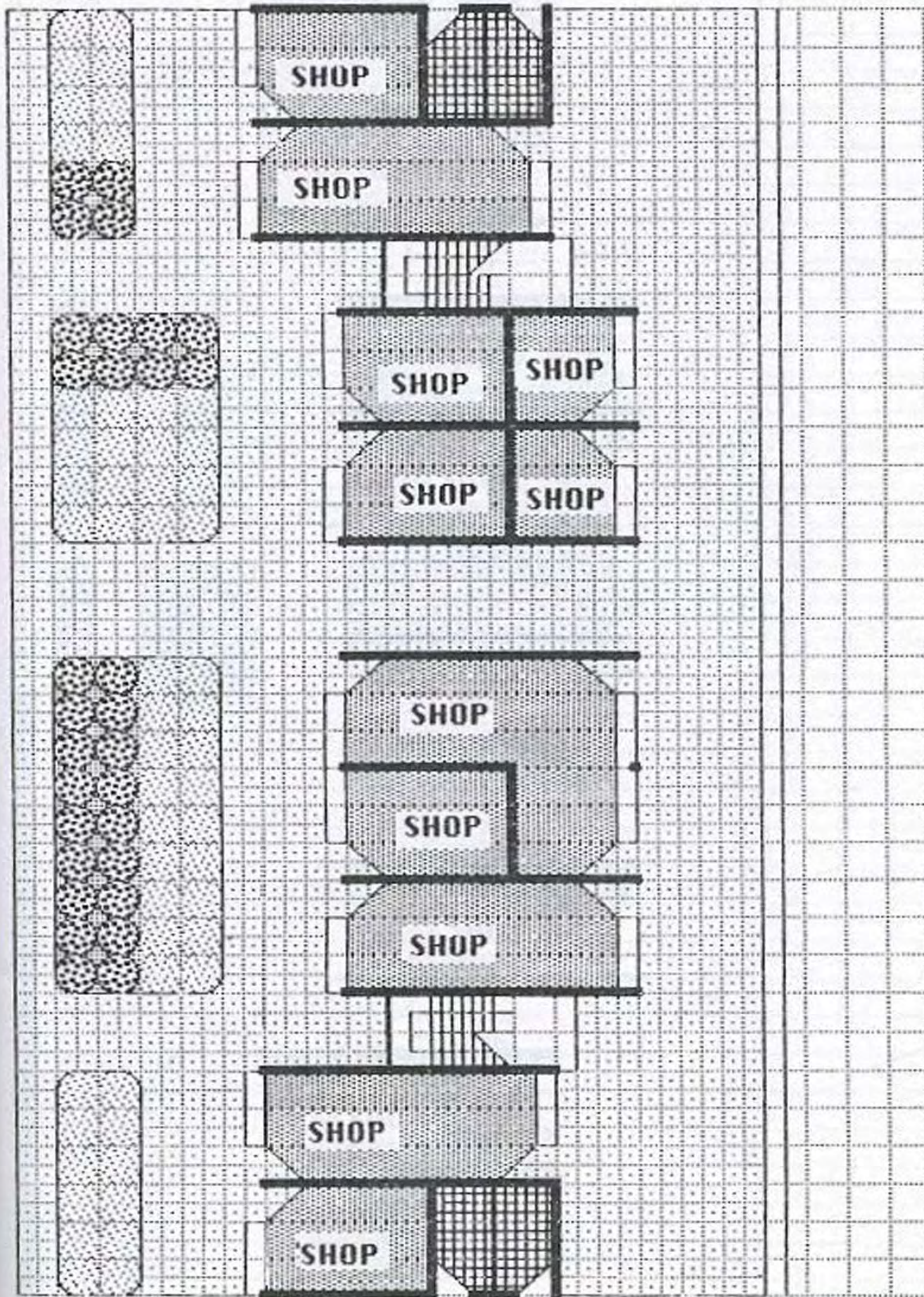
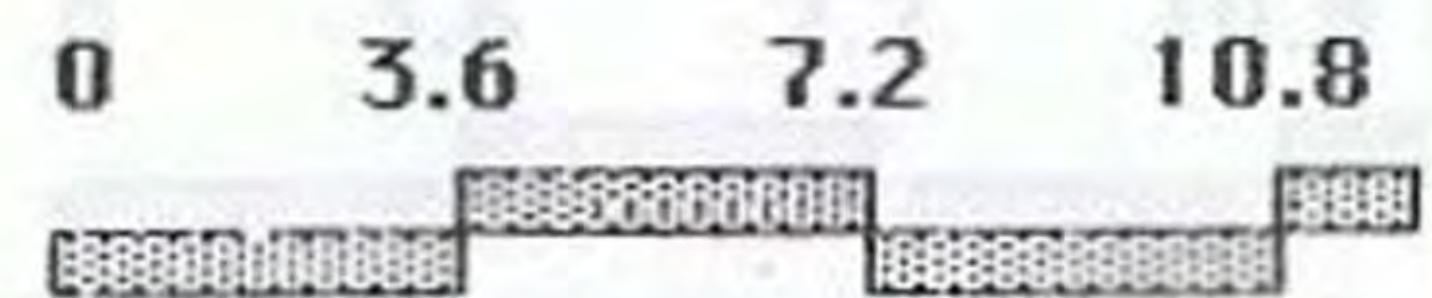


FIGURE (76) :

HOUSING PROTOTYPE (F) ,
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES .



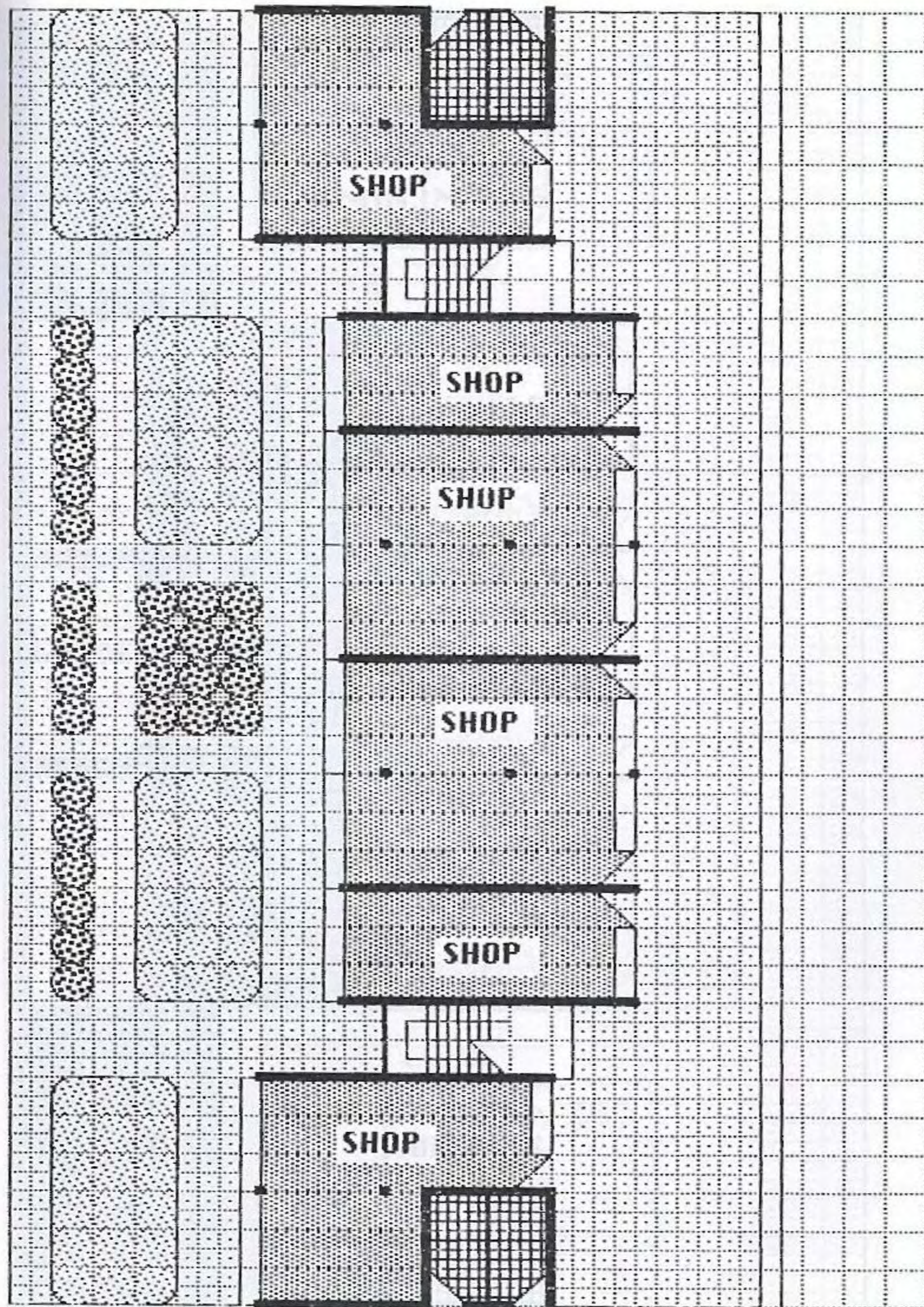
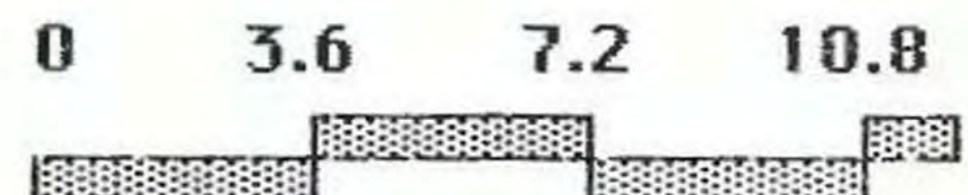


FIGURE (77) :

HOUSING PROTOTYPE (F),
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES .



ENTR.

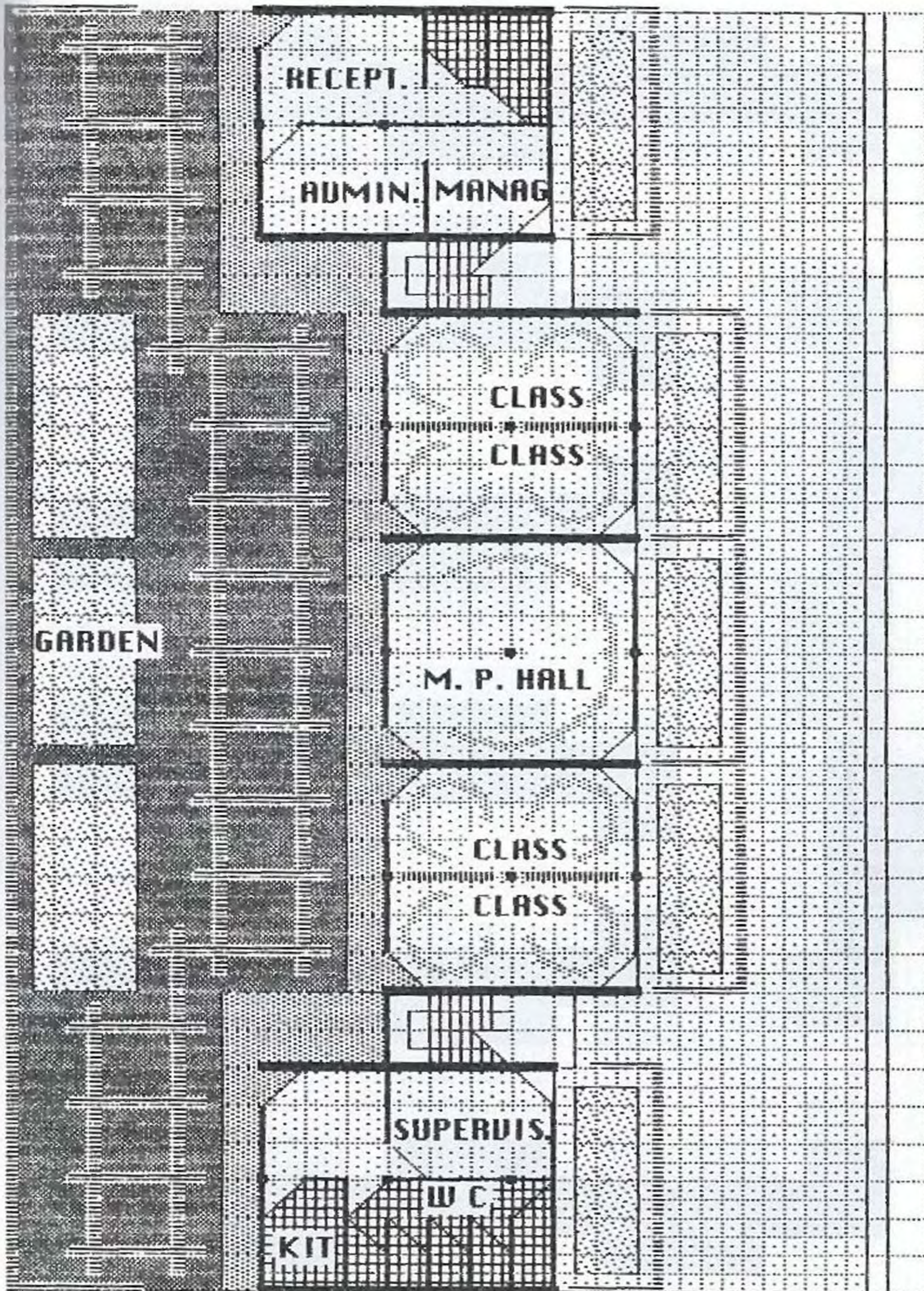
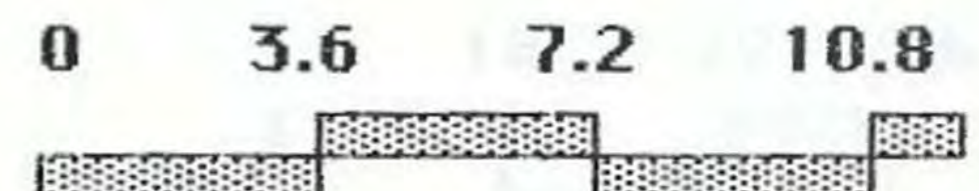


FIGURE (78) :

HOUSING PROTOTYPE (F)
POSSIBLE USE OF THE
GROUND FLOOR FOR A
NURSERY .



