UIA MONOGRAPH

INTERNATIONAL COMPETITION FOR SOLUTIONS ON NEW TECHNOLOGIES FOR SOCIAL HOUSING · CACERES-BRIGHTON

MOPU

MINISTERIO DE OBRAS PUBLICAS Y URBANISMO-ESPAÑA

UNITED NATIONS ORGANIZATION-INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS

IYSH·1987

CON MIS MEJORES AUGURIOS POR EL EXITO DEL CONCURSO, CUYOS RESULTADOS DEBERAN PERMITIR AVANZAR EN LA RESOLUCION DEL PROBLEMA DE LA VIVIENDA SOCIAL EN TODO EL MUNDO.

FOREWORDS

INTRODUCTION

1987 signifies a year of special importance for the persons and institutions whose vocation or profession is dedicated to the search for solutions to the problem of adequate housing for their respective populations, problems which vary in intensity according to their social, economic, or geographic location. Food and shelter are the priority inherent needs of human beings and, therefore, are requirements which must be universally recognised for all the planet's inhabitants.

This International Year of Shelter for the Homeless must force all community members responsible for governmental tasks to reflect on two considerations. Firstly, it demands that we evaluate those aspects which arise in our immediate surroundings regarding the homeless and secondly, take into account the United Nations' wish to focus special attention on the problem during this period. This introspective view casts some doubts which must be clarified as quickly as possible by the public authorities concerning what, in general terms, can be considered a satisfactory situation of established housing needs, as in the case of our country.

Even more important is the international dimension of the problem and its dramatic self-evidence in some countries where there are obvious possibilities of action by the developed countries.

Approximately one quarter of the world population lives in extremely precarious and unhealthy housing conditions. The distressing tragedy of millions of human beings in developing countries who are forced to live with the street as their only home is more frequent every day. More than one hundred million people have no shelter. If this current demographic tendency continues, the problem, instead of being gradually solved, will become a serious factor of instability and social imbalance. Absolutely each and every one of us is conscientiously obliged to look for and find solutions.

The methodology for approaching the housing problem of the homeless populations must necessarily be varied, and amongst its many facets the search for imaginative architectural solutions carries specific importance.

In this context I am especially satisfied with the presentation of this book, which the International Union of Architects offers as its contribution to the «International Year of Shelter for the Homeless», and which makes a further contribution to the synchronised effort which the United Nations aims to project in 1987 to urge active participation which must continue beyond this year and be extended thereafter with the aim of halting the increasing housing problem at a worlwide level.

It is absolutely certain that this book, which includes all the projects presented to the «International Competition for New Technological Solutions to Social Housing», which was convened by the International Union of Architects and organised by its Spahish Section, is full of suggestions, innovations and efficient and billiant ideas, which will serve not only to make us aware of the magnitude of the problem with which we are dealing, but will also form a reference guide of incalculable value for all those people whose decisions influence the effective improvement of the living conditions of the most underprivileged.

My congratulations to you all the conveners, the organisers, the winners, and the competitors in general, in the knowledge that your efforts and dedication, of unquestionable social and human significance, have providad a unique and irreplaceable contribution to the fight against poverty and misery to which we are all uncompromisingly dedicated.

JAVIER SAENZ DE COSCULLUELA
MINISTRO DE OBRAS PUBLICAS Y URBANISMO, ESPAÑA

HOMELESS BUT NOT HOPELESS

1987 is by UN dedicated as the International Year of Shelter for Homeless, IYSH, to be the checkpoint for a process of several years of planning and active actions which should be put in practice up to the year 2000 and then continued further on.

The homelessness is the most grave problem of mankind today, even increasing in the future. It can not be solved by governmental programmes only. It can not even be solved by producing houses «for the poor». It is necessary to look for new ways and new solutions. One key is the resourses of the inhabitants, the poor people themselves. They are homeless but not hopeless.

The Non Governmental Organizations, NGO:s, have during the preparation for the IYSH-programme proved, that the experiences and engagement from NGO:s must be used. Together with Community Based Organizations, CBO:s, in the poor areas, NGO:s can demonstrate alternative solutions meeting the needs of the poor through specific programmes, projects and experiences as organizations, enablers and implementors of new ideas and models.

Union Internationale des Architectes, UIA, is an international NGO and has as such the most worldwide network of any profession with membersektions in more than 90 countries, organizing alltogether 900.000 architects. As all international organizations UIA has the responsibility to provoce exchanges of professional experiences and thus permit a balance of recourses between the rich and poor countries.

The needs for actions, expressed in the UN Shelter-programme, thus ask for participation from architects, but in an utmost extreme and new shape. The UIA General Assembly 1985 in Cairo decided IYSH to be and important activity in the UIA 1985-87 programme.

The XVI UIA Congress July 1987 in Brighton is consequently organized with the theme «Shelter and Cities - Building Tomorrow World».

The three years preparation of the Congress has engaged all national sektions, UIA workgroups and commissions. The XVI Congress is the main UIA contribution in 1987 to the IYSH.

Thanks to the Consejo Superior de los Colegios de Arquitectos, the very active Spanish UIA section, it has been possible to fulfill the decission of UIA Council 1983 in Santiago, to organize the UIA International Competition for Solutions, CINTUS.

The idea was to create a useful and inspiring presentation of Shelterprojects from UIA Sektions all over the world, showing examples that prove, that architects in cooperation with others have experiences, ideas and willness to work with Shelter for Homeless. The result of this is now visible in this book.

The jury of the competition at its meeting in Caceres in Spain also formulated the Proclamation of Cáceres including the Appeal on how to make use of the result of CINTUS and to continue with an UIA CINTUS-competition every three years.

UIA is taking other actions in line with the IYSH programme. In cooperation with UNESCO as a first step in a more long-term activity, UIA is organizing programmes and training materials for the purpose of how architects can start professional support in self-help projects to be continued by the inhabitants themselves. Experiences from projects in Asia and especially the Orangi proyet in Karachi is the Starting point.

IYSH means a renewed and deeply human role for the architect. How can the profession pariticipate when only very simple technology is available or when self-help on a very basic level is the only solution?

In Cáceres in Spain, at the same time as the jurymeeting for CINTUS , UIA Secretariat with support from UNESCO organized a Round Table-Meeting bringing together expert-architects from the UIA Regions where the solutions of homelessness are desperatly needed. The meeting formulated Recommendations What Architects should do and defined a New Role for Architects in the challenge of solving the enormous task of providing shelter and services for the homeless throuout the world.

This book with the result and examples from the CINTUS-Competition, with the Proclamation of Cáceres and with the Recommendations what architects should do consequently is an important from UIA. It shall be widely spread to Nations and Organizations all over the world showing Governments and others, that architects take responsibility. But it should also evoke architects to get involved.

The results of the meetings in Cáceres and of the XVI Congress in Brighton as well as other UIA activities during 1987 must be a turning point for the continuing activities of the UIA in the future.

NILS CARLSON
UIA SECRETARY GENERAL

PRESENTATION

We have just culminated an effort of years and of worldwide magnitude, in response to the anguished S.O.S. from the United Nations: ***«A billion brothers have no shelter».***

The International Union of Architects entrusted us with the honour and responsibility of implementing the ambitious project of selecting, for the first time in history, the best solutions of social housing in each country and, finaly, in an unusual sort of «competition of competitions», collecting the most relevant ones.

Remenbering the legitimate proud we felt that day in which humanity managed to achieve the impossible of erradicating smallpox from face of the earth and the faith got with this precedent, we have worked hard, convinced that it would be the first step in combatting this other endemia of the Human Family.

When the Competition had been successfully completed and the Jury had made its decision, an international press conference was held to publicise the happy event.

A month later, the heading of the only news appeared in the mass-media reads: «ARCHITECTS AGAINST THE ATOMIC BOMB».

When half recovered from this depressing surprise, we considered two possible ways analysing the poor result obtained:

It could be the «News is either negative or propaganda» —McLujan dixit—, or, more likely, the subject was just not interesting, it was not news material; this invites to reflection.

It is obvious that, by chances of the attention, it has been concentrated on an honorary mention that the Jury has made to underline a sweet and warn irony that has come from the cold:

The soviet Architect Elena Kozelcova proposes converting the missiles that will become jobless after the «000» disarmament option into homes.

This is a tender provocation, or revival, of the old disjunctive: «cannons or butter».

Confronted with this dilemma, accepting apriority as an axiom, there can be not doubt that Architects will always be aghainst «the bow and the arrows».

Howeber, wer run the grave risk of conceptual proverty and, consequently, of error, entailed in all hypetr-simplification. The suppression of the arms race is not sufficient to automatically solve the problem of the shelterless.

We shall simply have put an end to one of the most powerful incentives to human resolution and, at the same time, to the most wicked of counsellors: Fear.

Howewer, if we eliminate this detonator, its outcome —the determination to produce extraordinary economic resources- would simply disappear.

To have an extra emergency capital available for housing, it will be essential to recreate an unusual polarizer of the infinite power latent in human nature, and this renewed —but ancient— resource of the potential we got is simply: Love.

The authentic alternative does not lie in butter versus cannons, but in ***love versus fear.***

Only by giving ourselves over to a transforming sense of solidarity we could be absolutely sure or putting an end to the false consciousness causing our present remorse.

— The pending generosity revolution—.

To believe that the solution in solely technological, or that we are facing a monopoly of Architects and even that it is just an economic problem, is hypocritical rhetoric.

We are, then, aware that, although correctly approaching a problem entails more than half solution of same, we have only done this: to place it graphically on everyone's working table.

Because this is everyone's problem.

This publication attests our partial contribution.

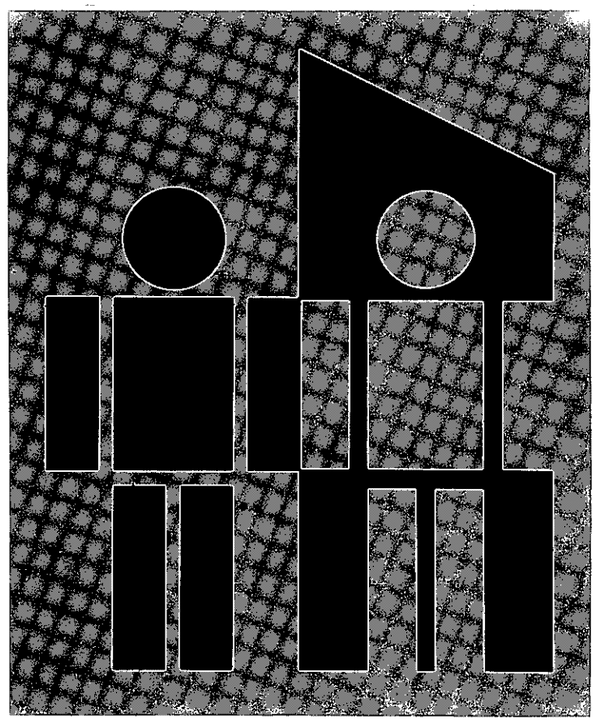
At least Architects have not been insensitive.

Nor are we the only ones: Our dep recongnition to H. M. Juan Carlos I and to all the other sponsors who have encouraged us along this exciting path.

R. DE LA-HOZ,
PRESIDENT OF C.S.C.A. SPAIN.
U.I.A. PAST-PRESIDENT

Jevtović Života, Arhitekta *Bombaj - Indija*

COMPETITION INFORMATION



COMPETITION INFORMATION

INTERNATIONAL UNION OF ARCHITECTS, U.I.A.

CONTRIBUTION FOR THE UNITED NATIONS INTERNATIONAL YEARS OF SHELTER FOR THE HOMELESS IYSH

PRESENTATION OF PEOJECTS FROM U.I.A. SECTIONS

INTERNATIONAL COMPETITION FOR SOLUTIONS

CINTUS

CONDITIONS

INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS (IYSH) INTERNATIONAL COMPETITION FOR SOLUTIONS

1. INTRODUCTION

1.1. THE PROBLEM

Nearly a quarter of the world's population live in the utmost poverty and misery; a hundred million have no shelter of any kind. This situation is steadily worsening and there are no signs of improvement.

Down through the ages, Man has always sought refuge from the discomforts and dangers of a hostile world; Modern Man is no exception. The sad fact is, however, that millions of human beings, old and young alike, are without a home and are forced to live and sleep in the open. In the developing countries over 50% of city-dwellers live in flimsy, makeshift abodes that can hardly be classed as inhabitable; in some cities this figure is as high as 80%.

Over the next 15 years the urban population of the developing countries is expected to grow twice as fast as that of non urban areas but the population of the slum areas and poorer parts of the cities is expected to grow four times as fast; one hundred million people, in the main poor and destitute, will be squeezed into already overcrowded cities.

Experience has shown that governments lack the necefsary resources to aliviate the situation. In the past, little or no attention was paid to the problem, while at present, housing programmes are suffering severe cutbacks as a result of the slow and erratic behaviour of the economy; less overall spending and other priorities make the situation even more difficult.

Adequate housing for all the population is perhaps the greatest challenge facing local communities today. The shortage housing in third-world countries is so acute that the situation can be said to be catastrophic. The population of the world is expected to increase by nearly 5.000 million during the next two decades; this and the fact that migration to the cities is unlikely to fall will certainly make things much worse in the future.

It is now felt that the problem of providing adequate shelter for millions of people cannot be solved by traditional methods. The construction of cheap, government-planned housing has only succeeded in highlighting the tremendous plight of the vast majority of people while the amount of public and private spending, even in the more developed countries, has been insufficient to provide decent and professionaliy-built housing for the entire population. In short, millions of human beings are denied the right to an adequate dwelling.

1.2. INITIATIVES

One of the important outcomes of HABITAT «UNITED NATIONS CONFERENCE ON HUMAN SETTLEMENT» held in Vancouver (Canada) in 1976 was the recognition, by all the participating countries, that the whole approach to the question of human settlement needed to be revised. This same posture was expressed in numerous resolutions and guidelines for future action at international conferences held in Stockholm, Vancouver and elsewhere. But in spite of all these resolutions and despite the fact that the right to a decent abode has been universally accepted for over a quarter of a century, the truth is that the situation has continued to worsen. The general public was also encouraged to play an active role in decision-making as it was thought that this would be of vital importance in strategy planning and would also act as a positive influence on government thinking.

The General Assembly of the United Nations, declaring 1987 «International Year of Shelter for the Homeless», pointed out to all the nations of the world the need for a renewal of political strategy and for a more effective and efficient participation in the task of improving the quality of the human dwelling.

The aims of «International Year of Shelter for the Homeless» are as follows:

- Obtain the active collaboration of government and non-governmental organizations in the search for new methods and strategies destined to achieve decent housing and surroundings for the underprivileged.
- Ensure that the results and solutions emanating from «International Year» projects be given the widest possible diffusion in all the nations of the world.
- Convince all nations of the need to evaluate the wants, prospects and priorities of those who lack a decent abode and who have no hope of obtaining one.
- Draw international attention to the fundamental role of housing in the development of a nation.

The following decision was adopted by the Council of the International Union of Architects during its 59th Meeting held in Santiago de Chile in 1983:

«THE COUNCIL ACCEPTS THAT AN INTERNATIONAL COMPETITION BE ORGANISED ON NEW TECHNOLOGY FOR THE RESOLUTION OF THE PROBLEMS OF SOCIAL HABITAT IN DEVELOPING COUNTRIES. THIS SHOULD BE REALIZED VIA THE INTERMEDIARY OF THE U.I.A. COMPETITIONS COMMITTEE, WITH THE SUPPORT OF THE UNITED NATIONS AND THOSE NATIONAL SECTIONS INTERESTED AND SHOULD REPLY TO THE BASIC PROBLEMS PUT FORWARD BY THE CHILEAN SECTION».

This decision was adopted in virtue of the proposals made by the Colegio de Arquitectos de Chile and by the Coopération Neuf-Monde, whose, President, architect, Hernán Larrain has been the principal promoter of this iniciative from the very beginning with the support of the United Nations Economic Commission for Latin America and the Pan-American Federation of Associations of Architects. The following, Interarch'83, the II Biennial of Architecture, Sofia (Bulgaria) and the International Centre for Study, Research and Creativity, Sofia, also supported.

At the Council Meeting, 1984 in Montreal, Canada, it was furthermore decided to:

- «Organize an International Competition of New Technologies for the Construction of Human Dwellings, the results of which would constitute the Union's contribution to "International Year of Shelter for the Homeless" (IYSH) 1987, proclaimed by the United Nations».
- «Entrust the organization of the Competition to the Spanish Section, "Consejo Superior de los Colegios de Arquitectos de España"».

The United Nations, in the person of the Special Assistant to the Secretary General, gave its written support on April 26, 1984.

Dr. Arcot Ramachadran, Executive Director of the U.N. Centre for Human Settlements and Mrs. Ingrid Munro, Director of «International Year of Shelter for the Homeless», have also offered their total support and have expressed the wish to include the results of the Competition among the aims of IYSH 1987.

The XV U.I.A. Congress, held in Cairo (Egypt) in January 1986, decided that:

«This Competition will constitute the main contribution of the U.I.A. to IYSH 1987; the Congress, therefore, puts before the General Assembly of the U.I.A. and the National Sections the following proposals:

1. That they should help with their support and experience in the organization of the Competition.
2. That they should encourage the different governments and national and international organizations to give all the necessary moral and material support to the success of the undertaking.

His Majesty Juan Carlos I, King of Spain, has kindly accepted the Competition's Presidency of Honour.

The spirit behind the Competition is expressed by the Bureau of the U.I.A. in an article published in the 1986 February Bulletin under the heading «What can architects do?», part of which follows:

«The U.I.A.'s contribution — that of architects all over the world — to the International Year of Shelter for the Homeless, IYSH, is closely linked to the programme of the XVIth U.I.A. Congress in Brighton and to its theme: «Shelter and Cities-Building Tomorrow's World».

Reading the ideas, the texts and the programmes of the UNCHS, we feel a professional motivation to participate actively in the IYSH.

The financial resources of the IYSH are limited. The only resources really available are time and the efforts that individuals themselves can make. Architects should participate, and show that it is possible through new methods

and by developing projects throughout the world, to help the under-priveleged to improve their housing and environment.

Architects should give priority to new information techniques directly related to auto-construction and effective use of resources, methods and local construction materials. The Competition-Presentation of projects is open to all the Sections of the U.I.A. who will be responsible for selecting the proposals sent in by participants. The purpose of Confrontation is to provide a platform for the discussion of studies reflecting a wide range of attitudes, social contests and technological or architectural possibilities and to encourage those ideas capable of being implemented on a large scale for the improvement of housing and surrounding. The technique proposed may be either modern or traditional, born of scientific research or elaborated from local tradition, the end result, however, must lead to a more effective use of the resources placed at the disposal of architects.»

This competition, which is above all a presentation of projects on a same theme, includes:

- A language: graphic or written (taken in the wide of the word) and in which architects have traditionally expressed themselves.
- An instrument for deliberation: a round table of experts.
- A Jury which will evaluate the interest of the solution submited and their adaptation to the objective confrontation.
- Competitors: whose ideas will be channeled through one of the Sections of the U.I.A.

Architects and all those committed to the aims of IYSH will be informed of the results in a book to be published by the U.I.A. This document will be a compilation of all the studies subject of debate and of the arguments and opinions reflecting their evaluation. This document will also be the final and definitive vehicle for divulging among the profession and the public at large whatever of interest results from the Competition for Solutions and will be presented officially at the XVI Congress of the U.I.A. in Brighton along with the Exhibition of those studies chosen by the different Sections.

It is in this spirit that the U.I.A. Secretary General intends organizing a Round Table for experts, to debate the role of the profession to the problem of construction of housing for the poor, in a situation where one disposes of little or no technology and limited resources. How can architects participate when a very simple technology is available or where self-help on a very basic scale is the only solution? The Round Table for Experts will be sponsored by UNESCO and will bring together a group of experts who are expected to formulate a series of conclusions, commenting on the projects presented. Their comments will be published together with the projects in a book.

2. COMPETITION OF SOLUTIONS, PRESENTATION OF PROJECTS

2.1. PURPOSE

In the light of the challenge represented by IYSH'87, to help resolve the world-wide problem of the homeless:

- by studying the basic resources offered by the humanities, the sciences and technology in the search for a solution,
- by proposing an analytical criticism of the current constructional, financial, legal, burocratic and technological aspects of housing with a view to their updating or elimination,
- by encouraging the application of new legal, financial and technological solutions based on aids for large-scale building programmes, self-made constructions or better supplies, and geared to the needs of shantytowns and other depressed areas.

These problems should largely become the task of architects, since they are responsible for organizing the necessary space for all human activity, of which housing is basic. The problems also involves other professions which, within their own field of competence, can offer practical solutions for the problems. We therefore invite professionals from the different branches of human learning to put forward any new or significant answers to the world-wide problem of housing.

The need for a renewed and fresh scientific approach to the whole question of social building is felt to be more and more acute in different areas of development.

Architects, by their very vocation, are expected to play a major role in this respect and help —by the proper use of simple technology— in raising the quality of human living conditions. Can efficient use of technology act as a catalyst in the creation of the necessary climate needed for tackling the grave problem of social housing? In this respect, the whole question of scientific and technological planning should be treated as an essential part of a nation's overall plan for development since the tools and means thereby provided would greatly enhance the prospects of finding solutions for problem of human settlement.

Besides the search for new ideas, this Competition also hopes to rescue from oblivion ideas developed in the past but which, for want of a proper opportunity, did not enjoy the necessary publicity, development or application. Knowledge obscured in the past should now come to light and help in ameliorating the housing problem.

This Competition also intends to help in the analysis and setting-up of national technologies better adapted to the sociocultural context of the respective countries and to the individual necessities of local communities.

Efforts should be spent towards achieving a happy balance between traditional technologies or new technologies suitably adapted and the economic, social and ecological conditions and housing needs of the individual countries.

Participants are expected to refer not only to the more immediate technological aspects, such as the application of new building materials and components, but also to other broader issues: the whole concept of housing, for example, or the legal aspects involved in the promotion and financiation of domestic building. The Competition is open to studies with subject matters such as new concepts of housing or of its organic parts or of the different stages in its execution or of any other aspect which might have caught the interest of participants. Themes such as the energetics of durability, transport and recycling, ecological aspects, local atmosphere, variety of styles and aesthetics will all be taken into consideration.

2.2. ORGANIZATION

2.2.1. *Denomination*

INTERNATIONAL COMPETITION FOR SOLUTIONS, CINTUS-PRESENTATION OF PROJECTS FROM SECTIONS. THE U.I.A. CONTRIBUTION FOR THE INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS (IYSH)'87.

2.2.2. *Promoter*

The Competition-Presentation is promoted by the U.I.A. and sponsored by the HABITAT CENTRE in Nairobi and UNESCO. The organization has been delegated to the Spanish Section, Consejo Superior de los Colegios de Arquitectos de España.

2.2.3. *Honorary Committee*

* HONORARY PRESIDENT

His Majesty Juan Carlos I, King of Spain.

* MEMBERS

- GUEORGUI STOILOV,
  President of the International Union of Architects, U.I.A.
- JAVIER PEREZ DE CUELLAR,
  Secretary General of the United Nations, U.N.O.
- ARCOT RAMACHADRAN,
  Executive Director of the United Nations Centre for Human Settlements, UNCHS.
- JAVIER LUIS SAENZ COSCULLUELA,
  Minister of Works and Urban Development Spain. M.O.P.U.
- JUAN TORRES HIGUERAS,
  President of the Pan-American Federation of Associations of Architects. F.P.A.A.
- HERNAN LARRAIN ERRAZURIZ,
  President of Coopération Neuf-Monde.
- RANKO RADOVIC,
  President of the International Federation for Housing and Planning, IFHP, Councilmember of U.I.A.
- JAI RATTAN BHALLA,
  Ex-President of the International Union of Architects, U.I.A.

2.2.4. *Organizing Committee*

PRESIDENT:	RAFAEL DE LA HOZ ARDERIUS, President of Consejo Superior de los Colegios de Arquitectos de España, Spanish Section of the U.I.A.
SECRETARY:	ALBERTO GARCIA GIL, Secretary of Consejo Superior de los Colegios de Arquitectos de España, Spanish Section of the U.I.A.
MEMBERS:	MARIANO MARIN RODRIGUEZ-RIVAS, Architect (Spain).
	ALVARO DE TORRES MC CRORY, Architect (Spain).
TECHNICAL SECRETARY:	JULIAN PEÑA PEÑA, Architect (Spain).

2.3. TYPE

The Competition-Presentation is a Single Phase, Anonymous Competition of Ideas.

2.4. OBJECT

Those studies not known internationally which, by their specificity and originality, contain revealing or innovating ideas and which can be added to the architect's repertoire of large-scale solutions for impoving the living conditions of the homeless.

2.5. PARTICIPANTS

Architects belonging to the different National Sections of the U.I.A. and professionals from the world of technology, the sciences or the humanities who, conscious of the tremendous drama of the homeless, have original ideas on how their specific knowledge can help solve the problem of housing in the terms comprising the Purpose or the Competition and who are willing to express their proposals in a written paper; together with an architect belonging to one of the National Sections who will be responsible for the formal exposition of the said paper.

2.6. SECTIONS

The wide range of proposals expected and the need for comparison makes it necessary to establish the following thematic areas towards which participants may direct their answers:

SECTION I

Concept of Habitation, which includes not only those proposals critical of the actual concept of housing and which offer new criteria, but also those other proposals expressing a critical vision of the legal or financial aspects of the problem and suggesting alternative solutions.

SECTION II

Comprises those solutions based on architectural considerations confined to specific geographical conditions and popular tradition but with the sufficient wealth of technical content as to make them capable of being used systematically and on a large scale.

SECTION III

Solutions reflecting an original attitude to the choice, use or arrangement of constructional elements and offering some essential technical innovation in materials, structural systems and building methods.

SECTION IV

Solutions in which technological advances from other fields in new materials or new forms of energy are applied to the problem of human habitation.

SECTION V

All those ideas not mentioned in the previous sections.

2.7. DOCUMENTATION AND PRESENTATION

Contents

The following documents should be presented by participants in the Competition-Presentation:

- PAPER: A written description of the proposal and a clear reference to its position in one of the above mentioned Sections.
- GRAPHIC DOCUMENTATION: When the nature of the proposed idea or innovation demands some kind of graphic information.

Presentation

All studies shall be anonymous and shall obey the following regulations:

A copy expressing the proposal and consisting of one sole document fulfilling the maximun and minimun requirements shall be presented in accordance with the following specifications:

The totality of the documentation shall be contained on one sole sheet of papel measuring 594 mm by 1.680 mm.

The said sheet shall be divided into four modules 420 mm wide by 594 mm high; some of the modules may be left empty if they were not needed for the exposition of the idea.

The documentation, paper and plans contained in each of the modules may be distributed at will.

The sheet shall be folded in zigzag along the lines separating the different modules with the first module acting as a cover.

Graphic information contained in the paper and graphic documentation shall obey the following rules:

Paper

- The paper shall be written in one of the official languages of the U.I.A. (1) and the letters shall have a height of at least 2 mm.

Graphic Documentation

- Drawings shall be in black line on white paper.
- Inscriptions shall be written in one of the official languages of the U.I.A. (1) and in capital letters.

All studies shall be accompanied by an opaque envelope containing personal data; a key number made up of eight digits chosen by the participant shall be written on the outside of the said envelope, in the top left-hand corner, in letters 60 mm high.

3. OTHER ITEMS

COPYRIGHT

Authors will retain the copyright but the International Union of the Architects U.I.A. shall have the right of reproduction on one sole occasion: in the Final Publication of the Competition-Presentation's Results.

PUBLICATION

A final publication will include all those papers chosen by the National Sections participants.

This final publication will be sent to all the governments in the world to facilitate the proper understanding of the ideas expressed therein.

(1) English, Spanish, French or Russian.

SPONSORS

UNESCO.

UNITED NATIONS CENTRE FOR HUMAN SETTLEMENTS.

MINISTERIO DE OBRAS PUBLICAS Y URBANISMO DE ESPAÑA.

EXCMA. DIPUTACION DE CACERES. FUNDACION LEOZ (ESPAÑA).

FUNDACION JUAN MARCH.

CONSEJO SUPERIOR DE LOS COLEGIOS DE ARQUITECTOS DE ESPAÑA.

THE AMERICAN INSTITUTE OF ARCHITECTS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SINGAPORE INSTITUTE OF ARCHITECTS.

COLEGIO DE ARQUITECTOS DE CHILE.

COOPERATION NEUF-MONDE. HERNAN LARRAIN.

FEDERACION PANAMERICANA DE ASOCIACIONES DE ARQUITECTOS.

EXPERTS MEETING

SHELTER FOR THE HOMELESS

What Architects should do

Recomendations from Round Table Experts-Meeting, 20-21 May, 1987, in Cáceres, Spain.

Concerned by the suffering of the one billion homeless poor living in urban squatter areas and slums and poor rural shelters largely in developing countries.

Aware that the population increase with lead to the need for housing of, at least, another one billion people in developing countries.

Also aware that the cities of developing countries will grow with one billion people to the year 2000.

Encouraged and inspired by the response from governments to the goals of the ***International Year of Shelter for the Homeless*** and the many programmes and projects that have already benefitted millions of poor.

Especially encouraged by the many governments in developing countries that have adopted or developed new shelter strategies and programmes aiming at shelter and services for all of the poor.

Convinced that architects could and should play an important role in solving this enormous task of providing shelter and services for the homeless throughout the world.

Convinced also that the overwhelming part of the construction and upgrading of shelters and neighbourhoods have to be undertaken by the poor themselves, as that is the only way to manage this enormous undertaking withing the limited resources available.

Therefore suggests that:

A new role for Architects

1. Architects will have to meet this challenge with a new attitude and approach to their profession aiming at assisting the poor in their efforts and based on a new or removed committment to the goal of shelter and services for the poor. This may not give personal fame but the architects as a group will gain recognition as professionals concerned about the needs of the poor, who are the ones that need them the most.

2. In working with the poor the architect will have to leave the traditional architect client-contractor relationship and be more of a facilitator and advisor to the community. The poor can not afford to make mistakes. They need durable, practical and healthy shelters and neigbourhoods at affordable costs and with indegenous beauty and cultural values. These qualities determine the economy, the health and the overall quality of live of the poor.

3. National policies, legislation and financing systems should be bases on the needs of the poor.

In their new role as facilitators architects should play a role in education and training programmes, in the improvement of indegenous thechniques and materials and in the planing design and management of slum-upgrading programmes, as well as the planing and management of new settlements affordable to the poor.

4. Architects should understand that working ***with*** the poor as an advisor and facilitator is quite different from designing and building ***for*** the poor in a traditional way. A true teamwork will have to be established in which the architect is the interpreter and advisor looking for a rational, durable, aesthetic and affordable utilization of limited resources in meeting the demands and needs as expressed by the inhabitants.

5. The needs of the poor go beyond food and housing, water and sanitation. Health clinics, schools and empleoyment possibilities are important factors for improvement of the quality of life. Experience shows that the availability of a resource person or group of resourcepersons with the widest possible knowledge of and understanding for the inhabitants and their different needs and requirements is crucial to the success of slum upgrading and sites and service type

of selfhelp projects. This can sometimes be a NGO, sometimes a gevernment social worker and sometimes one or several strong personalities acting with the inhabitants in the community. The architect should therefore normally work with and through such persons or groups in their role as facilitators.

6. In this context it is also important for architects to understand and recognize the needs of the vulnerable groups such as the sheet children, the handicapped and the elderly. These groups will not manage to participate in shelter and neighbourhood upgrading schemes or in selfhelp construction on new sites sithout special care and assistance. Yet they represent the groupe in the greatest need of improved living conditions. Similarly the womenheaded households often are among the poorest of the poor. These families too need extra care and attention. The mothers have extremely long workinghours with minimal income and their margins for survivals are often so low that they need extra support in order to be able to participate in slum upgrading and various self help schemes.

7. It is also essential for architects to understand taht the shelters do not only provide the house but also in most poor communities the space for income earning activities, be it a shop or a small cottage industry or backyard production unit. The quality of the shelters ***and neighbourhoods*** are also crucial to the health and survival of the poor. The survival of the income-earner determines the lives and the future of the children. Furthermore extensive shelter and neighbourhood upgrading programmes create many new jobs in construction and production of building materials and components. Thus, shelter policies and programmes for the poor can give force to overall employment generation programmes as well as being vital to the economy and the survival of the individual families.

Educatyion and training programmes

8. The education of new architects should forms new attention on the need for the students to understand the scale and the nature of the problems of the poor. This has been grossly neglected in the past and only a few universities and postgraduate training institutes provide such course. It is important that new curricula are develope where shelter and services for the poor become a mandatory part of the education of architects in developing countries. But some courses in this field should also be available in industrialized countries to provide the basis for participation of architects in, for instance, projects of bilateral developement.

9. As a true understanding and respect for the needs and demands of the poor cannot easily be required through books and theoretical studies, departments of architecture are urged to plan such courses as a constructive participation of the students in real slumupgrading projects provinding actual assistance to NGO:s and other activities in the field.

10. RDD in the departments of architecture should preferably also be linked to actual government, NGO and private sector programmes. The experience of one city, district or country should be compared with and improved through the experiences of other cities, districts and countries. Exchange programmes and RDD cooperation on a subregional basis would benefit these efforts. Donors promoting postgraduate training programmes should preferably place these institutions and/or courses in developing countries and in universities with such extensive exchange programmes in the subregion.

11. Equally important is a continous training of artisans and small scale enterpriss as well as community workers giving advise to the people on the design and construction in slumupgrading or sites and service schemes. Architects could play an important role as trainers of such trainers. Each national association of architects is urgent to review, stablish and or facilitate such training programmes.

Techiniques and materials

12. One of the most essential part in the architects' work as advisor for the poor, deals with practical advise in real and useful building and construction questions as being the necessary basement for the quality of the upgrading process and the future living conditions.

It deals with the development and improvement of traditional techiques and materials in orden to give and affordable,

healty and durable result, as well as introduction of new idas and building-methods that can be adopted and used by the inhabitants.

It also deals with how to promote the extensive use of local materials and the research on existing materials previously used or unused.

U.I.A.

13. During the year 1987 beiung the UN International Year of Shelter for the Homeless and during the preparation of it, the U.I.A. has started activitiers that should in the future be a main activity as the real meaning for the U.I.A., being the international body to exchange experiences and intelectual resources between architects in different parts of the world with different conditions.

U.I.A. should show governments that architects take this responsability but should also evoke architects to do it through continous activities and information in this field and by giving awards to good examples where architects have played an active role.

It is proved by experience that architects and architect's firms can integrate a system for the poor, combined with their more traditional work.

This big task for the profession should become aware for everybody and specially for the young architects - the future of the profession.

INGRID MUNRO, IYSH.
WAHED EL WAKIL, EGYPT.
NICOLAS RUEDA GARCIA, COLOMBIA.
ARIF HASAN, PAKISTAN.
SHARAD MAHAJAN, INDIA.
DAVID MUTISO, KENYA.
NILS CARLSON, U.I.A.

CALL FROM CACERES

CALL FROM CACERES

For the first time in the History, representatives of world's-wide architects met in Cáceres (Spain), city included in Humanity's Heritage, have debated extensively about the problem of social habital, —antihuman concept needing tho be redefined to create a new notion of the true human habitat—, analyzing minutely the proposals remitted from the numerous countries inclined to provide appropiate solutions to the seriousness of this problem.

Today's society has created productive forces, mass media and extraordinary energetic materials and resources.

But being now 18 years ago, since man stepped on the moon, contemplating 400 million homeless families in the world, does cause a deep shame. Cipher wich, if serious steps are not taken, will duplicite in the year 2000.

Around the big cities, «favelas» and hovels in which life conditions annul the human dignity, provoking physical and moral degradation, are getting multiplied.

Architects, Public Authorities, all Planet's inhabitants must undertake the most important strife for mankind happiness: the struggle for a dignified home.

So, it is necessary to establish a new town-planning and shelter policy aiming to exclude the idea of speculation, and consider housing under legislation, as a natural right and prime need for the individual and society.

Home is the territory of person's freedom and independence. So that, Architecture should favour the total development of man, and working in this sense, avoid human stacking.

We architects consider necessary

— To eliminate forever, from the earth's surface, the armaments race, squanderer of great resources and, create national and international funds destined to solve the habitat problem.

— To promote, in each country, the elaboration of step-by-step plans, to attempt to solve the habitat inside of a harmonious environment.

— To create architectural and technological ideas which let face, in a short term and on a world-wide scale, the solution to the problem.

— To make every human being take conscience that his active participation in these plans related with the habitat, is a personal and public duty.

— To coordinate and promote the suitable conditions to the quality of life, with deep respect to nature and environment.

— To impede the creation of «ghettos» without soul, contrary to stimulate the complex development of the personality, changing when necessary, the way of thinking, in order to formulate a new understanding of the habitat and necessary environmental quality, and of the functional and spiritual qualities, to stimulate the physical and cultural man's development, establishing for it the harmony with nature and environment.

— To create and Architecture for the joy and happiness of mankind. No more monuments: Monuments are for deads and Gods.

— To define consequently, a new role for today and future.

Architecture is not only a work of artist and technicians but should rather be organisation, sociology, ecology... and must come out from professional narrow limits to open the thinking way of all society, and then be able to create a better quality of life.

— To make use of the new «tools-attitudes» from communitary development, from sociology (research, action and «reflected animation») and from computers aid.

Because of that we appeal

— To the best Humanity's reserves to, using all capacity of the present constructive systems and proposing new ideas, according with the existing progress in the diverse industrial fields, create an International Plan for the Social Construction to be developed by all world's countries in solidum, independently of their political systems, on an international collaboration which honour and dignify us as human beings.

— To all National and International Governments and Institutions, in orden to agree on the steps to take, which favour the habitat's development, as may be taxes reductions and customs facilities.

— To the different activities sectors which may be affected by the problem, pressing to its solidary action.

The U.I.A. representatives, in agreement with this proposals have decided to instutionalize a similar Contest to CINTUS, with a triennial periodicity, in order to promote contributions to the problem's solution, according to the progress of Science and Technology.

Call, which we do in Cáceres (Spain), on twenty-first May, 1987.

Signed:

DE LA HOZ, Rafael (Spain)
GARCIA VAZQUEZ, Francisco (Argentina)
GASPAR, Tibor (Hungary).
GOMEZ CORTES, Juan (Spain).
JAFFERY, Syed Zaigham S. (Pakistan).
KROLL, Lucien (Belgium).
LARRAIN, Hernán (Chile).
STOILOV, Georgi (Bulgaria).

DECISIONS

Composition of the Jury

Georgi STOILOV, President.

Lucien KROLL, representing U.I.A Region I.

Tibor GASPAR, representing U.I.A. Region II.

Francisco GARCIA VAZQUEZ, representing U.I.A. Region III.

Syed Zaigham S. JAFFERY, representing U.I.A. Region IV.

Hernán LARRAIN, representing Coopération Neuf-Monde.

Juan GOMEZ CORTES, Secretary.

MINUTES OF THE JURY

The Jury of the International Competition for solutions on New Technologies for Social Housing, CINTUS, met in Cáceres (Spain) on 20, 21 and 22 May 1987, as stated in point 2.8. Schedule.

The Jury realized that 123 projects were received in the foreseen delay.

The Jury has taken into consideration, as basic principle of the Competition, its object, that is those studies not known internationally which, by their specificity and originality, contain revealing of innovating ideas and which can be added to the Architect's repertoire of large-scale solutions for improving the living conditions of the homeless.

This Competition is an important international contribution to the United Nations programme for 1987 «International Year of Shelter for the Homeless».

The Jury has notices the great diversity of presented proposals, covering all aspects of the Habitat problem.

This Competition contains quite a lot of experiences and international ideas, coming from different continents, countries and social regimes.

The authors of the projects express their ideas on the economical, social, technological, cultural and urbanistic aspects.

The Jury states that it is an important beginning, offering the possibility to establish a permanent study on this present problem.

After studying the projects, the Jury decided:

1. To grant Prizes to the following projects:

12345678
22223333
11111111
64636034
64321684

and Mentions to the following projects:

13577531
22560902
63747287
25025719
58345231
19421955
26038700
19341941

and to offer a special Mention to the project 18181817, keeping this idea as symbol of the Competition.

The Jury decided to put the different amounts offered by the American Institute of Architects and the National Section of Singapore together, and to distribute them among the five winners.

The Jury also decided to grant the five scholarships at the same winners, leaving to the U.I.A. Spanish Section the decision of sharing out the mentioned scholarships, as well as the Prizes denominations.

2. To recommend the International Unión of Architects to organize a similar competition every three years.

3. The Jury recommends the United Nations Centre for Human Settlements in Nairobi and the International Academy of Architecture to create a standing research centre on the new technologies of human habitat.

4. The Jury proposes to the Forum of Young Architects to organize training courses of three weeks with Architects of different parts of the world to work in search of the technology and the human habitat, using to this end the funds provided by UNESCO for this matter.

ADDITIONAL PROCEEDING: After opening the envelopes corresponding to the winning projects in the presence of the Jury, the Prizes and Mentions correspond to the following authors:

Diplomas:

12345678 University of Sciences and Technologies of Huazhong:
Sun Minghui, Long Yuan, Wu Ming, Huang Jie. THE PEOPLE'S REPUBLIC OF CHINA.

22223333 Luis Bravo Heitmann, Luis Bravo Zehnder, Pedro Bravo Zehnder. CHILE.

11111111 Hansruedi Bolliger, Daniel Dubs. SWITZERLAND.

64636034 Nikolaus Griebel, Silke Hermann, Ute Herzog, Ullrich Weber. GERMAN DEMOCRATIC REPUBLIC.

64321684 Abdel W. El-Wakil. ARAB REPUBLIC OF EGYPT.

Mentions:

13577531 Eliseo Guzmán Negrón, Emilio Luisoni Prada. PERU.

22560902 Michael A. Belov, Katrin A. Belova. USSR.

63747287 Marcelo Roberto Martinelli, Ricardo Alberto Trovant. ARGENTINA.

25025719 Peter Haugan, Bjarne Frederiksen, Ulla Egebjerg. SWEDEN.

58345231 Moges W. Grabriel, Nikolaus Griebel, Reiner Rietsch, Sabine Wendt. GERMAN DEMOCRATIC REPUBLIC

19421955 Aspasie Kamberou, André Scobeltzine. FRANCE.

26038700 Harald N. Rostvik. NORWAY.

19341941 Enrique Fernán Bravo Cartabio, Ricardo Novaro Bocco. SPAIN.

Special Mention:

18181817 Serjio Barjin, Elena Kozelcova. USSR.

Cáceres, 22nd May 1987.

Composition of the Jury

Georgi STOILOV, President.

Lucien KROLL, representing U.I.A Region I.

Tibor GASPAR, representing U.I.A. Region II.

Francisco GARCIA VAZQUEZ, representing U.I.A. Region III.

Syed Zaigham S. JAFFERY, representing U.I.A. Region IV.

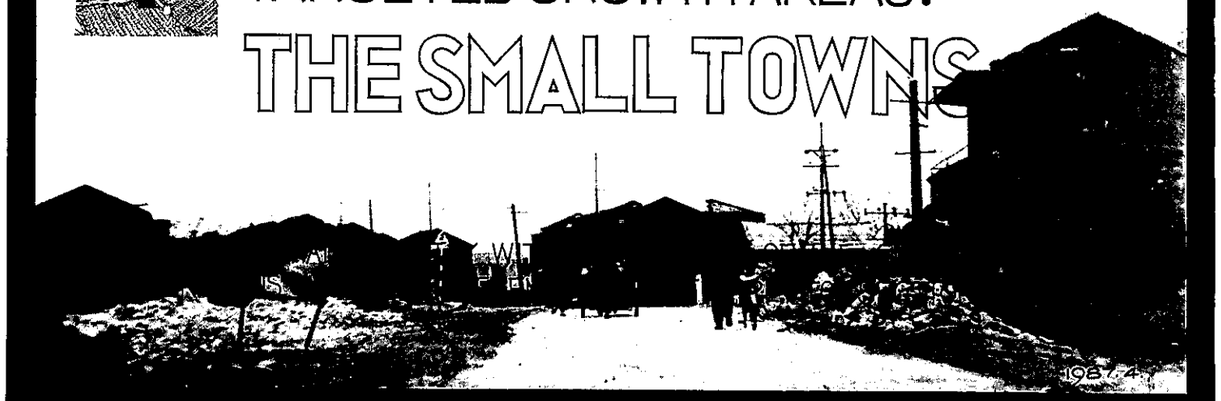
Hernán LARRAIN, representing Coopération Neuf-Monde.

Juan GOMEZ CORTES, Secretary.

AWARDS

12345678

1 HOUSING PEOPLE IN CHINA'S TARGETED GROWTH AREAS: THE SMALL TOWNS



PROBLEM

CHINA'S MODERNIZATION OF AGRICULTURE POSES A BIG PROBLEM: HOW TO DEAL WITH PEOPLE WHO ARE NO LONGER NEEDED FOR FARMING. OBVIOUSLY, IF SUCH PEOPLE FLOCK TO THE CITIES, URBAN AND SOCIAL SYSTEMS WILL BE OVERBURDENED AND MANY PEOPLE WILL BE HOMELESS AND HOUSED IN SUBSTANDARD CONDITIONS.

RESOLUTION

According to present Chinese government policy our country is energetically developing the small city and small town.

THE PRESENT SMALL TOWN SITUATION

- There is a great increase in the number of small towns.

year	1982	1985	1986	1990
number of towns	2786	7521	9140	10,000 (projected)

- Recently, the countryside has experienced an upsurge in self-built housing, From 1981 to 1985, new housing for farmers totalled three billion two hundred million square metres and the government plans that from 1986 to 1990, we will build three billion square metres of farmer's houses. For Hubei province alone, 3% of farmer households build new houses every year, that is 270 thousand households.
- There are two ways small town houses get built: most houses are built by the people themselves, others are built by the government, but these are usually more expensive than people are willing to pay. As mentioned later, however, both ways of providing housing present other problems as well.

THE SMALL TOWN'S FUNCTION

The small town is the connection and mixed area between the city and the village countryside. On one hand, the State is developing the countryside's economy through small town development. On the other hand, the small town attracts the surplus of farmers from villages. Thereby reducing population pressures on the cities

This project addresses the need of small towns to accept the great influx of population from villages.

GOVERNMENT POLICY

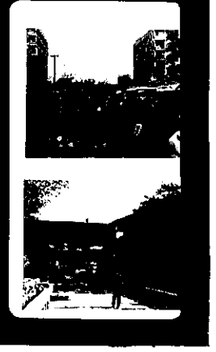
- Limit the size of big cities. Moderately develop middle size cities. Energetically develop small towns.
- Chinese government policy states. "The main focus of the Ministry for Urban-Countryside Construction and Environmental Protection must change from the construction of cities to that of small towns."
- In small towns, the funds for constructing individual houses are provided by the users themselves. Funds for public services and facilities are provided partly by local collectives and partly by government.
- The State is now permitting farmers to move to small towns from villages and to engage in free enterprise there.

OUR PLAN

Our project works within the constraints described above and addresses additional concerns: ① town planning for houses built by individuals, ② inefficient house design, ③ construction problems of individual houses; ④ low-quality environmental and housing conditions of many people; ⑤ the fact that there are very few Chinese architects:

2.2 architects / 100 thousand people

We will present our process on page two and describe and give an example of our method of construction for lower-income family houses on page three and four.



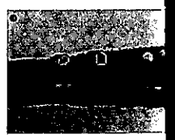
2 WE STRESS THE USERS' ROLE IN SELF BUILD, DRAWING ON THEIR OWN UNTAPPED STRENGTHS. WE STRESS GOVERNMENT'S ROLE IN COORDINATING THE PLANNING OF MOST LOWER-INCOME HOUSING IN SMALL TOWNS

EXISTING METHOD

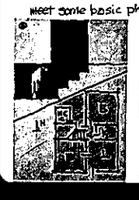
MAIN PROBLEMS EXISTING IN THE PRESENT SELF-BUILD METHOD

—The gap between what is presently built (permitted by government policy and economic power) and what current building technology and scientific method could produce.

1. When dwellers buy land, he gets the right to use it. The national "LAND LAW" of 1987 only states "The community or individual which uses land has the obligation to preserve, manage and make a reasonable use of land." But how to do so is not specified. So dwellers build what they want without any local regulations or special institutional control, and this often results in arrangements which we, as well as the users themselves see as uncoordinated and inefficient.
2. No professional assistance
3. No user evaluation and feedback.



- ① Houses occupy the cultivated fields.
- ② Untidy and dirty
- ③ The rich build their new houses. How do the poor?
- ④ The gables of two houses must be separated.
- ⑤ Breaking with local building context
- ⑥ This layout is not optimal. It doesn't meet some basic physical needs.



THE CHINESE GOVERNMENT'S COUNTER-MEASURE

—Addressing the conditions described above, our government has made a new policy on building in small towns. that is "To unify development, to unify construction, to unify distribution. To unify management." The policy is basically effective. But there are still many problems that must be resolved.

1. This policy suits higher-income people. Lower-income dwellers can't afford the government housing.
2. Dwellers don't like the houses the government has built. Every family has its special needs. Also it is a traditional Chinese custom for people to build dwellings for themselves.
3. Some of the houses built by the government according to the new unifying policy are not of very good quality. Which depends on the professional level of builders.

—Focusing on the inadequacies of both self-build and government built houses we present a method which encourages the dwellers to self-build, drawing on their own untapped strengths. At the same time, we stress the government's role in coordinating the planning of most lower-income housing, to avoid bad living conditions in small towns.

WE PRESENT A METHOD

DESIGN SYSTEM

1. Developing a local BUILDING ACT
   - BUILDING ACT
     - LAND USE MANAGEMENT
     - BUILDING MANAGEMENT
     - FOREST & ENVIRONMENTAL PRESERVATION
     - DEALING WITH VIOLATORS
2. Organizing a Building Committee composed of local dwellers themselves in order to increase dweller co-operation among themselves and bridge the gap between the government and the individual. Due to our socialist system this is possible to do. Endowed by the government with great power to enforce to building regulations, the Committee is responsible for all construction affairs according to the local Building Act. The Committee should control the whole process of neighborhood development. Every Committee has one architect as professional adviser.
3. Using architects as educators and participants. In China the number of architects is so small that they could not meet all the small town's needs. Furthermore almost all architects are living in big cities. In this case what can Architects do?
   - Educate local dwellers to realize alternative living enviroments and to take the concept "HOUSE" as a process not a product. This prepares them to enlarge and improve their houses at any time in the future. Train "Barefoot Architects (who come from the Committee)" to enhance their professional level of expertise in building and planning.
   - Help dwellers to devise a local house model based on the ideas of reducing costs and minimizing the amount of land occupied.
   - Put the model into practice. Set up an example.
   - Post-Occupancy Evaluation.

◀ The roles architects take.

The currently materials that used ▶

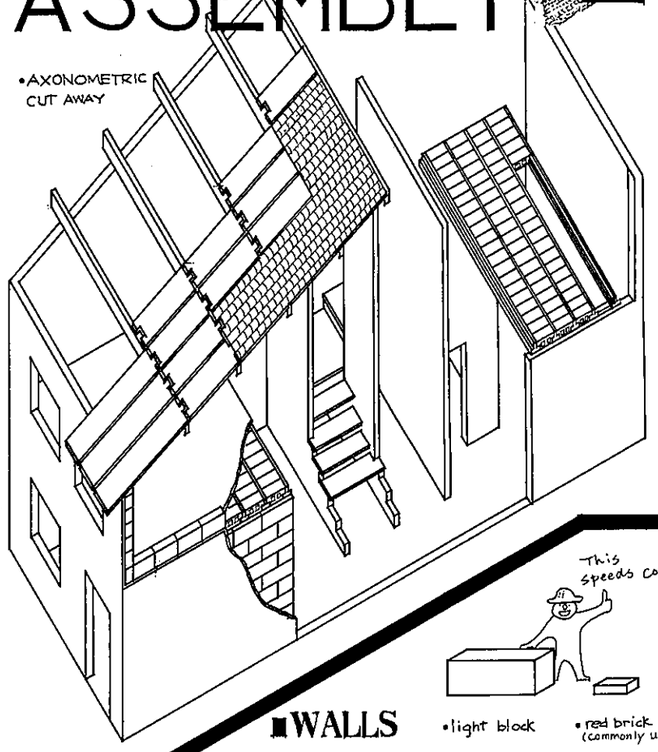
BUILDING SYSTEM

1. MATERIALS
   We use light-weight concrete instead of red bricks and heavy concrete currently used. Making red bricks consumes a large amount of land resources and energy. Heavy concrete is much more expensive.
2. COMPONENTS
   We use a system of small components which are easy to design with and convenient to transport and install.
3. CONSTRUCTION
   Presently most towns often has several concrete factories. Under the direction of the Committee, these factories can manufacture the components on a large scale. Most of the components can also be easily built on site by the individual. Building construction can be done in stages. Various house styles can be produced to meet the demands of the dwellers.
4. LOCAL BUILDING MATERIALS
   We make the best use of local building materials.

COMPONENTS AND ASSEMBLY

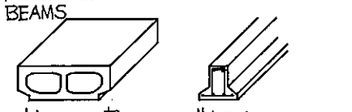
THIS CONSTRUCTION SYSTEM SAVES EARTH AND WOOD RESOURCES, SAVES ENERGY, AND REDUCES TRANSPORT FEES ITS INSTALLATION AND PRODUCTION IS SIMPLE. THUS THE TATAL FEE OF THIS KIND OF FRAME IS ABOUT 15–20% LOWER THAN THAT OF THE BRICK AND TIMBER FAAME

•AXONOMETRIC CUT AWAY



■FLOOR

THE FLOOR IS COMPOSED OF PLAIN CONCRETE HOLLOW PLANKS AND SMALL PRESTRESSED REINFORCED CONCRETE BEAMS



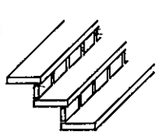
• plain concrete hollow block

• small beam

• concret tread of stair

• PRICE The price of this kind of floor is 75% the price of the prestressed reinforced concrete hollow planks floor commonly used.

• TRANSPORTATION Our small and light-weight components are much easier and cheaper to transport than the components commonly used.

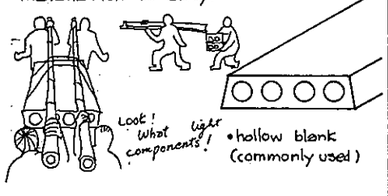


• red brick riser

• INSTALLATION The installation of the prestressed reinforced concrete hollow planks are carried much difficuitly. Our flooring parts can be carried by single person

• PRODUCTION The technology is very simple so the parts can be produced by the individual builder.

• STAIR TREAD The shape of the tread is very simple so its production is also very simple. This part is small and its installation is easy.



• hollow blank (commonly used)

■WALLS

• light block • red brick (commonly used)

LIGHT FOAMED CONCRETE BLOCK OR COAL. ASH BLOCK

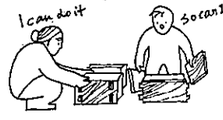
• PRICE Walls of the former material are cheaper by 3–4%. Walls of the latter material are cheaper by 10%. (Comparied with walls of red brick)

• SAVING LAND These two kinds of block do not use earth.

• SAVING ENERGY This production processes consume much less energy the red brick

• CONSTRUCTION The size of either block is sixteen times larger than a red brick. This can raise construction efficiency 40%

• TRANSPORTATION The weight of the external wall can be reduced about 15–50% and the transport fee can also be reduced 15–50%.



• PRODUCTION The technology for these block is simple and the small town's enterprises are able to make them by themselves.

■ROOF

REINFORCED CONCRETE PURLINS, REINFORCED CONCRETE CEILING, CEILING LATH AND SMALL BLACK TILES

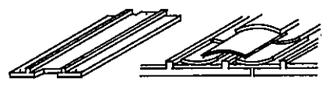
• SAVING RESOURCES The reinforced concrete frame take the place of the timber frame, thus saving a great deal of wood, which is a very precious resource in our country.

• PRICE The reinforced concret roof is cheaper than the timber roof (The price of wood in the center of China is very expensive)

• CHARACTERISTICS The reinforced concrete roof is superior to the timber roof in strength, fire prevention, water-resistance, insect pest prevention, and endurance.

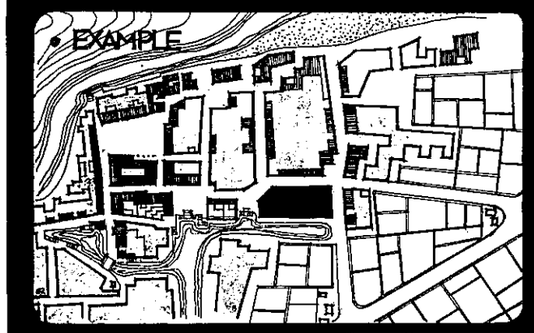
• INSTALLATION The process of roof installation is simple because the ceiling lath takes the place of rafters, insulation, water-resistant material, etc.

• PRODUCTION All these components can easily be produced by individuals.



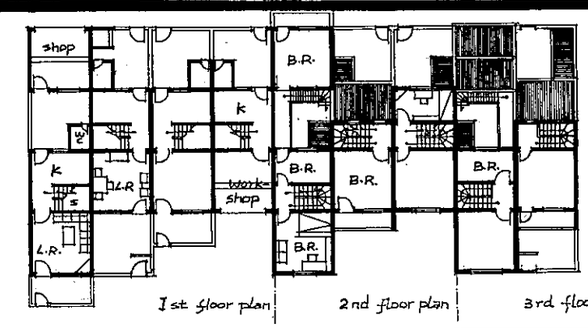
• ceiling lath • small black Tiles straw and mud ceiling lath

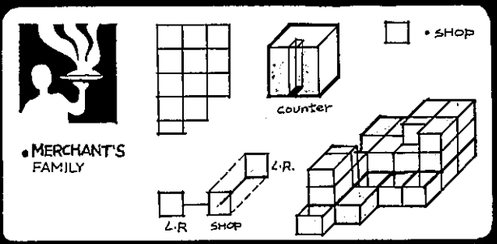
• EXAMPLE

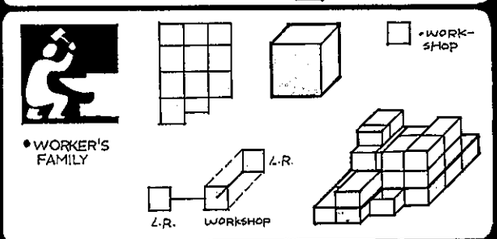


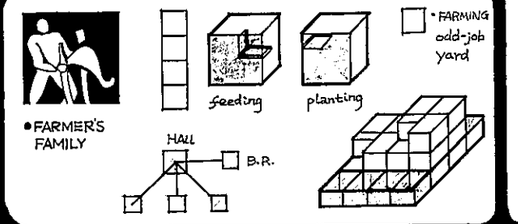
DESIGN—BASED ON THE TRADITIONAL CHINESE DWELLING CONCEPT

• IMPROVEMENT ON A RESIDENTICAL QUARTER IN A SMALL TOWN IN CENTRAL CHINA

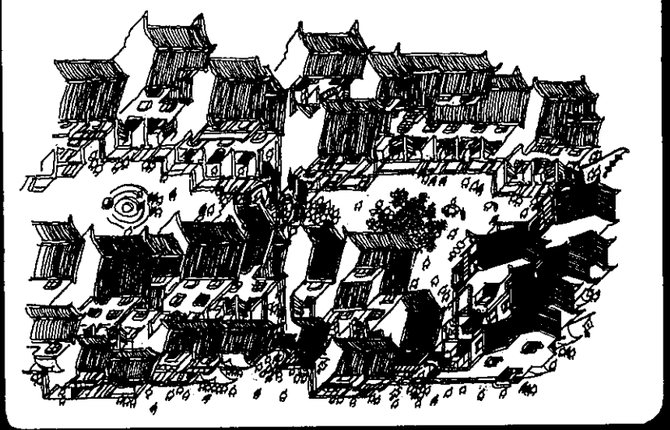




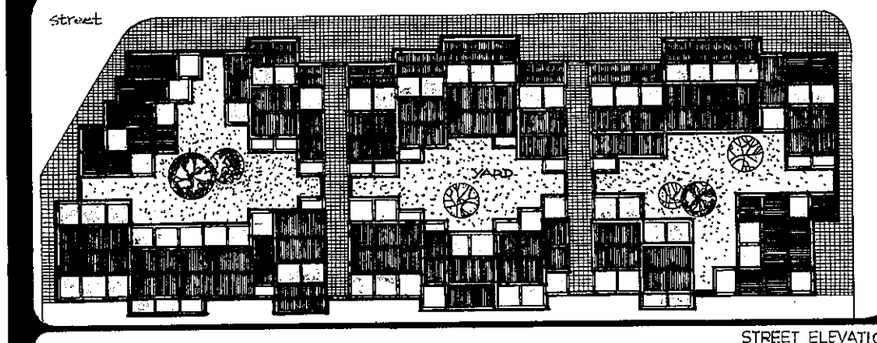


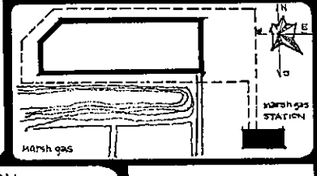


BIRD'S-EYE-VIEW WITH LOCAL FEELING



SITE PLAN





STREET ELEVATION

4

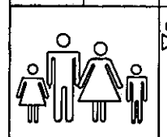
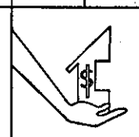
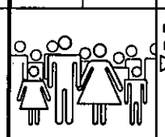
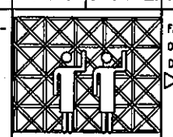
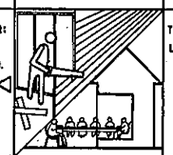
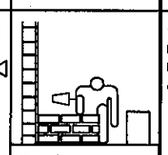
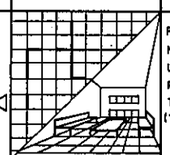
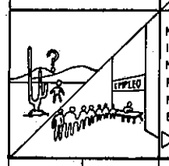
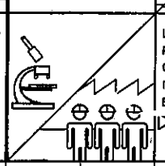
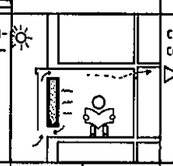
22223333 "A. LATINA: APOYAR LA VIVIENDA SOCIAL DESDE TODOS LOS SECTORES" I

" LA SOLIDARIDAD COMO ACTITUD DE FONDO IMPLICA, EN LAS DECISIONES ECONOMICAS, SENTIR LA POBREZA AJENA COMO PROPIA, ...NO SE TRATA SOLO DE LA PROFESION DE BUENAS INTENCIONES SINO TAMBIEN DE LA DECIDIDA VOLUNTAD DE BUSCAR SOLUCIONES EFICACES EN EL PLANO TECNICO DE LA ECONOMIA, CON LA CLARIVIDENCIA QUE DA EL AMOR Y LA CREATIVIDAD QUE BROTA DE LA SOLIDARIDAD."

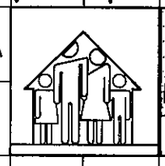
JUAN PABLO II, ABRIL DE 1987

LA IDEA: LA MAGNITUD Y URGENCIA SOCIAL DEL PROBLEMA REQUIERE UN PLANTEAMIENTO QUE REBASE LA VIVIENDA COMO "PRODUCTO-CANTIDAD" INFINANCIABLE POR LA VIA PRESUPUESTARIA DE LOS GOBIERNOS Y QUE SE TRADUCE POR LO GENERAL EN POLITICAS DE "PROVISION DE VIVIENDA". EN CAMBIO, PODEMOS INTENTAR AUNAR TODAS LAS FUERZAS VIVAS DE UNA NACION TRAS UNA MEJORA DEL "PROCESO-CALIDAD", AUN MAS, ABRIR LA PUERTA A UN INTERCAMBIO DE COMPONENTES Y PARTES ENTRE PAISES. DETECTAR Y PONER EN MOVIMIENTOS TALES FUERZAS, EMPEZANDO POR PAISES HERMANOS, ES LO QUE LLAMAMOS UNA POLITICA DE "APOYO A LA VIVIENDA".

POLITICA

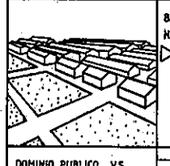
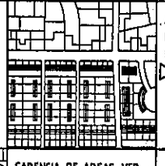
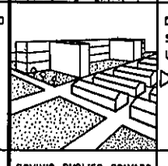
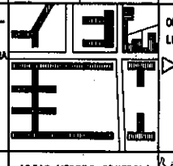
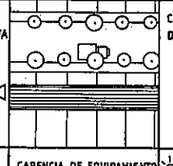
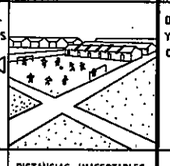
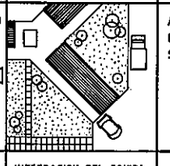
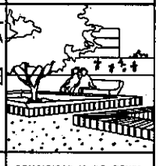
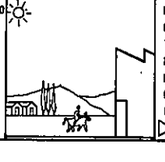
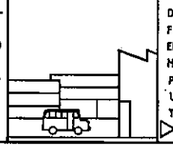
LO ACTUAL: POLITICA DE "PROVISION" DE VIVIENDA				PROPOSICION: POLITICA DE "APOYO" A LA VIVIENDA			
	FAMILIA ESTA SOLA.		FAMILIA APORTA DINERO.		FAMILIA ACTUA EN COMUNIDADES ORGANIZADAS.		FAMILIA APORTA DINERO O TRABAJO AL VALOR DE SU VIVIENDA.
DISEÑO SIN RACIONALIZAR: DESPERDICIOS MOBILIARIO NO PREVISTO.		TECNOLOGIA TRADICIONAL: LENTA E INEFICIENTE.		COORDINACION MODULAR: RAPIDEZ, ECONOMIA MOBILIARIO MODULAR DE ACUERDO A ESPACIO.		PREFABRICACION DE COMPONENTES Y PARTES. USUARIO PARTICIPA EN CERRAMIENTOS, DIVISIONES Y TERMINACIONES. (TECNOLOGIA MIXTA).	
	NO EXISTE PROSPECCION INVESTIGACION Y EXPERIMENTACION SISTEMATICA DE RECURSOS REGIONALES. FALTAN OPORTUNIDADES DE EMPLEO.		CALOR CON USO DE COMBUSTIBLES NO RENOVABLES		LA UNIVERSIDAD Y LA EMPRESA INVESTIGAN RECURSOS REGIONALES INCREMENTO DEL EMPLEO EN TODOS LOS AMBITOS.		CALOR Y VENTILACION CON ENERGIA RENOVABLE.

VIVIENDA

FAMILIA ADQUIERE UNA CASA TIPO Y TRATA DE "ADAPTARSE" A ELLA.		FAMILIA ADQUIERE UN ESPACIO CON SERVICIOS EL CUAL ADAPTA SEGUN LO REQUIERA TRANSFORMANDOLO EN SU VIVIENDA.

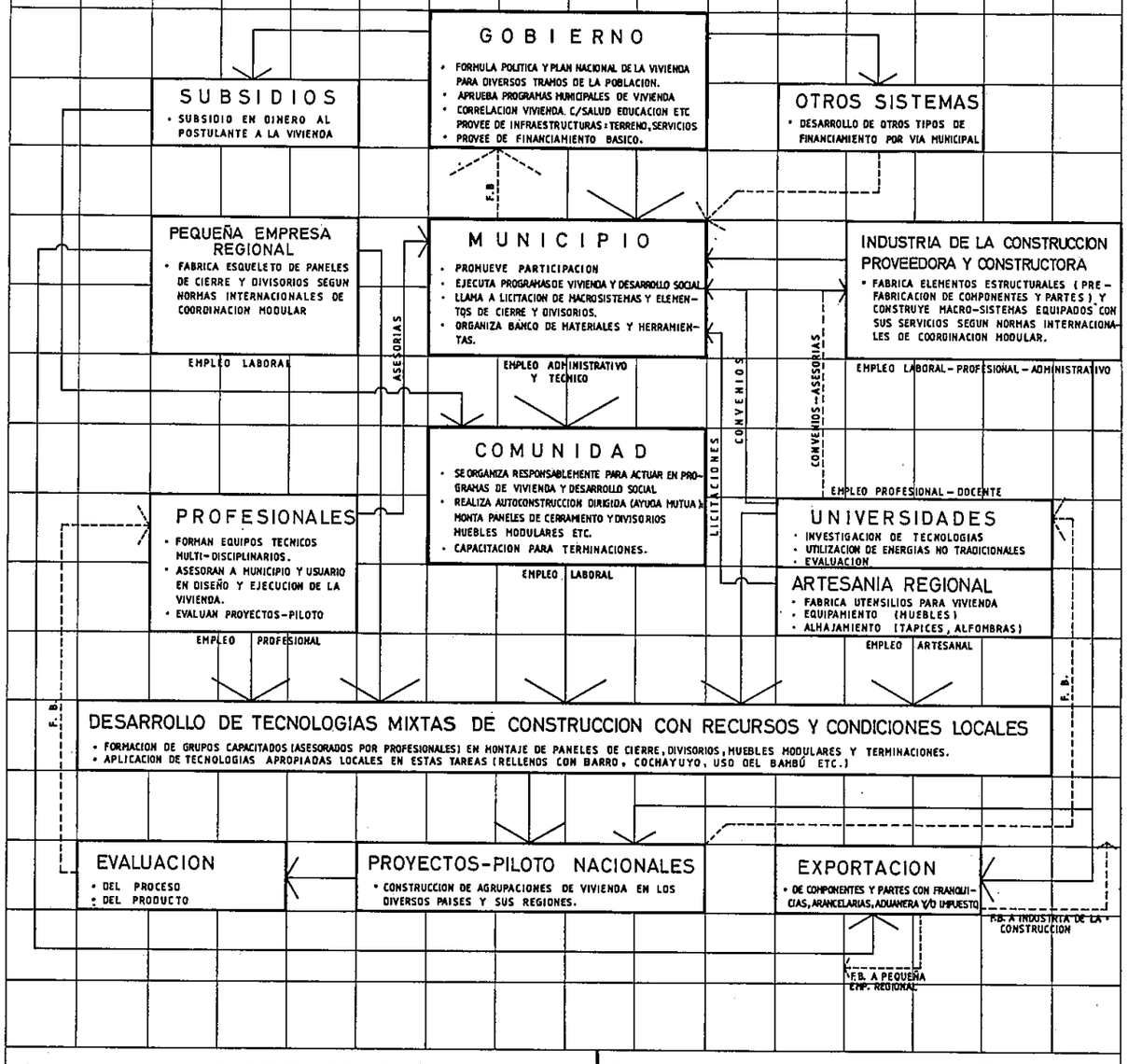
CIUDAD

EL CONJUNTO DE ESTAS CASAS FORMAN BARRIOS SIN IDENTIDAD PROPIA.		ESTOS ESPACIOS SE ORGANIZAN EN MACROSISTEMAS QUE "HACEN CIUDAD" Y LA ORDENAN. DENTRO DE ELLOS HAY DIVERSIDAD DE EXPRESIONES.

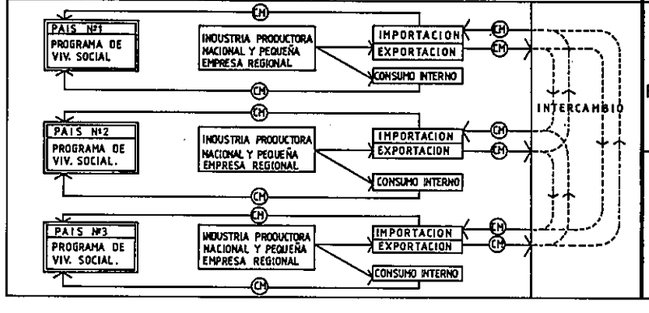
	BAJAS DENSIDADES URBANAS		ATOMIZACION DEL TERRENO NO URBANO PERIFERICO: DESORDEN.		DENSIFICACION Y RE-DENSIFICACION DE SECTORES URBANOS CON MEDIA ALTURA		ORDEN ESPACIAL, PERSONALIZACION, IDENTIDAD.
DOMINIO PUBLICO VS. DOMINIO PRIVADO DIFICULTA LA VIDA COMUNITARIA Y PRIVA DE AGRADO.		CARENCIA DE AREAS VERDES SOLO ESPACIOS LIBRES		DOMINIO PUBLICO, PRIVADO Y MIXTO PARA LA VIDA COMUNITARIA Y AGRADO.		AREAS VERDES CONTROLADAS EN SU DISEÑO Y PARA SU MEJOR MANTENCION.	
	CARENCIA DE EQUIPAMIENTO COMUNITARIO A DISTANCIA RAZONABLE.		DISTANCIAS INACEPTABLES DE LA VIVIENDA AL TRABAJO Y VICEVERSA. MAL APROVECHAMIENTO DE INFRAESTRUCTURA URBANA DE SERVICIOS DE UTILIDAD PUBLICA Y TRANSPORTES.		INTEGRACION DEL EQUIPAMIENTO BASICO CON LA VIVIENDA CONSTRUYENDOLO SIMULTANEAMENTE. (USO DE ALGUNOS PRIMEROS PISOS)		DENSIFICAR Y RE-DENSIFICAR SECTORES URBANOS EN ALTURA MEDIA, CON MACRO-SISTEMAS. POLITICA DE RENOVACION URBANA INSERTA EN POLITICA DE DESARROLLO URBANO.

CÓMO ORGANIZAR EL APOYO

ROL, ACCIONES Y RELACIONES DE LOS SECTORES PÚBLICO, PRIVADO Y UNIVERSIDADES Y GENERACION DEL EMPLEO LOCAL.



INTERCAMBIO ENTRE PAISES: EJ. MECANISMO (CM = COORD. MODULAR)

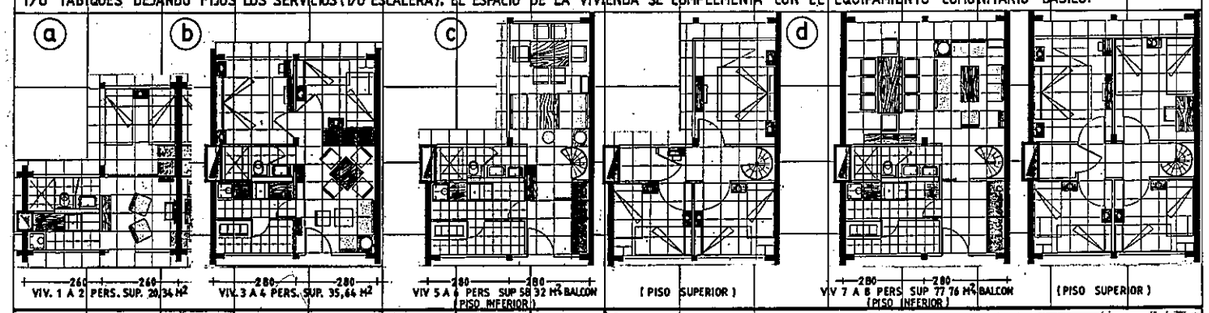


PARTICIPACION DEL USUARIO EN EL APOYO (DISEÑO PARTICIPATIVO)

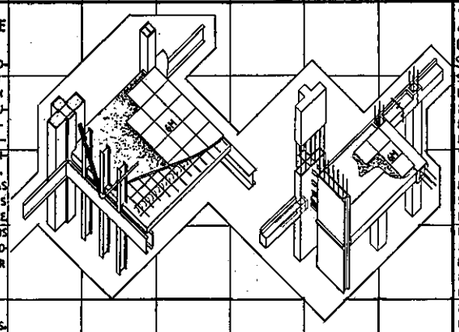
ETAPAS	OBJETIVOS	CONTENIDOS	MEDIOS	ESPECIALISTAS
I PLANIFICACION	DEFINIR • SISTEMAS ESTRUCTURALES DE AGRUPAMIENTO DE VIVIENDAS. • RASGOS TIPOLOGICOS DE LOS FUTUROS HABITANTES	1º DEFINICION DE PRINCIPIOS BASICOS DEL HABITAT. 2º ESTUDIO DE CONDICIONANTES REGIONALES Y LOCALES 3º ESTUDIO DEL USUARIO EN SI.	INVESTIGACIONES POR AREA DE ESPECIALIZACION: CENSOS, ENCUESTAS, PROGRAMAS COMPUTACIONALES QUE COMBINEN CONTENIDOS PARA OPTIMIZAR ETC.	• ECOLOGO • SOCIOLOGO • ECONOMISTA • ARQUITECTO • ING. ESTRUCTURAL
II DISEÑO CON USUARIOS	ENCONTRAR UNA ADECUADA ADAPTACION A: • PREFERENCIAS DE GRUPO • PREFERENCIAS INDIVIDUALES	ENRIQUECER EL POTENCIAL DE CONOCIMIENTO Y EXPRESION DE LOS USUARIOS.	• MODELOS A ESCALA NATURAL DE COMPONENTES CONSTRUCTIVOS (EJ TABIQUES DIVISORIOS) • PERIODOS DE PRUEBAS EN LA VIVIENDA MODELADA ETC	• ARQUITECTO • SOCIOLOGO • ANALISTA • OPERADOR EN COMPUTADORA

LA VIVIENDA: UN EJEMPLO

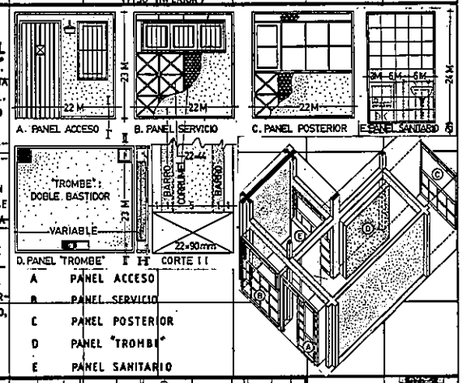
LA VIVIENDA CON ESPACIO FLEXIBLE ES EL OBJETIVO DE ESTA TECNOLOGIA MIXTA QUE TIENE CAPACIDAD DE RESPUESTA A LAS NECESIDADES DEL USUARIO Y AL MEDIO DONDE SE INSERTA. LOS SIGUIENTES EJEMPLOS SON CONVENCIONALES PERO LOS ESPACIOS PUEDEN VARIARSE CON FACILIDAD MOVIENDO MUEBLES Y/O TABIQUES DEJANDO FIJOS LOS SERVICIOS (Y/O ESCALERA). EL ESPACIO DE LA VIVIENDA SE COMPLEMENTA CON EL "EQUIPAMIENTO COMUNITARIO BASICO".



1 ESTRUCTURAS DE ACERO U HORMIGON ARMADO. FORMAN "MACRO-SISTEMAS" QUE PUEDEN TENER 2 A 5 PISOS SIN ASCENSOR. LOS CONSTRUYE LA EMPRESA CONSTRUCTORA (PREFAB. SEMIPESADA) POSTULANDO A LICITACIONES MUNICIPALES. SON ENTREGADOS POR ESTAS A LOS GRUPOS ORGANIZADOS CON ESCALERAS, TECHUMBRE, INSTALACIONES Y PAVIMENTOS LISTOS. ESTOS ULTIMOS POSEEN CUADRICULA MODULAR QUE SIRVE DE GUIA AL USUARIO PARA EL MONTAJE EN SECO DE DIVISIONES Y UBICACION DE LOS MUEBLES. SE TRATA DE UNA "TECNOLOGIA FORMAL RACIONALIZADA".



2 PANELES DE CERRAMIENTO, PANEL SANITARIO Y "TROMBE". SU ESTRUCTURA LA EJECUTA LA PEQUEÑA EMP. REGIONAL. LOS DE ACCESO Y SERVICIO PUEDEN VARIARSE SEGUN RECURSOS REGIONALES; GUSTOS DEL USUARIO Y/O EXIGENCIAS CLIMATICAS. EL PANEL SANITARIO VIENE CON SUS CAÑERIAS PUESTAS Y SE MONTA SOBRE BLOQUE-PREFABRICADO DE DESAGUE. EL PANEL "TROMBE" ES DE DOBLE ESTRUCTURA POR REQUERIMIENTOS DE INERCIA TERMICA ESTOS "MICRO-SISTEMAS" PERMITEN SU MONTAJE, RELLENO, REVESTIMIENTO Y PINTURA POR EL USUARIO.



3 PANELES INTERIORES. MODULADOS Y DESMONTABLES SE COMBINAN PARA LOGRAR CUALQUIERA EXIGENCIA DE DISTRIBUCION DEJANDO FIJOS LA ZONA HUMEDA (Y/O ESCALERA). CONSTAN DE UN ZOCALO DE 30 CM DE ALTO CON EL CUAL EL USUARIO MODELA EL ESPACIO A ESCALA NATURAL. SOBRE EL, SE MONTA CON 2 RESORTES EL RESTO DEL PANEL RELLENANDOLO, PARA UNA MEJOR ATENUACION ACUSTICA, CON ARENA SECA SIN REQUERIR FIJACION ALGUNA ENTRE SI, SOLO VAN A PRESION ENTRE PISO Y CIELO. SE DESMONTAN RETIRANDO LOS RESORTES DEL ZOCALO. ESTE ES UN INVENTO DEL PROPONENTE (VER MONTAJE).

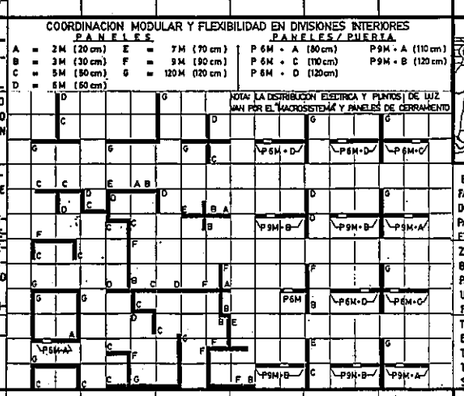
COORDINACION MODULAR Y FLEXIBILIDAD EN DIVISIONES INTERIORES

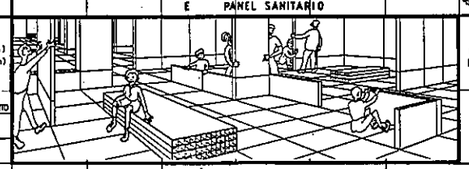
PANELES

A	= 2M (20 cm)	E	= 7M (70 cm)	P 6M + A (80 cm)	P9M + A (110 cm)
B	= 3M (30 cm)	F	= 9M (90 cm)	P 6M + C (110 cm)	P9M + B (120 cm)
C	= 5M (50 cm)	G	= 12M (120 cm)	P 6M + D (120 cm)	
D	= 6M (60 cm)				

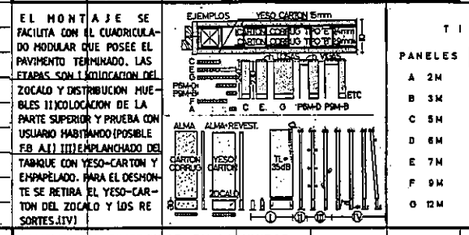
PANELES/PUERTA

NOTA: LA DISTRIBUCION ELECTRICA Y PUNTOS DE LUZ VAN POR EL "MACROSISTEMA" Y PANELES DE CERRAMIENTO





CORTE TRANS. DEL ZOCALO



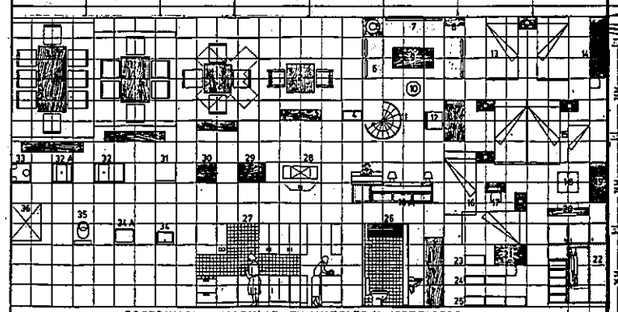
EL MONTAJE SE FACILITA CON EL CUADRICULADO MODULAR QUE POSEE EL PAVIMENTO TERMINADO. LAS ETAPAS SON I) UBICACION DEL ZOCALO Y DISTRIBUCION MUEBLES II) COLOCACION DE LA PARTE SUPERIOR Y PRUEBA CON USUARIO HABITANDO (POSIBLE F.B. A.) III) EMPLANCHADO DEL TABIQUE CON YESO-CARTON Y EMPAPELADO. PARA EL DESMONTE SE RETIRA EL YESO-CARTON DEL ZOCALO Y LOS RESORTES. (IV)

TIPOLOGIA

PANELES	PANELES/PUERTAS
A 2M	P6M + A
B 3M	P6M + C
C 5M	P6M + D
D 6M	P9M + A
E 7M	P9M + B
F 9M	
G 12M	

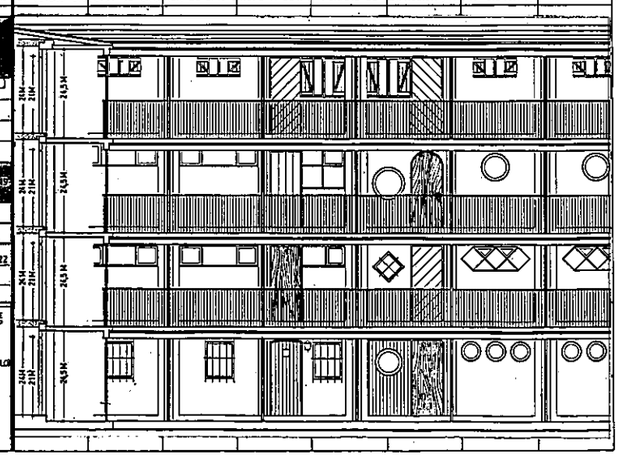
4 LOS MUEBLES Y ARTEFACTOS. SON TAMBIEN MODULARES PARA FACILITAR LA PRODUCCION MASIVA, EL BUEN USO DEL ESPACIO Y POSIBLE INTERCAMBIO DENTRO O FUERA DEL PAIS (IMPORTACION/EXPORTACION). LOS MUEBLES ARTESANALES DE ALGUNAS REGIONES PODRIAN TENER CABIDA A CONDICION DE QUE SE ALLANARAN A ADOPTAR CIERTAS DIRECTRICES DIMENSIONALES.

CONCLUSION: DIVERSIDAD EN LA UNIDAD. LA COORDINACION MODULAR, LEJOS DE PRODUCIR MONOTONIA OFRECE SOLUCIONES DE DISEÑO EN LOS PANELES DE CERRAMIENTO LOS QUE PUEDEN SER RELLENADOS, REVESTIDOS Y/O PINTADOS A GUSTO DEL USUARIO INCORPORANDO PRACTICAS LOCALES INTERESANTES ("TECNOLOGIAS APROPIADAS"). EL "MACRO-SISTEMA" SE ENCARGA DE DAR UNIDAD A ESTAS FORMAS DE EXPRESION ("MICRO-SISTEMA").



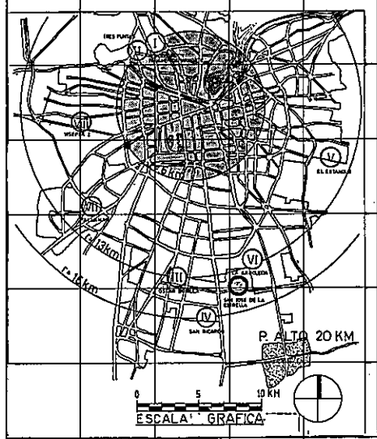
COORDINACION MODULAR EN MUEBLES Y ARTEFACTOS

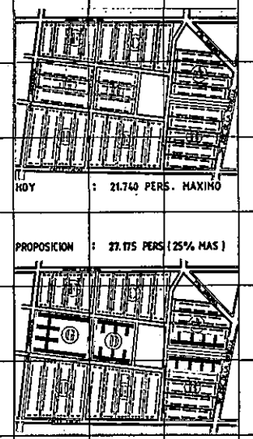
1 MESAS Y SILLAS DE COMEDOR
2 MESA Y SILLAS PATAS PLEGABLES
3 APARADOR
4 MESA T.V.
5 MESA LAMPARA
6 SOFA DOBLE O DOS SILLONES JUNTOS
7 SOFA TRES PLAZAS
8 LIBRERO
9 MESA DE CENTRO
10 POUFFE
11 ESCALERA DE CARACOL
12 ESCRITORIO GRANDE
13 CAMAS CON VELADOR CENTRAL
14 CLOSET TRIPLE
15 CAMAS CON VELADOR LATERAL Y CUNA
16 Y 16A CAMAS EN DIVERSAS ALTURAS
17 MAQUINA DE COSER
18 ASIENTOS (PISOS) ACOPLABLES
19 CLOSET DOBLE
20 TOCADOR
21 ESCRITORIO CHICO
22 CLOSET TRIPLE DE FRENTE
23 ESTANTE DE COLGAR O LIBRERO
24 IDEM
25 IDEM
26 BAÑO
27 COCINA
28 ARTEFACTO LAVADO ROPA
29 MUEBLE BASE COCINA PARA AJUSTE (FUERA DE MODULO)
30 MUEBLE BASE COCINA, MODULAR
31 REFRIGERADOR
32 Y 32 A LAVAPLATOS
33 ARTEFACTO COCINA
34 Y 34 A LAVATORIOS
35 INODORO
36 DUCHA



LA CIUDAD: UN EJEMPLO

DENSIFICAR LAS CIUDADES CUANDO LOS TERRENOS CUENTAN CON INFRA-ESTRUCTURA COMPLETA DE URBANIZACION Y TRANSPORTE, ES UN IMPERATIVO QUE DICTA EL BUEN USO DE LOS RECURSOS. SIN EMBARGO, EN LA MAYORIA DE LAS CAPITALES LATINOAMERICANAS SE SIGUEN CONSTRUYENDO AGRUPACIONES DE VIVIENDA SOCIAL EN 1 PISO, A DISTANCIAS MENORES DE 6 KM DEL CENTRO, CON MAYOR RAZON A DISTANCIAS MAYORES.





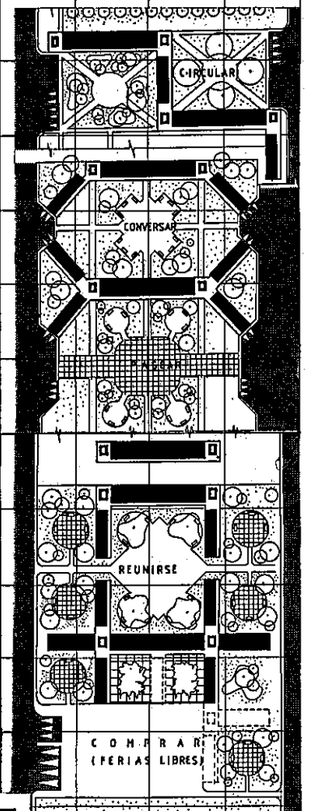
UN EJEMPLO CLARO ES EL DE LA FIG. SUPERIOR EN DONDE SE VEN 9 POBLACIONES IMPORTANTES DE VIVIENDA SOCIAL, UBICADAS RECIENTEMENTE ENTRE 6 Y 16 KM DEL CENTRO. ESTO ALEJA AL POBLADOR DE SU FUENTE DE TRABAJO OBLIGANDOLO A DESTINAR A DESPLAZAMIENTOS MAS DE 2 HORAS DIARIAS. SI SE TOMARA 1/10 DE LA SUPERFICIE DISPONIBLE DENTRO DE UN RADIO DE 6 KM PARA ESTE FIN, SE CONTARIA CON 1.130 HA DESTINABLES A VIVIENDA LAS QUE PODRIAN CONTENER MAS DE 500 MIL PERSONAS EN LUGAR DE LAS 100 MIL QUE VIVEN AHORA. ELLO REQUERIRIA DE UNA POLITICA DE DESARROLLO URBANO QUE PERMITIERA LA CONSTRUCCION DE MACRO-SISTEMAS DE ALTURA MEDIA (6 A 5 PISOS) Y RECUPERAR ESTRUCTURAS URBANAS DETERIORADAS AUNQUE NO OBSOLETAS (POLITICA DE RENOVACION URBANA).

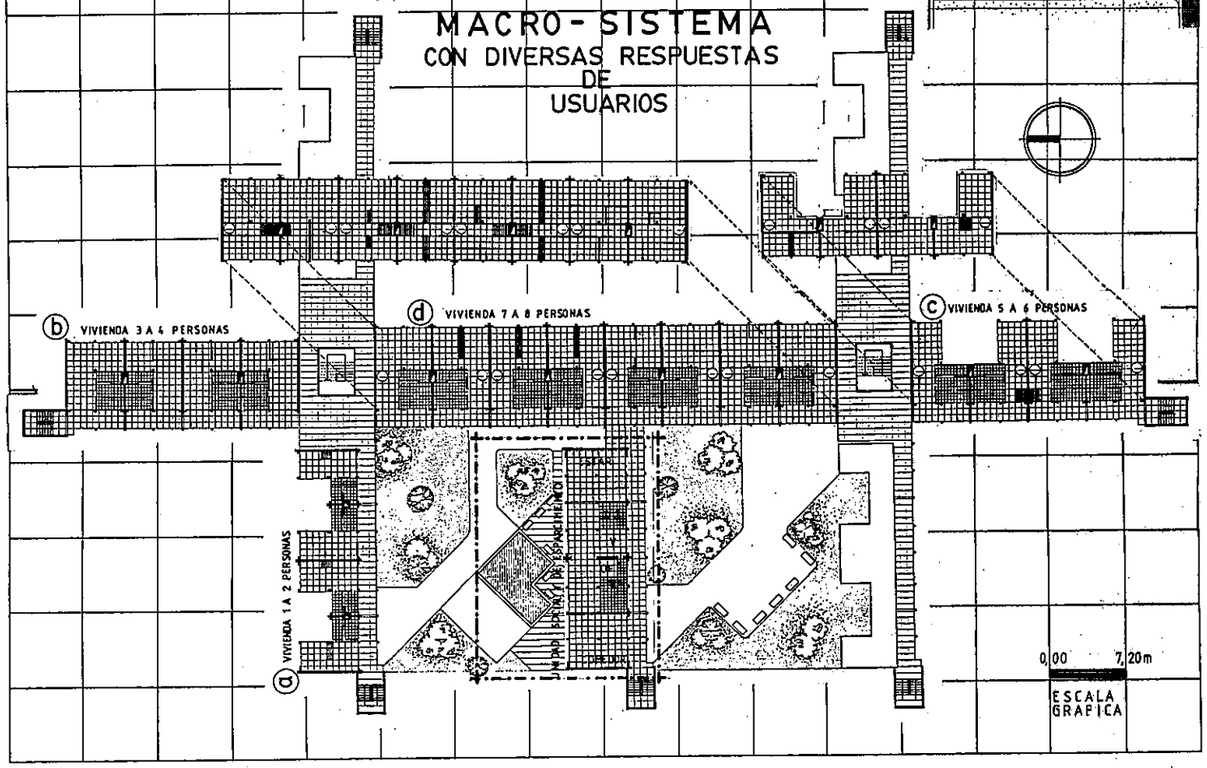
LA PERIFERIA DE LAS CIUDADES, EN CONSECUENCIA, ESTA HOY EN DIA CONSTRUIDA CASI TOTALMENTE EN 1 PISO, ES MONOTONA Y CARECE DE IDENTIDAD. NO HAY ESPACIOS INTERMEDIOS ENTRE LO PRIVADO Y LO PUBLICO Y LAS NUEVAS POBLACIONES EN EXTENSION NO CONSIGUEN ORDENAR LA CIUDAD. SE PROPONE INTERCALAR MACRO-SISTEMAS QUE CONFORMEN ESPACIOS Y "HAGAN CIUDAD". EJEMPLO: EN EL LOTEO DE LA FIG. SUPERIOR SE LOGRA UN 25% MAS DE CABIDA CON LOS MACRO-SISTEMAS INDICADOS.

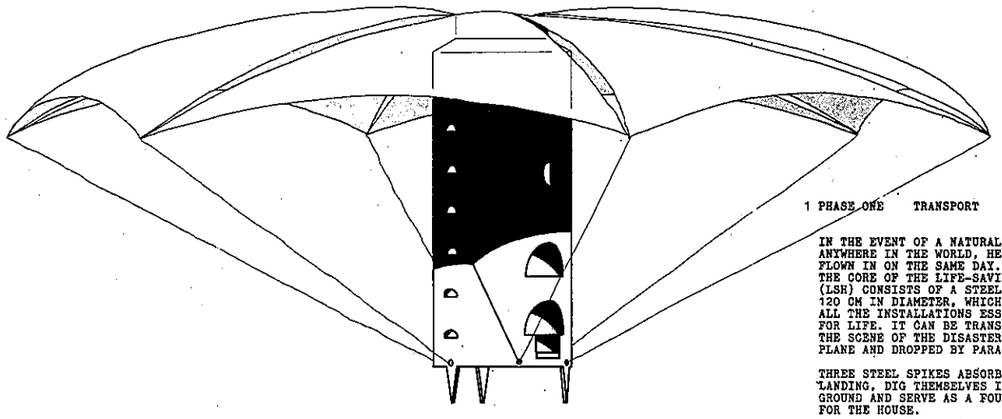
LOS MACRO-SISTEMAS SERIAN DISEÑADOS BAJO COORDINACION MODULAR Y SU PARTICULARIDAD DESDE EL PUNTO DE VISTA URBANISTICO SERIA SU GRAN FLEXIBILIDAD YA QUE PODRIAN ARTICULARSE ENTRE SI PARA CONTROLAR EL ESPACIO Y CREAR AMBIENTES INTERMEDIOS PARA UNA MEJOR VIDA COMUNITARIA. DE ACUERDO A LOS ESTUDIOS SOCIOLOGICOS PREVIOS, LOS BLOQUES CONTENDRIAN VIVIENDAS DE DIVERSOS TAMAÑOS.

EL EQUIPAMIENTO COMUNITARIO BASICO SE INSTALARA DE ACUERDO A LAS NECESIDADES EN ALGUNOS PRIMEROS PISOS DE DICHOS BLOQUES, COMPENSANDOSE ASI LA LIMITACION DEL ESPACIO FAMILIAR EN LA VIVIENDA. LAS UNIDADES BASICAS SERIAN: SOCIABILIDAD Y ESPARCIMIENTO; ASISTENCIAL; SANITARIA Y DE PRODUCCION. EN LA FIGURA INFERIOR SE DA UN EJEMPLO DE "MACRO-SISTEMA" CON UNIDAD SOCIAL Y DE ESPARCIMIENTO.

LAS AREAS VERDES PODRIAN CONTROLARSE MEJOR EN SU EXTENSION Y MANTENCION, DANDO PREFERENCIA, SEGUN EL MEDIO DE QUE SE TRATE, AL JARDIN "TIPO MEDITERRANEO" SOBRE EL JARDIN "TIPO INGLES".







1 PHASE ONE TRANSPORT

IN THE EVENT OF A NATURAL DISASTER ANYWHERE IN THE WORLD, HELP CAN BE FLOWN IN ON THE SAME DAY.
THE CORE OF THE LIFE-SAVING HOUSE (LSH) CONSISTS OF A STEEL TUBE, 120 CM IN DIAMETER, WHICH CONTAINS ALL THE INSTALLATIONS ESSENTIAL FOR LIFE. IT CAN BE TRANSPORTED TO THE SCENE OF THE DISASTER BY AIRPLANE AND DROPPED BY PARACHUTE.

THREE STEEL SPIKES ABSORB SHOCK ON LANDING, DIG THEMSELVES INTO THE GROUND AND SERVE AS A FOUNDATION FOR THE HOUSE.

EVERY BASIC ELEMENT OF THE LSH SERVES SEVERAL FUNCTIONS, THUS KEEPING COSTS TO A MINIMUM.

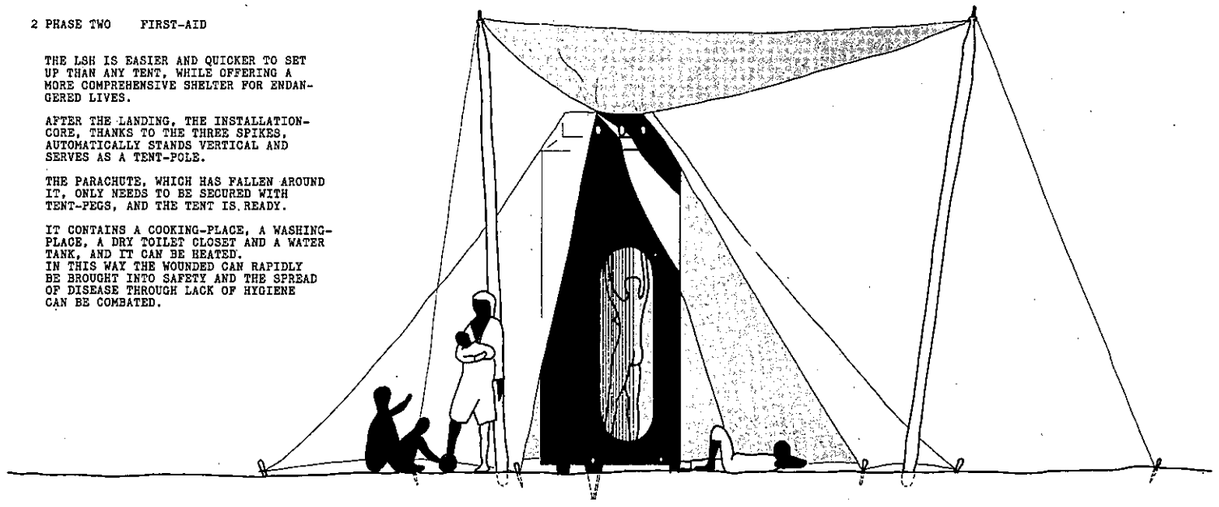
2 PHASE TWO FIRST-AID

THE LSH IS EASIER AND QUICKER TO SET UP THAN ANY TENT, WHILE OFFERING A MORE COMPREHENSIVE SHELTER FOR ENDANGERED LIVES.

AFTER THE LANDING, THE INSTALLATION-CORE, THANKS TO THE THREE SPIKES, AUTOMATICALLY STANDS VERTICAL AND SERVES AS A TENT-POLE.

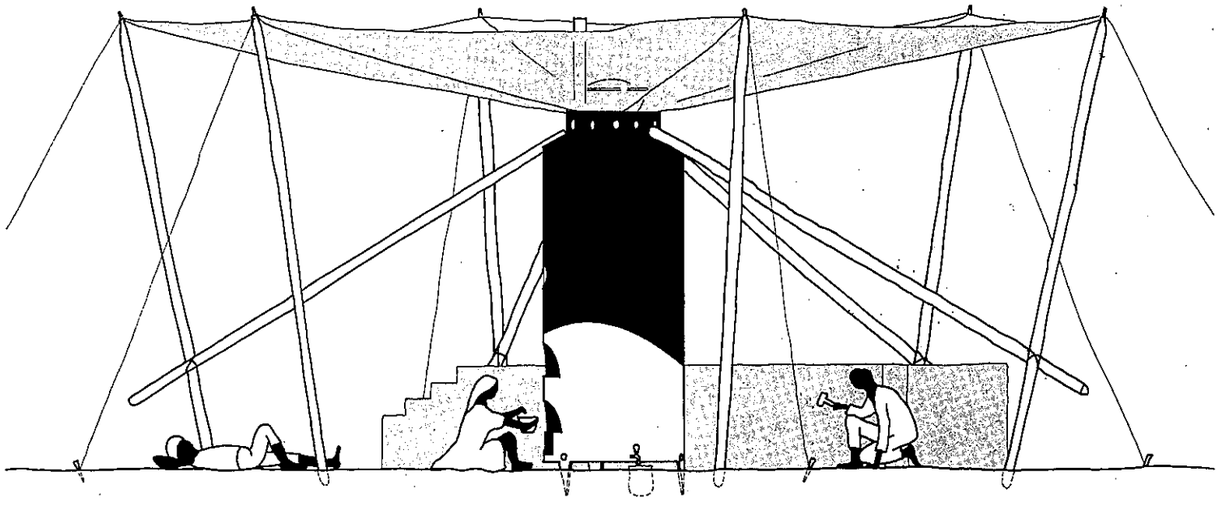
THE PARACHUTE, WHICH HAS FALLEN AROUND IT, ONLY NEEDS TO BE SECURED WITH TENT-PEGS, AND THE TENT IS READY.

IT CONTAINS A COOKING-PLACE, A WASHING-PLACE, A DRY TOILET CLOSET AND A WATER TANK, AND IT CAN BE HEATED.
IN THIS WAY THE WOUNDED CAN RAPIDLY BE BROUGHT INTO SAFETY AND THE SPREAD OF DISEASE THROUGH LACK OF HYGIENE CAN BE COMBATED.

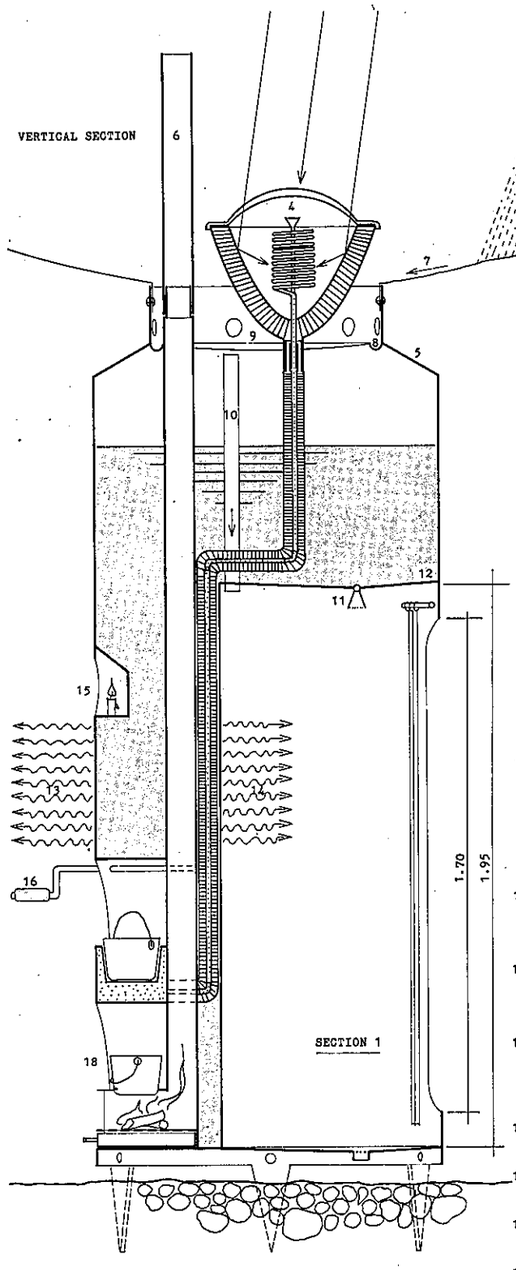


3 PHASE THREE BUILD-UP (CONSOLIDATION)

THE LSH IS A PROJECT THAT HELPS PEOPLE TO HELP THEMSELVES.
ONLY THE ESSENTIALS FOR LIVING ARE SUPPLIED AND THE OCCUPANTS ARE THEN INSPIRED TO CONTINUE THE BUILDING THEMSELVES.
THE TENT ROOF CAN BE PROPPED UP ON POLES AND THEN SERVES AS A FUNNEL TO COLLECT RAINWATER AND PASSES IT INTO A TANK. AT THE SAME TIME THE ROOF PROVIDES SHELTER AGAINST SUN AND RAIN FOR THE BUILDING-SITE WHICH IS COMING INTO BENEATH IT. THE WIND CAN BLOW THROUGH UNDER THE ROOF, COOLING THE BUILDING-SITE AND THE NEW HOUSE WHICH IS BEING CONSTRUCTED FROM LOCAL MATERIALS.
IN REGIONS WHERE WOOD IS IN SHORT SUPPLY, A PARABOLOID-SHAPED SOLAR-COLLECTOR CAN BE DELIVERED AFTERWARDS. IT IS FIXED ONTO THE ROOF AND PERMITS COOKING AND ALSO THE HEATING OF THE HOUSE ON COOL NIGHTS.



VERTICAL SECTION



4 IN THE CONSOLIDATION PHASE, A SOLAR COLLECTOR, DELIVERED AFTERWARDS, CAN BE FITTED ONTO THE ALREADY-INSTALLED OIL-PIPES.
A DOUBLE-GLAZED SKYLIGHT DOME CHANGES SUNLIGHT INTO HEAT AND RETAINS IT IN THE PARABOLIC COLLECTOR.
A BLACK COPPER SPIRAL FILLED WITH OIL IS HEATED FROM ALL SIDES.
THE OIL IS TRANSPORTED TO THE SOLAR OVEN.
A SOLAR OVEN CORRESPONDING IN PRINCIPLE TO THIS ONE, HAS ALREADY BEEN TESTED SUCCESSFULLY BY THE PHYSICIST, PROF.DR. A.GOETZBERGER IN GERMANY.

5 IN THE CONSOLIDATION PHASE, ROOF BEAMS CAN BE PLACED AND SECURED HERE.

6 THE CHIMNEY IS LENGHTENED IN THE CONSOLIDATION PHASE, SO THAT THE SOLAR COLLECTOR DOES NOT GET SOOTY.

7 RAINWATER IS COLLECTED THROUGH THE ROOF.

8 IN THIS EASILY CLEANABLE CHANNEL, THE WORST DIRT FROM THE ROOF IS COLLECTED.

9 AN OPENING ON THE TOP OF THE TANK ALLOWS ACCESS FOR CLEANING.
A MOSQUITO-NET FILTERS THE RAINWATER. IT CAN EASILY BE REMOVED AND WASHED.

10 THIS PIPE SERVES BOTH AS AN OVERFLOW FOR THE WATER TANK AND AS VENTILATION FOR THE SHOWER-COMPARTMENT.

11 THE SHOWER IS TURNED ON BY SIMPLY TURNING THE HEAD. IT CAN ONLY BE OPERATED BY ADULTS AND THIS HELPS TO SAVE WATER.

12 WHEN THE WATER RESERVE DROPS BELOW THIS LEVEL, THE WATER SUPPLY TO THE SHOWER IS AUTOMATICALLY CUT OFF, SAVING THE WATER FOR COOKING.

13 THE WATER TANK STORES WARMTH AND RELEASES IT DURING THE NIGHT.

14 THE SHOWER-COMPARTMENT IS WARMED BY THE SURROUNDING WATER TANK.

15 LIGHTING IS PROVIDED BY CANDLES OR BULBS SUPPLIED FROM SOLAR-CELLS.

16 THIS CRANK-HANDLE OPERATES A MINI-TURBINE, WHICH SETS IN MOTION THE OIL CIRCULATION BRINGING THE HOT OIL FROM THE COLLECTOR ON THE ROOF DOWN TO THE COOKING-PART.

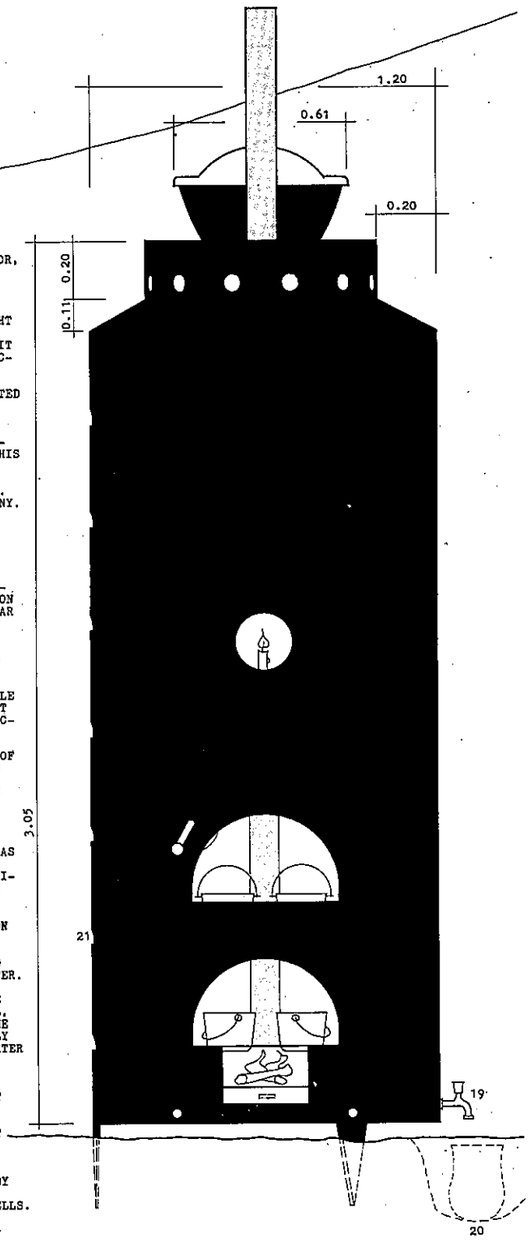
17 THE DRY TOILET CAN BE STORED IN THE SHOWER-COMPARTMENT.

18 IN THE FIRST-AID PHASE, COOKING IS STILL WITH WOOD, POSSIBLY DEBRIS.

19 THIS WATER FAUCET IS SCREWED IN AFTER LANDING.

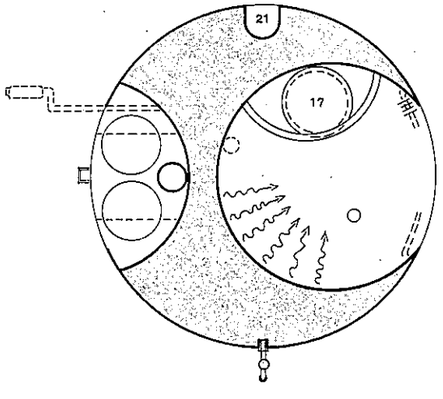
20 A DITCH IN THE GROUND PROVIDES DRAINAGE.

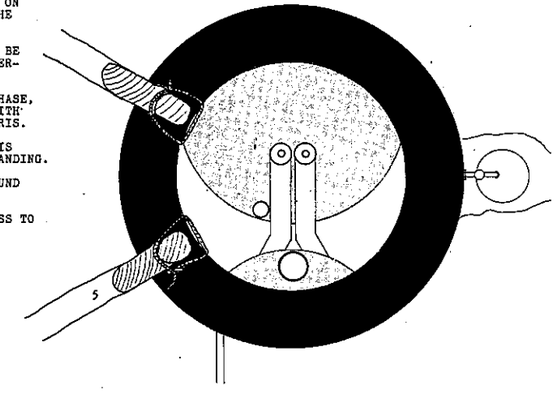
21 LADDER GIVING ACCESS TO THE ROOF.



VIEW FROM ABOVE

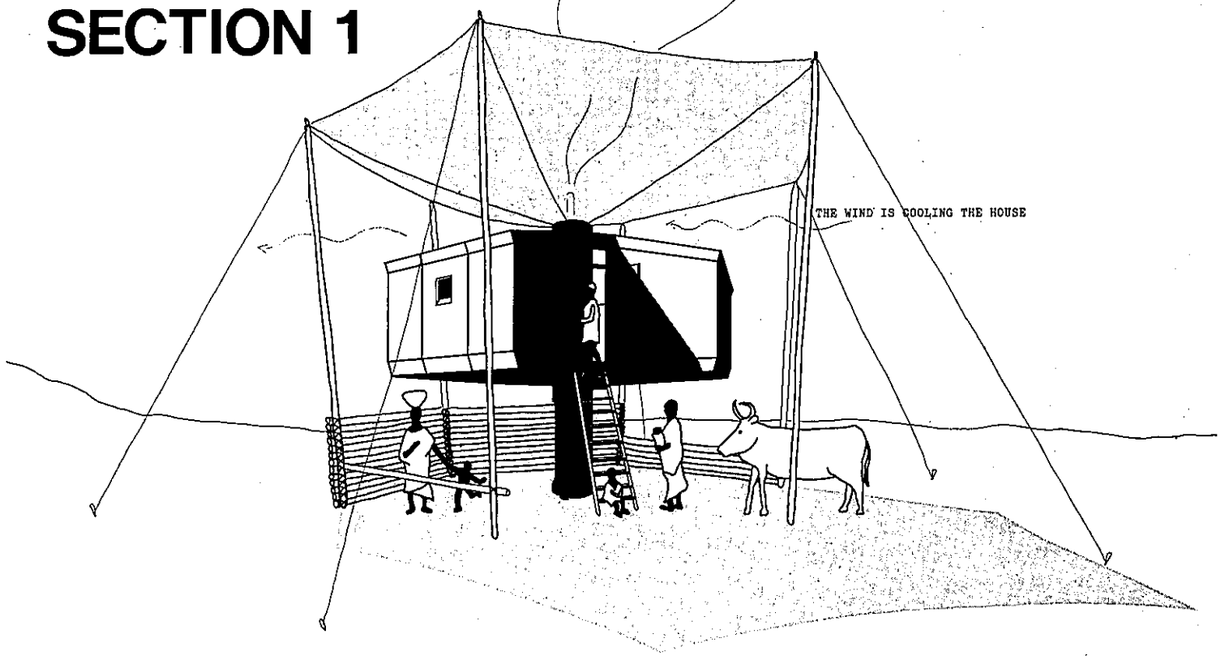
SECTION 1



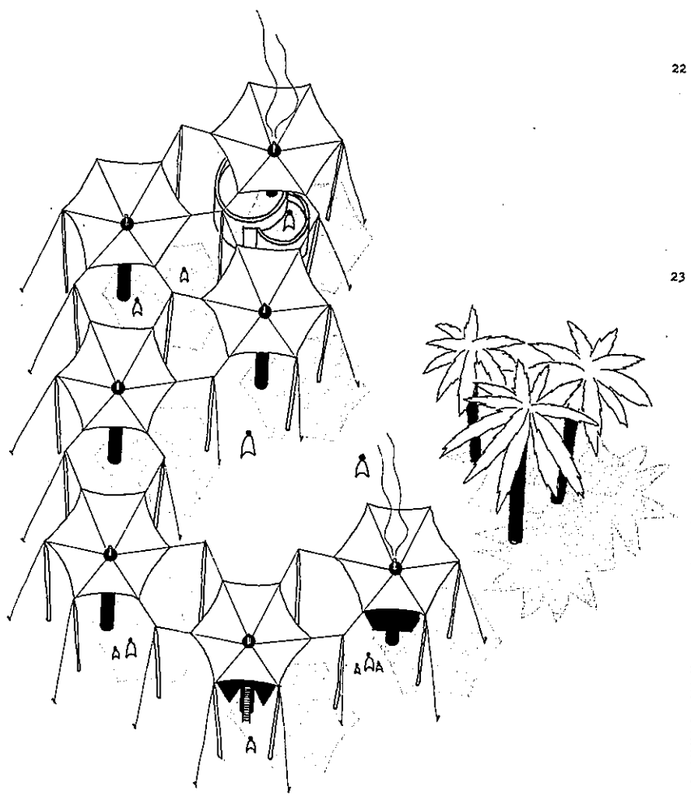


SECTION 1

THE LIFE-SAVING HOUSE FOR DISASTER-RELIEF OR THE »ANTI-BOMB«



THE WIND IS COOLING THE HOUSE



22 ALTERNATIVE

A TWO STOREY INSTALLATION-CORE CAN BE SUPPLIED, WITH THE KITCHEN ABOVE AND THE SHOWER-COMPARTMENT AND TOILET BELOW.

INSULATED, LIGHTWEIGHT BUILDING MATERIALS CAN BE DELIVERED LATER BY SHIP OR TRUCK AND ATTACHED TO THE CORE.

THE SHELTERED PLACE UNDER THE HOUSE CAN BE FURTHER BUILT UP AS LIVING-SPACE OR USED FOR ANIMALS.

THIS CONSTRUCTION WOULD ENABLE SURVIVAL EVEN IN COLD REGIONS.

23 THE HISTORY OF THE LIFE-SAVING HOUSE AND THE FINANCIAL PROBLEM.

IN 1978 THE SWISS DEPARTMENT OF FOREIGN AFFAIRS HELD A COMPETITION TO OBTAIN PLANS FOR A DISASTER EMERGENCY HOUSE. I TOOK PART IN THIS COMPETITION BUT LACK OF TIME PREVENTED ME FROM SUBMITTING MY FINAL PLANS.

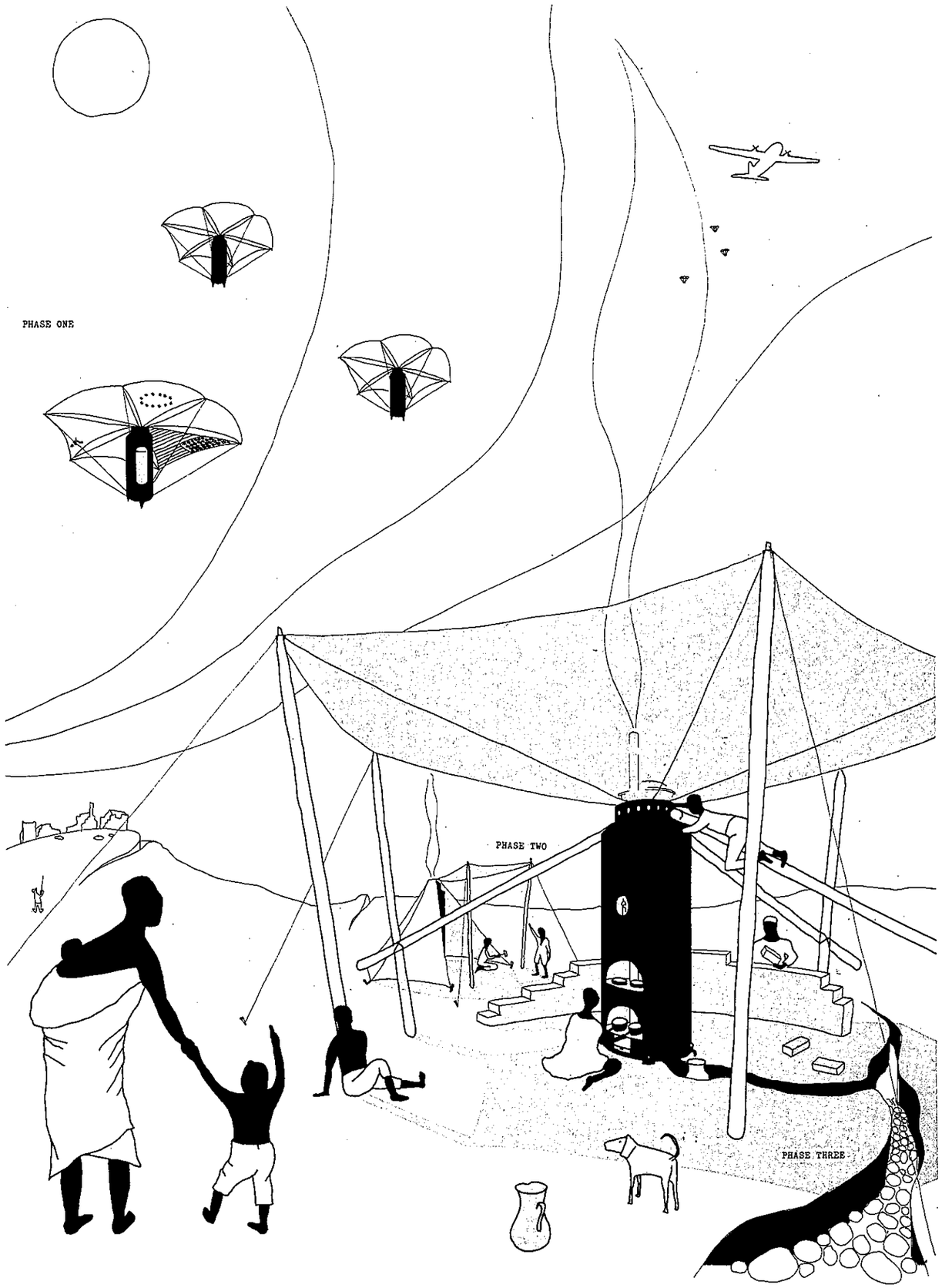
IN 1983 I RESUMED WORK ON THE PROJECT AND BEGAN TO CONSIDER HOW IT COULD BE FINANCED. AN EMERGENCY HOUSE MUST BE EXTREMELY CHEAP AND NEEDS THEREFORE TO BE PRODUCED IN VERY LARGE NUMBERS IN ORDER TO KEEP THE COST PER PIECE TO A MINIMUM.

I THEREFORE BEGAN TO THINK ON A WORLD-WIDE SCALE AND IN 1984 I PRESENTED THE PROJECT TO THE FORMER PRESIDENT OF THE U.S.A., JIMMY CARTER, AND HIS WIFE ROSALYNN. THEY BOTH FOUND THE IDEA VERY GOOD AND ASKED ME TO BUILD A PROTOTYPE. FOR ME AS A PRIVATE INDIVIDUAL A FULL-SCALE PROTOTYPE WOULD HAVE BEEN VERY EXPENSIVE, AND I CONSTRUCTED A MODEL TO A SCALE OF 1:10 AND TESTED ITS FLIGHT AND LANDING CHARACTERISTICS. THE RESULTS WERE VERY ENCOURAGING. TOGETHER WITH A RELIEF AGENCY WITH WHICH EX-PRESIDENT CARTER IS INVOLVED, WE WORKED OUT THAT THE COST OF ONE SINGLE HOUR IN THE ARMAMENTS PROGRAMME OF THE TWO SUPER-POWERS, THE U.S.A. AND THE U.S.S.R., WOULD BE ENOUGH TO BUILD 100'000 EMERGENCY HOUSES, WHICH CORRESPONDS WITH THE AVERAGE NUMBER REQUIRED IN THE WORLD IN A YEAR.

IN 1986, THE 'YEAR OF PEACE', WE GATHERED 1058 SIGNATURES FROM 21 COUNTRIES FOR A PETITION ASKING THE TWO SUPER-POWERS TO FINANCE THIS HUMANITARIAN WORK OUT OF THEIR ARMAMENTS BUDGETS. BOTH GOVERNMENTS HAVE ANSWERED, EXPRESSING SYMPATHY WITH THE AIM OF THE PETITION.
WE HAVE NOW BEGUN NEGOTIATIONS AND HOPE IN THIS 'YEAR OF THE HOMELESS' TO BE ABLE TO CONSTRUCT, TEST AND DEMONSTRATE PROTOTYPES.

THIS PROJECT STANDS AT THE MEETING POINT OF EAST-WEST AND NORTH-SOUTH, AND CONTAINS POLITICAL POTENTIAL: EMERGENCY HOUSES FALL LIKE BOMBS FROM THE SKY, BOMBS WHICH DO NOT KILL AND DESTROY BUT WHICH SAVE LIFE AND HELP TO REBUILD.

THIS IS THE ANTI-BOMB.



SHELTER FOR THE HOMELESS

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most increase of population

climatic zones vegetation

hurrican earthquake areas

water problem areas

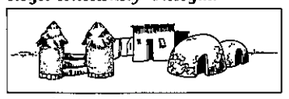
wind -, dust and sand storms, high diurnal temperature ranges

continous wind, quite erratic rain high humidity ranges

monsoon areas, seasonal rainy periods high humidity ranges

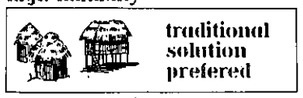
thunderstorms, no dry periods high humidity

sand, stones, loam, laterit, grasses, brushwood low groundwater level

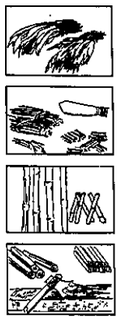


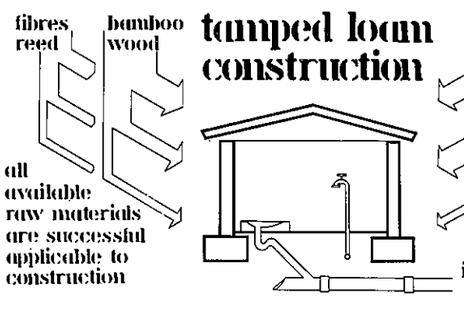
sand, stones, loam, laterit, grasses, reed, trees - changing groundwater level

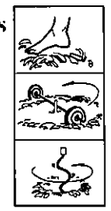
stones, loam, reed, grasses, bamboo, leaves, high trees long rainy season

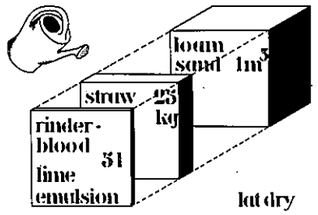


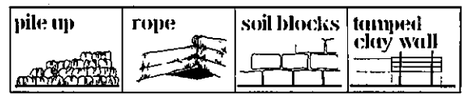
reed, wood and brushwood, bamboo, leaves because of constantly rain tamped clay wall unsuitable











INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS

The presented work is to give all interested countries the possibility to create human lodgings in large scale like a self-help program. These lodgings are to offered vitally necessary and hygienic minimum comfort.
The contribution of this work is arranged in the section 2, basing on architectural views. These note the specific geographical conditions and popular traditions. The technical content of this work make possible to use the architectural statements systematical and in large scale.
The first aspect of the work is the expecting growth of population on the earth. It turns out that the most growth of the population is noted down in the countries of Latinamerica, South Asian, North- and Central Africa. These districts lay above all in the subtropical and tropical climates. This is answered through a selection of building material, formation of ground-plan, constructive-technical realisation and finally through the town-planning formation.
The countries in these districts are mainly little developed agrarian state. For that reason in this work was renounced on expensive Imports and highly perfected technologies, wich required the know how of the developed countries Here a solution is showed, wich con accept and plan by inhabilants in self-help programs and with natural raw materials.

At the second list of the presented work statements concerning the construction system are demonstrated. In the beginning view are indicated the materials having at hand. Basing on this knowledge the using of clay construction offer directly. This construction has a millenium old tradition in many of the countries, traditional ruled and employed. Centres of points and stimulations are indicated in a survey.
Than the success is guarantee, if the homeless are interested in the improvement of their situation and self lended hands with engagement. The possibility is very great through the simplicity of the proceeding. Only little demands with regard to grade of qualification are put to the homeless.
The selected constructional system had tested by Prof. Dr. Minke, FRG, with success. It is a proceeding of shuttering for using of a reinforced tamped clay wall. This make possible a continous working process, further the development of even wall surfaces without great treatment. Addition of rectangular ground-plans are created with little technical-technological expences.
The form is made of single pressed boards, 40 cm hig, on both sides like composite structure, wich guarantee a crack of the form during the process of the compression. For that reason the fibre-cord laying on the end secure the form boards against crack. The dimensions of the shuttering are so choosed, that it can work in a 1- and 2 mater screen.
The buildings must carefully based, seperately in endangered districts concerning earthquakes. To his a tamped clay foundation, reinforced like a ring beam. The depth is to be between 30 and 60 cm regarding the demands. The "ring beam" is made of reed, bamboo cane or similar materials, important is the solid bonding of the rods. However in some districts the expense for foundation can reduce to a minimum.
A protection against splash-water and underwashing can reach through a about 50 cm high ground-wall made of natural stone or very compacted tamped clay. The form is put also on the foundation or the ground-wall. Now the prepared clay mix can fill in. Wooden rods, bamboo canes or other materials can act as reinforcement. During the working process the form is interchangeably vertically moved. In order to make possible a thothing of the wall strips narrow wooden rods are fitted within the form at the front sides. Joints are are arised between the wall panels, wich filled in, servad like depit point of fracture in districts with earthquake.or partly open let in order to fill tasks for ventilation. Door openings arise by enlarging of the distance between the wall panels. Further possibilities for openings are given through the using beare respectly through the putting in of twisted bows or wooden frame in the form. During of the compression supporting provision are necessary. The belated chisel of the openings is also possible.
The roff structure, wich is a development by Prof. O. Büttner, GDR, was so choosed, that they can be used in several districts. They are formation as flat roof or with slope of roof, with Attika or projecting roof. This construction can serve as a roof setting foot on or floor. The execution is thinkable simple: Wooden rods are layed diagonal one after another on the walls surrounding rooms and that is the true all crossing points are knoted cone with another, so that is possible a great load transfer on the relative thin bears. Dependend on the used cross-sections the distance of the rods is varied, even reed materials are possible. A layer of clay can bring up on a tight twisted mat consist of fibre or teaf material laying on the wooden rods. The thickness of the layer can differed in the climatic districts. In the hot-dry zones is to recommend that a layer of light gradistricts. In the hot-dry zones is to recommend that a layer of light gravel and conohoidal fracture is bringed up a thick layer of clay.

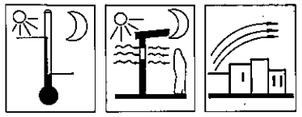
At the third list statements regarding formations of ground-plan and settlement are demonstrated. Minimum demands result from the functions of living. Dependend on the demands and possibilities the inhabitants can add oneself further rooms. Our list shows examples for the expansion under consideration of the respective climatic and traditional conditions.
The erection of a group of dwelling houses is to in team-work of the future inhabitants. An instruction in the first phase is necessary. However the skills using for the erection develop very quickly. The land for the settlement is purchased by the government and is available to the settlers. Every settler is got a plot market off before. Establishments of the states are to force opening up of the districts with streets and qqueducts.
Pay attention that the families are got sufficient land. The neighbours can help one another by using of the system of shuttering. At our list the total action of konstrukfion is showed including the way of operation.
The list shows also examples beginning with the ground-plan and closing with an ensemble of dwelling houses.
In the arid zones the separation of the kitchen and altrine is created in order to avoid illnesses. A sanitary unit is only possible with a high stock of water. In this case a coupling of the shower, kitchen and toilet is proposed in order to use the water as maximum. The atrium house is spread in a large scale, in particular in the states of islam. In the humid areas the ground-plans are formed open. The compactness of the grouping of rooms is softened. More great openings than in the dry-zones are foreseen in order to reach a sufficient ventilation. A projecting roof is prefered. The distance of the houses are choose greater and the streets are layed out more wide and long in order to improve the climate. The traditional and religious conditions always must take into consideration.

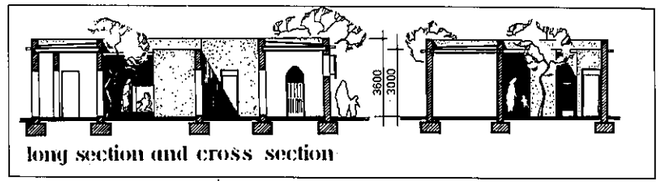
The fourth list of the proposed work busies with the problems of water supply and sewage engineering. These result from the climativ conditions and the stand of the development. Simple system of the water-household are required. For that reason the designers propose a conception able to expand and to complete. This is to realize with a four-step-plan. Most important is to open up the problem areas with concerning engineering for water wich ist tied to creating of traffic connections, capacity of transport and further assumption. Only when this calculated, it can think of programe against homeless. Our list shows a possible way and some statements. The preperation of installation material can represent a task for the developed countries in order to perform an effective contribution for the diminution of the problems of the homeless. However the self-help initiative of the homeless is the importance. The presented work can give only some directions and thoughs.

examples of buildings

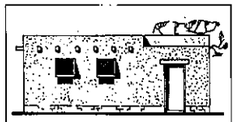
DESERT / SEMI DESERT

compact for intensive sunshine

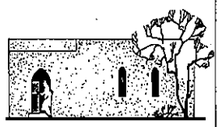




long section and cross section

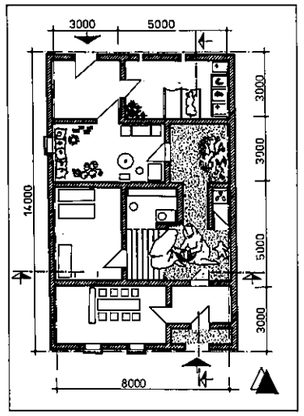


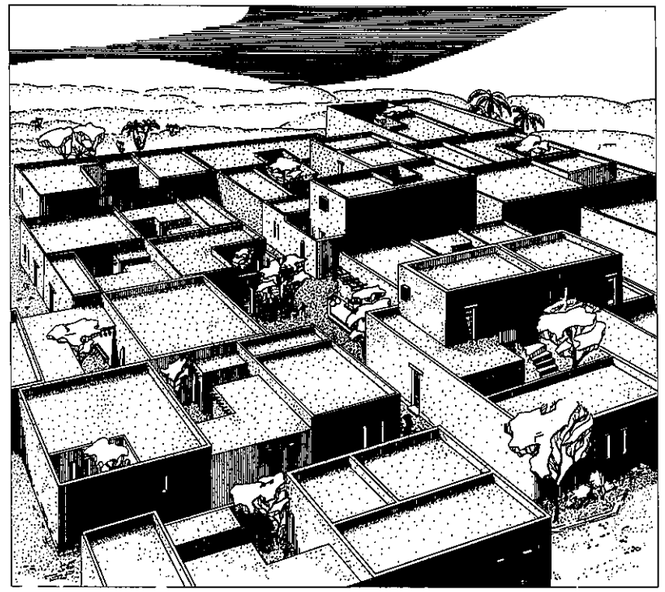
view from south

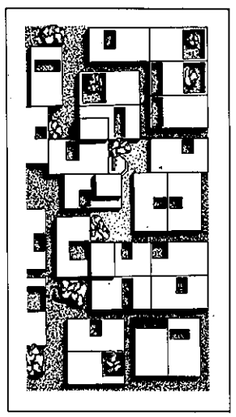


variation

short streets against sand- and carry-winds, many small green areas, closed construction and small openings. walls must have a high heatstorage-capacity, formation of several courts for climatic and religious reasons.

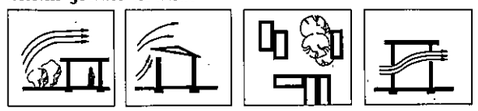




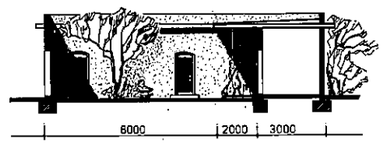


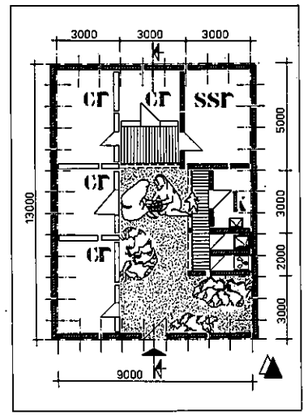
DRY SAVANNA

scattered for natural ventilation and sunshine long and short streets possible. large and small green areas.

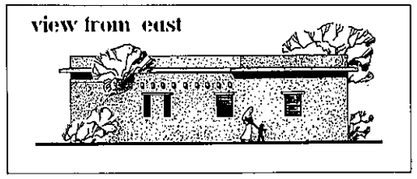


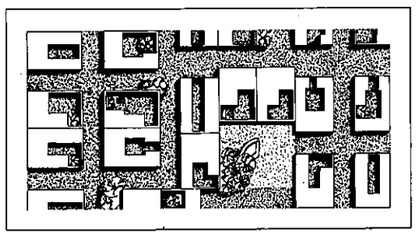
cross ventilation, roof with overhang, trees and shrubes for wind protection





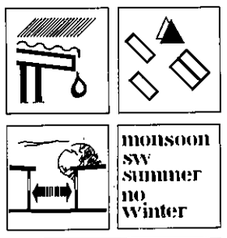
view from east



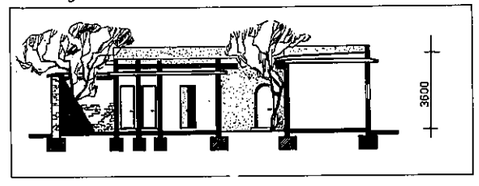


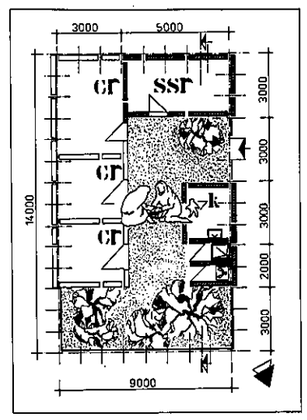
HUMID SAVANNA

wide scattered for natural ventilation, long streets for better air-movement, large green areas improve climate. good cross ventilation, roof with overhang, biggest outherwall arrange to wind.

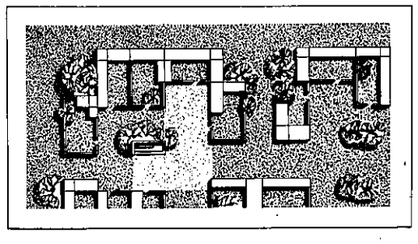


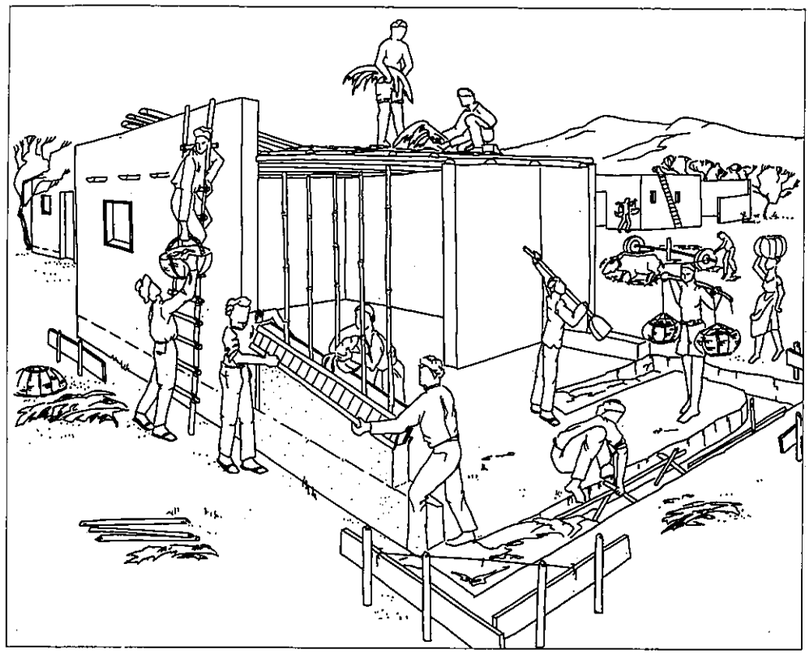
monsoon sw summer no winter





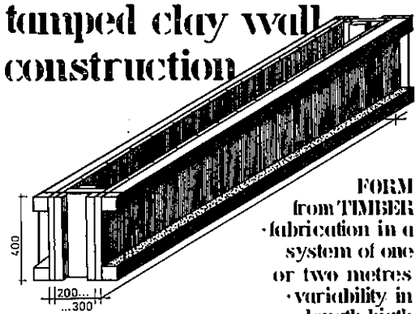
view from north east



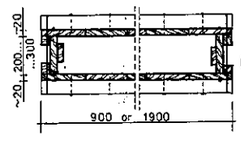


PRINCIPLE OF THE CONSTRUCTION

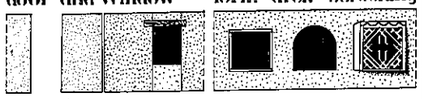
tamped clay wall construction



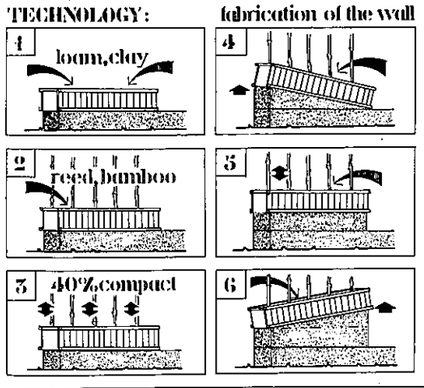
FORM from TIMBER
· fabrication in a system of one or two metres
· variability in length, higth and thickness
· reinforcement (reed, brushwood...)
· outher and inner walls with same system possible



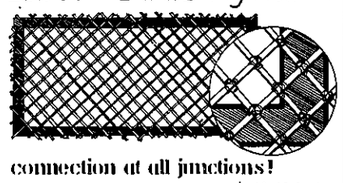
OPENINGS:
door and window — form arch screening



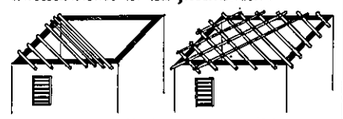
TECHNOLOGY: — fabrication of the wall



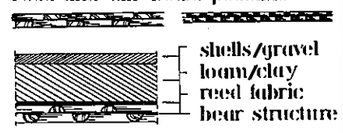
new roof system

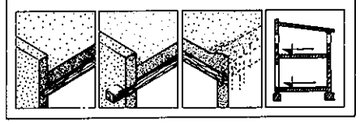


connection at all junctions!

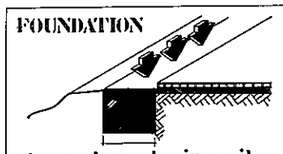


reed and tall beams possible



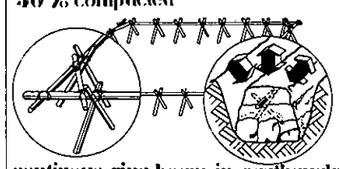


FOUNDATION



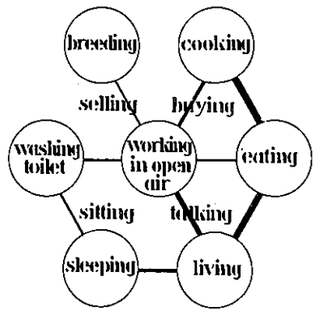
floor: soil blocks, bricks or also tamped clay

stones, clay, cohesive soil 40% compacted



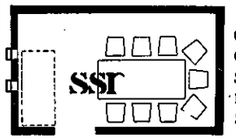
continous ring beam in earthquake areas (from bamboo or reed and clay)

MINIMAL REQUIREMENTS TO THE CONDITIONS OF HABITION



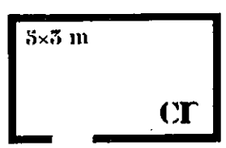
requirements of rooms

sitting sleeping room
ssr
start and central point of the futural ground plan

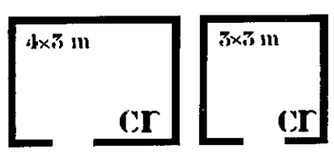


at day sitting and at night sleeping room
size: 3×5m

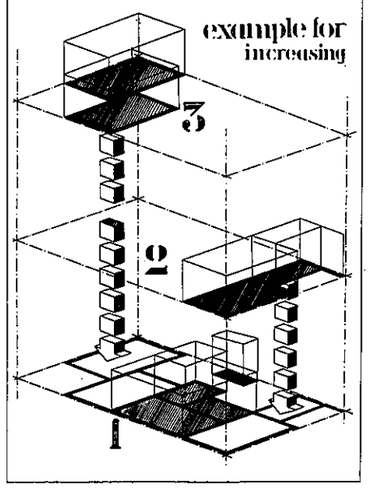
kitchen k for living, cooking and eating, size: 2×3m
shower s and toilet t of a size from 2×2 m. together with k, s, t sanitary unit and separation from dwelling.



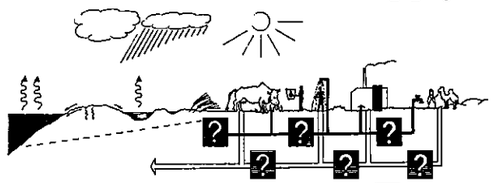
complementary rooms for sleeping, sitting, breeding, storing and others.



example for increasing



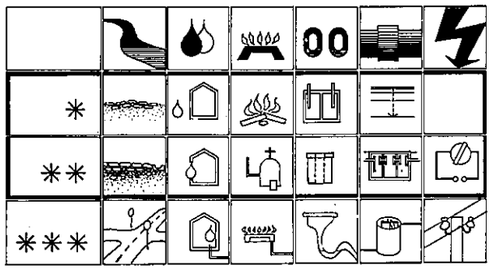
problem of water supply and sewage engineering

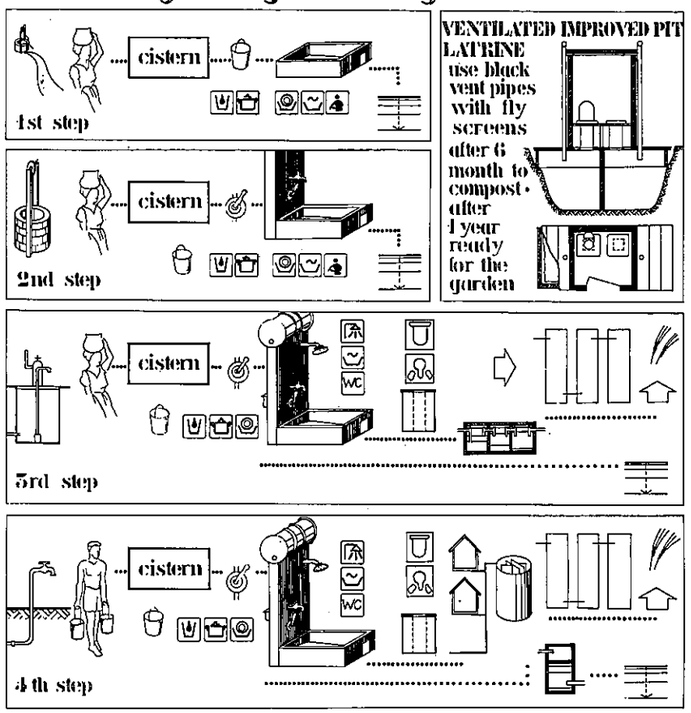


REASONS AND REQUIREMENTS ON ?

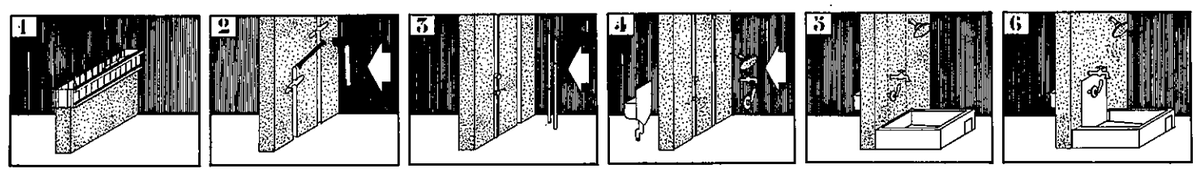
small financial means	low cost systems
no material basis	natural ressources
small knowledges	simple technology
hygiene - bad health	propaganda
climate	wear resistance
environment	natural raw materials
tradition, religion	adaptability
no exact prognosisses	flexibility

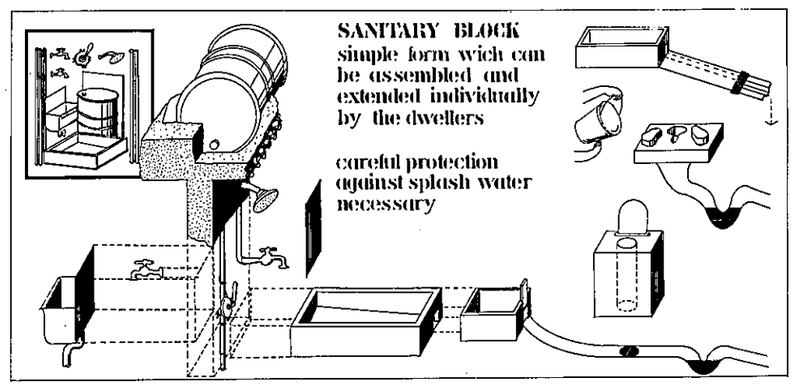
SOLUTION ONLY IN A LOW OR MIDDLE LEVEL POSSIBLE — **4 STEP PLAN**





VENTILATED IMPROVED PIT LATRINE
use black vent pipes with fly screens
after 6 month to compost · after 1 year ready for the garden

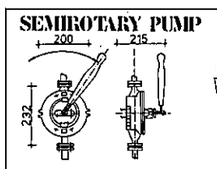




SANITARY BLOCK
simple form wich can be assembled and extended individually by the dwellers

careful protection against splash water necessary

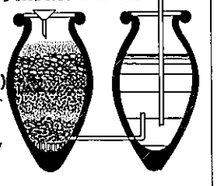
SEMIROTARY PUMP

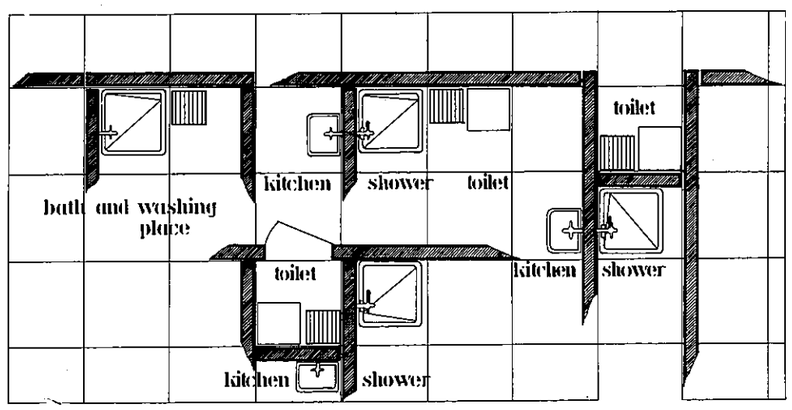


for drinking water

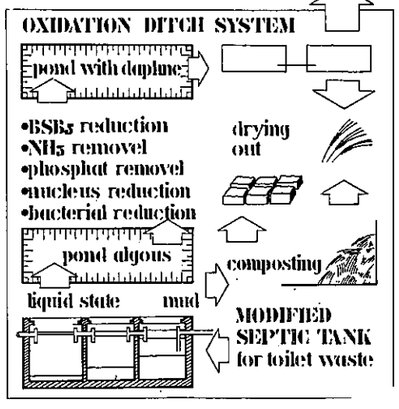
CISTERN WITH FILTER LAYERS

sand, gravel, charcole possible (if monthly changed) sand, marble for improvement of taste, cover clay





OXIDATION DITCH SYSTEM

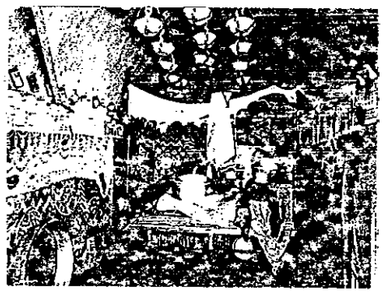


MODIFIED SEPTIC TANK for toilet waste

Habitation of limited resource communities in hot arid regions

Low income housing should represent shelter as one element within a whole range of social and economic activities; secondary sources of income, small shops selling everyday goods, open air work spaces, rented rooms and agricultural plots. Activities can also be temporary; a shop in the morning becomes part of the kitchen at noon and an extension of sleeping space at night. This multiple use of space is not only restricted to private spaces, but extends to public areas; a street is also a place for social gathering, a venue for a weekly market or a living place.

Plot sizes could be normalised to suit the inhabitant's needs and not be restricted to his economic capability, each plot would reflect the opportunities and potential of the household. Below a certain plot size (approximately 100m), accomodation for the extended family,for rented accomodation, for a workshop or shop, or for keeping a vegetable patch becomes difficult. These are the basic activities which the house has to accomodate if the inhabitants aspire to improve their lifestyles.



To some groups a house could just be a plot of land with four walls surrounding it. The plot could be a sort of equity for the poor, which they can subdivide into shelter, working space, agricultural plots, rented rooms or whatever suits their situation. In some cases it would just be enough to provide proper sanitary and cooking facilities on the plot. The concept of having plots as equity could prevent economic and social segregation within the neighbourhood. The size of plot is always the main criteria for positioning the houses within the framework, and therefore the prosperous are never placed alongside lower income groups. This segregation cuts off any welfare or service that could exist between the two groups and from which both would benefit.

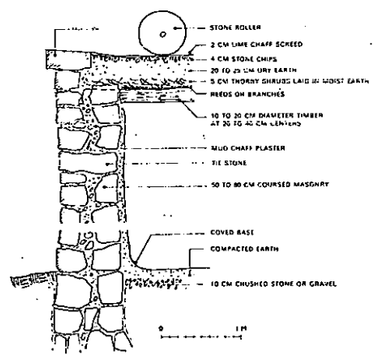
The plot itself should have a minimum frontage to cut down on the required infrastructure. The other practical advantages of a row formation of narrow houses are that side walls are available for future vertical expansion, and there is minimum exposure to the harsh climate. The layout would result in a very compact cluster, which not only enhances social activities and identity but also could generate a self-sufficient quarter with its local working environment at walking distance.

A main contribution of the design could be the means of generating extra income or attempting to become self-sufficient. Providing a back garden could have major benefits for the welfare of the inhabitant through growing the essential ingredients for his basic diet; protein and carbohydrates through keeping chicken and a goat, other sources of nourishment are cucumbers, tomatoes, onions,dates,and citrus fruit trees.

CONSTRUCTION

If control is kept through simple guidelines, then low-rise housing becomes an extremely economic and balanced proposition for the housing problem of developing communities:

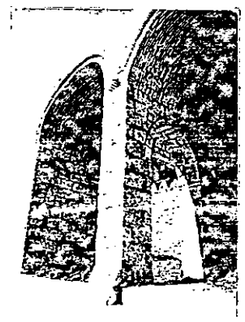
It is adaptable to the owner's needs and economic status and could therefore reflect the family at each stage of its development.

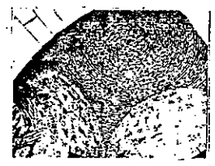


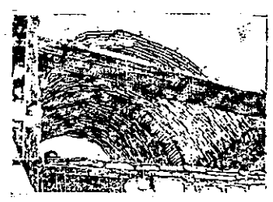
It could be quite responsive to the social, cultural, and religious tradition of developing communities. It allows for individual adjustment within the framework to suit particular priorities and lifestyles.

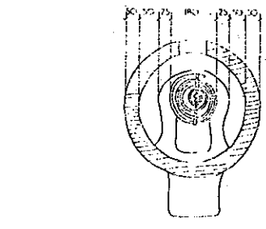
The techniques and materials of construction could be as simple and economic as possible. Natural materials, which are found in abundance, like stone, mud or earth bricks, reeds for mats and roofing, etc. could be used.

The speed and efficiency of construction could be much higher since the individual would be more motivated in building his own house. Furthermore, a low-rise building has a shorter construction period. These two factors could make great savings in terms of personal capital.
The level of technology involved is also quite basic and could be provided by local techniques and labour.

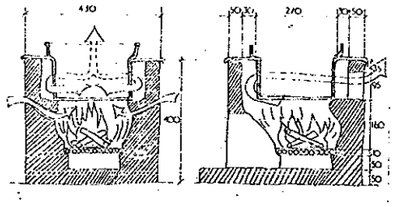


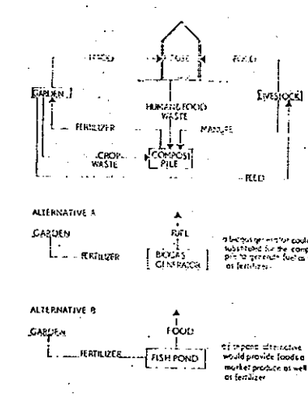


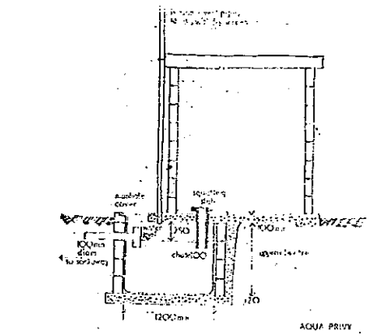


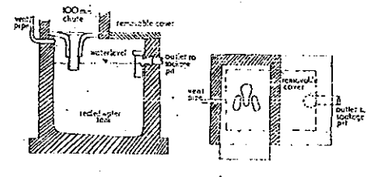


CRESCENT STOVE









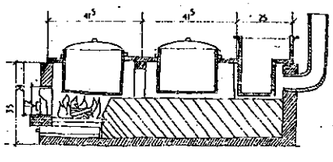
ENERGY AND ENVIRONMENT

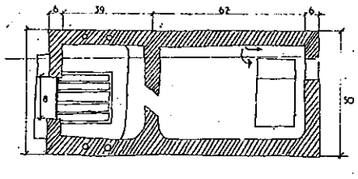
Technology can provide many easy solutions to the problems of designing in hot arid climates. Nevertheless the architect should give serious consideration to the well-tried traditional methods of construction and environmental control, which provide comfort with maximum economy. What has to be achieved is a decision on which advances in modern technology are truly superior to traditional methods, and in which circumstances the combination of the two will be most efficient, bearing in mind that heavy mechanisation has the disadvantages of high initial cost and subsequent running and maintenance expenses.

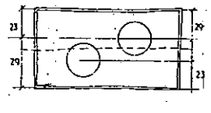
The serious deterioration of the environment and the growing scarcity of traditional energy resources and raw materials demand a replanning of the solutions to the housing problems of developing communities. Any new approach will have to be based on criteria of environmental protection and optimal use of natural resources.

This attitude would help to provde housing shelter that is formed for optimum energy use and which avoids excessive economic burdens. Both these results are tremendously important for the welfare of developing communities. First, it is the poor who should most benefit from the resources and indigenous materials which nature freely provides, and secondly their economic development should not be burdened by the rising cost of fuel, imposed by the energy crisis.

The successful growth and development of any community, but particularly poor communities, must be based on the use of natural, renewable resources; integrated with appropriate technologies. The house would then not only be an economic form of living but also a self-sufficient unit with its own natural energy resources, food production, waste disposal and regeneration system.



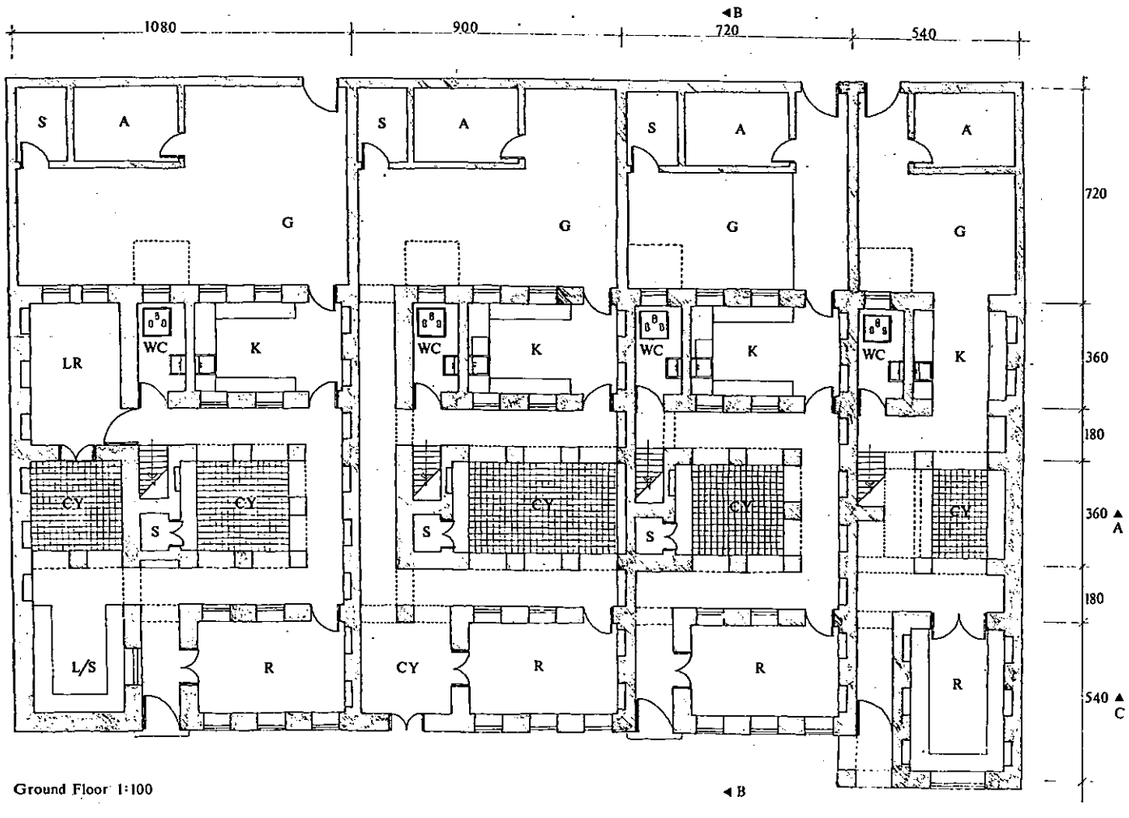




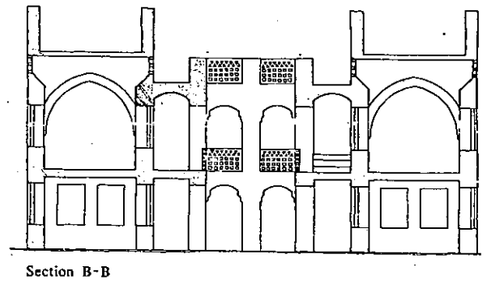
SANITATION

Many of the basic materials required for improvements in hygiene standards are either too expensive or unavailable to the poor rural or urban communities. The cost of such items as latrines, water filters and water supplies could be minimised by using local materials and products, as well as by introducing designs that the householders can build with little outside technical assistance. For instance the choice of latrine system could be based on the range of construction skills that already exist in the community and which are commonly used in house construction.

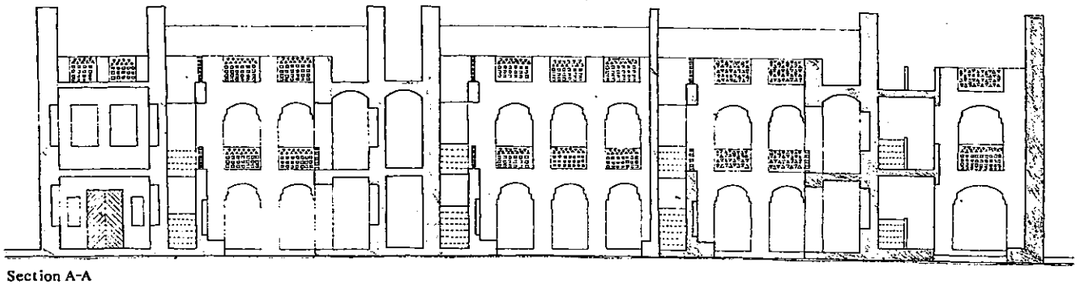
Excreta disposal might not be the most urgent problem needing attention; washing habits, laundry, food hygiene, cooking and storage, water filters and clean water, or even hygiene in child care; are also vitally important in poor communities. The range of possible improvements can be considerable, and the choice of the best combination of changes must depend on what the community can afford; what is most feasible in terms of time, cost, skill and the urgency of the problem concerned. The principle of appropriate technology is that equipment and techniques should be appropriate to local resources as well as local needs.



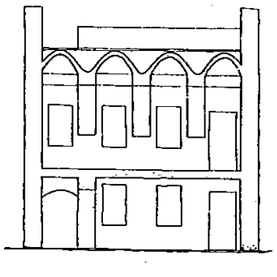
Ground Floor 1:100



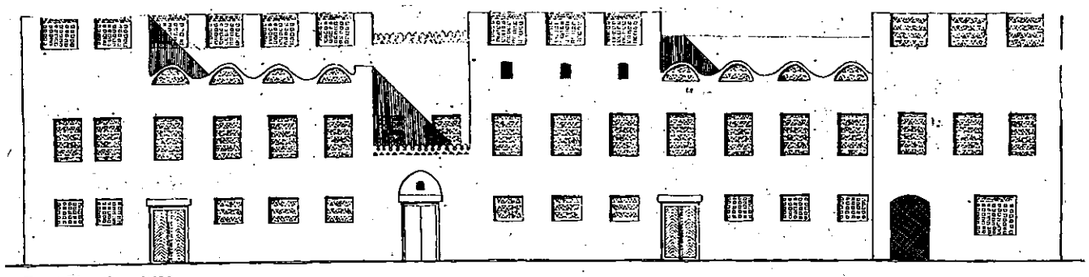
Section B-B



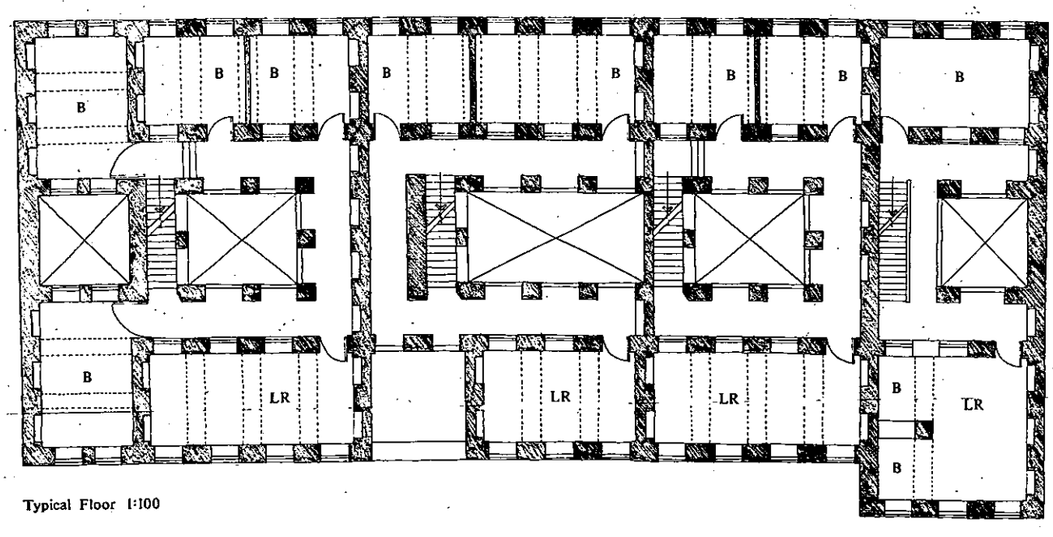
Section A-A



Section C-C



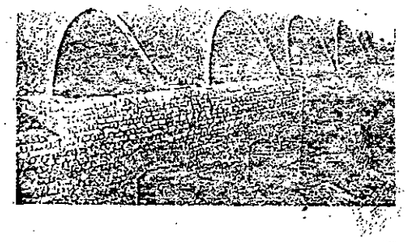
Front Elevation 1:100

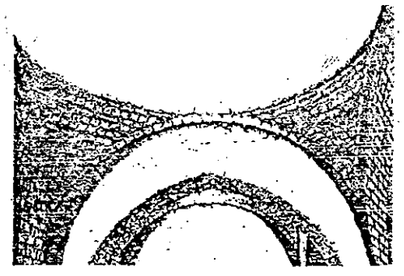


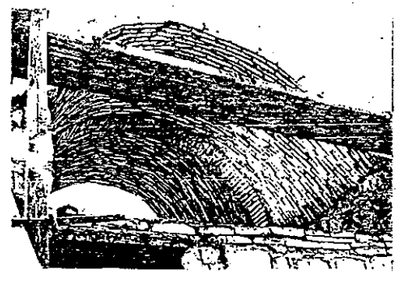
Typical Floor 1:100

KEY:
R Reception
CY Courtyard
K Kitchen
WC WC
S Storage
LR Family living room
B Bedroom
L/S Loggia/Shop
A Animal shed
G Garden area

Density per acre 150 – 200 persons







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presentación: SECTOR II

Nuestra propuesta es el resultado de una experiencia concreta actual dentro del concepto del desarrollo integrado de la comunidad.