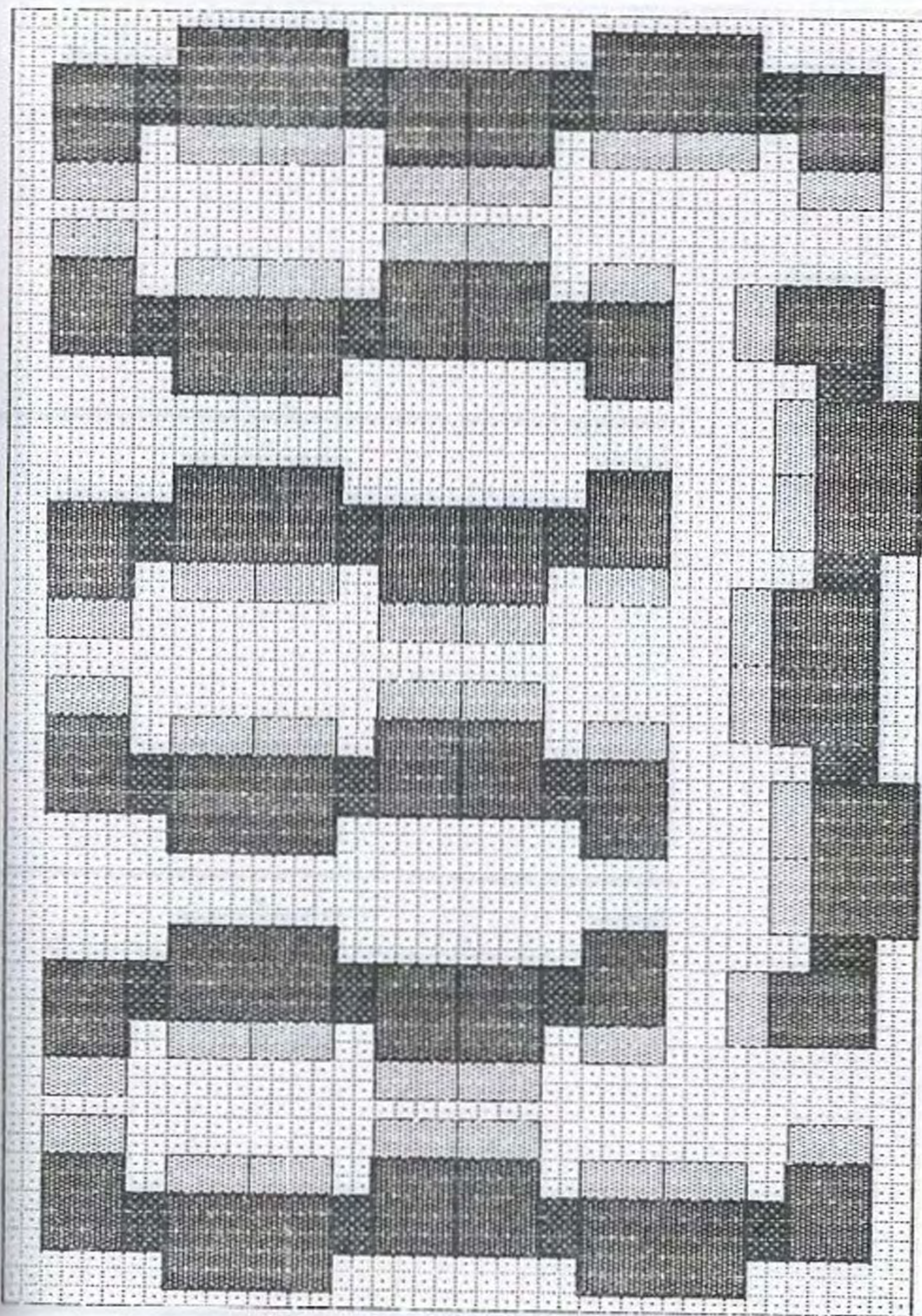
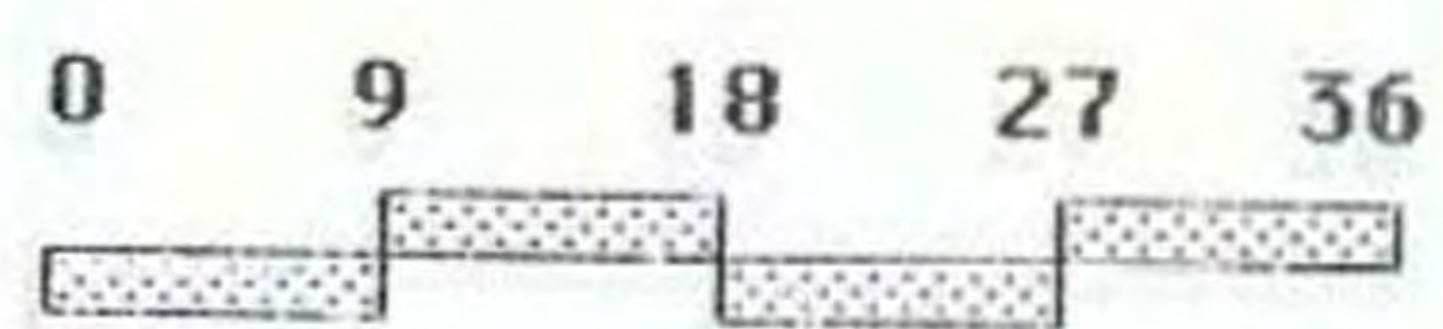


FIGURE (79) :
HOUSING PROTOTYPE (F),
POSSIBLE ARRANGEMENT
FOR LAYOUTS FOR INFRA-
STRUCTURE NETWORKS
HELPING TO LOOSEN THE
CITY.

- INFRASTRUCTURE
ROOT
- BUILDINGS IN
MALLINES



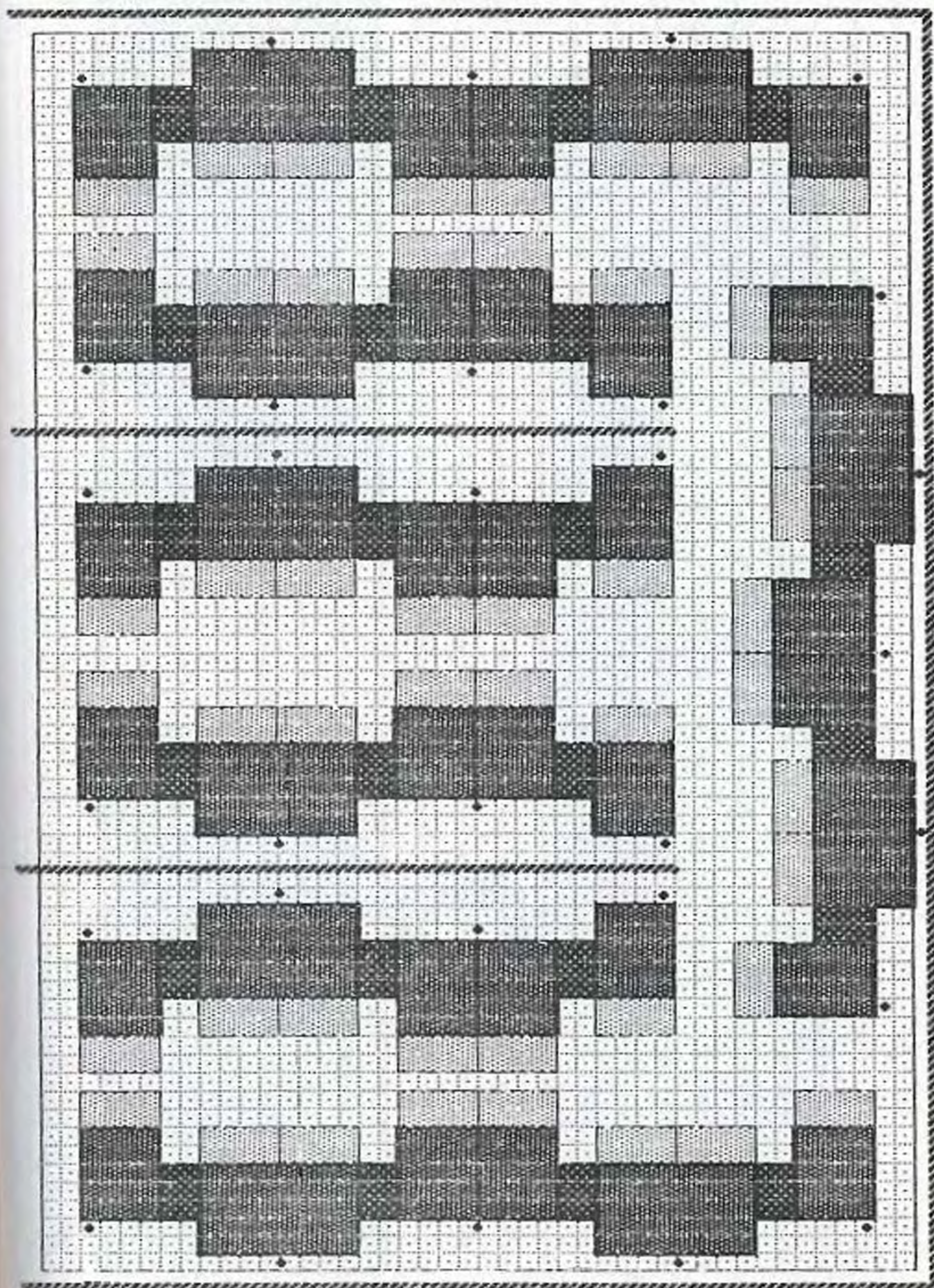
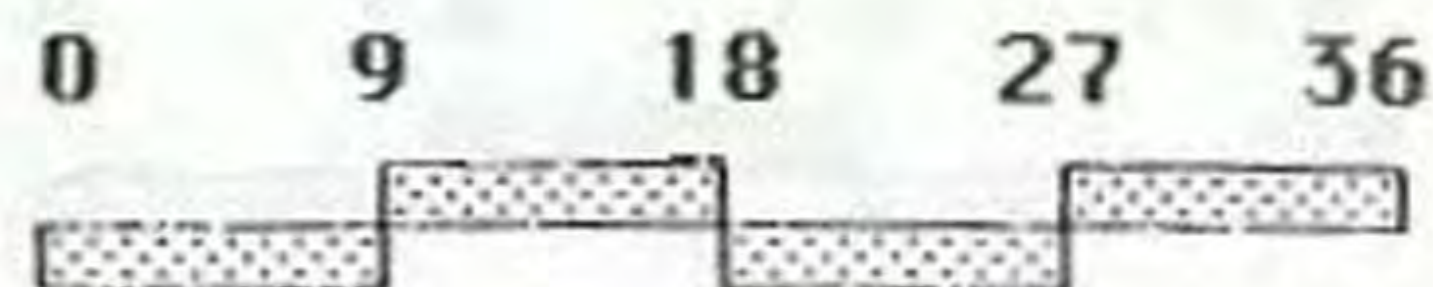


FIGURE (80) :

HOUSING PROTOTYPE (F), POSSIBLE ARRANGEMENT FOR LAYOUTS SHOWING THE ROUTES FOR INFRASTRUCTURE NETWORKS HELPING TO LOWER THEIR COST.

- INFRASTRUCTURE ROUTE
- WETPOINTS IN DWELLINGS



LOCATION OF COLUMNS

ZONE DISTRIBUTION

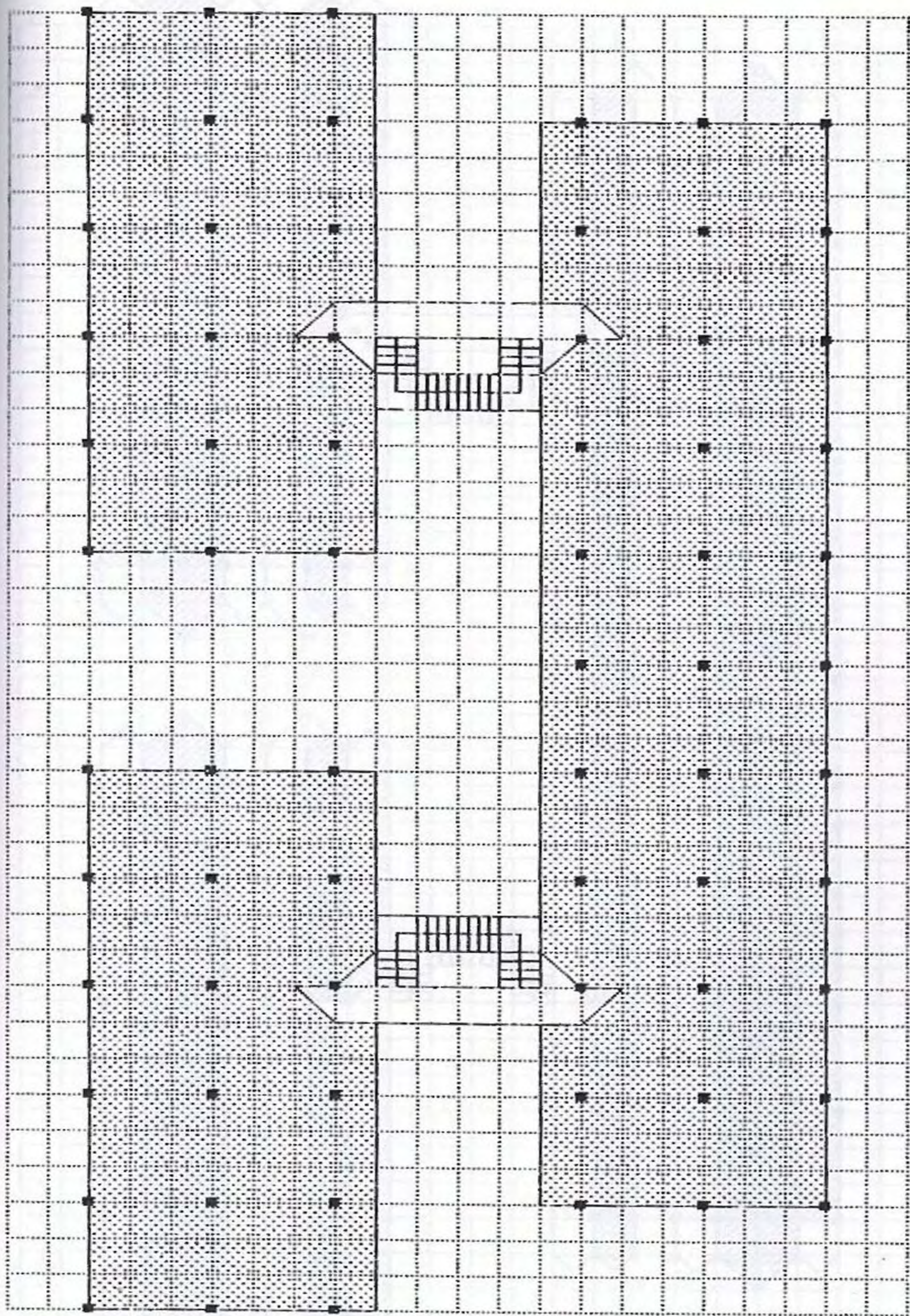
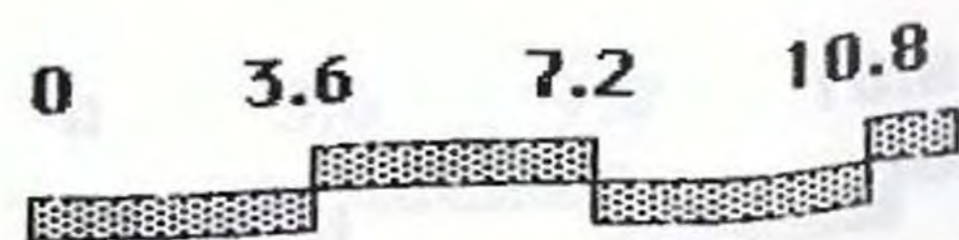


FIGURE (81) :

HOUSING PROTOTYPE (G),
LOCATION OF COLUMNS.



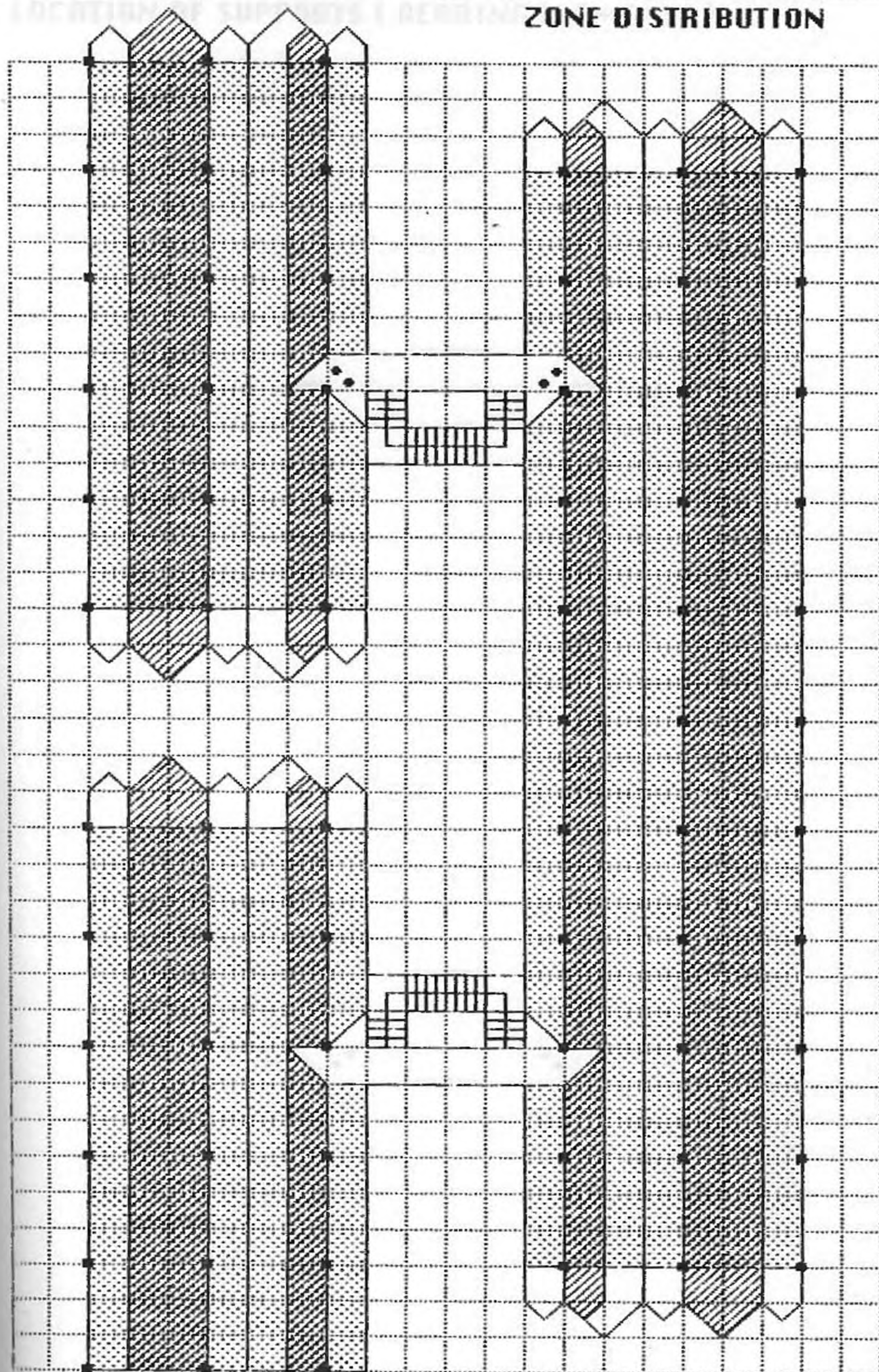
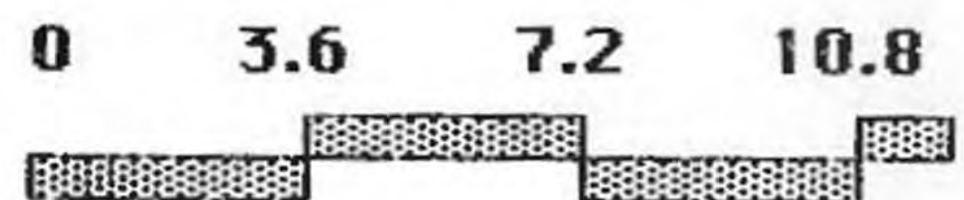


FIGURE (82) :

HOUSING PROTOTYPE (G),
CONCEPT OF ZONE
DISTRIBUTION.

STAIRS
OR PREFABRICATED
ELEMENTS ARE USED FOR
THE MAIN STRUCTURE.



LOCATION OF SUPPORTS (BEARING ELEMENTS)

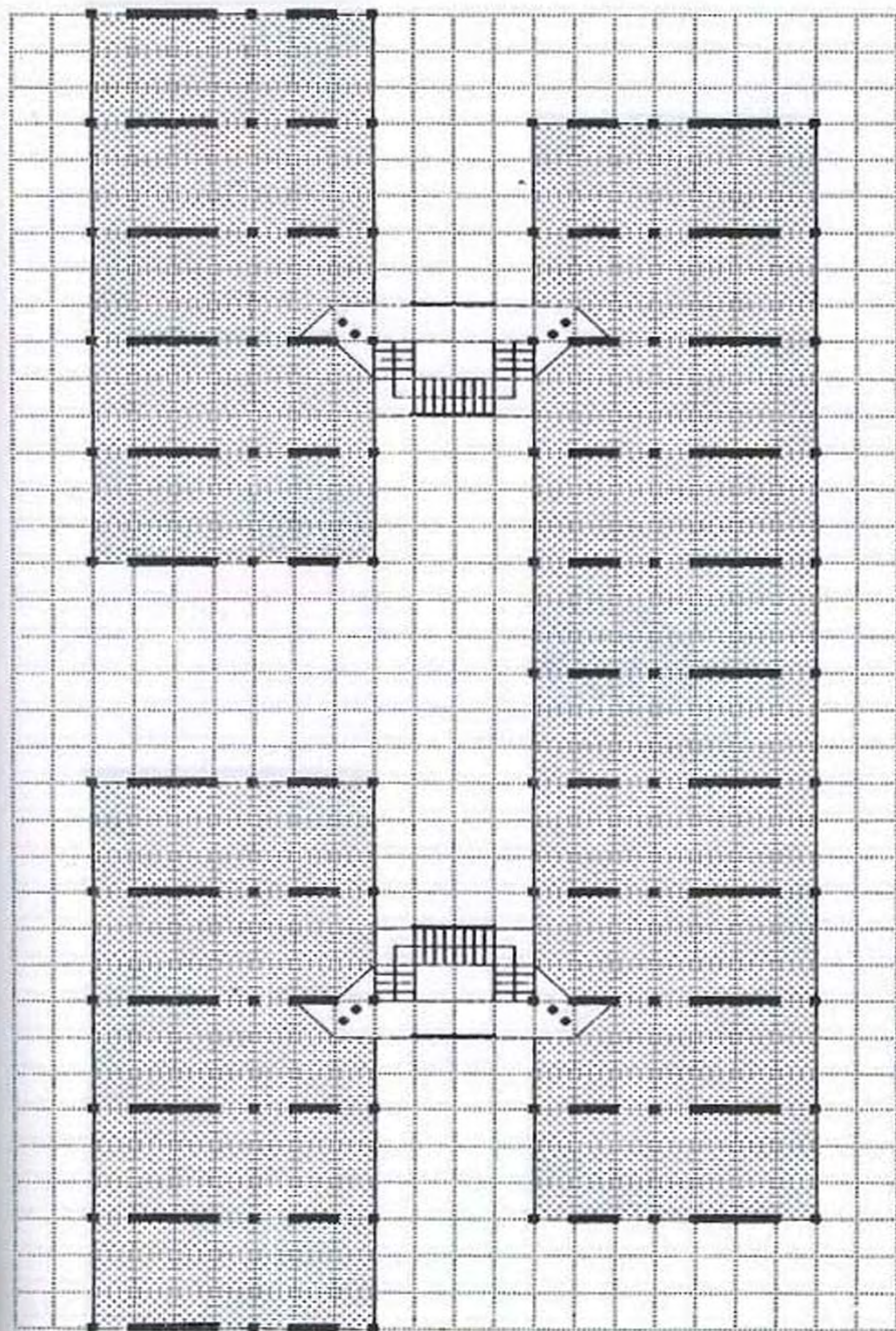
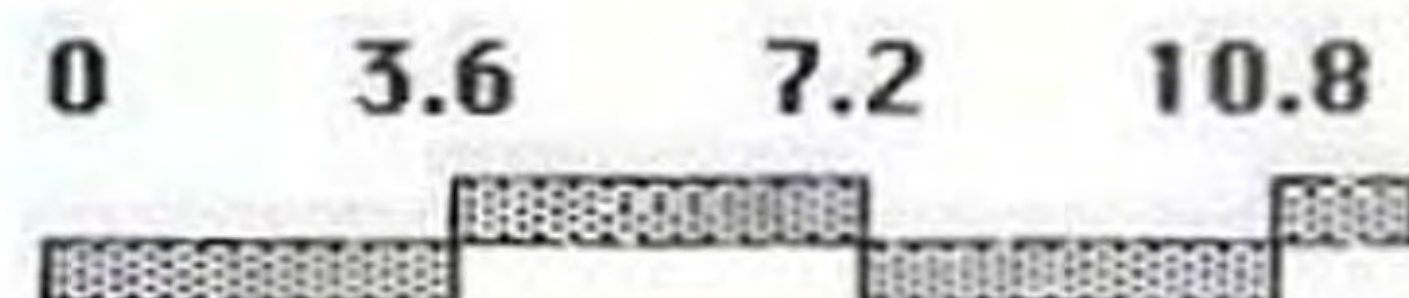


FIGURE (83) :

HOUSING PROTOTYPE (G),
LOCATION OF SUPPORTS
IN CASE TUNNEL FORMS
OR PREFABRICATED WALL
ELEMENTS ARE USED FOR
THE MAIN STRUCTURE.