Esta experiencia está ligada a condiciones sociales y geográficas precisas:
Se ubica en una zona tropical seca en un asentamiento humano de 3,000 habitantes que migraron a raíz de una catástrofe natural el año 1983.

Las soluciones a nivel de vivienda son resultado de estas condiciones sociales y geográficas, no son por lo tanto generalizables pero sí aplicables en gran escala en diversas áreas con condiciones similares.

Lo generalizable es la metodología empleada, basada en los siguientes objetivos :

objetivos:

Los objetivos se enmarcan dentro de la concepción del desarrollo integral de la comunidad y son los siguientes :

- La búsqueda de respuestas de calidad tanto arquitectónicas, técnicas como económicas a la problemática de los asentamientos populares, a fin de realizar soluciones habitacionales novedosas en autoconstrucción, de tal manera que en su desarrollo se establezcan vínculos entre el individuo, su familia y la comunidad.
- Investigar en métodos constructivos a fin de dar soluciones al alcance de la población, utilizando al máximo los materiales, técnicas y recursos locales realizando prototipos tanto en el campo de la vivienda como en los locales de uso comunal.
- Promover y fomentar la organización de talleres, empresas productivas, especialmente de materiales de construcción, artesanía, huertos, etc., en función de dar fuentes de trabajo a los pobladores.
- Implementar una adecuada red de servicios básicos en salud, educación, capacitación laboral-empleo.
- Fomentar actividades culturales, deportivas y recreacionales y desarrollar una coordinación interinstitucional orientada a racionalizar acciones a través de una planificación concertada.

areas de trabajo:

La implementación de los objetivos se lleva a cabo a través de cuatro áreas de trabajo :

- Area Urbanismo y arquitectura
- Area Socio-económica cultural
- Area Producción de materiales y equipo
- Area Tecnología apropiada

Area urbanismo y arquitectura (VIVIENDA)

Si bien se han realizado en esta área tanto el proyecto urbanístico como los diversos locales de equipamiento social, nos concentraremos en el aspecto de la vivienda.

Se han analizado las viviendas existentes con la finalidad de comprender los usos, costumbres, deseos y necesidades de la población en cuanto a utilización de áreas, funciones, sistemas constructivos, orientación, ventilación, asolamiento, etc.

Se ha llegado a la conclusión de que más que un diseño típico se requiere un sistema constructivo que se adapte a los espacios típicos de las viviendas, su crecimiento y a las necesidades de las familias.

Los diseños finales son individuales y buscan racionalizar y armonizar la modulación estructural con los usos y necesidades de las familias.

Se ha trabajado con materiales de la zona :

Bambú:
Armazón de paredes y techo
Caña brava y carrizo:
Trenzados como soporte de tarrajeos
Cascara de arroz:
Para darle más consistencia al adobe
Conchuela o yapato:
Para la base de los pisos
Tierra:
Para ejecución de tarrajeos y adobes
Cal:
Como estabilizador de mezclas con tierra
Yeso:
Para tarrajeos de techos y paredes

La ejecución de las viviendas se realiza por autoconstrucción con el apoyo de un fondo rotatorio amortizable con dinero, con mano de obra aplicada a las pequeñas empresas o con especies (artesanía, productos agrícolas, etc.)

En general la construcción se rige por 5 principios:

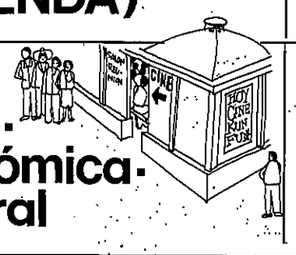
- Dar una respuesta económica y de calidad a la problemática de los asentamientos populares tanto en la vivienda como en el equipamiento social.
- Utilización de materiales locales fácilmente accesibles optimizando su uso.
- Uso de técnicas constructivas locales mejorando sus procedimientos.
- Posibilitar la construcción con mano de obra local mediante un corto proceso de capacitación de tal manera de hacer posible su aplicación en autoconstrucción.
- Hacer posible a partir de la producción de materiales aplicables a la construcción la creación de fuentes de trabajo.

El resultado de la aplicación de estos principios es una vivienda con posibilidad de crecimiento progresivo, antisísmica, resistente a las lluvias, con muy buenas características térmicas y de habitabilidad, con un carácter arquitectónico definido, variado y acogedor, y a un costo sumamente reducido.

Paralelamente estas viviendas se ubican dentro de un hábitat en permanente desarrollo hacia el logro de una vida digna dentro de la satisfacción de las necesidades del hombre.

acciones >

Area socio-económica-cultural



- Promueve la organización comunal a fin de motivar la participación en actividades culturales, educativas, recreacionales, de capacitación y productivas.
- Permite que el programa tenga acogida en su inicio y credibilidad progresiva.

acciones >

Area producción materiales y equipos

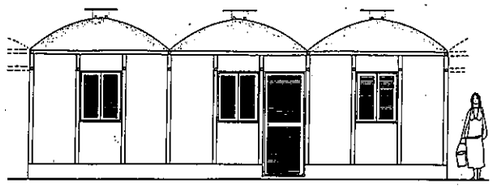
- Identifica los materiales, los lugares y las maneras de explotación adecuados para la autoconstrucción.
- Realiza la capacitación laboral, talleres y microindustrias.
- Participa en la elaboración de metodologías y diseño de sistemas de autoconstrucción.

acciones >

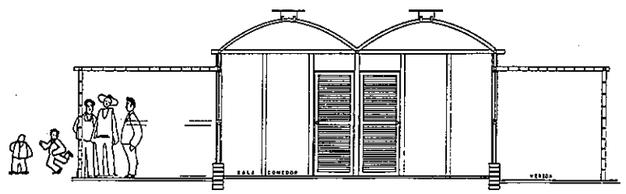
Area tecnología apropiada

- Promueve la solución de problemas ligados a la economía de los recursos energéticos a nivel local, mediante artefactos simples y de bajo costo.
- Impulsa la divulgación de las soluciones.

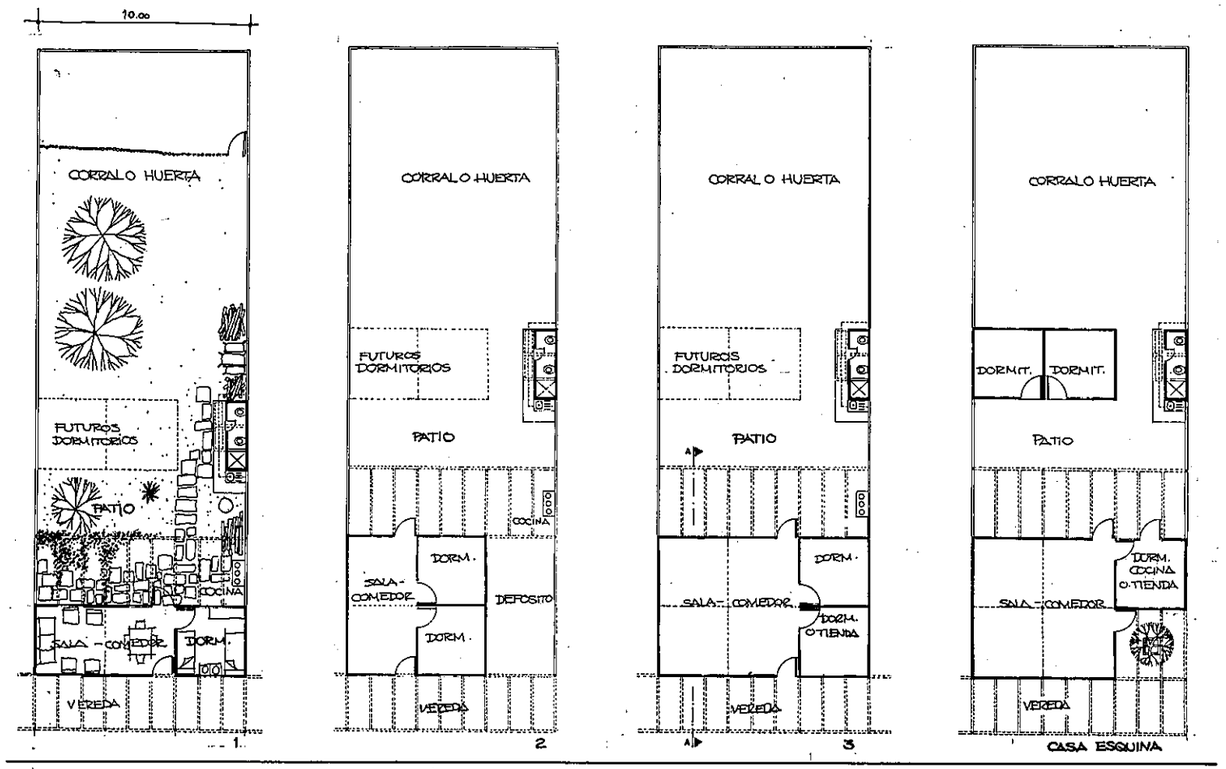
acciones >



ELEVACION FRONTAL (1)



CORTE A-A



FONDO ROTATORIO PARA PEQUEÑAS EMPRESAS Y TALLERES:
Ha permitido desarrollar diversas empresas y talleres administrados por la propia comunidad y que dan ocupación a la población local.

Producción de yeso
Producción de cal
Producción de adobe
Comercialización de leña, caña
Taller de carpintería

FONDO ROTATORIO PROGRAMA DE AUTOCONSTRUCCION DE VIVIENDAS:
Los pobladores que deciden mejorar o construir sus viviendas reciben un crédito en materiales que pueden amortizar en dinero, especies o en mano de obra aplicada a las pequeñas empresas u obras comunales.

ACTIVIDADES:

Periódico mural
Calendario
Revista

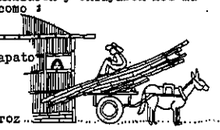
LOCALES CONSTRUIDOS:

Jardines de la Infancia
Puesto de Salud
Biblioteca Comunal
Area recreacional deportiva
Escenario al aire libre
Salón de reuniones
Oficinas

En estos locales se realizan reuniones, actividades culturales, musicales, deportivas, funciones de cine, cursillos, se dictan clases, se presta atención médica permanente, etc.

MATERIALES
Se detectaron, analizaron y ensayaron los materiales locales como :

Cal
Yeso
Conchuela o yapato
Tierra
Bambú
Carrizo
Caña brava
Cáscara de arroz

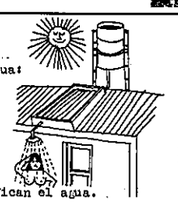


Estos materiales han servido de base para la ejecución de pisos, paredes y techos, además para la fabricación de muebles y herramientas.

EQUIPOS
Para el apoyo a la construcción fue necesario implementarnos con diversas herramientas y máquinas tanto para la construcción misma como para carpintería.

Se desarrollan prototipos de artefactos para resolver problemas de la vida diaria a bajo costo y se promueve su divulgación:

- Cocinas de leña mejoradas:
  Disminuye el consumo de leña, genera ahorro familiar, preserva recursos forestales, mejora la higiene doméstica.
- Sistema de aereación eólica:
  Renueva permanentemente el aire y refresca los ambientes.
- Calentadores solares de agua:
  Ahorran combustible.
- Cocinas solares:
  Ahorran combustible.
- Molinos de viento:
  Para bombear agua.
- Filtros de agua:
  Eliminan salinidad y purifican el agua.



- Sistema de letrina de dos cámaras:
  Ahorra agua y transforma los desechos orgánicos en abono.
- Muebles:
  Utilizando materiales locales.

Además se encuentran a nivel de estudio otros proyectos como :

- Cocina solar para chicha (bebida popular a base de maíz)

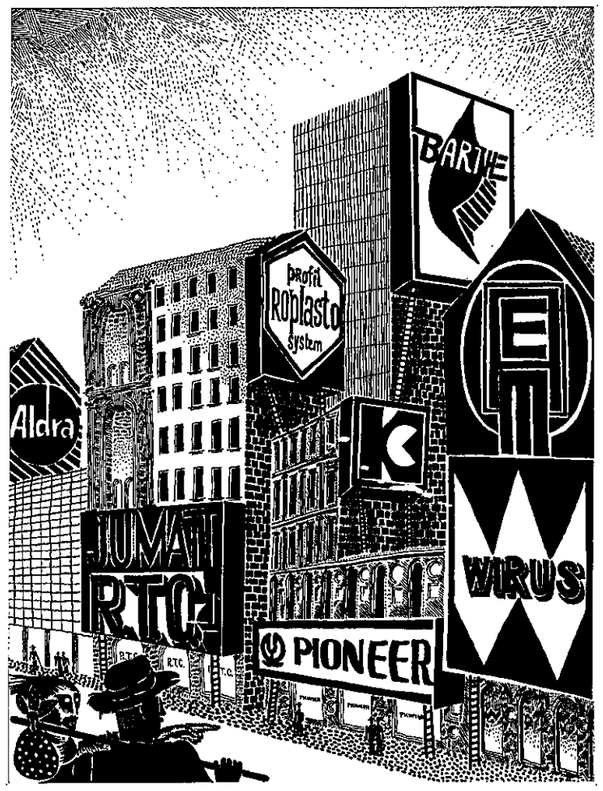
cimentación y columnas

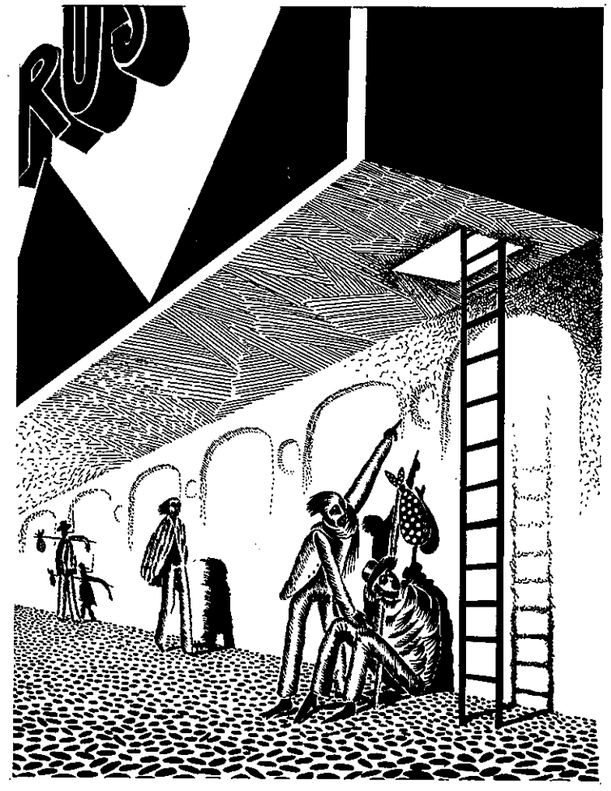
techos

paredes

detalles

- Briquetas de cáscara de arroz y desechos de algodón para combustible.
- Cargador fotovoltaico de baterías
- Hornos de cal y yeso
- Equipo didáctico de energías renovables.
- Sistema integrado de energía
- Sistema fotovoltaico para refrigerador y alumbrado.



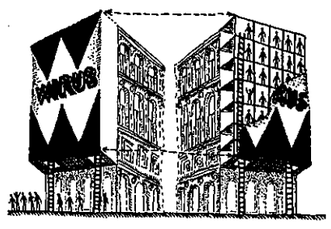


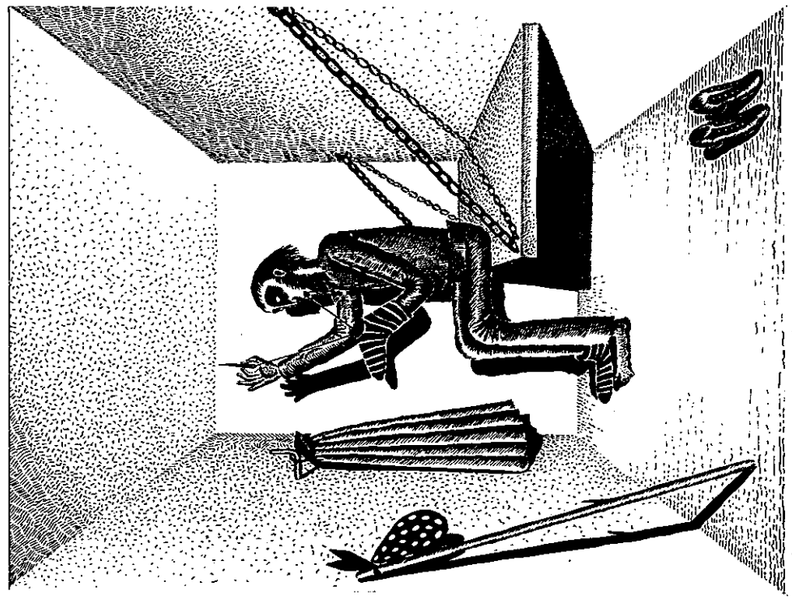
THE „THICK-AD" LAW

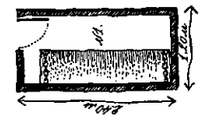
From 1988 all advertising shields in the cities are to be „thick" enough to be used as a modest shelter for homeless.

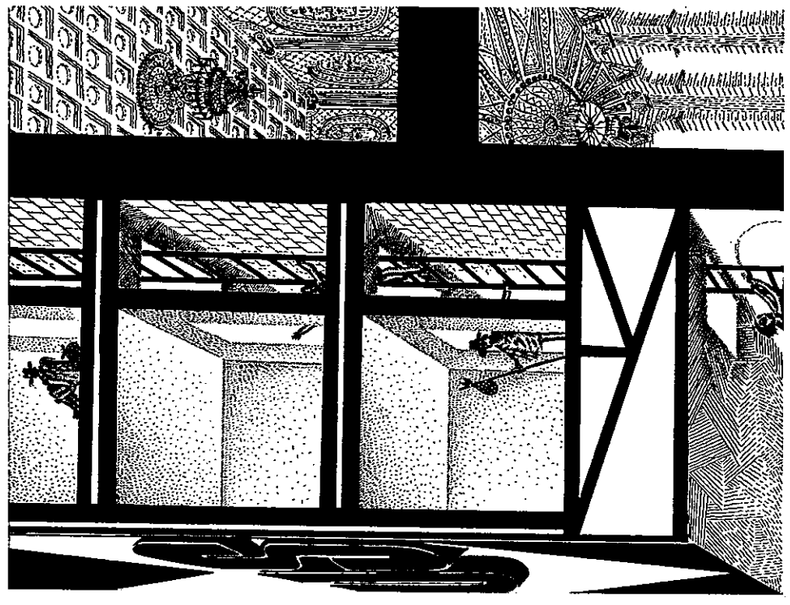
... so,

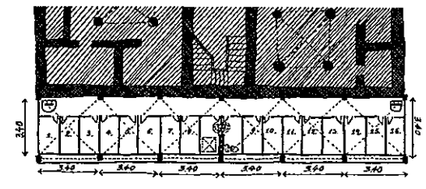
3m² of an ad ~ 1 shelter for a homeless.











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CINTUS **SECTOR II**

UN MODELO DE VIVIENDA EN LA PATAGONIA CENTRAL

Al acercarnos a examinar cualquier construccion tradicional en la que el usuario haya tomado determinaciones en cuanto al uso del espacio y su construccion (Arq. popular) podemos apreciar que existen pautas lo suficientemente elementales como para ser utilizadas por todos que admiten la espontaneidad, adaptabilidad, la movilidad y el cambio.

Existe pues una flexibilidad constructiva que proyecta al usuario como agente activo en la confeccion de su medio ambiente.

En principio se podria definir como construccion flexible la que admite modificaciones o correcciones, en parte o en su totalidad de manera rapida, comoda y sencilla. Por supuesto, para que esto sea posible, no es suficiente que los componentes materiales que se utilicen cumplan tales condiciones sino que, los "componentes espaciales" u organizaciones y ordenes tambien lo sean.

Las tipologias que responden directamente a esta problematica abarcan siempre en estrecha relacion, desde el terreno de lo conceptual y operativo (organizacion espacial) hasta el de lo material (soluciones constructivas)

Este estudio presenta un tipo general (del que deriva un modelo regional) en adelante llamado **T.D.P.** (Tipologia de Deslizamiento de Planta) que es:

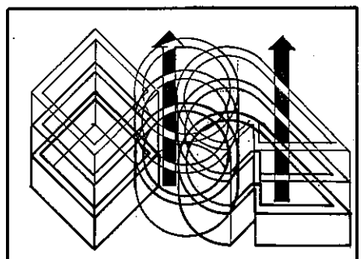
UNIVERSAL: En el sentido de que la base tecnologica es lo suficientemente sencilla para ser adaptada por distintos pueblos.

REGIONAL: En el sentido de que admita soluciones a los condicionantes socio-economicos, ambientales, culturales, etc., propios de cada region.

PERSONAL: En el sentido que permita la expresion propia del ultimo eslabon en la relacion sociedad-individuo.

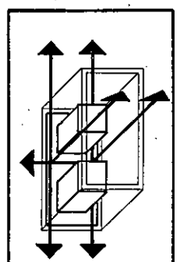
La genesis de los **T.D.P.** radica en la afirmacion de que la planta es el generador de la forma final y el espectro de su uso barre desde sistemas de forma geometricos y altamente racionalizados hasta sist. organicos.

El siguiente grafico especifica las caracteristicas fundamentales de los **T.D.P.**

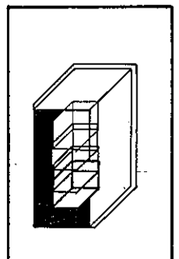


1
- Deslizamiento de planta
- Sistema con capacidad de alternativas formales
- Permite desde sistemas de composicion racionalizados hasta sistemas organicos.

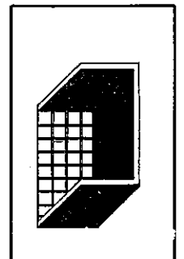
Los modulos pueden componer un conjunto de elementos estructurados (cuya forma y dimension dependen del programa)



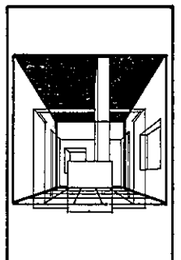
2
- Sistema hipercirculatorio
- Crecimiento tridimensional
- Circulaciones principales perimetrales



3
- Movilidad funcional.
- Centralidad de equipamiento.
- Permite una respuesta directa al cambio de necesidades.



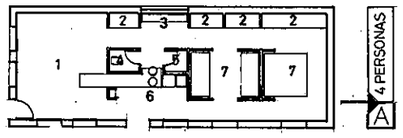
4
- Independencia de la envolvente.
- Caja muraria masiva.



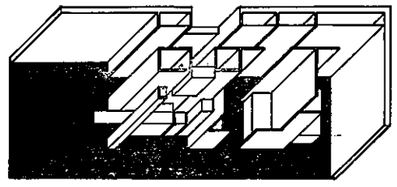
5
- Lectura integral del espacio.
- Apropiacion de la totalidad.
- Concepto de lugar.

A

Esc.



1.- Sala.
2.- Guardado
3.- Escritorio
4.- Inodoro
5.- Ducha.
6.- Cocina.
7.- Camas



B

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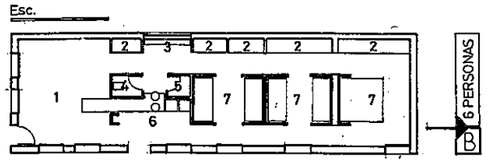
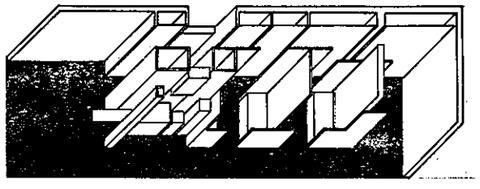
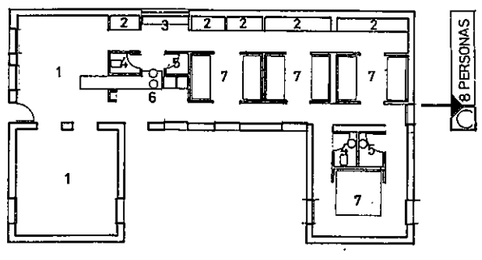
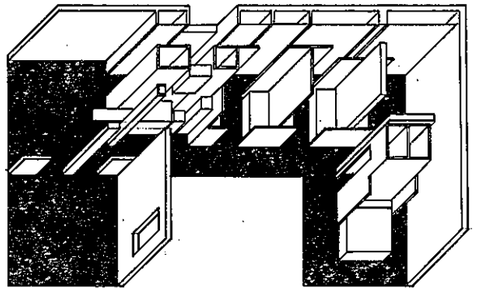




C

Esc.





El concepto de agrupamiento de los modelos descriptos anteriormente surge como estrategia para tratar de desarrollar embriones socio-productivos basicos (en nuestro caso actividad agraria selectiva y especializada) con la finalidad de estructurar redes urbano-territoriales que neutralicen las migraciones permanentes a las ciudades.

La definicion de alojamiento trascienden de esta manera la simple idea de vivienda minima autonoma para convertirse en una herramienta mas de planeamiento regional; un planeamiento que encara mas la micro que la macro gestion, fortaleciendo la estructura comunitaria y consolidando sus pautas basicas.

Entre otros logros el modelo de agrupamiento aqui propuesto tendiente a la idea de ciudad territorio o serie de centros urbano-rurales de apoyo a la produccion (antes que la tipica tendencia a los polos de concentracion) confirma en lo espacial el tipo de reorganizacion productiva sugerida.

El conjunto constituye ya un espacio socio-productivo de mayor calidad, pero fundamentalmente, la indole del proceso agrega a sus actores la participacion en la creacion y transformacion de su medio ambiente asi como una toma de conciencia de sus objetivos.

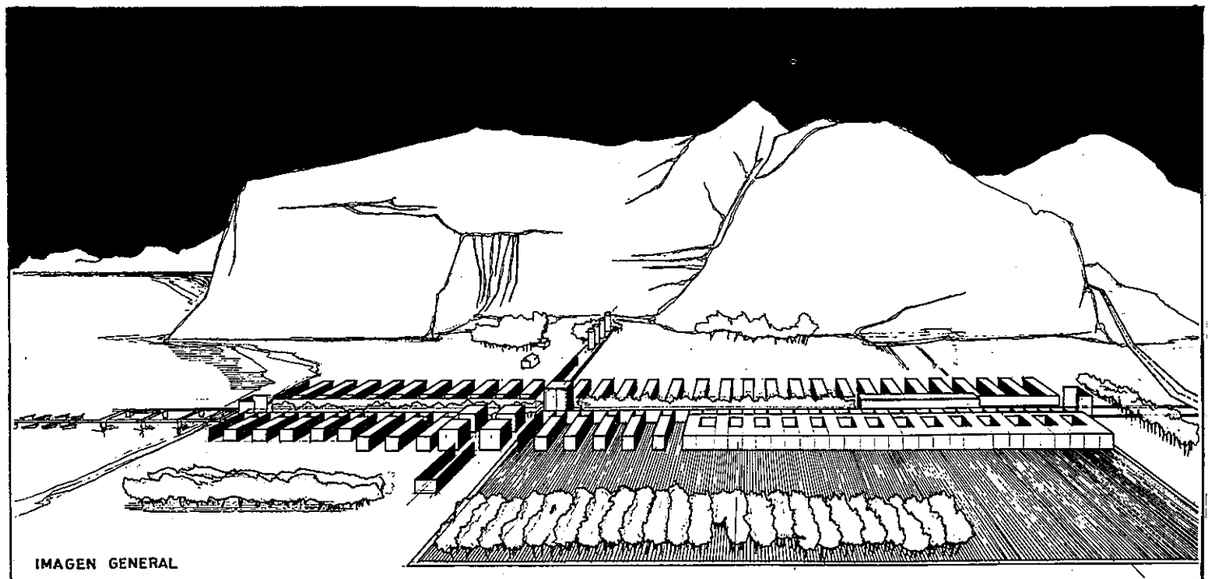


IMAGEN GENERAL

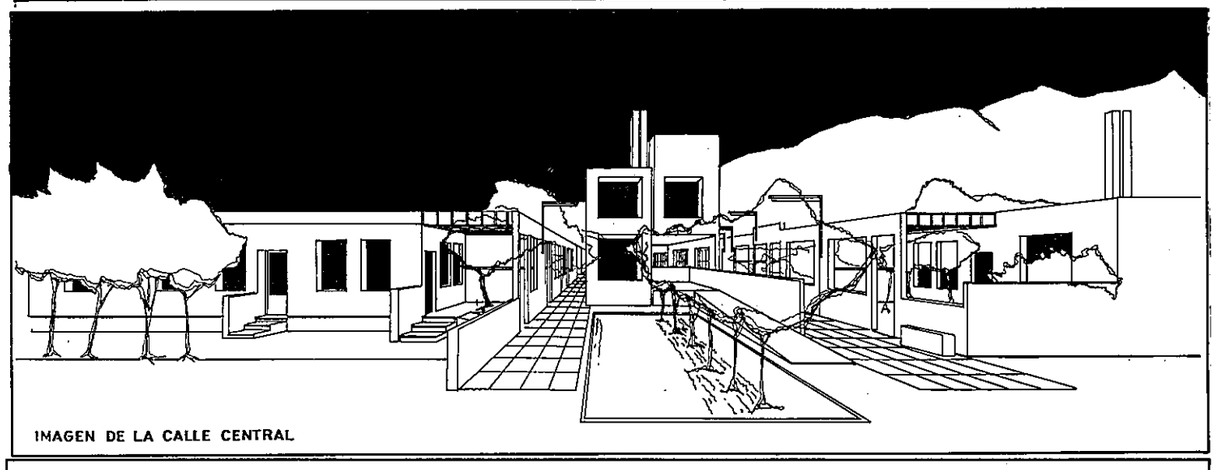


IMAGEN DE LA CALLE CENTRAL

MODELO REGIONAL

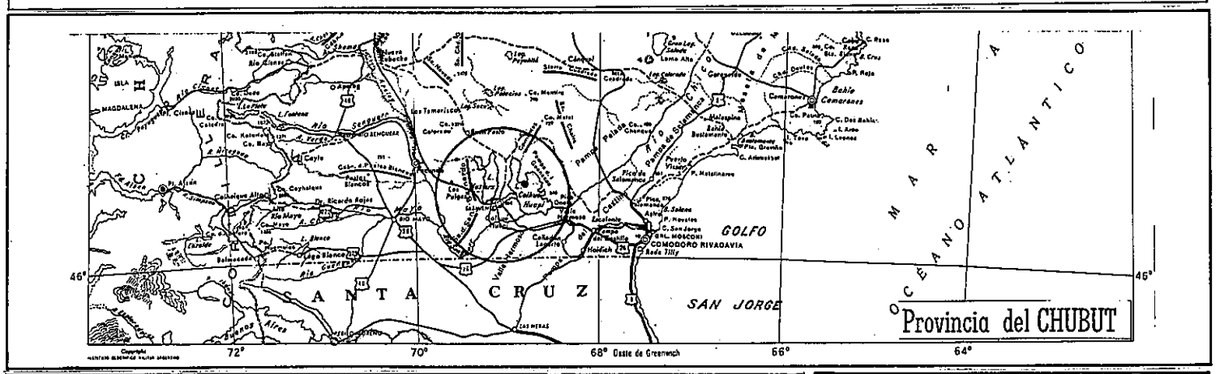
EL MODELO AQUI PRESENTADO ES UNA APLICACION DE LAS TIPOLOGIAS DE DESLIZAMIENTO DE PLANTA, LOCALIZADAS EN LA REGION PATAGONICA CENTRAL (ARGENTINA).—— LA DENCIDAD HABITACIONAL ES EXCESIVAMENTE BAJA Y LA DISPERSION DE LAS LOCALIZACIONES RESPONDE A QUE LA ECONOMIA DE BASE ES LA EXPLOTACION PRIMARIA DE LOS RECURSOS. LAS CARACTERISTICAS CLÍMATICAS Y LOS TIPOS DE PRODUCCION CONDICIONAN FUERTEMENTE LA CONCEPCION DE UN MODELO REGIONAL.—— NUESTRO ESFUERZO SE DIRIGE AL APROVECHAMIENTO DE LOS RECURSOS ESPECIFICOS PARA SATISFACER LAS NECESIDADES ELEMENTALES DE LA POBLACION EN MATERIA DE ALOJAMIENTO, DEFINIENDOSE ESTAS DE MANERA REALISTA Y AUTONOMA, A FIN DE EVITAR LA TRASPOSICION ACRITICA DE MODELOS ARQUITECTONICOS FORANEOS.—— fig A,B,C.—

SE ADAPTAN TECNICAS REGIONALES PRIMITIVAS fig D COMO MEDIO DE TECNOGIZACION DE LA TRADICION EN EL SENTIDO DE APROPIACION DE LOS MEDIOS TECNOLOGICOS DE LA MODERNIZACION QUE CONSOLIDEN LA VIGENCIA Y EL DESARROLLO DEL ESQUELETO MICROCULTURAL DE LA REGION.——

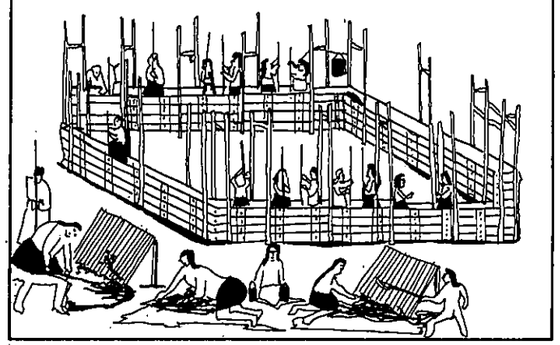
SE RESCATA ASI LA MANERA CONSTRUCTIVA DEL MURO MASIVO, CONFORMADO CON EL MISMO SUELO Y UN MINIMO DE AGLOMERANTE. ESTA ANTIGUA TECNICA CONOCIDA POR TODOS fig E NOS BRINDA EN SI MISMO, SOLUCIONES A PROBLEMAS TERMICOS, ACUSTICOS, PSIQUICOS Y DE RESISTENCIA ESTRUCTURAL.——

LA APLICACION DE LOS T.D.P. SE RELACIONA CON ESTA TECNICA CONSTRUCTIVA: PROPONIENDO UNA ESTRUCTURA LIVIANA, QUE IZADA EN ETAPAS SUCESIVAS, A LA MANERA DE UN ENCOFRADO DESLIZANTE DEJA A SU PASO MUROS MASIVOS. AL LLEGAR A LA ALTURA HABITABLE DICHA ESTRURA SIRVE COMO SOSTEN DE ENTREPISO O TECHO.——

LA ECONOMIA Y SIMPLICIDAD DEL SISTEMA PERMITE LA POSIBILIDAD DE AUTOCONSTRUCCION, LOGRANDO COSTOS COMPARATIVAMENTE BAJOS RESPECTO A SISTEMAS TRADICIONALES DE VIVIENDA ECONOMICA (INDUSTRIALIZACION- CONSTRUCCION TRADIONAL RACIONALIZADA).—— LA VIVIENDA SE HA PLANTEADO COMPUESTA, POR UNA PARTE, DE UN SOPORTE TECNICO Y ESTRUCTURAL FIJO, CON SUS PROPIAS LEYES DE DESARROLLO Y POR OTRA DE UN ESPACIO TANTO EXTERIOR COMO INTERIOR, QUE EL USUARIO PUEDE MANIPULAR DIRECTAMENTE.——

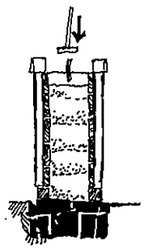


D

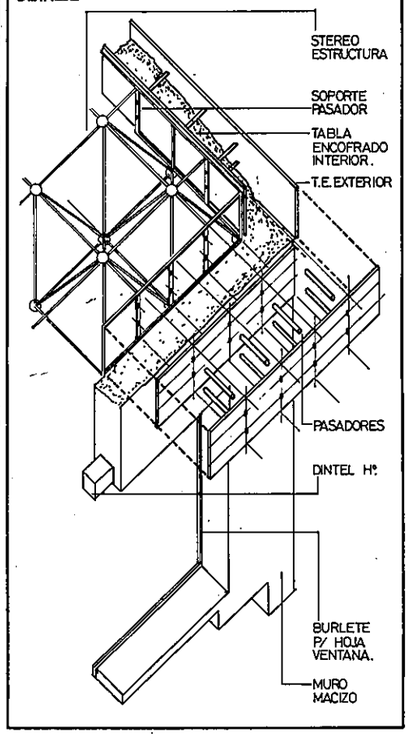


E

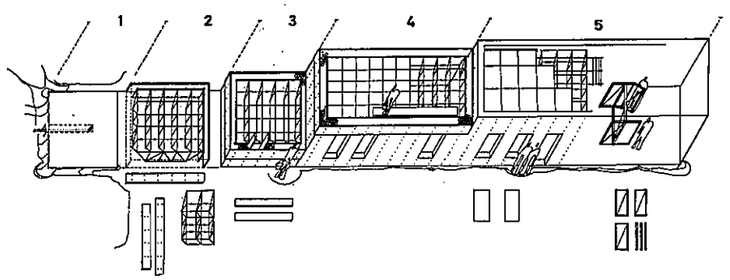
TECNICA PRIMITIVA DE CONFORMADO Y APISONADO DE MURO.—



DETALLE



SECUENCIA CONSTRUCTIVA.



REFERENCIAS DE SECUENCIA CONSTRUCTIVA.

1.—platea de fundacion de hº.— nivelacion y canalizacion desagües cloacales.—

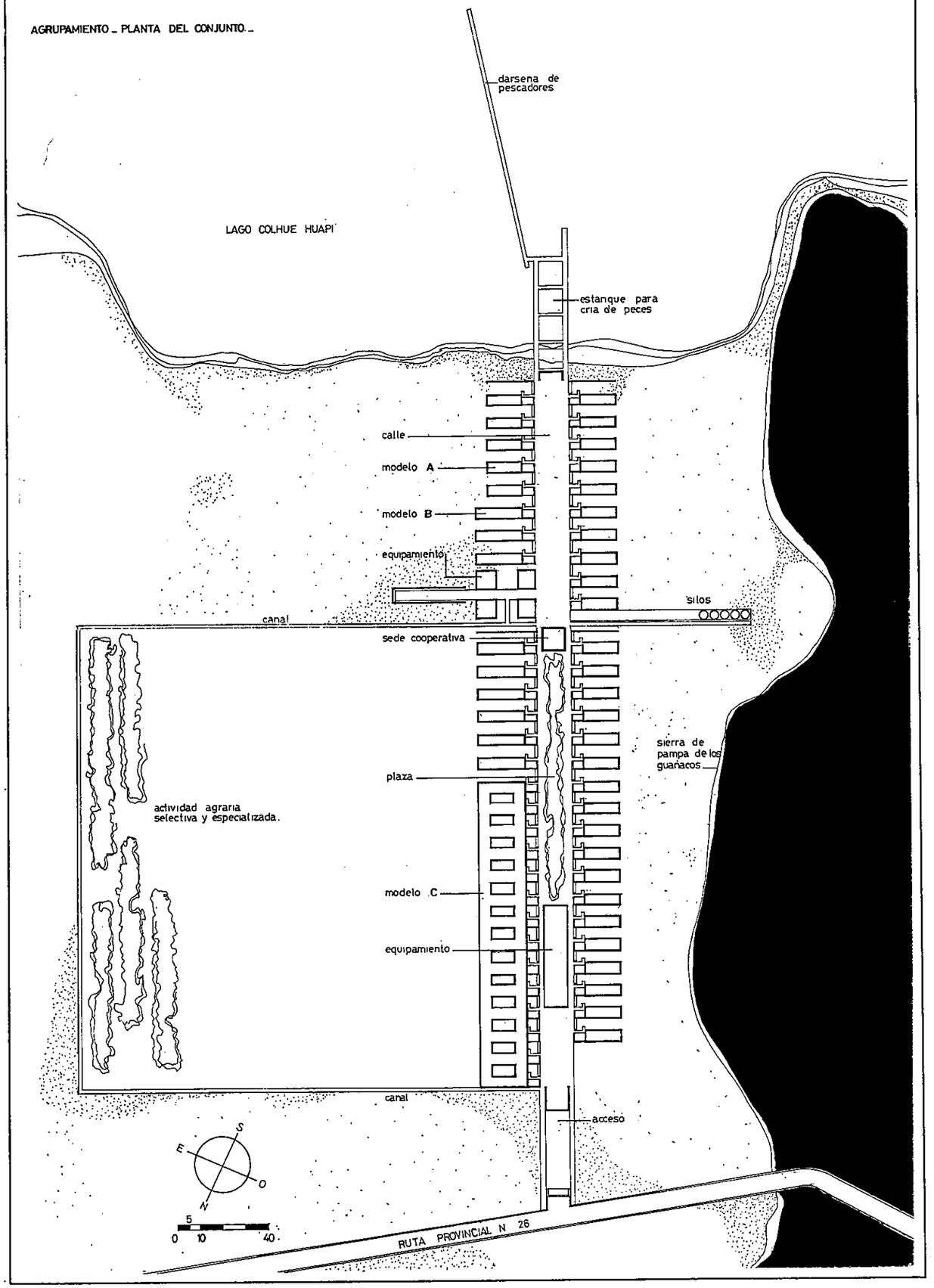
2.—modulo estereo-estructura s/platea.— colocacion encofrado.—

3.—llenado muros.— inclusion tablas para definicion vanos de puertas y ventanas.—

4.—varios modulos en sucesivos llenados.— izado manual.— la estructura de la cubierta es andamio.—

5.—altura habitable.— colocacion cubierta sobre estructura.— en su plano inferior se ata cielorraso.— divisiones interiores tabiques moviles.—

AGRUPAMIENTO.— PLANTA DEL CONJUNTO.—



Competition for Solutions on Social Housing

In the sixties the biggest cities in the world were New York, Tokio, Shanghai. In the eighties the biggest cities are situated in the 3rd world: - Sao Paulo, Rio de Janeiro, Bombay.

This shift of the cities size proportion from the industrialized countries to the 3rd world will in future increase, and approx. 75-80 per cent of the population in the big cities will live in squatter settlements.

That people move from the country into towns is no new phenomenon Due to this the big cities are growing and this, of course, first and foremost happens in the third world.

Mostly whole families are moving into towns and so to speek never casual individuals but self-contained people, who know what they are doing, many of which already have part of their family in town.

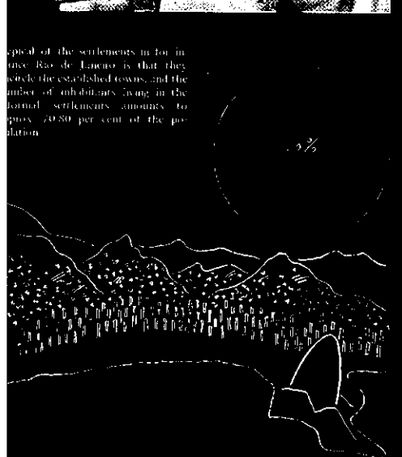
Today more than half of the town population is born in the country. Many people have to leave the country mainly due to the great industrializing of the farming. People go to town in order to survive and to experience a different and new life. In short: There is a general exodus in the 3rd world, sort of a migration as is known formerly.

When the family moves from the country into town it quite naturally looks for other settlements since they have to procure food and find material for the first primitive house. Of course the neighbours help as much as they can, but since new families arrive to the settlements every day the help is rather limited.

The first cottage or shelter is made of cardboard, plastic or wood from rubbish heaps. Not until later, when they have obtained a reasonable status, do they start buying stones for their houses.

Often they build around their old wooden cottage, and as the stone house is finished the wooden cottage is pulled down. Some time day the family resides in a stone-house, and this maybe has taken one or two generations. The family is established and no power can remove the house the family has obtained status.

pical of the settlements in for instance Rio de Janeiro is that they encircle the established towns, and the number of inhabitants living in the formed settlements amounts to prox. 20-30 per cent of the population



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The inhabitants in the informal buildings own absolutely nothing. They are poor, there is no work to obtain, the house is miserable often knocked together from available materials. There is practically no removal of refuse, no social security in case of for instance illness.

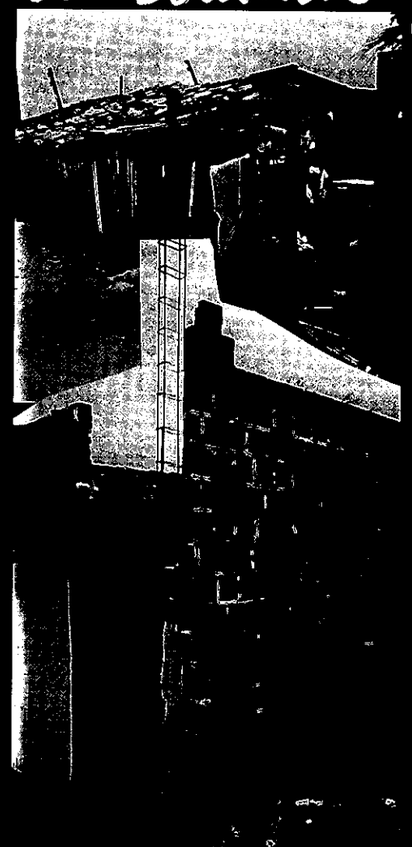
Lots of people subsist life by begging and stealing, dealing with narcotics or live by prostitution.

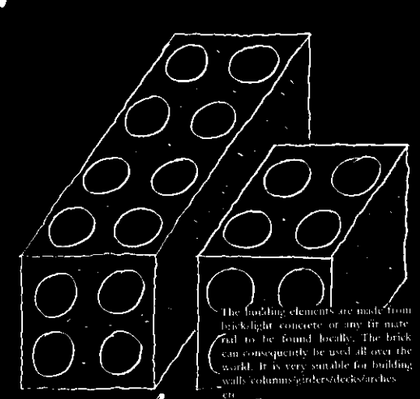
Infrastructure.

The casual building structure prevailing in the informal settlements creates an infrastructure that disregards any kind of planning. The way of building which in the first place looks like a practicable plan is quickly disorganized into haphazard pathsystems ending mainly as tracks made from streams of rainwater. Ambulances and fire-brigades etc. have no possibility whatsoever to enter the inner parts of the settlements.

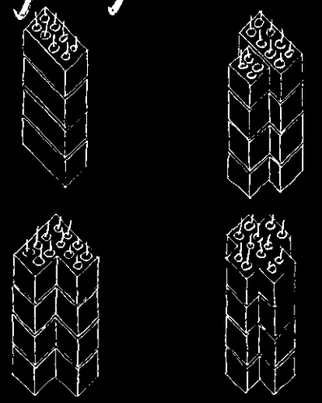
As to wiring in for instance Rio de Janeiro almost 100 per cent of the informal houses have electricity, while practically none have sewerage, waste water pipes or removal of refuse. Institutions, Civil Service, schools, health authorities do not exist.

Our Solution for a new building System

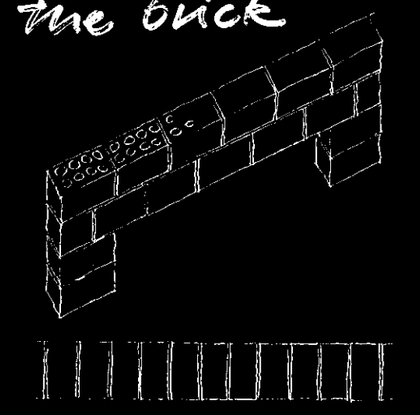


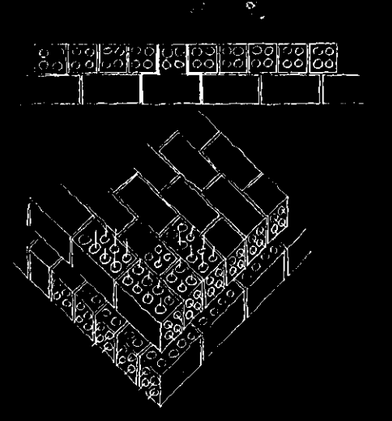


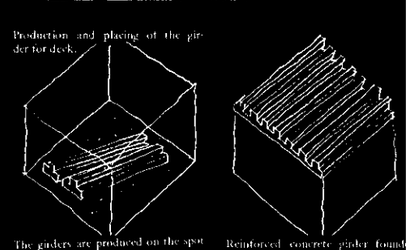
The building elements are made from lightweight concrete or any fit material to be found locally. The brick can consequently be used all over the world. It is very suitable for building walls columns girders decks arches etc.



the brick

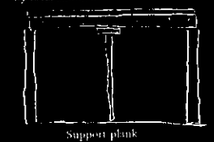






Production and placing of the girder for deck

The girders are produced on the spot by local labours.

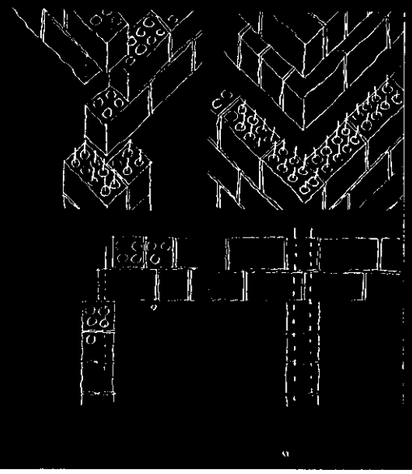


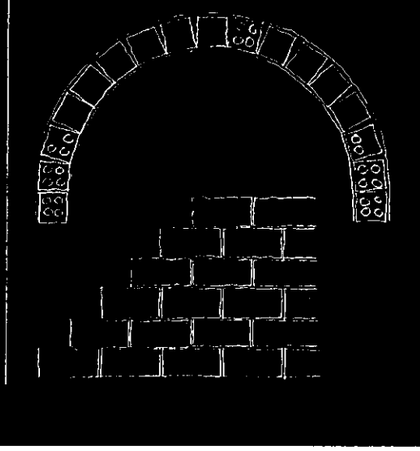
Support plank

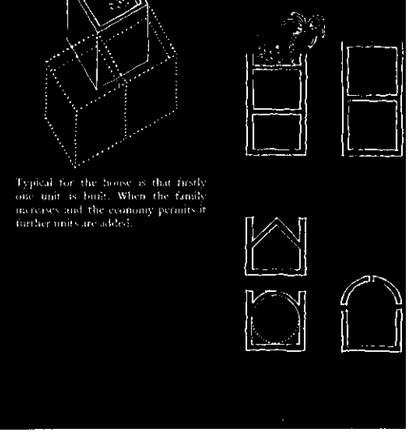
Reinforced concrete girder founded on the spot (prefab.)

Weight 0.06 x 0.15 x 2.60 m x 3.6 = 80 kilos/pcs

The girder makes "baths" and forms part of the final construction. The girder is supplied with armouring which is cast together with the in-situ concrete.





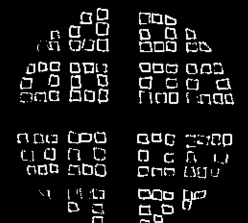


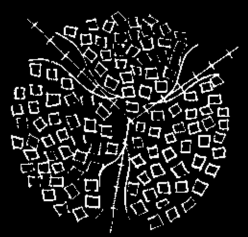
Typical for the house is that firstly one unit is built. When the family increases and the economy permits it further units are added.

Our Solution for a town structure

Our solution is based on the problems in Rio de Janeiro. Typical of Rio de Janeiro's informal settlements is that they are built on the hillsides surrounding the city and that people live unreasonably close to each other and finally that the area is directly over-populated.

With our proposal for a solution it will be possible to partly ameliorate the refuse system, partly effect slum clearance or simply build up quite residential quarter.





One of the main problems in the informal settlements on the hillsides of Rio de Janeiro is the vertical movement.

The transportation problems are great both with regard to garbage and refuse in case of illness and general passenger traffic.

We suggest this problem to be solved by establishing sort of an aerial cableway to bring down the garbage to containers and persons/goods up/down.

Centre of the town.

Schools, medical house, office for housing problems etc.

Garbage and refuse is a great problem, not only in the industrialized world but especially in the 3rd world. The problem becomes even worse in the big cities that are surrounded by informal settlements which in 80-90 per cent of the cases have absolutely no refuse system.

The inhabitants simply throw the refuse outside their doors or in the streets in the established town. And you need no phantasy to imagine the problems, diseases, epidemics etc. caused by this.

The development of the human settlements sector is in itself of great social and economic value. Therefore it is only fair that this sector is given priority in the development planning. Experiences from the post worldwar period show that in case the human settlements sector is deliberately developed it will serve as an effective frame of the economic development.

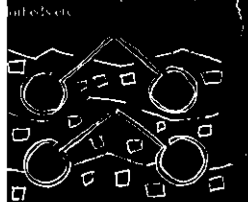
The most typical houses on the hillsides of Rio de Janeiro have flat roofs due to the wish to build up further floors later on.

The groundareas are very small and vacant areas are not to be found. The flat roofs can advantageously be used, not only as clothes yards but also as green areas for growing vegetables, fruit trees and flowers. By utilizing the areas this way the families can partly be self sufficient with provisions.

The fertile roof-gardens are also attractive vacant areas while at the same time they are shadowy and provide coolness both in the gardens and in the houses where in certain periods of the year it is baking hot.

town structure

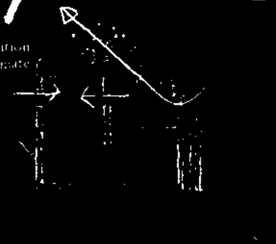
Drainage of slope leading the water to reservoirs/tanks. The water can be used for watering of roof gardens, toilets etc.



Our proposal for a house

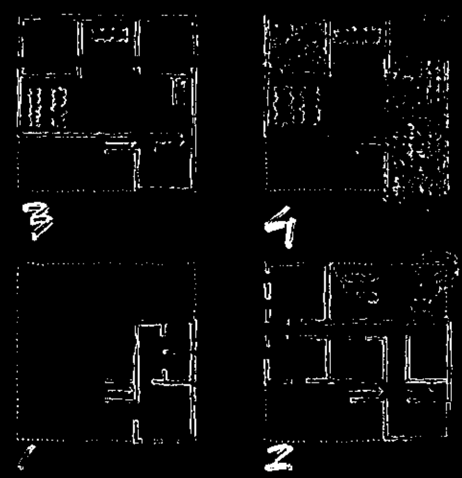
Ventilation

It is important to establish ventilation in the house, since the climate is very hot and moisty.



Shadow:

The many green plants on the houses' flat roofs give shadow and coolness as well as they supplement the family's need for food.



The dream

The house contains all sorts of facilities such as toilets burning the contents into mould, running water, electricity and so on.

The families are self sufficient with vegetables.

There is fresh water as well as rain water for the plants, there is coolness and freshness.

CHARACTERISTICS

OFFICIAL NAME:- SOCIALIST ETHIOPIA

AREA:- 1,221,900 km.²

GEOGRAPHICAL SITUATION:- 3° AND 18° NORTH OF EQUATOR AND 33° AND 48° EAST OF GREENWICH.

CLIMATE:- THE TROPICAL CLIMATE IS MADE TEMPERATE BY THE ELEVATION OF ITS TERRITORY, MIN. MEDIAN 13°C-16°C & MAX. ~ 29°C

ECONOMY:- AGRARIAN

POPULATION: 1984 TOTAL 42 091 418 INHAB.
RURAL POPULATION 37 276 563 INHAB.
URBAN POPULATION 4 742 855 INHAB.
ANNUAL RATE OF POPUL. GROWTH 2.9 %

ADDIS ABABA

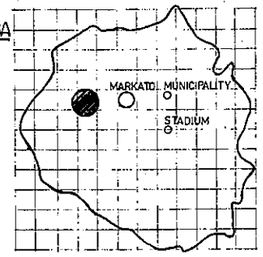
LOCATION

9° 20' N, 38° 45' E
2411 M. ABOVE SEA LEVEL

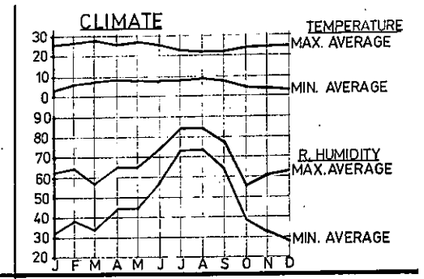
POPULATION

1412575, 29.78% OF THE TOTAL URBAN POPUL (1984)

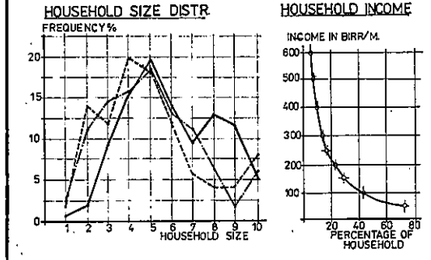
AREA OF PROPOSAL



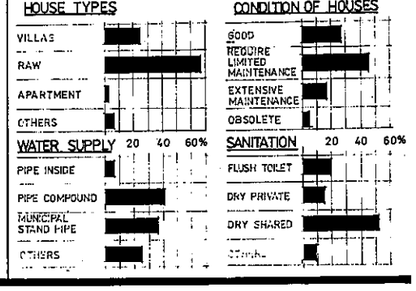
CLIMATE



SURVEYS IN THREE SELECTED AREAS OF ADDIS



HOUSING INDICATORS IN ADDIS



uia

A CONTRIBUTION FOR THE UNITED NATIONS

IYSH-1987
INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS

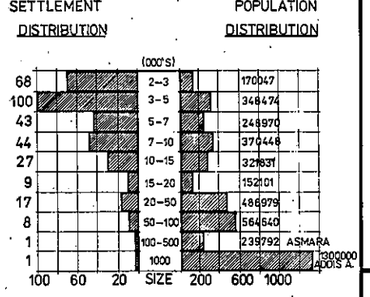
INTERNATIONAL COMPETITION FOR SOLUTIONS

A HOUSING PROPOSAL FOR THE LOWER INCOME PEOPLE IN

ETHIOPIA/ADDIS ABABA

58345231

DUE TO LACK OF ADEQUATE TECHNICAL AND SOCIAL INFRASTRACTURE, ABSENCE OF TIMELY AND ADEQUATE MAINTENANCE, LOW HOUSEHOLD INCOME, UNBALANCED BUILDING MATERIALS PRODUCTION, ACUTE SHORTAGE OF HOUSING AND OVERCROWDING AND LOW INVESTMENT IN HOUSING MANY LOWER INCOME PEOPLE LIVE IN A POOR AND DETERIORATING CONDITIONS.



THE MAJORITY OF THE TOWNS SERVE AS ADMINISTRATIVE CENTERS WITH SMALL SCALE TRADE. THE FEW EXISTING INDUSTRIES ARE CONCENTRATED AROUND ADDIS ABABA AND ASMARA WHICH CREATED ATTRACTION FOR MIGRANT JOB SEEKERS. THIS UNPROPORTIONAL URBAN GROWTH AND MIGRATION RESULTED TO OVERCROWDING, CONJESTION AND SERIOUS HOUSING PROBLEMS SPECIALLY IN ADDIS ABABA.

MARKETING — MOSTLY ON OPEN ROAD SIDES. FOODSTUFFS ARE EXPOSED TO DIRT.

WEAVING — SUCH ECONOMIC ACTIVITIES LACK ORGANIZATION. INDIVIDUALS COULD NOT SATISFY THEIR MINIMAL NEEDS.

TAILORING

WATER — EVEN FOR WASHING WATER IS TRANSPORTED.

FOOD PREPARATION — KITCHEN SHOULD HAVE DIRECT CONNECTION TO COURT YARD.

TRADITIONAL GRASS HOUSE

"ADDIS ABABA STYLE"

MEASURES TO BE TAKEN IN THE SELF HELP PROCESS

- EDUCATE AND CONVINCE MEMBERS TO FILL RESPONSIBILITY AND TO GUARANTEE THE LONG PROCESS OF THE SELF HELP.
- USE THE EXISTING NON-PROFIT INSTITUTIONS AND STUDENTS TO PARTICIPATE IN THE SELF HELP PROCESS.
- USE THE TRADITIONAL MUTUAL ASSISTANCE ASSOCIATION "EDIR" TO STRENGTHEN THE ORGANIZATION.
- MAKE DISTRIBUTION AND SELECTION OF PLOTS AND EXPANSIONS IN AGREEMENT WITH MEMBERS.

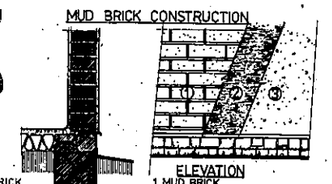
HAND MADE MUD BRICK PRODUCTION

MIXTURE OF CLAY SOIL, STROW AND WATER.

AIR DRIED MUD BRICK

LATER USE SIMPLE MACHINE FOR A BETTER BRICK AND TO SPEED UP THE PRODUCTION

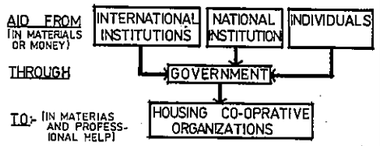
MUD BRICK CONSTRUCTION



STONE FOUNDATION WALL POINTED WITH CEMENT OR LIME + SAND

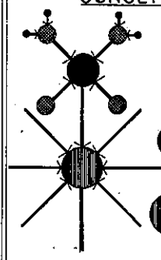
ELEVATION
1 MUD BRICK
2 MUD PLASTER BOTH SIDES AND LIME PAINT INSIDE. AND LATER
3 CEMENT PLASTER

FINANCING POSSIBILITIES



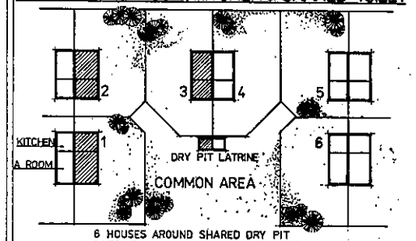
USE THE TRADITIONAL SAVING AND CREDIT SYSTEM "EKUB" IN THE SELF HELP PROCESS.

CONCEPT



- 2-3 DWELLING UNITS WITH COMMUNAL SHARED TOILET.
- 5-6 DWELLING UNITS WITH COMMON AREA FOR CEREMONIES, MOURNING & WORKING.
- 25-30 DWELLING UNITS AROUND COMMUNAL WORKSHOP, STAND PIPE, WASHING AND TRASH COLLECTION.
- 3000-5000 INHABITANTS WITH MARKETING, SERVICES, EDUCATIONAL, CULTURAL, ADMINISTRATIVE & RECREATIONAL FACILITIES.

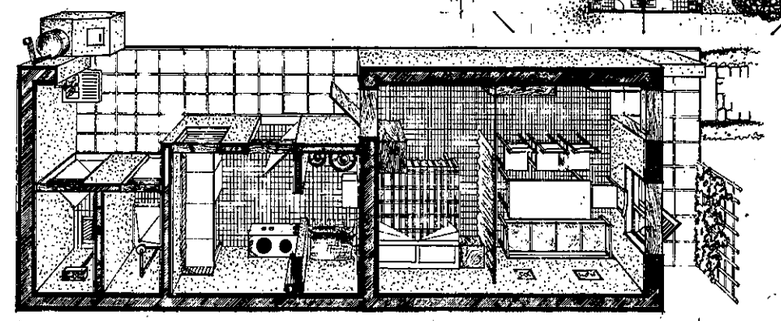
1ST STAGE: ONE ROOM, KITCHEN & SHARED TOILET

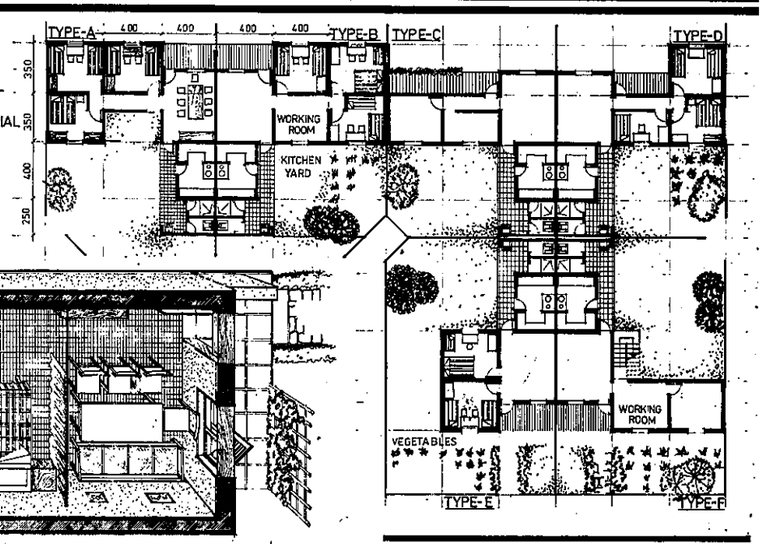


6 HOUSES AROUND SHARED DRY PIT LATRINE AND LATER WITH STAND PIPE.

PROGRAMME FOR SOLUTIONS

- CREATE POSSIBLE MEANS OF FINANCING
- ORGANIZE SELF HELP HOUSING CO-OPERATIVES
- ECONOMICAL AND EXPANDABLE HOUSING, PROVIDING AREA FOR POSSIBLE INCOME SOURCE
- USE WIDE AVAILABLE DURABLE AND LOW COST MATERIAL
- SIMPLIFICATION AND SPEED IN CONSTRUCTION
- CREATE EMPLOYMENT
- PRESERVE TRADITIONAL LIVING CONDITIONS
- USE ECONOMICAL AND SIMPLE TECHNICAL MECHANISMS



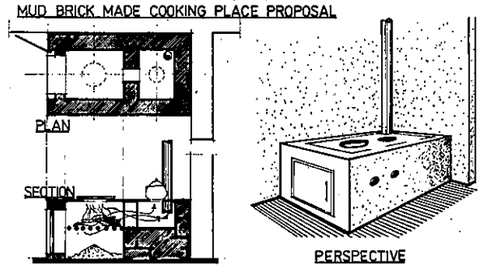


HOUSE TYPES

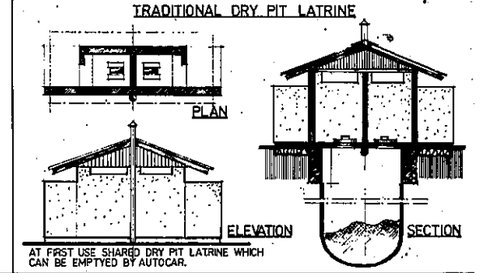
TRADITIONAL COOKING

THE TRADITIONAL OPEN COOKING SYSTEM AFFECTS THE ROOM WITH SMOKE AND IS UNECONOMICAL USAGE OF FIRE WOOD.

MUD BRICK MADE COOKING PLACE PROPOSAL

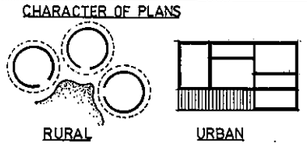


TRADITIONAL DRY PIT LATRINE



AT FIRST USE SHARED DRY PIT LATRINE WHICH CAN BE EMPTYED BY AUTOCAR.

CHARACTER OF PLANS



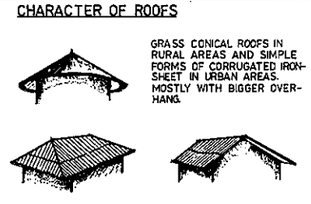
RURAL

BUILT AROUND A CENTRAL EXTERNAL SPACE ALLOWING EVERY ROOM TO HAVE A STRONG CONNECTION. BUT A WEAK RELATION OF ROOMS.

URBAN

A CLOSE RELATION OF ROOMS BUT A WEAK CONNECTION TO EXTERNAL SPACE. MOSTLY BUILT WITH VERANDA.

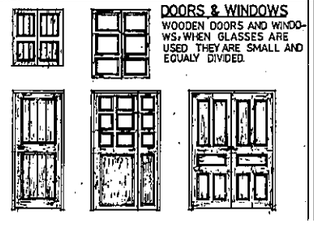
CHARACTER OF ROOFS



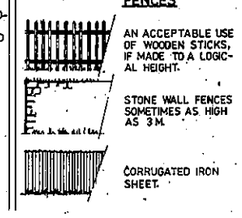
GRASS CONICAL ROOFS IN RURAL AREAS AND SIMPLE FORMS OF CORRUGATED IRON-SHEET IN URBAN AREAS. MOSTLY WITH BIGGER OVERHANG.

DOORS & WINDOWS

WOODEN DOORS AND WINDOWS WHEN GLASSES ARE USED THEY ARE SMALL AND EQUALY DIVIDED.



FENCES

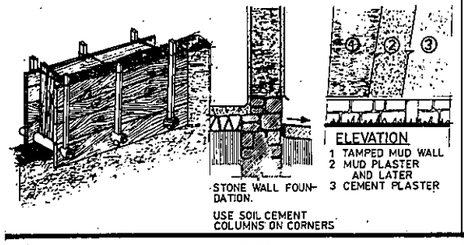


AN ACCEPTABLE USE OF WOODEN STICKS, IF MADE TO A LOGICAL HEIGHT.

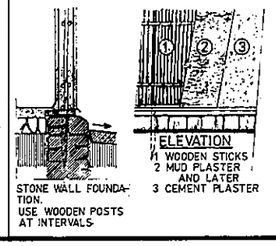
STONE WALL FENCES SOMETIMES AS HIGH AS 3 M.

CORRUGATED IRON SHEET.

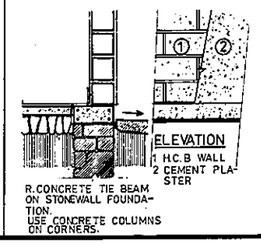
TAMPED MUD WALL CONSTRUCTION



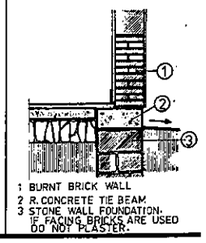
WOOD & MUD WALL CONSTRUCTION



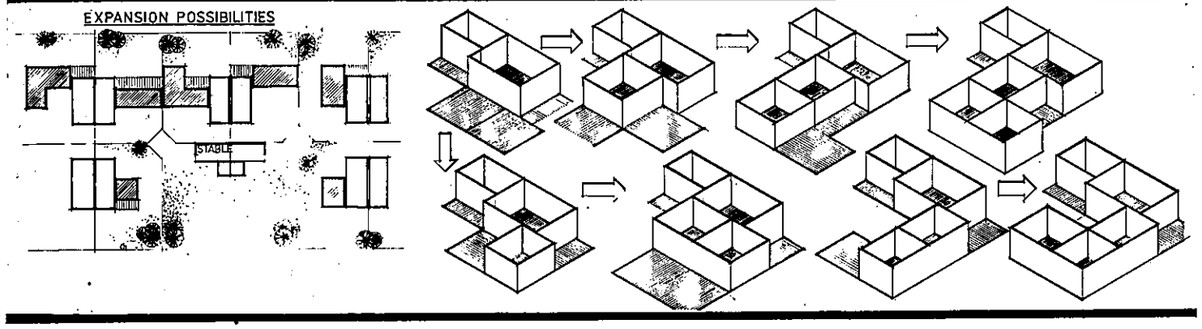
H.C.B. WALL CONSTRUCTION

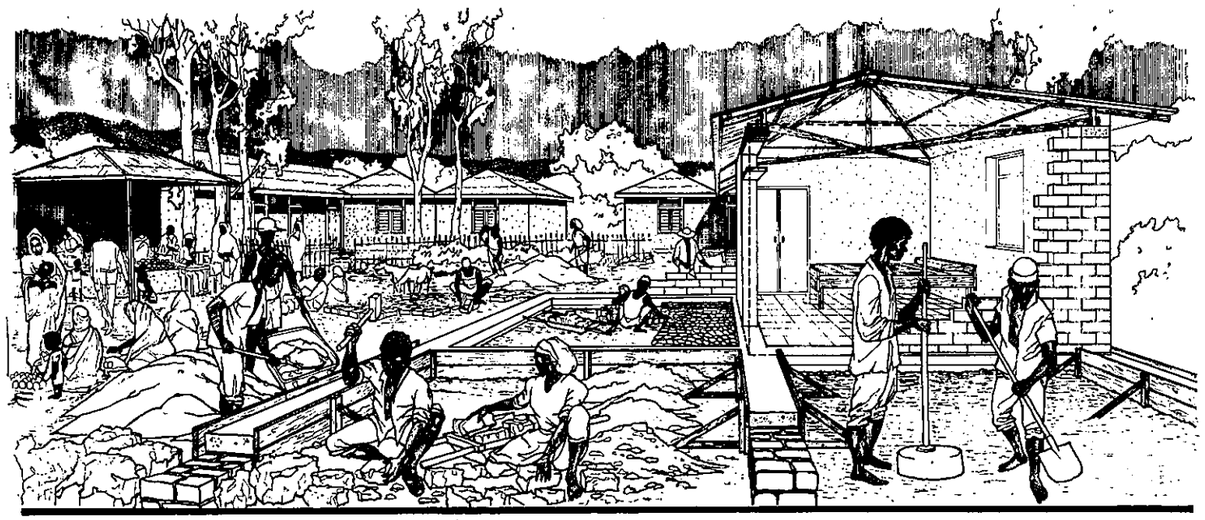


BRICK WALL CONSTRUCTION



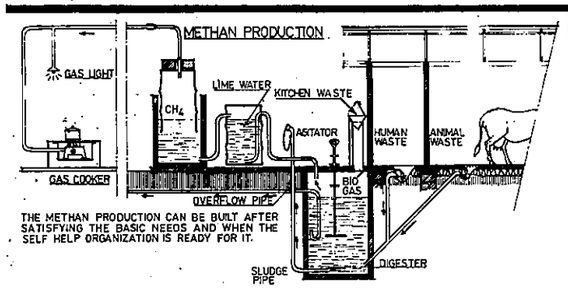
EXPANSION POSSIBILITIES





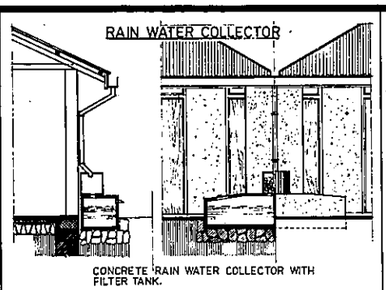
SCENE OF SELF HELP CONSTRUCTION

METHAN PRODUCTION



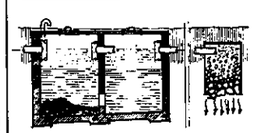
THE METHAN PRODUCTION CAN BE BUILT AFTER SATISFYING THE BASIC NEEDS AND WHEN THE SELF HELP ORGANIZATION IS READY FOR IT.

RAIN WATER COLLECTOR



CONCRETE RAIN WATER COLLECTOR WITH FILTER TANK.

SEPTIC TANK



MINIMUM OF $5M^3$

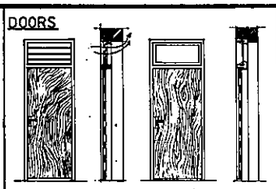
PROCESS OF USAGE

1. ONLY SEPTIC TANK IT CAN BE EMPTIED BY AUTOCAR.
2. SEPTIC TANK WITH SOAKAWAY PIT
3. DIRECT CONNECTION TO MUNICIPAL SEWERAGE.

WINDOW

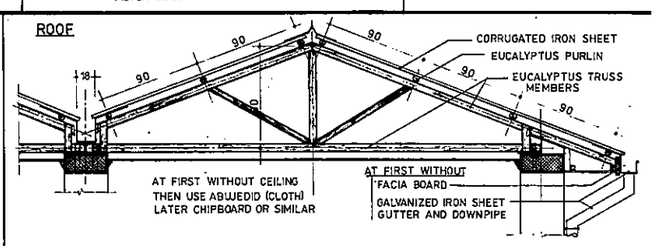
AT FIRST USE WOODEN WINDOW. THE GLASS WILL BE BUILT IN LATER.

DOORS

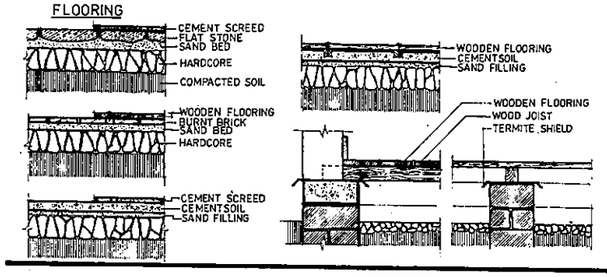


USE DOORS WITH TOP FIXED SHUTTERS FOR TOILETS AND SHOWERS AND DOORS WITH TOP WINDOW FOR ENTRANCES.

ROOF

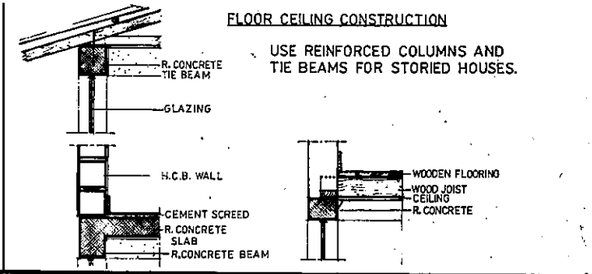


FLOORING

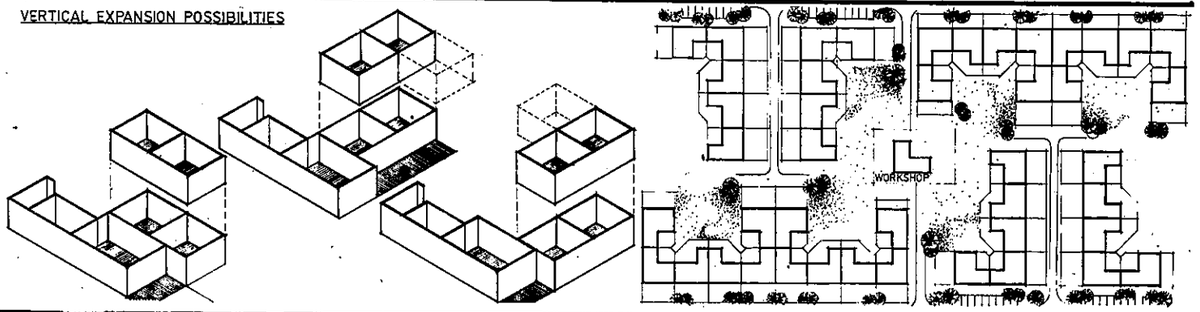


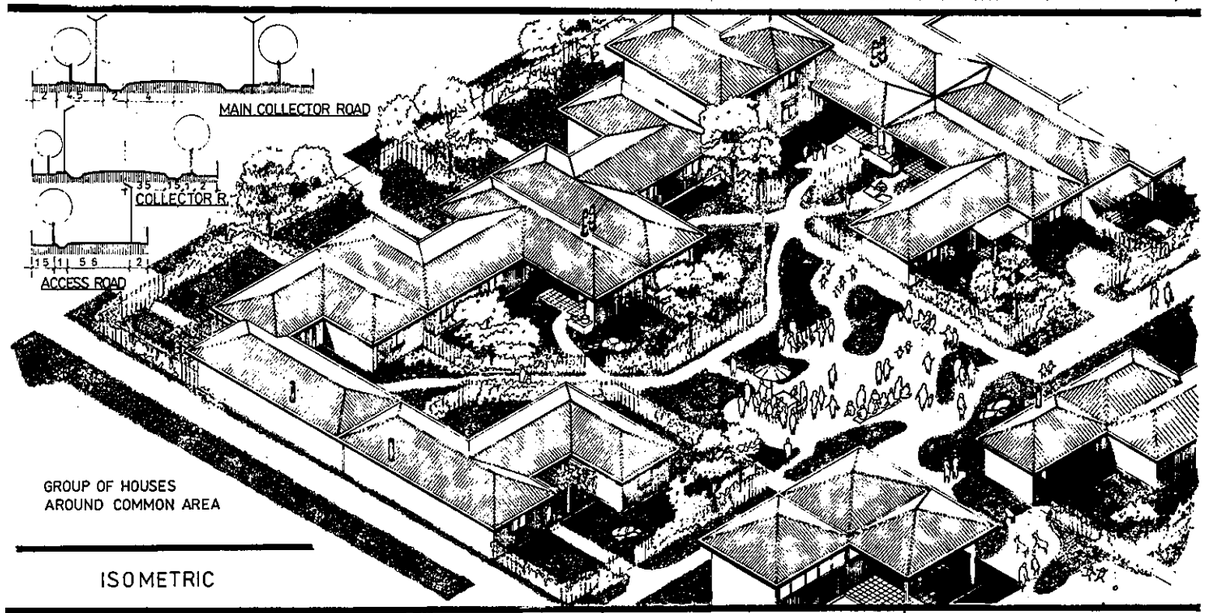
FLOOR CEILING CONSTRUCTION

USE REINFORCED COLUMNS AND TIE BEAMS FOR STORIED HOUSES.



VERTICAL EXPANSION POSSIBILITIES





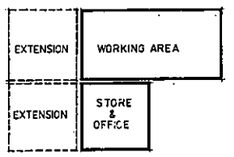
GROUP OF HOUSES AROUND COMMON AREA

ISOMETRIC

CREATESMALL SCALE MANUFACTURE ASSOCIATIONS WITHIN 25-30 DWELLING UNITS AS INCOME SOURCE FOR INDIVIDUALS AS WELL AS FOR SELF HELP ORGA.

- WEAVERS ASSOCIATIONS
- TAILORS ASSOCIATIONS
- METAL WORKERS ASSOCIATIONS
- WOOD AND HANDICRAFT ASSOC. AND
- BAKERY
- GRAIN MILLS
- POULTRY
- AND OTHERS

WORKSHOP FOR SMALL SCALE MANUFACTURE

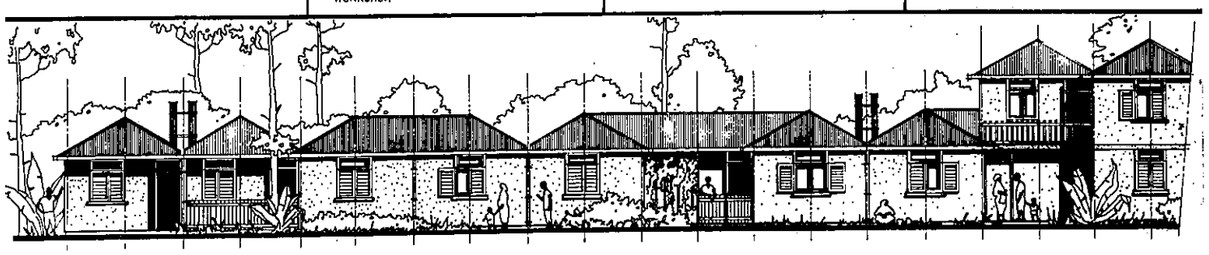


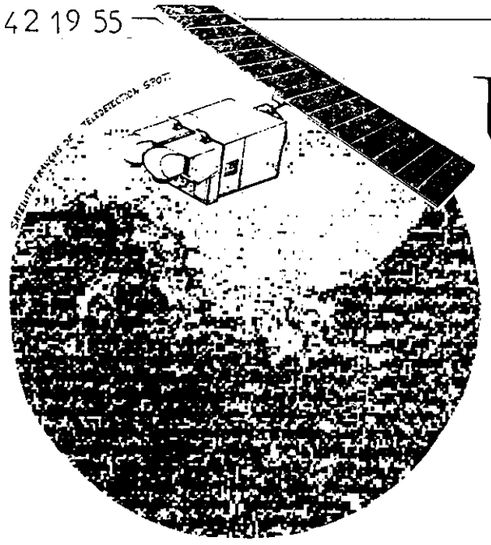
THE FIRST TO BE CONSTRUCTED, TO USE IT AS STORE AND MODEL TO SHOW HOW TO BUILD A HOUSE. LATER CAN BE EXPANDED AND USED AS WORKSHOP

SOCIAL FACILITIES FOR A NEIGHBOURHOOD (3000-5000 HAB.) "KEBELE"

- SALING AREA FOR DAILY NEEDED GOODS
- MARKET
- SERVICES
- MULTIPURPOSE HALL WITH ADMINISTRATION
- RESTAURANT
- KINDERGARTEN AND ELEMENTARY SCHOOL
- LIBRARY WITH READING AREA
- PARK
- SPORT FIELD

FUNCTIONAL RELATIONS OF SOCIAL FACILITIES





URBANISME SANS FRONTIERES

DE NOUVEAUX OUTILS CARTOGRAPHIQUES POUR PALIER LA CRISE URBAINE DES VILLES EN EXPANSION

Pour contribuer à résoudre le problème des sans-abris dans les villes du Tiers-Monde où l'essentiel de ce qui se construit est dû à l'initiative individuelle, nous proposons ici, d'utiliser la télédétection par satellite et la photogramétrie aérienne, pour élaborer des "plans de développement" permettant de prévoir et de canaliser la croissance urbaine spontanée sur les terrains qui lui conviennent le mieux.

L'origine de notre proposition part d'un constat. Le constat que les étudiants qui viennent pour étudier en Europe et qui souhaitent faire un diplôme d'architecture ou d'urbanisme situé dans leurs pays d'origine ont très souvent le plus grand mal à se procurer des cartes et des relevés topographiques pour leurs travaux. Les documents qu'ils arrivent à récolter (quand les administrations concernées les leur fournissent de bonne grâce, ce qui n'est pas toujours le cas), sont obsolètes, à des échelles différentes et ne comportent généralement pas les indications essentielles dont ils auraient besoin pour élaborer leurs projets. En fait, il nous est apparu très vite qu'à de rares exceptions près, il n'existait pas de cartographie urbaine digne de ce nom dans les villes des pays en voie de développement. Villes qui en auraient pourtant un besoin urgent puisqu'elles doivent tenter de maîtriser, ou pour le moins de canaliser une croissance urbaine extrêmement rapide avec des moyens limités et un personnel compétent peu nombreux.

L'ABSENCE D'OUTILS CARTOGRAPHIQUES ADAPTES CONTRIBUE A AGGRAVER LA CRISE URBAINE ET A PRECARISER ENCORE LA SITUATION DES PLUS DEFAVORISES.