TECHNICAL DRAWING
BY
REAS OF DWELLING:
- 60 SQUARE METERS
- 90 SQUARE METERS



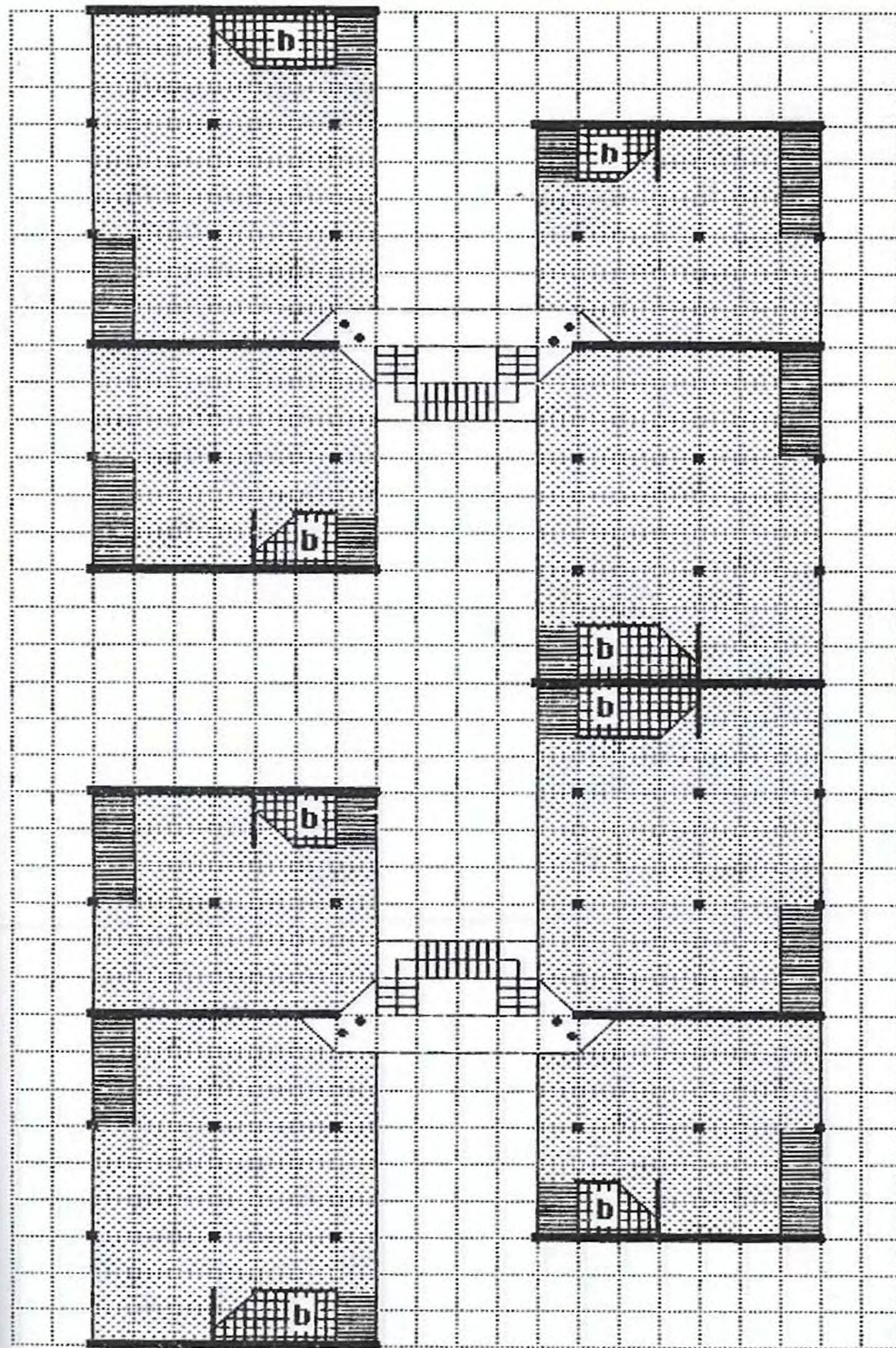


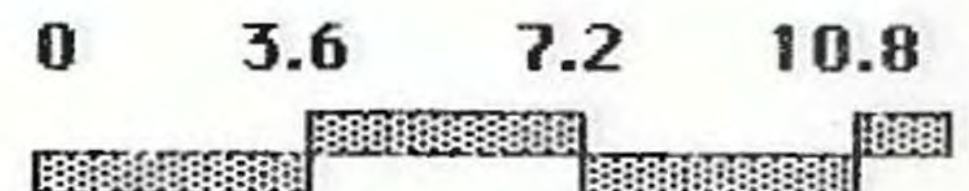
FIGURE (84) :

HOUSING PROTOTYPE (G),
PHASES OF DEVELOP-
MENT:

- INITIAL PHASE WITH
SUPPORTS, OUTER SKIN,
TECHNICAL INSTALLA-
TIONS.

AREAS OF DWELLINGS:

- 60 SQUARE METERS
- 90 SQUARE METERS



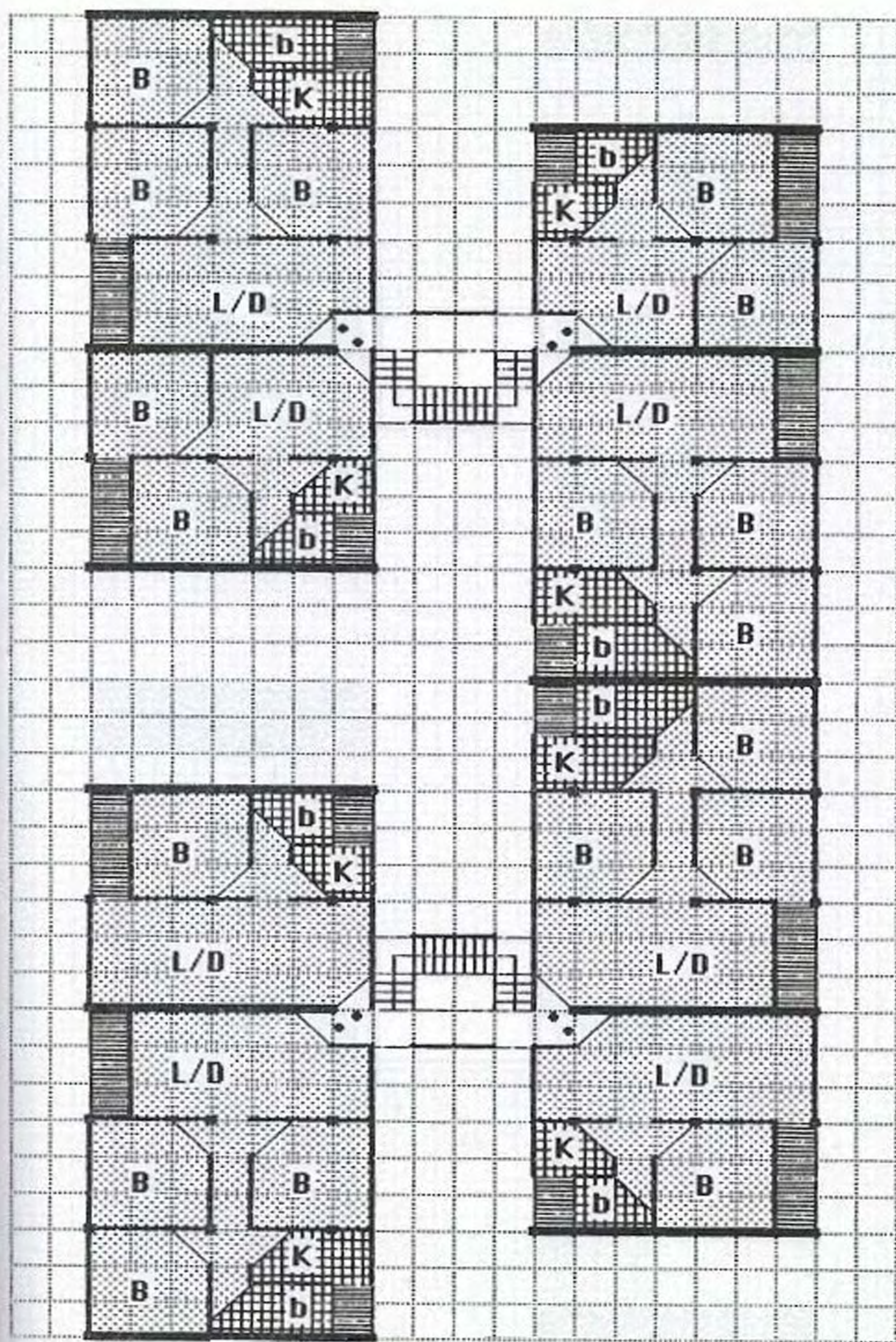


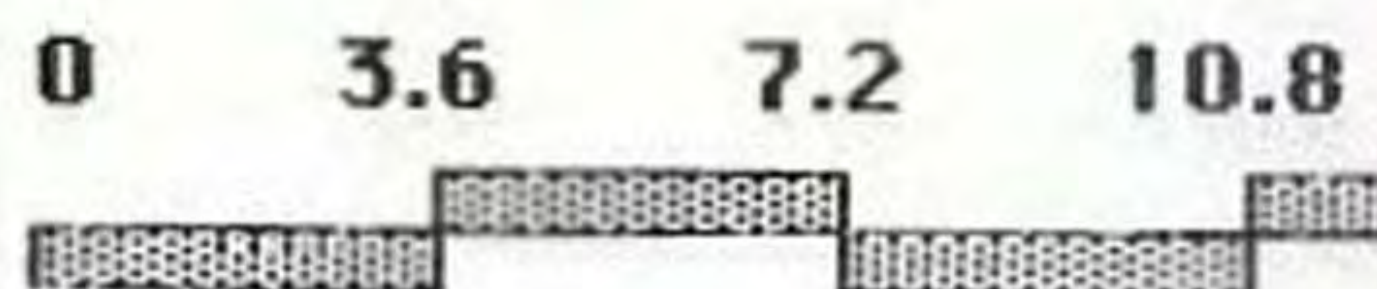
FIGURE (85) :

HOUSING PROTOTYPE (G),
PHASES OF DEVELOP-
MENT :

- FINAL PHASE LEFT TO
THE USER (INTERNAL
PARTITIONS AND
GRADUAL FINISHING)

AREAS OF DWELLINGS :

- 60 SQUARE METERS
- 90 SQUARE METERS



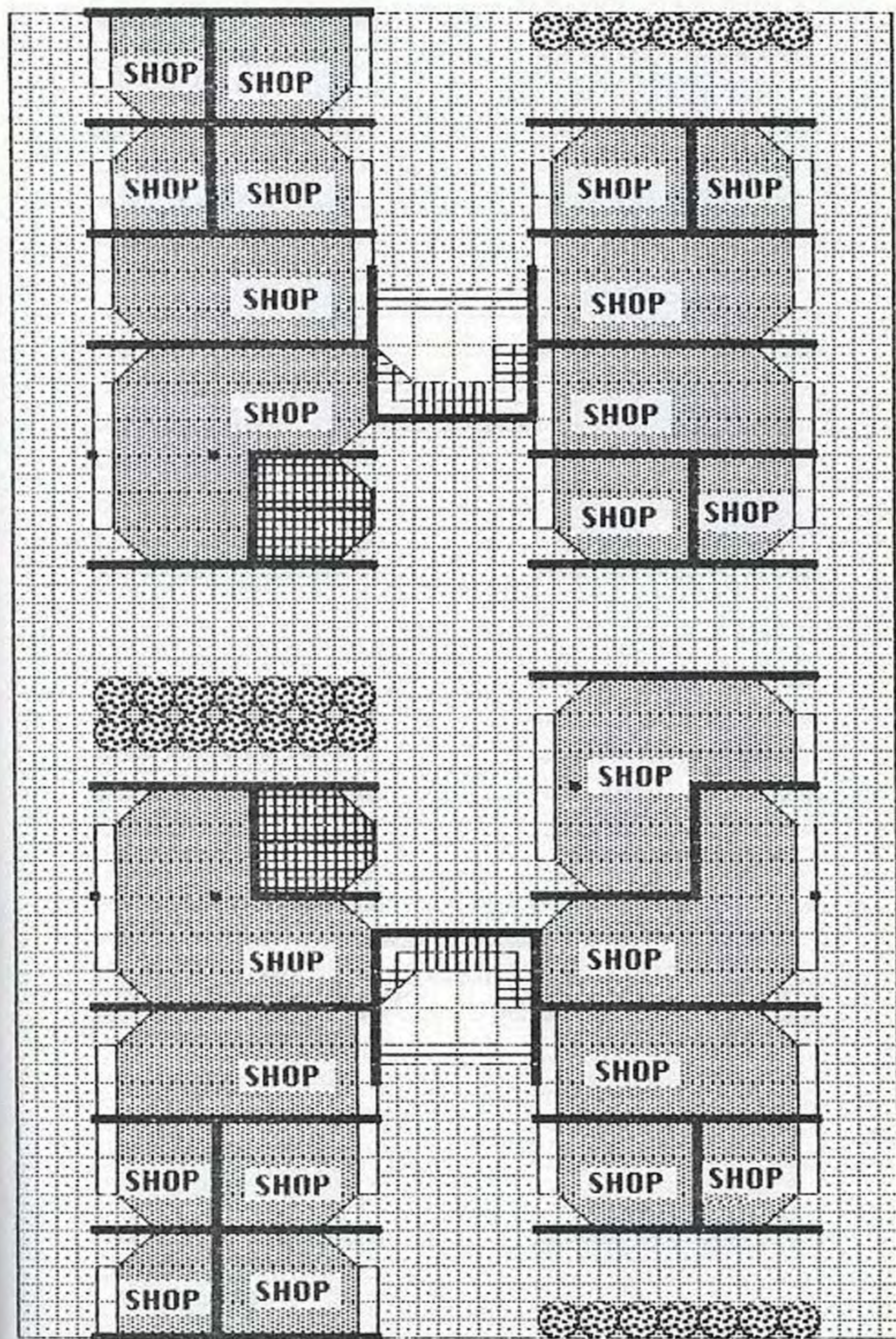
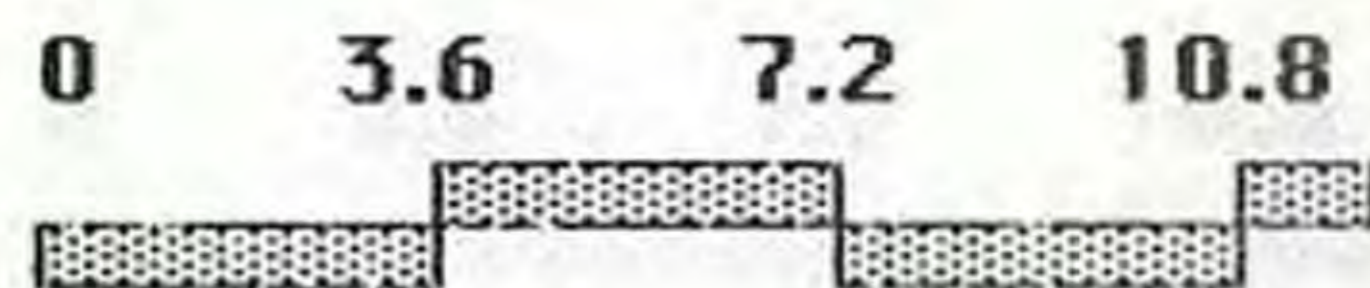


FIGURE (86) :

HOUSING PROTOTYPE (G) ,
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES .



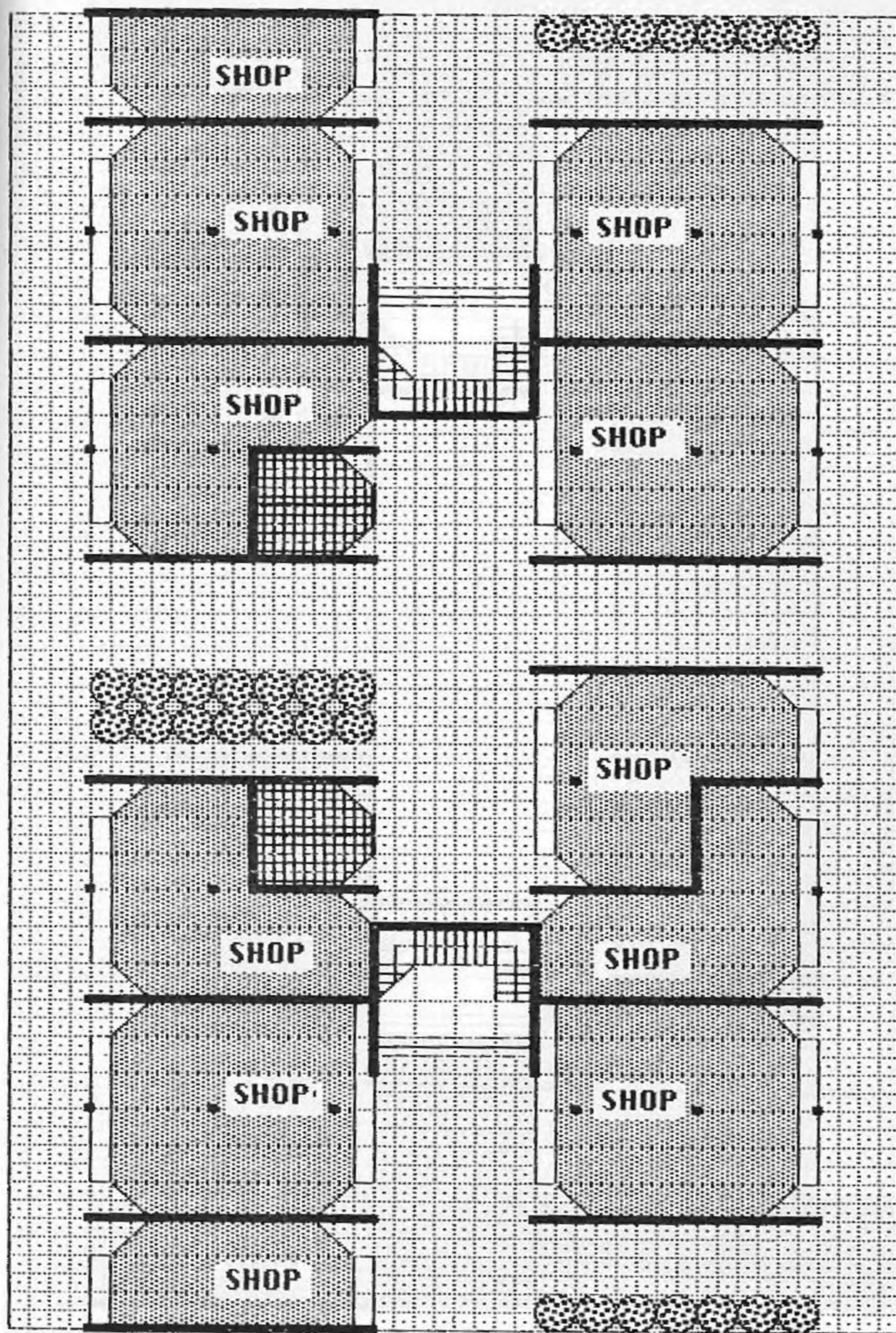
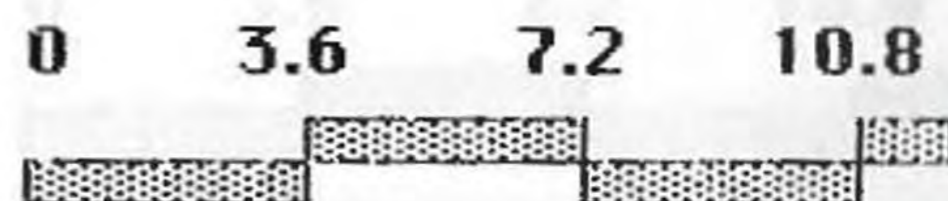


FIGURE (87) :

HOUSING PROTOTYPE (G),
POSSIBLE USE OF THE
GROUND FLOOR FOR
SHOPPING ACTIVITIES .



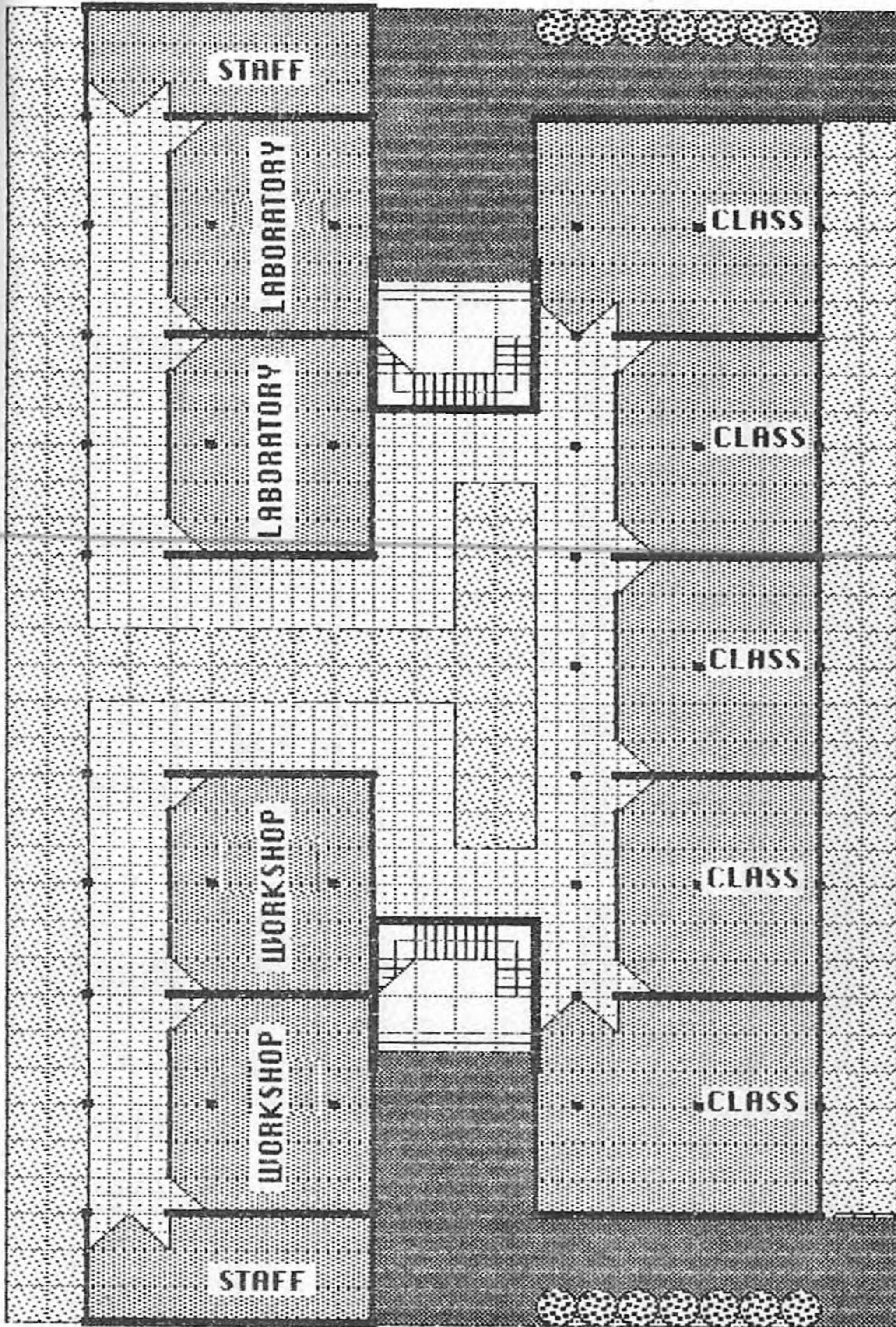
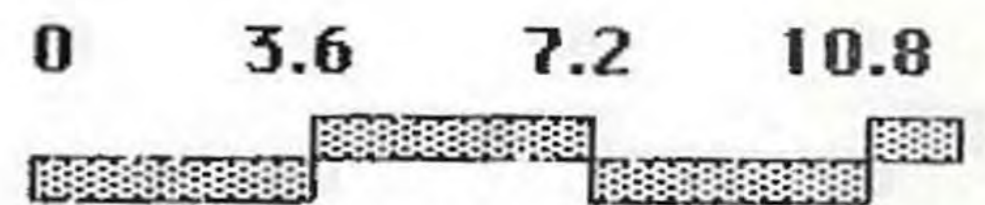


FIGURE (88) :

HOUSING PROTOTYPE (G),
POSSIBLE USE OF THE
GROUND FLOOR FOR A
SCHOOL, (See next fig.)



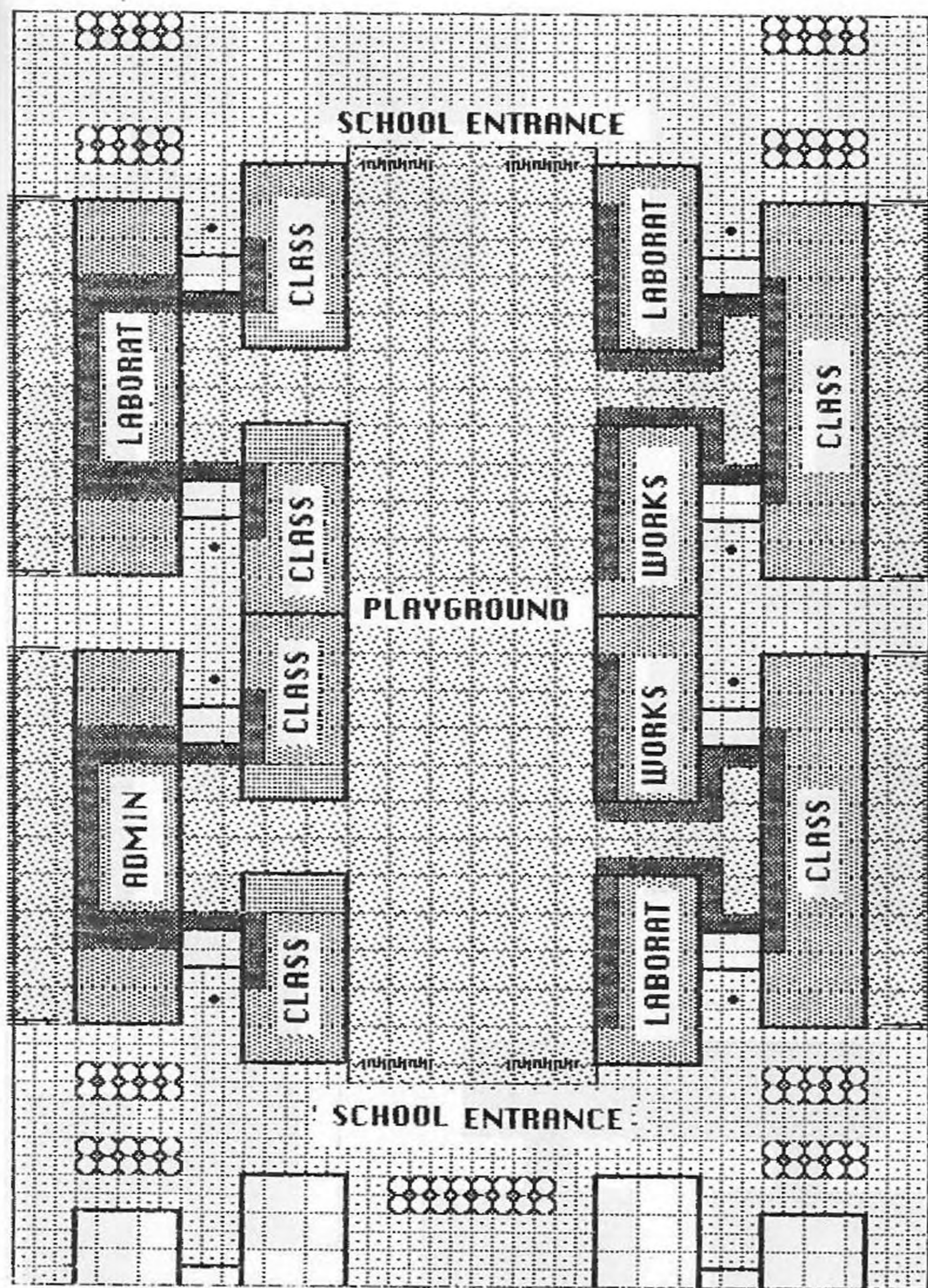
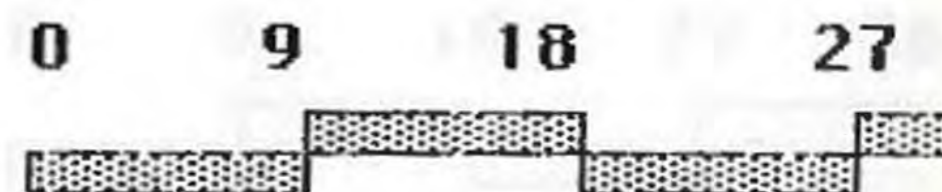