Aujourd'hui, l'incapacité de beaucoup de villes du Tiers-Monde à canaliser leurs expansions spontanées sur un schéma urbanistique (même tout à fait élémentaire), a des conséquences passablement dramatiques. La première est le développement en tache d'huile, incontrôlé, des agglomérations qui entraîne très vite toute une série de nuisances :

- L'engorgement des circulations traversantes qui grève le développement économique de la cité et entraîne tout un cortège de dangers et de pollutions. Une ville comme Kampur en Utah Pradech, par exemple, se marginalise par rapport aux autres cités indiennes du fait des nuisances entraînées par son essor même et notamment de la paralysie des transports où sur les mêmes routes engorgées qui traversent l'agglomération, les camions côtoient des chars tirés par des buffles et des cohortes de piétons avec tous les dangers et les lenteurs que cela comporte.

- L'accroissement démesuré des temps de transport (souvent pédestres) qui est un handicap majeur notamment pour les plus défavorisés, et la difficulté corrélative à mettre en place des transports en commun dans des zones que ne structure aucune hiérarchie de voies de circulation. A Lagos au Nigeria, il n'est pas rare de faire trois heures de marche quotidienne pour se rendre à un travail ou à une école.

- La promiscuité entre zones d'habitat et zones industrielles dangereuses. On se rappelle à ce propos de la catastrophe de Bohpal aux Indes qui a fait un grand nombre de victimes parmi les habitants des bidonvilles qui cernaient l'usine.

- La difficulté d'assurer de façon rationelle les adductions d'eau et le traitement des effluents, et donc de se prémunir contre les contaminations. La ville de Kampur, déjà citée pour ses nuisances urbaines, est par ailleurs la zone où le taux de tuberculose est le plus élevé du pays.

La deuxième conséquence de l'échec de toute planification urbaine touche particulièrement les plus défavorisés qui risquent d'être obligés de "déguerpir" des habitats qu'ils ont construits, en y investissant parfois l'énergie de toute une vie, parce qu'ils les ont construits dans des zones qui ne sont pas propices à l'urbanisation :

- Du fait que ce sont des zones périodiquement inondées.

- Du fait de l'érosion des sols, comme dans les zones collinaires entourant Kinshasa qui se dégradent au fur et à mesure qu'on tente de les urbaniser et où nombre de constructions sont abandonnées au bout de quelques années.

- Du fait que les terrains concernés devaient être logiquement affectés à d'autres usages urbains (équipements collectifs, installations industrielles...).

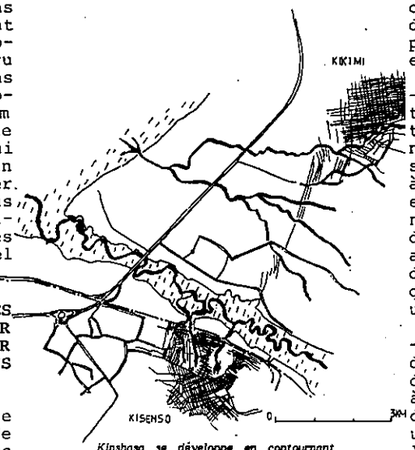
- Du fait que le réseau de desserte y est si mal dessiné au départ qu'il faudra d'évidence, à terme, retracer des voies dans le tissu bâti ou élargir les voies existantes pour éviter que la zone ne devienne inaccessible et impénétrable. A San Pedro en Côte d'Ivoire, comme dans beaucoup d'autres localités, l'effort pour équiper les quartiers spontanés s'accompagne malheureusement de la destruction de nombre d'habitations mal placées dont les occupants sont rarement dédommagés pour le préjudice qu'ils subissent de ce fait.

Bien sûr, la mauvaise qualité des outils cartographiques dans les villes des pays en voie de développement n'explique pas à elle seule la crise urbaine qui y sévit. Mais elle contribue sûrement, pour une part, à cette crise en rendant difficile toute vision synthétique de l'agglomération (qui pourrait permettre la définition d'une politique d'action réaliste). Et en entravant, par manque d'information, les initiatives et projets des professionnels intéressés à oeuvrer pour le bien commun.

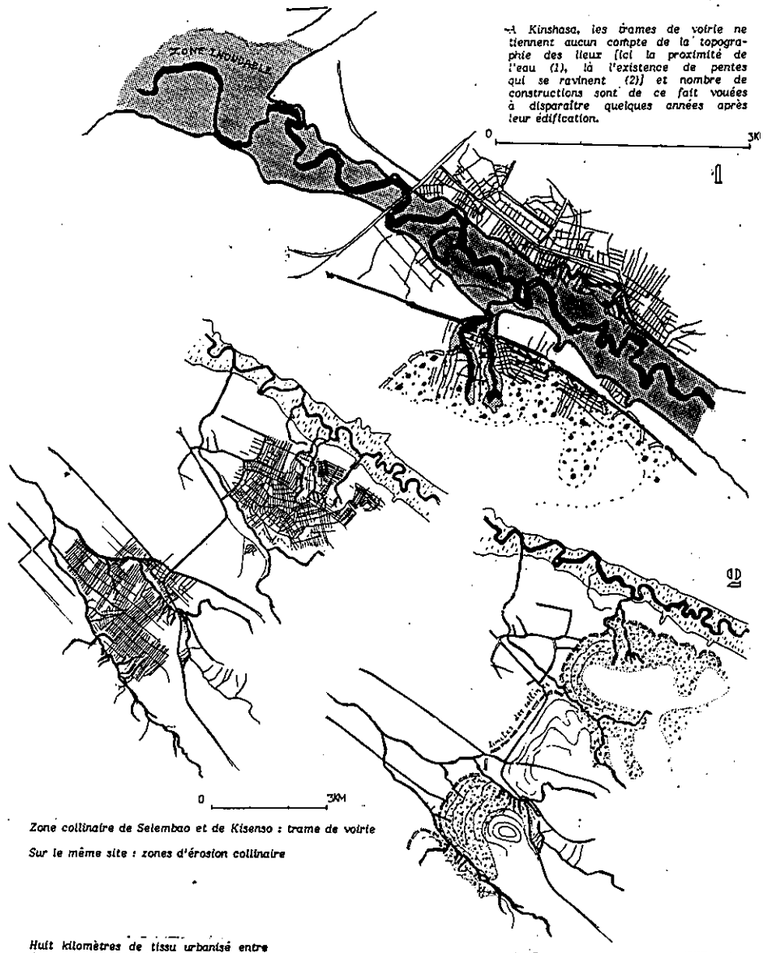
CE QUE DEVRAIENT ETRE DES CARTES URBAINES ET DES PLANS DE DEVELOPPEMENT POUR LES VILLES DU TIERS-MONDE EN EXPANSION.

Très didactiques, les documents que nous vous proposons d'élaborer seraient constitués d'un ensemble comportant :

1) UNE CARTE DE L'ETAT ET DE LA "VOCATION" DES SOLS.



Kinshasa se développe en contournant des obstacles naturels (comme ici la zone inondée de N'gili) et rien ne relie les quartiers qui se situent de part et d'autre de ces obstacles. D'où l'allongement des temps de transport (pédestre) pour ceux qui ont à se rendre d'un point à l'autre de l'agglomération comme ici de Kisenso à Kikimi.

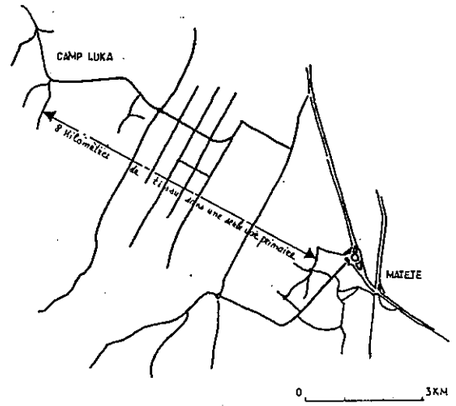


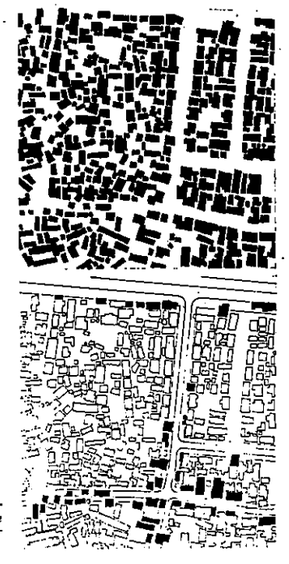
A Kinshasa, les trames de voirie ne tiennent aucun compte de la topographie des lieux (ici la proximité de l'eau (1), là l'existence de pentes qui se ravinent (2)) et nombre de constructions sont de ce fait vouées à disparaître quelques années après leur édification.

Zone collinaire de Selembao et de Kisenso : trame de voirie

Sur le même site : zones d'érosion collinaire

Huit kilomètres de tissu urbanisé entre Camp Luka et Matete à Kinshasa sans aucune desserte primaire. Le jour où l'on installera une voirie, il faudra raser un grand nombre de constructions.





San Pétro (en Côte d'Ivoire). En noir les constructions qui devront être rasées pour le tracé d'une future desserte de quartier.

Cette carte, obtenue en croisant les informations émanant de la télédétection, de la photographie aérienne et de l'observation sur place, comporterait, outre les indications morphologiques générales (relief, nature des terrains, réseau hydrographique, nappes phréatiques, végétation, tracés de voirie et nature des constructions), une évaluation des "vocations" naturelles des terrains. A savoir s'il s'agit de terres agricoles de qualité, de zones favorables à la construction d'habitat, de milieux écologiques fragiles qu'il faudrait protéger, de zones urbaines qui ont vocation à se densifier, etc ... Cette carte de la "vocation des sols" comporterait donc une part d'interprétation, interprétation préliminaire à tout travail de planification proprement dit.

2) UNE CARTE DES HABITATS :

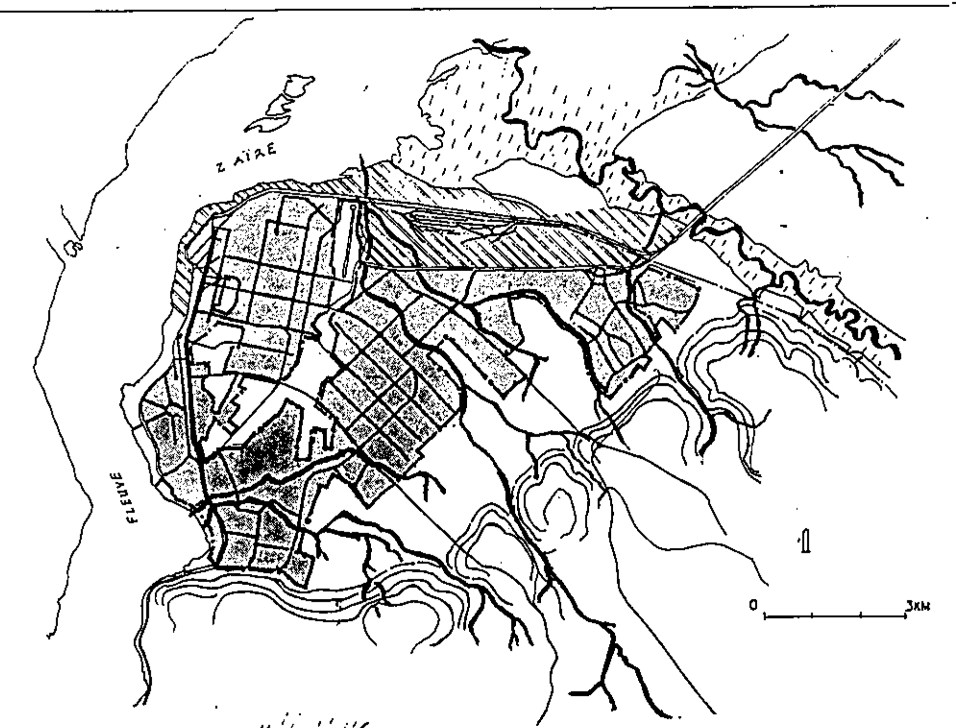
Ce document indiquerait les zones d'habitat existantes avec leurs densités et les réserves de densification qui y sont à chaque fois envisageables. Une typologie fine des tissus urbains que l'on rencontre dans les divers quartiers de l'agglomération (échantillons pris sur photos aériennes et comptage des habitants sur place), annexée au document, servirait de référence à cette carte ainsi qu'à la projection démographique décrite en 3.

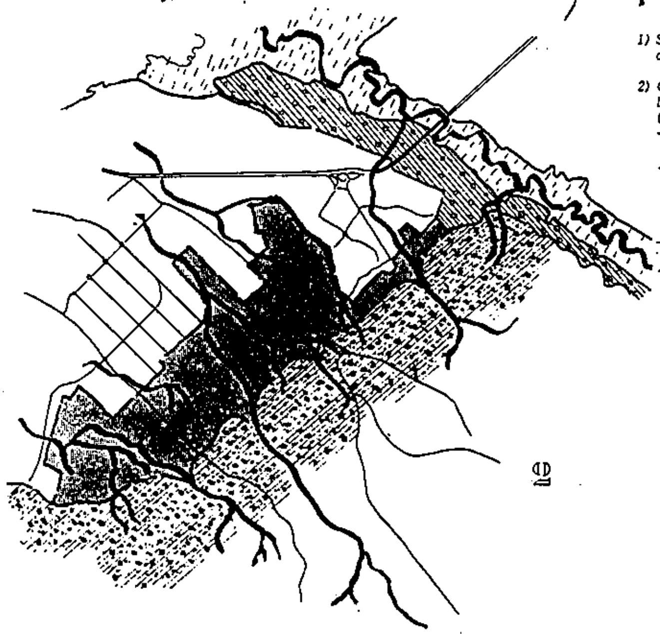
3) UNE PROJECTION DEMOGRAPHIQUE PREVISIONNELLE SUR DIX ANS :

(Croissance démographique plus éxode rural) avec estimation des surfaces qui seraient vraissemblablement affectées de ce fait à de l'habitat et de celles qui, déjà urbanisées verront s'accroître leur densité (estimations faites à l'aide de la typologie des tissus obtenue en 2).

4) UN PLAN DE DEVELOPPEMENT SUR DIX ANS :

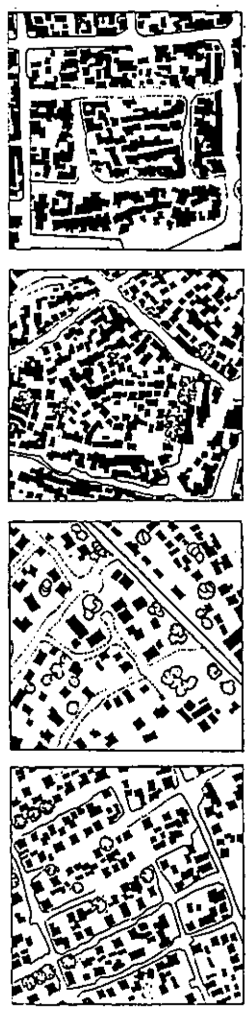
Il s'agirait d'un document de synthèse élaboré en concertation avec les édiles pour mettre en forme les enseignements des documents 1, 2 et 3 et expliciter à ce propos quelques choix "politiques" essentiels concernant la future localisation des grands réseaux et équipements. Ce "plan de développement" comme nous l'appellons, permettrait de visualiser un avenir possible de l'agglomération à l'horizon de 10 ans. Il servirait également de document de travail pour les tracés de base des nouveaux quartiers, des voies de circulation et des réseaux. Ce plan, pour être opératoire devrait être assorti en outre d'une panoplie de moyens spécifiques à mettre en oeuvre dans chaque cas d'espèce (moyens à définir avec les responsables locaux) pour s'assurer que la croissance urbaine se fasse effectivement selon les lignes de force proposées. Dans un projet pour Antirabé à Madagascar, par exemple, les réserves foncières pour l'emprise des futures voiries sont mises à la disposition des éleveurs du voisinage comme zones de pâturage pour le gros et le petit bétail de façon à les protéger d'une urbanisation sauvage intempestive.





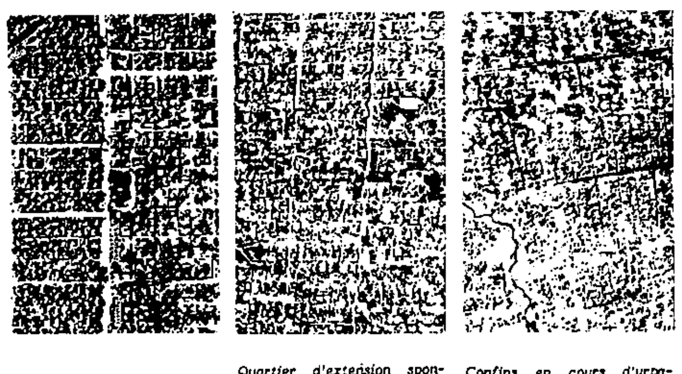
1) Simulation de Kinshasa il y a quinze ans. Schéma morphologique.

2) Ce qu'aurait pu être à l'époque le fragment d'une carte de la "vocation des sols".
- zone inondable dangeureuse
- zone collinaire fragile à préserver ou à urbaniser de façon contrôlée
- sol agricole de qualité
- sol propice à l'urbanisation.



Exemple de retranscription graphique de photos aériennes (Douala, Cameroun) servant de base pour l'évaluation des densités (nombre d'habitants par hectare en période nocturne). Une fois le choix et l'analyse d'échantillons de ce type réalisés, il est possible de dresser la carte des densités d'une agglomération avec indication des réserves de densité prévisible (à l'horizon de dix ans).

Photos aériennes de différents tissus de Kinshasa



Quartier planifié des années 1930-1950 avec plan orthogonal et hiérarchie des voiries bien marquée.

Quartier d'extension spontanée postérieur à 1960 dans le site collinaire au sud de la ville. Rues sableuses, ravins d'érosion catastrophiques.

Confins en cours d'urbanisation (1975) à l'est de la rivière N'djili, dans une zone de terres agricoles potentiellement très riches.

DE LA NECESSITE D'UNE COOPERATION NORD-SUD POUR L'ELABORATION SYSTEMATIQUE DE CARTES ET DE PLANS DE DEVELOPPEMENT.

La réalisation des documents dont nous parlons implique de croiser des informations recueillies sur place (densités, typologie des tissus, croissance démographique ...) et des informations provenant de photos aériennes et de satellites de télédétection comme le Landsat ou plus récemment le satellite français Spot. Elle implique également de synthétiser toutes ces données à la lumière des informations d'une banque de données "ad hoc" sur les problèmes d'urbanisation dans le Tiers-Monde.
De ce fait, cette réalisation n'est pas à la portée de chaque ville ou de chaque pays isolé et il vaut mieux envisager pour ce faire une action concertée regroupant divers partenaires autour d'un même projet. L'économie d'échelle aidant, on pourra mettre au point alors un "produit" à chaque fois différent, mais qui dans sa structure pourra s'adapter à nombre de villes qui sont confrontées à des problèmes similaires.

Concrètement, pour réaliser un tel produit, nous devrons nous associer avec un producteur de documents cartographiques maîtrisant les techniques dont nous avons fait mention (comme l'I.G.N. français par exemple) et à qui il sera demandé de sous-traiter au maximum avec les organismes existants dans les pays clients. Nous comptons nous associer également avec une école d'architecture ou un institut d'urbanisme qui aurait à charge de constituer une banque de données de cartographie urbaine pour le Tiers-Monde. Et nous comptons également nouer des contacts avec les professionnels des pays concernés (par le biais de leurs associations) pour les amener à participer aux recherches et réflexions afférantes à l'élaboration et à l'utilisation des documents que nous proposons.

POUR UN SOUTIEN DE l'U.I.A. A CETTE INITIATIVE.

En conclusion, nous souhaitons pouvoir, grâce au soutien de l'U.I.A. et des organismes qui patronent le présent concours, engager une première opération pilote de façon à expérimenter pour une agglomération donnée la proposition que nous avons faite ici. Puis si cette première expérience s'avère concluante, nous souhaiterions contribuer par la suite à en multiplier la pratique au bénéfice des pays qui en auraient le plus besoin.

SECTION 4 ou 5

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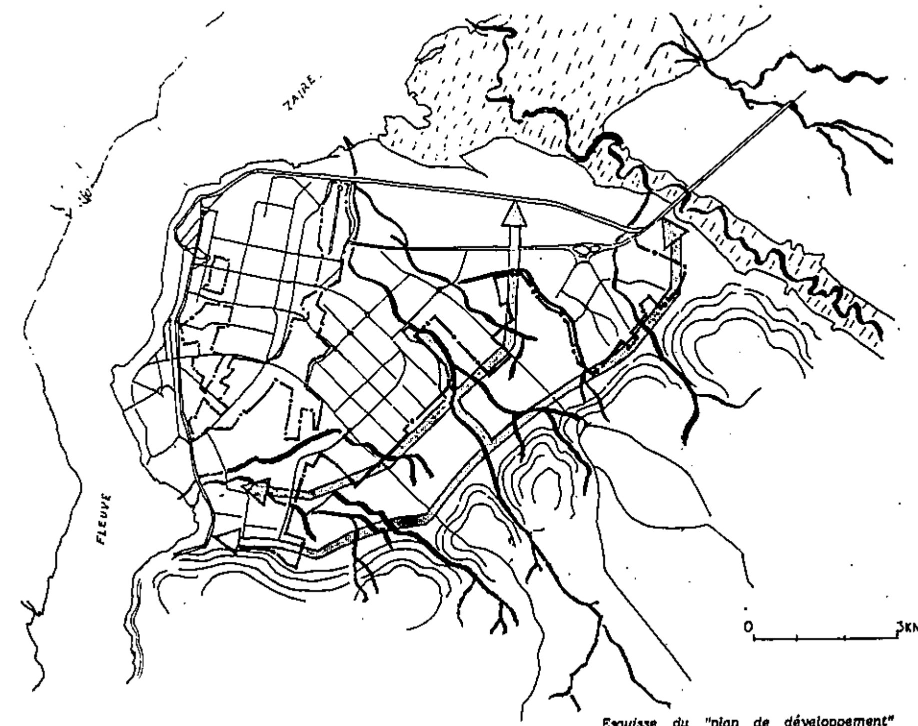
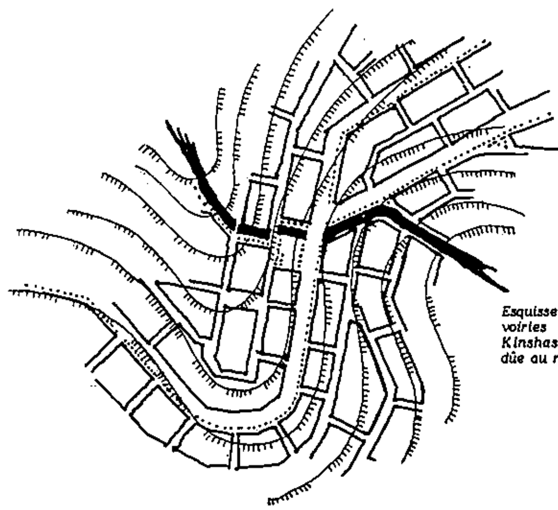


Esquisse du "plan de développement" qui aurait pu être fait il y a quinze ans pour la zone sud de Kinshasa. Une réserve foncière pour une voirie de bouclage aux pieds des collines et une autre à la limite de l'agglomération ainsi que le long de la rivière Bumbu, assorties d'une esquisse de principe montrant la façon de lotir sur les terrains en pente (en créant des voiries qui suivent les courbes de niveau), auraient suffit pour éviter l'imbroglio urbain et le désartre écologique que l'on connait aujourd'hui.



Esquisse montrant la disposition des voiries à prévoir sur une colline de Kinshasa menacée par une érosion due au ruissellement des eaux.

LA CRISE URBAINE ET LES SANS ABRIS

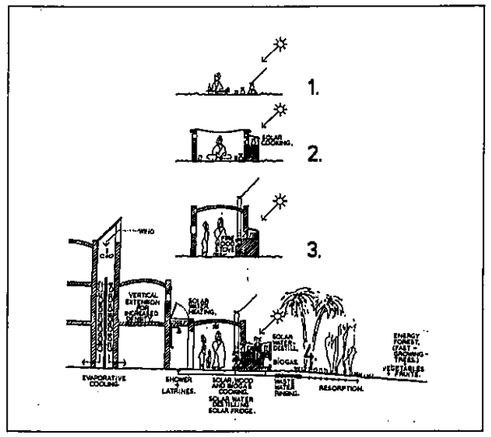
Une ville est un écosystème dans lequel chaque groupe social joue un rôle bien particulier, et les plus défavorisés, les "sans abris", n'échappent pas à cette règle. En général leur premier souci n'est pas du tout de se construire un abri, mais de trouver du travail et des ressources pour faire face au plus pressé (la nourriture), puis par la suite de louer quelque logement. Et ce n'est que bien plus tard, une fois familiarisés avec la ville et les réseaux de relations qui s'y tissent, qu'ils pourront chercher à s'installer sur une parcelle pour y édifier un habitat, pour eux et d'éventuels locataires. De ce fait, il est illusoire (et dangereux) de vouloir règler, par quelque solution miracle, le problème des sans- abris sans s'attaquer de façon plus large à la crise urbaine que connaissent les villes des pays en voie de développement. Cette crise urbaine a de multiples dimensions (démographique, économique, sociale, politique ... urbanistique aussi) et c'est pour tenter d'y pallier pour une petite part dans le champ qui est le nôtre (celui de l'aménagement et de l'urbanisme), que nous avons développé la présente proposition.

LES NOUVELLES TECHNOLOGIES AU SERVICE DE LA PLANIFICATION URBAINE

L'utilisation de la photographie aérienne pour la confection des cartes est une technique courante, par contre de grands progrès sont actuellement en cours dans le domaine de l'informatisation du traitement photogramétrique des clichés et de leur transcription graphique. Informatisation qui permet et qui permettra encore plus à terme d'abaisser les prix de revient des documents cartographiques (et donc d'en multiplier l'usage). Par ailleurs, le développement de la télédétection par satellite qui enregistre l'énergie réfléchie par les objets au sol (de l'infra-rouge à l'ultra- violet) avec une surface de résolution (ou pixel) qui peut descendre jusqu'à 100 m^2, permet de relever toute une gamme d'informations inédites (humidité, températures des sols, degré de pollution des eaux ...) complémentaires de celles qui émanent de clichés aériens et fort précieuses pour la connaissance des zones d'habitat diffus.

C'est une combinaison de ces deux procédés (complétée par des repérages sur place) que nous proposons de mettre ici au service de la planification urbaine des villes à forte croissance des pays en voie de développement.

SELF-CONTAINED SOLAR COMMUNITIES FOR VIRGIN SITES OR FOR REHABILITATION OF SLUM AND SQUATTER AREAS.



A TOTALLY INTEGRATED COMMUNITY-CONCEPT

ON ALL BIOLOGICAL AND FUNCTIONAL LEVELS,

WHERE EACH COMMUNITY (OR FAMILY OR NEIGHBOURHOOD) TAKES -

OR RATHER GETS - THE RESPONSIBILITY FOR THEIR OWN HOUSING-LIFE

INCLUDING THEIR OWN FOOD PRODUCTION AND WASTE HANDLING.

A WHOLEISTIC-VIEW-APPROACH

WITH TOTALLY INTEGRATED ENERGY SOLUTIONS BASED ON RENEWABLES

ON A VERY BASIC SCALE AND TECHNOLOGICAL LEVEL.

THE MAIN RESOURCES TO BE COMBINED :

LOCAL PEOPLE.
LOCAL BUILDING MATERIALS.
LOCAL TECHNIQUES.
LOCAL ENERGY.

THE HIERARCHY OF VALUES - IN LINE OF ORDER

1 · ECOLOGICAL LIMITATIONS.

ECOLOGY.

AN INTEGRATED SOLUTION INCORPORATING KNOWLEDGE ABOUT THE LIMITS OF ECOLOGICAL EXPLOITATION.
AN ATTEMPT AT SHOWING A MORE EFFICIENT USE OF RESOURCES CALLING FOR CHOICE OF LOCAL, RENEWABLE ENERGY, LOCAL AND RENEWABLE MATERIALS AND RECYCLING OF WASTE TO ENCOURAGE NOURISHMENT AND GROWTH OF VEGETABLES AND TREES.
INSTEAD OF SPENDING HUGE SUMS OF MONEY EVERY YEAR IN REPAIRING ECOLOGICAL DAMAGES, IT WOULD BE MORE ECONOMICAL TO INVEST IN SOLUTIONS TO HOUSING- , ENERGY- AND WASTE-PROBLEMS IN ORDER TO AVOID ECOLOGICAL DAMAGES.
ARCHITECTS CAN CONTRIBUTE TOWARDS DEVELOPING SOLUTIONS THAT AVOID CAUSING ECOLOGICAL PROBLEMS AND THUS ENCOURAGE THE SOLUTION OF THE REAL PROBLEMS INSTEAD OF TREATING SYMPTOMS - ONLY.
SOONER OR LATER MAN WILL HAVE TO ACCEPT THE ECOLOGICAL LIMITS OF NATURE AND ACT WITHIN THESE LIMITS.
ARCHITECTS - HAVING A BROAD KNOWLEDGE OF THE RELATIONSHIP BETWEEN DIFFERENT FIELDS - SHOULD TAKE A LEAD HERE. SINCE THE PROBLEM OF HOUSING THE HOMELESS IS OF SUCH A HUGE SCALE, EVERYTHING WE DO WILL HAVE A GREAT INFLUENCE ON USE OF ALL KINDS OF RESOURCES.
THEREFORE WE WILL HAVE TO MAKE SURE THAT WHATEVER WE DO, AT LEAST WE RECOMMEND SOLUTIONS AVOIDING ECOLOGICAL CONFLICTS.
AUTONOMOUS, GREEN AND DESENTRALISED THINKING IS NOW WORTH TRYING. THE ECOLOGICAL SITUATION CALLS FOR BRAVE SOLUTIONS THAT DON'T NEGLECT THE MOST IMPORTANT CONSTRAINT OF ALL - THE LIMITS SET BY THE ABILITY OF MOTHER EARTH TO FUNCTION IN ECOLOGICAL BALANCE.
ARCHITECTS HAVE TO TAKE THEIR PART OF THE SHARING OF THE GLOBAL PROFESSIONAL RESPONSIBILITY TO SECURE THE FUTURE FUNCTIONING OF THIS PLANET.

MATERIALS.

HOUSING THE HOMELESS WILL DEMAND AN ENOURMOUS VOLUME OF BUILDING MATERIALS.
IT IS UNLIKELY THAT ALREADY SCARCE TYPES OF MATERIALS WILL PROVIDE REALISTIC SOLUTIONS.
THE COST OF MATERIALS AND THE USE OF EXPORT INCOME TO PAY FOR IMPORTED MATERIALS HAS TO BE CAREFULLY CONSIDERED.
AS AN EXAMPLE SOME COUNTRIES SPEND 10% OF ITS EXPORT INCOME TO PAY FOR IMPORTED CEMENT.
THIS DAMAGE CAN BE REDUCED BY RELYING MORE ON LOCALLY AVAILABLE MATERIALS LIKE SUN DRIED MUD.
STEEL AND CEMENT ARE NOT GOING TO SOLVE THE PROBLEM AND TIMBER IS SCARCE IN MOST COUNTRIES.
TODAY'S SOCIAL HOUSING IS OFTEN TOO ADVANCED FOR THE PEOPLES'S PREVIOUS LIVES - EX. CONCRETE TOWER BLOCKS IN CITIES IN DEVELOPING COUNTRIES.
AN IN-BETWEEN-ROAD HAS TO BE LOOKED FOR, USING LESS RESOURCES - RESULTING IN MORE (AND POSSIBLY BETTER) DWELLINGS - KEEPING PEOPLE CLOSER TO THE GROUND LEVEL.
EVEN ROOFS SHOULD BE BUILT IN LOCAL (EX.MUD) MATERIALS.
MATERIALS SHOULD BE CHOSEN TO REFLECT TRADITIONAL TECHNOLOGY AND ARCHITECTURE , STRESSING THE VALUE OF DURABILITY, RELATIONSHIP TO SYMBOLISM AND RELIGION - IF POSSIBLE, HEREBY RESULTING IN MEANINGFUL, HEALTHY AND ECONOMICAL HOUSING-CONCEPTS.
FAST-GROWING TREES AND GRASS COULD ALSO BE CONSIDERED WHERE SCARCETY IS NOT A LARGE PROBLEM.
MATERIALS SHOULD BE CHOSEN SO THAT IT IS POSSIBLE TO INCREASE THE NUMBER OF STOREYS - STAGE BY STAGE - UP TO AN APPROPRIATE DENSITY.

WASTE.

WASTE HANDLING ON A DOMESTIC AND ON A LARGER SCALE IS ONE OF THE MAIN PROBLEMS IN DENSE DWELLING SITUATIONS - ALSO FROM A HEALTH POINT OF VIEW. THE SUFFERING OF THE HOMELESS IS INCREASED BY ILLNESSES CAUGHT FROM WASTE CREATED PROBLEMS.
A MORE LOCALLY BASED HANDLING OF WASTE IS HERE CALLED FOR WHERE WASTE IS PUT BACK INTO THE GROUND - WHERE POSSIBLE TO NOURISH GROWTH OF TREES (ENERGY-FOREST AND AND FRUIT FOREST) AND VEGETABLES.
ALTERNATING GREEN BELTS AND HOUSING WILL POSSIBLY BE ABLE TO SOLVE MANY WASTE PROBLEMS LOCALLY. GREEN BELTS CAN BE USED FOR PATHS ETC. TO DUPLICATE USE OF THE LAND.
THE HUGE SAVINGS THAT CAN BE DONE BY AVOIDING CENTRALISED WASTE HANDLING BY CENTRAL SEWAGE SYSTEMS COULD BE USED FOR SUBSIDISING THE BUILDING OF RINSING AND RESORPTION SYSTEMS LOCALLY FOR WASTE HANDLING.
RAINWATER SHOULD BE LED INTO THE GROUND - NOT INTO SOME CENTRALISED CHANNEL LEADING TO THE SEA OR THE RIVER.
A COMBINATION WITH LATRINES AND BIOLOGICAL TOILETS SHOULD BE DEVELOPED TO SUPPLEMENT THE WASTE HANDLING.
ALTERNATING GREEN BELTS AND HOUSING WILL ARISE FROM DEVELOPING SUCH A CONCEPT.
A CONCEPT OF ALTERNATING GREEN BELTS AND HOUSING WILL NEED A THOROUGH ANALYSIS OF DIFFERENT LAND USE PATTERNS. DIFFERENT LAND USE PATTERNS ALSO NECESSITATES DIFFERENT TRANSPORT NET-WORKS. THE COST OF THESE - BOTH CAPITAL AND RUNNING COSTS - CAN VARY DRAMATICALLY.
PROVIDED LAND IS AVAILABLE, LARGER SOLAR SYSTEMS FOR DISTILLING SALT AND BRACKISH WATER CAN BE BUILT ON THE GROUND - TO SUPPLEMENT THE WATER PROVIDED BY THE SMALL DRINKING WATER DISTILLERS IN EACH HOUSE.

ENERGY.

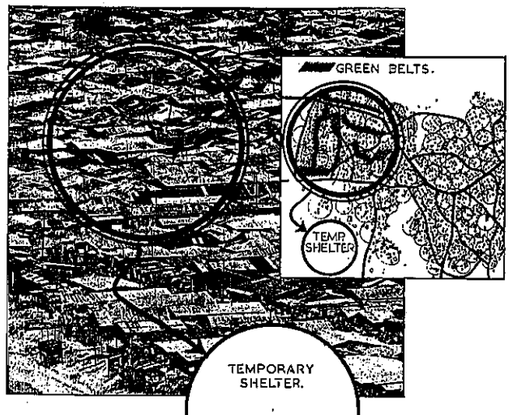
SUPPLYING ENERGY IN A FORM AND AT A COST THAT IS COMPATIBLE WITH THE ECONOMY OF THE POOR , IS A KEY PROBLEM IN DEVELOPING COUNTRIES.
FIREWOOD IS SCARCE AND SOME DEVELOPING COUNTRIES SPEND 50 TO 85% OF ALL EXPORT INCOME TO IMPORT OIL FROM WHICH EX. KEROSENE IS MADE. DESPITE THE RECENT OIL-PRICE-DROP, PRICES FOR THE AVERAGE MAN IS INCREASING STEADILY AS GOVERNMENTS PUT UP PRICES TRYING TO AVOID OVERUSE AND OVER-DEPENDENCE OF CHEAP OIL PRODUCTS.
THE DECENTRALISED DWELLING PATTERN IN DEVELOPING COUNTRIES CALLS FOR LOCAL ENERGY LIKE SOLAR FOR :

THERMAL - SIMPLE TECHNIQUES - NEW AND OLD IMPROVED. LOCALLY PRODUCED FROM LOCAL MATERIALS.
1. COOKING (HOT BOX AND POSSIBLY FOCUSING).
2. WATER DISTILLATION (FROM SALT AND BRACKISH).
3. FOOD COOLING (EVAPORATIVE - WETTED CLOTH).
4. WATER HEATING (SIMPLE PASSIVE SYSTEM).
5. SPACE COOLING (EVAPORATIVE WIND TOWERS).
6. SPACE HEATING (PASSIVE - EX.TROMBE WALLS.)

ELECTRIC - REJECT SOLAR CELLS WITH LESS PRECISE OUTPUT CAN BE PROVIDED CHEAPLY. PUT TOGETHER LOCALLY. A FEW WATTS ONLY. AS A START AT 2US$/WATT FOR CELLS ONLY - EXPANDABLE INTO MORE AND MORE TYPES OF USE IF ECONOMY ALLOWS.
1. LIGHTING. (INSIDE AND IN STREETS).
2. WATER PUMPING. (FROM RIVER OR WELL OR TANK).
3. SUPPLEMENTING PASSIVE EVAPORATIVE COOLING SYSTEM WITH (TRADITIONAL ELECTRIC COMPRESSOR COOLING SYSTEM. SMALL SPACE IN WALL - ONLY).

COMBINED - COOKER ABLE TO USE SOLAR THERMAL, BIOGAS AND FIREWOOD, BUILT INTO A KITCHEN DESK.

GREEN ZONES.



CLIMATIC ZONES.

THIS PROPOSAL WILL NECESSARILY FOR THE TIME BEING HAVE TO BE LIMITED TO CERTAIN CLIMATIC ZONES.
MAIN EMPHASIS SHOULD BE PLACED ON THE HOT DRY ZONES, WHERE HEAVY MATERIALS LIKE MUD ARE COMMON AND PRACTICAL IN ZONES WITH LITTLE OR NOE EARTHQUAKE ACTIVITY.
A TYPICAL EXAMPLE CAN BE THE SAHEL AREA - F.EX. MALI.
ALSO COLD DRY ZONES CAN BE INTERESTING FOR THE PRESENT PROPOSAL - ESPESIALLY SINCE THE PASSIVE SPACE HEATING POSSIBILITY CAN BE USEFUL IN IMPROVING HEALTH CONDITIONS.
A TYPICAL EXAMPLE CAN BE THE COLD PARTS OF NEPAL, AND THE MOUNTAIN AREAS OF SRI LANKA WHERE DAYS ARE WARM AND SUNNY AND NIGHTS ARE FREEZING.
THE PRINCIPLES CAN IN A MORE MODIFIED FORM BE APPLIED IN OTHER ZONES LIKE THE WET AND WARM ONES.

NOTE THAT THIS PROPOSAL IS SHOWING PRINCIPLES ONLY. FROM HERE DEVELOPMENT AND ADJUSTMENT IS NECESSARY.

2 - STEP BY STEP PROCESS.

GREEN BELTS AND HOUSING ALTERNATING.

IN DEVELOPING A SLUM INTO A SELF- CONTAINED SOLAR COMMUNITY, AREA BY AREA BHOULD BE DEVELOPED IN BTAGES. PEOPLE COULD BE MOVED INTO TEMPORARY SHELTER WHERE THEY CONTINUE TO FUNCTION UNTIL THE DEVELOPED AREA IS ABLE TO ACCOMODATE THEM. THE TEMPORARY SHELTER CAN BE USED OVER AND OVER AGAIN AS AREA AFTER AREA IS DEVELOPED.WORK AND HOUSING IS THEREBY IN CLOSE VICINITY. FROM THIS STEP BY STEP PROCESS. COMFORTABLE, HEALTHY AND CHEAP HOUSING CAN RESULT, BASED ON HELP TO SELF HELP PRINCIPLES.

PLANNING FOR PEOPLE

PLANNING FOR PEOPLE INVOLVES TWO MAIN STEPS :

1. GIVE UP MOST TRADITIONAL PLANNING CONCEPTS RELATED TO THE PHYSICAL ENVIRONMENT.
2. BEGIN AT THE BEGINNING AGAIN. ASK HOW PEOPLE LIVE. WHAT THEY WANT AND WHAT PROBLEM THEY HAVE THAT NEED SOLVING.
   SUCH QUESTIONS WILL PROBABLY SHOW THAT PEOPLE ARE WILLING TO CONTRIBUTE WITH THEIR LABOUR AND TIME. THAT THEY ARE WILLING TO WORK IN A STEP BY STEP PROCESS AND THAT THEY WANT HELP TO SELF HELP MEANS.
3. INVEST IN THE DEVELOPMENT OF THE LOCAL PEOPLES'S OWN IMAGINATION.

THE ARCHITECT CAN BE IMPORTANT HERE - AS INTERPRETER, PLANNER AND DESIGNER SETTING UP THE OVERALL FRAMEWORK WITHIN WHICH PEOPLE CAN SOLVE THEIR OWN HOUSING PROBLEMS STEP BY STEP.

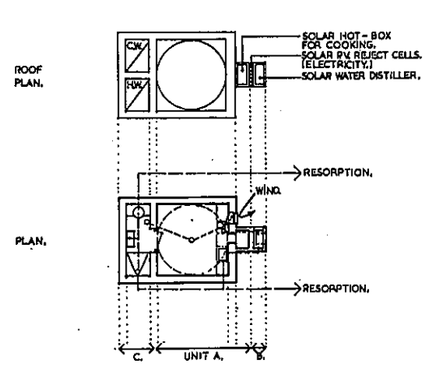
THE KEY SLOGANS AND POINTS OF DEPARTURE SAHOULD BE :

- PLANET IN PERIL.
- A BLUEPRINT FOR SURVIVAL.
- CONCLUSIONS OF "THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT".
- GLOBAL 2000 REPORT

- DESIGNINGS FOR THE REAL WORLD.
- REVIVAL OF THE EARTH TRADITION.
- RESCUING EXCELLENT OLD IDEAS FROM OBLIVION.
- KNOWLEDGE OBSCURED IN THE PAST MUST COME TO LIGHT AGAIN.

STEP BY STEP.

PLAN.



FULLY DEVELOPED VERSION.

NATURE' COMPLETE HOME BUILDERS KIT.

3 - HELP TO SELF HELP PROCESS.

PUBLIC CONTRIBUTION.

THERE ARE NOT ENOUGH GOVERNMENT OFFICERS IN THE WORLD TO ORGANISE THE HUGE PLANNING AND BUILDING WORK THAT IS NEEDED IN ORDER TO SUPPLY PROPER HOUSING FOR ALL PEOPLE. TRADITIONAL CENTRALISED PUBLIC STEERING IS THEREFORE NOT ENOUGH.
THE PUBLIC TASK WILL - DUE TO LACK OF CAPACITY - HAVE TO BE LIMITED TO SUPPLYING SATISFACTORY INFRASTUCTURE - IF NEEDED - AND HAVE AN OVERALL VIEW OF DEVELOPMENT.
THE PUBLIC TASK WILL FURTHERMORE BE OF A FINANCING NATURE AND OF A LOAN-ORGANISING NATURE.

PRIVATE

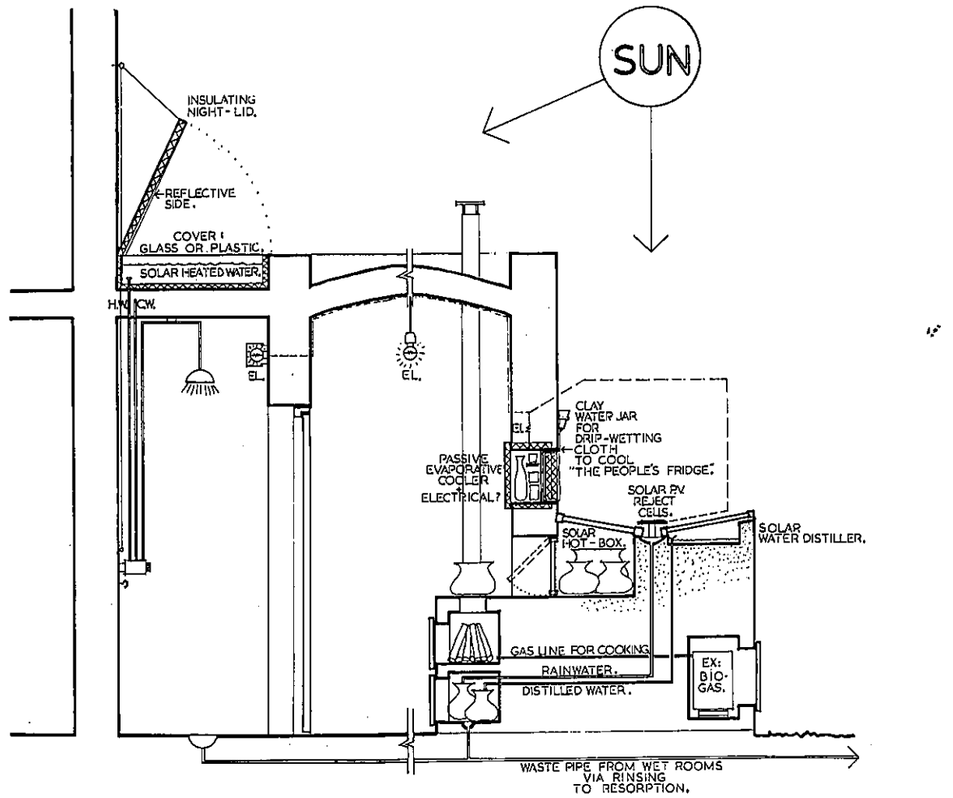
THE PRIVATE CONTRIBUTION HAS AN ENOURMOUS POTENSIAL. LABOUR INTENSIVE SOLUTIONS ARE THEREFORE VALUABLE AND PREFERABLE.
THE LEVEL OF TECHNOLOGICAL KNOWLEDGE MUST BE REFLECTED IN THE SOLUTIONS THAT ARE SOUGHT.
THE NUMEROUS HOMELESS IN THE WORLD HAVE TO GET MORE INVOLVED IN BUILDING THEIR OWN HOMES IN THE FUTURE.
TO DO THIS THEY WILL NEED PLANNING, INFRASTRUCTURE AND KNOWLEDGE SUPPLIED AND TRANSFERRRED BY THE PUBLIC.

FINANCE.

NEW LEGAL AND FINANCIAL SOLUTIONS HAVE TO BE SOUGHT. POSSIBLY BY MAKING THE LOCAL TRADESMEN INTO A "BANK". LOANS HAVE TO BE ESTABLISHED FOR HOUSING AND ENERGY. INSTEAD OF PEOPLE SPENDING MONEY EVERY DAY TO PAY FOR FIREWOOD, THEY COULD GO TO THE "BANK" AND PAY INTEREST AND DOWNPAYMENT ON A SOLAR COOKING SYSTEM OR ON A SOLAR CELL BYSTEM FOR ELECTRICITY-PRODUCTION FOR LIGHTING OR EX. COOLING FOOD.
OR - TO PAY FOR MATERIALS ONLY - SO THAT THEY CAN BUILD THEIR OWN SYSTEMS.
CHEAP PUBLIC LOANS CAN THUS HELP THE POOR AND THE HOMELESS.
ALL THIS IS A MATTER OF ORGANISING ONLY, AND IT IS THIS KIND OF ORGANISING THAT THE PUBLIC SHOULD BE DOING.

COMMUNICATION.

COMMUNICATION AND INFORMATION ABOUT HOW THE AVERAGE MAN SHOULD GO ABOUT BUILDING HIS OWN HOUSING CAN BE SOLVED BY USING MODERN MEDIA TECHNIQUES.
VIDEOS FOR INSTRUCTION WITH LARGE SCREENS FOR SHOWING CAN NOW BE PUT UP ALMOST EVERYWHERE DUE TO THE GREAT POSSIBILITY OF USING SOLAR ELECTRICITY FOR POWERING FILM EQUIPMENT.
IT WOULD PROBABLY HAVE A GREATER EFFECT IF THE PUBLIC FINANCED SUCH COMMUNICATION SYSTEMS FOR THE TRANSFER OF KNOWLEDGE INSTEAD OF ACTUALLY BUILDING AND PAYING FOR THE HOUSE ITSELF - WHILE THE PEOPLE THEMSELVES SIT AROUND WATCHING WITH THEIR FOLDED HANDS IN THEIR LAPS.
THE ESTABLISHMENT OF MOVEABLE "KNOWLEDGE CENTRES" WHERE LEAFLETS AND FILMS CAN BE SHOWN AND BORROWED COULD BE VERY USEFUL IN CONVEYING MESSAGES/IDEAS/INSTRUCTIONS.



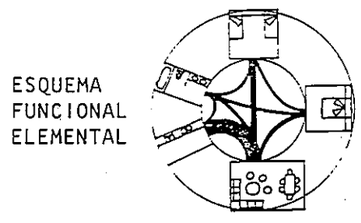
FULLY DEVELOPED VERSION.

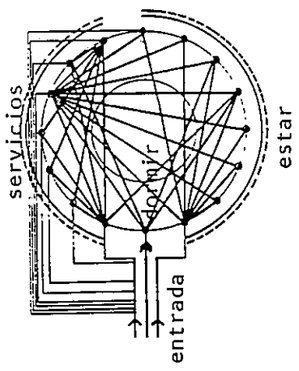
1934 1941

SECTOR V

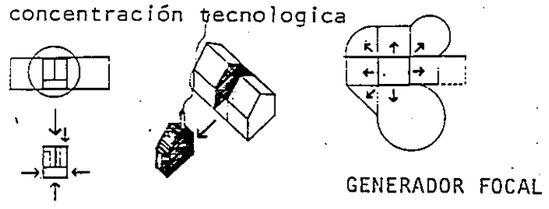
"Al margen de los gobiernos y los técnicos, y casi siempre con su oposición, las masas populares han construido en los últimos años varios millones de viviendas improvisadas con su propio esfuerzo. Si bien es cierto que esta iniciativa se ha traducido en el surgimiento de extensas barriadas marginales (callampas, favelas, villas miserias, rancherios), no lo es menos que ellas representan una formidable fuerza creadora, una evidente capacidad de inversión y una notable capacidad de organización y de acción que pueden y deben ser incorporadas a las politicas de vivienda. Aun cuando no existan muchos estudios que permitan una cuantificación en términos económicos de este esfuerzo colectivo, la observación directa permite pensar que sólo el volumen de materiales y de mano de obra empleados en estas barriadas marginales significa un aporte potencial de tanta significación que bien podrian constituir la base de la politica y la acción nacional para estos sectores.
Rubén D. UTRIA.(El problema de la vivienda y el desarrollo de la América Latina).

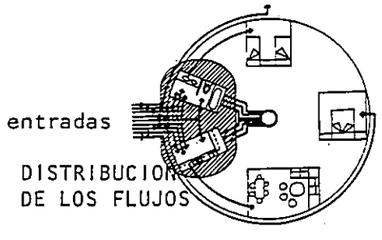
Los pueblos, el hombre siempre, en cualquier circunstancia y por lo general por sus propios medios, ha construido su recinto habitable (zona vivencial) lo que no ha podido resolver solo, o le ha significado un esfuerzo mucho mayor, tanto por no depender de él como por su complejidad y costo son aquellos servicios y áreas específicas, que además de proveerlo de confort y calidad de vida, constituyen la base de la higiene y de la salud privada y pública.

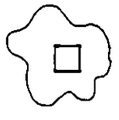




INTERACCION Y FLUJOS ENTRE FUNCIONES DE LA VIVIENDA Y SU RED DE ABASTECIMIENTO.....



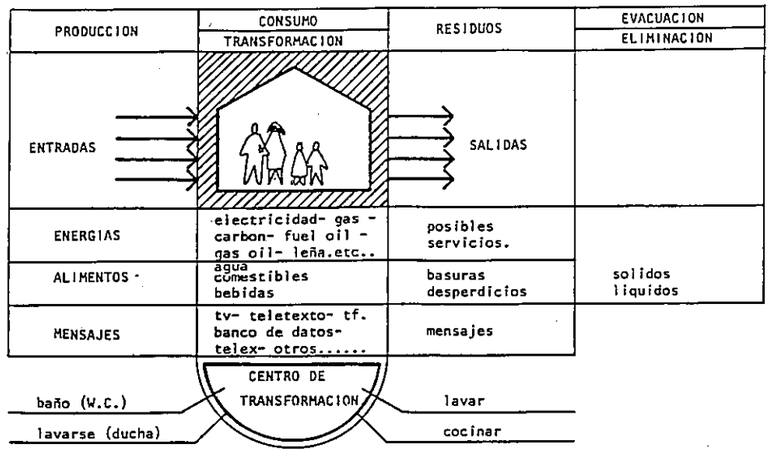


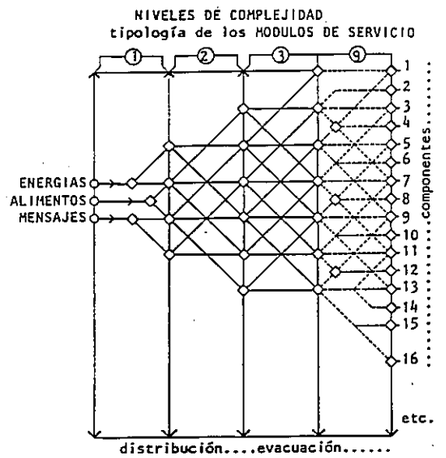


EL NUCLEO (Módulo de servicio). Los espacios vivenciales.

PRINCIPIOS DE LA PROPUESTA

Se trata de facilitar la construcción de un máximo de viviendas de interés social a un mínimo costo.
Analizando en profundidad el hecho funcional constructivo de la vivienda, y su comportamiento en las más variadas tipologias, resulta siempre una situación común; parte de ellas, los servicios, porcentualmente la zona más conflictiva, pequeña y cara, contiene componentes complejos que dificultan y encarecen su producción requiriéndo para su realización una mano de obra cualificada.
Los restantes espacios vivenciales que conjuntamente configuran la vivienda cuantitativamente más amplios y constructivamente simples de realizar no requieren una mano de obra cualificada.





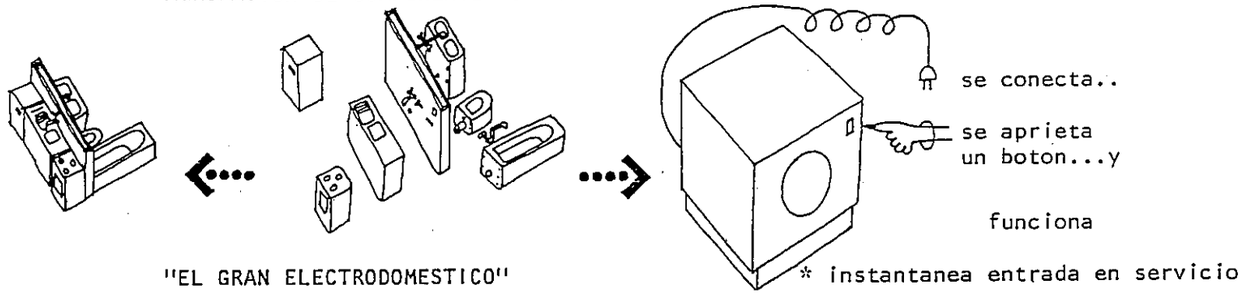
Toda vivienda está formada por dos tipos distintos de espacios funcionales, interrelacionados.

A) DE SERVICIO (Baño-Cocina)(vestibulo distribuidor).
Reunen e incorporan tecnologia compleja: entradas-transformación de energia, procesado de alimentos y ropa y evacuación de materias no asimilables (uso universal-indiferente al entorno-industrializable).

B) VIVENCIALES (Estar-Comedor-Dormitorios-Terrazas)
Simples de realizar. Adecuados al entorno, al medio físico social y familiar. Resolución Artesana, puede ser industrial.

PROPONEMOS
Concentrar los requerimientos de tecnologia compleja, simplificarlos, producirlos industrialmente y ponerlo en obra volumétricamente empaquetados y terminados.

AGRUPACION DE COMPONENTES COMPLEJOS



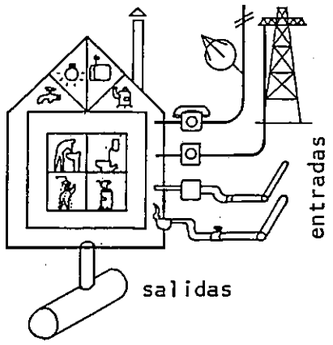
Modulo de servicio = Generador focal de viviendas

La vivienda se configura, adapta y crece alrededor del Módulo de servicio que queda envuelto por los recintos vivideros.

En este proceso intervienen una serie de productos, artilugios y aparatos que obligan a la utilización de una TECNOLOGIA PUNTUAL especialmente compleja, que exige el empleo de mano de obra cualificada y medios industriales especializados para su construcción.
COMO ES?
Unidad tecnológica compacta como un gran ELECTRODOMESTICO

Se fabrica en serie
Se transporta
Se conecta
FUNCIONA sin la intervención de especialistas

COMPONENTES (Tubos, manguitos, válvulas, llaves, grifos, cajas, registros, reguladores y mecanismos universales) puede ser muy primario y simple (agua y fosa séptica) hasta complejo y sofisticado.
AGLUTINANTES: Unidades complejas elaboradas, inodoro, lavabo, cocina, central de alarma, circuitos impresos, teleprocesos, etc.



ACTIVIDADES UNIDAD COMPLEJA

LA TECNOLOGIA

información..
alimentos....
agua.....
energía.....
otros.....

procesado → DESPERDICIOS...

LA FUNCIONALIDAD

accesos.....

dormir
servicios
circular
estar

EL CORAZON TECNOLOGICO FUNCIONAL

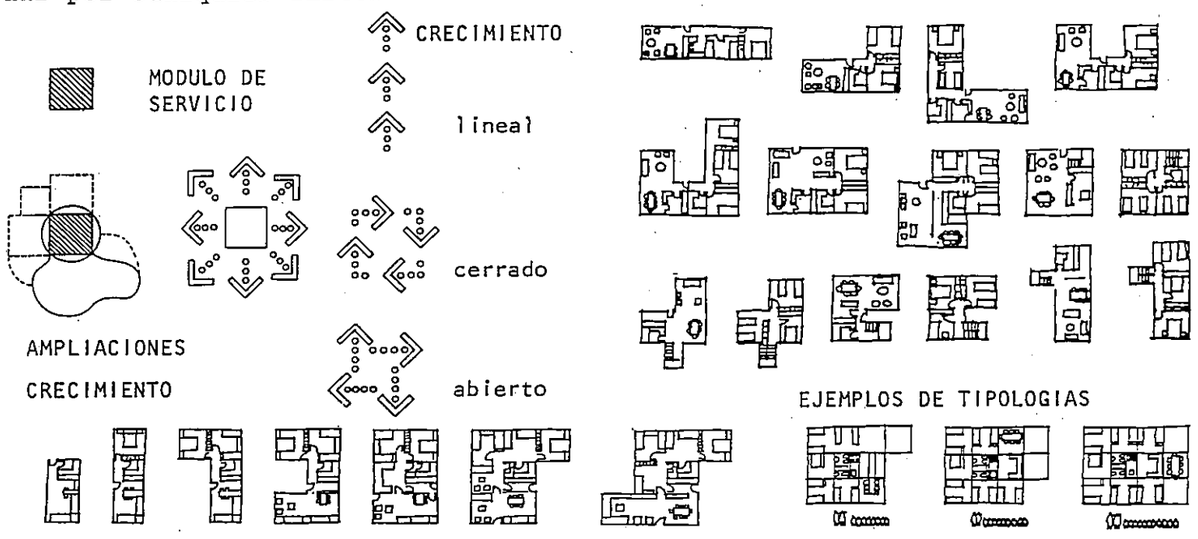
EL MODULO DE SERVICIO

OBJETIVOS DE LA PROPUESTA

Se debe establecer en cada caso concreto una ESTRATEGIA adecuada que permita optimizar los rendimientos y la productividad en función de las posibilidades económicas, humanas, territoriales, etc.

El MODULO DE SERVICIO por principio es un GENERADOR FOCAL DE VIVIENDAS y puede servir en la AUTOCONSTRUCCION como elemento de apoyo que tiene resueltos los aspectos más complejos.

EN LA CONSTRUCCION POR EMPRESAS facilita y agiliza la realización de viviendas por cualquier sistema o técnica constructiva.



Ejemplos de crecimiento a partir del MODULO DE SERVICIO

ADAPTABILIDAD Y CRECIMIENTO

A continuación se enuncian algunas de las ventajas más significativas que pueden derivarse del empleo del "Módulo de Servicio" como generador focal de viviendas.

SOCIALES: Posibilita el acceso a una vivienda digna a vastos sectores sin recursos.

INDUSTRIALES: Normalización, seriación, recambios, control de calidad, control de precio, etc..

LABORALES: Asegura máximo empleo de mano de obra local, no cualificada.

EMPRESARIALES: Admite la participación de la Empresa constructora tradicional conjuntamente con pequeñas y medianas empresas locales.

COMERCIALES: Asistencia técnica, promoción, venta a plazos, seguros, etc.

ECONOMICAS: La rapidez de implantación y entrada en servicio aseguran un importante ahorro en relación al precio total de la vivienda.

POLITICAS: Con el presupuesto disponible, a nivel gubernamental se amplia el número de beneficiarios al aportar el núcleo de la futura vivienda. La continuación de las mismas genera puestos de trabajo.

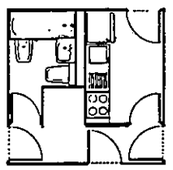
SANITARIAS: Permite ejercer un mayor control higiénico-sanitario sobre la población, asegurando la salud privada y pública.

CONSTRUCTIVAS: Admite y promueve el uso de materiales y técnicas propias de cada región no entrando en conflicto con las tradiciones culturales y ambientales.

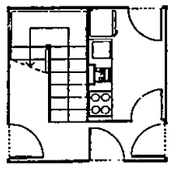
TRANSPORTE: Admite la máxima flexibilidad en función a las necesidades, con un radio de acción ilimitado, pudiendo llegar a sitios dificilmente accesibles.

ADAPTABILIDAD: El conjunto de componentes puede según las necesidades formar una unidad compacta o agruparse en núcleos parciales para facilitar su adaptabilidad a cada necesidad.

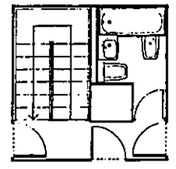
PRECIO: La producción en serie reduce los costos. La variedad de modelos y posibilidades le permiten adaptarse a todo tipo de recursos.



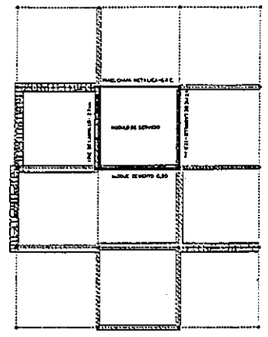
MODULO TIPO I



MODULO TIPO II PLANTA BAJA



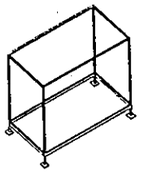
MODULO TIPO II PLANTA ALTA



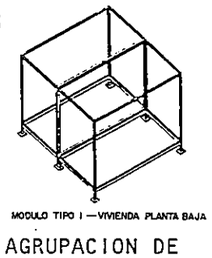
EJES MODULARES Y POSIBILIDADES DE CRECIMIENTO CON DISTINTOS MATERIALES A PARTIR DEL MODULO DE SERVICIO EL CUAL ESTA A SI MISMO PREVISTO PUEDE SER REALIZADO CON MATERIALES DIFERENTES

FICHAS DE DISEÑO

MODULOS PRIMARIOS

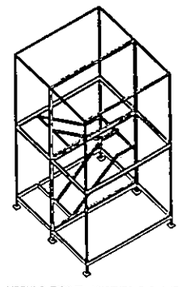


UNIDAD BASICA



MODULO TIPO I —VIVIENDA PLANTA BAJA

AGRUPACION DE UNIDADES ELEMENTALES



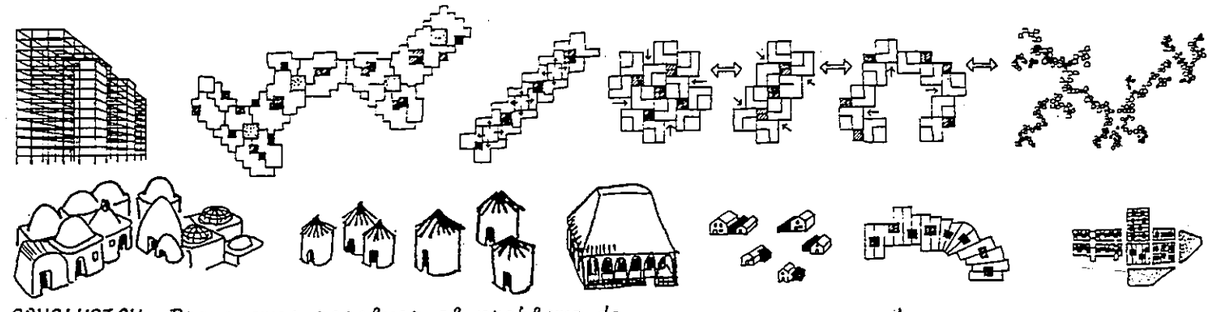
MODULO TIPO II—VIVIENDA 2 PLANTAS

APILADO-UNIDAD VERTICAL

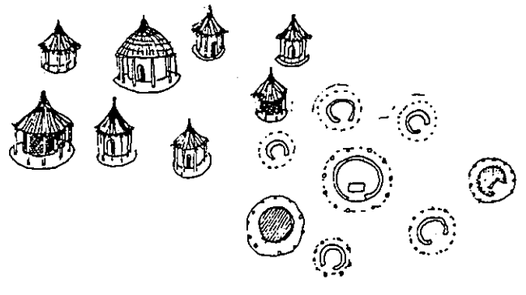
MODULACION EN EL CRECIMIENTO TIPO ORTOGONAL.....

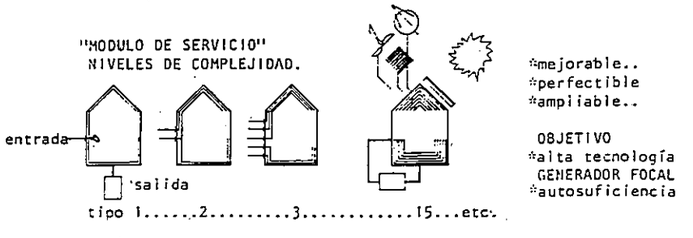
AMBITO DE LA PROPUESTA - UNIVERSAL

Este concepto es totalmente flexible, permitiendo adaptarse a diferentes requerimientos, tanto topográficos, climáticos, etc., como culturales, de costumbres y de rehabilitación, donde la carencia de servicios es mas evidente.



CONCLUSION: Proponemos resolver el problema de la vivienda, realizando lo complejo y especializado, mediante la UNIDAD FOCAL TECNOLOGICA y permitiendo un crecimiento espontaneo, con multiples posibilidades de materialización.





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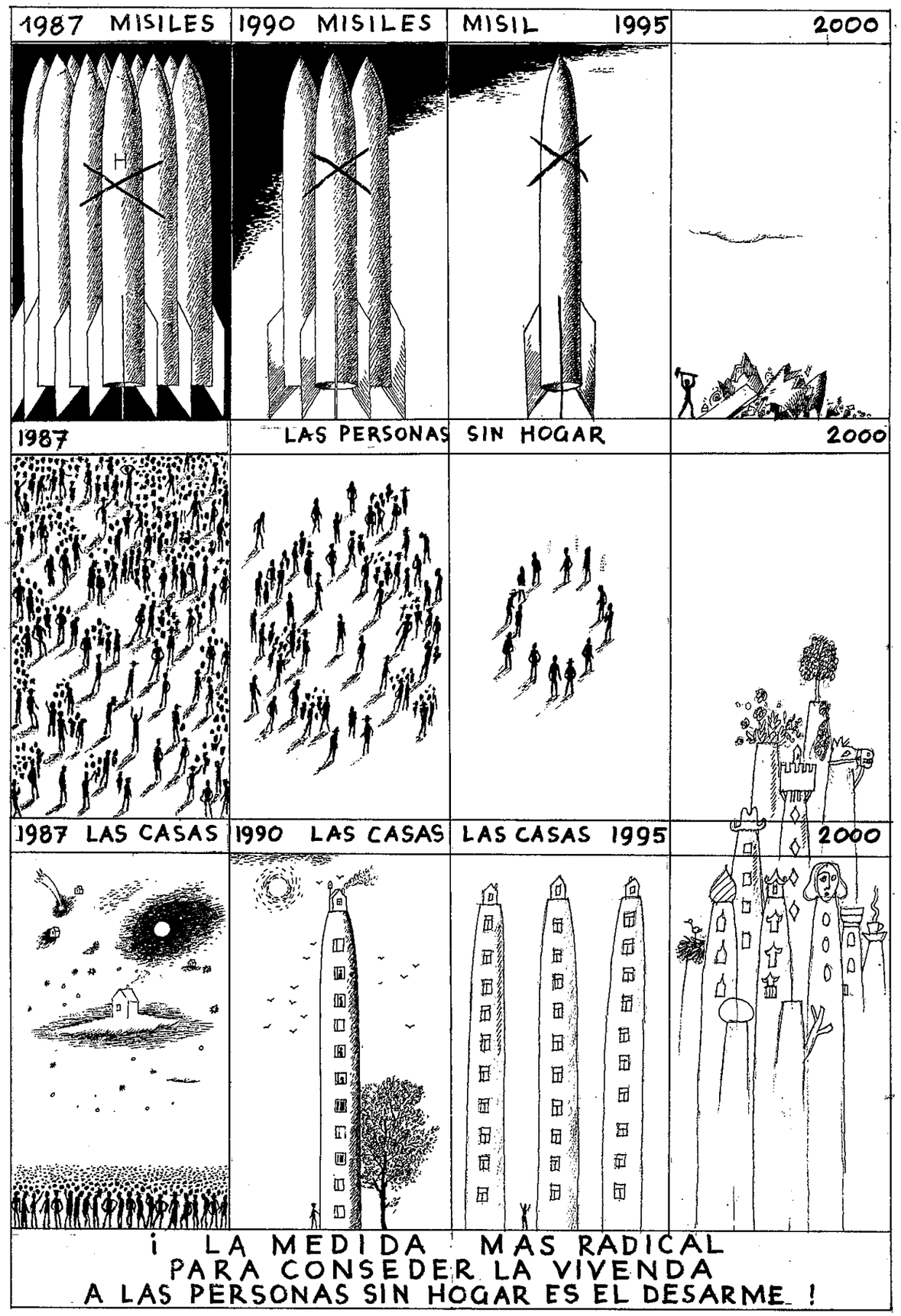
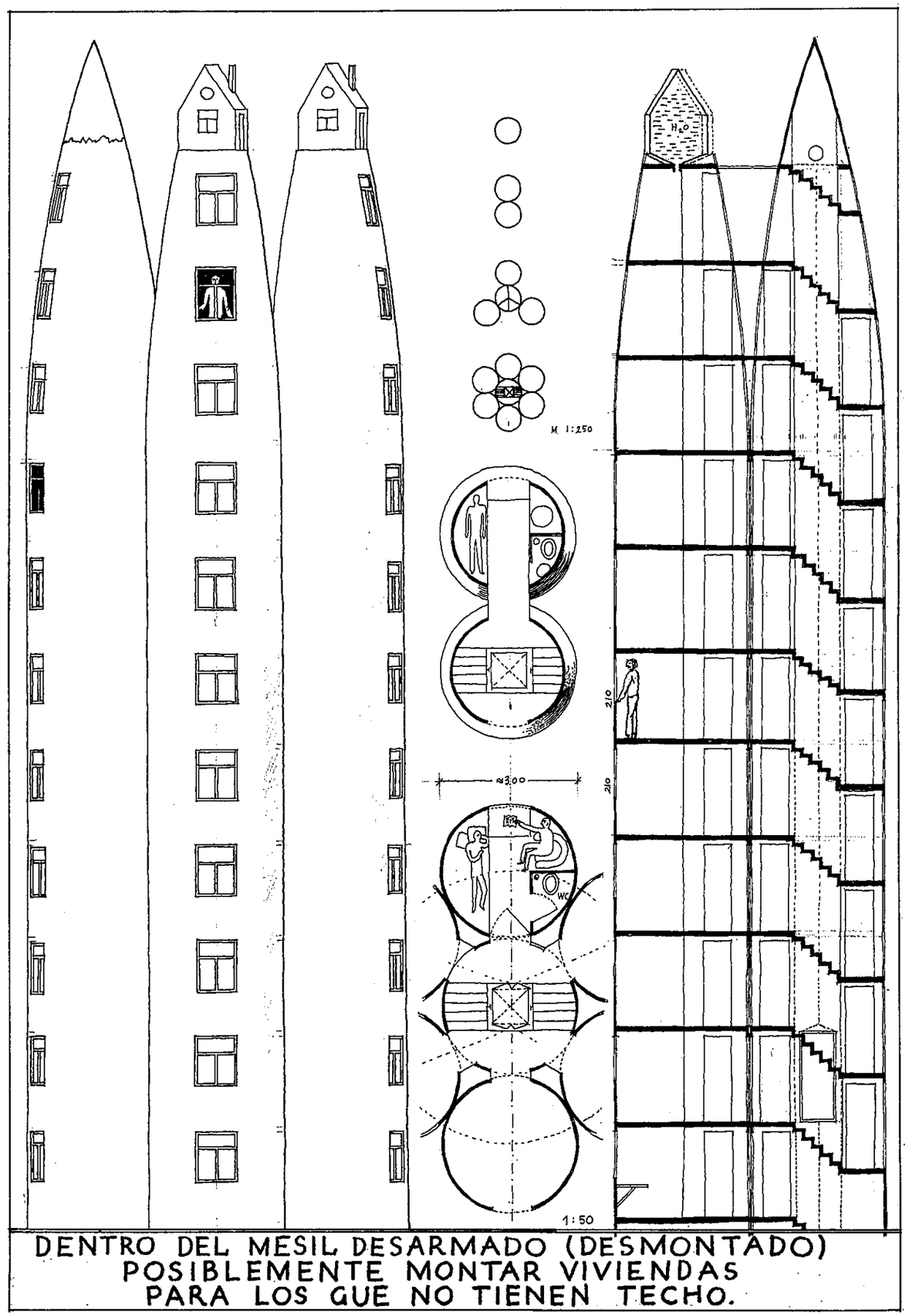

1987 MISILES
1990 MISILES
MISIL 1995
2000
1987
LAS PERSONAS SIN HOGAR
2000
1987 LAS CASAS
1990 LAS CASAS
LAS CASAS 1995
2000
¡ LA MEDIDA MAS RADICAL
PARA CONSEDER LA VIVENDA
A LAS PERSONAS SIN HOGAR ES EL DESARME !


M. 1:250
≈3.00
210
210
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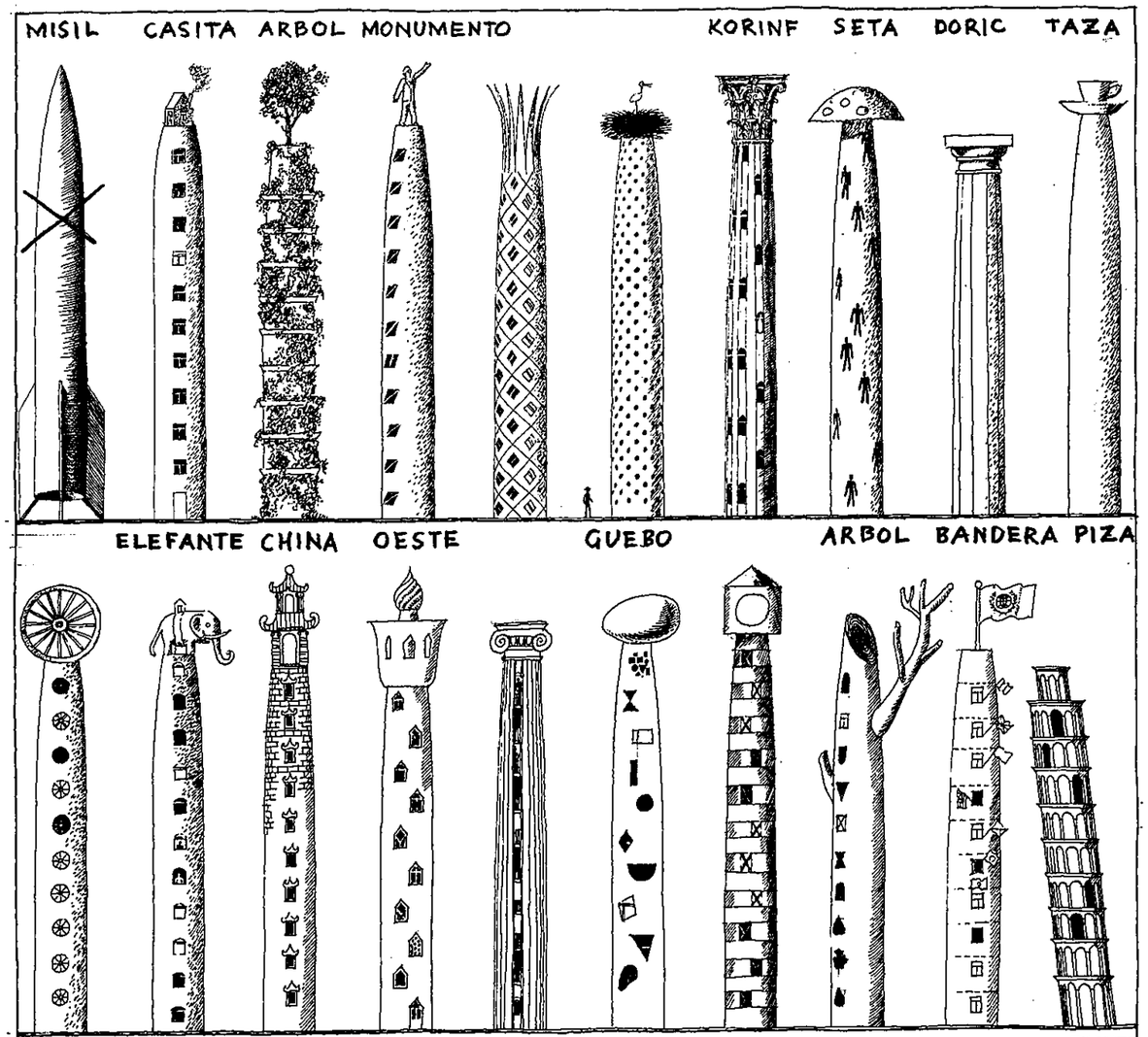
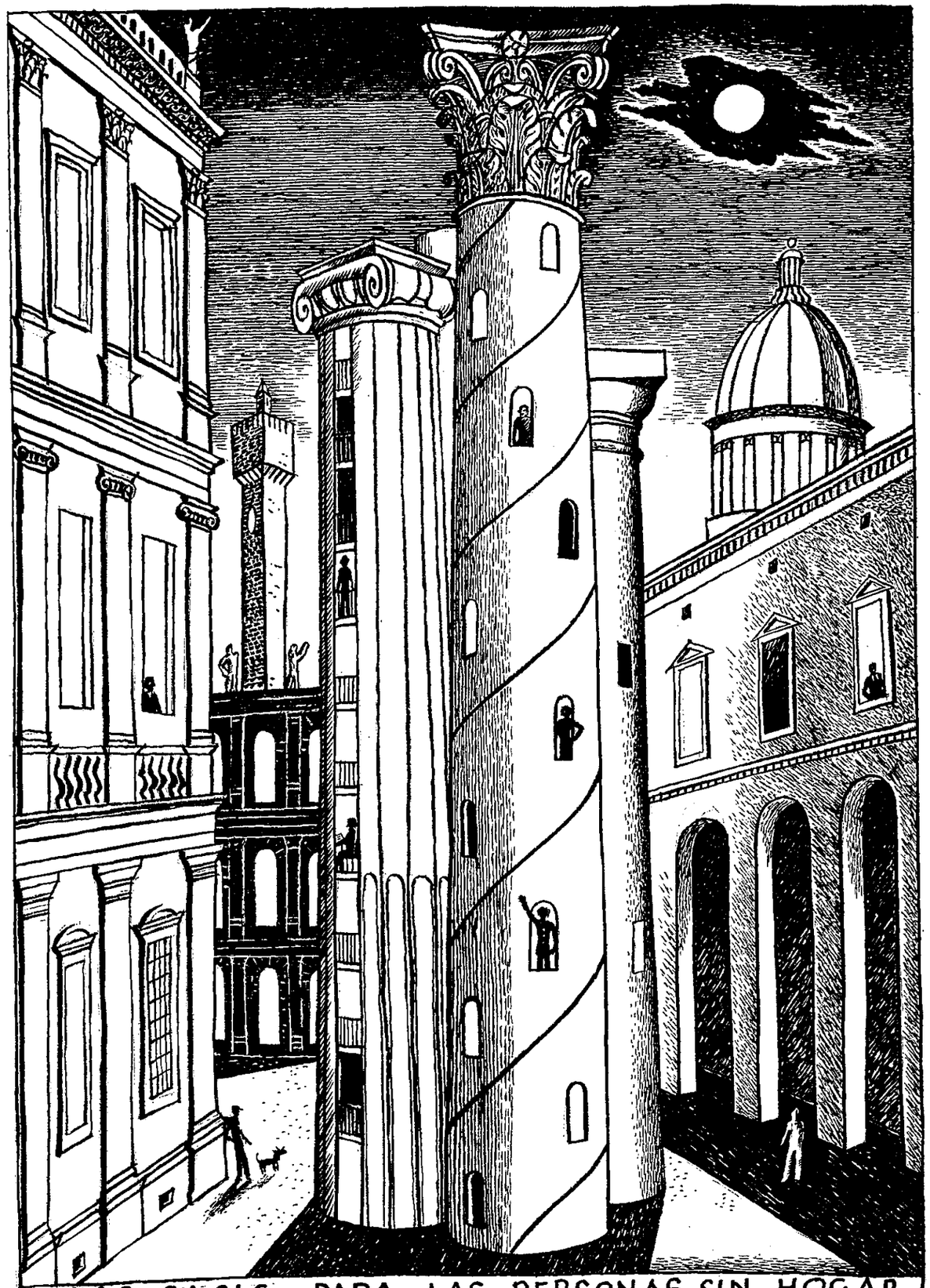
DENTRO DEL MESIL DESARMADO (DESMONTADO)
POSIBLEMENTE MONTAR VIVIENDAS
PARA LOS QUE NO TIENEN TECHO.



EL ASPECTO ARQUITECTONICO DE ESTAS VIVIENDAS PUEDE SER DIFERENTE.

ESTAS VIVIENDAS CONSTRUIDAS DENTRO DE LOS MISILES SERAN COMO UN MONUMENTO ETERNO A LA VICTORIA OBTENIDA POR LA PAZ SOBRE LA GERRA Y LA MISERIA.



LAS CASAS PARA LAS PERSONAS SIN HOGAR CONSTRUIDAS DENTRODE LOS MISILES EN UNA SIUDAD EUROPEA

AWARDS

Diplomas:

12345678 University of Sciences and Technologies of Huazhong:
Sun Minghui, Long Yuan, Wu Ming, Huang Jie. THE PEOPLE'S REPUBLIC OF CHINA.

22223333 Luis Bravo Heitmann, Luis Bravo Zehnder, Pedro Bravo Zehnder. CHILE.

11111111 Hansruedi Bolliger, Daniel Dubs. SWITZERLAND.

64636034 Nikolaus Griebel, Silke Hermann, Ute Herzog, Ullrich Weber. GERMAN DEMOCRATIC REPUBLIC.

64321684 Abdel Wakil El-Wakil. ARAB REPUBLIC OF EGYPT.

Mentions:

13577531 Eliseo Guzmán Negrón, Emilio Luisoni Prada. PERU.

22560902 Michael A. Belov, Katrin A. Belova. USSR.

63747287 Marcelo Roberto Martinelli, Ricardo Alberto Trovant. ARGENTINA.

25025719 Peter Haugan, Bjarne Frederiksen, Ulla Egebjerg. SWEDEN.

58345231 Moges W. Grabriel, Nikolaus Griebel, Reiner Rietsch, Sabine Wendt. GERMAN DEMOCRATIC REPUBLIC

19421955 Aspasie Kamberou, André Scobeltzine. FRANCE.

26038700 Harald N. Rostvik. NORWAY.

19341941 Enrique Fernán Bravo Cartabio, Ricardo Novaro Bocco. SPAIN.

Special Mention:

18181817 Serjio Barjin, Elena Kozelcova. USSR.

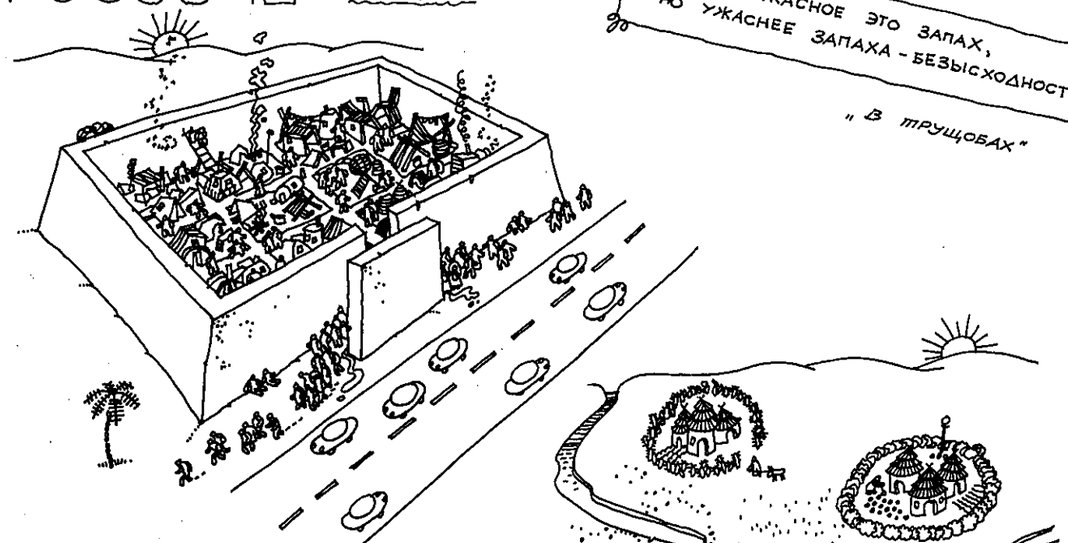
Cáceres, 22nd May 1987.