FIGURE (89) :

HOUSING PROTOTYPE (G),
POSSIBLE USE OF THE
GROUND FLOOR OF FOUR
APARTMENT BLOCKS FOR
A SCHOOL



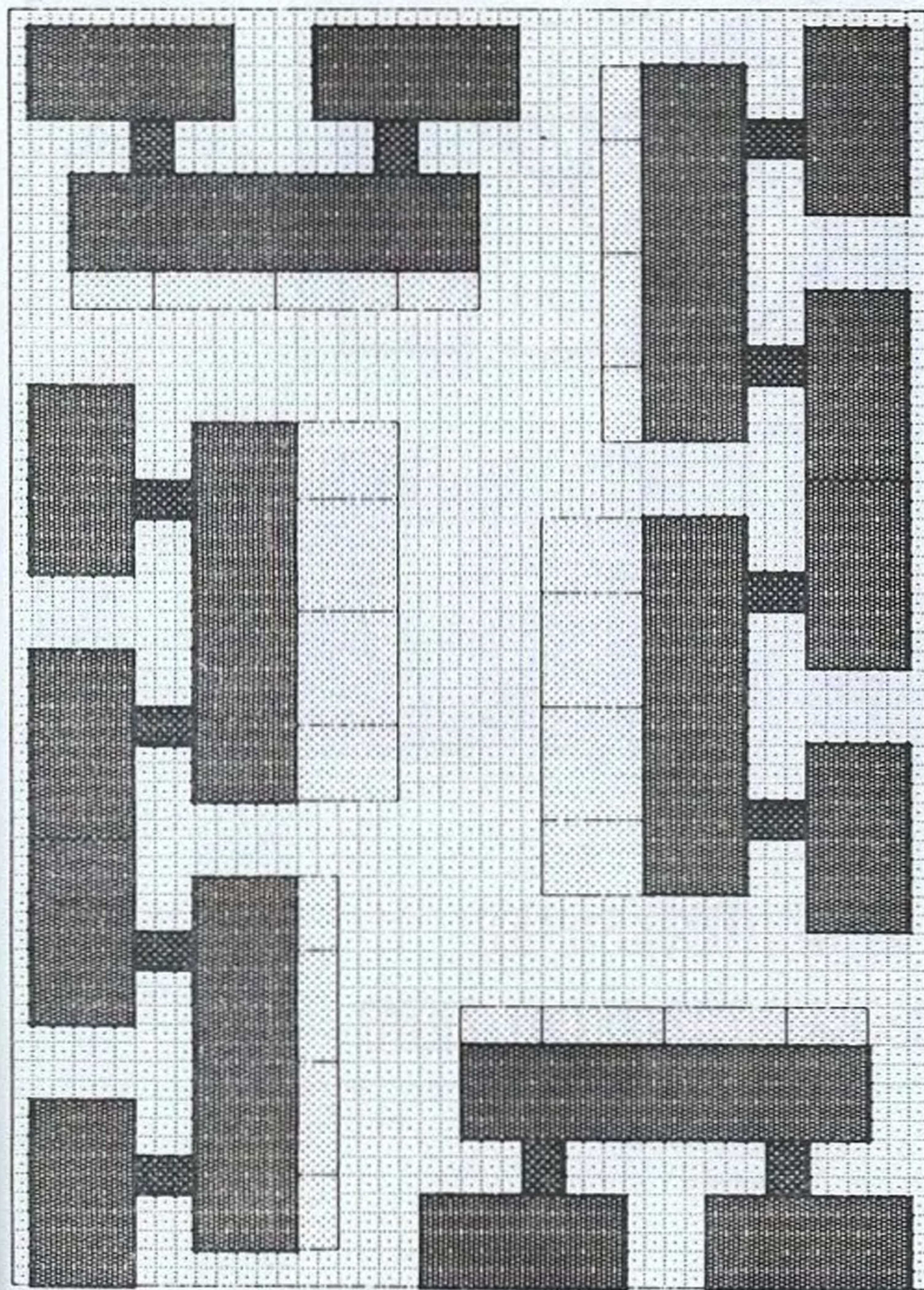
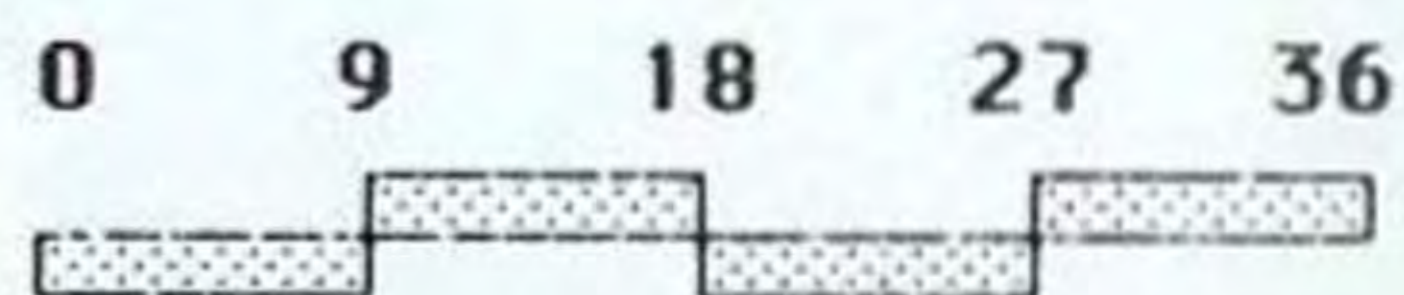


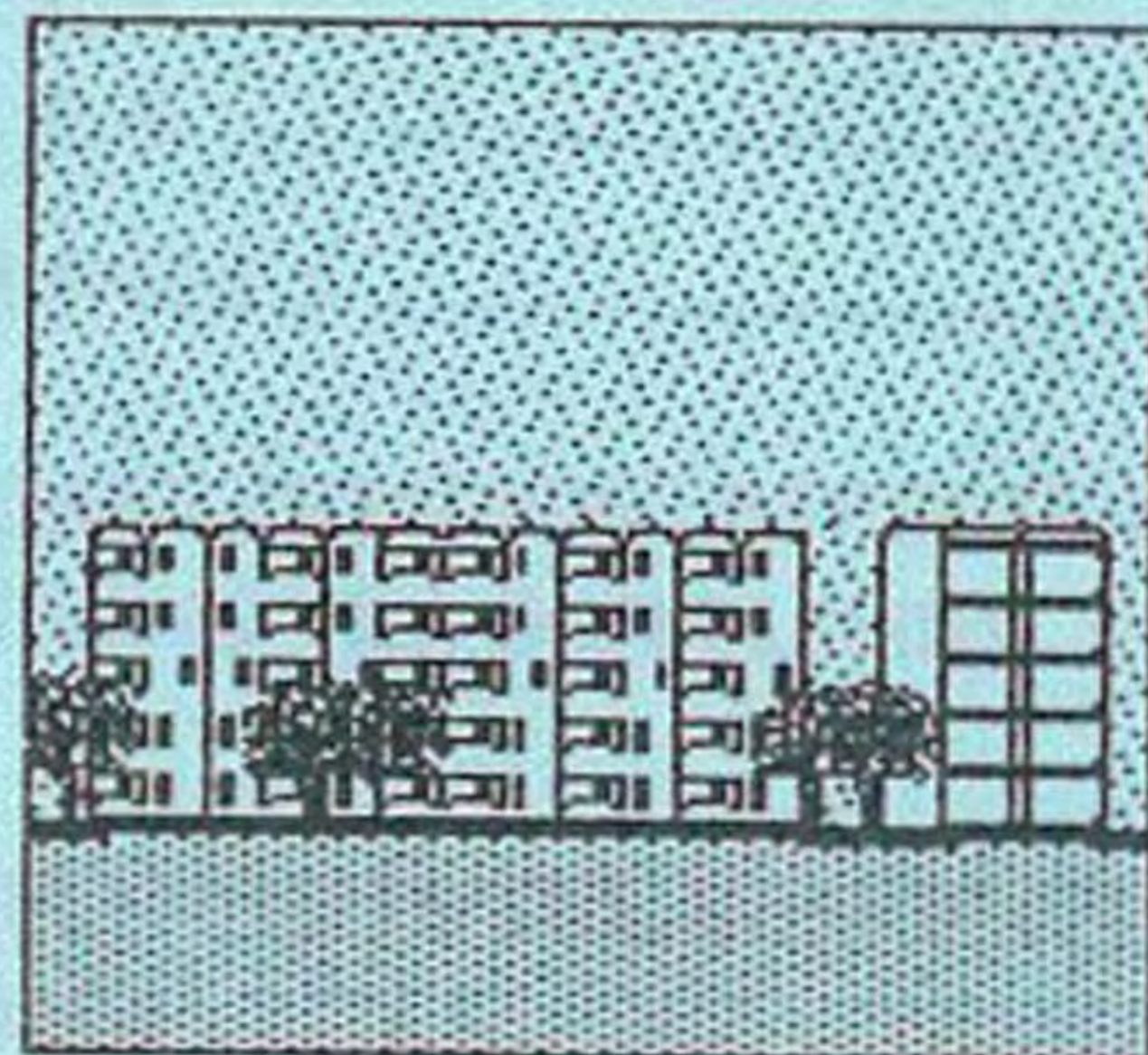
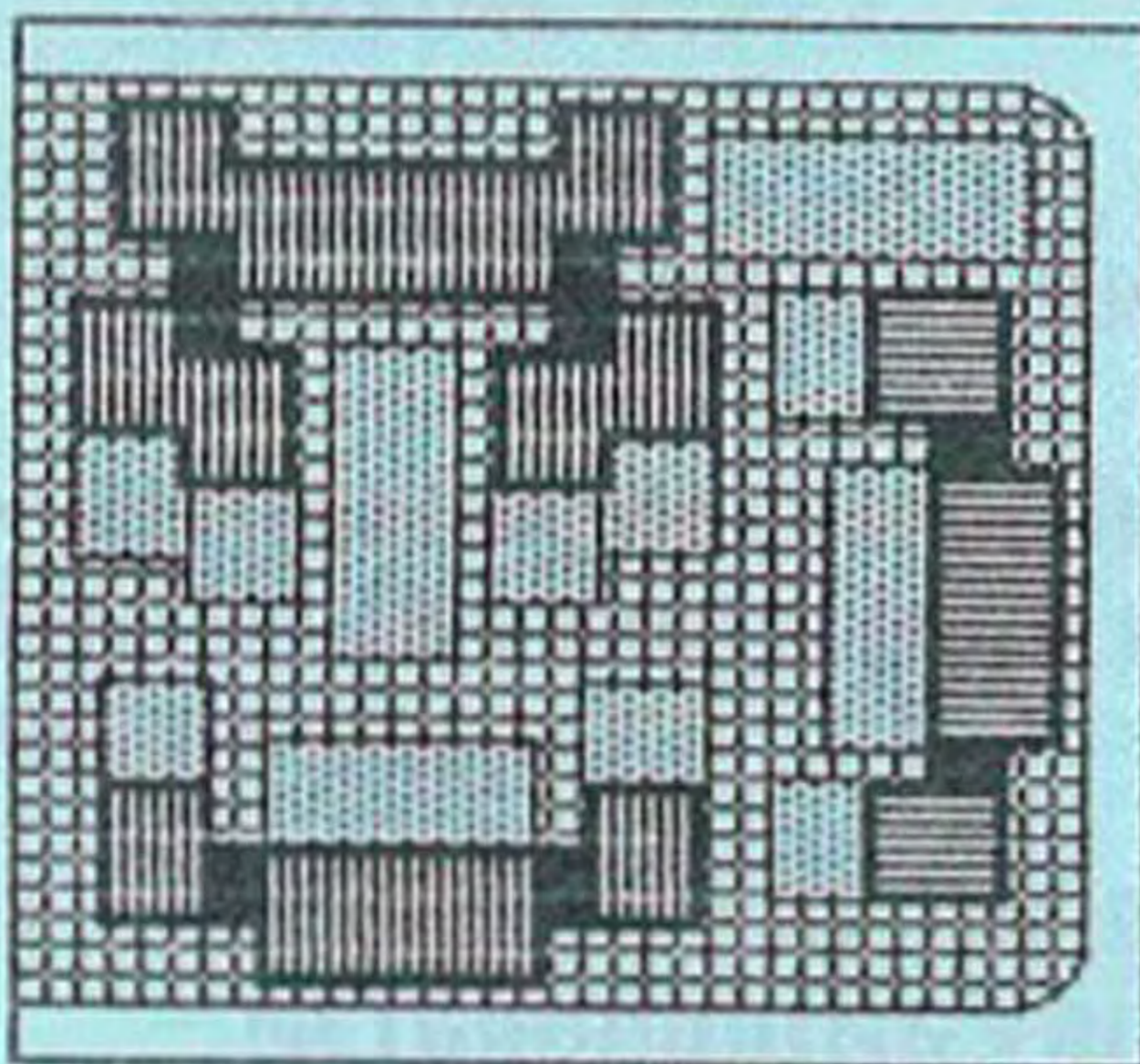
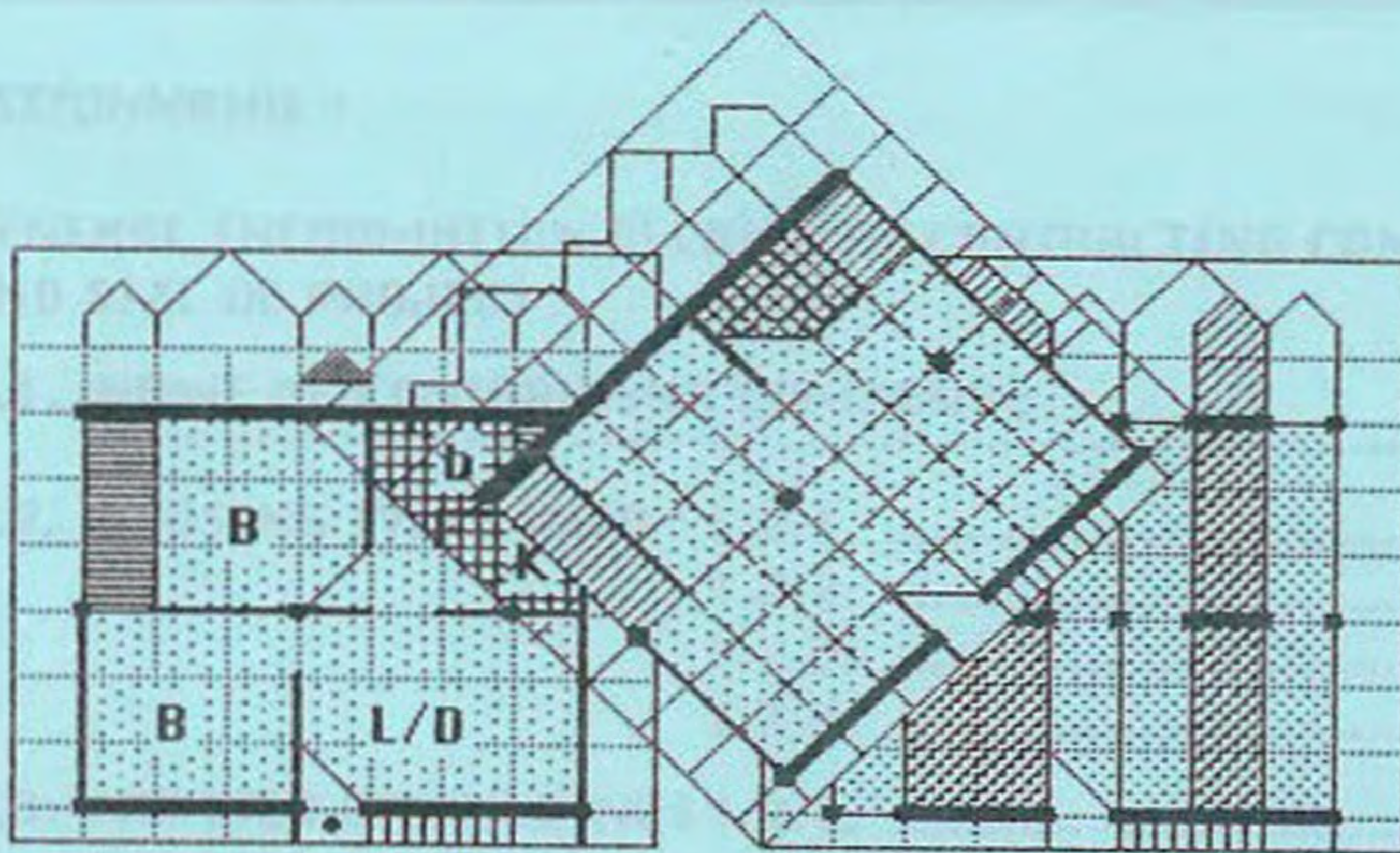
FIGURE (90) :

HOUSING PROTOTYPE (G),
POSSIBLE ARRANGEMENT
FOR LAYOUTS .



APPENDIX 2

QUESTIONNAIRE



APPENDIX 2 :
THE QUESTIONNAIRE

FINAL REPORT

1991

APPENDIX 2

QUESTIONNAIRE : (CONTINUED)

1. GENERAL INFORMATION RELATED TO CONTRACTING COMPANIES
AND SIZE OF PROJECT .

1.1. NAME OF CONTRACTING COMPANY :

1.2. HOUSING TYPES USED : 1.2.1.

1.2.2.

1.2.3.

1.2.4.

1.3. NUMBER OF BUILDINGS 1.2.1.

RELATED TO EACH 1.2.2.

HOUSING TYPE : 1.2.3.

1.2.4.

1.4. TOTAL NUMBER OF DWELLINGS :

2. INFORMATION RELATED TO ORGANIZATIONAL ASPECTS (MAINLY
IDENTIFYING WAYS OF ALLOCATING THE DWELLINGS, EXPECTED
TYPE OF USER, ETC...)

2.1. ALLOCATION OF THE DWELLINGS IS THE RESPONSIBILITY OF:

- NEIGHBOURING FACTORIES

- SYNDICATES

- HOUSING COOPERATIVES

- INDIVIDUALS

- OTHERS (IDENTIFY)

2.2 THE USERS ARE IDENTIFIED AT THE EARLY STAGES OF THE
DEVELOPMENT : YES NO3. INFORMATION RELATED TO ECONOMIC ASPECTS (HIGHLIGHTING
A BREAK DOWN OF THE COST, RANGES OF REAL COST AND
MARKETING PRICES)3.1. EXPECTED COST PER SQUARE METER OF PARTIALLY FINISHED
DWELLINGS : L.E.

APPENDIX 2

QUESTIONNAIRE (CONTINUED) :

3.2. EXPECTED COST PER SQUARE METER OF COMPLETELY FINISHED DWELLINGS : L.E.

3.3. PERCENT OF COST FOR: 3.3.1.FOUNDATIONS.....%
3.3.2.MAIN STRUCTURE.....%
3.3.3.PARTIAL FINISHING.....%

3.4. EXPECTED MARKETING PRICE FOR THE PARTIALLY FINISHED SQUARE METER : L.E.

4. INFORMATION RELATED TO TECHNICAL ASPECTS (METHODS OF CONSTRUCTION USED, CHANGES IN SUGGESTED MATERIALS, SUGGESTED DESIGNS, ETC...)

4.1. METHODS OF CONSTRUCTION USED :

- TRADITIONAL METHOD OF CONSTRUCTION WITH COLUMNS, BEAMS AND SLABS.....
- TRADITIONAL METHOD OF CONSTRUCTION WITH BEAMLESS SLABS
- TUNNEL FORMS
- FLYING SHUTTERS
- PREFAB. PANELS AND SLABS

4.2. PROBLEMS RELATED TO BUILDING MARKATION IN SITE :

- PROBLEMS DUE TO VARIATIONS IN TOPOGRAPHY
- PROBLEMS DUE TO NATURE OF SOIL

4.3. SUGGESTED CHANGES IN SOME CONCEPTUAL FEATURES OF THE INITIAL DESIGN :

- CHANGES IN PLANS : YES NO.....
- CHANGES IN ELEVATIONS : YES NO.....
- CHANGES IN SUGGESTED MATERIALS FOR PARTIAL FINISHING : YES NO.....

(PLEASE SHOW MENTIONED CHANGES ON DRAWINGS)

APPENDIX 2

QUESTIONNAIRE (CONTINUED) :

5. REMARKS TO BE ADDED BY THE PERSON ANSWERING THE PRESENT QUESTIONNAIRE HIGHLIGHTING THE TECHNICAL ADVANTAGES AND DISADVANTAGES OF THE PROPOSED HOUSING TYPES ACCORDING TO HIS OWN POINT OF VIEW

ADVANTAGES :

- 5.1.
- 5.2.
- 5.3.
- 5.4.
- 5.5.

DISADVANTAGES :

- 5.6.
- 5.7.
- 5.8.
- 5.9.
- 5.10.

(THANKS FOR YOUR TIME AND COOPERATION)

APPENDIX 2

QUESTIONNAIRE :

1. GENERAL INFORMATION RELATED TO CONTRACTING COMPANIES AND SIZE OF PROJECT .

1.1. NAME OF CONTRACTING COMPANY : SPEECO

1.2. HOUSING TYPES USED : 1.2.1. PROTOTYPE "D"
 1.2.2.
 1.2.3.
 1.2.4.

1.3. NUMBER OF BUILDINGS RELATED TO EACH HOUSING TYPE :
 1.2.1. 22 BUILDINGS
 1.2.2.
 1.2.3.
 1.2.4.

1.4. TOTAL NUMBER OF DWELLINGS : 964 DWELLINGS

2. INFORMATION RELATED TO ORGANIZATIONAL ASPECTS (MAINLY IDENTIFYING WAYS OF ALLOCATING THE DWELLINGS, EXPECTED TYPE OF USER, ETC...)

2.1. ALLOCATION OF THE DWELLINGS IS THE RESPONSIBILITY OF:
 - NEIGHBOURING FACTORIES
 - SYNDICATES
 - HOUSING COOPERATIVES ✓
 - INDIVIDUALS
 - OTHERS (IDENTIFY)

2.2 THE USERS ARE IDENTIFIED AT THE EARLY STAGES OF THE DEVELOPMENT : YES NO ✓

3. INFORMATION RELATED TO ECONOMIC ASPECTS (HIGHLIGHTING A BREAK DOWN OF THE COST, RANGES OF REAL COST AND MARKETING PRICES)

3.1. EXPECTED COST PER SQUARE METER OF PARTIALLY FINISHED DWELLINGS : 155 L.E.

APPENDIX 2

QUESTIONNAIRE (CONTINUED) :

- 3.2. EXPECTED COST PER SQUARE METER OF COMPLETELY FINISHED DWELLINGS :230 L.E.
- 3.3. PERCENT OF COST FOR: 3.3.1.FOUNDATIONS.....15 %
3.3.2.MAIN STRUCTURE.....35 %
3.3.3.PARTIAL FINISHING.....50 %
- 3.4. EXPECTED MARKETING PRICE FOR THE PARTIALLY FINISHED SQUARE METER : 195 L.E.
4. INFORMATION RELATED TO TECHNICAL ASPECTS (METHODS OF CONSTRUCTION USED, CHANGES IN SUGGESTED MATERIALS, SUGGESTED DESIGNS, ETC...)
- 4.1. METHODS OF CONSTRUCTION USED :
- TRADITIONAL METHOD OF CONSTRUCTION WITH COLUMNS, BEAMS AND SLABS..... ✓
 - TRADITIONAL METHOD OF CONSTRUCTION WITH BEAMLESS SLABS
 - TUNNEL FORMS
 - FLYING SHUTTERS
 - PREFAB. PANELS AND SLABS
- 4.2. PROBLEMS RELATED TO BUILDING MARKATION IN SITE :
- PROBLEMS DUE TO VARIATIONS IN TOPOGRAPHY ✓
 - PROBLEMS DUE TO NATURE OF SOIL ✓
- 4.3. SUGGESTED CHANGES IN SOME CONCEPTUAL FEATURES OF THE INITIAL DESIGN :
- CHANGES IN PLANS : YES NO.....
 - CHANGES IN ELEVATIONS : YES NO.....
 - CHANGES IN SUGGESTED MATERIALS FOR PARTIAL FINISHING : YES NO.....
- (PLEASE SHOW MENTIONED CHANGES ON DRAWINGS)

APPENDIX 2

QUESTIONNAIRE (CONTINUED) :

5. REMARKS TO BE ADDED BY THE PERSON ANSWERING THE PRESENT QUESTIONNAIRE HIGHLIGHTING THE TECHNICAL ADVANTAGES AND DISADVANTAGES OF THE PROPOSED HOUSING TYPES ACCORDING TO HIS OWN POINT OF VIEW

ADVANTAGES :

- 5.1. EASY DEMARKATION OF BUILDINGS
- 5.2. HIGH SPEED OF EDECTION DUE TO STANDARDIZATION.....
- 5.3. SAVING IN MATERIALS DUE TO STANDARDIZATION.....
- 5.4. ABSENCE OF PARTITIONS ENHANCES INTERNAL FLEXIBILITY
- 5.5.

DISADVANTAGES :

- 5.6. HIGH COST OF FOUNDATIONS FOR IMPROPER SITE CHARACT..
- 5.7.
- 5.8.
- 5.9.
- 5.10.....

(THANKS FOR YOUR TIME AND COOPERATION)