SECTION I

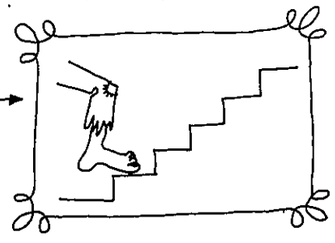
секция 1

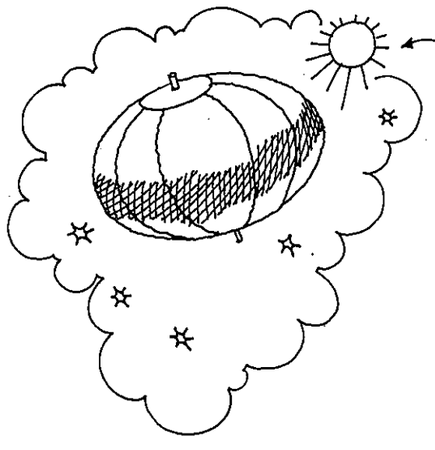
„ САМОЕ УЖАСНОЕ ЭТО ЗАПАХ,
НО УЖАСНЕЕ ЗАПАХА - БЕЗЫСХОДНОСТЬ "...

„ В ТРУЩОБАХ "



В ТЕ ЖЕ ГЕОГРАФИЧЕСКИЕ ШИРОТЫ ЕСТЬ И ДРУГОЙ ВИД НИЩИЕ ЛЮДИ - ЭТО КРЕСТЬЯНЕ.
ИХ ЖИЗНЬ В ОБЩЕМ ТАК ТЯЖЕЛА, КАК И БЫЛА 2000 ЛЕТ ТОМУ НАЗАД. НО ЖИЗНЬ ЭТА - ЭКОЛОГИЧЕСКАЯ. И ЕЩЁ - В ДЕЙСТВИТЕЛЬНОСТИ ОНА ТЕПЕРЬ ВОВСЕ НЕ ТАК БЕСПЕРСПЕКТИВНА КАК КАЖЕТСЯ: КУЧКА ХИЖИН МОГУТ ПРЕВРАТИТЬСЯ В МАЛЕНЬКУЮ ФЕРМУ.
А ВОТ ТРУЩОБА ОКРУЖЕННАЯ ТЫСЯЧАМИ ДРУГИХ ТРУЩОБ НЕ МОЖЕТ ПРЕВРАТИТЬСЯ В НИЧЕГО ИНОГО. ДАЖЕ ЕСЛИ В ЮТЯЩЕЙСЯ В НЕЙ СЕМЬИ КАКИМ ТО ЧУДОМ ПОЯВИЛИСЬ ДЕНЬГИ. ПОТОМУ ТО И БЕЗЫСХОДНОСТЬ.
В ОБЩЕМ ЦЕЛЬ НИЖЕИЗЛОЖЕННЫХ ИДЕЙ ПОДСКАЗАТЬ ВОЗМОЖНЫЙ ВЫХОД. И ПРЕЖДЕ ВСЕГО В ПСИХОЛОГИЧНО БЕЗДОМНЫХ. ТАК СКАЗАТЬ - КОМПРОМИСС МЕЖДУ ПРИВНЕСЕННОЙ ИЗВНЕ „ЦИВИЛИЗОВАННОЙ" ЖИЗНИ В БИДОНВИЛЯХ И ТРАДИЦИЮ ИДИЛЛИЧЕСКИХ ХИЖИН.
И ТАК КАК ПО НАЧАЛУ ЯСНО ЧТО ГОРОДА НЕ ЗАМЕНИТЬ ЭКОЛОГИЧЕСКИМ МИКРОФЕРМАМ ТО НАШЕ УСИЛИЕ ВЫГЛЯДИТ НЕСБЫТОЧНО ИЛИ С НИЧТОЖНЫМ ШАНСОМ УСПЕХА. И ВОПРЕКИ ВСЕМУ ЕСЛИ ОНО И ЕСТЬ ТА САМАЯ ПЕРВАЯ СТУПЕНЬ?...





ВСЕ МЫ ЗНАЕМ ЧЕГО НЕТ В ГЕОГРАФИЧЕСКИХ ШИРОТАХ БЕЗДОМНЫХ. НО ВСЕ ТАКИ ТАМ ЧТО ТО И ЕСТЬ - ЭТО
1. СОЛНЦЕ И
2. СВОБОДНЫЕ ПЛОЩАДИ
ЧЕГО НАДО ЕЩЁ ЛЮБОЙ ЦЕНОЙ:
ЧТОБЫ ИСЧЁЗ ЗАПАХ, УПОМЯНУТЫЙ В МОТО, НАДО ВОДЫ И КАНАЛИЗАЦИЮ;
ЧТОБЫ ИСЧЕЗЛА БЕЗЫСХОДНОСТЬ НАДО ПОРЯДОК ПОЗВОЛЯЮЩИЙ РАЗВИТИЕ
КАК ФИЛОСОФИЧЕСКИЙ И ПРОФЕСИОНАЛЬНЫЙ ПРИНЦИП МЫ ПРЕДЛАГАЕМ „ ЛИНИЮ " ВМЕСТО „ПЛОЩАДИ": ЛИНИЯ ЭТО ЗНАЧИТ: РИТМ, ПОРЯДОК, РАЗВИТИЕ.
ПЛОЩАДЬ - БЕЗЛИКАЯ, БЕЗНАДЕЖДНАЯ И ОТНЮД НЕБЕЗОПАСНАЯ...

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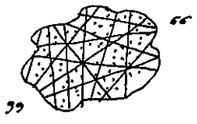
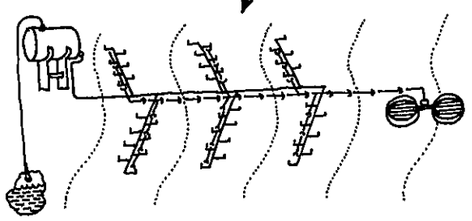
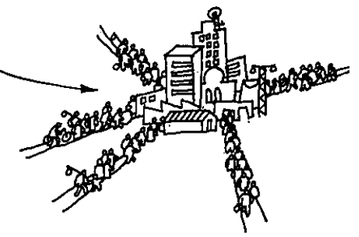
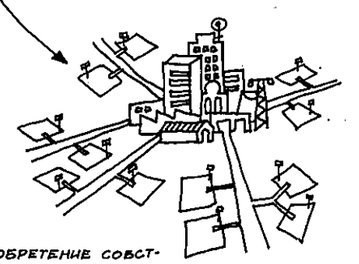
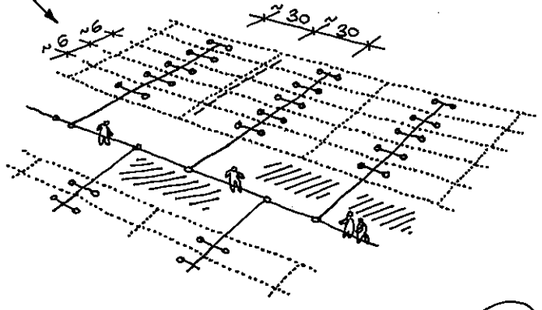


И ТАК КАК ГОРОД И В БУДУЩЕМ БУДЕТ ПРИВЛЕКАТЬ НЕ НАДО ДОПУСКАТЬ ЧТОВЫ „ПРИВЛЕЧЁННЫЕ" ОСАЖДАЛИ ГОРОДА ПЛОТНЫМ КОРДОНОМ ЛАЧУГ. А ТАМ ГДЕ ОСАДА ФАКТ - ЕЁ НАДО РУШИТЬ ПЛАНОМЕРНО И НЕОСТУПНО.
ВМЕСТО КОЛЬЦО ОКОЛО ГОРОДА - ЛУЧИ:
ОБОСОБЛЕННЫЕ НЕБОЛЬШИЕ ЖИЛЫЕ СТРУКТУРЫ - НАЗОВЁМ ИХ ПОСЁЛКАМИ - САТЕЛЛИТАМИ - НАХОДЯЩИЕСЯ В БЛИЗОСТИ С ЛУЧЕЙ СУЩЕСТВУЮЩИХ ТРАНСПОРТНЫХ МАГИСТРАЛ.
НАШИ ПРЕДЛОЖЕНИЯ:
ПЛОЩАДКИ ДЛЯ СТРОИТЕЛЬСТВА ОПРЕДЕЛЯЮТСЯ КОМПЕТЕНТНЫМИ ГОССУДАРСТВЕННЫМИ ОРГАНАМИ.
ПЛОЩАДКИ ОТВЕЧАЮТ СЛЕДУЮЩИМИ ОСНОВНЫМИ ТРЕБОВАНИЯМИ:
НЕДАЛЕКО ОТ ВХОДЯЩИХ АВТОМОБИЛЬНЫХ ПУТЕЙ;
НАЛИЧИЕ ВОДЫ ИЛИ НЕСЛОЖНЫЙ СПОСОБ ЕЁ ДОБИВАНИЯ;
ВОЗМОЖНОСТЬ ДЛЯ НЕДОРОГОГО ОСУЩЕСТВЛЕНИЯ КАНАЛИЗАЦИОННОЙ СЕТИ / БЛАГОПРИЯТСТВУЮЩИЕ НАКЛОН И ПОЧВА / ЗДОРОВЫЙ МИКРОКЛИМАТ И Т. Д.
НА ОПРЕДЕЛЕНЫХ ПЛОЩАДКАХ СООРУЖАЮТСЯ ВОДОПРОВОДНУЮ И КАНАЛИЗАЦИОННУЮ СЕТЬ ПРИМЕРНО ТАКИМ ОБРАЗОМ:
/ СРЕДСТВА ДЛЯ СООРУЖЕНИЮ ЭТОЙ МИНИМАЛЬНОЙ ИНФРАСТРУКТУРЫ ПРЕДСТАВЛЯЮТСЯ ГОССУДАРСТВОМ ИЛИ СПЕЦИАЛЬНЫМ МЕЖНАЦИОНАЛЬНЫМ ФОНДОМ/
ПЛОЩАДКИ ДЕЛЯТСЯ НА ПАРЦЕЛЛЫ / РАЗМЕР КАЖДОЙ ПАРЦЕЛЛЫ ПРИМ. 6/30 МЕТРОВ / И ПАРЦЕЛЛЫ ПРОДАЮТСЯ БЕЗДОМНЫМИ. ПЕРВОНАЧАЛЬНАЯ СТОИМОСТЬ ВОЗМОЖНО НИЖАЙШАЯ, А СРОК КРЕДИТА - ДЛИННЕЙШИЙ.
ДУМАЕМ ЧТО ИМЕННО АКТ ПРИОБРЕТЕНИЕ СОБСТВЕННОГО УЧАСТКА И ЕСТЬ ТА САМАЯ ПЕРВАЯ СТУПЕНЬ НАДЕЖДЫ.
ДУМАЕМ ЕЩЁ ЧТО ПРЕДЛОЖЕННАЯ НАМИ СХЕМА РЕАЛИСТИЧЕСКАЯ / НЕБОЛЬШАЯ ПЕРВОНАЧАЛЬНАЯ СТОИМОСТЬ /, ДАЁТ НЕЗАМЕДЛИТЕЛЬНЫЙ ЭФФЕКТ ПО ЧАСТИ ГИГИЕННИЧЕСКОЙ / СМ. МОТТО / И ПОДВЕРЖЕНА РАЗВИТИЮ.

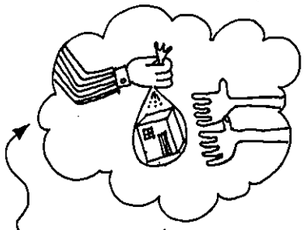




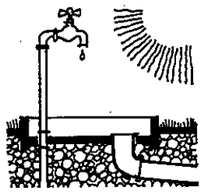


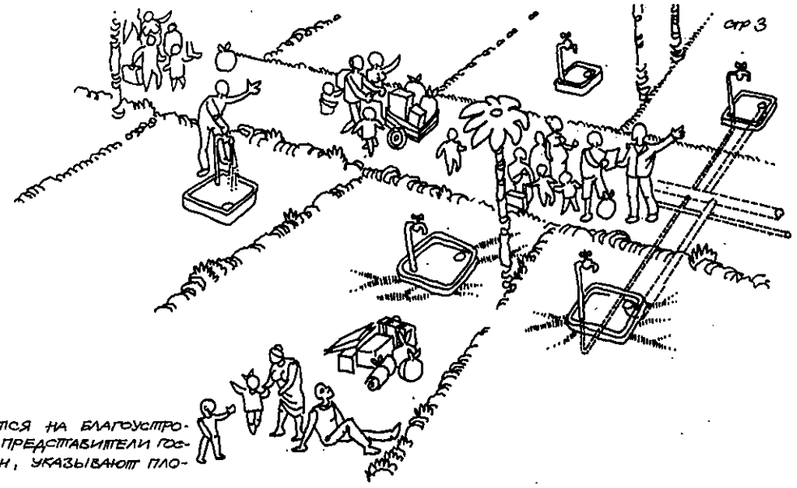


КАЖДЫЙ ПОСЕЛЕНЕЦ СМОЖЕТ:
ПОСТЕПЕННО СТРОИТЬ, РАЗШИРЯТЬ И УССОВЕРШЕНСТВОВАТЬ СВОЁ ЖИЛЬЕ В СООТВЕТСТВИИ С СВОИМИ ВОЗМОЖНОСТЬЯМИ И ПОНИМАНИЕМ;
РАЗРАБАТЫВАТЬ ПРИЛЕЖАЩИЙ К ДОМУ ОГОРОДИК И ПОЛУЧАТЬ НЕМНОГО ВИТАМИНОЗНОЙ ПИЩИ А ТАКЖЕ И НЕКОТОРЫЕ ЗЕМЛЕДЕЛЬЧЕСКИЕ НАВЫКИ.
САМЫЙ ПОСЁЛОК - САТЕЛЛИТ СМОЖЕТ ПОСТЕПЕННО, ПОВЫШАТЬ УРОВЕНЬ БЛАГОУСТРОЙСТВА ДО СТЕПЕНИ НОРМАЛЬНОЙ ТРАДИЦИОННОЙ ДЕРЕВНИ / ЭЛЕКТРИЧЕСТВО, УЛИЧНАЯ СЕТЬ, ЗЕЛЕННЫЕ НАСАЖДЕНИЯ, ДЕТСКИЕ САДЫ, ШКОЛЫ, СПОРТИВНЫЕ ПЛОЩАДКИ /
ВЕЛИЧИНА ОДНОГО САТЕЛЛИТНОГО ПОСЕЛКА? НЕ МЕНЬШЕ 2000 И НЕ БОЛЬШЕ 5000. ЭТИ ШИФРЫ БОЛЕЕ ПСИХОЛОГИЧЕСКОГО ЧЕМ ТЕХНИЧЕСКОВО ПОРЯДКА.
ЕСТЬ ОДИН ВОПРОС КОТОРЫЙ АРХИТЕКТОРЫ ВЕСЬМА НЕ ЛЮБЯТ. ЭТО ВОПРОС СТОЙМОСТИ. НО ИМЕННО В ДАННОМ СЛУЧАЕ ЕГО НЕ НАДО ИЗБЕЖАТЬ.
ДУМАЕМ ЧТО НА ОДНОМ УЧАСТИЕ ПОЛАГАЮТСЯ СЛЕДУЮЩИЕ ВИДЫ СТРОИТЕЛЬНЫХ РАБОТ ОК. 5 М. КАНАЛИЗАЦИОННОЙ ТРУБЫ Ф 10 СМ. ОК. 3 М. КАНАЛИЗАЦИОННОЙ ТРУБЫ Ф ПРИМ. 30 СМ. И НЕСКОЛЬКО САНТРИМЕТРОВ САНТИМЕТРОВ КОЛЕКТОРА. ТО ЖЕ САМОЕ КОЛИЧЕСТВО ВОДОПРОВОДНЫХ ТРУБ. В ОБЩЕМ ПРИМЕРНО 4-500 ДОЛЛАРОВ. ДОПОЛНИТЕЛЬНО: САНИТАРНАЯ ПЛОЩАДКА 120/120 СМ., АРТЕЗИАНСКИЙ КОЛОДЕЦ, ИЛИ ВОДОЁМ; ИНСТАЛАЦИЯ (БАССЕЙН) ДЛЯ ОЧИСТКИ СТОЧНЫХ ВОД (В ИДЕАЛЬНЫХ ЧАСТЯХ). ПОЛУЧАЕТСЯ СУММА НЕБОЛЬШАЯ - ПОРЯДКА 1000 ДОЛЛ.

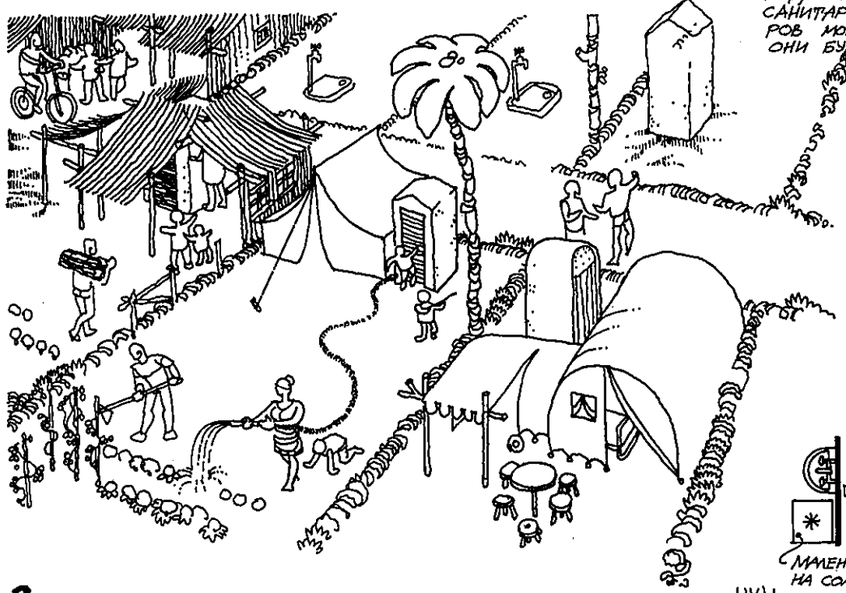


НЕ ТАК УЖ МНОГО. НО ЧТО ПОДУМАЮТ БЕЗДОМНЫЕ?
В ВСЯКОМ СЛУЧАЕ МЫ ДУМАЕМ, ЧТО ЕСЛИ ЭТО И БЫЛО ВОЗМОЖНО, РАЗДАЧА ГОТОВЫХ, УНИФОРМЕННЫХ УПАКОВАНЫХ ДОМОВ / КАК РАЗДАЧА ПИЩИ ДЛЯ ГОЛОДАЮЩИХ / НЕ РЕШИТЬ ПРОБЛЕМА.
А ЗАМЕНИТЬ ЕГО ИНЫМ.
МОЖЕТ БЫТЬ БОЛЕЕ ТРЕВОЖНЫМ.

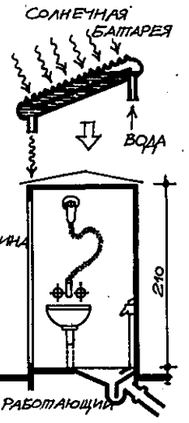




1. ДЕНЬ ПЕРВЫЙ...
ТЫСЯЧИ БЕЗДОМНЫХ УЖЕ НАХОДЯТСЯ НА БЛАГОУСТРОЕННЫХ ПАРЦЕЛЯХ. ОТВЕТСТВЕННЫЕ ПРЕДСТАВИТЕЛИ ГОСУДАРСТВА, А МОЖЕТ БЫТЬ И ООН, УКАЗЫВАЮТ ПЛОЩАДКИ ИХ БУДУЩИХ ДОМОВ....



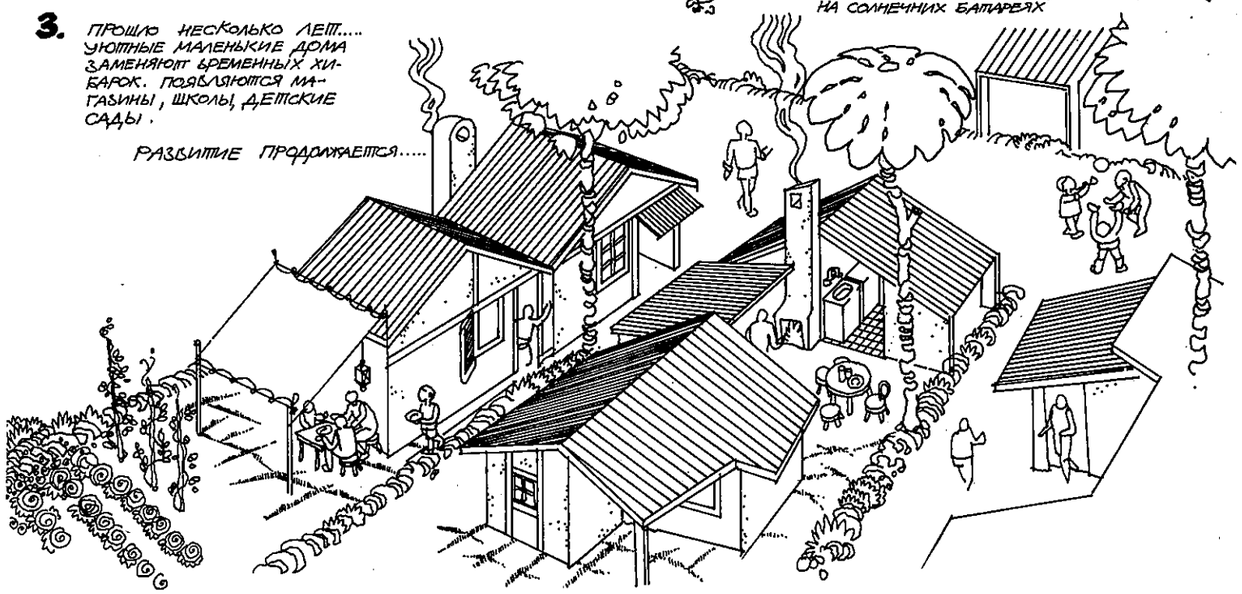
2. ПРОШЛО НЕСКОЛЬКО НЕДЕЛЬ....
ВОЗНИКЛИ ПЕРВЫЕ ПАЛАТКИ И ЛЕГКИЕ, САМОДЕЛЬНЫЕ ДОМА ИЗ МЕСТНЫХ МАТЕРИАЛОВ САНИТАРНЫЕ КАБИНЫ МИНИМАЛЬНЫХ РАЗМЕРОВ МОГУТ БЫТЬ ДОСТАВЛЕНИ НА МЕСТЕ. ОНИ БУДУТ НЕДОРОГИ В РЕЗУЛЬТАТЕ МАССОВОЙ ПРОМЫШЛЕННОЙ ПРОДУКЦИИ



МАЛЕНЬКИЙ ХОЛОДИЛЬНИК, РАБОТАЮЩИЙ НА СОЛНЕЧНЫХ БАТАРЕЯХ

3. ПРОШЛО НЕСКОЛЬКО ЛЕТ.... УЮТНЫЕ МАЛЕНЬКИЕ ДОМА ЗАМЕНЯЮТ ВРЕМЕННЫХ ХИБАРОК. ПОЯВЛЯЮТСЯ МАГАЗИНЫ, ШКОЛЫ, ДЕТСКИЕ САДЫ.

РАЗВИТИЕ ПРОДОЛЖАЕТСЯ.....



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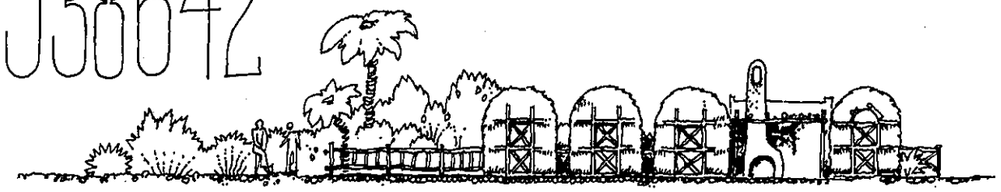

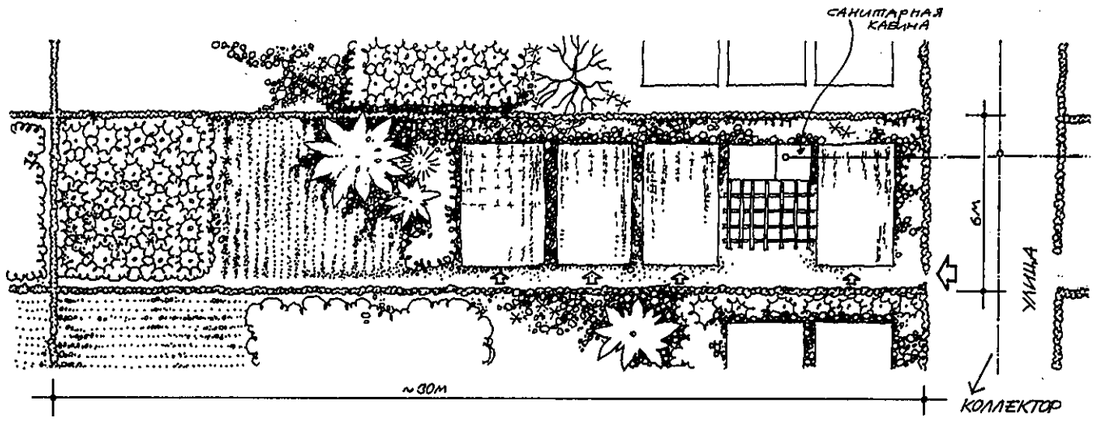

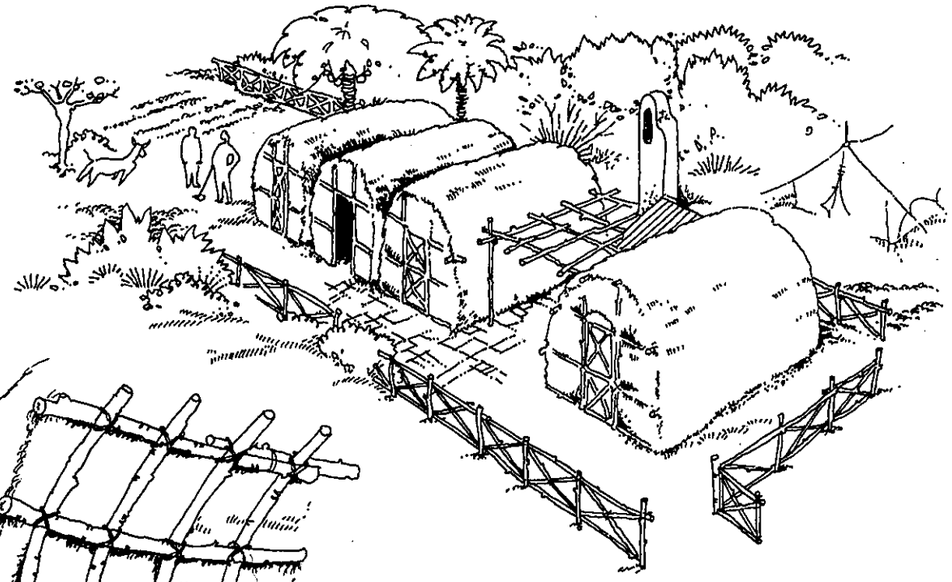

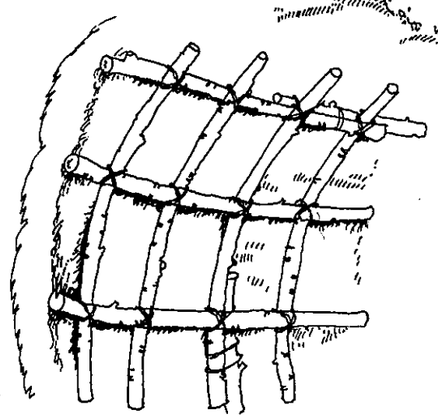

ПРИМЕР КАК МЕСТНЫЕ СТРОИТЕЛЬНИЕ ТРАДИЦИИ МОГУТ СОСУЩЕСТВОВАТЬ С СОВРЕМЕННОЙ ИНЖЕНЕРНОЙ ИНФРАСТРУКТУРОЙ

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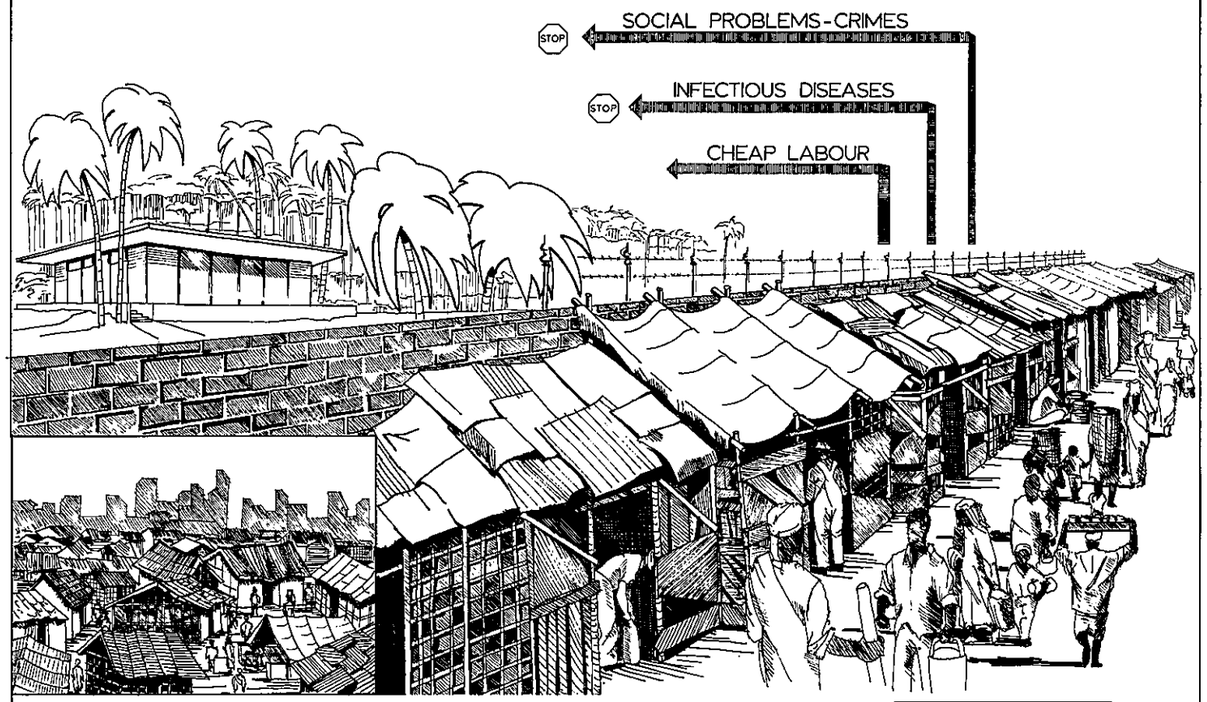
MINIMAL URBANIZATION SLUMS TRANSFORMATION



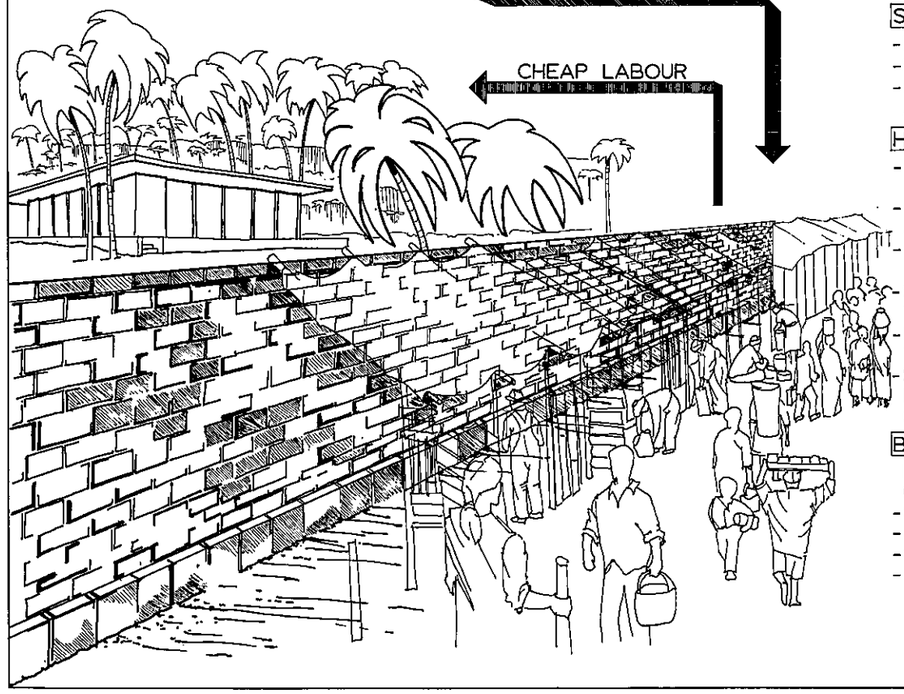
SLUMS REALIZATION
- OWN RESOURCES
- OWN INVENTION
- OWN CONSTRUCTING EXPERIENCE

SLUMS DISADVANTAGES
- BAD HEALTH CONDITION
- SOCIAL PROBLEMS-CRIMES
- LACK OF PLANNING AND SYSTEM SOLUTIONS

HOW TO SOLVE IT ?
- DEFINE SETTLEMENT LOCATION
- ORGANIZE THE AVAILABLE AREA
- DICTATE THE TRANSPORTATION PASS WAYS
- STANDARIZE ALLOCTED TO THE RESIDENTS
- DISTRIBUTE THE SAVE WATER
- STIMULATE ERECTING INDIVIDUAL SETTLEMENT CONSTRUCTION

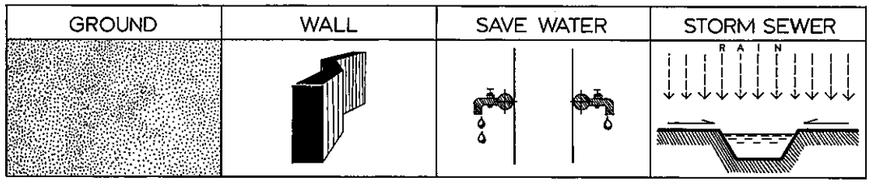
BUILDING CONSTRUCTING

RESIDENTS DO THIS BASING ON:
- OWN RESOURCES
- AVAILABLE MATERIALS
- OWN EXPERIENCE
- MINIMAL INICIAL INVESTMENT

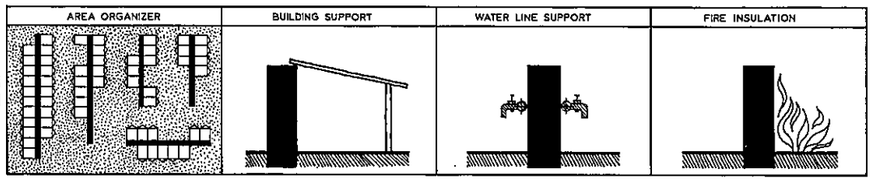


MINIMAL

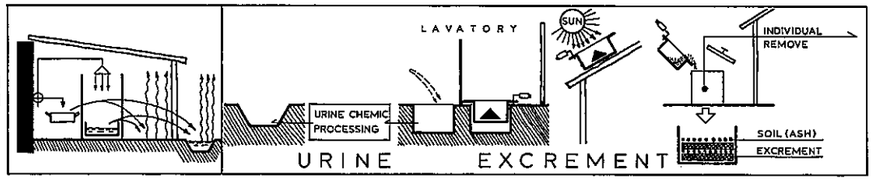
RESOURCES



WALL FUNCTIONS

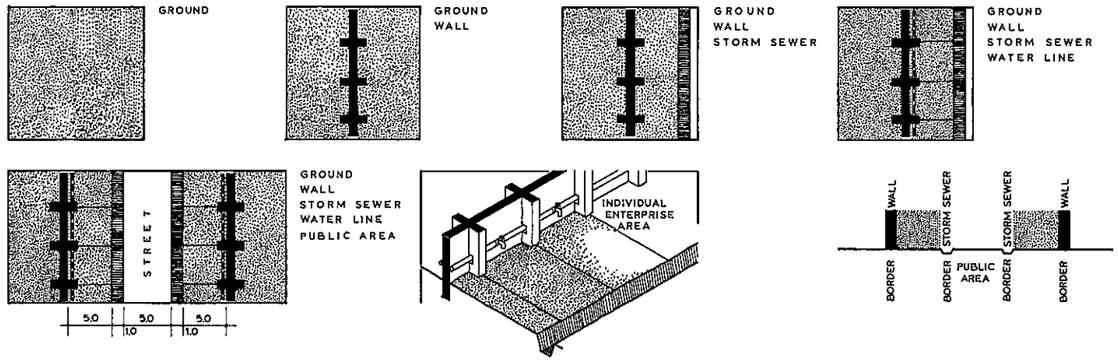


SAVE WATER

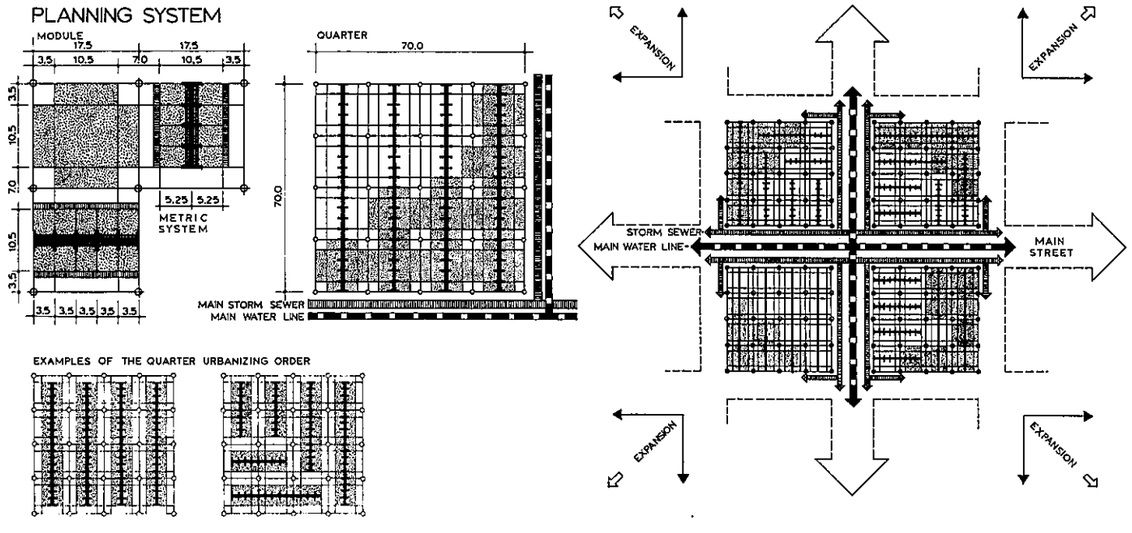


URBANIZATION

PLANNING ELEMENTS

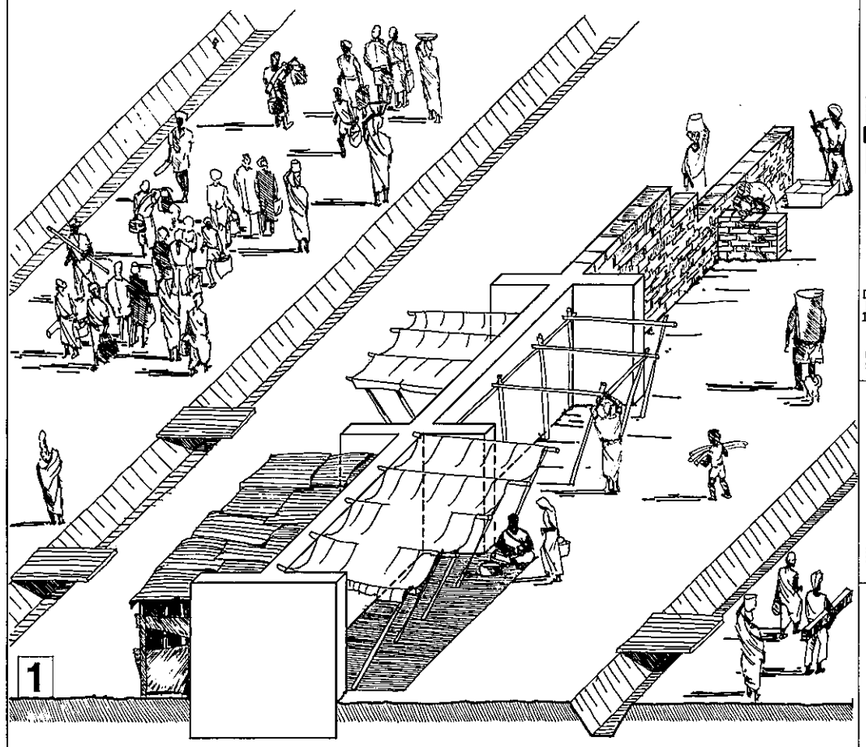


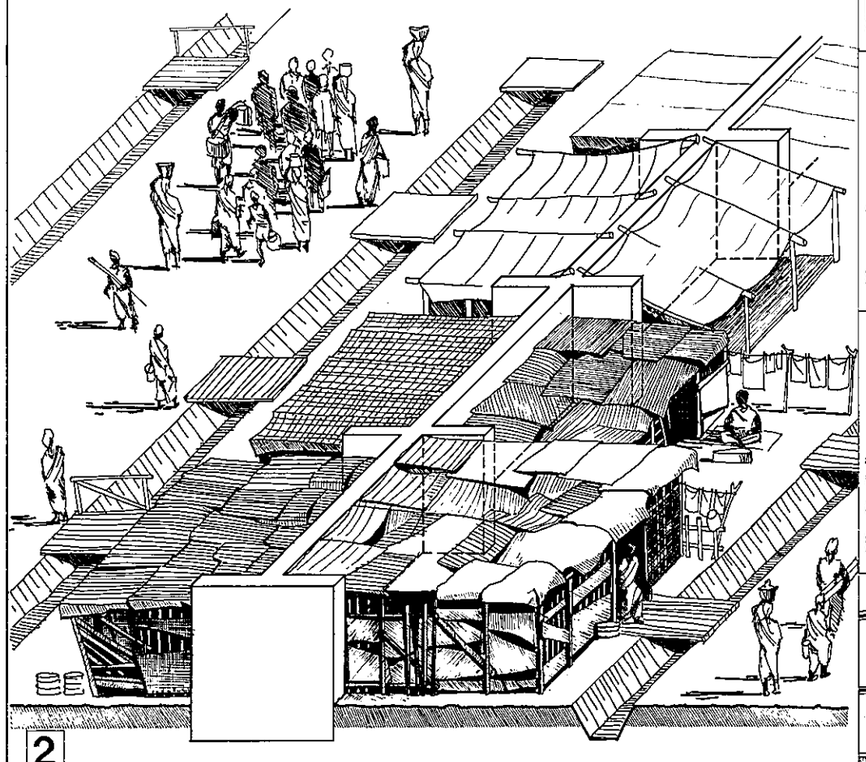
PLANNING SYSTEM

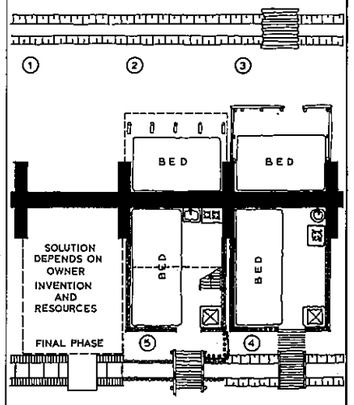


EXAMPLES OF THE QUARTER URBANIZING ORDER

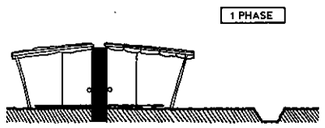
TRANSFORMATION

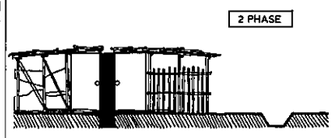


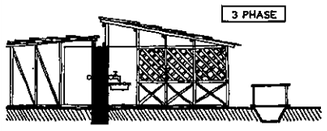


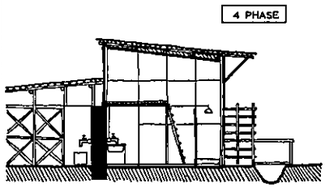


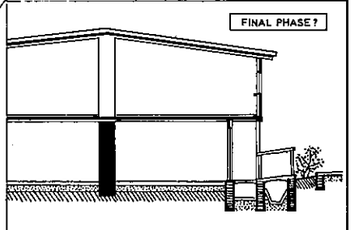
POSSIBILITIEST OF SHELTER TRANSFORMATIONS
FINANCE - OWN RESIDENT RESOURCES



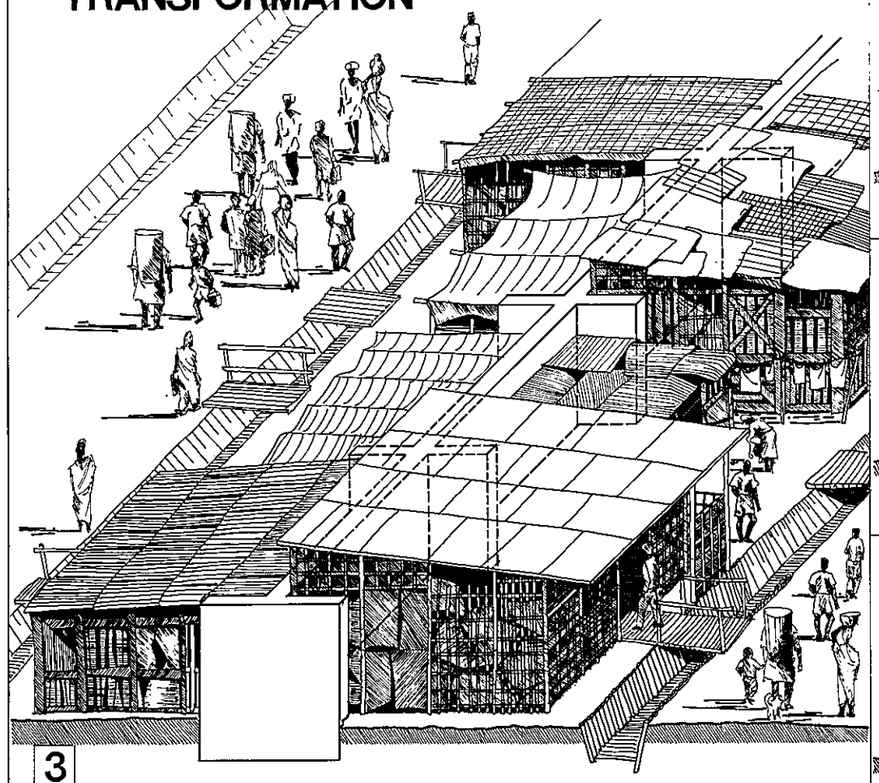




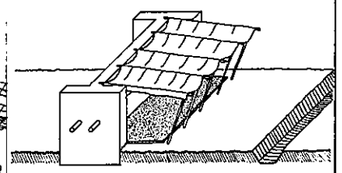


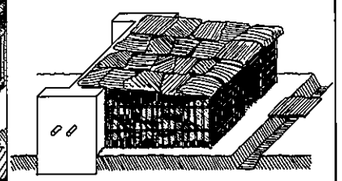


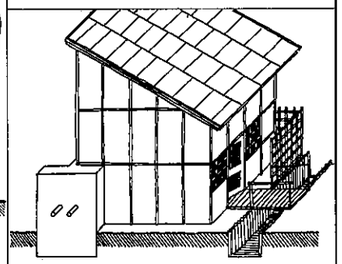
TRANSFORMATION

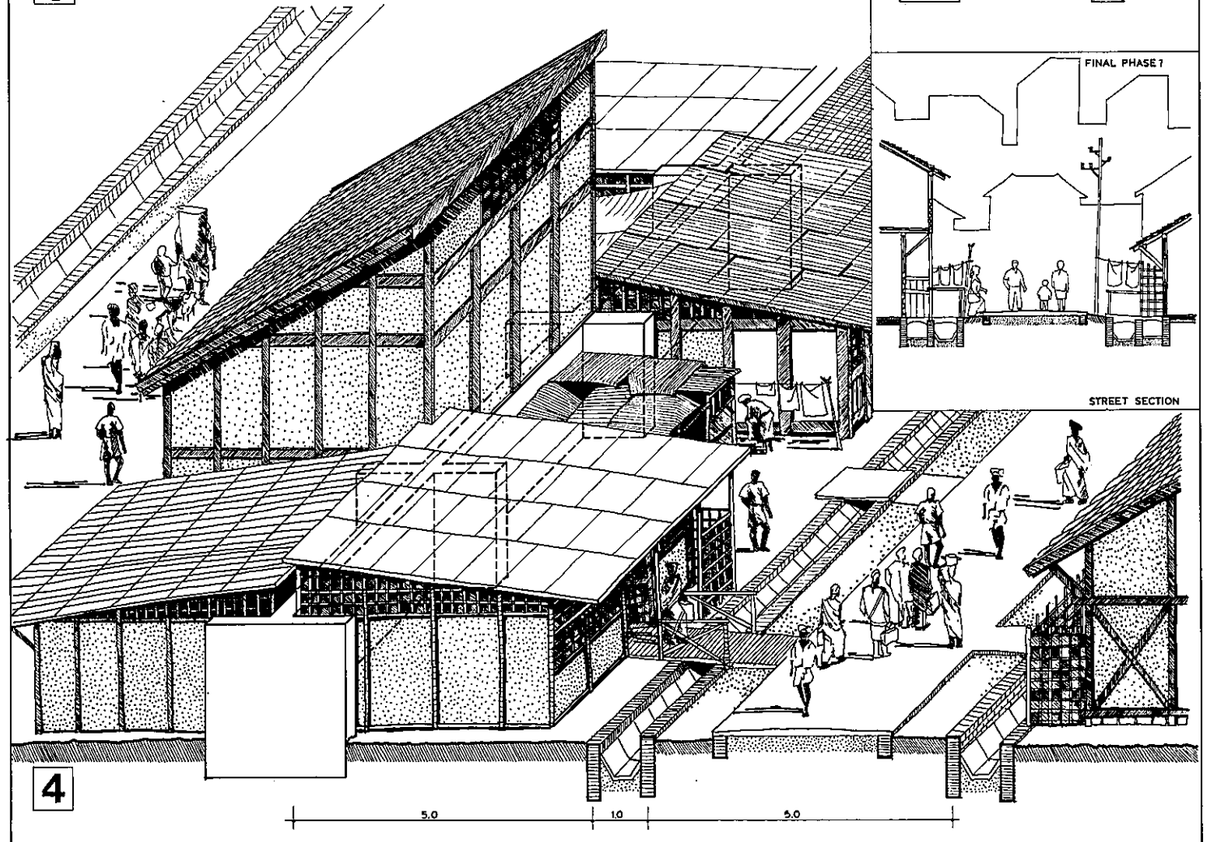


POSSIBILITIEST OF SHELTER TRANSFORMATIONS









SECTOR I

LA VIVIENDA.

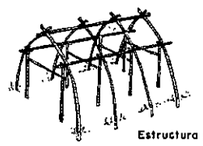
En el transcurso de milenios la vivienda del hombre se ha perfeccionado. Los primeros hombres no construían sus viviendas, sino que, como la mayoría de los animales, utilizaban cobijos naturales. Principalmente se refugiaban en cuevas o se colocaban bajo las rocas en voladizo. Durante mucho tiempo el hombre utilizó como material de construcción lo que le brindaba la naturaleza: hojas, hierbas, ramas y barro. Pero a medida que se perfeccionaron los útiles se abrieron nuevas posibilidades. Con ayuda del hacha era posible cortar troncos y ramas para construir sencillos abrigos. Con ayuda de la azada se cavaba un hoyo en la tierra y luego se cubría el foso—vivienda con un techo elemental. Se empezaban a combinar los materiales para realizar ensambljes graduales. También el fuego, al trasladarlo de la entrada de la cueva al interior de la vivienda, fue un avance muy importante, al situarse en el centro del suelo en un hogar abierto, gradualmente se convirtió en una obra de construcción, la salida del humo determinaba la forma del techo.

La historia de la vivienda, propiamente dicha, empieza cuando el hombre comenzó a cultivar la tierra, pasando de la vida nómada a la sedentaria, estableciéndose en lugares fijos. La choza sencilla, el tipo primitivo de vivienda, consistía en una habitación, donde se comía y dormía, incluso servía para cobijo de los animales domésticos. Su construcción dependía por completo de los "materias primas" existentes en el lugar, ya que no se disponía de medios para realizar transportes largos. "La tierra, los materiales y la forma" eran de libre disponibilidad del hombre.

De ordinario la choza se construye con bastidor de estacas y pilotes. Las paredes varían según los materiales disponibles. En las regiones tropicales, por ejemplo, se usan esteras trenzadas o paja de arroz tejida y amasada con barro. En otros casos, las paredes se hacen con mantas y pieles, como las viviendas de los nómadas del hemisferio norte. La cabaña más evolucionada es con troncos o tablas. También se hace con piedra o barro secado al sol (ladrillo) en las regiones que escasean árboles. Pero en todas las épocas la función de la vivienda ha sido la misma: proteger la vida de los hombres y sus dominios. Pero esta protección ha adoptado diferentes formas influido primordialmente por el clima de las distintas partes del mundo: el hombre necesita refugio contra el calor, la lluvia ó contra el frío y la nieve, y también amparo contra los enemigos de su propia especie o contra los animales salvajes y venenosos.


El hombre busca abrigo


La pre-choza

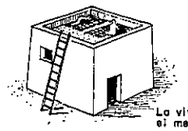

Estructura primitiva

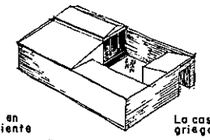

La choza

En la antigüedad, las casas del Oriente Medio, culturas Egeo y del Mesopotamia, eran de ladrillo cocido al sol. En las importantes civilizaciones de Egipto y Grecia se logró un perfeccionamiento gradual, muy notable, de las viviendas. Al lado de las chozas sencillas de los pobres se erigieron quintas palaciegas con grandes jardines y edificios suntuosos. Los ciudadanos acaudalados instalaban sus hogares con todo lujo y confort posibles, adornándolos con obras de arte, aunque las fachadas eran sobrias. La vivienda constituía un mundo aparte, totalmente aislado del bullicio, del calor y del polvo de la ciudad. Los romanos se inspiraron en la arquitectura griega. La casa-vivienda romana estaba construida en torno a un patio cerrado (atrio), con un estanque central para el agua de lluvia; en los habitaciones no había ventanas, la luz entraba por los grandes vanos de puertas abiertas al atrio.

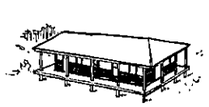
Al margen de la cultura occidental destacan dos formas de vivienda: La vivienda árabe en Africa Norte y Oriente Medio, y la vivienda construida en China y Japón. La casa árabe recuerda la vivienda de la antigüedad; cerrado hacia afuera y abierto hacia el interior a un patio rodeado de galerías de columnas. Para estar al aire libre se disponía del tejado plano. La casa se decoraba con azulejos multicolores y ornamentos. Las viviendas del Lejano Oriente se basan en el prototipo de la casa con porche. Disponen de una armazón de pilares verticales que sostienen el tejado. Los pilares de la casa japonesa están hincados en tierra, sosteniendo a cierta altura del suelo el pavimento de la casa. Las casas japonesas son de líneas flexibles y esbeltas. Las paredes ligeros son de estera cubierta con revoque o de papel encolado sobre una estructura de tablillas. Los tabiques y parte de las paredes exteriores son corredizos, modificando fácilmente la disposición de las habitaciones. Esta arquitectura de líneas sencillas ha influido mucho en las viviendas occidentales.

Durante la Edad Media se crearon nuevas necesidades en las viviendas: comodidad y ambiente acogedor. La población urbana aumentó y alcanzó cierta prosperidad, y surgió la vivienda burguesa, menos majestuosa que los castillos y fortalezas, pero mucho más acogedora. Las mansiones burguesas y las casas de los comerciantes se construyeron en un mismo núcleo urbano, nace la ciudad que predomina todavía hoy en los lugares densamente poblados. El hogar burgués satisfacía los requisitos de los nuevos tiempos en orden a la comodidad. En el siglo XVIII el aspecto acogedor y el confort vinieron a ser los factores decisivos incluso en las viviendas de la clase superior. Un ejemplo, la "mansión señorial" en el campo, con su fachada de líneas sencillas y elegantes, habitaciones de techo no muy alto y decoración sobria.


La vivienda en el medio oriente


La casa griega


La vivienda medieval


La casa japonesa


La vivienda de hoy

En el siglo XIX la industrialización creó una nueva "aristocracia" adinerada, de patronos industriales y comerciantes. Sus viviendas combinaron criterios modernos con el lujo. Las habitaciones ya no se colocaban en hilera, como se hacía antes, sino eran unidades independientes y orientadas hacia diferentes puntos cardinales; según la función de cada una. Por otra parte se construyeron techos más altos, y el mobiliario adquirió caracteres de lujo y ostentación exageradas.

Durante el siglo XX, la vivienda de nuestra comunidad urbana suele tener un exterior no muy lujoso, en cambio en su interior dispone de gran comodidad y amplios recursos técnicos. En los grandes centros urbanos las viviendas colectivas de los grandes bloques de apartamentos con todos los servicios necesarios, es la otra alternativa para la mayoría de la clase media y obrera. Gracias al prodigioso desarrollo industrial, la vivienda de hoy puede construirse con cualquier material existente en el mundo, así sea el más alejado, por la facilidad de los medios de transporte.

Al recorrer la historia, encontramos que se ha mantenido la función esencial de la vivienda: protección, seguridad y confort. Pero al comienzo, en los tiempos remotos, la construcción de viviendas dependía por completo de los materias primes existentes en el lugar; "tierra, materiales y mano de obra" estaban al alcance del hombre, sin ninguna condición. Aun hoy, subsiste dicha situación en los pueblos primitivos.

Después, en las culturas antiguas (Mesopotamia, Egipto, Grecia, Roma, Lejano Oriente) hasta la Edad Media, dichos materias primas eran parte integrante y natural del medio. La población no solo construía sus propias viviendas, sino también elaboraban con gran maestría y gusto artístico todos los artículos de su hogar, por pequeño que fuera. De tal manera, que—tierras, materiales y mano de obra—estaban al alcance de la población y las artes y las técnicas se confundían en la creación de los mismos obras.

Pero a partir del siglo XVIII, al desarrollarse y extenderse el industrialismo, y acelerarse aún más durante la mitad del siglo XX con el portentoso avance tecnológico y científico industrial, se escinde—compulsivamente el cauce, por el cual transitaba lentamente la vida humana: pasa a ser el hombre parte de la maquinaria industrial, artífice antes que artesano y cambian los valores que aprisionan la vida de la comunidad—valores sociales, culturales y económicos—catacando en inalcanzables para la mayoría de la población, las materias primas necesarias para construir su vivienda "tierras, materiales y mano de obra". Y el resultado es, como lo señala el CINVIS, que en 1986 un cuarto de la población mundial carece de viviendas.

Debe tenerse siempre presente, que la familia y su hogar son las piedras fundamentales de la sociedad, y que el desarrollo físico y espiritual del hombre dependen en buena parte del medio donde es criado, donde se desenvuelve su vida de hombre, y donde realiza su labor diaria. Si ese hogar, ese medio, elevan al hombre—individual y colectivamente—la sociedad estará mejor preparada para un orden social significativo.

LA CIUDAD.

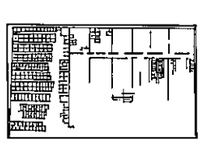
Cuando el hombre comenzó a cultivar la tierra pasó de la vida nómada a la sedentaria. Entonces empezó a reunirse en "aldeas" donde la vida en común le permitió protegerse contra el entorno y ayudarse mutuamente. Como consecuencia apareció cierta forma de organización en la que se refiere a dirección, prácticas religiosas, trabajo, etc. Nace la ciudad.

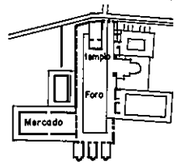
Pero la construcción de una ciudad exigía una organización mas avanzada. En las ciudades más antiguas, 2000 años antes de nuestra era, China, India, Egipto, Grecia, Roma, Asia Menor, Mediterráneo, América del Sur y América Central, comienzan a planificar las ciudades: sistema ordenado de calles, algunas veces longitudinales y otras radiales; divisiones de la ciudad en partes menores funcionales, desarrollo de ubicaciones centrales para los palacios, templos y sistemas avanzados de fortificaciones, abastecimiento de agua y alcantarillado.

Las ciudades occidentales de la Edad Media proceden de la ciudad burguesa griega y romana, la "ciudad feudal", originada bajo la dirección de un señor feudal, tenía como centro el templo y el palacio del señor. A su lado se agrupaban las viviendas de los cortesanos y servidores. Para su mantenimiento se precisaba de una gran producción de alimentos, ropa y artículos domésticos, por lo que artesanos y comerciantes fueron elementos muy importantes de la población ciudadana. Al iniciarse el comercio con países lejanos, los traficantes adquirieron cierto bienestar y un capital móvil, donde se establecían surgía la "ciudad burguesa", con sus propios concejos y su propia administración.
Poco a poco surgió una nueva forma de ciudad, al principio como ciudades reales o condales, con edificios para el gobierno de las diferentes provincias regidas por los lugartenientes del príncipe, los condes. Junto a ellos, creció la ciudad comercial, que cada vez se gobernó por sí misma. En general, las ciudades medievales eran de forma regular, pero cuando creció mas allá de sus primitivos límites, resultaron muy irregulares.

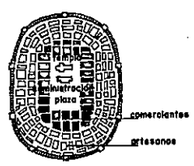
Durante el Renacimiento, en las ciudades de los príncipes se empezó a combinar la idea de fortificación con la ciudad comercial, dando lugar a las ciudades amuralladas, de planos muy regulares, introduciéndose en la ciudad hermosas plazas en forma de estrella, pero la realización más importante fué la construcción de parques en las ciudades, abiertos a todos los ciudadanos sin distinción de clases, hecho insólito en esa época.


La aldea


La ciudad egipcia: Kahun



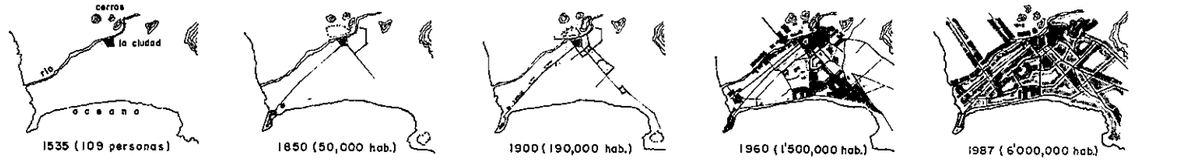
La ciudad romana: pompeya



La ciudad medieval

A mediados del siglo XVIII, con la "revolución industrial", al sustituirse la fabricación manual por el trabajo de la máquina en la producción industrial, comienza la desintegración de la atmósfera de la ciudad al trasladarse las fábricas a las zonas urbanas. Se expanden los límites de la ciudad, invadiéndose extensas zonas de la campiña circundante y se introduce una nueva clase social, los obreros industriales, que por sus modos y hábitos rurales, afecta profundamente las características urbanas, tanto sociales como físicas. La motivación de la vida económica comienza a ser exclusivamente materialista.
Luego, el desarrollo de los medios de tranporte acelera considerablemente el desarrollo urbano. Primero el ferrocarril, luego el tranvía y después el automóvil, influyen en el fenómeno migratorio rural, que invade la ciudad y crea nuevas condiciones de vida, diluyéndose aún más la consistencia de costumbres tradicionales e influyendo profundamente en la destrucción de la coherencia física y espiritual de la ciudad. Esta mezcla y convivencia de distintos clases sociales cambia la estructura de la sociedad poco a poco y obliga a la formación de un nuevo orden social. Las masas oprimidas comienzan a ascender en la escala social, presionando para tomar la dirección de la comunidad y originando consecuencias perniciosas para la vida social en su conjunto, que se expresa en la nivelación del orden físico y urbano sobre un plano de vulgaridad y superficialidad, cada vez más materialista.

La ciudad supone una organización que se refleja en sus distintos zonas edificadas. En los pueblos pequeños están mezclados los edificios: no hay división entre edificios públicos, casas particulares, tiendas o industrias. El aumento de población exige más tareas administrativas y locales comerciales, para un mayor contacto entre sí y un perfecto servicio a la población, todas estas actividades se reúnen en el centro. Esta conjunción de servicios reunidos en una zona aumenta la especulación del suelo en ese punto, influyendo en el precio de los alquileres y de los solares. Esta circunstancia conduce a que los edificios del centro se destinen para locales de administración, oficinas, tiendas, dando paso a la formación de una city (núcleo, centro urbano). El precio del terreno es menor cuanto más alejado esté de la "city". Así pues, aparecen zonas en forma de anillo, cuyo tipo de edificación lo decide el precio del terreno. Junto a la city surge una zona de viviendas, con casas de varios de pisos, a continuación una zona industrial y, después otra zona de viviendas con pequeñas casas de pocos pisos. Las variaciones del precio del terreno en relación con su distancia de la city se refleja también en la altura de los edificaciones, los más altos en el centro mientras que en las afueras casas de una a dos plantas. Las personas que viven en la zona exterior de la capital no pueden disfrutar totalmente de los servicios de la "city", debido a las largas distancias. La city sólo puede expansionarse hasta cierto punto a causa, entre otros razones, de los incrementos de los alquileres y del problema del tráfico. Para poder ofrecer a la población cada vez más densa, el servicio que ésta exige, se van formando "ciudades satélites"; las cuales cumplen las funciones propias de la city. Cada vez más, la ciudad se va desordenando y termina por ser inorgánica. Ejemplo: Lima, la capital del Perú.



En los países en desarrollo, la tasa elevada de crecimiento demográfico y la compulsiva urbanización, han creado necesidades de vivienda, muy difíciles de satisfacer, dados el bajo nivel del producto y del ingreso, los recursos humanos y materiales insuficientemente utilizados y, con frecuencia, las estructuras gubernamentales y de administración ineficaces.

- El desarrollo no es sólo crecimiento económico, sino también el mejoramiento de las condiciones sociales y culturales de la vida del hombre. El mejoramiento de su vivienda moviliza a cada persona a intensificar su esfuerzo para capacitarse y ahorrar, y da un significado personal al progreso económico.
- Tanto en las zonas rurales como en las urbanas, el proceso de desarrollo produce y necesita cambios. Hay que transportar las materias primas y los productos a fábricas, mercados y puertos. La industria tiene que disponer de abastecimiento de agua y hay que eliminar los productos de desecho. El crecimiento de la población exige más calles, escuelas, servicios médicos y otros. Al aumentar las exigencias se produce una demanda, incluso en las zonas rurales, de servicios que se aproximen más a las pautas modernas. Los migrantes rurales acuden en gran número a las ciudades y sobrecargan aún más sus ya inadecuados servicios. La densidad cada vez mayor de población en las ciudades crea problemas críticos de suministro de agua y de saneamiento. La edificación de nuevas viviendas y la creación de nuevas comunidades urbanas tiene que complementarse con servicios urbanos más o menos completos.
- El suministro de servicios que necesita una zona residencial presenta problemas diferentes, en la creación de viviendas en sí. Las casas se pueden construir una por una, aquí y allá, según lo van permitiendo las circunstancias y los recursos de los gentes, y se pueden mejorar, ampliar, derribar y volver a construir, siempre que sea necesario y posible. Las calles, los servicios y los instalaciones públicas, en cambio, no se pueden proporcionar sobre la base de la familia individual, sino que tiene que haber un plan urbano general, aunque sea rudimentario. Los sistemas de calles, las redes de distribución de agua, los alcantarillas, los cables de electricidad, deben disponerse con alguna idea de relación futura que guardarán con ellas las casas, y las diversas partes de la ciudad. Para la planificación de estos servicios e instalaciones es esencial, pues, que estén estrechamente coordinados con las metas y objetivos incluidos en el programa de vivienda de la ciudad que depende a su vez de la planificación regional, rural y metropolitana. Mientras que incluso en los más deficientes o provisionales barrios improvisados, hoy que proporcionar esos servicios mínimos básicos necesarios para la vida y la salud, como agua sin contaminar, alcantarillado que no corrompa las fuentes de agua y desagües de superficie, aunque sean zanjas abiertas, la asignación de recursos para servicios modernos debe hacerse según la ubicación de la urbanización permanente en el futuro, su densidad probable y posibles necesidades ulteriores, pues representaría desperdicio serio trasladar o reemplazar servicios por haber dejado de ser ellos útiles ó adecuados.

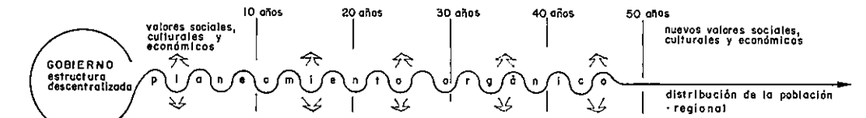
Así se han desenvuelto las cosas durante el largo viaje de la cultura humana. Desde los tiempos remotos en que el hombre empezó a reunirse en aldeas hasta nuestros días en que las grandes ciudades de los países en desarrollo, ofrecen un testimonio sobrecogedor de la pobreza del país. En la que una élite administrativo y financiero decide el desarrollo económico de la nación representando una fracción mínima de la población y la gran masa vive en chabolas de madera, hojalata, esteras, etc. y/o carecen de viviendas de cualquier clase y sin los servicios mínimos de educación, salud e higiene.

HACIA UNA SOLUCION ORGANICA DE LA VIVIENDA Y LA CIUDAD EN UN PAIS.

El hombre al construir su vivienda y sus ciudades utiliza "tierras, materiales y mano de obra". La sociedad establece las leyes, métodos e instrumentos que rigen dicha utilización colectivamente. Al principio, época primitiva, "tierras, materiales y mano de obra" eran elementos de libre disposición, para a lo largo del camino de la historia, las sociedades cada vez más complejas convirtieron dichos elementos en mercancías, a través de centurias, cada vez menos disponibles, y como consecuencia, millares de personas no tienen vivienda y masas de población se debaten en condiciones infrahumanas en sus ciudades congestionadas (80% de la población mundial mundial viven en áreas urbanas).

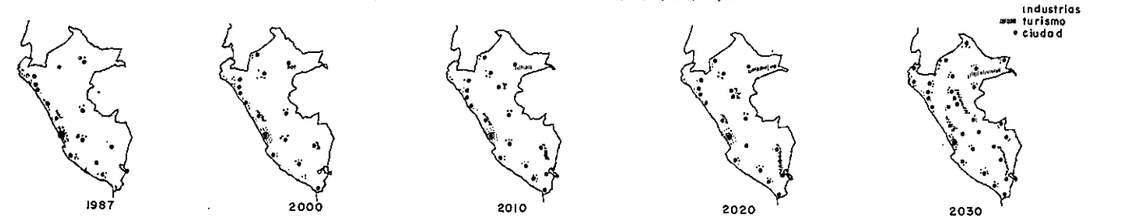
En todo el mundo, los gobiernos de los países industrializados o del tercer mundo, de economía centralizada o de mercado, desesperadamente—corrigen, modifican, afinan ~ sus leyes, métodos e instrumentos para mejorar la vida del hombre, y, en vez de ello, la empeoran y agravan. ¿Porqué tan poderosos esfuerzos en recursos humanos, materiales y económicos no tienen ningún resultado efectivo?

La respuesta es una sola: ¡No se sigue el camino correcto! Todos esos esfuerzos deben dirigirse a resolver principalmente las causas esenciales del problema. Primero, que el Estado encause eficazmente su estructura gubernamental administrativa y, segundo, conducir el crecimiento desordenado de su población a un desarrollo ordenado, orgánico, de la cual emerjan valores estables (sociales, culturales y económicos), en su tiempo y espacio, para que "tierras, materiales y mano de obra" vuelvan a estar disponibles, al alcance de la población, y ésta pueda construir sus viviendas baja una atmósfera coherente, tranquila y constructiva para el desarrollo físico y espiritual de ella misma y su descendencia. Como lo fueron en las ciudades que desarrollaron las culturas antiguas hasta la edad medieval, obras de arte colectivas, en las que generaciones de individuos fueron adaptando más o menos, nuevos formas a las que existían antes que ellos, sin que perdiesen su carácter orgánico.

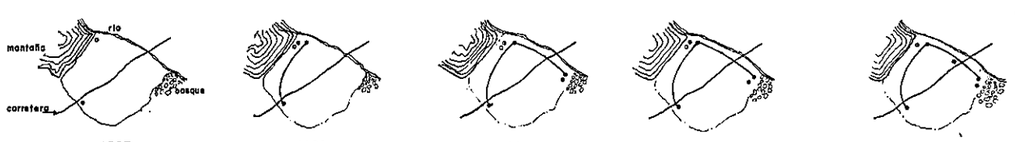


Este planeamiento orientado por el Gobierno, será orgánico en su esencio, si asimila sus recursos humanos, materiales y económicos a las realidades de su geografía, crecimiento poblacional, y a lo largo y ancho de su territorio.

— A escala nacional, reordenando estratégicamente en todo su territorio sus centros de producción y/o explotación agrícola e industrial—canteras, materias primas, yacimientos, productos y/o explotación de cualquier otro recurso valioso del país—en sus ubicaciones naturales, cuyos únicos límites serán las llanuras, bosques, ríos, lagos y montañas de su geografía. Serán verdaderas y funcionales unidades estratégicas y económicas, vinculadas entre ellas por las grandes rutas férreas, terrestres, fluviales o aéreas nacionales, para intercambiar sus productos con el exterior (otros países) y con el interior de su propio país. En dichas rutas extendidas y ramificadas por todo el territorio, irán formándose pueblos y ciudades conforme vaya aumentando la población e integrándose a la trama rural y urbana territorial. Primer rasgo del planeamiento orgánico: la descentralización natural y ordenada de la población por todo el territorio. Ejemplo, un país, el Perú.



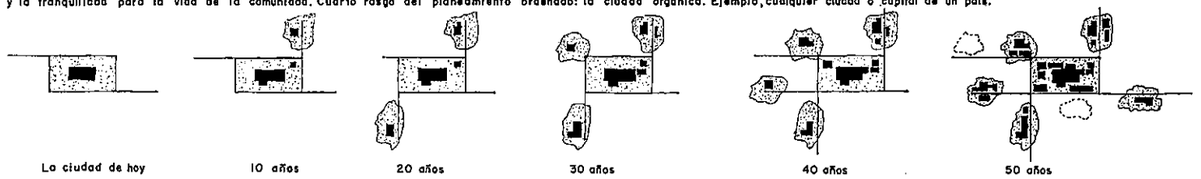
— A escala regional. Conforme se vaya desarrollando el centro y/o centros de producción en nuevos asentamientos humanos — profesionales, técnicos, empleados, obreros — al principio en campamentos, luego como pueblos, después como ciudades, más o menos importantes, según la amplitud del recurso en explotación (cantera, filón, yacimiento petrolífero, aguas termales, restos arqueológicos, etc.), se convertirán en "polos naturales de desarrollo", cuya producción perfeccionada sin cesar, de creación continua e investigación, servirá de verdadero transfusión manual—intelectual, primero absorviendo y luego estabilizando las migraciones externas y propios de diversos zonas del territorio, conformándose en conglomerados naturales de producción integrados a la trama rural y urbano existente, en regiones, fuertes unidades económicas y espirituales nacidas de la humanización del suelo. Segundo rasgo del planeamiento orgánico, la conformación natural de regiones en todo el territorio; Ejemplo, cualquier región de un país.



— A escala rural. A lo largo del proceso de estabilización regional, las aldeas y/o comunidades campesinas—parcelas individuales, cooperativas, unidades de explotación agrícola—ante la demanda creciente de los nuevos asentamientos de población emergentes de los centros de producción, tenderán a optimizar la productividad de sus espacios agropecuarios con los avances tecnológicos y científicos (nuevos fertilizantes, maquinarias, selección de semillas, mejoramiento de razas, etc.) estableciéndose la necesidad de "centros comunales" radiados por pueblos rurales, tendrán que ser equipados con lo mejor de la vida urbana para el desarrollo social, económico y cultural de las comunidades campesinas: centros artesanales para la formación de aprendices; escuelas tecnológicas para enseñanza agrícola, ganadera, doméstica; centros de salud e higiene; centros deportivos, biblioteca, teatro-móvil, áreas recreacionales, etc. Tercer rasgo del planeamiento orgánico, la revitalización del campo y una estructura rural dinámica. Ejemplo, cualquier espacio rural de un país.

– A escala urbana. Como consecuencia de la distribución continua y natural poblacional a nivel nacional, regional y rural, las migraciones irracionales hacia las ciudades disminuirán grandemente, permitiendo una distribución mas ordenada en las áreas circundantes disponibles para el crecimiento urbano. A la vez, podrá tambien organizarse la rehabilitación de las áreas urbanas en decadencia y zonas tugurizadas. Todas estas asentamientos se orientarán conformando barrios funcionales — funciones y/o diferentes actividades agrupadas de acuerdo a sus fines y requerimientos de tráfico, zonas residenciales, comercio, industria ligera, oficinas, tiendas de abasto, edificios administrativos, biblioteca, teatro, cines. etc. — rodeados totalmente por grandes áreas arboladas.

  - El rasgo mas conspicuo de la ciudad será la dispersión de la población urbana en barrios funcionales, separados unos de otras por amplias zonas verdes. Estas cinturas verdes serán los límites protectores de cada barrio que no podrán ser alteradas por ninguna circunstancia y, con la amplitud necesaria para permitir — hasta cierta medida — el crecimiento de la población. Una red vial de intercomunicación rápida a través de estas áreas verdes conectarán los barrios entre sí, y de éstos con el centro cívico de la ciudad, núcleo urbano madre. La ventaja de esta red vial a través de estas áreas verdes será permitir flexibilidad para sus ampliaciones por los continuos cambios tecnológicos del transporte público (aumento creciente de carros particulares, nuevos tipos de transporte, helipuertos, cintas mecánicas, etc.), a la vez que su entorno de árboles, plantas y arbustos proveerán además de la protección y oxigenación de la salud, la quietud y la tranquilidad para la vida de la comunidad. Cuarto rasgo del planeamiento ordenado: la ciudad orgánica. Ejemplo, cualquier ciudad o capital de un país.



La ciudad de hoy — 10 años — 20 años — 30 años — 40 años — 50 años

Todo este proceso de transición, de un crecimiento compulsivo y concentrado, al azar — por consiguiente caótico — hacia un crecimiento ordenado y adecuado a la realidad del país (recursos humanos, materiales y económicos adaptados a su geografía y crecimiento poblacional), plantea una nueva concepción: ya no es el Gobierno central, sino el Gobierno local el que decide sus objetivos — a nivel nacional, regional, rural y urbano), no sólo en términos de crecimiento ecónomico sino también en términos de progreso social y mejoramiento del nivel de vida de la persona y de sus oportunidades para lo porvenir. Sólo el Gobierno local, una vez formuladas sus normas, metas y establecido los objetivos, podrá ponderar las prioridades, según su contribución relativa al logro de dichos objetivos, evitando la acción ineficaz y la defectuosa asignación de unos recursos que son muy limitados. El siguiente cuadro lo objetiviza.

Estructura del estado	Estructura orgánica descentralizada	Condicionantes primordiales	Factores básicos	Objetivos finales: vivienda y servicios conexos (normas mínimas)
GOBIERNO central regional rural urbano	–ESCALA NACIONAL (gobierno central en coordinación con las autoridades regionales)	A. GOBIERNO organismos públicos desarrollo comunidades B. POBLACION crecimiento C. RECURSOS ECONOMICOS productividad formación capitales	a. TIERRAS uso de la tierra b. MATERIALES materiales construcción c. MANO DE OBRA capacitación	VIVIENDA (normas básicas) – Clima: abrigo contra el calor, frío, lluvia, nieve, huracanes; ventilación para aliviar el calor y la humedad; protección del sol y resol. – Costumbres: construcción con métodos, materiales y diseño locales. – Higiene y saneamiento: baño y retrete, privado, con iluminación y ventilación; prever eliminación de aguas negras que proteja de la contaminación. – Espacio: suficiente y con aislamiento para realizar las funciones humanas básicas; preparar alimentos y comer; cuidar a los niños; descansar y dormir; lavar y secar la ropa; actividades en horas libres, atender huéspedes. – Densidad: prever espacios abiertos entre edificaciones en relación con la altura de éstos, a fin de que las habitaciones tengan luz, aire y cuando corresponda, sol; espacios libres para jugar niños y desarrollar sus actividades de recreo adultos. – Costo: calcular el costo, teniendo en cuenta la mayor eficiencia de la producción en gran escala (una meta), el menor precio del predio (resultado de la política de tierras) y otros medios de reducir los costos. Considerar condiciones de crédito a largo plazo para familias con ingresos mínimos. – Políticas de vivienda: SERVICIOS COMUNALES (normas mínimas) – Servicios públicos: agua, drenaje pluvial, recolección y eliminación de desechos, gas, electricidad, calles. Normas mínimas de sanidad, costumbres, clima, función, densidad y costo. Tener en cuenta las diferencias en zonas rurales con las zonas urbanas. Normas mínimas de alcantarillado conectado con planta de tratamiento de desechos. Normas mínimas de costos para calles pavimentadas, con afirmado o simples huellas. Tener en cuenta su anchura, materiales de superficie, etc. Normas suministro gas, electricidad y otras fuentes. Normas sobre diferentes tipos de desagüe. – Servicios generales: escuelas, hospitales y clínicas, unidades sanitarias, transportes, servicio social, protección contra incendios, parques, campos de juego, salas de reunión, museos, bibliotecas y otros edificios públicos. – Servicios comerciales: mercados, almacenes, talleres de reparaciones, servicios de esparcimiento. La norma mínima para los servicios generales y comerciales, depende de los recursos de la economía en su totalidad y de la importancia relativa que se asigne en la planificación del desarrollo nacional, a este sector de inversión con respecto a otros.
	–ESCALA REGIONAL (gobierno regional en coordinación con las autoridades rurales y urbanas)	A. GOBIERNO (regional) organismos regionales desarrollo comunidades B. POBLACION crecimiento C. RECURSOS productividad. formación capitales	a. TIERRAS (región) uso de la tierra b. MATERIALES materiales construcción c. MANO DE OBRA capacitación	
	–ESCALA RURAL (gobierno local de cada pueblo)	A. GOBIERNO (local) organismos rurales desarrollo comunidades B. POBLACION crecimiento C. RECURSOS productividad formación capitales	a. TIERRAS (rurales) uso de la tierra b. MATERIALES materiales construcción c. MANO DE OBRA capacitación	
	–ESCALA URBANA (gobierno local urbano, municipios)	A. GOBIERNO (local) organismos públicos desarrollo comunidades B. POBLACION crecimiento C. RECURSOS productividad formación capitales	a. TIERRAS (urbanas) uso de la tierra b. MATERIALES materiales construcción c. MANO DE OBRA capacitación	

CONDICIONANTES FUNDAMENTALES

A. GOBIERNO

En los paises en desarrollo, el poder central afincado física y espiritualmente en la capital — desde la cual se estudia, programa, financia y ejecuta la obra, aún de la localidad mas remota — es el motor motor acelerante del desequilibrio social, cultural y económico de la nación. Uno de sus resultados: escasez de viviendas y deterioro creciente de los servicios urbanos. Es primordial corregir la acción centralizada y computsiva del gobierno a una acción gubernamental abierta, orgánicamente desplegada, actuando directa y localizadamente en ámbitos físicos racionales. Se plantean los siguientes instrumentos jurídicos y/o financieros:

1. Descentralizar la estructura del gobierno central hacia una estructura gubernamental administrativa descentralizada, a nivel regional, rural y urbana.
   - Todo desarrollo — social, cultural y económico — es la vivencia colectiva de la tradición, modos y costumbres de la población adecuada a la realidad de su clima y geografía, y, ¿Quién mejor que el Gobierno local? para conocer los recursos humanos, materiales y económicos de su localidad, pueblo o ciudad.
2. Establecer dentro de la estructura del Gobierno local, como órgano superior planificador y ejecutivo, la oficina de planeamiento arquitectónico y de urbanismo.
   - Dentro de la estructura del Gobierno local, deben existir los órganos adecuados con la autoridad, recursos y personal necesarios para formular y administrar programas destinados a proporcionar viviendas y servicios conexos a las zonas rurales y urbanas de la región. Debe existir un órgano superior encargado de todos los aspectos del desarrollo urbano, inclusive la vivienda y la planificación rural, urbana y metropolitana. El director tiene que participar en la planificación del desarrollo social y económico, en la formulación de metas y objetivos, determinación de políticas de localización de industrias, la asignación de inversiones por regiones y sectores, la formulación de programas en el campo que puedan influir en migraciones a las urbes y otros aspectos del desarrollo. Construir directamente viviendas y servicios conexos o formular planes con el sector privado y/o semipúblico, y, supervisar y aprobar propuestas en conformidad con los planes regionales o locales de desarrollo.
3. Exoneración de tributos a las Universidades, institutos, Fundaciones y/o sector privado, cuando desarrollen programas de formación de técnicos, supervisores y personal para la administración pública. Así mismo utilizar las becas existentes en el país o en el extranjero o las visitas de expertos, para la formación de personal de trabajo, en seminarios u otras formas.
   - El objetivo es fomentar la formación de personal técnico eficaces. Los problemas que entraña la formulación y ejecución de programas de vivienda y urbanización son complejos y abarcan muchos campos de actividad como: arquitectura, ingeniería, educación, sanidad pública, bienestar social, organización de comunidades, planificación urbana y regional, administración pública y otros.