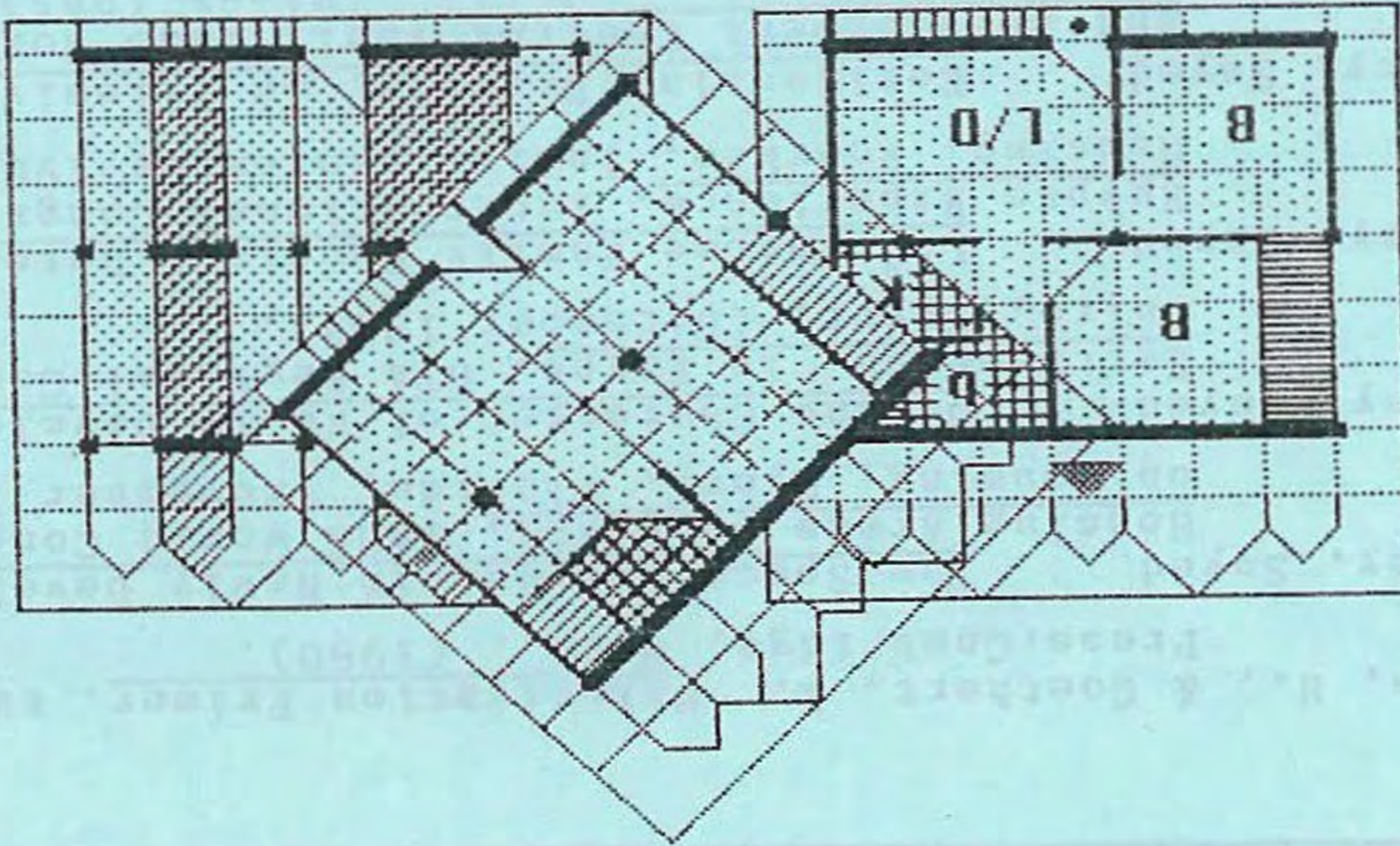
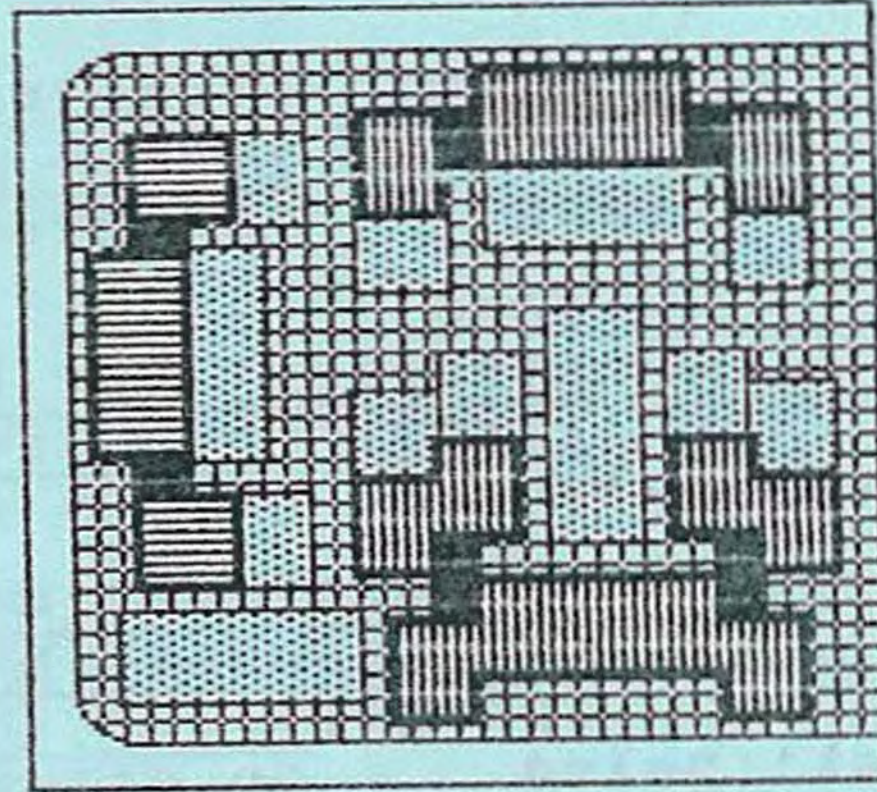
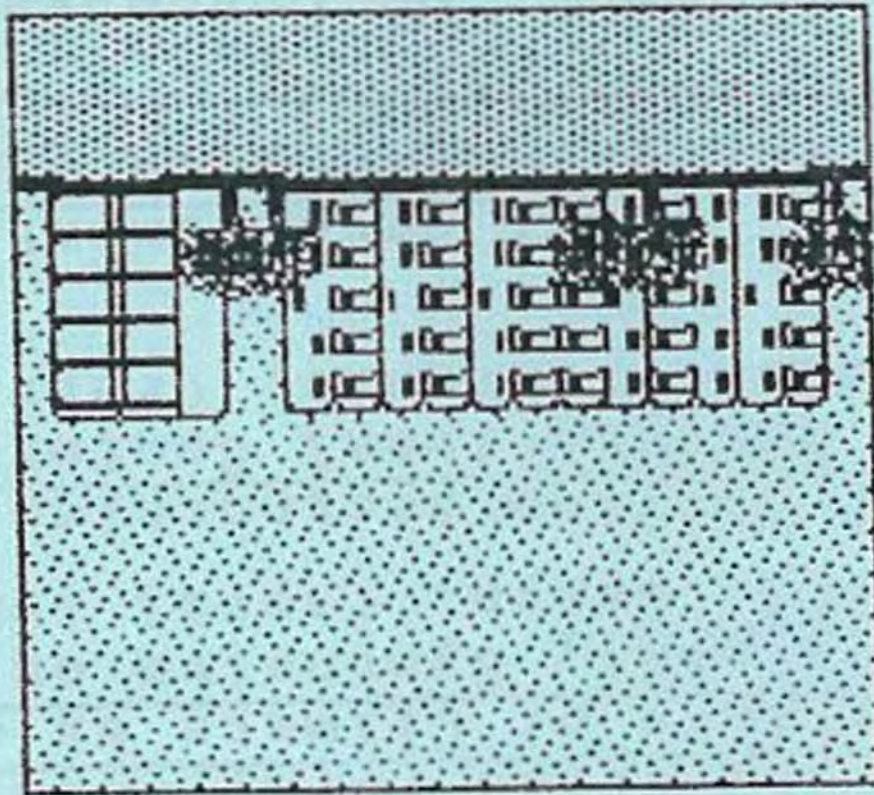
APPENDIX 3
SELECTED RESIDENCES

1991

FINAL REPORT

SELECTED REFERENCES

APPENDIX 3 :



FORMAL LOW COST HOUSING PROTOTYPES - EGYPT : MONITORING, ASSESSMENT AND DEVELOPMENT .

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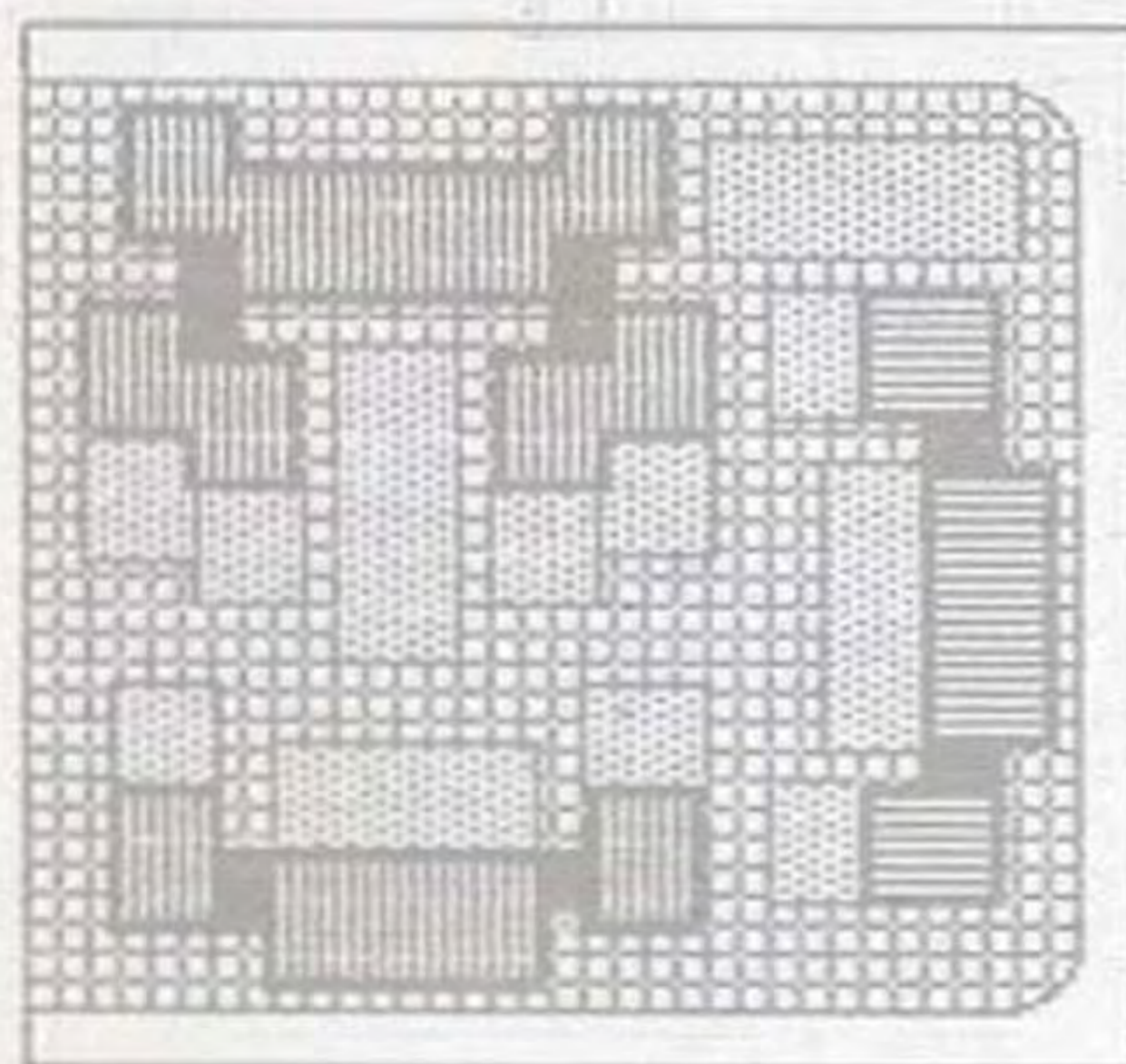
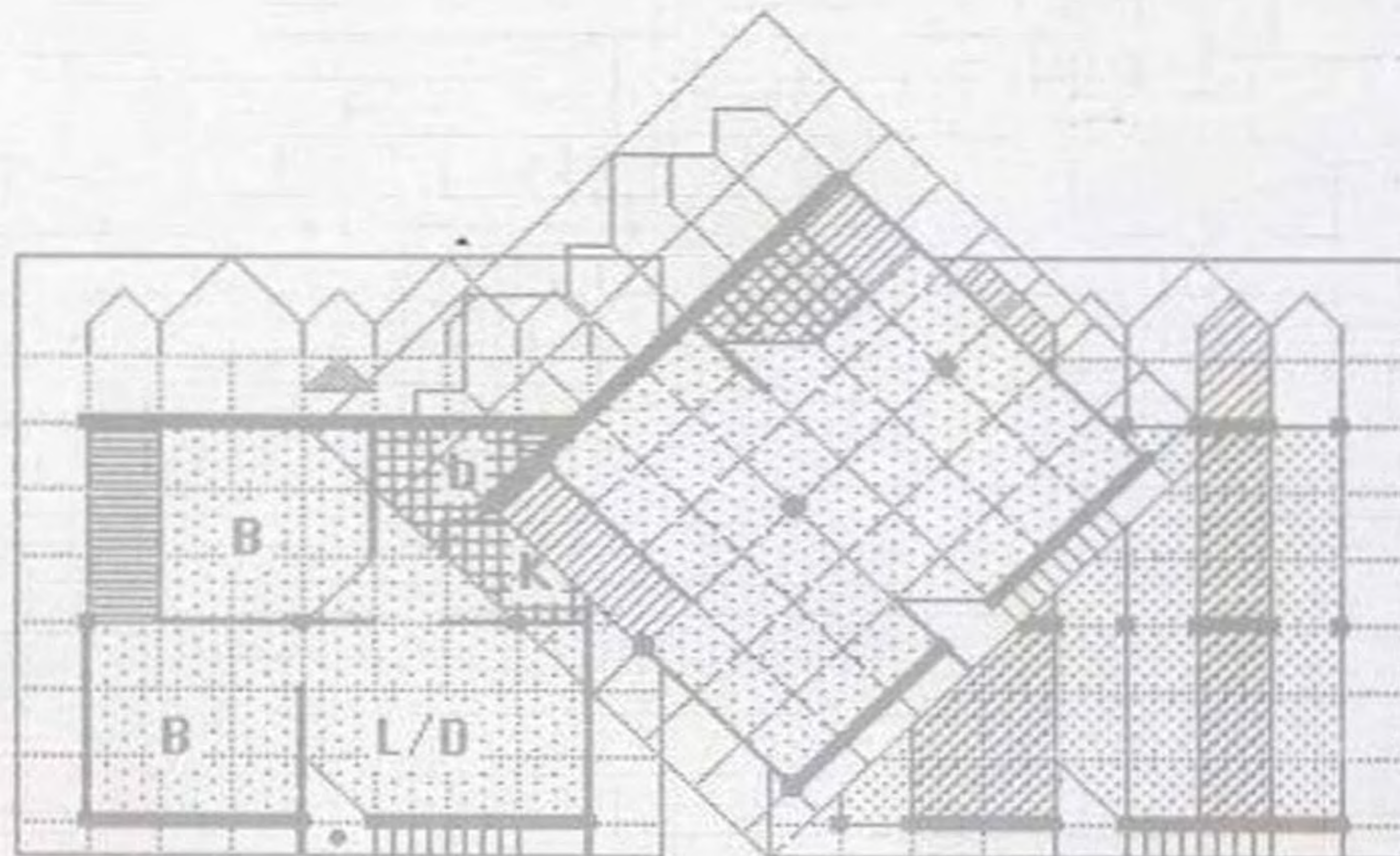
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