B. POBLACION

Crecimiento poblacional

En los paises en desarrollo, la urbanización precede a la industrialización que la exige, ya sea por falta de alimentos ó de tierra en el medio rural ó por las espectativas de mejor vida en la ciudad — 60% de la población urbana son "precaristas", viven en chabolas de esteras, palos, hojalatas — Se plantean los siguientes instrumentos jurídicos y/o financieros.

- Factor importantísimo del desarrollo urbano y de la vivienda es la planificación de "nuevos" centros industriales en sus asientos naturales — cantera, filón, yacimiento, recurso, etc. — conformando "polos naturales de desarrollo" que descongestionarán la superconcentración de las urbes del país y el beneficio que representa el desviar el exceso hacia otras regiones.
- El desarrollar nuevos sectores de recursos en las regiones — aguas termales, restos arqueológicos e históricos, zonas recreacionales al borde de los ríos, lagos, océanos, montañas, parques nacionales — es constituir industrias turísticas y por ende nuevas comunidades con nuevas oportunidades económicas, por la construcción de carreteras y caminos, y también respecto del comercio, los servicios y otros funciones auxiliares. La contratación de obreros para estos sectores — procedentes de zonas rurales empobrecidas, así como de grandes urbes congestionadas alivia la presión de la población sobre los centros urbanos existentes.
- Los programas de desarrollo rural — reforma agraria, regadíos, abonos, restauración de terrenos de cultivo, etc. — elevan el nivel económico del campo enriqueciendo la vida de sus pobladores y contribuyendo al desarrollo total del país y a una disminución de las migraciones rurales a las ciudades.
- Promover mediante incentivos tributarios y/o emplazamientos adecuados, la re-localización de industrias y fábricas que perturban el crecimiento ordenado de las urbes congestionadas a ciudades más pequeñas o zonas relativamente no desarrolladas del país.

1. Exoneración de tributos parcial o total, al sector privado que instale: "nuevos" centros de producción y/o explotación en sus asientos naturales; desarrolle "nuevos sectores de recursos regionales", ejecute programas de "desarrollo rural"; y, traslade sus industrias de los urbes metropolitanas a ciudades mas pequeñas y/o zonas relativamente no desarrolladas del país.
2. Inversiones públicas, con recursos propios y/o préstamos de ayuda externa, para la ejecución de los programas anteriores. O sociedades mixtas con el sector privado para los mismos objetivos.
3. El sector público recuperará sus inversiones recaudando: el "peaje" por la utilización de las nuevas carreteras; la "plusvalía" que pagarían los propietarios beneficiados por los programas públicos; el "tributo" por los servicios turísticos; y los "impuestos" que el comercio y los servicios de las nuevas comunidades tributan.

Desarrollo de las comunidades.

El suministro físico de viviendas y servicios no crea automáticamente todas las condiciones necesarias para una vida urbana satisfactoria. El migrante rural solitario necesita integrarse en el sistema económico moderno a través de un trabajo productivo y particular en la vida comunal de algún modo útil y significativo. Se plantea el siguiente instrumento:

1. Programas de ejecución de obras de mejora del vecindario y de desarrollo de la comunidad por el sistema de auto-ayuda.
   - En los paises en desarrollo, la única posibilidad de mejorar las condiciones de vida de la mayoría de la población, consiste en la utilización máxima del sector no monetario de la economía, el uso del ingenio y trabajo del migrante y de cualesquiera materiales que puedan obtenerse a bajo costo. Además de los resultados físicos, el sentido de realización personal y de grupo será una experiencia satisfactoria de "formar parte de algo", muy valiosa — desde la limpieza del vecindario, sembrado de jardines y parques públicos, áreas de juego y recreación hasta la construcción de viviendas y servicios comunales, escuelas, unidades de salud, etc., para la comunidad. —

C. RECURSOS ECONOMICOS Y FINANCIEROS

Aumento de la productividad nacional y del ingreso real.

Una de las metas centrales del desarrollo es el aumento del producto nacional y la productividad y de los ingresos reales de la población. Se plantean los siguientes instrumentos:

1. Aumentar los niveles de salarios e ingresos reales, cada año, respecto del aumento del producto nacional bruto.
   - Estos incrementos beneficiosos para la población, aumentarán su capacidad de pago para adquirir una vivienda nueva ó mejorar la que ya tenían. Esto no sólo reduce lo que se sacaba del tesoro público, sino que aumenta la cantidad total asignada a inversiones en viviendas y al consumo de éstas.
2. Aumento de la proporción de capital fijo para viviendas, respecto del aumento del producto nacional bruto.
   - La aportación de los recursos de capital para mejorar, cada año, el número de viviendas y servicios urbanos y satisfacer las necesidades del aumento de la población es una función necesaria de la planificación nacional para el desarrollo económico.
3. Optimizar cada año, la relación entre consumo e inversión, y planificación para un equilibrado desarrollo social y económico.
   - El aumento de la producción debe ir acompañado con el aumento de una mayor cantidad de servicios sociales educativos, sanitarios y de bienestar, es decir, de una mejora de la infraestructura humana — nutrición, sanidad, educación, alojamiento y otros aspectos del nivel de vida del pueblo — es una medida válida de productividad.
4. Exoneración de impuestos al sector privado cuando construya viviendas a "costo económico".
   - El producir viviendas y servicios conexos, moviliza la mano de obra y uso de materiales contribuyendo al producto nacional bruto, aumenta los niveles de inversión y eleva los ingresos reales del pueblo y su nivel de vida. Se acelera el proceso de desarrollo y se obtienen fines sociales muy importantes.

Aumento de la formación de capitales para vivienda y servicios.

En los paises en desarrollo las mayores inversiones en viviendas y servicios conexos se pueden extraer del aumento global de producción y ahorro creado por el proceso de desarrollo. Se plantean los siguientes instrumentos:

1. Aumentar las inversiones públicas en viviendas y servicios, mediante una eficiente estructura tributaria y otorgar préstamos públicos, ayudas y subsidios para ese fin.
   - En los paises en desarrollo, la captación de recursos de capital por conducto del sector público es esencial y para ello, debe mejorar su estructura tributaria y tener un sistema progresivo de impuestos que conservan los niveles de utilidades lo bastante altos para estimular la inversión y la actividad empresarial, impidiendo la especulación de terrenos.
2. Fomentar la creación y desarrollo de instituciones sociales y privadas que financien viviendas, otorgándoles "capital inicial" o "capital siembra" con préstamo y/o ayuda externa
   - Es muy importante este tipo de instituciones para los modestos ahorros individuales, y cuando existe un sistema de crédito, público o privado, porque aflora un mayor volumen de capital privado para aumentar la producción de viviendas, que de otro modo no afluirían a inversiones de esta índole.

ELEMENTOS BASICOS PARA LA CONSTRUCCION DE VIVIENDAS Y SERVICIOS CONEXOS

a. TIERRAS

Control del uso de la tierra.

La tierra representa uno de los problemas mas importantes para formular programas viables para viviendas y servicios urbanos. La especulación, la estructura tributaria, las prácticas de la construcción y la subdivisión antieconómica, y la falta de aplicación de las reglamentaciones han creado una escasez relativa de tierra disponible para urbanización, a precios que permitan, desde un punto de vista económico, la construcción de viviendas y servicios conexos a costo reducido o moderado. Se plantean los siguientes instrumentos jurídicos y/o financieros:

1. Reglamento de control urbano y metropolitano del uso de la tierra — plan director, zonificación, subdivisión de tierras —.
   - Cuando no hay control del "uso de la tierra urbana", el resultado es una modalidad desordenada de usos mixtos de la tierra, congestión, la utilización antieconómica de los servicios públicos y otras consecuencias del desarrollo no planificado.
2. Reglamento de evaluación anual de los valores de venta de los terrenos urbanos, por la autoridad pública.
   - El objetivo es el control de precios de venta de terrenos para restringir la especulación, mediante la publicación oficial anual de los precios de mercado "normales".
3. Estructura tributaria de "impuestos altos progresivos", para los solares que estando dispuestos para la edificación, no son utilizados; y, a los incrementos del valor de la tierra por los beneficios de las obras de infraestructura pública.
   - El objetivo es reducir los incentivos a la especulación de tierras, aplicando y recaudando gravámenes altos para desalentar la especulación y absorver los beneficios procedentes de ello.
4. Compra obligatoria por la autoridad pública, de solares vacios ó edificados, previo pago a los propietarios, cuyo valor estará referido al valor de "uso de la tierra" según la zonificación.
   - La expropiación de terrenos privados se hace necesario, en ciertos casos, para el mejor ordenamiento de la ciudad en beneficio de la comunidad.
5. Derecho de concentración parcelaria de terrenos adyacentes, por la autoridad pública: a) para darles un nuevo trazado, dotarlos de infraestructura de servicios y redistribuirlos entre los propietarios originales; ó b) en sociedad mixta con la asociación de propietarios, proceder a urbanizarlos según el plan aprobado por el municipio.
   - El objetivo, es la cooperación entre los sectores privados y públicos para obviar dificultades inherentes a la obtención de capital, la concentración parcelaria y la mejor utilización del terreno.
6. Adquisición por la autoridad pública, basado en el "derecho de preferencia municipal", de terrenos periféricos ó zonas alejadas de la ciudad, para conservarlos hasta que sea necesario y proporcionarlos a los interesados para su urbanización planificada.
   - Los objetivos son: aumentar la oferta de terrenos urbanos para reducir sus precios o disminuir la tasa de incremento a un nivel "tolerable"; y/o economizar los recursos totales al desarrollar un programa mas satisfactorio de urbanismo; y/o captar una proporción considerable de la plusvalía en la infraestructura de servicios urbanos; y/o proporcionar programas de viviendas a "costo económico" para la población laboral, y/o viviendas en alquiler.
7. Programas públicos de descentralización de las industrias ubicadas dentro de las urbes congestionadas, proporcionando emplazamientos adecuados en ciudades mas pequeñas ó en zonas alejadas de la ciudad, propiciando el establecimiento de ciudades satélites.
   - El objetivo es reducir la presión sobre la tierra en las grandes ciudades actuales y de mantener el crecimiento de aglomeraciones rurales sobre una base económica sólida. Si es necesario debe subvencionarse la infraestructura de desarrollo de este traslado de las industrias.

b. MATERIALES

Desarrollo de los materiales de construcción y de la industria de la construcción.

Otro elemento importante para la inversión en vivienda y servicios conexos son los materiales de construcción, la mano de obra y la organización necesarios para contruir. Los instrumentos jurídicos y/o financieros para lograr programas encaminados a conseguirlos serían:

1. Los programas públicos de vivienda y servicios conexos, deben utilizar los materiales de construcción y mano de obra experimentada de la "localidad" donde se ejecuta la obra.
   - El objetivo es reducir al mínimo las importaciones, eliminar la dependencia de transporte y utilizar la mano de obra ya experimentada en métodos tradicionales y que, bien estudiada resulta más atractiva y económica que las casas modelo creadas artificialmente y basadas en normas de países muy desarrollados y que a menudo requiere de la prefabricación ó importación de piezas, la aplicación de técnicas desconocidas de construcción y el gasto de divisos escasas.
2. En los planes de desarrollo, consignar recursos para las industrias, para mejorar sus instalaciones y produzcan materiales de construcción modernos, mas eficaces y a menor costo.
   - El objetivo es, que al recibir capital de inversión, las industrias puedan producir mejores materiales de construcción a menor costo, no solo para vivienda, sino para todos los demás tipos de construcción necesarios en el proceso de desarrollo.
3. En los planes de desarrollo, consignar recursos de capital, para la creación de institutos de investigación y experimentación en métodos de construcción más productivos y lograr la "normalización de piezas, así como otros medios de mejorar la calidad y reducir costos.
   - Sienda indispensable la reducción de los costos de la vivienda en los paises en desarrollo, es fundamental intensificar las investigaciones a este efecto de los materiales de construcción.
4. Aumentar el volúmen de construcción con programas públicos de vivienda a mas largo plazo, para que la "industria de la construcción" pueda desarrollar unidades de construcción a gran escala
   - La máxima reducción de los costos no puede realizarse a menos que el volúmen y la escala de construcción sean lo bastante grandes como para permitir que se aprovechen las posibilidades que proporcionan las investigaciones, la experimentación y la normalización. Y esto sólo puede hacerse con una industria de construcción desarrollada y un mercado en gran escala para sus productos, así como la continuidad a lo largo de un cierto periodo de años. La inversión en equipo de capital exige la seguridad de su uso continuo, lo bastante prolongado como para amortizarlo.
5. Creación de un "Banco de materiales" por la autoridad pública.
   El objetivo es otorgar "crédito" en materiales de construcción a la población laboral para que puedan construir sus viviendas.

c. MANO DE OBRA

Capacitación y utilización del desempleado

Otro factor importante que guarda estrecha relación con la vivienda y el desarrollo urbano, es la necesidad de capacitar a los migrantes, los desocupados y otros trabajadores no calificados para que satisfagan la demanda cada vez mayor de mano de obra en la construcción, con lo que se incrementaría su capacidad de obtener ingresos y se satisface la necesidad de contar con obreros competentes. Pero más grave aún, es la existencia de un amplio sector de personas en situación de desempleo y subempleo, compuesto principalmente por migrantes rurales no especializados que a duras penas ganan para sobrevivir, llevando bultos o vendiendo artículos en las calles (ambulantes) ó utilizando su tiempo y sus energías de un modo relativamente improductivo. Se plantean los siguientes instrumentos jurídicos y/o financieros.

1. Exoneración de tributos al sector privado por el "derecho de preferencia de trabajo" a desempleados y subempleados.
   - La absorción de desempleados y subempleados en los cauces de la vida económica en las comunidades urbanas y rurales, permitirá el incremento de ingresos necesarios para adquirir viviendas y comodidades urbanas decorosas. Estos recursos ociosos, una vez acogidos en el sistema económico de desarrollo, podrán permitirse un nivel de vida cada vez mayor.
2. En los programas de vivienda y servicios conexos del sector público construir por el sistema de auto-ayuda.
   - Los programas de auto-ayuda rurales y urbanos acelaran el proceso de desarrollo, utilizando la mano de obra ociosa en la construcción de viviendas e instalaciones, lo cual contribuirá al desarrollo en la demanda que ello crea de otras industrias y en el valor de lo producido.
3. Exoneración de tributos al sector privado, que mantenga permanentemente programas de "capacitación y adiestramiento" dirigidos a los empleados y subempleados.
   - Estos programas ayudarán al migrante en su transición de la vida rural a la vida urbana y que no sólo necesitará el mismo para conseguir empleo, sino que requerirá tambien la economía en desarrollo a medida que aumenta su mano de obra. Además el de cubrir las necesidades de los paises en desarrollo, de contar con trabajadores calificados y experimentados.

OBJETIVOS FINALES

VIVIENDA Y SERVICIOS CONEXOS

En el desarrollo de la vivienda y del ambiente residencial las normas varían ampliamente de un país a otro, por regiones por zonas urbanas y rurales, por etapa de desarrollo y urbanización. Varían con el clima, la cultura y la época. Por lo tanto las "normas" dependerán de las condiciones reales existentes en el país — familias sin vivienda, hacinamiento, materiales disponibles, mano de obra, tierra e inversiones; nutrición, sanidad, enseñanza e industria, crecimiento de población, productividad, ingresos, ahorros, grado de tecnología y otros —

En los paises en desarrollo, los recursos de inversión existentes no bastan para construir viviendas con las "normas mínimas", adquiriendo mayor gravedad con el fenómeno que plantean las "urbanizaciones precarias": la invasión masiva y compulsiva de la población rural a la ciudad. Si no se planifica por anticipado la mayoría de la población mundial puede llegar a aceptar los barrios de precaristas como una forma de vida inevitable (actualmente, el 60% de la población en las ciudades son "precaristas"). La falta de zonas organizadas de recepción de migrantes, el alto precio de los terrenos en las zonas urbanas próximas a las oportunidades y mercados de empleo, la inseguridad y la pobreza lleva a los "precaristas" o asociarse y a ocupar — legal ó ilegalmente — un trozo de parcela sobre el cual levantan sus viviendas precarias. Al mismo tiempo hay que controlar de alguna manera los procesos caóticos de poblamiento que se producen en esas zonas, a fin de satisfacer mejor las necesidades de los habitantes y de aprovechar al máximo los recursos invertidos.

Una norma adecuada de emergencia podría ser, la de preparar los terrenos donde se construirán las viviendas, instalar los servicios indispensables y ayudar a los migrantes a construirse viviendas provisionales, baratas pero aceptables. Hasta que puedan establecerse mejor, previamente se alojarían en "arcas de noé" construídos por ellos mismos con sus propios materiales: palos, esteras, hojalatas (pabellones para albergar grupos de 100, por sexo, con olla común). Por otra parte en los sectores de la ciudad que están bien situados en relación con las oportunidades de empleo, se ayudaría a los ocupantes a construir viviendas "núcleo" ó de "armazón" en emplazamientos preparados para una densidad adecuada y con servicios mínimos; luego a medida que lo permiten los recursos, estas viviendas podrán mejorarse hasta alcanzar la norma mínima.

Una vez convenidas las "normas mínimas" se determinarán las necesidades (cantidad de nuevas viviendas a construir para satisfacer el déficit, mejorar las viviendas existentes, sustituir las casas tugurizadas, así como el aumento de la población) y de acuerdo con los recursos disponibles y periodos de tiempo que se desea cumplir, establecer prioridades, acordar políticas y emprender programas concretos. Para lo cual, el gobierno central en coordinación con las autoridades regionales y locales, fijará las metas a largo plazo destinadas a satisfacer las necesidades presentes y previsibles dentro de 20, 40, ó 50 años, y luego determinar metas intermedias, basadas en las prioridades más urgentes y los limitados recursos para construirlos en cinco ó diez años.

13111985 SECTOR 1

PROGRAMAS DE RECUPERACION SOCIAL Y ECONOMICA CON SOBREVIVIENTES DE LA ERUPCION DEL VOLCAN ARENAS DEL NEVADO DEL RUIZ.

REASENTAMIENTO DE LA COMUNIDAD " NUEVA PRIMAVERA" EN LA FINCA MONTEVIDEO DE LA ZONA CAFETERA DE CALDAS - COLOMBIA.

OBJETIVO: DESARROLLO Y EJECUCION DE UN PROYECTO DE VIVIENDA SOCIAL.

ANTECEDENTES

- **CON RELACION AL LUGAR**

  LA COMUNIDAD PARTICIPANTE EN EL PRESENTE PROGRAMA ESTA CONFORMADA POR LAS FAMILIAS SOBREVIVIENTES DE VARIOS SECTORES CONTIGUOS CARACTERIZADOS COMO POBLACION CAMPESINA E INVASORA DE TERRENOS RESIDUALES DEL ANTIGUO FERROCARRIL AL MUNICIPIO DE VILLA MARIA, ASENTADOS A LO LARGO DEL RIO CHINCHINA, CUYA FORMA DE ASENTAMIENTO ES PROPIA DE LA POBLACION MARGINAL.

- SU COHESION SOCIAL

  ESTABA DADA POR FUERZAS POLITICAS INTERESADAS EN MANTENER LA SITUACION DE MARGINALIDAD COMO FACTOR AGLUTINANTE DE UN PODER ELECTORAL.

- LA FORMA DE EMPLEO

  SE LIMITABA AL TRABAJO OCASIONAL EN AREAS SUBURBANAS Y RURALES, PRINCIPALMENTE COMO RECOLECTORES DE CAFE EN TIEMPO DE COSECHA' SIENDO EN CONSECUENCIA UNA POBLACION MIGRANTE DE ALTA MOVILIDAD QUE ANTES DE LA EMERGENCIA DEL 13 DE NOVIEMBRE DE 1985 CONSIDERABA YA LA POSIBILIDAD DE UBICARSE EN LOS CENTROS URBANOS SIN DESLIGARSE DE SU OCUPACION EN EL CAMPO.

- LA VIVIENDA

  SE CONCEBIA COMO UN TECHO, CONSTRUIDA CON MATERIALES INADECUADOS Y DE DESECHO EN MUCHOS CASOS (CARTON, LATAS, ETC.); CON INEXISTENCIA DE INFRAESTRUCTURA DE SERVICIOS (AGUA, ENERGIA, VIAS, ALCANTARILLADO, ESCUELAS, CENTROS DE SALUD, ZONAS RECREATIVAS).

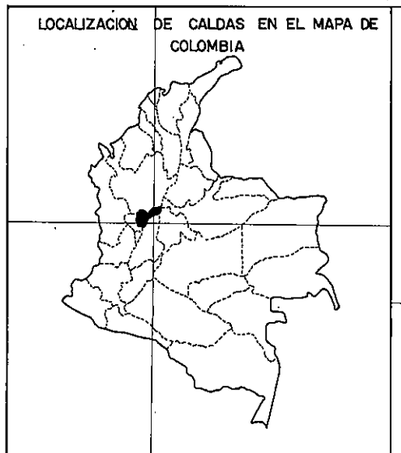
- **CON RELACION AL PAIS**

  LA COMUNIDAD DE LA PRIMAVERA RESPONDE A LAS CARACTERISITICAS DE LA ZONA RURAL COLOMBIANA: ANTE LA IMPOSIBILIDAD DE LOS INDIVIDUOS DE INVOLUCRARSE O INTEGRARSE A LA VIDA SOCIO-ECONOMICA DEL PAIS BAJO EL REGIMEN ESTABLECIDO POR LA LEY CREA SUS PROPIOS MECANISMOS DE SUBSISTENCIA Y SU PROPIO CONCEPTO DE HABITAT, CARENTE DE TODO PRINCIPIO DE DIGNIDAD HUMANA, DEBIDA A LAS LIMITACIONES ECONOMICAS Y SOCIALES DE LAS FAMILIAS ASENTADAS.

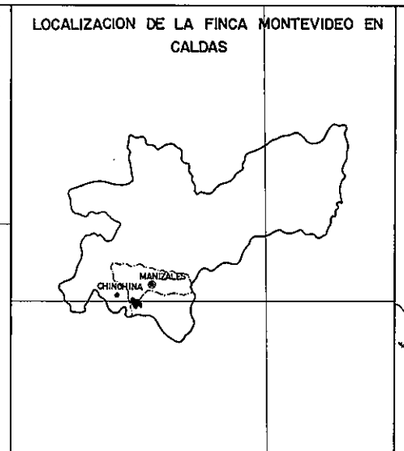
- SON PROBLEMAS DEL CAMPO
  - LA FALTA DE CONTINUIDAD DE POLITICAS DE REFORMA AGRARIA A TRAVES DE LA HISTORIA.
  - EL INCUMPLIMIENTO DE LAS LEYES Y OBLIGACIONES LABORALES (SALARIOS BAJOS, NO PRESTACIONES SOCIALES, INESTABILIDAD LABORAL) PARA CON LOS TRABAJADORES ASALARIADOS.
  - LA IMPOSIBILIDAD DE ADQUISICION DE TIERRAS PARA EXPLOTACION INDIVIDUAL O COLECTIVA, TANTO PARA EL GOBIERNO COMO PARA EL SECTOR PRIVADO.
  - LA AUSENCIA DE UN SISTEMA CREDITICIO A UNAS TASAS DE INTERES QUE RESPONDAN A LAS CONDICIONES DE INGRESOS REALES DE LAS FAMILIAS.
  - LA AUSENCIA DE SERVICIOS Y ATENCION BASICA DIRECTA A LA POBLACION.
  - LA DESMEMBRACION DE LA UNIDAD FAMILIAR POR LA MOVILIDAD EN LAS REGIONES PARA ENCONTRAR EMPLEO OCASIONAL.
  - LA RESPUESTA DE ULTIMO MOMENTO DEL GOBIERNO CON PROGRAMAS QUE CORRESPONDEN SOLO A LAS PRESIONES EJERCIDAS EN EL CAMPO ANTE LA AMBIVALENCIA DEL SECTOR CAMPESINO, UBICADO ENTRE FUERZAS POLITICAS EXTREMAS (GUERRILLA - PARTIDOS POLITICOS) TENDIENTES A AGUDIZAR Y A ATOMIZAR LA DIFICIL SITUACION ECONOMICA DE LAS REGIONES, BUSCANDO SU DESESTABILIZACION SOCIAL.

  DICHOS PROGRAMAS NO SON PRODUCTO DE UNA PLANIFICACION SERIA, ENMARCADA DENTRO DEL CONTEXTO REGIONAL, LOCAL O NACIONAL.

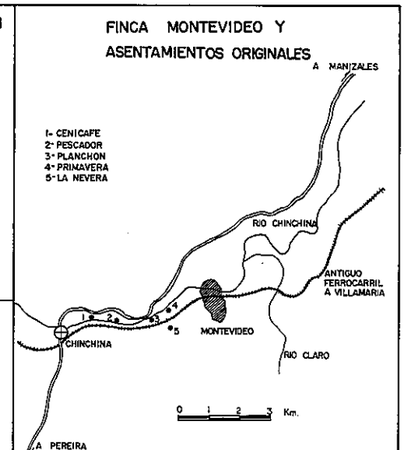
LOCALIZACION DE CALDAS EN EL MAPA DE COLOMBIA



LOCALIZACION DE LA FINCA MONTEVIDEO EN CALDAS

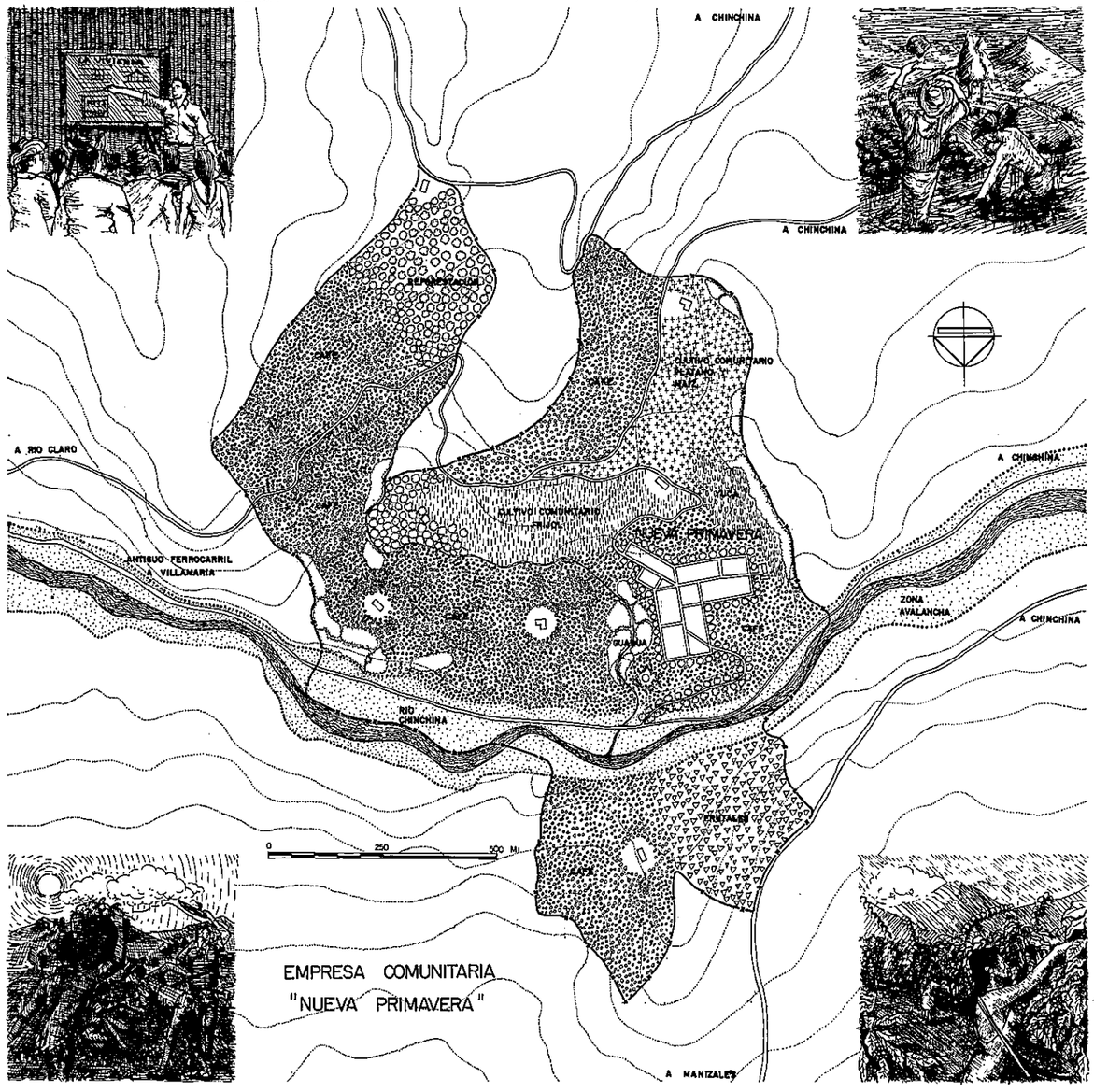


FINCA MONTEVIDEO Y ASENTAMIENTOS ORIGINALES



DISEÑO PARTICIPATIVO DE LA VIVIENDA

EXTRACCION DE MATERIALES DEL RIO



CULTIVOS DE AUTOSUFICIENCIA

LABOR EN PRODUCCION DE CAFE

ALTERNATIVA INTEGRAL

Ante la agudización de los conflictos sociales y de las condiciones anteriores, agravados por el desastre natural, se establece una estrategia de recuperación social de orden rural con noventa familias (540 personas) que perdieron todas sus posibilidades de albergue y trabajo, en una finca cafetera de 135 hectáreas, la cual fue posible mediante una ley de negociación forzosa por parte del sector público con aportes económicos del sector privado.

La tierra en producción constituye el soporte del proyecto y considera en primera instancia el recuperar a las familias campesinas para el agro, evitando el establecimiento de ellas en el área urbana debido a su pérdida física y humana, mediante un asentamiento comunitario de los grupos sobrevivientes que sea el punto de partida de un nuevo habitat social y que comprende no solo la recuperación de la vivienda sino también del trabajo colectivo, de las relaciones afectivas con su familia y las de sus vecinos: **Comunidad Integral.**

ESTRATEGIA DESARROLLADA

- Identificación de las familias afectadas directamente o sobrevivientes campesinos mediante un Comité de reconocimiento de la misma comunidad.
- Aplicación de una ficha social-familiar que determina: Pérdidas humanas y materiales, beneficiarios del proyecto, niveles de educación, ocupación y oficio, parentesco, edad, aptitudes y actitudes frente al área agrícola, explotación de materiales del río y autoconstrucción.
- Recuperación de la historia social y de su habitat en los diferentes sectores geográficos afectados por la tragedia:
  - Su organización de base
  - Sus líderes naturales
  - Antecedentes de trabajos colectivos
  - Experiencias positivas y negativas del trabajo colectivo.
  - Concepciones de la vivienda y equipamento comunitario.
  - Expresiones e identidad cultural de las comunidades.
- Traslado de las familias al nuevo asentamiento conformado por la vivienda transitoria, elaborada por la comunidad con materiales propios de la región (guadua) y de acuerdo a sus conocimientos en construcción. Esta vivienda representa un paso intermedio entre el albergue en carpas y la vivienda definitiva recuperándose en ella la intimidad y las relaciones del grupo familiar.
- Identificación con el lugar y estrategia de supervivencia. La finca posibilita una función económica de empleo con el cultivo del café lo que significa un ingreso familiar en dinero.

La diversificación de cultivos en forma comunal, cuyo objetivo es la autosuficiencia, permite un nivel de apropiación de las tierras cuyo fin último es permitir el establecimiento de una **EMPRESA AGRICOLA COMUNITARIA** consecuente con el grado de desarrollo de la comunidad.

No toda la comunidad es agricultora. Un pequeño grupo se dedicaba a la extracción de materiales del río (arena, piedra, cascajo).

Se estimula el retomar este oficio mediante la compra de los materiales necesarios para la obra, por parte de las entidades que apoyan financieramente el programa.

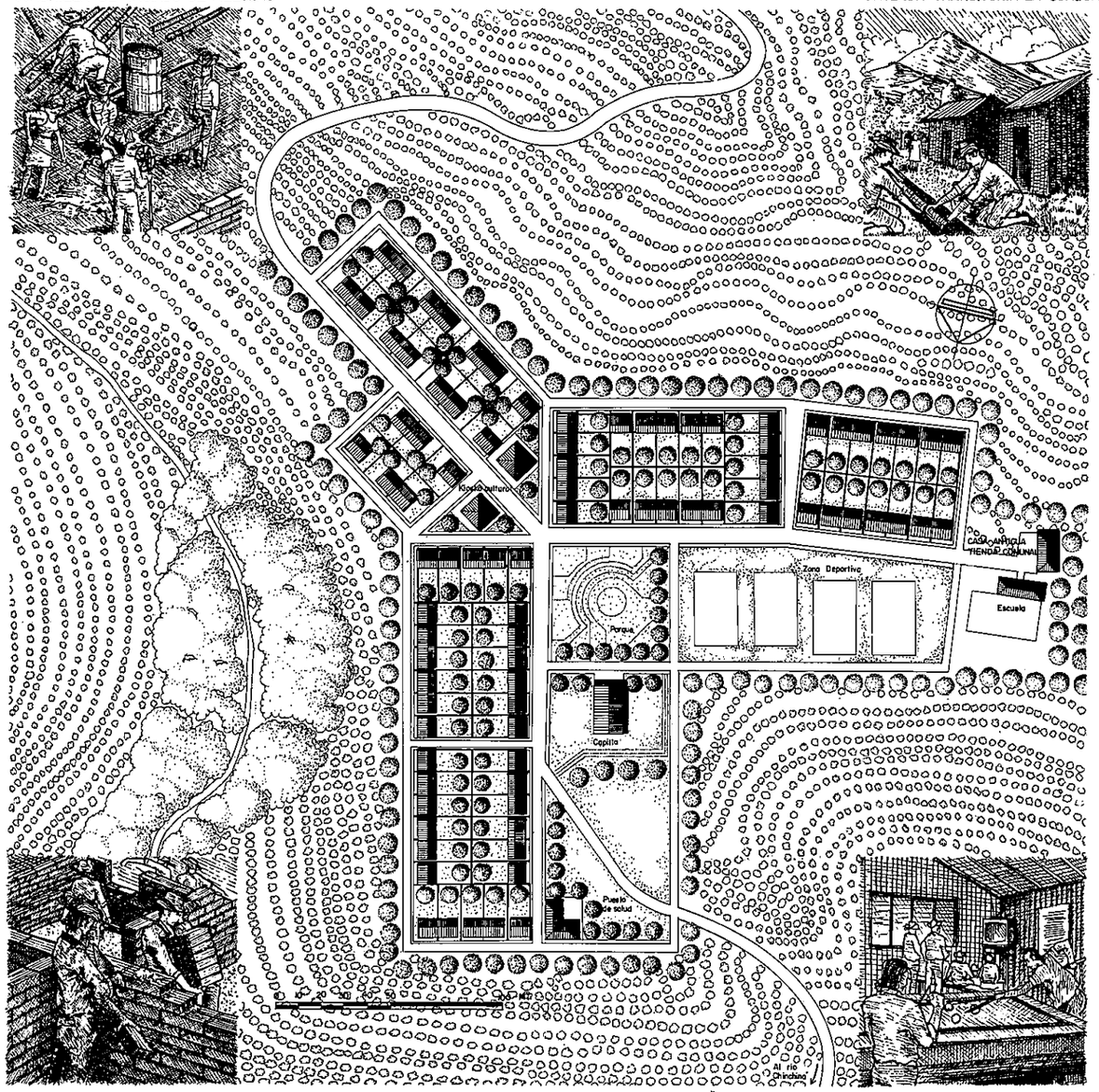
Dada la calidad y cantidad de estos materiales, se opta por fabricar los bloques para la mampostería en el sitio, lo que permite el ingreso de recursos a todas las familias dedicadas a la extracción, complementario a la función económica del agro.

- Garantizado un ingreso familiar permanente y ubicadas las familias en las casas provisionales, se dió inicio a la construcción de la vivienda definitiva.

PROCESOS EVOLUTIVOS CON LA COMUNIDAD

- Diseño participativo de la Vivienda: La comunidad define los espacios necesarios, su distribución arquitectónica y los materiales básicos.

CUADRILLA DE VACIADO DE MEZCLAS



CUADRILLA DE MAMPOSTEROS

KIOSKO CULTURAL

- Es preciso la vinculación permanente de un miembro de la familia a los frentes de construcción.
- Estudio de casos Especiales para definir su forma de participación en la autoconstrucción: Grupos familiares compuestos por ancianos; un solo miembro de la familia es sobreviviente.
- Capacitación para la construcción, difundiendo la información necesaria que posibilite la evolución de la obra, manteniendo la vocación agrícola.
- Distribución por cuadrillas o grupos de trabajo para cada fase de la autoconstrucción, acorde con las aptitudes de las personas y el proceso de capacitación.
- **TODOS CONSTRUYEN LAS CASAS DE TODOS**, así como las obras de infraestructura.
- **EL PUEBLO RECUPERA SU PUEBLO**
- Todos los procesos exigen orientación Social y Técnica permanentes.

SOPORTE SOCIAL PARA EL PROYECTO

- La comunidad reconoce sus líderes naturales; con ellos se conforma el Comité Coordinador quien actúa como puente entre la comunidad participante y las entidades financiadoras del proyecto.
- Rescate de la organización de base (Junta de acción comunal) y movilización de los usuarios a participar en los diferentes comités que la hacen operativa :

1. Comité de Vivienda :

   Incide en la obra por autoconstrucción de las viviendas e infraestructura; facilitador de la participación de la comunidad y quien aplica el reglamento interno de trabajo.

2. Comité Agrícola :

   Promotor de actividades agrícolas de autosuficiencia, de formación y organización de la empresa comunitaria.

3. Comité de Educación :

   Desarrolla campañas de alfabetización, promueve la escuela de padres y de desarrollo familiar.

4. Comité de Salud :

   Difunde los programas preventivos en salud física, mental, ambiental y de recuperación emocional.

5. Comité de Recreación y Deportes :

   Además del deporte, rescata valores culturales de la zona (música y teatro).

6. Comité de Prensa y Comunicaciones :

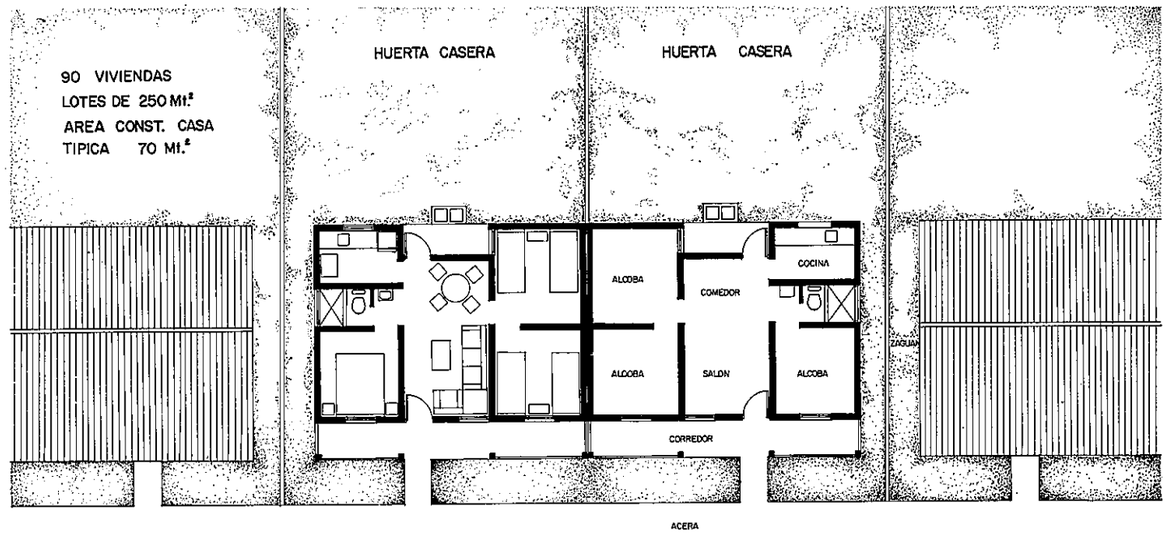
   Edita el boletín informativo periódico para dar a conocer a toda la comunidad el estado y avances del programa, estimulando a los grupos familiares en el trabajo colectivo.

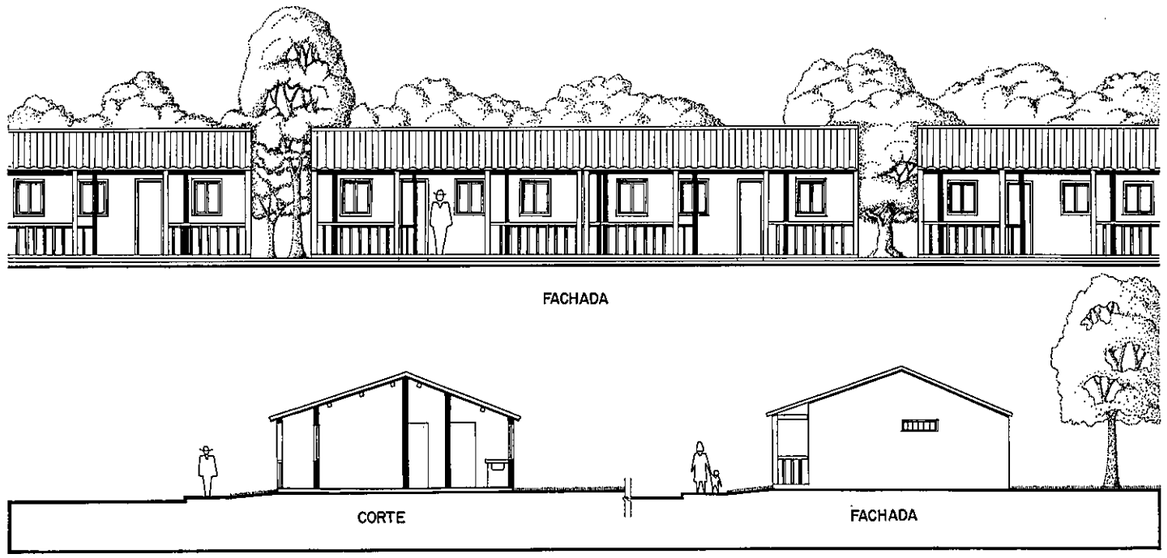
7. Comité de Empleo :

   Coordina la rotación de personal entre la finca, el río y la autoconstrucción de vivienda y redes de servicios. Gestiona también recursos para las Empresas Económicas Familiares (Famiempresas).

   Los representantes de cada Comité tienen voz y voto en el Comité Coordinador.

VIVIENDA TRANSITORIA EN GUADUA





- Otros Soportes :
  - Distribución de productos básicos de la canasta familiar y de productos farmacéuticos a precios económicos bajo la modalidad de Tienda Comunal manejada por los mismos habitantes.
  - Soporte al grupo familiar que participa en las obras por autoconstrucción con un **SALARIO INTEGRAL** por cada 96 horas de trabajo, así :

    50% materiales para la vivienda y los servicios públicos comunitarios.

    25% atención médica y odontológica permanente.

    25% víveres y comestibles, capacitación y ropa para el trabajo.
  - Conformación de otras actividades productivas de apoyo al programa de reconstrucción (carpintería, cerrajería, confecciones, mercadeo, etc.).

CONCLUSIONES :

- La metodología implementada permite aplicar el esquema de trabajo en otros contextos económicos, políticos y sociales previamente identificados e interpretada su situación social, económica y humana, no necesariamente derivada de desastres naturales, con el concurso del Estado aportante de sus instrumentos jurídicos y financieros, de las entidades orientadoras de los procesos y el esfuerzo de las comunidades carentes de vivienda o de los servicios básicos de atención (acueducto, alcantarillados, escuelas, puestos de salud y generación de empleo).
- Dar respuesta a problemas de este orden demanda de un equipo interprofesional (Técnico-Social) con un lenguaje unificado en la práctica quien, conjuntamente con la comunidad, desarrolle una planeación participativa, acorde con las necesidades reales de la población.
- Se ha recuperado un área rural colombiana afectada por su anterior situación marginal y agudizados sus problemas por el desastre natural, involucrando a las familias en el proceso social y económico mediante la **AUTOCONSTRUCCION**. Se ha recuperado la vivienda perdida y se ha devuelto también un espacio social con un concepto integral en cuyo soporte físico se interrelacionan la educación, la salud, la recreación, la infraestructura de servicios comunitarios y ante todo el empleo que incorpora individuos a la vida productiva del país, recuperando también el equilibrio en las zonas afectadas.

- El nivel de arraigo en el lugar y el grado de cohesión y organización comunitaria alcanzados, garantizan el establecimiento y continuidad de la **EMPRESA AGRICOLA COMUNITARIA**, que tiende a ser autosuficiente, gestora de su propio destino.
- El problema no se reduce exclusivamente a dar un techo a las familias necesitadas. El concepto de **VIVIENDA INTEGRAL** significa el recuperar a los hombres afectados, para que ellos mediante su propia capacidad productiva y asociativa le devuelvan a sus familias la dignidad de vivir y compartir unidos un futuro más promisorio y estable. Solo así existirá la oportunidad de que "el pueblo recupere su pueblo".

DHARAVI IS OUR HOME - HELP US TO IMPROVE IT

SECTION I

Several bigger cities in the world are today surrounded by large slum areas. The squatter settlements have enormous environmental, health, economic and social problems. The United Nations" campaign for the IYSH 1987 describes the situation thoroughly and convincingly. Wishing to make a contribution for the Year of the Homeless, we participate on a case study in Bombay. The targets obtained from our environmental studies and from contacts with the squatters of Dharavi, one of the infamous slum areas in India, are such that we believe that there are good possibilities for carrying out considerable environmental improvements in this area.

The following is a suggestion for a pilot project with the idea of making environmental improvements by utilizing local resources, the dwellers themselves being the main one. Needless to say, substantial aid and moral support are also required from the authorities.

Dharavi is a slum area of 2.1 square kilometre in the northern part of central Bombay. The first settlements are approximately 100 years old and about 500,000 people are living there today. Many ethnic groups, languages and religions are represented.

Expansion of the area has been rapid, extensive and totally unplanned while the projection of an infrastructure has been deficient and full of problems. Density is very high, 2,360 inhabitants per hectares, the main part consists of small one-storey squatter settlements. Dharavi has also many good points and we maintain this is the case in other slum areas too. The grouping and density of the buildings provides chances of making many social contacts and surprisingly there are many pleasant outdoor spaces. Despite many problems, the environment often provides a sense of creativity.

A tentants" organization named PROUD (Peoples" Responsible Organisation of United Dharavi) has been in existance for eight years. PROUD has succeeded in organizing the dwellers to cooperate, help one another and to negotiate with the authorities, all of which should lead to a positive development of the existing situation.

We have seen elsewhere many rebuilding schemes carried out where the entire slum area is first levelled and thereafter standard element houses are built on a large scale. The result turns into an alien and costly place to live in. Most people are compelled to move because they cannot afford it and because they would not feel at home.

We suggest that a primary target should be to have the dwellers remaining in the same settlement after the completion of the improvements.

We suggest the following can be done by the architect.

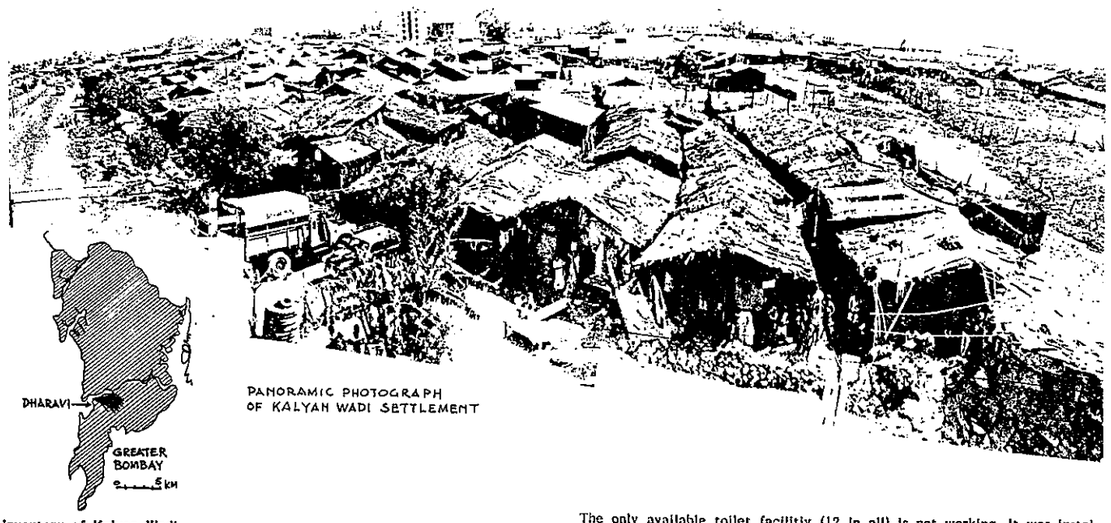
1. Carry out an environmental inventory, survey and analysis of conditions in the area.

2. To make suggestions for development by using the dwellers" skills and work as the main resource for the reconstruction.

3. Analyse the useability of local building materials and building technics and submit suggestions for improvements.

It is essential to have a good knowledge of the area and its people to achieve the above target.

This presentation is a case study for a part of Dharavi - KALYAN WADI - where we, being on sincere and open terms with the inhabitants, have studied local conditions and buildings, building technics and material, are suggesting environmental improvements as follows.



PANORAMIC PHOTOGRAPH OF KALYAN WADI SETTLEMENT

Inventory of Kalyan Wadi

Kalyan Wadi is part of north-western Dhalavi. Most of the people originate from Tamil Nadu in southern India. The oldest houses are about 50 years old. The area is approx. 6,000 square metre and has an irregular building structure. There are about 300 houses, a squatter settlement, where 42 are built in 2-storeys. Their foundations are laid on a former marsh that has been used as a dump by the local council. The narrow pathways, about 1 m wide, are partly of concrete, resulting in large concrete slabs that are "floating" on the former marsh.

The buildings have a simple construction. The walls are 85% wood, approx. 2" timber, and the rest of the houses, many of them new, are constructed in bamboo covered to 90% by corrugated metal sheets. The rest of the material is jute, plastic sheets and various waste products. Some of the houses have plastered brick walls and plinths of concrete. The roof frame work is made of wood and bamboo which is covered mainly by mud bricks and in some cases bamboo mats. Plastic and asbetic tiles are used as well. The building materials are to some extent available in Dharavi, including also wood and corrugated iron sheets.

The size of each house is approx. 10 square metre, consisting of one room for a family of about 4-5 people. Practically all the houses lack windows and the door is the only opening. Cooking is normally done indoors on a petroleum-oil stove. See Fig.

There are in all, three water taps for the whole community installed by the council. Water is available daily but only between 4 - 8 p.m. People, mostly women, queue to fetch the water in buckets which they then store in casks and barrels in their houses.

There is an open sewage, some in the gutters, some in cast trenches as part of a concrete pathway. The fall is slight and in many places the water is not running at all. During the monsoon period the water level rises and is about half a metre over larger parts of the area.

The only available toilet facilitiy (12 in all) is not working. It was installed by the council and has a tank that has to be emptied regularly. It seems today that the council is not emptying it often enough to have it working properly. Thus Kalyan Wadi has no proper toilet facilities. In reality the road-side between the settlement and the area is used as toilet for over 1,000 people.

Electricity is installed by the council. The connections are made on private initiatives, legally or illegally.

Hardly any of the dwellers are out of work. Many of them work within Kalyan Wadi.

There is some commerce and handy-craft on a small scale. Some streets have the character of a bazaar.

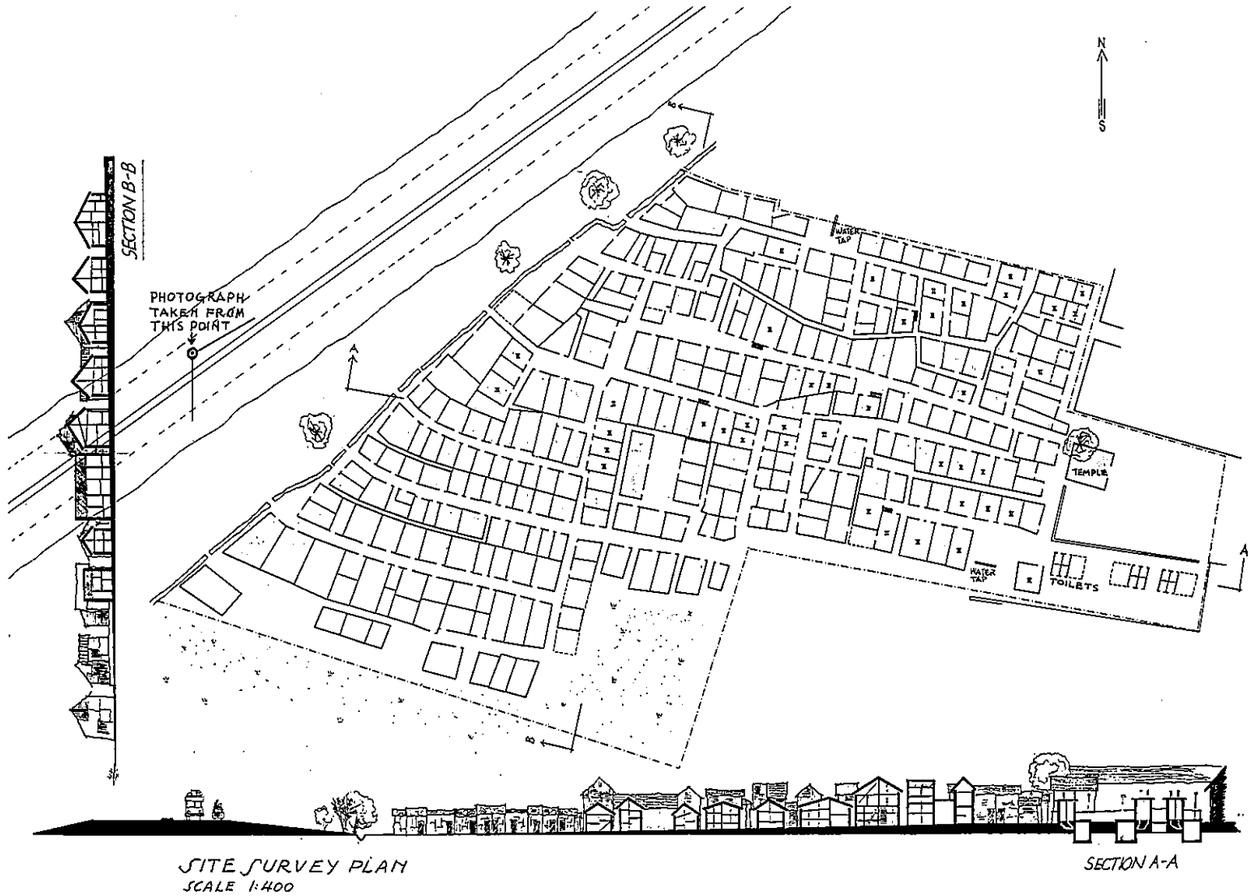
The main problems are sanitation, water, sewage and above all the toilets. The odour is strong in the settlement and the air is polluted in many ways.

The families have an average income of 1,000 RS a month and many would be able to put down 4,600 RS as an initial installment payment on a house. But the uncertainty of whether people can remain in the area or not, refrain them from investing any large sum of money in a stable dwelling.

The density of the area is the reason why no real private zones major open space or market exist.

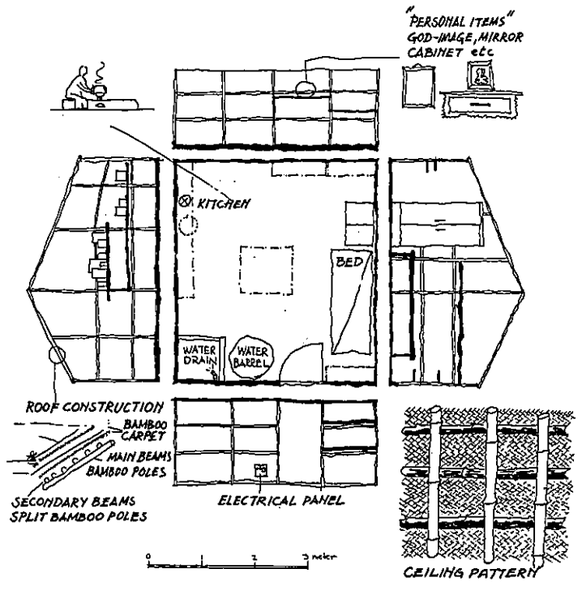
The inhabitants consists of a socially rather homogen group and while we were making our survey we noticed very few conflicts or strained situations.

Despite the large differencies and difficulties we observed in the ... settlement, there was always a sense of hope and a strong wish to work to improve the existing situation.



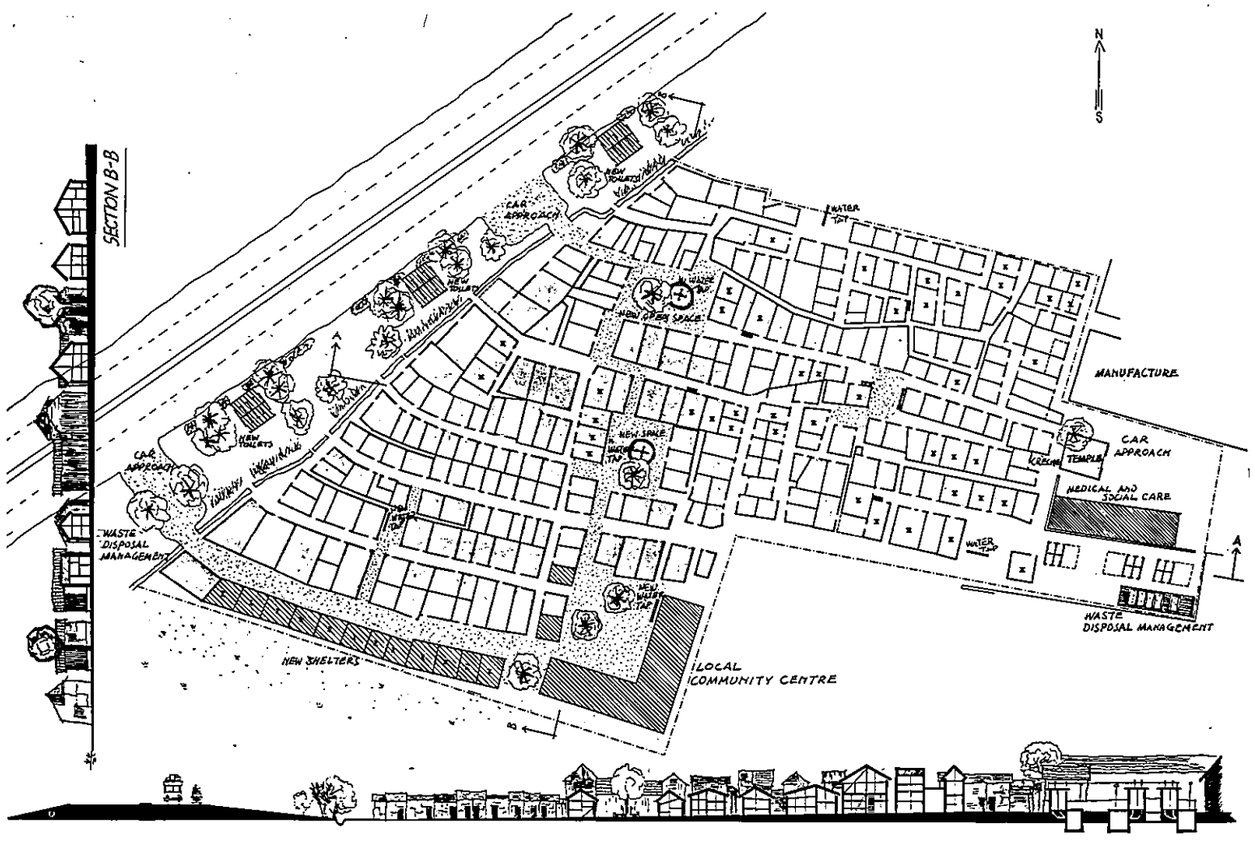
SITE SURVEY PLAN
SCALE 1:400

SECTION A-A

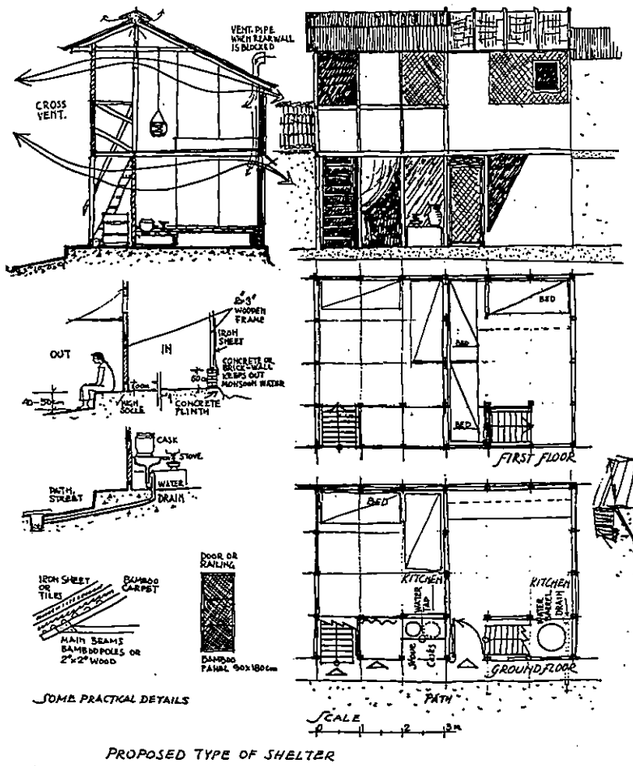


MEASURED DRAWING OF TYPICAL HUT

AXONOMETRIC SKETCH OF EXISTING GROUP OF SHELTERS



PROPOSED SITE PLAN
SCALE 1:400



PROPOSED TYPE OF SHELTER

AXONOMETRIC SKETCH "ROUND A NEW OPEN SPACE"

Proposal for Development Plan

1. Measures that should come into effect immediately:
- Negotiations with the local council as to the emptying of toilet tanks.
- Improvement of water-supply service.
- Legalization of all squatter settlements.

1.1. To provide organisational help and information for the inhabitants with the assistance of PROUD (or equivalent) such as to organise adequate maps and charts based on land surveys and inventories of the area and to advise on the selection of available building materials etc.

1.2. To provide three main drains in accordance with enclosed layout plan by cooperative labour. The three outlets emerge in the trench at the road-side. A survey would be necessary for the calculations of appropriate falls. The difference from the highest ground level to the lowest is ca 2.5 m.

The three main outlets are to be constructed of reinforced concrete and partly covered with paving stone. The trench at the road-side should be drained and reinforced. The individual drains from each house are connected to the streets' open drain, which in turn are connected to the three main "drain-ditches".

1.3. To provide 24 new toilets, and to repair and empty the 12 existing toilets - 36 in all. Thus giving one toilet per 40 people. The new toilets should be accessible to a "suction-collecting" vehicle, and placed in three groups of eight at intervals along the road according to proposed site plan on page 3. Alternative solutions for waste disposal, in the event that above collecting system fails, should also be prepared.

2. Further successive steps should be:

2.1. Installment of three new water taps on new sites. (No more so called "illegal" connections in the houses.)

2.2. The electrical supply system to be extended, giving people the possibility of connecting up to the system at cost price.

3. Measures for environmental improvement:

3.1. Resiting of the housing units to obtain three open areas of ca 100 square metre each. This can be done by the removal of 12 - 14 houses and placing them on top of neighbouring one-storey houses. Accordingly the number of 2-storey houses is increased from 42 to 54 (out of a total of 300). Other suitable sites for a 2-storey development are marked on the plan, page 3.

The proposal means that one third of the houses in the area can be converted to 2-storeys. The advantages are, using the same density, to create more open areas for easier access and outdoor meeting places, the airing of the bedrooms can be improved as well as obtaining more privacy by sleeping upstairs.

3.2. In conjunction with the the new open spaces, water taps, showers, washing facilities and sitting areas should be planned; trees and vegetation should also be introduced. Space for handy-craft, manufacturing and commerce on a small scale should be arranged.

The ground floor can be drawn-in providing a levelled floor slab shaded from the sun and suitable as sitting place. This also provides space for a safe cooking arrangement on a concrete slab. See plan.

4. Some suggestions to improve housing conditions with self-help:

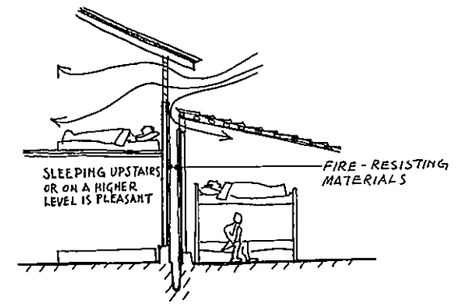
4.1. Walled plinths of 30 - 50 cm in height provided around the houses as a protection against flooding. There should be a 20-30 cm high plinth at the doorway. More windows and ventilation openings in the ceilings. Light-coloured surface materials are to be recommended.

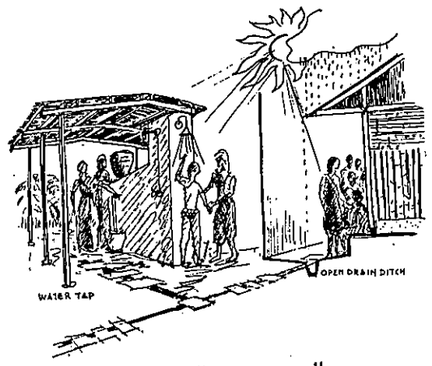
4.2. The houses are small, thus walls could be constructed of 2"x3" wooden frames covered with corrugated metal sheets or wood. Roof beams in bamboo to be covered with bamboo mats, brick tiles or corrugated metal sheets. The problem of solving heat insulation needs ingenuity and will depend on the building materials available.

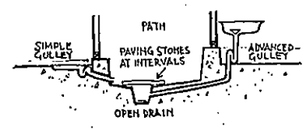
Finally it is of interest to note that each family can afford the sum of 1500 - 2000 RS a year for the costs for water, electricity, taxes, maintenance and repayment of loans. The inhabitants of Kalyan Wadi can, according to an investigation, also invest approx. 1.25 million RS on environmental improvements, infrastructural supply and improvements to their houses, providing of course they are given recognition and guarantees to be able to settle in the area for good.

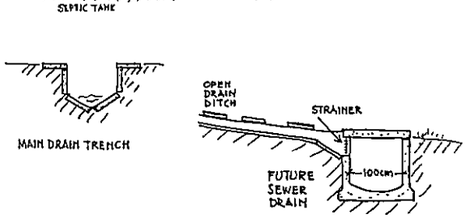
The above proposal is to be considered as the first realistic step towards a promt improvement of Dharavi with modest means.

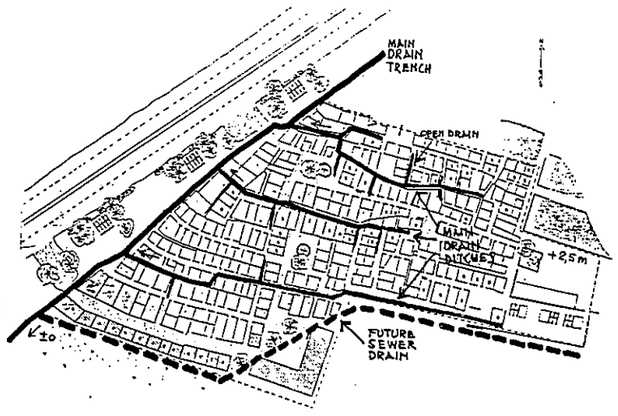
We left the settlement with a sense of optimism and faith in the people of Dharavi.











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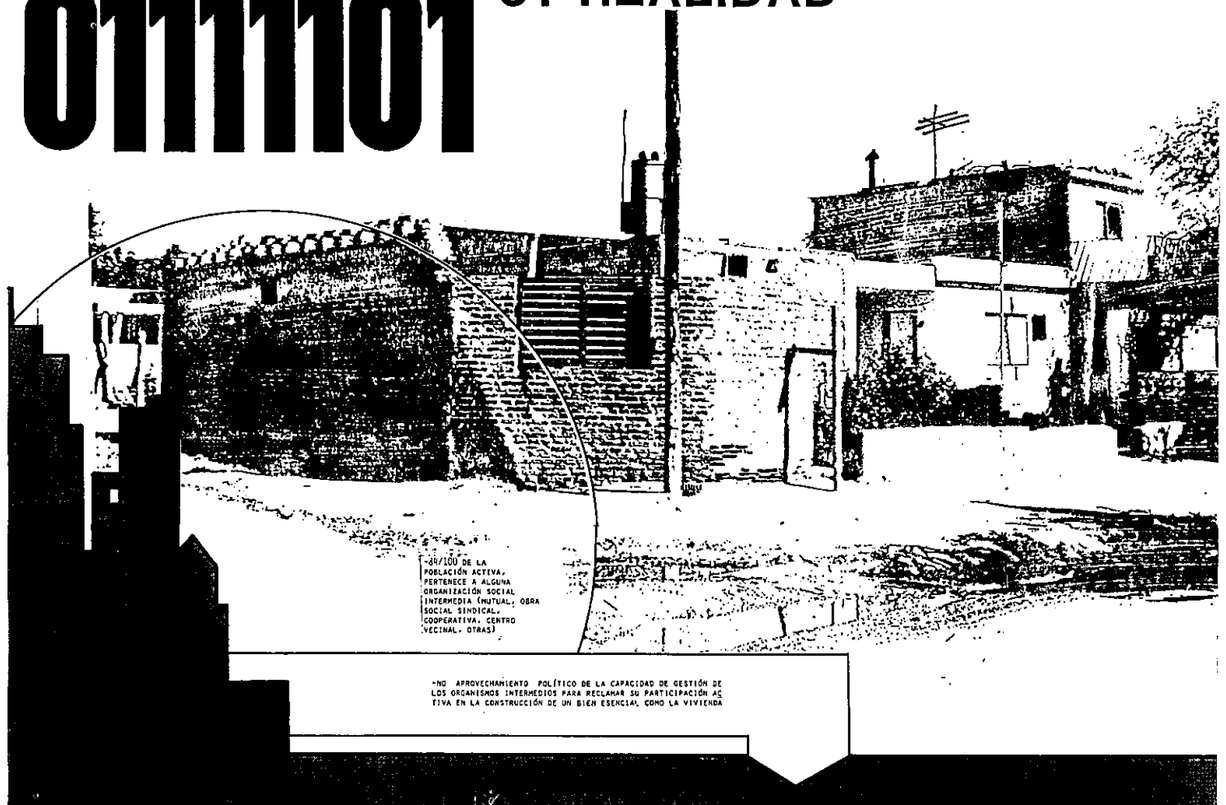
01 REALIDAD



.FUERZA PARA OBTENER LA TIERRA
.FUERZA PARA PROMOVER SU CASA
.FUERZA PARA FINANCIAR SU PROCESO HABITACIONAL
.SATISFACCION INICIAL CON NIVELES DE HABITABILIDAD REDUCIDOS
.FUERZA PARA CONSTRUIR LA VIVIENDA

EL VALOR DEL CONOCIMIENTO COMO TRANSFORMA LA REALIDAD

SIN EMBARGO

EL 60% DE LAS VIVIENDAS QUE SE CONSTRUYEN SON PRODUCIDAS POR EL SECTOR INFORMAL, QUE NO RECIBE APOYO OFICIAL.

-NO HAY SISTEMAS DE CRÉDITOS NO CONVENCIONALES. NO HAY LEYES QUE LO PROTEJAN ADECUADAMENTE DE LA ESPECULACIÓN INMOBILIARIA. LAS EXIGENCIAS DE LOS CÓDIGOS DE EDIFICACIÓN LOS OBLIGA A CONSTRUIR AL MARGEN DE LA LEY.

LOS POBRES EN SU SISTEMA NATURAL, SON LOS NUEVOS CONSTRUCTORES DE LA CIUDAD

-EL ESFUERZO INDIVIDUAL DE CADA FAMILIA DEBILITÓ E HIZO LENTO EL PROCESO...

-COMPRA DE LA TIERRA ENCARADA EN FORMA INDIVIDUAL
-ACCESO A LOTEOS DEFICITARIOS Y SIN RELACIÓN CON LA HISTORIA PERSONAL DE LOS POBRADORES
-AUMENTO DEL CAOS URBANO

-LA FINANCIACIÓN SE BASA EN UN AHORRO SOLITARIO
-EL CAPITAL NECESARIO PARA CONSTRUIR EL NÚCLEO BÁSICO PERMANECE IMPRODUCTIVO DURANTE DEMASIADO TIEMPO

-DIFICULTADES FUNCIONALES Y CONSTRUCTIVAS, POR FALTA DE PREVISIÓN EN EL CRECIMIENTO

-FALTA DE INTERVENCIÓN TÉCNICA OPORTUNA Y ADECUADA

-COMPRAS INDIVIDUALES Y DISPERSAS

-INTERVENCIÓN PROFESIONAL TARDÍA Y SOLAMENTE FORMAL

-98/100 CONSIGUIERON POR SÍ MISMOS LA VIVIENDA. ESTO GENERÓ ARRAIGO (LLEVAN 17 AÑOS PROMEDIO OCUPANDO LA MISMA CASA) Y REALIZACIÓN (80/100 DECLARARON SATISFACCIÓN POR SU PROCESO HABITACIONAL)

-EN LA POBLACIÓN ENCUESTADA 85/100 COMPRARON EL LOTE A CRÉDITO. PARA LA DECISIÓN SÓLO TUVIERON EN CUENTA QUE LA CUOTA FUERA ACCESIBLE. EN TODOS LOS CASOS (100/100) LA UBICACIÓN ES MARGINAL. 45/100 DE LOS TERRENOS CARECÍAN DE AGUA Y LUZ.

-88/100 FINANCIARON POR SÍ MISMOS SU ALTERNATIVA HABITACIONAL. 78/100 HUBIERAN QUERIDO FINANCIACIÓN, SIN EMBARGO, A 95/100 NO LES SERVIERON LOS CRÉDITOS CONVENCIONALES. INICIARON LA CONSTRUCCIÓN Y SÓLO 18 MESES DESPUÉS LA HABITARON.

-85/100 CONSTRUYERON EN ETAPAS. LA MAYORÍA (59/100) HABITARON UN NÚCLEO INICIAL DE UNA PIEZA Y UN BAÑO. 58/100 AÚN NO TERMINARON SU VIVIENDA, A 17 AÑOS DE HABERLA COMENZADO.

-75/100 AUTOCONSTRUYERON. LO HICIERON SIN ASISTENCIA TÉCNICA. 97/100 USARON LADRILLO COMÚN DE BARRO COCIDO, SEGÚN MODOS TRADICIONALES. 65/100 RECONOCIERON DEFICIENCIAS TÉCNICAS (LA MAYORÍA EN LA INSTALACIÓN SANITARIA)

-TODOS (100/100) COMPRARON LOS MATERIALES EN PROVEEDORES MINORISTAS. LAS COMPRAS DE CADA UNO FUERON DISPERSAS. SEGÚN AVANZABA, A LO LARGO DE LOS AÑOS, EL PROCESO CONSTRUCTIVO.

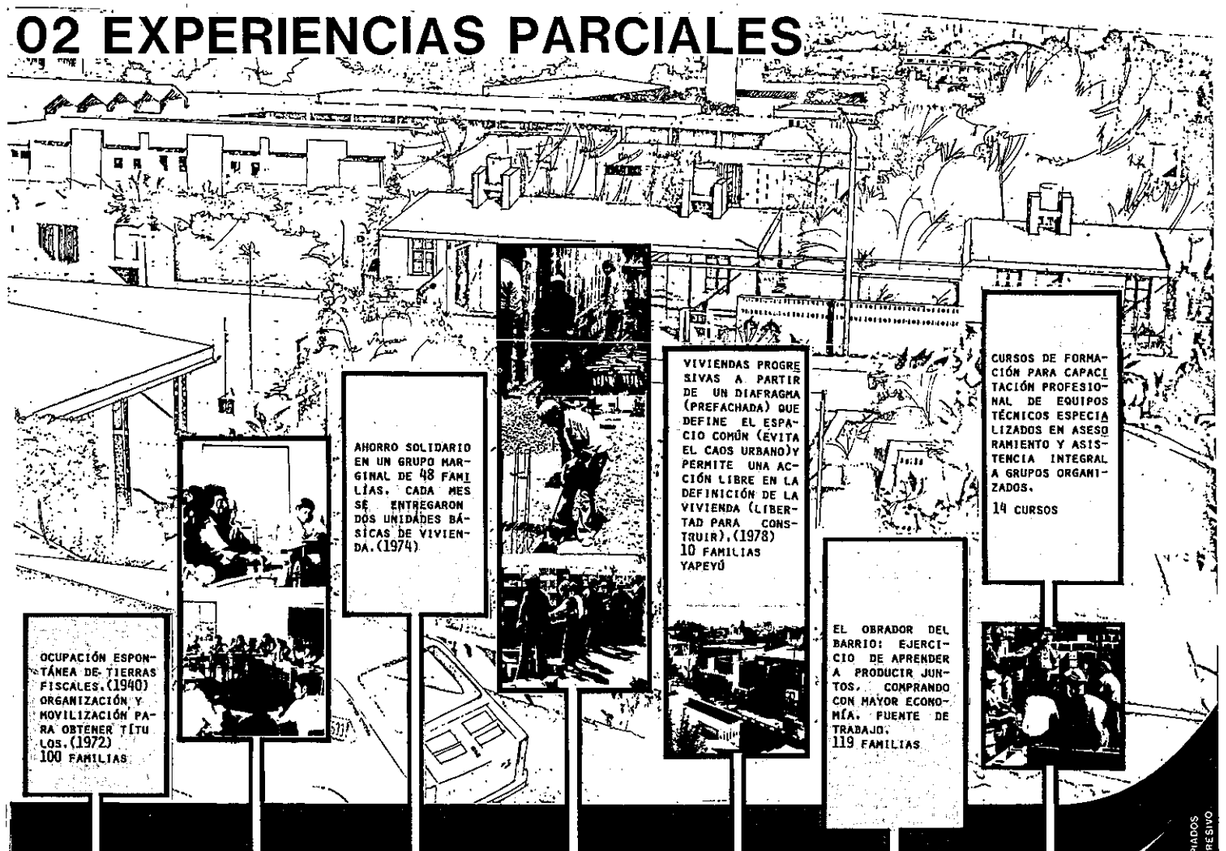
-73/100 CONSTRUYERON SIN PLANOS OFICIALES. PERO AL FINAL DEL PROCESO 80/100 TIENEN DOCUMENTACIÓN REGULARIZADA

LA INFORMACION DE ESTE PANEL SURGE DE UNA INVESTIGACION REAL-VIVIENDA AUTOPROMOVIDA- PRESIDENCIA DE LA NACION

LA REALIDAD NUTRE LA INVESTIGACION.

SE TRATA DE ESTUDIAR EL PROCESO HABITACIONAL DE LOS QUE ESTAN ASENTADOS EN EL TERCIO MAS POBRE DE LA CIUDAD, PARA OBSERVAR QUÉ HAN LOGRADO Y CÓMO LO HAN CONSEGUIDO. LAS FUERZAS-DEBILIDADES DE ESTE SISTEMA NATURAL NUTREN LA INVESTIGACION.

02 EXPERIENCIAS PARCIALES



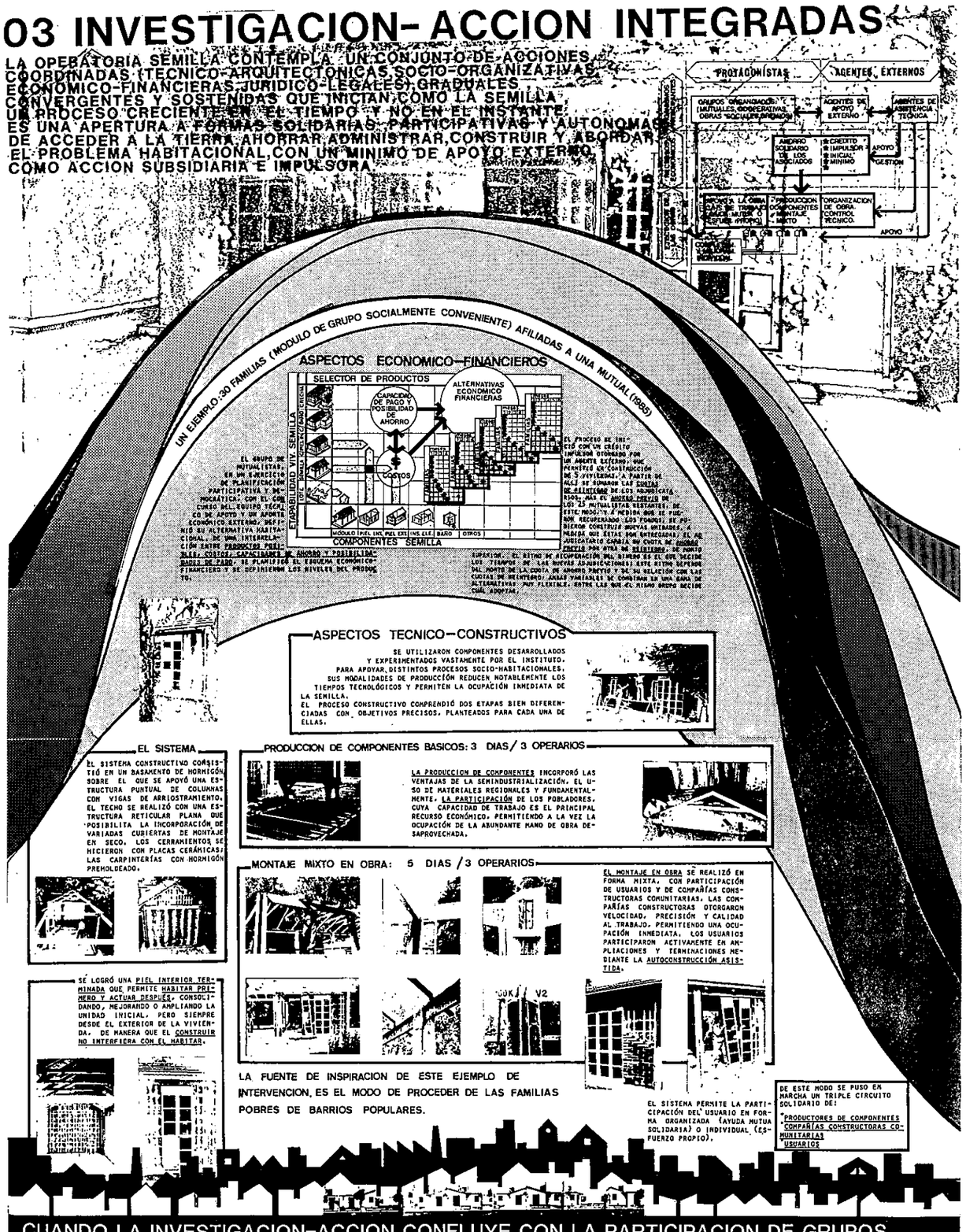
LOS EJEMPLOS QUE AQUI SE CITAN SON PRODUCTO DE TRABAJOS DE INVESTIGACION QUE HEMOS REALIZADO EN UN LAPSO DE 15 AÑOS

LA INVESTIGACION .CUANDO ES ADEMAS ACCION .
GENERA HECHOS PUNTUALES QUE INTERVIENEN SOBRE LA REALIDAD.

LA INVESTIGACION DE LA REALIDAD NO TERMINA EN SU MERO CONOCIMIENTO. LAS FUERZAS-DEBILIDADES DEL SISTEMA NATURAL INSPIRAN EXPERIENCIAS CONCRETAS EN CADA UNO DE SUS ASPECTOS PARA POTENCIAR UNAS Y NEUTRALIZAR OTRAS, BUSCANDO SU OPTIMIZACION. ENTONCES, LA INVESTIGACION ES, ADEMAS, ACCION, Y PERMITE INTERVENIR RESPETUOSAMENTE SOBRE LA REALIDAD.

03 INVESTIGACION- ACCION INTEGRADAS

LA OPERATORIA SEMILLA CONTEMPLA UN CONJUNTO DE ACCIONES COORDINADAS (TECNICO-ARQUITECTONICAS SOCIO-ORGANIZATIVAS ECONOMICO-FINANCIERAS JURIDICO-LEGALES) GRADUALES CONVERGENTES Y SOSTENIDAS QUE INICIAN COMO LA SEMILLA UN PROCESO CRECIENTE EN EL TIEMPO Y NO EN EL INSTANTE ES UNA APERTURA A FORMAS SOLIDARIAS PARTICIPATIVAS Y AUTONOMAS DE ACCEDER A LA TIERRA AHORRAR ADMINISTRAR, CONSTRUIR Y ABORDAR EL PROBLEMA HABITACIONAL, CON UN MINIMO DE APOYO EXTERNO COMO ACCION SUBSIDIARIA E IMPULSORA



CUANDO LA INVESTIGACION-ACCION CONFLUYE CON LA PARTICIPACION DE GRUPOS ORGANIZADOS, SE GENERAN INTERVENCIONES, TODAVIA PUNTUALES, PERO INTEGRALES.

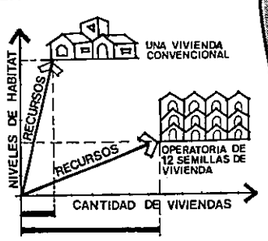
EL MODELO INTEGRAL DE INTERVENCION NO SE BASA EN PROPUESTAS DE GABINETE SINO EN LAS MISMAS FUERZAS -DEBILIDADES DEL SISTEMA NATURAL DE PRODUCCION. DE ALLI SURGEN LAS TECNOLOGIAS APROPIADAS, PRODUCTO DE UN PROCESO EMPIRICO CON FUNDAMENTO CIENTIFICO. NO OBSTANTE, PARA QUE EL MODELO SEA INTEGRAL DEBE INCLUIR LA PARTICIPACION DE LOS POBLADORES, POR LO CUAL, ADEMAS DE APROPIADA, LA TECNOLOGIA DEBE SER APROPIABLE.

04 PROPUESTA POLITICA

LA VIVIENDA

A PARTIR DE LAS MANERAS POPULARES DE CONSTRUIR LA VIVIENDA, PROPONEMOS UNA NUEVA POLITICA QUE PERMITA INICIAR LA MARCHA DE MUCHOS ANTES QUE ASEGURAR LA LLEGADA DE POCOS, MULTIPLICANDO LA PROMOCION DE UNIDADES BASICAS DE VIVIENDA

	VIVIENDA CONVENCIONAL	SEMILLA DE VIVIENDA
COSTO/M²	1,00	0,65
SUPERFICIE	1,00	0,50
%DE FINANCIAMIENTO A CARGO DEL ESTADO	0,95	0,25
PRODUCTO RESULTANTE	0,95	0,06125
RELACION	11,69	



CON UNA VIVIENDA CONVENCIONAL DE PLANES ESTATALES, SE PUEDEN SEMBRAR 11,7 SEMILLAS DE VIVIENDA...

-ESPACIO CUBIERTO INICIAL MÍNIMO (BAJO COSTO/RÁPIDO MONTAJE)
-OCUPACIÓN INMEDIATA (SOLUCIÓN DE URGENCIA)
-PROCESO DE CRECIMIENTO Y MEJORAMIENTO SEGÚN RITMOS DE CADA POBLADOR (BOLSILLO) Y GUSTOS PROPIOS (CULTURA)
-APOYO TÉCNICO INTEGRAL Y CONTINUADO

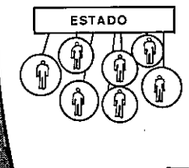
-EMPLEO MASIVO DE TECNOLOGÍAS APROPIADAS: GENERADORAS DE EMPLEO/OPTIMIZADORAS DEL USO DE RECURSOS LOCALES

-POTENCIACIÓN DEL AUTOAHORRO: MULTIPLICACIÓN DEL AHORRO IRREGULAR EN DINERO Y/O INCORPORACIÓN DE NUEVOS RECURSOS DESPERDICIADOS: MANO DE OBRA, MATERIALES

LA ACCIÓN DISPERSA DE LOS HABITANTES DE LA CIUDAD ESPONTÁNEA E INFORMAL FORTALECE LAS DEBILIDADES DEL SISTEMA NATURAL, CUYA FUERZA ES SIN EMBARGO EVIDENTE (CONSTRUYE EL 60% DE LA CIUDAD). POR SEPARADO, NUMEROSAS ORGANIZACIONES SOCIALES NO APROVECHAN SU AMPLIA CAPACIDAD DE GESTIÓN PARA ENCARAR EL TEMA DE LA VIVIENDA. LA CONVERGENCIA DE AMBAS FUERZAS EN UNA ACCCIÓN INTEGRADA ES EL FUNDAMENTO DE NUESTRA PROPUESTA DE OPERATORIA SEMILLA.

LA COMUNIDAD

PROPONEMOS EL FORTALECIMIENTO DE LOS GRUPOS ORGANIZADOS MEDIANTE LA INCORPORACION DE SUS CAPACIDADES A LOS PROCESOS HABITACIONALES, DE MODO QUE LA CONSTRUCCION DE LA VIVIENDA SIRVA COMO FUERZA PARA CONSTRUIR LA COMUNIDAD, MULTIPLICANDO LA PARTICIPACION



SUSTITUIR LA RELACION ESTADO-INDIVIDUOS, POR LA RELACION ESTADO-GRUPOS ORGANIZADOS

-EMPLEO MASIVO DE TECNOLOGÍAS APROPIABLES: FORMACIÓN DE RECURSOS HUMANOS/ PARTICIPACIÓN POPULAR EFECTIVA

-GENERACIÓN DE AHORRO SOLIDARIO: ORGANIZACIÓN Y MULTIPLICACIÓN DEL AHORRO PREVIO

LA TIERRA

PROPONEMOS QUE EL ESTADO CONSAGRE EL DERECHO A LA TIERRA DE TODOS LOS HABITANTES, Y APROVECHE SU PODER POLITICO PARA GARANTIZAR ESE DERECHO MEDIANTE EL LOTE FAMILIAR NECESARIO, MULTIPLICANDO EL AHORRO, YA QUE UN TERRENO, ES LA MEJOR ALCANCIA DE LOS POBRES

BANCO NACIONAL DE TIERRAS

PODER CENTRAL
ADMINISTRACION POR MUNICIPIOS

1/ ACOPIO DE TIERRAS URBANAS (TIERRAS FISCALES BALDÍAS, COMPRA, EXPROPIACIÓN, DONACIONES, ETC.)
2/ REGULACIÓN Y FIJACIÓN DE PRECIOS DE LAS TIERRAS URBANAS.
3/ NORMALIZACIÓN DE TÍTULOS.
4/ DISTRIBUCIÓN DE LA TIERRA URBANA CON CRITERIO DE INTERÉS SOCIAL, A GRUPOS ORGANIZADOS (VENTAS, CRÉDITOS, CESIONES A TÉRMINO, DONACIONES, ETC.)

LA MI... MA DE... MARCHA EN U... NA NUEVA POLÍ... TICA DE... DO QUE LOS RECURSOS... SECTOR VI... VIENDA SE... VIDAN; PARA U... STRIBUCIÓN MÁS... EQUITATIVA QUE PER... MITA LLEGAR A TO... DOS LOS SECTORES SOCIALES... 1/UNA PARTE PA... A EL PAQUETE TRADICIONAL: TIE... RRA + VIVIENDA CONVENCIONAL TERMINADA 2/OTRA PARTE PARA TIERRA SOLAMENTE LOTES Y SERVICIOS. 3/OTRA PARTE PARA ATENDER RECUPERACIÓN Y MEJORAMIENTO DE LO EXISTENTE. 4/OTRA PARTE PARA SEMILLA DE VIVIENDA.

UNA POLITICA HABITACIONAL
CON BASE EN LA INVESTIGACION-ACCION DA COMO RESULTADO HECHOS MASIVOS.

SI LOS PODERES DEL ESTADO DECIDEN APLICAR LA NUEVA POLITICA PROPUESTA, BASADA EN LOS SISTEMAS NATURALES DE LA CONSTRUCCION POPULAR Y EN LA INCORPORACION DE LAS ORGANIZACIONES NATURALES DE LA SOCIEDAD A LA GESTION HABITACIONAL, EL EFECTO MULTIPLICADOR CREARIA UNA MOVILIZACION MASIVA EN TORNO DE LA VIVIENDA, CON PROFUNDAS REPERCUSIONES SOCIALES, UN FUERTE IMPACTO EN LA PRODUCCION Y NUEVAS FORMAS EN LA MANERA DE PRODUCIR.

INTERNATIONAL COMPETITION FOR SOLUTIONS ON NEW TECHNOLOGIES FOR SOCIAL HOUSING — SECTION I.

HOMELESSNESS IS A WORLDWIDE PROBLEM WITH HISTORICAL ORIGINS AND PERSPECTIVES. THIS PROBLEM OF HOMELESSNESS AFFECTS EVERY SOCIETY, BUT MOST NOTABLY THOSE OF FORMER COLONIAL STATUS. AS THIS PROBLEM PREVIOUSLY EXISTED WITHIN THE FRAMEWORK OF GENERAL ECONOMIC AND SOCIAL DEVELOPMENT BEFORE INDEPENDENCE, BUT WAS ACCELERATED BY THE NEWLY ESTABLISHED POLITICAL INDEPENDENCE OF THESE COLONIES. IT IS ONLY OBVIOUS THAT THE ECONOMIC AND SOCIAL DEVELOPMENT WILL SIGNIFICANTLY AFFECT ANY SOLUTIONS TO THE PROBLEM. ADDITIONALLY, AS STABLE POLITICAL INDEPENDENCE ULTIMATELY RELIES ON SOUND ECONOMIC INDEPENDENCE, A SOLUTION LIES IN POLITICS WHICH DO NOT EXACERBATE CURRENT LOAN REPAYMENT PROBLEMS.

I. BASIC PRINCIPLES OF PLANNING

A SATISFACTORY SOLUTION TO HOUSING PROBLEMS DEPENDS ON DEMOGRAPHIC AND TECHNOLOGY FACTORS, AS WELL AS ECONOMICS. THE REALITY WHICH CONSTITUTES THESE FACTORS IS HOWEVER NEITHER EASILY NOR QUICKLY CHANGED; LONG TERM MONITORING AND PROGNOSTICATION IS REQUIRED.
LONG TERM SOLUTIONS ULTIMATELY RELY ON A FLEXIBLE PLANNING PROCESS. TIME PERSPECTIVES FOR PLANNING IN DEVELOPING COUNTRIES ARE AFFECTED BY TWO FACTORS. FIRST, CHANGING LIFE EXPECTANCIES FROM 50-60 YEARS TO 70-80 YEARS, AND CHANGING ECONOMIC NEEDS, ONE OF THE FOREMOST OF WHICH IS HOUSING; SECOND, THERE IS THE TECHNOLOGICAL FACTOR. BUILDINGS AND THE PUBLIC SERVICES WHICH THEY REQUIRE, ONLY PROVIDE FUNCTIONAL USE FOR SOME 50-100 YEARS.

FIRST, IN ORDER TO GENERALISE OUR FINDINGS, WE WILL EXPLAIN THE RATIONALE FOR A PROPOSED PERSPECTIVE FOR PLANNING. FOR OUR PURPOSES, CHRONOLOGY BEGINS WITH THE TERMINATION OF THE FORMER COLONIAL ECONOMIES, AND THE COMMENCEMENT OF DEVELOPMENT UNDER A NEW POLITICAL FRAMEWORK. /STATISTICS ESPECIALLY LATE FROM 1970./
THE PERSPECTIVE PERIOD FOR PLANNING ENDS WITH THE PREDICTED TIME FOR ATTAINMENT OF "ZERO POPULATION GROWTH", APPROXIMATELY 2060. /THIS FIGURE WAS CHOSEN AS IT WAS THE FORECAST OF THE WORLD DEMOGRAPHIC CONFERENCE IN BUDAPEST, 1968/. HENCE, THIS PERIOD OF NINETY YEARS IS USED FOR OUR PLANNING STATISTICS AND ALL MONETARY VALUES WILL BE CALCULATED ACCORDING TO STARTING DATE VALUES / 1970 USD/

GRAPHS WILL ILLUSTRATE VARIOUS MEASURES OF CHANGING QUANTITATIVE AND QUALITATIVE ASPECTS OF THE VARIOUS SOCIO-ECONOMIC PHENOMENA THAT AFFECT HOUSING NEEDS.

A WORKING MODEL WAS BASED ON CONDENSED STATISTICS FROM A SAMPLE OF EIGHT DEVELOPING COUNTRIES /EGYPT, ALGERIA, CUBA, VENEZUELA/ AND ALREADY DEVELOPED COUNTRIES /HUNGARY, SOVIET UNION, U.S.A./. STATISTICS WERE PROJECTED TO THE STATE OF DEVELOPMENT DURING ZERO POPULATION GROWTH /2060/.
THE FIRST THREE COUNTRIES ABOVE AVERAGE SEVERAL HUDRED DOLLARS GROSS DOMESTIC PRODUCT PER PERSON. THE FOURTH IS CONSIDERED ONE OF THE "LUCKY" DEVELOPING COUNTRIES, AS A NATUREL RESOURCE IS SOLD WHICH DOES NOT REQUIRE A LARGE INFRASTRUCTURE FOR PRODUCTION. VENEZUELA'S GDP/PERSON IS ABOUT 2500 USD, BUT AN OVERBUILDING CHARACTERISTIC OF SUCH A "LUCKY" DEVELOPMENT IS A GREAT DIFFICULTY IN SUSTAINING WELL BALANCED GROWTH.

WHERE A COUNTRY FINDS ITSELF IN THE ABOVE DESCRIBED PAST AND PROJECTED DEVELOPMENT CONTINUUM, CAN SERVE TO IDENTIFY BOTH QUANTITATIVE AND QUALITATIVE ASPECTS OF ITS DEVELOPMENT.

D. LAND USE POLICY

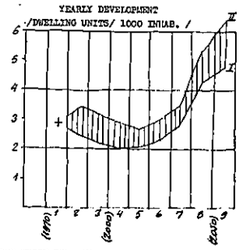
OPTIMAL LAND USE REQUIRES THAT AGRICULTURAL AND HOUSING DEVELOPMENT DOES NOT CONFLICT BY UNWISELY CONSUMING THE AVAILABLE RESOURCE. AGRICULTURAL AREAS MUST BE PROTECTED AND REVITALIZED, AND CONSTRUCTION MUST FOLLOW WHERE IT DOES NOT INTERFERE WITH THESE PROCESSES AND WHERE IT CAN BE SUSTAINED BY THE CHARACTERISTICS OF THE LAND /e.g. AREAS WHERE THE SOIL QUALITY IS POOR, DESTROYED BY EROSION, WAR, ETC./.
THE NET DENSITY OF URBAN AREAS WITH THREE OR FOUR STORY STRUCTURES CAN REACH A MAXIMUM OF 800 INHABITANTS PER HECTARE. THOSE AREAS WHERE 1-2 STORY STRUCTURES PREDOMINATE /i.e. HOUSING AREAS INCLUDING SCHOOLS, BUSINESSES, ETC./ REQUIRE 5 HECTARES PER 100 DWELLINGS; INITIALLY WITH THE DEMOGRAPHIC EXPLOSION, THE DENSITY OF POPULATION INCREASES FROM 400 TO 700 INDIVIDUALS PER HECTARE. THEN FINALLY DECREASING TO 100 INDIVIDUALS PER HECTARE.

LAND CLEARING MUST BE HANDLED BY THE GOVERNMENT ADEQUATELY SO AS TO ENSURE AN EFFICIENT BEGINNING FOR HOUSING PROJECTS. LOTS CAN BE SURVEYED AND PARCELED OUT BY THE ABOVE MENTIONED TRAINED TEAMS - ON THE CONDITION THAT, AND IN EXCHANGE FOR BASIC REQUIREMENTS BEING MET /STANDARDS WITH PREFABRICATED COMPONENTS EXECUTED BY THE FUTURE OWNERS/.

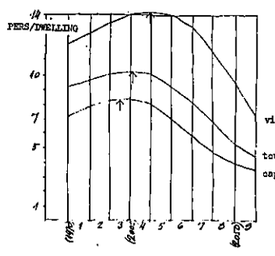
E. HOUSING POLICY

IN SPITE OF THE GREAT EFFORTS, HOUSING CONDITIONS WILL DETERIORATE IN THE FIRST FEW DECADES BECAUSE OF THE DEMOGRAPHIC EXPLOSION,

YEARLY DEVELOPMENT
/DWELLING UNITS/ 1000 INHAB. /



WITH WHICH THE CONSTRUCTION OF A MERE THREE DWELLING UNITS PER 1000 INHABITANTS YEARLY CAN NOT KEEP PACE. AS THE CREATION OF THE INDUSTRY IN THE FIRST PERIOD ENJOYS THE HIGHEST PRIORITY, THE INDEX OF HOUSING CONSTRUCTION RELATIVE BETWEEN 2 AND 3 DU/YEAR/1000 INHAB. IN THE LAST THREE DECADES HOUSING CONSTRUCTION GATHERS MOMENTUM AND 4, THEN 6 DU/YEAR/1000 INH. ARE BUILT, AND AN ORGANIZED UPGRADING OF EARLIER HOUSING UNITS IS STARTED.
IN THE THIRD, FOURTH AND FIFTH DECADES CROWDING REACHES ITS MAXIMUM WITHIN EACH HOUSING CATEGORY, AFTER THAT THE DIMINISHING OF AGE GROUPS AND A DYNAMIC UPSWING IN HOUSING CONSTRUCTION RAPIDLY AMELIORATE THE HOUSEHOLD DENSITY FIGURES.



C. THE BUILDING AND CONSTRUCTION INDUSTRY

IN THE FIRST SIX DECADES OF THE BUILDING INDUSTRY EMPHASIS MUST BE PLACED ON PRODUCING THOSE TYPES OF PRODUCTS NECESSARY FOR CONSTRUCTION WHICH CAN NOT BE PRODUCED BY POPULAR, TRADITIONAL AND CONVENTIONAL MEANS: DOORS; WINDOWS, ELECTRICAL FIXTURES, SANITATION FIXTURES, ETC.

SUCH A DEVELOPMENT PROCESS WOULD LEAD TO THE INCREASED IMPLEMENTATION OF MODERN TECHNOLOGY IN THE CRUCIAL SMALLER URBAN AREAS, AND A GRADUAL DIMINUTION OF OBSOLESCENT BUILDING TECHNIQUES IN THESE AREAS.

THIS, IN GENERAL, ENTAILS A REVOLUTION IN THE WHOLE CONCEPTION OF BUILDING. OUR PROPOSALS OFFER SOLUTIONS TO VARIOUS ASPECTS THAT PROVE PROBLEMATIC IN THIS APPROACH. THESE PLANS ARE PART OF A PROPOSED FRAMEWORK FOR PROVIDING

PERMANENT CONSTRUCTION
WITH LOCAL MANPOWER AND
AVAILABLE RESOURCES.

ASSUMING QUALIFIED PERSONNEL AT A MINIMUM, TRAINED

MANAGEMENT TEAMS

WOULD PROVIDE INFORMATION ON BASIC SKILLS AND REQUIREMENTS. THESE TRAINED TEAMS /TECHNICIAN, MASONS, LAYER OF ADOBES, ETC./ CONSTITUTE THE

NUCLEUS

OF THE WHOLE POPULAR BUILDING ACTIVITY. THEIR PRESENCE AT THE LOCAL LEVEL IS THE DECISIVE FACTOR OF ALL DEVELOPMENT.

II. PRINCIPAL PROPOSITIONS OF THE STUDY

A. DEMOGRAPHY

DEVELOPING COUNTRIES WILL CONSTITUTE THE HIGHEST POPULATION GROWTH AREAS - POPULATIONS GREATER THEN TWICE THEIR CURRENT SIZES; FROM THE PRESENT TIMES TO THE MIDDLE OF THE 21st CENTURY THE WORLD POPULATION ESTIMATIONS ARE BETWEEN 1.4 AND 2.8 TIMES GREATER THAN TODAY.

AMONG THE DEVELOPING COUNTRIES ALGERIA MAY PROVIDE A CHARACTERISTIC CASE. BIRTH RATES IN THE FIRST TWO THIRDS OF THIS CENTURY INCREASED FROM 3.5 % TO 5 %. BY THE MIDDLE OF THIS CENTURY THE DEATH RATE WAS APPROXIMATELY 2-3 % PER YEAR. SINCE, IT HAS INCLINED TO A CURRENT 1 % PER ANNUM. FOUR DIFFERENT GROWTH HYPOTHESES WERE USED FOR THE PERIOD 1990-2050, THEREBY YIELDING THE FOUR DIFFERENT FORECASTS:
1. BIRTHRATE BEGIN AT 4 % AND INCREASE TO 5%.
2. A CONSTANT BIRTHRATE OF 4 %.
3. A DECREASING BIRTHRATE TO 1 % BY 2040, THEREAFTER CONSTANT.
4. A DECREASING BIRTHRATE UNDER 1 % BY 2050, THEREAFTER A SLIGHT INCREASE.

THE FOUR FORECASTS YIELD THE FOLLOWING POPULATION GROWTH ESTIMATES:

1. 2200 % OF 1990 FIGURES
2. 1800 " " "
3. 550-600 % "
4. 360-370 " "

A SERIOUS WARNING: THE LAST TWO ESTIMATES ARE STILL MUCH HIGHER THAN THE LAST AVERAGE PROJECTED TRENDS FOR DEVELOPING COUNTRIES!

B. ECONOMIC CONDITIONS

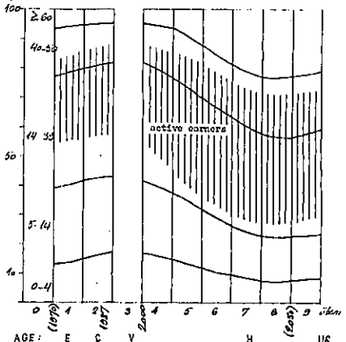
AN ECONOMY WHICH CAN SUSTAIN A BUILDING INDUSTRY RELIES ON CONSISTENT, BALANCED DEVELOPMENT. EMPLOYMENT OPPORTUNITIES MUST BE MAXIMIZED, MOSTLY DURING THE FIRST THREE DECADES. THIS MEANS 47-50 % OF THE TOTAL NUMBER OF THE POPULATION, INCLUDING MORE THAN 90 % OF MEN AND 60-65 % OF WOMEN CAPABLE OF WORK.

AS INITIALLY THIS WORKFORCE WILL IN ALL PROBABILITY BE UNSKILLED, RUDIMENTARY TOOLS AND SKILLS MUST FIRST BE DEVELOPED.
VALUABLE CAPITAL RESOURCES CAN ALSO BE SAVED BY CULTIVATING CURRENT WORKSITES /HOMES!/ SO THAT NEW EMPLOYMENT SITES AND BUILDINGS NEED NOT SLOW THE MOBILIZATION OF THE UNEMPLOYED LABOUR FORCE.
IN THE FIRST THREE DECADES OF DEVELOPMENT /IN THE PROPOSED TIMESCALE/ IT IS IMPORTANT THAT THE INVESTMENT CAPITAL PER PERSON BE KEPT TO A MINIMUM SO AS TO MAXIMIZE EMPLOYMENT OPPORTUNITIES. IT MUST, ON AVERAGE, BE LESS THAN 5000 USD PER EMPLOYEE.
ASSUMING THAT A SMALL MINORITY OF THE WORKFORCE ARE SUFFICIENTLY SKILLED TO GENERATE A DISPROPORTIONATELY HIGH AMOUNT OF THIS AVERAGE /i.e. A 20.000 USD FIGURE, AS ON 1970 AVERAGE IN THE DEVELOPED WESTERN EUROPEAN COUNTRIES/, THIS PORTION OF THE WORKFORCE PROVIDES THE GROUNDWORK FOR CONSISTENT INCREASED DEVELOPMENT AND PRODUCTION. BY 2020-2050 A GOAL FOR DEVELOPING COUNTRIES MIGHT BE THIS 20.000 USD FIGURE, OF WHICH A SMALL PORTION WOULD BE THE 40.000 USD AVERAGE PER PERSON, THE THRESHOLD OF AUTOMATION.

DEVELOPMENT PATTERNS FOR THE BUILDING INDUSTRY WOULD IN A GENERAL SENSE MIRROR THESE GENERAL TRENDS OF ECONOMIC DEVELOPMENT.

POPULATION-ECONOMY

(1) AGE COMPOSITION OF THE POPULATION
THE SHARE OF ACTIVE EARNERS



IT IS SHOWN THE HISTORICAL DEVELOPMENT OF THE POPULATION IN THREE SUCCESSIVE GENERATIONS.
THE FIRST THREE DECADES ARE CHARACTERIZED BY A HIGH PROPORTION OF YOUNG PEOPLE AS A RESULT OF IMPROVING HEALTH SERVICES

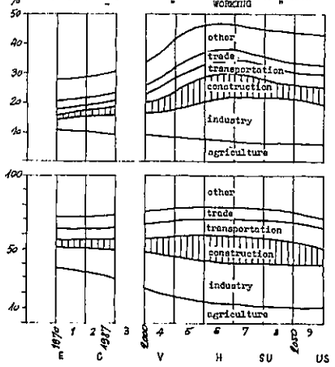
DURING THE NEXT THREE DECADES THIS GENERATION JOINS THE LABOUR FORCE AND IN THE LAST THREE DECADES REACHES THE AGE BRACKET OF THE ELDERLY - TO A SIZE SIMILAR TO THE EXPERIENCED IN MORE DEVELOPED COUNTRIES AT PRESENT.

IN THE MODEL THE AGE BRACKET 15-59 YEARS IS CONSIDERED WORKING AGE, REPRESENTING SOLE 50-55 % OF THE OVERALL POPULATION. UNDER THE CONDITIONS OF TODAY AND THE RECENT PAST 50-65 % OF THEM HAVE PERMANENT OR TEMPORARY EXPANSE TO PAID EMPLOYMENT. AT THE BEGINNING OF THE NEXT CENTURY, WITH THE WOMEN ENTERING THE WORK FORCE, EMPLOYMENT RATE MAY REACH 85 %.

AFTER REACHING THE 47-50 % OF THE WHOLE POPULATION, THE EMPLOYMENT RATE BEGINS TO EBB OFF AS A CONSEQUENCE OF LONGER SCHOOLING AND LOWER RETIREMENT AGE FOR WOMEN. THUS THE PROPORTION OF ACTIVE WAGE EARNERS IS REDUCED TO 42-43 % WITH CONTINUED DECLINE IN THE LONG TERM;

THE AGE DISTRIBUTION WILL APPROACH THAT EXPERIENCED IN HUNGARY AFTER THE MIDDLE OF TWENTIETH CENTURY.

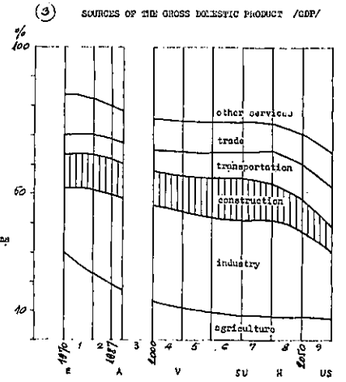
(2) DISTRIBUTION OF ACTIVE EARNERS AMONG ECONOMIC SECTORS - PERCENTAGE OF THE OVERALL POPULATION WORKING



A REGIONOVERLIG SHARE OF THE SECTORS OF THE NATIONAL ECONOMY CAN BE OBSERVED IN THE LABOUR MARKET; AS A FUNCTION OF DEVELOPMENT.

THE SHARE OF AGRICULTURE WILL DROP BY THREE QUARTERS, BUT THE OVERALL INCREASE IN THE SIZE OF THE POPULATION WILL MAINTAIN THE ABSOLUTE NUMBER OF THE AGRICULTURAL WORKPOWER.
INDUSTRY WILL INCREASE ITS SHARE, PERCENTUALLY AND IN ABSOLUTE NUMBERS AS WELL, UNTIL THE END OF THE MIDDLE THREE DECADES. IN THE LAST TWO DECADES ITS SHARE WILL FALL AND MAY EVEN DECLINE. THE AUTOMATION MAY PREMATURELY REDUCE THE INDUSTRIAL EMPLOYMENT BEYOND THE TIME SPAN OF PROGNOSTICATION.
THE LABOUR DEMAND OF CONSTRUCTION WILL GROW TOGETHER WITH THE NUMBER AND VOLUME OF INVESTMENTS, DURING THE FIRST DECADES MOSTLY IN THE FIELD OF MATERIAL DEVELOPMENT. AFTER PEAKING IN THE FIFTH AND SIXTH DECADES THE INTRODUCTION OF MORE ADVANCED BUILDING TECHNOLOGIES MAY SLOW OR EVEN REVERSE ITS GROWTH.
TRANSPORTATION, TRADE AND THE OTHER SERVICES WILL SEE A SLIGHT DECREASE IN THEIR SHARE UP TO END OF THE SIXTH DECADE, BUT THE ACTUAL NUMBER OF JOBS MAY GROW THREE OR FOUR TIMES, ESPECIALLY IN EDUCATION.

(3) SOURCES OF THE GROSS DOMESTIC PRODUCT /GDP/



DESPITE ITS RELATIVELY SLOW GROWTH, PER CAPITA GDP MAY INCREASE BY A FACTOR OF 2 TO 4 BY THE FIRST HALF OF THE 21st CENTURY, REACHING SIX TIMES ITS PRESENT VALUE BY AROUND 2060.

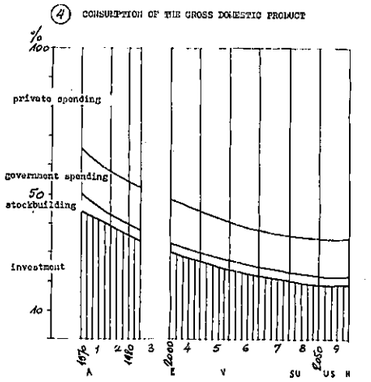
GROWTH RATES OF 1-2 %/YEAR, 1-3 %/YEAR and 3-5 %/YEAR MAY BE SUSTAINED IN THE FIRST, SECOND AND THIRD THREE DECADES RESPECTIVELY.

THE CONTRIBUTION OF MATERIAL PRODUCTION WILL FALL FROM THE INITIAL 65 % TO ABOUT 55 % IN THE MIDDLE THREE DECADES, AND TO 40 % AFTER 2050.

BECAUSE OF ITS INHERENTLY SLOWER DEVELOPMENT, AGRICULTURE IS TAKEN TO CONTRIBUTE TO THE GDP WITH 75 TO 80 % OF ITS LABOUR MARKET SHARE, ACCORDING TO OUR MODEL.

WITH ITS 12-14 % CONTRIBUTION, CONSTRUCTION HAS A MAJOR ROLE IN THE CREATION OF PUBLIC FACILITIES, UTILITIES AUTOCONSTRUCTIONS UP TO THE END OF THE SEVENTH DECADE. AFTER THIS PERIOD ITS TASK WILL CHANGE TO THAT OF PROVIDING QUALITY HOUSING, AND ITS SHARE MAY FALL BELOW 10 PERCENT.

(4) CONSUMPTION OF THE GROSS DOMESTIC PRODUCT



DEVELOPING COUNTRIES MUST ALLOCATE A SIGNIFICANTLY HIGHER THAN AVERAGE PORTION OF THEIR GDP TO ACCUMULATION, IF THEY WANT TO BE ABLE TO RAISE THE CONSUMPTION OF THEIR POPULATION ABOVE THE POVERTY LINE IN THE FORESEEABLE FUTURE. AS OPPOSED TO AN ACCUMULATION OF AROUND 20 % IN THE MORE DEVELOPED COUNTRIES, CAPITAL INVESTMENTS MUST REACH 40-50 % INITIALLY, FALLING TO JUST 30-33 % BY THE BEGINNING OF THE 21st CENTURY.
IN 1970 INDUSTRY SHOWED THE FOLLOWING NET WORTH OF FIXED ASSETS PER JOB

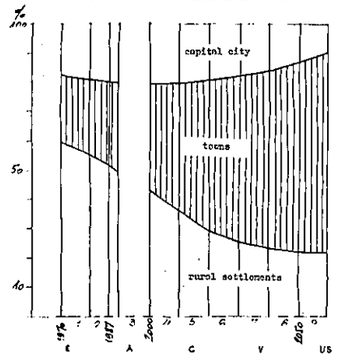
VALUES:	
HUNGARY	5 - 7 thousand USD
WESTERN EUROPE	appr. 20 "
CANADA	30 "
THE THRESHOLD	
OF AUTOMATION	" 40 "

AT A PER CAPITA GDP OF 400-600 USD AN ACCUMULATION OF 45 % REPRESENTS 180-270 USD/YEAR
WHICH IS 1/22 PART OF 5000 USD !

ACCORDINGLY IT IS VITAL FOR DEVELOPING COUNTRIES TO KEEP PRIVATE SPENDING LOW FOR A PERIOD OF A FEW DECADES, UNTIL MINIMAL INDUSTRIALIZATION AND HOUSING CONSTRUCTION PROJECTS ARE STARTED.

ECONOMY-SETTLEMENTS

(5) POPULATION DISTRIBUTION BY SETTLEMENT TYPES



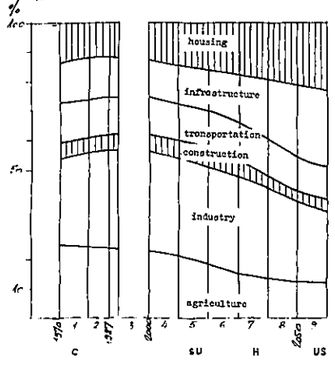
SOCIAL DIVISION OF LABOUR ENTAILS A TERRITORIAL DIFFERENTIATION ACCORDING TO DEVELOPMENT LEVELS. ABILITY TO USE AND SUPPORT MODERN INFRASTRUCTURE IS TIED TO JOB DEMANDS AND LEVELS OF EDUCATION. THIS CONSIDERATION NECESSITATES A DIFFERENTIATED APPROACH TO INDIVIDUAL DEVELOPMENT, WITH A MINIMUM OF THREE MAIN CATEGORIES OF SETTLEMENT OBSERVED.

IN ITS GENERALITY THE CAPITAL CITY WHICH CONTAINS THE SEATS OF ECONOMICAL AND ECONOMIC DEVELOPMENT, AS WELL AS THE HIGHER LEVELS OF ADMINISTRATION AND CULTURE. IN VIEW OF THE POPULATION TRENDS OF DEVELOPING COUNTRIES, THE CAPITAL CITY MAY SHOW A TWO TO THREEFOLD INCREASE IN POPULATION, WHILE ITS NATIONAL WEIGHT MAY, IN FACT, DECREASE TO ABOUT HALF OF ITS PRESENT VALUE OF AROUND 20 %.

RURAL SETTLEMENTS /FARMS, VILLAGES ETC./ MAY INCREASE THEIR POPULATION BY A FACTOR OF 1,5 - 2, WITH A SIGNIFICANTLY REDUCTION OF THE SHARE OF THE RURAL POPULATION FROM 60 % TO 22-24 %.

THE MOST DYNAMIC DEVELOPMENT IS EXPECTED TO TAKE PLACE IN TOWNS, WHOSE POPULATION MAY GROW BY A FACTOR OF 2,5 - 4,5 WHILE THEIR SHARE IS TRIPLED.

(6) PERCENTAGE BREAKDOWN OF INVESTMENTS



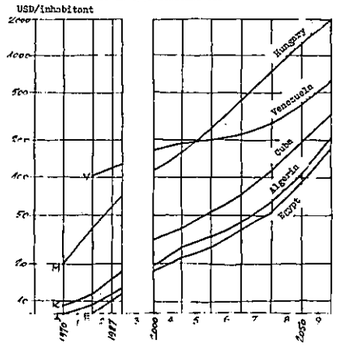
IN THE FURTHER BREAKDOWN OF THE ACCUMULATED PORTION OF THE GDP INVESTMENTS ARE CONVENIENTLY GROUPED INTO MATERIAL /PRODUCTIVE/ AND SOCIAL CATEGORIES.

THROUGH THE PERIOD EXAMINED THE SHARE OF MATERIAL PRODUCTION IN THE NET ACCUMULATION IS DECREASING FROM 60 % TO 40 %, WITH A PEAK OF 62 %, OCCURRING AROUND THE THIRD DECADE.
CONSUMAL INVESTMENTS MAY INCREASE THEIR SHARE FROM 40 % TO 60 %.

IT MUST BE NOTED IN CONNECTION WITH THESE TWO OPPOSING TRENDS THAT INVESTMENTS INTO PRODUCTION, ON WHICH ECONOMIC GROWTH IS BASED, ARE MOSTLY BEGUN AT VERY LOW LEVELS OF THE GDP,

THE SHARE OF HOUSING WILL RISE FROM THE INITIAL 13 % TO 11 % IN THE FIRST THREE DECADES TO A DYNAMICALLY GROWING 22 % BY 2050. THIS INVESTMENT LEVEL IS SUFFICIENT TO ALLOW FOR A GRADUAL UPGRADING OF HOUSES, BUILT EARLIER, TO LOWER STANDARDS.

(7) ANNUAL INVESTMENT INTO HOUSING CONSTRUCTION EXPRESSED IN 1970 CONSTANT USD



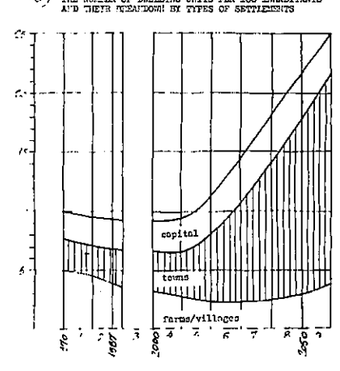
BASED ON THE PORTION OF THE GDP GOING INTO HOUSING CONSTRUCTION, THE BUDGET CAPABILITIES OF THE DEVELOPING COUNTRIES INCLUDED IN THE MODEL CAN BE FORECAST. WITHIN THE MIDDLE AND THE LAST 30 YEAR PERIOD, THOSE COUNTRIES WITH LOWER GDP WILL INCREASE THEIR FUNDING OF HOUSING CONSTRUCTION BY ROUGHLY 11 TIMES. THIS CORRESPONDS TO A FOURFOLD INCREASE IN THE CASE OF VENEZUELA, WHICH STARTS FROM A LEVEL 10 TIMES HIGHER.
THE MAGNITUDE CAN BE REPRESENTED WITH THE FOLLOWING SET OF DATA:

	YEAR OF FORECAST 2000	2050	
MINIMUM	36	390	USD/YEAR/INH.
MAXIMUM	66	740	"
VENEZUELA	360	1380	"

/THE DIAGRAM INCLUDES HUNGARY FOR INFORMATION/
CALCULATION EXAMPLE:

	2000	2060	
PERSONS/HOUSEHOLD		8	4
AVAILABLE FUNDS	MIN.	36	390
/USD/PERSON/YEAR/	MAX.	66	740
	VEN.	360	1380
AVAILABLE FUNDS	MIN.	288	1560
/USD/HOUSEHOLD/Y./	MAX.	528	2960
	VEN.	2880	5520
CONSTRUCTION COST /USD/DWELLING UNIT/		50,000	
ACCUMULATION TIME	MIN.	104	12
/YEARS/	MAX.	57	10
	VEN.	10	5

(8) THE NUMBER OF DWELLING UNITS PER 100 INHABITANTS AND THEIR DISTRIBUTION BY TYPES OF SETTLEMENTS



FROM THE DISTRIBUTION OF THE POPULATION BY SETTLEMENT TYPES /FIG. 5/ AND FROM THE SIZE OF HOUSEHOLDS /GRAPH OF THE FOREWORD/,
DISTRIBUTION OF DWELLING IN TYPES OF SETTLEMENTS CAN BE CALCULATED.

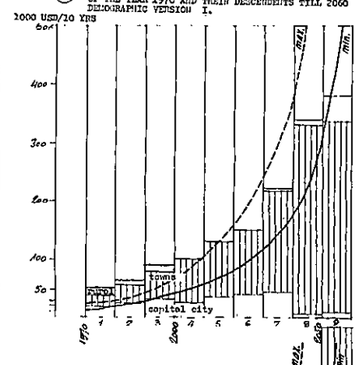
THIS INDICATOR IS NECESSARY FOR THE COMPARISON OF AVAILABLE FUNDS WITH THE CONSTRUCTION DEMAND, AND FOR THE CLASSIFICATION OF DWELLINGS BY THEIR COST OF CONSTRUCTION.

ACCORDING TO ALGERIAN HOUSING POLICY CATEGORIES, THE CONSTRUCTION COSTS /AT 1970-75 CONSTANT USD/ OF FULL-VALUED URBAN, SIMPLER "SOCIAL" AND PRIVATELY FINANCED SUBSIDIZED DWELLING UNITS AMOUNT TO 50, 15 AND 6 THOUSAND USD RESPECTIVELY.

THE NUMBER OF DWELLING UNITS IN DIFFERENT SETTLEMENT TYPES AND AT DIFFERENT STAGES IS SHOWN IN THE SECTION CONTRASTING CONSTRUCTION DEMAND WITH CAPABILITY.

CONSTRUCTION DEMAND AND CAPABILITY

(9) COST OF HOUSING CONSTRUCTION PER 100 INHABITANTS OF THE YEAR 1970 AND THEIR DESCENDENTS TILL 2060
DEMOGRAPHIC VERSION I.



WITHIN THE 9-DECADE PERSPECTIVE CONSIDERED HERE THE DEMANDS AND CAPABILITIES SHAPING THE POLICY OF HOUSING CONSTRUCTION CAN BE COMPARED IN A MODEL, WHICH EXTENDS IN ITS SCOPE FROM THE POPULATION AT PRESENT TO ITS DESCENDENTS INCLUDED IN THIS PERIOD IN QUESTION. BELOW, THE CHARACTERISTIC DATA FOR TWO VERSIONS OF THE DEMOGRAPHIC ESTIMATE LIMITED BY THE CONSTRUCTION, AND FOR THE CORRESPONDING HOUSING CONSTRUCTION PROPOSALS, ARE SHOWN:

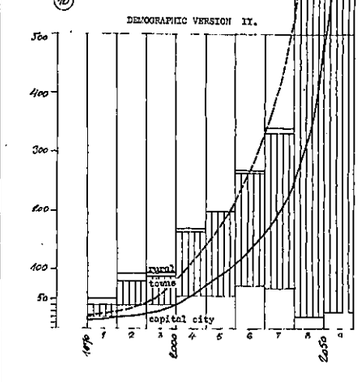
		VERSIONS: I.	II.
INHABITANTS	1970	100	100
	2000	242	270
	2060	375	610
DWELLING UNITS	1970	10	10
	2000	22	25
	2060	84	157
CUMULATIVE COST BY SETTLEMENT TYPES /1000 USD/90 YEARS/			
	CAP.C.	220	378
	TOWNS	1214	2056
	RURAL	78	148
	TOTAL	1522	2582
AVERAGE CONSTRUCTION COST /1000 USD/DWELLING UNIT/		18,0	18,0

ESTIMATED DISTRIBUTION OF CONSTRUCTION COSTS BY KINDS OF DWELLING UNITS AND SETTLEMENT TYPES, AS USED IN THE WORKING HYPOTHESIS, IS THE FOLLOWING:

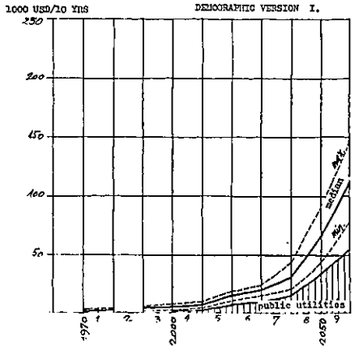
CONSTRUCTION COST: /1000 USD/DWELLING UNIT/	50	15	6
	PERCENTUAL DISTRIBUTION /%/		
CAPITAL CITY 1970	40	40	20
2000	55	31	14
2050	70	20	10
2060	80	15	5
TOWNS 1970	15	55	30
2000	32	48	20
2050	45	32	23
2060	60	35	5
RURAL SETTL. 1970	5	15	80
2000	8	19	73
2050	9	26	65
2060	10	30	60

BY BALANCING THE COST INTERVALS EXPRESSED BY THE CURVES AGAINST THE CONSTRUCTION SCHEDULES WITHIN EACH DECADE, THE PROBLEM AREAS ARE BROUGHT TO LIGHT. CORRESPONDING MODIFICATIONS CAN THEN BE REFLECTED IN CONSTRUCTION SCHEDULES. HISTORICAL AND OTHER DATA, UNTIL OPTIMAL VERSIONS ARE FOUND.

(10) DEMOGRAPHIC VERSION IV.



(11) THE STRUCTURE OF INFRASTRUCTURAL INVESTMENTS
UTILITIES AND PUBLIC FACILITIES
1000 USD/10 YRS DEMOGRAPHIC VERSION I.



FUNDING AVAILABLE FOR THE WHOLE OF THE INFRASTRUCTURE IS SPLIT EQUALLY BETWEEN THE CONSTRUCTION OF UTILITIES AND PUBLIC FACILITIES.

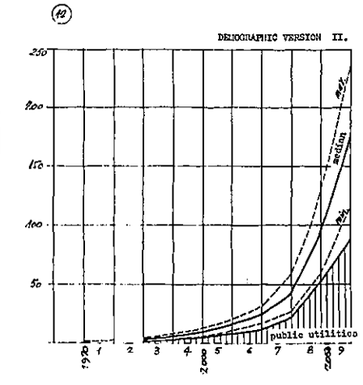
FUNDING IS BASED ON THE ASSUMPTION THAT FOR EVERY 100 INHABITANT OF TODAY THERE WILL BE 376 /VERSION I./ OR 610 /VERSION II./ AT THE END OF THE TIME - HORIZON OF THE MODEL.

DEVELOPMENT STAGES OF THE PUBLIC WATER SUPPLY SYSTEM:

	DAILY CONSUMPTION PER CAPITA /LIT./
1. COLLON POINTS WITHIN 3-5 KM =	5- 8
2. " " 0,5-1 " =	7-10
3. " " 0,5-0,5 =	10-15
4. " " 0,5 " =	12-20
5. " " 0,5 KM AND INDIVIDUAL CONNECTIONS IN 20 % OF DWELLING UNITS	50-50
6. C.P. 0,2 KM, IND. 20-50 % =	50-80
7. " 0,2 " " 50-80 % =	100-150
8. " 0,2 " " OVER 80 % =	150-200

DEVELOPMENT STAGES OF THE WATER SUPPLY SYSTEM ARE INDICATED BY CONCENTRIC ARCS WITHIN THE BROKEN CIRCLES IN FIGS. 17. AND 21.

(12)

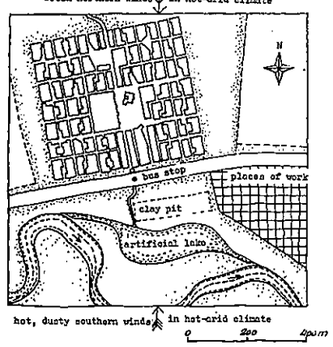


DEVELOPMENT STAGES OF THE SEWERAGE SYSTEM: / % /
1. SEPTIC TANKS 0-10
2. DRAINAGE FROM DWELLINGS 10-20
3. " " 20-30
4. " " 30-40
5. " " 40-50
6. " " 50-60
7. " OVER 60 %

DEVELOPMENT STAGES OF THE SEWERAGE SYSTEM ARE INDICATED BY THE NUMBER OF CONCENTRIC ARCS OUTSIDE THE BROKEN CIRCLE IN FIGS. 17 AND 21.

COMMUNITY DEVELOPMENT

(13) SETTLEMENT STRUCTURE



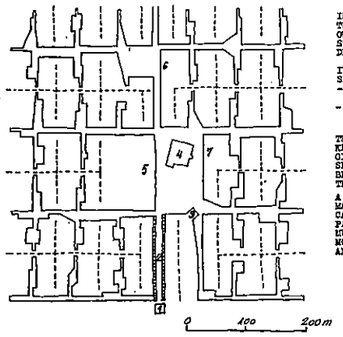
PEOPLE SETTLE WHERE THERE'S WATER AND EMPLOYMENT. ACCORDINGLY, NEW SETTLEMENT ARE BUILT:
- IN TOWNS WITH JOB OPPORTUNITIES
- ON UNTILLABLE LAND
- AROUND WELLS OR WATERING POINTS.

IN HOT-ARID CLIMATES SETTLEMENTS MUST HAVE A LOCAL SOURCE OF CLAY SOIL, SUITABLE FOR ADOBE BRICKS; LATER THE CLAY PITS CAN BE DEVELOPED INTO BATHING PONDS FREE FROM BILHARZIASIS, THE POND WITH ITS AFFORESTED SURROUNDINGS AFFORD A DEGREE OF PROTECTION TO THE NEW COMMUNITY FROM THE DUST SOUTHERN WINDS.

IN HOT-HUMID CLIMATES TIMBER AND BAMBOO IS USUALLY AVAILABLE LOCALLY OR WITHIN REASONABLE REACH.

EMPLOYMENT SHOULD BE MADE AVAILABLE IN THE FOLLOWING CATEGORIES:
- CREATION OF AN OUTWORKER NETWORK, WITH LOCAL DISTRIBUTION AND COLLECTION POINTS.
- MASSIVE LOWSKILL JOB OPPORTUNITIES NEAR THE SETTLEMENT
- OTHER JOBS IN URBAN AREAS IN COMMUTING DISTANCE WITH BICICLE OR BUS.

(14) PEOPLE - ANIMALS - VEHICLES



IN HOT CLIMATE ZONES LIFE IS LIVED ON THE STREET: ADULTS, CHILDREN, ANIMALS, OUTLET WATER.
STREETS DO NOT HAVE TO HAVE UNDERGROUND DRAINAGE, THOUGH TO BE FIT FOR

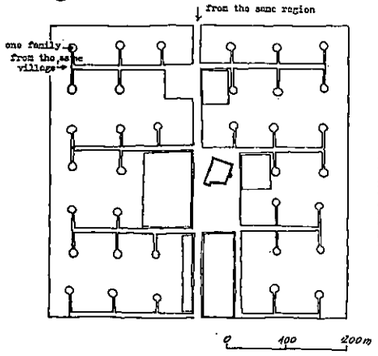
HUMAN ASSEMBLY

IF THE FOLLOWING ZONING RULES ARE OBSERVED:
- HOUSES AND BUILDINGS GO OUT TO THE ZONES STREETS, FORMING THE HUMAN ZONE
- BACKYARDS, BEING THE VENUE FOR FARMING ACTIVITIES, OPEN TO THE BACK STREETS.

THE BACKYARD WHERE THE ANIMALS ARE KEPT IN THE INITIAL STAGES, SLOWLY GIVES WAY TO OTHER ACTIVITIES REQUIRING SPACE FOR WORKSHOPS OR STOREROOM AND MAY BE COMPLETELY TRANSFORMED IN THE LONG TERM INTO A PARKING AREA OR GARAGE.

A GATEHOUSE LEADS THE WAY TO AN ARCADED MALL /1/, LINED WITH WORKSHOPS, STORES, CAFES. AN INTERNAL PEDESTRIAN STREET PATTERN CONNECTS THE OTHER SIDES OF COMMUNITY LIFE: THE PUBLIC WELL /3/, A MOSQUE /4/, THE SCHOOL /5/; THE BATH/6/ AND THE THEATER /7/;

(15) COMMUNITY PATTERNS

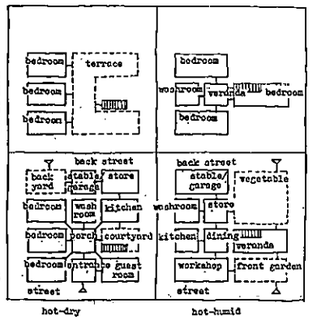


FAMILIES MIGRATING TO TOWNS TEND TO CONGREGATE WITH OTHER FAMILIES FROM THE SAME VILLAGE OR REGION, EVEN AS SQUATTERS. ACCORDINGLY AN APPROPRIATE PATTERN FOR A NEW COMMUNITY WOULD BE:
- 10 TO 20 FAMILIES CONNECTED BY KINSHIP OR GOOD NEIGHBOURLY RELATIONS FORM A SMALL RESIDENTIAL GROUP
- 4 TO 6 RESIDENTIAL GROUPS, COMPOSED FOR EXAMPLE OF PEOPLE FROM THE SAME VILLAGE, FORM A NEIGHBOURHOOD
- 6 TO 8 NEIGHBOURHOODS, MAINLY FROM THE SAME REGION OR PART OF THE COUNTRY, FORM A COMMUNITY

SUCH TIES OF KINSHIP, TRIBE OR RELIGION ARE VERY IMPORTANT AND RELEVANT TO THE QUESTIONS OF SETTLING DOWN, SELF HELP HOUSING CONSTRUCTION, AND USE/MAINTENANCE OF FACILITIES AND PUBLIC SPACES.

THE IDENTITY OF COLONIAL GROUPS CAN EVEN FIND ITS EXPRESSION IN ARCHITECTURE: IN CUSTOM-DESIGNED HOUSE, IN COMMON INTERIOURS FORMED BY GROUPS OF PEOPLE, ETC.

(16) LIVING FUNCTIONS



IN HOT-DRY CLIMATE:

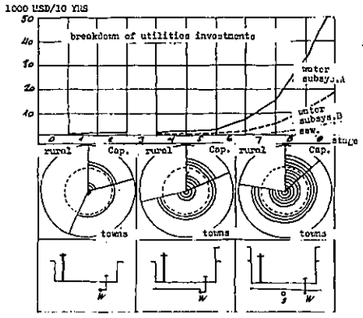
MUSLIM TRADITION'S FAVOUR AN INWARD-LOOKING, EXTERNALLY CLOSED ARRANGEMENT OF ROOMS. THE ENTRANCEWAY, BLOCKING THE VIEW TO THE INNER PARTS OF THE HOUSE, GIVES IMMEDIATE ACCESS TO THE GUEST-ROOM.
BEDROOMS ARE ARRANGED ON ONE SIDE, OPPOSITE TO THE KITCHEN AND THE WASHROOM, EATING AND HOUSEWORK IS USUALLY DONE IN THE SHADOW OF THE INNER COURTYARD OR ITS PORCH.
THE KITCHEN IS CONNECTED WITH THE STORE ROOM, OPENING OUT TO THE BACKYARD AND THE STABLE.
A SECOND FLOOR IS USED FOR MORE BEDROOMS AND SLEEPING TERRACES.

IN HOT-HUMID CLIMATE:

CHARACTERIZED BY PHYSICALLY AND PSYCOLOGICALLY MORE OPEN BUILDINGS, IN LATIN AMERICA CONSPICUOUSLY SCREENED-LOOKING, WELL VENTILIATED AND IN THE TROPICS GENERALLY ELEVATED ON STILTS, IN WHICH THE FAMILY GETS TOGETHER IN THE ROOFED BUT OPEN VERANDA, BEDROOMS ARE LOCATED ON TOP.
THE BACK OF THE YARD MAY SERVE AS A VEGETABLE GARDEN, IN ADDITION TO ANIMAL RAISING.

CONSTRUCTION IN HOT-DRY CLIMATE

(17) DEVELOPMENT OF UTILITIES IN HOT-DRY CLIMATE



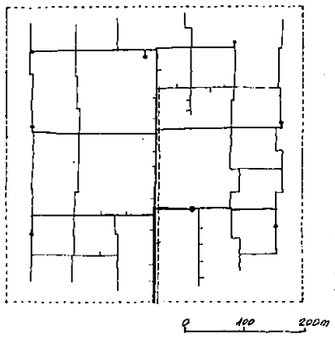
IN ARID ZONES /I < 500 MM PER YEAR/ WATER IS VERY SCARCE AND WATER MANAGEMENT IS VIRTUALLY SYNONYMOUS WITH CONSUMPTION CONTROL.

USEFUL SOURCES OF WATER ARE COLLECTED AND THE CREATION OF NEW SOURCES IS EXPENSIVE /LONG WATER PIPES, DESALINATION

SURFACE WATERS ARE USUALLY SEASONAL, GROUND WATER IS HARD TO REACH AND SALINE.
IN THE NEXT 50 YEARS VILLAGES WILL HAVE TO GO WITHOUT PIPED WATER, AS ALL AVAILABLE RESOURCES MUST BE CHANNELLED TO THE WATER SUPPLY SYSTEM OF TOWNS AND THE CAPITAL CITY. EVEN SO, WATER CONSERVATION MEASURES WILL BE NEEDED AND ENFORCED ON A VOLUNTARY BASIS.

THE DEVELOPMENT OF UTILITIES IS SHOWN IN A CROSS SECTION OF THE MAIN STREET. SEWERS WILL ONLY BE INSTALLED IN THE FINAL PHASE AND EVEN THEN AS A LAST RESORT /THE SEEPAGE CAPACITY OF THE SOIL IS EXHAUSTED BY INCREASING DISCHARGE OF EFFLUENTS, OR BY A LOW YOLD RATIO/.

(18) DEVELOPMENT OF THE UTILITIES NETWORKS IN HOT-DRY CLIMATE



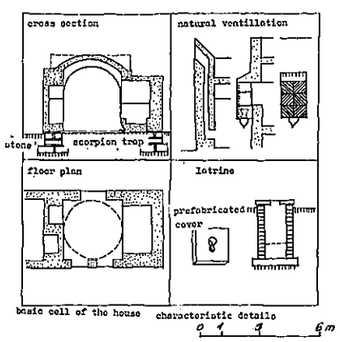
IN THE FIRST 15-20 YEARS AVAILABLE FINANCES WILL HAVE TO BE CONCENTRATED ON SUBSYSTEM "A" OF THE WATER SUPPLY SYSTEM /WITHDRAWAL AND TREATMENT OF WATER/. IN THE NEW SETTLEMENTS THE ONLY REACHABLE GOAL IS TO PROVIDE THE INHABITANTS WITH 5 LITERS OF ACCEPTABLE QUALITY WATER PER PERSON, AVAILABLE WITHIN 1-5 KM.

IN THE NEXT 20-25 YEARS THE DEVELOPMENT OF SUBSYSTEM "A" IS CONTINUED AND THE SUBSYSTEM "B" IS TAKEN UP. WATER SUPPLY WITH COLON POINTS WITHIN 0,5-2,5 KM WALKING DISTANCE BECOMES TYPICAL, WITH A SMALL PORTION OF THE HOUSES HAVING INDIVIDUAL CONNECTION. PER CAPITA CONSUMPTION IS RAISED TO 10 LITERS.

IN THE FINAL PERIOD UP TO 2050 THE SUBSYSTEM "A" IS EXPANDED TO A PER CAPITA SUPPLY CAPACITY OF 30 LITERS AND PREPARATIONS ARE MEDUN FOR THE CONSTRUCTION OF SEWERS.

I. stage
II. stage
III. stage
sewer

(19) STRUCTURES IN HOT-DRY CLIMATE



IN HOT-DRY CLIMATE THE DEMANDS OF HABITABILITY: LOW COST, READY AVAILABILITY AND SELF-HELP ARE ALL SATISFIED BY ADOBE, AS A CONSTRUCTION MATERIAL.

HOUSES STAND ON NATURAL STONE FOUNDATIONS, HAVE 0,5 M THICK ENDBRICK WALLS AND VAULTS, AND A DOME MADE OF ADOBE BRICKS.

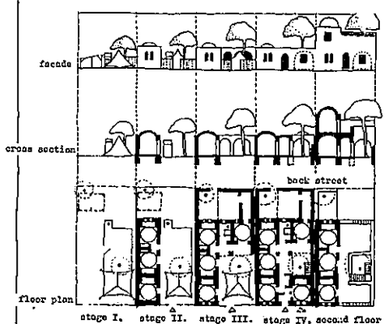
THE ROLED BEDROOM, BEING THE CORE OF THE HOUSE, MAY CONTAIN ALCOVES FOR SLEEPING IN AND FOR STORAGE. THE BED IS PROTECTED BY A SCORPION TRAP;

TRADITIONAL MEANS OF NATURAL CLIMATISATION, LIKE A VENTILATION SYSTEM OPEN TO THE FRESH NORTHERN WINDS, AND AN EARTHEN JUG PLACED IN THE WINDOW, LATTICED FOR PROTECTION AGAINST THE SUN AND INQUISITIVE LOOKS CAN BE USED.

AS A FIRST PERMANENT ELEMENT OF THE HOUSE A PREFABRICATED REINFORCED CONCRETE COVER CAN BE PLACED OVER THE LATRINE PIT, LAID WITH BRICKS OR SIMPLY DUG IN THE GROUND;

GROUPS OF HOUSES CAN HAVE COMMON ADJOINING WALLS.

(20) POSSIBLE DEVELOPMENT STAGES OF A HOUSE IN HOT-DRY CLIMATE



A TYPICAL HOUSE MAY BE ERECTED GRADUALLY ON A LOT MEASURING 10 BY 20 METERS.

IN THE FIRST STAGE THERE IS A LIVING TENT AND A SMALL YARD WITH A TREE, SURROUNDED BY A TEMPORARY FENCE.

IN THE SECOND STAGE THE FIRST ADOBE STRUCTURE IS BUILT: A ROW OF BEDROOMS.

IN THE THIRD STAGE A WASHROOM; A KITCHEN AND POSSIBLY SOLE AUXILIARY ROOMS ARE ADDED.

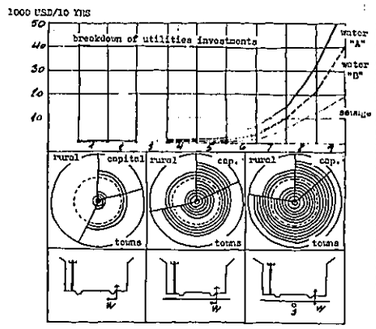
IN THE FOURTH STAGE THE TENT GIVES WAY TO A GUEST ROOM;

IN THE FINAL STAGE A SECOND FLOOR IS ERECTED WITH BEDROOMS AND SLEEPING TERRACES, ACCESSED BY EXTERNAL STAIRS FROM THE YARD. ONE OF THE GROUND FLOOR BEDROOMS OR THE GUEST ROOM MAY BE REMODELLED INTO A SHOP.
IN THE LONG TERM A WORKSHOP OR A GARAGE MAY TAKE THE PLACE OF THE STABLE.

THIS EXAMPLE IS NO PRESCRIPTION, ONLY A GUIDANCE. THE TIME SCALE OF THE DEVELOPMENT IS ALSO VERY FLEXIBLE.

CONSTRUCTION IN HOT-HUMID CLIMATE

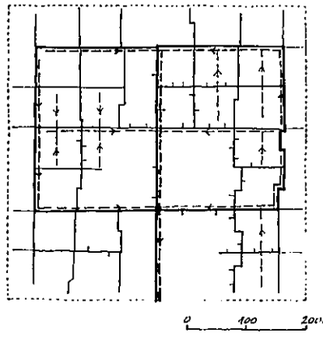
(21) DEVELOPMENT OF UTILITIES IN HOT-HUMID CLIMATE



IN RAINY AREAS /I = 500-3000 MM PER ANNUM/ WATER DEMANDS CAN BE MET FROM AVAILABLE WATER RESOURCES AS THEY ARE, OR AFTER LITTLE TRAINING, ALTHOUGH WATER CAN BE DRAWN AT RELATIVELY LOW COST, FREQUENT AND COPIOUS RAINS REQUIRE SOME KIND OF COLLECT DRAINAGE FACILITIES, INSTEAD OF INDIVIDUAL EFFLUENT TREATMENT.

IN THE FIRST PERIOD RURAL SETTLEMENTS CAN ONLY BE SUPPLIED WITH SURFACE WATER AT A WALKING DISTANCE OF 1-3 KM.
IN THE SECOND AND THIRD PERIODS PIPED WATER ACCORDING TO THE STANDARD LAID DOWN FOR THE THIRD OR FOURTH STAGE MUST BE DEVELOPED IN VILLAGES, WHILE IN TOWNS AND ESPECIALLY IN THE CAPITAL CITY HIGH POPULATION DENSITIES AND PUBLIC HYGIENE REQUIRE THE PARALLEL DEVELOPMENT OF SEWERAGE FACILITIES /FOURTH AND FIFTH STAGE/.
THE CROSS SECTIONAL DRAWINGS OF THE MAIN STREET REFLECT THE RESULTS OF GRADUAL DEVELOPMENT: IN HOT-HUMID CLIMATE STORM DRAINAGE IS A MUST FROM THE BEGINNING, TOGETHER WITH A PUBLIC WELL, BEGINNING FROM HERE PIPED WATER SUPPLY IS DEVELOPED /WITH INDIVIDUAL CONNECTIONS/, AND THEN SEWERAGE FACILITIES ARE BUILT.

(22) DEVELOPMENT OF THE UTILITY NETWORK IN HOT-HUMID CLIMATE

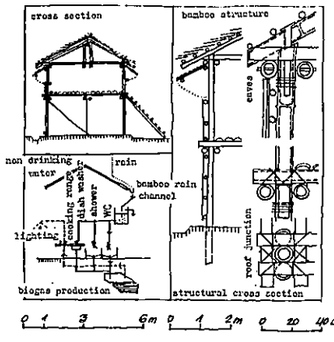


IN THE FIRST 15-20 YEARS AVAILABLE FINANCES WILL HAVE TO BE CONCENTRATED ON SUBSYSTEM "B" /THE PIPE NETWORK/ OF THE WATER SUPPLY SYSTEM, AS A MEANS OF PROVIDING SUITABLE DRINKING WATER. WATER FOR OTHER PURPOSES CAN BE IMPOUNDED IN RAIN COLLECTORS. BECAUSE OF THE COPIOUS AND FREQUENT RAINS, THE SETTLEMENTS HAVE STORM DRAINAGE FROM THE VERY BEGINNING, WITH SEWERAGE ADDED LATER, IN THE FORM OF AN OPEN SYSTEM AT FIRST.

IN THE NEXT 50 OR 60 YEARS THE WATER SUPPLY SYSTEM IS EXPANDED GRADUALLY AND ORGANICALLY, IN LINE WITH THE DEMAND. A SEWAGE NETWORK IS ESTABLISHED AND PREPARATIONS ARE LADE FOR THE INTRODUCTION OF SEWAGE TREATMENT.

LAYING OF WATER PIPES IN THE FIRST 15-20 YEARS
DRAINAGE/SEWERAGE FACILITIES IN THE FIRST 15-20 YEARS
WATER PIPES IN THE NEXT 20-25 YEARS
DRAINAGE "
WATER PIPES IN THE LAST 20-25 YEARS
DRAINAGE "

(23) STRUCTURES IN HOT-HUMID CLIMATE



IN HOT-HUMID CLIMATE TIMBER AND BAMBOO ARE TRADITIONAL STRUCTURAL MATERIALS.

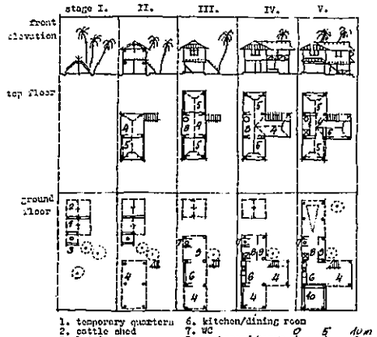
THE ROOF AND THE SIDE WALLS ARE MADE OF THATCHED FOLIAGE AND/OR WHOLE OR SPLIT BAMBOO STALKS. HOUSES ARE USUALLY ELEVATED ON STILTS FOR PROTECTION AGAINST FLOODING AND CREEPING AND CRAWLING CREATURES, AS WELL AS FOR GOOD VENTELLATION.

BAMBOO STAKES ARE TIED DOWN WITH BASS ROPES. THE ROOFS CAN BREATHE THROUGH THE GAPS AMONG THE LEAVES/BAMBOO SLATES.

RAINWATER GATHERED INTO VATS FROM THE ROOF, IS SUPPLIED GRAVITATIONALLY TO THE WATER FLUSHED TOILET; THE SHOWER AND THE DISHWASHER.

HOUSEHOLD EFFLUENT AND LIQUID MANURE MUST BE REMOVED REGULARLY IN A CLOSED SYSTEM, OR DIGESTED IN A BIOGAS-PRODUCTION EQUIPMENT. BIOGAS IS USEFUL FOR COOKING AND LIGHTING.

(24) POSSIBLE DEVELOPMENT STAGES OF A HOUSE IN HOT-HUMID CLIMATE



A TYPICAL HOUSE IS ERECTED GRADUALLY, PARTIALLY ON THE STREET LINE, AT A SIDE DISTANCE FROM THE LOT BOUNDARY EQUAL TO THE EAVES OVERHANG, ON A LOT MEASURING 10 BY 20 METERS.

IN THE FIRST STAGE THERE IS A TEMPORARY STRUCTURE SUPPORTED BY POSTS, DIVIDED INTO TWO PARTS FOR HUMAN AND CATTLE QUARTERS, WITH AN ADJOINING LATRINE.

IN THE SECOND STAGE THE FIRST PART OF THE PERMANENT BUILDING IS CONSTRUCTED WITH THE SLEEPING QUARTERS ON TOP, ABOVE THE OPEN-SIDED AREA FOR OTHER FUNCTIONS.

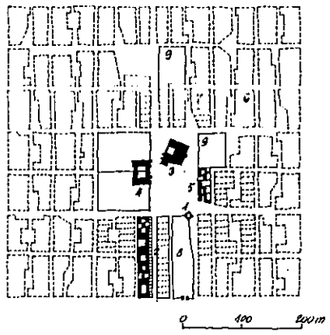
IN THE THIRD STAGE THE DWELLING FUNCTIONS OF THE TEMPORARY BUILDING END WITH MORE AND MORE BEDROOMS, BEING FORMED ON THE TOP FLOOR OF THE HOUSE, AND ITS GROUND FLOOR ACQUIRES MORE DIFFERENTIATED USE FORMS AND SUPPORTING ROOMS. THE LATRINE IS INCORPORATED INTO THE GROUND FLOOR.

IN THE FOURTH STAGE THE HOUSE IS EXTENDED WITH MORE ROOMS ADDED TO THE SIDE.

A NEW BEDROOM IS FORMED FROM ONE PART OF THE VERANDA, WITH A STORE OR WORKSHOP FORMED NEAR TO ENTRANCE AND A FRONT GARDEN ADDED. THE HOUSE BECOMES FULLY INTEGRATED WITH THE STREET, AS LOCAL CUSTOMS REQUIRE.

CONTINUOUS BUILDING

(25) THE FIRST STAGE

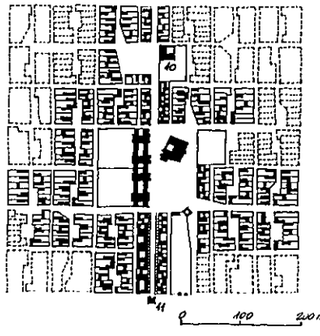


COMMUNITY DEVELOPMENT BEGINS WITH THE ESTABLISHMENT OF A WELLHEAD OR STANDPIPE /1/
AND THE ERECTION OF A SMALL ROW OF BUILDINGS /2/, POSSIBLY WITH THE USE OF PREFABRICATED LIGHT STRUCTURES, FINANCED BY THE STATE AS TEMPORARY QUARTERS FOR THE SITES-AND-SERVICES TEAM OF TECHNICIANS AND CRAFTSMEN, DEALING WITH THE PLANNING, ORGANIZATIONAL AND TRAINING TASKS OF THE SELF-HELP HOUSING SCHEME.

THE FIRST HOUSE, AN EDIFICE TO GOD, IS BUILT WITH THE HELP OF THE FIRST GROUPS OF NEW ARRIVALS, SETTLING DOWN IN TENTS AND OTHER TEMPORARY QUARTERS OF LONG /7/ WHICH ARE PART OF LARGER UNITS /6/ ASSIGNED OF THE BASIS OF KINSHIP TIES. A MOSQUE /3/, A BOYS' AND A GIRLS' SCHOOL /4/ AND A ROW OF MODEL DWELLINGS /5/ ARE BUILT, ALL FROM TRADITIONAL LOCAL MATERIALS, ON THE ENVISIONED MAIN SQUARE, UNDER THE GUIDANCE OF THE SITES-AND-SERVICES TEAM.

BEHIND THE WELL A WATERING PLACE CAN BE FORMED FOR LIVESTOCK /8/. A FENCE IS BUILT AROUND THIS PLACE, AND AROUND ALL AREAS RESERVED FOR COLONIAL FACILITIES.

(26) THE SECOND STAGE



THE NEW SETTLERS, HAVING ACQUIRED THE REQUISITE SKILLS, FORM SELF-HELP GROUPS TO BUILD THEIR HOUSES AT ONE TIME, OR GRADUALLY. /SEE FIGS. 20 AND 24/

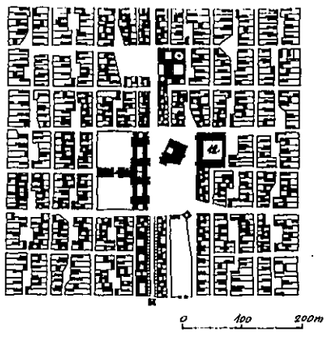
THE BUILDING OF SCHOOLS IS CONTINUED, USING TRADITIONAL TECHNOLOGIES AND MATERIALS. SCHOOLHOUSE HAVE OF COURSE CAN BE JUST AS APPROPRIATE AND ATTRACTIVE IN HOT-ARID CLIMATE AS GRASS-COVERED BAMBOO STRUCTURES IN THE TROPICS.

THE FIRST STAGE OF THE BATH /HAMMAM/ /10/ IS BEGUN. IN THE MUSLIM WORLD THE BATH MEANS MUCH MORE THAN MERE CLEANLINESS. IT IS A PLACE FOR LEISURE, SOCIAL LIFE AND A RICH STORE OF TRADITIONS.

A COLLECTION POINT IS ESTABLISHED AT THE BAZAAR FOR THE OUTWORKERS.

A GATEHOUSE WITH PROPYLONEES /11/ IS BUILT AT THE ENTRANCE TO THE BAZAAR ROW, - AS A SYMBOLIC GATE TO THE NEW COMMUNITY.

(27) THE THIRD STAGE



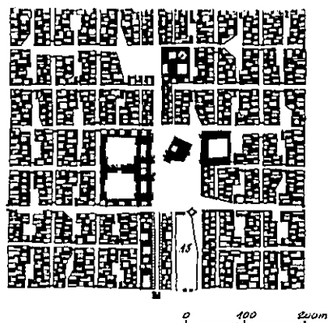
WHILE THE BUILDING OF INDIVIDUAL HOUSES AND GROUPS OF HOUSES CONTINUES, THE SCHOOLS ARE ALSO EXPANDED WITH SPECIAL LECTURE ROOMS AND CHAPELS.

THE BATH, ONE OF THE CENTRES OF COMMUNITY LIFE, CAN BE FINISHED, AND A "THEATRE-CUM-CULTURAL CENTRE" IS BUILT NOT SO MUCH FOR THEATRE PERFORMANCES IN THE EUROPEAN SENSE, BUT RATHER AS A STAGE FOR TRADITIONAL FOLK PLAYS, FOLK DANCES, GAMES AND COMPETITIONS, FAMILY OCCASIONS, EARRIAGES.

AS THE POPULATION GROWS, HOUSES INCREASE AND THE NETWORK OF WATER PIPES COMPLETE, WHERE THE SETTLEMENT, THE WATER OUTLETS BECOME AS MANY FOCAL POINTS OF COMMUNITY LIFE, TRANSFORMING THE COMMUNITY FROM A SINGLE-CENTERED ORGANIZATION TO A MULTIFOCAL, DIFFERENTIATED ONE.

AN INDIGENOUS BODY OF ELECTED LEADERS MAY REPLACE THE STATE APPARATUS.

(28) THE FOURTH STAGE



IN THE MIDDLE OF THIS LONG CENTURY THE FOLLOWING GOALS MAY BE REALISTICALLY REACHED, EVEN IN HOT-DRY AREAS:

- A HIGH PROPORTION OF DWELLINGS HAS INDIVIDUAL WATER CONNECTIONS
- LARGE CONSUMERS OF WATER ARE CONNECTED TO THE SEWERS
- LIVESTOCK RAISING IS GRADUALLY REPLACED BY INDUSTRIAL AND SERVICE ACTIVITIES, MOTOR-VEHICLES BECOME UBIQUITOUS WITH THE SPREAD OF MOTORIZATION THE DIFFERENTIATED STREET NETWORK MAY PROVE TO BE A BLESSING, AS BACKSTREET TRAFFIC CAN BYPASS THE PEDESTRIAN ZONE
- MORE AND MORE HOUSES HAVE A BATHROOM AND MORE PERMANENT CONSTRUCTION MATERIALS ARE USED, FEASIBILITY FOR SURFACE COVERING AND DECORATION
- TREES THAT WERE PLANTED EARLIER ARE MATURE AND GIVE SHADE, AND A PLEASANT PARK IS FLOURISHING ON THE SITE OF THE FORMER LIVESTOCK MARKET /13/.
- IN SOME PLACES EVEN ARCADES MAY BE BUILT, AS HOUSES EXPAND.

. . .

THE COMMUNITY DEVELOPMENT CONCEPT DESCRIBED HERE IS EQUALLY APPLICABLE TO NEW DEVELOPMENT PROJECTS AND TO THE UPGRADING OF SLUMS;

"... LOGER LES HOMMES D'ABORD, LES METTRE A L'ABRI DES INTEMPERIES ET DES VOLEURS, MAIS SURTOUT AMENAGER AUTOUR D'EUX LA PAIX D'UN FOYER, FAIRE TOUT CE QU'IL FAUT POUR QUE L'EXISTENCE DEROULE SES HEURES DANS L'HARMONIE, SANS TRANSGRESSION DANGEREUSE DES LOIS DE LA NATURE..."

LE CORBUSIER
(ENTRETIEN AVEC LES ETUDIANTS DES ECOLES D'ARCHITECTURE)

- CONTRIBUTION A L'ANNEE INTERNATIONALE DES SANS-ABRI DES NATIONS-UNIES
  A I S A
- CONCOURS INTERNATIONAL POUR DES SOLUTIONS ARCHITECTURALES
  C I N T U S

SECTION 1

INTRODUCTION

... LES ABRIS SONT CONCUS GENERALEMENT POUR ETRE UNIVERSELLEMENT UTILISABLES. LES CRITERES DE CONCEPTION SONT CEUX DU DONNEUR. LA TECHNOLOGIE EST SOUVENT INAPPROPRIEE ET LEUR MONTAGE SOUVENT DEMANDE UNE MAIN-D'OEUVRE HABILE.

L'INDIVIDU QUI RECOIT SOUHAITE, LUI, UNE UNITE PEU CHERE, SOCIALEMENT, CULTURELLEMENT ET CLIMATIQUEMENT ADAPTEE. DE PLUS, SA VIE EST SOUVENT LIEE A DES USAGES DE L'ABRI NON-PREVUS PAR LES CONCEPTEURS.

LE COEUR DU PROBLEME RESIDE PEUT-ETRE DANS LE FAIT QUE L'HABITAT EST L'UN DES SUJETS LES PLUS COMPLEXES ET LES PLUS DIFFICILES A RESOUDRE; C'EST AUSSI CELUI OU CHACUN A SA PROPRE OPINION, CREANT AINSI BEAUCOUP DE CONFUSIONS ENTRE LES EVALUATIONS OBJECTIVES ET SUBJECTIVES. CE QUI EST MOINS COMPRIS C'EST QU'UNE MAISON EST LE PRODUIT FINID'UNE CHAINE SOCIALE, ECONOMIQUE, TECHNOLOGIQUE, ECOLOGIQUE ET POLITIQUE. DANS CERTAINS PAYS, LA MAISON N'EST PAS PRIORITAIRE CONTRAIREMENT A LA TERRE ET AUX SERVICES (EAU, ELECTRICITE, ROUTES, TRANSPORTS, ETC) TANT QU'IL NE SERA PAS COMPLETEMENT COMPRIS QUE L'ABRI EST UN PROCESSUS PLUTOT QU'UN PRODUIT, BEAUCOUP DE PROGRAMMES DE LOGEMENT, TOUTEFOIS BIEN COMPRIS, SERONT MAL RECUS...

PARAMETRES FONDAMENTAUX

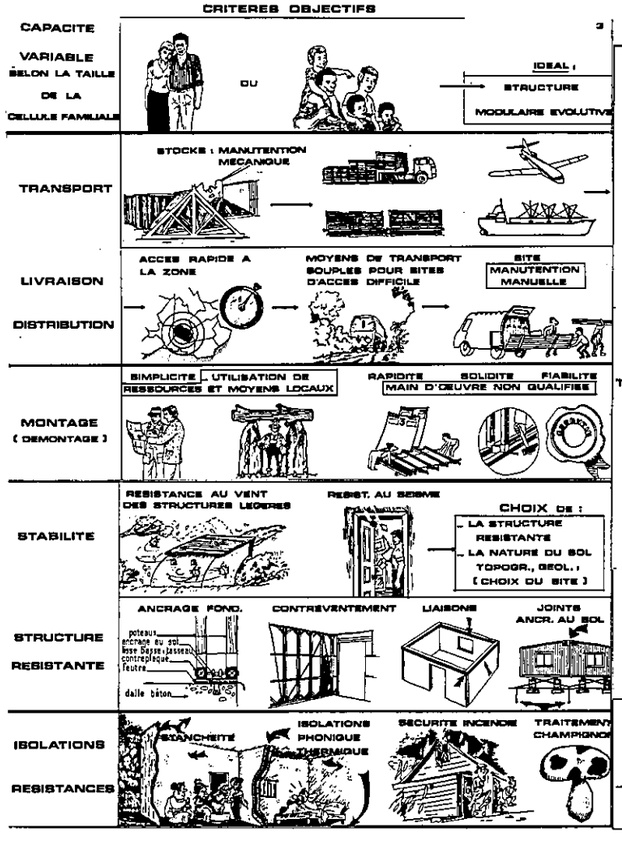
* CONCEPT DE LA "FOURNITURE D'ABRIS" : CE CONCEPT EST CONTRAIRE A UNE GRANDE MAJORITE DES SYSTEMES SOCIAUX DU MONDE. LES HABITATIONS NE SONT PAS "FOURNIES POUR" MAIS "CONSTRUITES PAR".

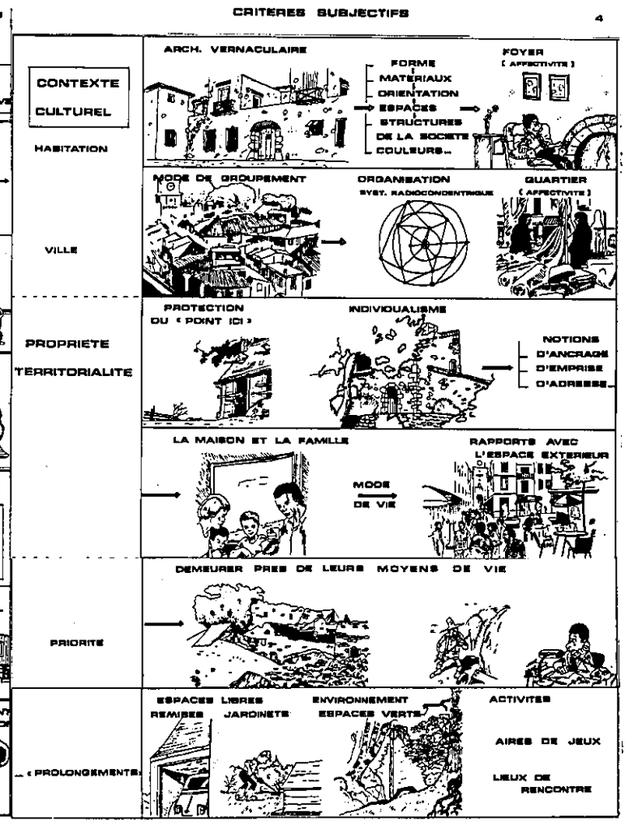
* NOTION DE DURABILITE MAXIMALE : IL S'AGIT DE CHOISIR LES MATERIAUX AFIN D'OBTENIR LA DURABILITE MAXIMALE POUR UN PRIX PLAFOND DETERMINE. TOUS LES FACTEURS DE PRODUCTION ONT UN COUT, C'EST POURQUOI LA DURABILITE "MAXIMALE" RESTE BIEN SOUVENT TRES FAIBLE.
  - CONSTRUIRE MOINS CHER, PLUS VITE ET DAVANTAGE

* NOTION DE CONSTRUCTION PROGRESSIVE QUI POURRA S'ETENDRE SUR PLUSIEURS ANNEES. DANS CE PROCESSUS UNE PART VARIABLE D'AUTOCONSTRUCTION COMPLETERA LE TRAVAIL REMUNERE DES TACHERONS.
  - L'AUTOCONSTRUCTION PARTIELLE PEUT-ETRE ENVISAGEE EN HAUTEUR (EXTENSION VERTICALE)

* UTILISATION DE MATERIAUX LOCAUX ET DE MATERIAUX DE RECUPERATION
  - LES SYSTEMES A OSSATURE ET REMPLISSAGE PEUVENT VALORISER LES RESSOURCES LOCALES
    --- LES MATIERES PREMIERES LOCALES : TERRE, AGREGATS, BOIS,...
    --- LES OUTILS DISPONIBLES : PRESSES A BLOCS, MOULES, INSTALLATIONS DE SCIAGE, FOURS ARTISANAUX...
    --- LES SAVOIR-FAIRE LOCAUX, A LA FABRICATION DES COMPOSANTS COMME A LA POSE. (LA DEBROUILLARDISE)

* LES CONSTRUCTIONS A OSSATURE BOIS ONT FAIT LEURS PREUVES, NON SEULEMENT AU NIVEAU DE PROTOTYPES ISOLES, MAIS AUSSI A TRAVERS DES PROJETS DE PLUSIEURS CENTAINES OU PLUSIEURS MILLIERS D'UNITES. CE PROCEDE A REJOINT LA MACONNERIE DE BLOCS DE BETON OU DE BRIQUES CUITES DANS LE CATALOGUE DES TECHNIQUES FIABLES ET POTENTIELLEMENT ECONOMIQUES.





PLAN DE L'ETUDE

DANS LE PREMIER MODULE, NOUS AVONS SITUE LE PROBLEME ET PRESENTE LES DONNEES DE BASE FONDAMENTALES QUI PREFIGURENT LA FACON DONT NOUS AVONS ABORDE L'ETUDE ET NOTRE TYPE DE REFLEXION.

* NOUS AVONS JUGE BON DE REFLECHIR SIMULTANEMENT SUR LA STRUCTURE ET SON EXTENSION (CONSTRUCTION PROGRESSIVE) ET SUR LE PLAN D'AMENAGEMENT (PRINCIPE D'EXTENSION) D'UN SITE DESTINE A RECEVOIR DES SANS-ABRI (LE SITE ETANT UN BIDONVILLE). IL NOUS A SEMBLE EN EFFET QUE LE PROBLEME DES SANS-ABRI OU "MAL LOGES" SE POSE TANT AU NIVEAU DE L'HABITATION QUE DE LA GESTION ET L'AMENAGEMENT DES TERRES SUSCEPTIBLES DE LES ACCUEILLIR. CECI PARCE QUE LES CONTRAINTES FONCIERES FONT AUSSI PARTIE INTEGRANTE DU PROBLEME.

NOTRE ETUDE EST DONC UNE REFLEXION SUR :
1) UNE STRUCTURE ADAPTEE ET SA CONSTRUCTION PROGRESSIVE
2) UN PLAN D'AMENAGEMENT SOUPLE PERMETTANT DIFFERENTES ADAPTIONS

D'UNE MANIERE GENERALE, TANT AU NIVEAU DE LA STRUCTURE CHOISIE QUE DU TYPE MEME DE L'AMENAGEMENT DU SITE, NOUS AVONS CHERCHE DES SOLUTIONS PERMETTANT UNE GRANDE SOUPLESSE D'ADAPTATION EN FONCTION DES BESOINS ET DES CRITERES LOCAUX.

A - CHOIX D'UN PRINCIPE CONSTRUCTIF

* DANS L'ENONCE DES PARAMETRES FONDAMENTAUX, LES QUALITES D'UN SYSTEME A OSSATURE BOIS ONT ETE MISES EN EVIDENCE. LES AUTRES PARAMETRES QUI ONT DETERMINE LE CHOIX DE CE TYPE DE STRUCTURE SONT MENTIONNES DANS LE TABLEAU DE SYNTHESE CONTENANT LES CRITERES OBJECTIFS ET DANS LA PLANCHE TECHNIQUE PRESENTANT LE SYSTEME CHOISI.

* LE SYSTEME MODULAIRE A OSSATURE BOIS SE PRESENTE SOUS LA FORME D'UN KIT PREFABRIQUE. UN DES INTERETS DE CE SYSTEME SE SITUE AU NIVEAU DES PANNEAUX MURAUX PLIABLES -(Cf. PLANCHE TECHNIQUE 1). CECI PERMET D'AVOIR DES PANNEAUX MURAUX PREMONTES, DE FAIBLE ENCOMBREMENT, PLIES, RAPIDEMENT MIS EN OEUVRE, TRES LEGERS, DONC FACILEMENT PORTABLES PAR UN INDIVIDU; (SECTION D'UN POTEAU: 3,6 CM X 3,6 CM), DE GRANDE STABILITE (STRUCTURE PARAYSISMIQUE) PERMETTANT UNE GRANDE LIBERTE ARCHITECTURALE, POUVANT RECEVOIR DES ETAGES (1 ETAGE : ENTRAXE POTEAUX = 60 CM; 2 ETAGES : ENTRAXE POTEAU = 40 CM), ET NE NECESSITANT PAS DE MAIN-D'OEUVRE QUALIFIEE POUR LA POSE.

NOUS AVONS CHOISI CE TYPE DE SYSTEME QUI PEUT PARAITRE SOPHISTIQUE POUR DES SANS-ABRIS DEMUNIS, EN PARTANT DES NOTIONS DE DURABILITE MAXIMALE, D'UTILISATION DES RESSOURCES ET MATERIAUX LOCAUX, DE FIABILITE.

CE SYSTEME DE REALISATION SIMPLE, PEUT ETRE PRODUIT EN GRAND NOMBRE DANS LES PAYS EN DEVELOPPEMENT, CE QUI ABAISSERAIT CONSIDERABLEMENT SON PRIX ET EN FERAIT UN SYSTEME DE CONSTRUCTION PEU ONEREUX. LES SURCOUTS DUS AUX TRANSPORTS, A LA MAIN-D'OEUVRE ETANT MOINS IMPORTANTS QU'UN SYSTEME OSSATURE TRADITIONNEL.

LE BUT EST DE DONNER AUX SANS-ABRI LA POSSIBILITE DE CONSTRUIRE UNE OSSATURE SOLIDE PERMETTANT LES REMPLISSAGES LES PLUS VARIES ET LES PLUS UTILISES LOCALEMENT (OU MATERIAUX DE RECUPERATION).

- REMPLISSAGE EN TERRE = "CONSTRUCTION A COLOMBAGE"
- REMPLISSAGE EN BAMBOUS
- REMPLISSAGE EN FEUILLES TRESSEES

B - CONSTRUCTION PROGRESSIVE

COMME INDIQUE SUR LA PLANCHE TECHNIQUE ET SUR LA PLANCHE "EXTENSION DES STRUCTURES", NOUS AVONS CHOISI LE PRINCIPE D'UNE CONSTRUCTION PROGRESSIVE A TROIS NIVEAUX :

1) CELLULE DE BASE : DANS UN PREMIER TEMPS, LES SANS-ABRI POURRAIENT SE CONSTRUIRE UNE STRUCTURE DE BASE "MINIMUM" QU'ILS POURRAIENT AGRANDIR SELON LEURS MOYENS ET LEURS BESOINS (FINANCIERS. TAILLE DE LA FAMILLE).

2) EXTENSION HORIZONTALE : DANS LES LIMITES DES PARCELLES OU DES BOUTS DE TERRES DISPONIBLES, LA CELLULE DE BASE POURRAIT ETRE AGRANDIE.

3) EXTENSION VERTICALE : LE SYSTEME CHOISI PERMET UNE EXTENSION VERTICALE QUI DONNE AUX DEMUNIS POSSEDANT UNE PARCELLE TRES REDUITE LA POSSIBILITE D'AGRANDIR LEUR ABRI EN SUPERPOSANT UN ETAGE.

C - AMENAGEMENT DU SITE

NOUS NOUS SOMMES FIXES COMME OBJECTIFS D'AMENAGER UN SITE POUR RECEVOIR DES SANS-ABRI. LE SITE CHOISI EST UN BIDONVILLE. IL S'AGIT DE GERER LA ZONE A TRES FORTE DENSITE AFIN DE PREPARER UN AMENAGEMENT LE PLUS EFFICACE POSSIBLE.

NOUS AVONS DISTINGUE TROIS TYPES D'ETUDES :

1) DEVELOPPEMENT SEQUENTIEL DU SITE (PRINCIPES)
2) DEVELOPPEMENT DE MODES DE GROUPEMENT (UNITES)
   EXTENSION DANS LE SITE
3) ETAPES DANS LA PREPARATION DE L'AMENAGEMENT
   (MISE EN PRATIQUE DES PRINCIPES SUR UN TERRAIN REEL AVEC DES OBJECTIFS PROCHES DE CEUX QU'ON TROUVE DANS LA REALITE)

1) DEVELOPPEMENT SEQUENTIEL

LE SITE ETANT OCCUPE PAR UN BIDONVILLE, NOUS AVONS CHOISI UN TYPE DE DEVELOPPEMENT PAR TRANCHES AUTOUR D'UN NIVEAU CENTRAL (ROTATION). CE MODE DE DEVELOPPEMENT PROGRESSIF DU SITE PERMET DE RESTRUCTURER LA ZONE SANS "EXPROPRIER" LES FAMILLES.

TRAME

ETUDIER UN PRINCIPE D'AMENAGEMENT QUI PUISSE ETRE ADAPTE AUX BESOINS ET CRITERES LOCAUX : TEL A ETE NOTRE BUT.
LA TRAME DETERMINE DES UNITES OU MODES DE GROUPEMENT. CES MODES DE GROUPEMENT SERONT DEFINIS (NOUS DONNONS TROIS EXEMPLES) EN FONCTION DU CONTEXTE CULTUREL ET SURTOUT EN FONCTION DE LA DENSITE DU SITE. DE PLUS, CES UNITES DOIVENT ETRE DIFFERENTES ET VARIEES POUR RECREER UNE HETEROGENEITE.

2) DEVELOPPEMENT DES UNITES : EXTENSION DANS LE SITE

EN FONCTION DE LA DENSITE, DIVERSES CONCEPTION SONT POSSIBLES. SOIT UNE CONCEPTION A DENSITE MAXIMALE OU LES UNITES SE SUIVENT LE LONG D'UNE ROUTE; SOIT UNE CONCEPTION A DENSITE MOINDRE AVEC DES ESPACES VERTS ET DES ESPACES LIBRES ENTRE LES UNITES.
LES PRINCIPES D'EXTENSION SONT INDIQUES SUR LA PLANCHE.

3) ETAPES DANS LA PREPARATION DU PLAN D'AMENAGEMENT

NOUS AVONS MIS EN PRATIQUE NOS PRINCIPES SUR UN SITE REEL EN PERIPHERIE D'UNE VILLE. NOUS NOUS SOMMES FIXES COMME OBJECTIF 700 LOGEMENTS. SOIT AVEC UNE DENSITE MOYENNE DE 3 PERSONNES PAR FAMILLE : 2100 SANS-ABRI. NOUS AVONS ESSAYE DE TENIR COMPTE AU MAXIMUM DE LA DISPONIBILITE DES TERRAINS : PROBLEMES FONCIERS.

CONCLUSION

DANS CETTE ETUDE, NOUS AVONS TENU AVANT TOUTE CHOSE A REFLECHIR SUR DES PRINCIPES GENERAUX QUI PUISSENT AVOIR UNE APPLICATION ADAPTEE EN FONCTION DU CONTEXTE CULTUREL .
DANS LA CULTURE LOCALE, LE LIEN EST TRES FORT ENTRE LES STRUCTURES PROFONDES DE LA SOCIETE ET LEUR EXPRESSION DANS LA FORME DE LA MAISON.
LE MODE DE GROUPEMENT, COMME LE MODE DE PARTITION INTERNE DES BATIMENTS CORRESPOND EGALEMENT A DES STRUCTURES CARACTERISTIQUES DETERMINEES PAR LA CULTURE. L'ORGANISATION DES VILLAGES, DES PETITES ET GRANDES VILLES ET DE LA CAMPAGNE QUI LES ENTOURE N'EST PAS L'EFFET DU HASARD MAIS LE RESULTAT D'UN PLAN DELIBERE QUI VARIE AVEC L'HISTOIRE ET AVEC LA CULTURE.

STRUCT. MODULAIRE A OSSATURE BOIS

① EMBALLAGE, STOCKAGE, TRANSPORT : FACILES
LIVRAISON INDIVIDUELLE : FOURGONNETTE
MANUTENTION MANUELLE : LEGERETE, FAIBLE ENCOMBR.

② **MONTAGE**
- RAPIDE
- SIMPLE : OUTILS COURANTS
- ADAPT. TERRAINS : PENTE
- DIFFICILES : INST., SABLE
- SUR DALLE OU POUTRES

③ **STABILITE**
- EQUERRAGE
- CONTREVENT.
- LIAISONS

④ **LIBERTE ARCH.**
- INTEGRATION
- EXTENSION - TRANSFORM.
- REVETEMENTS, REMPLISSAGES : VARIES

⑤ **ISOLATIONS**
- BOIS : PAS DE PONTS THERM.
- TRAITEMENT FONG. ET INSECT.
- RES. AU FEU

① PLIE — DEPLIE

② LISSE HAUTE, JAMBETTE, BARRE D'ECARTEMENT, POTEAU

③ SOLIVES 150 x 50, LINTEAU, ENTRETOISE, TRAVERSE SOUS APPUI, LIAISON INTERM. METAL. POTEAU, POTELET SOUS APPUI, TENDEUR CONTREVENT., TENON ET ANCRAGE METALLIQUE

ANCRAGE, LISSE BASSE, FEUTRE BITUMINEUX, DALLE BETON OU FONDATION LINEAIRE OU MADRIER IMPREGNE SUR GRAVIERS (AVEC ANCRAGE)

JAMBETTES BASSES AUGMENTER LA STABILITE EN ZONE SISMIQUE

④ CATALOGUE DES ELEMENTS

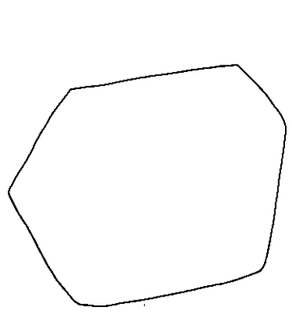
POTEAU SOUS LINTEAU — POTELETS SOUS APPUI

TRAVERSES D'APPUI

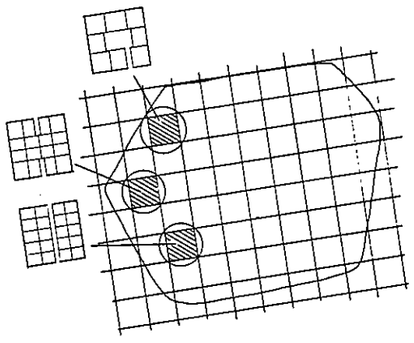
④ PLAN (CONCEPTION) — 6 fois 600 + 180, STRUCTURE DE BASE, ENTRAXE DES POTEAUX : 600 mm, COTE POTEAU/MUR NEGLIGEABLE

⑤ TYPES DE REMPLISSAGES "INDUSTRIALISES"

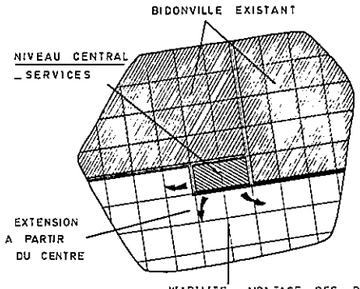
ISOLATION : LAINE DE VERRE, ENDUIT, REVETEMENT, CONTRE LATTAGE, FIBRALITH, AGLO OU PLACO., POTEAU BALADEUR SOUS LINTEAU, POTELET SOUS APPUI



A- SITE (BIDONVILLE)

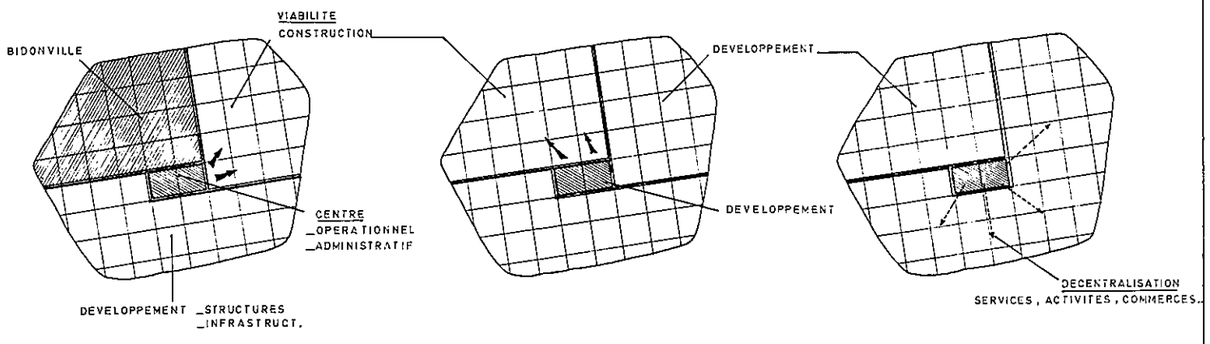


B- SITE TRAME



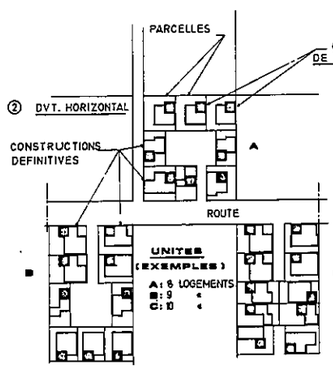
C- PREMIERE PHASE D'OCCUPATION

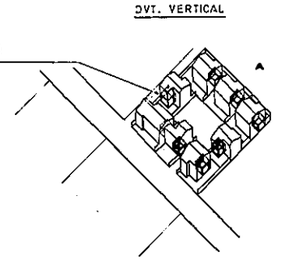
DEVELOPPEMENT SEQUENTIEL D'UN SITE



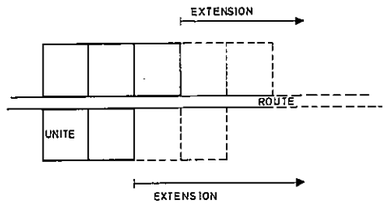
D- DEUXIEME PHASE — E- TROISIEME PHASE — F- QUATRIEME PHASE

EXTENSION DES STRUCTURES

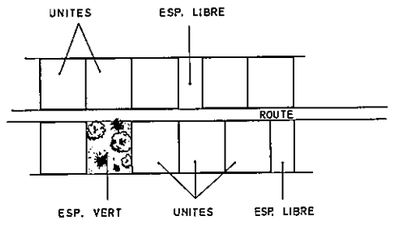




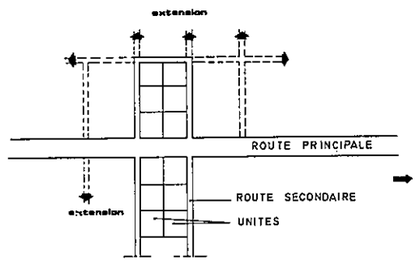
AXONOMETRIE ECH 1/1000e



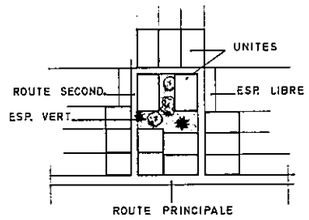
CONCEPTION A DENSITE MAXIMALE



DENSITE MOINDRE AVEC ESPACES VERTS



CIRCULATIONS ECH 1/4000e

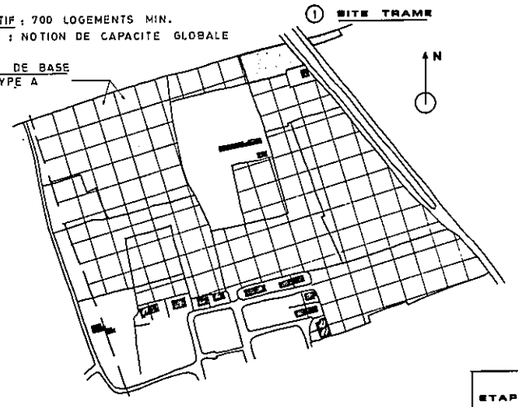


EXEMPLE DE DEVELOPPEMENT
ECH 1/4000e

- DEVELOPPEMENT DE MODES DE GROUPEMENT (UNITES)
- EXTENSION DANS LE SITE

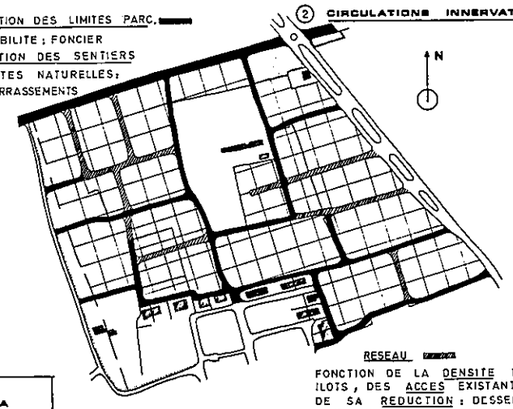
OBJECTIF : 700 LOGEMENTS MIN.
TRAME : NOTION DE CAPACITE GLOBALE
UNITE DE BASE TYPE A

① SITE TRAME



- UTILISATION DES LIMITES PARC.
- DISPONIBILITE : FONCIER
- UTILISATION DES SENTIERS ET LIMITES NATURELLES
- DE TERRASSEMENTS

② CIRCULATIONS INNERVATION

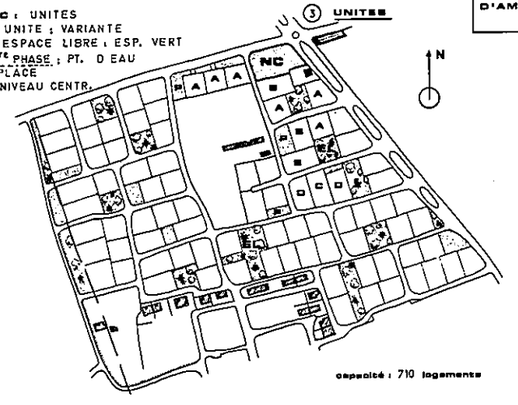


RESEAU
FONCTION DE LA DENSITE DES ILOTS, DES ACCES EXISTANTS, DE SA REDUCTION : DESSERTE MAX. POUR RESEAU MIN.

ETAPES DANS LA PREPARATION DU PLAN D'AMENAGEMENT
ECH 1/4000e

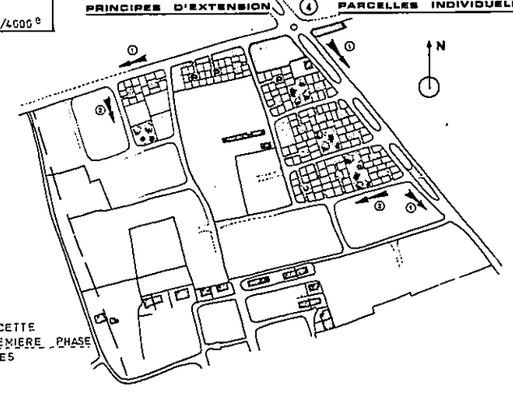
- A-B-C : UNITES
- D : UNITE ; VARIANTE
- EL : ESPACE LIBRE ; ESP. VERT EN 1ère PHASE ; PT. D EAU
- P : PLACE
- NC : NIVEAU CENTR.

③ UNITES



capacité : 710 logements

PRINCIPES D'EXTENSION — ④ PARCELLES INDIVIDUELLES



P : PLACETTE EN PREMIERE PHASE
: LATRINES

A. HOMELESSNESS

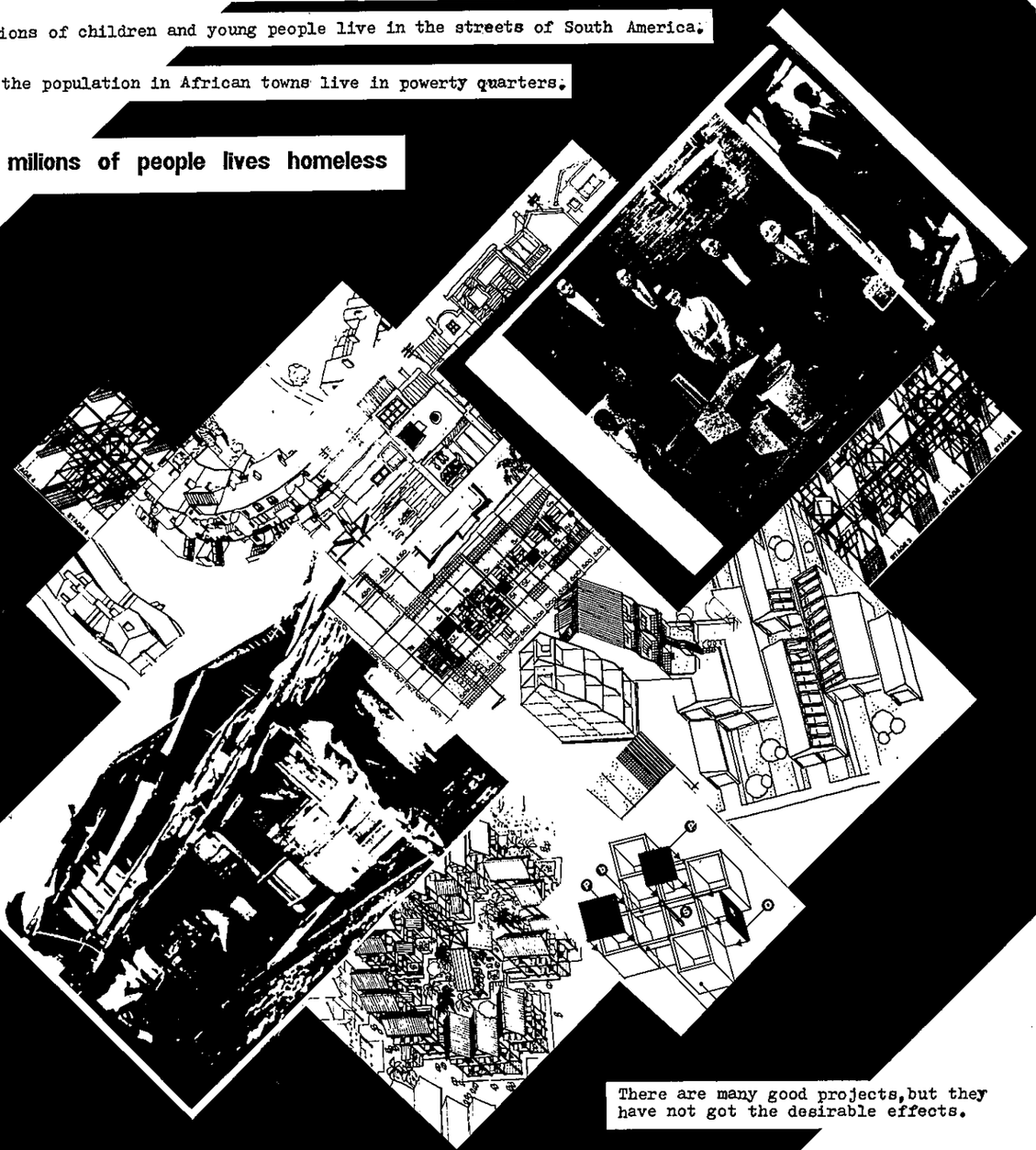
52444837

100 millions of people live without a permanent residence.

20 millions of children and young people live in the streets of South America.

80% of the population in African towns live in powerty quarters.

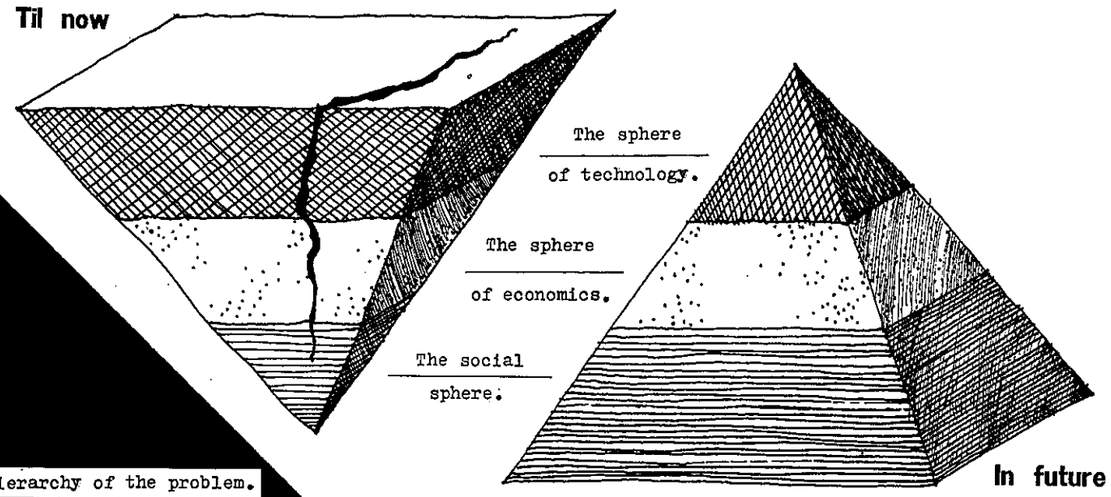
1000 milions of people lives homeless



There are many good projects, but they have not got the desirable effects.

Up til now the technocratic attemps of solving the homelessness problem have not brought any results.

B. IDEA, ENVIRONMENT, HABITAT.



1. Hierarchy of the problem.

The problem of flats for the homeless is neither solely a technical one nor just an economical one, but first of all it is a sociopolitical problem.

2. The definition of the problem.

The essens of the problem of the homeless is different in various countries and its reasons are also different.

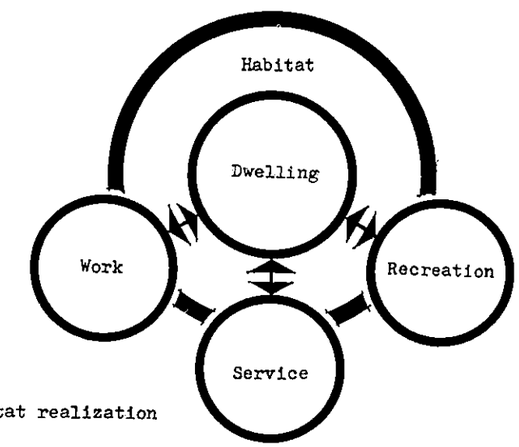
Therefore no universal solutions of the problem exist.

Every attempt at solving the problem has to be proceded by analysis of reasons in local conditions.

The problem of the homeless, when it is not placed in geografic, demografic, social and politycal reality, is a meaningless expression.

3. The habitat idea.

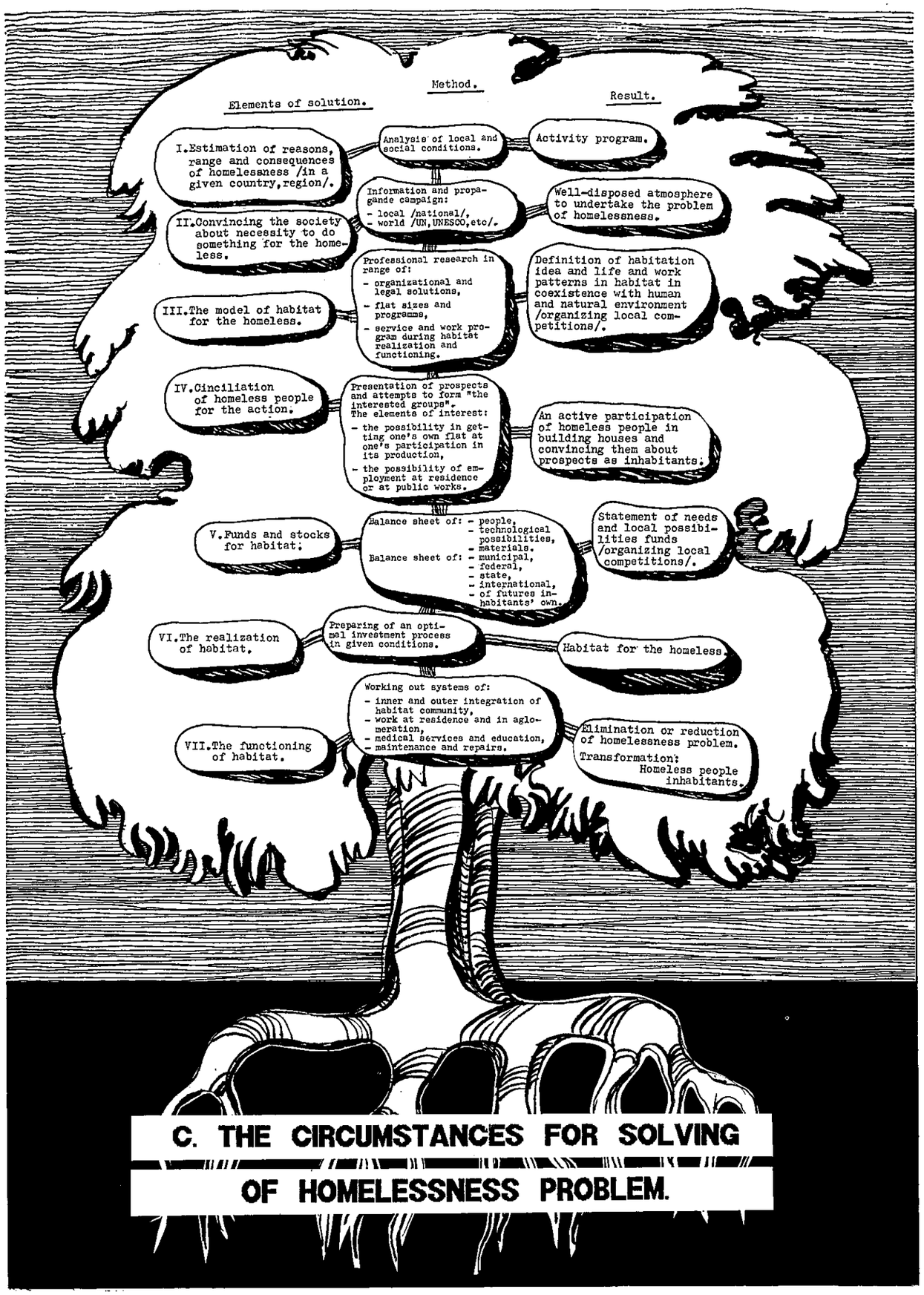
A separate dwelling for every family is a necessary but insufficient presupposition for solving the problem of the homeless.
Work for people who are homeless is an essential element of the creation and functioning of the habitat.



4. Inhabitants' participation.

Inhabitants' participation is necessary for the habitat realization and to its proper functioning.

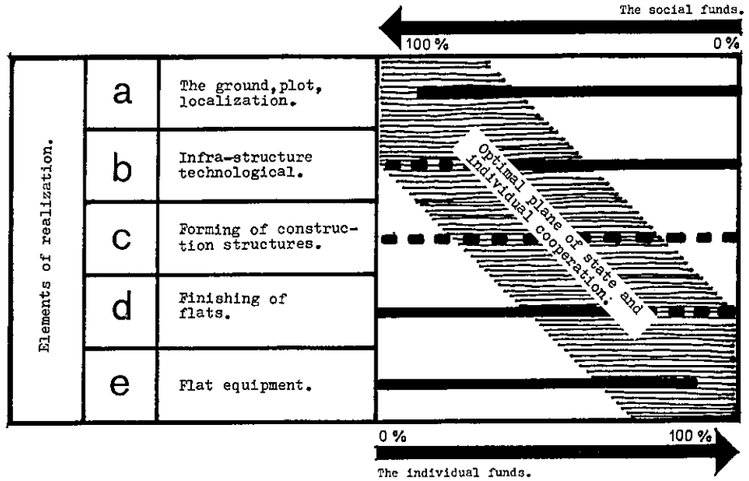
Building of flats for the homeless should release people's versatile activity.



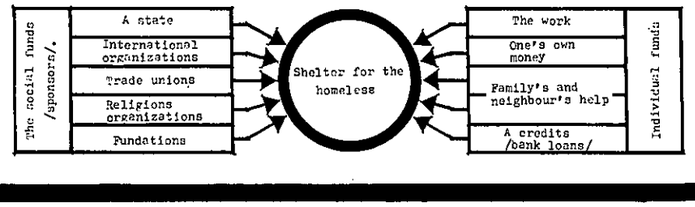
C. THE CIRCUMSTANCES FOR SOLVING OF HOMELESSNESS PROBLEM.

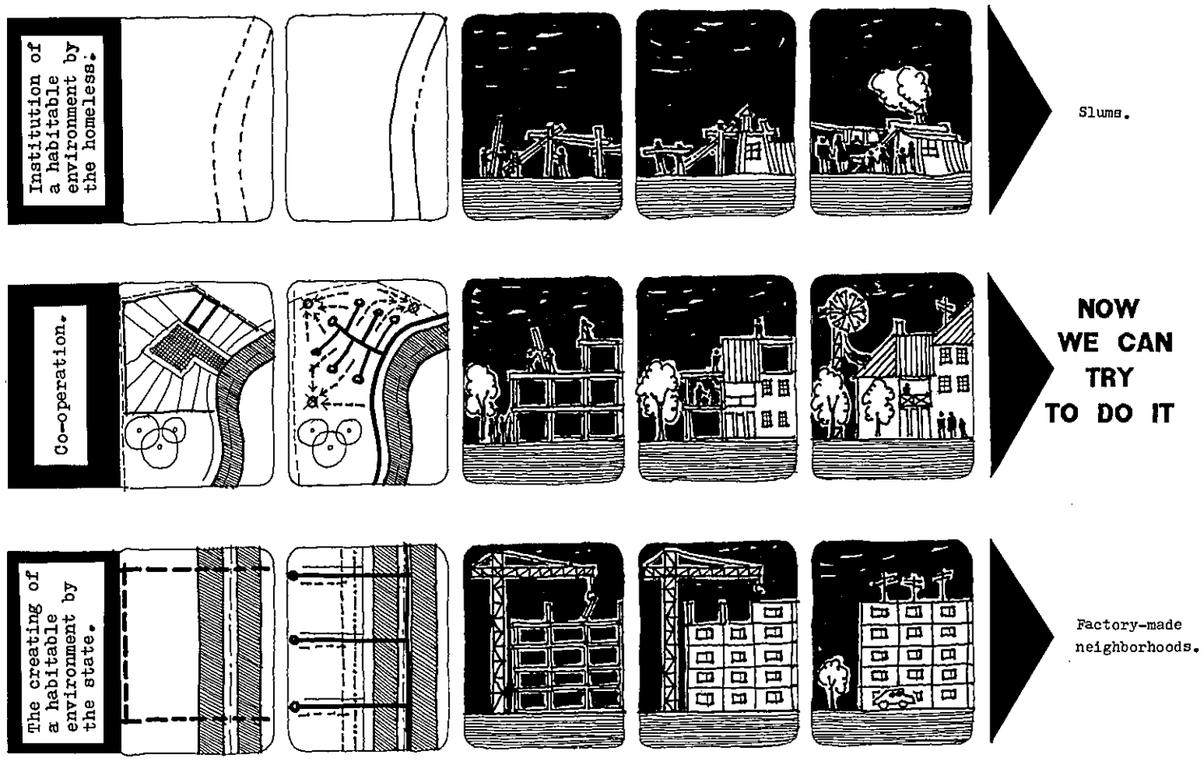
D. THE PRINCIPLES AND FUNDS OF HABITAT REALIZATION.

The social and individual funds share in habitat realization.



The funds for shelters for the homeless.





12344321. SECTION 1

WE OFFER: NO PROJECT, BUT A CONCEPT

FURTHER DEVELOPED PREFAB CONSTRUCTION AS A FLEXIBLE SYSTEM A GDR SPECIFIC CONTRIBUTION TO AIDING IN THE ELIMINATION OF WORLD-WIDE SHORTAGE OF FLATS.

12344321

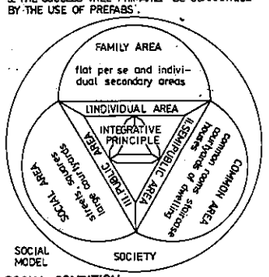
■ IMMATERIAL ACHIEVEMENTS
MAKING AVAILABLE SCIENTIFIC FINDINGS, PROJECTING WORK AND EXPERTS

■ TRANSFER OF TECHNOLOGY
PRINCIPLES OF FLEXIBLE PRODUCTION IN ACCORDANCE WITH SPECIFIC USERS' REQUEST INCLUDING AUTOMATION (CAD)

■ EXPORT OF STRUCTURAL COMPONENTS
ECONOMIC CONSTRUCTION, VARIABLE STRUCTURAL COMPONENTS

REASONS

1. THE GDR DISPOSES OF EXTENSIV KNOWLEDGE AND EXPERIENCE IN USING PREFABS FOR INDUSTRIAL BUILDING.
2. UNTIL 1990 THE GDR WILL SOLVE ITS HOUSING PROBLEMS WITH REGARD TO QUANTITY.
3. THE SUCCESS WILL PRIMARILY BE GUARANTEED BY THE USE OF PREFABS.



SOCIAL CONDITION

DENSITY OF POPULATION

STRUCTURE OF THE POPULATION (e.g. GDR 16,7 millions of inhabitants): children 18,7%; adults capable of working 64,6%; old age pensioners 16,9%

FAMILY STRUCTURE: 1 person, single; 2 persons-family; 3 " "; 4 " "; 5 " "

CULTURAL CONDITIONS

habits of living → functional structure – usual forms of living → concepts of living:
one generation or multi generation families / zoning of flats / concepts of design / aesthetic demands / traditional building materials / building technologies

CLIMATIC CONDITIONS

POLAR CLIMATE — protection against cold/wind/snow-drifts

TEMPERATE CLIMATE — in winter: protection against wind and cold, in summer: protection against insolation and violent rainfalls

TROPICAL (ARID) CLIMATE — protection against the and sandstorm, insulation of the temperature amlitude, cooling by means of evaporation

HUMID CLIMATE — protection against rain, condensend water, insulation

☐ FUNCTIONAL AND STRUCTURAL MODEL

TYPES OF UTILIZATION

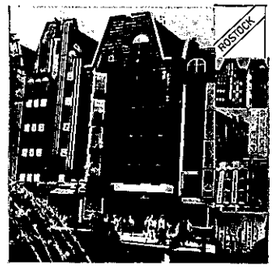
ACCESS TO ROOMS / FLAT ZONING

A direct (via living room or hall) — B indirect — C not zoned — D zoned into communication and individual areas

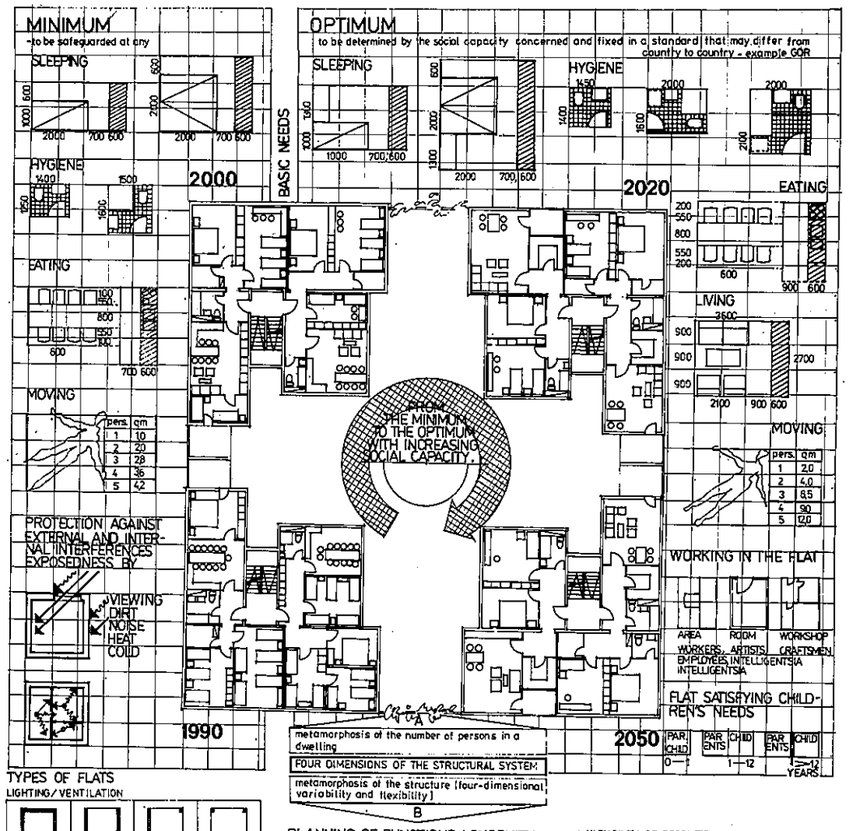
TERRITORIAL (LOCAL) CONDITION

TOPOGRAPHIC CONDITIONS

level — lightly inclined — steep



SOME REALIZED EXAMPLES IN THE G.D.R.



TYPES OF FLATS

LIGHTING/VENTILATION: one-sided — two-sided — three-sided — universal

DESCRIPTION OF FORM: square — rectangular — angular — irregular

NUMBER OF STOREYS: one-storeyed — 1,1/2-storeyed — 2-storeyed — 2,1/2-storeyed — normal case maisonettes

TYPS OF BUILDING

FORMS OF FLAT BUILDINGS: detached — serial houses — wide spread

TERACED FORMS OF BUILDINGS: natural terraces — man made terraces — house on a hillside

FORMS OF STOREYS: point building — slab block — atrium

FOR OF ACCES: detached — serial access — gallery/apartment houses — apartment houses with inner corridor

PLANNING OF FUNCTIONS LONGEVITY THROUGH PURPOSIVE CONSIDERATION OF THE VARIABILITY AND FLEXIBILITY OF THE BUILDING CONSTRUCTION

I. VARIABILITY

1. PRIMARY VARIABILITY = possibilities for alternative plan solutions within a given area of equal size — basic variants A0 B0 C0 1990 x0

2. UTILIZATION VARIABILITY = possibilities of functional change within a basic variant through a) planning of compact plans b) small structural changes
A0 1990 — A01 1995 — A02 2000 — A03 2005

3. VARIABILITY OF STRUCTURAL ALTERATION = possibility of structural alteration (e.g. owing to change of tenants) to a limited extent.
previos condition (date of vacation of the flat) — new condition (primarily achieved by tenant do-it-yourself)
A03 2005 — A0310 2005 A03n 2005
or owing to altered social conditions (material basis) — ...-altered average allotment of storing areas
A0320 2005 A0321 2005

4. VARIABILITY OF RECONSTRUCTION = possibilities of removing effects caused by moral and physical wear of the flats and simultaneous adjustment to new social requirements.
repatriation to a new basic variant, standing on a higher step
A1 2050 — A0310 2050 — A0320 2050

II. FLEXIBILITY

1. STRUCTURAL EXPANSION
A0 1990 — A2 2005 — A3 2050

2. EXPANSION AND CONTRACTION
1 1/2-R-FLAT-
3 -R-FLAT
5 -R-FLAT
7 -R-FLAT

WE OFFER: SOCIAL CONCEPT AS A DEVELOPMENTAL STRATEGY 1

12344321

DEVELOPMENT OF THE CONSTRUCTION (EXAMPLE NORMAL STOREY, ANALOGUOUS ARRANGEMENT OF BASEMENTS AND STOREYS FOR SOCIAL USE: UPPER ENDINGS OF THE BUILDINGS)

classification according to building structures
I. primary structure = load-bearing construction — groups of construction: 1. ceiling 2. walls 3. staircases
II. secondary structure = enveloping structure — groups of construction: 1. load bearing construction 2. insulation 3. weather protection layer
III. fertial structure = development — groups of construction: 1. partitions 2. cupboard units for storing purposes 3. doors 4. windows 5. installation
IV. quartiary structure = supplementary construction — groups of construction: 1. local structures (example: special insulation constructions)

principle of introduction: stepwise introduction into the groups of

I. GROUP — LOAD-BEARING CROSS WALLS SPANNING THE SHORT SIDE OF THE AREA(S)
II. GROUP — TWO-BEARING OR SPANNING THE LONG SIDE OF THE AREA(S) LESS THAN 80% OF AREA(S)
I. GROUP — ONE-BEARING OR SPANNING THE SHORT SIDE OF THE AREA(S) MORE THAN 80% OF AREA(S)

COMBINATION OF SOLID AND HOLLOW BLOCK WALL (FLEXIBLE)
FLEXIBILIZATION OF THE BEARING WALL SYSTEM WITH REGARD TO:
1. USE OF MATERIAL ACCORDING FUNCTIONAL REQUIREMENT
2. ARRANGEMENT OF SERVICE LINES, BREAK-THROUGHS
3. STANDARDIZE STRUCTURAL SOUND INSULATION (SMALLEST VALUE 50 dB)

TREND OF DEVLOPMENT

STRUCTURAL POSSIBILITIES FOR VERTICAL LOADBEARING SYSTEM (INNER WALLS)
INDUSTRIAL WALL MANUFACTURING TECHNOLOGY
A. TRADITIONAL WALL MANUFACTURING TECHNOLOGY
B. COMBINATION OF SOLID WALL AND HOLLOW BLOCK WALL
C. SOLID WALL

MAX. NUMBER OF STOREYS

VARIANT: 6-8 (80–80 KN)
FULL DEVELOPMENT AND UTILIZATION OF ALL TECHNOLOGICAL FUNCTIONAL AND ARCHITECTONIC POSSIBILITIES

RECOMMENDATION: GRADUATED PROGRAMME FOR THE INTRODUCTION OF THE SYSTEM / EXTENSION / PERSPECTIVE (stepwise introduction according to the conditions specific for the country)

VARIANT: 2 (120 KN)
REPRESENTATION OF THE POSSIBILITIES OF VARIATION FOR THE INTRODUCTION PERIOD EXEMPLIFIED BY THE VARIANT STRUCTURE (LOAD-BEARING SYSTEM) WITH THE STRUCTURAL GROUPS CEILING AND WALL

VARIANT: 1 (180 KN)
REPRESENTATION OF THE POSSIBILITIES OF VARIATION FOR THE INTRODUCTION PERIOD EXEMPLIFIED BY THE VARIANT STRUCTURE (LOAD-BEARING SYSTEM) WITH THE STRUCTURAL GROUPS CEILING AND WALL

range of maximal utilization of the system's capacity: 80 KN — 60 KN — 40 KN — 30 KN — 20 KN — 10 KN

main advantages:
1. graduated programme designed in such a way that the effects are successful at the earliest possible time
2. temporal independence of the stages

ensured by principles:
staging: introduction of flexible technologies
staging: increasing of the efficiency of the system
attaining: development and extension of the degree of industrialization
gradual: development from the simple to the complex (dialectic of spiral shaped development)

To be achieved among other things by:
— flexible formwork systems for prefabrication
— mobile prefabrication techniques
— load stage programme
— increasing use of structural components containing voids (saving of materials and expenses)
— specialization through formation of structural groups
— low degree of industrialization under the condition of flexible construction requires an assortment of small elements
— with increasing degree of industrialization the assortment can be designed to contain larger members by means of textile technology (differentiation by means technology)

function, flexibility and variability can be fully ensured possibilities: 1. reinforced concrete technology for the prefabrication of ceilings, 2. design of components

limited functional flexibility and variability

Aims envisaged:
1. organisation: staff of the country concerned controls and develop the production
2. Technology:
- gradual establishment of central prefabrication sites for load-bearing systems
- use of mobile manufacturing techniques for the secondary structure
- combination of stationary and mobile hoisting technique

ceiling: variant A: combination of manual wall construction and industrial ceiling construction
wall: variant B: industrial wall and ceiling construction
variant C: import of structurel components (high costs of transport and storage not very favourable)
ceiling: combination of prestressed concrete and reinforced concrete hollow ceiling (variant 2-8) – reinforced concrete hollow ceiling (variant 1)

stage of introduction
1. organisation: choice of initial variant possible; user participation in the execution of construction work (making available possibilities of employment)
2. technology: use of mobile techniques of prefabrication and hoisting not depending on site

Graduated increase of load stage extends possibilities of: -increase of productivity -architectonic design (owing to enlarged constructive possibilities) -degree of industrialisation

Prospects for longer periods: 1. organisation – user participation in the planning stage 2. technology (use of CAD/CAM)

TREND OF DEVELOPMENT

TECHNICAL, TECHNOLOGICAL AND ORGANIZATIONAL STRATEGY 2

12344321

EXAMPLE FOR THE BASIC ASSORTMENT IS FORMED ACCORDING TO THE LOAD STAGE 0 01 02 m

1. MASS OF ELEMENTS : 351 kg/m²
2. MASS OF ELEMENTS INCLUDING JOINT : 355 "
3. MASS INCLUDING FLOOR SCREED : 426 "
4. STANDARD OF SOUND INSULATION : 54 dB

MANUFACTURE IN SITU — MAGNET SUPPORT

40 KN : SL_{max} = 9000, SW_{max} = 2400	50 KN : SL_{max} = 9000, SW_{max} = 1600	40 KN : SL_{max} = 9000 SW_{max} = 1200	20 KN : SL_{max} = 9000 SW_{max} = 600
	336 kg/m²	357 kg/m²	402 kg/m²
	362 "	375 "	415 "
	435 "	418 "	486 "
	54 dB	54 dB	54 dB
CABAREL OF BEING PREFABRICATED			
2...3 OPENINGS >110 a <310	SL = 7200	1 OPENING >16 <310	
12...14 STEELS		3 STEELS	
2 . 3 OPENINGS >110a< 310	SL = 8400	1 OPENING >110, < 310	
		6 STEELS	
19 ... 21 STEELS		5 STEELS	
1 OPENING >110 a < 310 22 STEELS	SL = 9000	1 OPENING >110 < 310	
2 OPENINGS " 21 "		6 STEELS	
(1 SITUATED AT THE EDGE)			
21 ... 24 STEELS		6 STEELS	

EXAMPLE OF A COLUMN HEAD WITH VARIABLE ANGLES 0 02 m

VARIABLE IN WIDTH

CAVITATION BY MEANS OF SPIRAL SHAPED SHEET TO ENSURE THE BOND

BONDING EFFECT OF THE SYSTEM

EFFECTS OF ECONOMY

EXAMPLES:
1. CONTINUOUS BEAMS
2. INCLUSION OF THE CEILING IN THE STATIC HEIGHT OF THE BEAMS
3. CONTINUOUS SUPPORTS

LOAD BEARING CONSTRUCTION (HORIZONTAL) 0 01 02 m

304 kg/m²

CROSSING TAPE GRID FOR WALLS LEADS TO A GEOMETRICALLY AND STRUCTURALLY OPEN SYSTEM FOR VERTICAL BEARING SYSTEMS

„OPEN" CONNECTIONS IN CORNERS WITH CROSSING AND LINEARLY ARRANGED WALLS – ONLY ONE GEOMETRY OF THE EDGE

φ100 WITH W_c = 180
φ110 WITH W_c = 190

432 kg/m²

SHEARPROOF CONNECTIONS

ASSORTMENT HORIZONTAL:
BASIC ASSORTMENT: 6M (n x 300)
SUPPLEMENTARY ASSORTMENT: ½ M (n x 150)
ADJUSTMENT ASSORTMENT: –

VERTICAL:
3M (n x 300)
3M (n x 300)

PRINCIPLE OF A CONSTRUCTION WITH VARIABLE ANGLES 0 01 02 m

α = ANGLE REQUIRE FROM THE VIEWPOINT OF TOWN PLANNING

4-R FLAT · 4½-R FLAT · 2-R FLAT · 3-R FLAT · BATTERY MANUFACTURE · LYING MANUFACTURE

SUPPLEMENTARY ASSORTMENT

CONTINUOUS ADJUSTMENT ASSORTMENT

FLEXIBLE WIDTH OF INSULATION
WEATHER PROTECTION

FLEXIBLE CONSTRUCTION OF OUTER WALL 0 01 m 02

- K = VARIABLE
- FLEXIBLE SUSPENSION OF WEATHER PROTECTION (LAYER)
- SUSPENSION – LOAD STAGE VARIABLE
- ADJUSTABLE IN 3 DIRECTIONS
- MOVEABLE IN 3 DIRECTIONS
- SPECIAL STEEL 27 kg = 1.1 kg STRUCTURAL STEEL (G = 14.9 kg)
- EYE HOOK AS AN JOINT

THIRD FLOOR · SECOND FLOOR · FIRST FLOOR · GROUND FLOOR · STORE · SHOP

WALL-SHAPED BEAM

WALL-SHAPED COLUMN (AS A TRANSITION TO THE WALL SYSTEM)

SITE PLAN 0 5 10 m

WE OFFER:
POSSIBILITIES / VARIA
FOR INDIVIDUAL CO

12344321

BASIC ASSORTMENT (n-1) x 6M

NON MODULAR RANGE

SUPPLEMENTARY ASSORTMENT ½ M

PRINCIPLE OF A COLUMN HEAD WITH VARIABLE ANGELS

MINIMUM α = 45°

2x4800=9600 · 2x4950=9900 · 2x5100=10200 · 2x5250=10500 · 2x5400=10800 · 2x5550=11100 · 2x5700=11400 · 2x5850=11700

FLEXIBLE CEILING FORMWORK 0 05 m 1

EXAMPLE OF USE → PAGE 3

STATIONARY BE ABLE TO FLAP

SEPERATION DISK FOR CUTTING THE FRESH CONCRETE

REINFORCEMENT

ADJUSTABLE 3M

ADJUSTABLE ½ M

FOAM MATERIAL

LONGITUDINAL FORMWORK

EXAMPLE: 2 x 6000 = 12000

n x ½ M

EXAMPLE l_1+l_2 = 4800 + 5850 = 10.650

l_1+l_2 = 10800 = MAXIMUM

BASIC GEOMETRICAL PRINCIPLES FOR THE DESIGN OF STRUCTURAL COMPONENTS

1. UNIFORM COORDINATED MODULES
2. GEOMETRICALLY DEFINED POSITION OF DETAILS AND CONNECTING POINTS
3. SIMPLE BASIC GEOMETRIES OF STRUCTURAL COMPONENTS (AVOID COMPLICATED SPATIAL COMPONENTS – PRINCIPLE OF ASSEMBLING)
4. GROUP FORMATION FOR GROUPS OF STRUCTURAL COMPONENTS
   1. BASIC ASSORTMENT
   2. SUPPLEMENTARY ASSORTMENT
   3. ADJUSTMENT ASSORTMENT
5. PRINCIPLE OF ASSORTMENT FORMATION OPEN AT THE TOP
6. CONCENTRATION OF MODULAR IRREGULARITIES OF SYSTEM POINTS

THIRD FLOOR · SECOND FLOOR · FOURTH FLOOR · FIRST FLOOR · GROUND FLOOR · BRICK WALLS · LOAM WALLS · CONCRETE CONSTRUCTION

POSSIBILITIES OF TOWN PLANNING 0 5 10 m

MANUFACTURE: 1. BEARING WALL OF THE ENVELOP CONSTRUCTION - TILTING MOULD. LYING INNER SIDE DOWNWARDS. 2. INTERIOR WALLS BATTERY OF FORMWORK (HENCE FOR 1. AND 2. SURFACE FINISHED WALLS)

PRINCIPLES: ADJUSTMENT OF EDGE FORMWORK - MANUAL, MECHANICAL, HYDRAULIC

DEVELOPMENT: GRID PLAN SCRATCHED ON THE BASE - COMPUTER-AIDED (COORDINATE NETWORK IN THE COMPUTER)

FLEXIBLE WALL FORMWORK

JOINT USE BARS FOR MEMBERS & VOIDS

ADJUSTABLE n x ½ M

VARIABLE ASSORTMENT FOR VOIDS

ADJUSTMENT ASSORTMENT

PERMANENT MAGNETS FOR ARRESTING CORES

ARRANGEMENT OF VOIDS ACC. TO DIMENSIONS

STATIONARY

7200

TENSION MEMBER

IN CASE IT IS NECESSARY TO DESIGN THE SOLID WALL

VARIABLE RANGE

LONGITUDINAL STIFFENING

VARIABLE

EXAMPLE FOR STIFFENING VARIANTS EXAMPLE:

BASIC STATIC PRINCIPLE

STIFFENING BY MEANS OF CONTINUOUS WALLS (GRADUATED REDUCTION OF THE STIFFENING SECTION OF THE WALL)

PRINCIPAL POSSIBILITIES:
1. CAVITY REINFORCEMENT
2. VERTICAL REINFORCEMENT
3. WELDING JOINT REINFORCEMENT

ANTS
OMPILATION

SURVIVAL IN A NUTSHELL

SURVIVAL IN A NUTSHELL

A STRATEGY TO RESTORE A BALANCED ENVIRONMENT, A MOTIVATED COMMUNITY AND SELF-REGULATING SUPPORT SYSTEMS WITH LOCAL RESOURCES.

THE PROBLEM

THERE WILL BE INCREASINGLY MORE PEOPLE WITHOUT A HOME - - ACCORDING TO MOST PREDICTIONS. THEIR NUMBER INCREASES BECAUSE PEOPLE CAN FIND NO LONGER SUBSISTENCE AND BECAUSE THEY ARE POOR (IN HAITI 90%). THEY LOOK UP AND OUT TO PLACES WHERE PEOPLE ARE RICH AND SEEMINGLY HAVE NO SUCH PROBLEMS.

THE CITY IS ONE OF THOSE PLACES -ON FIRST SIGHT- WITH UNLIMITED POSSIBILITIES, INDEPENDENT OF THE SOIL, RAIN, DROUGHT, DAYLIGHT OR TIME. ON SECOND SIGHT CITIES ARE HUGE SATELLITES NOURISHED BY THE COUNTRY. FURTHERMORE, POTENT CITIES ARE TO A DREGREE FED BY LESSER ONES. RAW MATERIALS ARE REFINED AS THEY MOVE UP IN THE URBAN SYSTEM. THEIR VALUE IS INCREASINGLY ABSTRACTED. THE BALLANCE IS DRAWN UP IN MONEY AND DISSIPATED INVERTEDLY: HIGHER POSITIONS RECEIVE MORE REWARDS THAN LOWER ONES. FOR THE MANY AT THE BOTTOM VERY LITTLE IS LEFT.

THE RESULT CAN BE SEEN IN MANY OF THE "THIRD-WORLD" COUNTRIES: NO HOME, NO MONEY, NO FOOD AND NO WAY BACK. (SEE EXODUS)

HELP

LOCAL GOVERNMENTS ARE HELPLESS: SHORT TERMS, A COMMITMENT AND INCLINATION TOWARDS FOREIGN POWERS AND THE SHEER SIZE OF THE PROBLEM OFTEN RESULT IN LISTLESS ADMINISTRATION OF AID-PROGRAMS OR CYNICAL CORRUPTION. THEREFORE FOREIGN AID REQUIRES ADDED PROJECT MANAGEMENT WITH ALL THE CRITICAL IMPLICATIONS ON ACCEPTANCE AND APPROPRIATENESS.

WE PROPOSE A STRATEGY THAT MAKES USE OF THE SNOWBALL SYSTEM: THE TRIGGER IS A DEMONSTRATION TO SELF-HELP - THE AIM IS TO STOP THE EROSION OF MATERIAL AND HUMAN VALUES. THIS STRATEGY COULD BE IMPLEMENTED IN MANY TROPICAL LOCATIONS BETWEEN 20°N AND 20°s. WE HAVE CHOSEN HAITI AS AN EXAMPLE, SINCE HERE THE RESULTS OF MISMANAGEMENT ARE MOST OBVIOUS AND THE PROBLEM OF HOMELESSNESS MOST APPALLING:

TAKING A PIECE OF THE COUNTRY BACK TO THE CHAOTIC CITY IS THE CENTRAL IDEA OF THIS PROPOSAL. WITHIN THE NO-MANS-LAND OF SHANTYTOWN WE WANT TO DEMONSTRATE SURVIVAL IN A NUTSHELL. WE WANT TO MOTIVATE SOME OF THE SQUATTERS TO MOVE TO ANOTHER LOCATION WHERE THEY CAN REGAIN SUBSISTANCE, TO A LOCATION YET CLOSE ENOUGH TO TOWN TO VINDICATE THEIR WAITING FOR A CHANCE ON THE LABOUR-MARKET.

CLASSIFICATION TO SECTION

A HOME FOR THE HOMELESS HAS TO COVER MORE NEEDS THAN KEEPING ITS INHABITANTS DRY: THAT IS TOO LITTLE WHEN THEY ARE DISCOURAGED AND STARVING.

IN OUR CONCEPT OF HABITATION WE INCLUDED MEANS FOR EACH INDIVIDUAL TO HELP HIMSELF TO BASIC FOODS AND THE PROPER RECYCLING OF THE REMAINS.

MAKING ONESELF AT HOME ENTAILS ESSENTIAL PARTICIPATION. THE MOTIVATION TO MAKE THAT HOME CANNOT BE SUBSTITUTED BY A READY-MADE PRODUCT.

IN OUR CONCEPT OF HABITATION WE WANT TO DEAL WITH THAT MOTIVATION BY MEANS OF THE DEMONSTRATION-UNITS AND THROUGH THE TRAINING OF ANIMATORS.

THEREFORE WE WANT TO PLACE OUR CONTRIBUTION IN SECTION 1.

REQUIREMENTS

THE ONLY ESSENTIAL INPUT REQUIRED FROM LOCAL GOVERNMENT IS THE COMMITMENT TO LEGALIZE OWNERSHIP OF LAND AND TO GUARANTEE LEGAL TITLES.

IN HAITI LARGE PLOTS OF LAND ARE MERELY OCCUPIED BY FORCE OR BY CROWDS. THE RIGHT TO BE THERE HAS TO BE CONSTANTLY ENFORCED BY THE OCCUPANTS (SEE EXODUS).

IN A DETAILED SURVEY LEGAL PLANS HAVE TO BE DRAWN UP, OCCUPANTS REGISTRED AND DISPUTES JUDGED. THIS WILL BE THE INPUT OF AN OUTSIDE ORGANISATION AND THE FIRST AND MAIN TASK OF A GROUP OF DEVELOPMENT ASSISTANTS, ALONG WITH THE SECURING OF A SUITABLE PROPERTY FOR THE DEMONSTRATION PROJECT.

SCHOOL FOR SURVIVAL

DEMONSTRATION OF SURVIVAL IN A NUTSHELL ON THE SELECTED SITE.

THE INHABITANTS OF A SUITABLE SLUM-AREA PROPOSE CANDIDATES WHO ARE TO BUILD NEW HOMES FOR THEIR FAMILIES ON THE SELECTED SITE. WITH THE HELP OF THE DEVELOPMENT ASSISTANTS THEY LEARN ON THE JOB ABOUT ADAPTED BUILDING TECHNOLOGY, METHODS OF PROPER COMPOSTING AND INTENSIVE GARDENING. THEY ALSO LEARN ABOUT COMMUNITY DEVELOPMENT, HEALTHCARE AND NUTRITION.

THE CANDIDATES EVENTUALLY BECOME ANIMATORS.

OTHERS WILL BECOME INTERESTED. THOSE WHO ARE WILLING WILL BE OFFERED OTHER SITES TO BUILD THEIR HOMES, PROVIDED THEY ADHERE TO PRESCRIBED SIZES AND GUARANTEE PROPER MAINTAINANCE OF THE GARDEN AND THE COMPOST-TOILET. THERE WILL BE A PROBATION PERIOD BEFORE THEY ARE HANDED OVER THE TITLE.

THE SNOWBALL-EFFECT SETS IN.

THE ORIGINAL MUD-PIT AND DEMONSTRATION UNIT - GIVEN ENOUGH PROPERTY - CAN BE EXPANDED IN STAGES TO A COMMUNITY CENTRE, ADDING DISPENSARY, CLASSROOMS, WORKYARDS AND A LARGE SHELTER FOR MARKET, ASSEMBLIES AND FESTIVITIES.
TOGETHER THESE PLACES COMPRISE A PUBLICLY ACCESSABLE SPACE FOR COMMUNICATION, EXCHANGE AND COUNCELLING. SINCE THE ANIMATORS AND COUNCELLORS ALSO LIVE ON THIS SITE, THERE WILL BE A CONSTANT SURVEILLANCE.

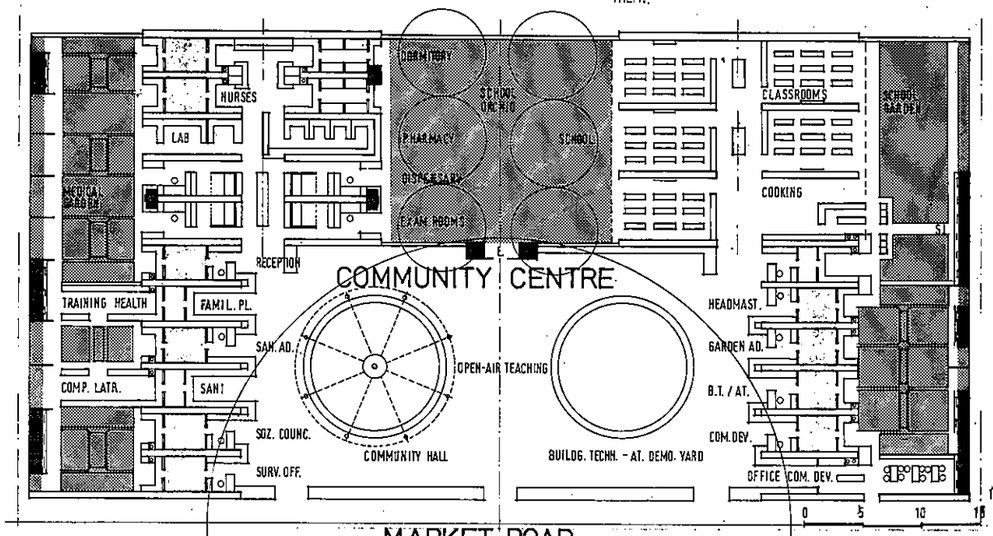
GARDEN OF EDEN

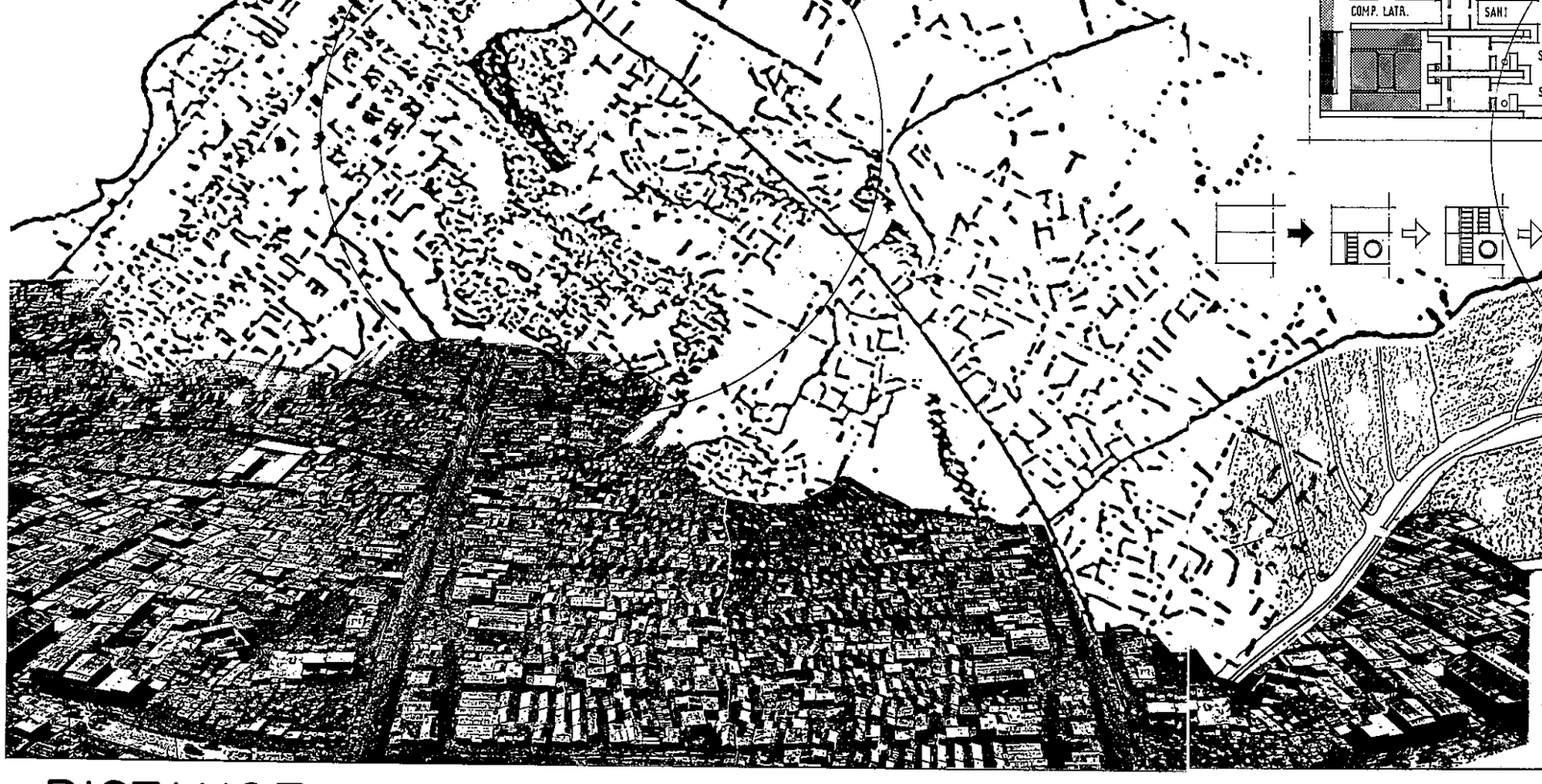
HAITI ONCE WAS A PROSPERING ISLAND. THE SAME IS TRUE FOR OTHER TROPICAL LOCATIONS. OUR CONCEPTS RESTATES A FRIENDLY RELATIONSHIP TOWARDS NATURE, A RELATIONSHIP OF GIVE AND TAKE.

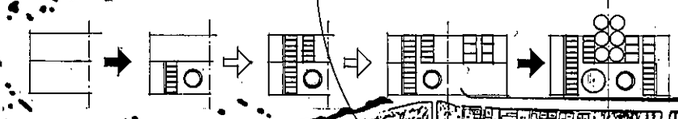
EVEN A SMALL VEGETABLE GARDEN OF 37 M² IS A BUFFER TOWARDS STARVATION, WHEN TENDED PROPERLY. PLANTS AND TREES PROVIDE SHADE, FRESH AIR AND SOFTEN THE IMPACT OF HEAT AND HEAVY RAINFALLS. PLANTS REQUIRE WATER AND FERTILISER: BOTH ARE PRESENT IN THE GARDEN. WATER IS STORED IN A COVERED UNDERGROUND TANK; FERTILISER IS PROVIDED BY THE COMPOST-TOILET.

WE HAVE SET THE FOLLOWING GUIDELINES FOR IMPLEMENTATION:

1 MINIMAL SIZE OF HOUSE FOR A MAXIMUM OF PRODUCTION AREA;
2 TO SUSPEND DEPENDENCE ON AN AILING PUBLIC WATER-SUPPLY AND WASTE MANAGEMENT, BY STORING WATER INDIVIDUALLY AND BY INTRODUCING COMPOST-TOILETS;
3 TO ORGANIZE HOUSES IN CLUSTERS IN ORDER TO ALLEVIATE THE FORMING OF SOCIAL GROUPS AND COMMUNITIES;
4 TO REDUCE THE WIDTH OF CIRCULATION PATHS TO A MINIMUM AND TO AVOID OPEN AREAS THAT ARE NOT ASSIGNED TO SPECIFIC PEOPLE OR GROUPS OF PEOPLE, SINCE THERE IS NOBODY TO MAINTAIN THEM.

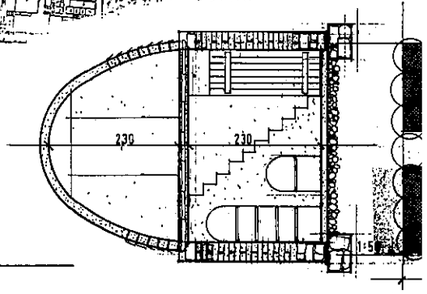






BUILDING TECHNOLOGY

VAULT:
STABILIZED MUDBRICK (7% LIME ORCEMENT), MUD-SISAL MORTAR, OVERHANGING FIBRES REENFORCE CEMENT / LIME PLASTER COATING.
FLOORSLAB:
BAMBOO OR TIMBER BEAMS, MUD-FIBRE COATING.
WALLS:
STONES FOR BASE, MUDBRICKS.
GROUDFLOORSLAB:
MUD - STONES

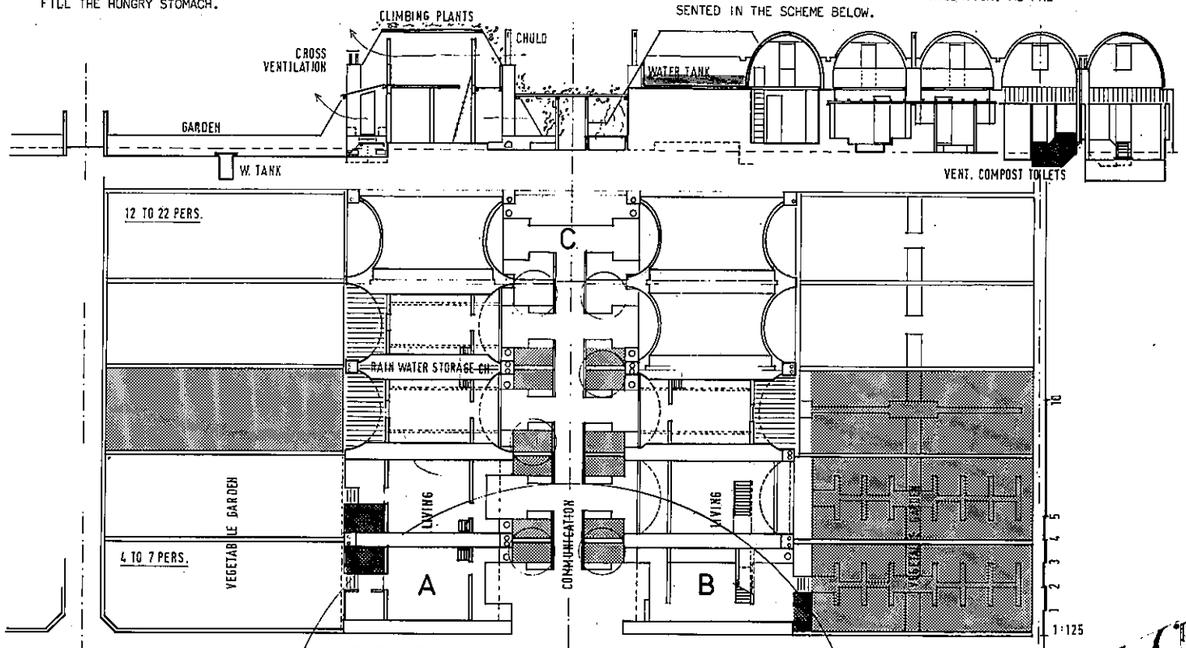


INFRASTRUCTURE

MOTIVATION FOR PROPER WASTE-MANAGEMENT DOES NOT PRIMARILY ORIGINATE IN THE ASPIRATION TOWARDS ADDED CLEANLINESS AND SANITATION, BUT IS DERIVED FROM THE EVERPRESSING URGE TO FILL THE HUNGRY STOMACH.

THE REALISATION OF OUR PROPOSAL RESTS ON THE FOLLOWING FUNDAMENTAL ELEMENTS:

1 ON THE SKILLS ACQUIRED DURING WORK IN THE COMMUNITY--CENTRE (TRAINING)
2 ON THE DIFFERENT ATTITUDE TOWARDS "WASTE" AND ITS POTENTIAL FOR FOOD PRODUCTION
3 ON A SELF-OWNED FOOD-PRODUCTION INTALLATION, AS PRESENTED IN THE SCHEME BELOW.



THE HOUSE

IT MAINLY CONSISTS OF ONE NUBIAN VAULT, WHICH IS HIGH ENOUGH TO ALLOW A SECOND LEVEL (5 MTRS.). WE CHOSE THE NUBIAN VAULT CONSTRUCTION, SINCE NO SCAFFOLDING IS NEEDED TO ERRECT IT.

THE USEABLE FLOOR AREA IS UP TO 43 M².

THERE ARE FRONT AND BACK PORCHES FOR COMMUNICATION AND OTHER USES SUCH AS KITCHEN, OFFICE OR A SMALL SHOP.

FROM THE FRONT OF THE HOUSES VEGETABLES (SQUASH, MELON, ETC.) GROW UP TO THE ROOF TO PROVIDE SHADING.

BETWEEN THE VAULTS IS AN AREA WITH CEMENT RENDERING FOR A FRESH WATER TANK (APPROX. 2.0 M³) IN ADDITION TO THE TANK IN THE GARDEN.

THE COMPOST-TOILET IS AT THE BACK OF EITHER THE HOUSE OR THE GARDEN.

DEPENDING ON THE SITE-LAYOUT, END UNITS CAN BE COMBINED FOR LARGE FAMILIES. IF AND WHEN LESS OF A GARDEN IS NEEDED, THE INDIVIDUAL HOUSES COULD BE EXTENDED TOWARDS THE BACK.

CONSTRUCTION AND MATERIALS OF THE HOUSE FOCUS ON THE AVAILABILITY OF RESOURCES: MUD, FIBRES, STONES, BAMBOO AND MANPOWER. SOME LIME, A REMANENT FROM THE SHUGAR PRODUCTION, IS USED TO STABILIZE THE MUD BRICKS FOR THE NUBIAN VAULT AND FOR THE RENDERING. CINVA-RAM PRESSES ARE PRODUCED IN THE COMMUNITY CENTRES.

THE MUD IS TAKEN FROM THE PLOT. AFTER CONSTRUCTION THE GARDEN WILL BE ONE FOOT BELOW, THE GROUNDFLOOR OF THE HOUSE WILL BE ONE FOOT ABOVE THE ORIGINAL TERRAIN.

CONSTRUCTION IS DONE IN SELF-HELP, FOLLOWING THE "COUMBITE-SYSTEM". THE KNOW-HOW IS ACQUIRED FROM THE LOCAL ANIMATOR.

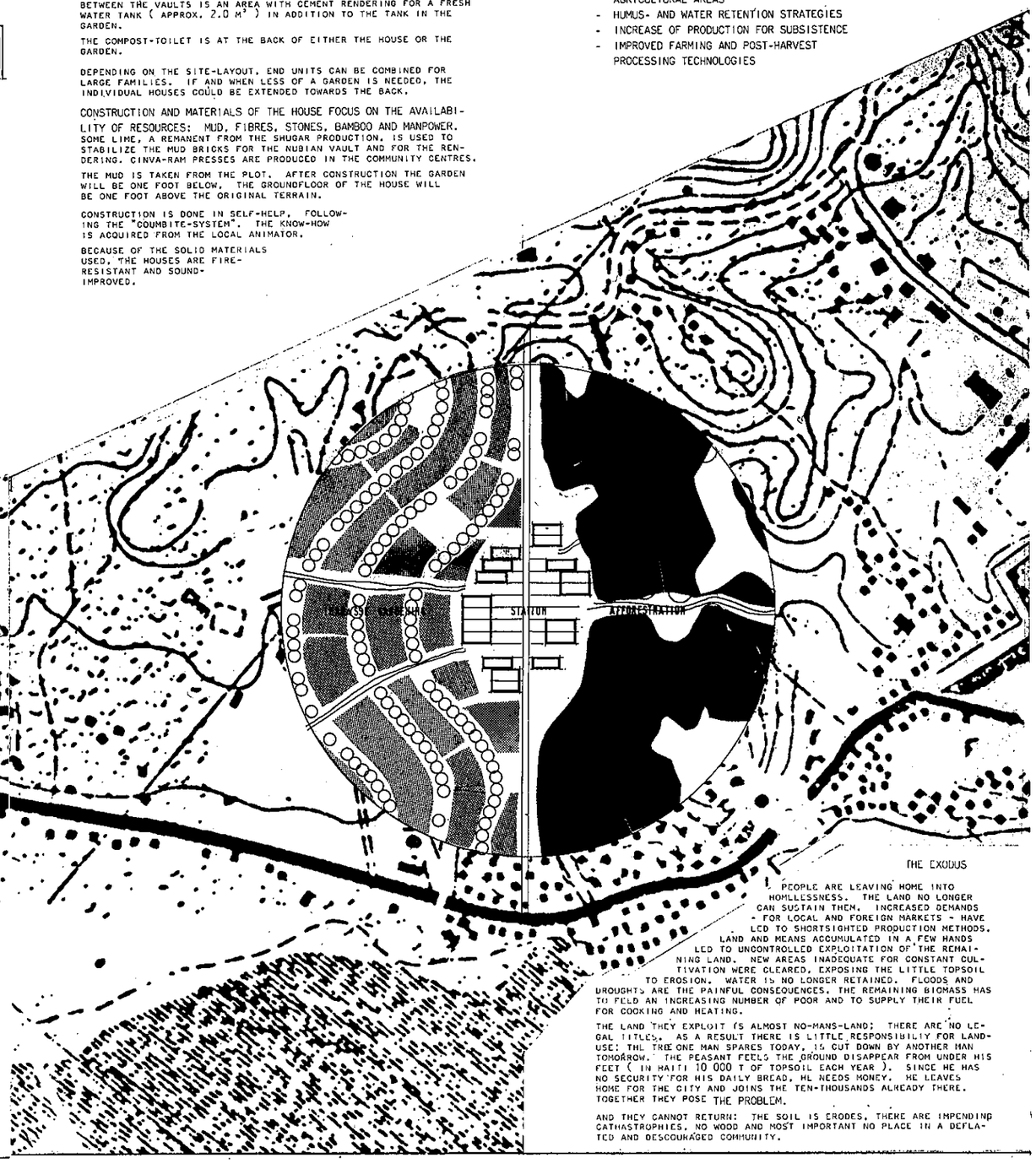
BECAUSE OF THE SOLID MATERIALS USED, THE HOUSES ARE FIRE-RESISTANT AND SOUND-IMPROVED.

THE MODEL-COMMUNITY FARMING-CENTRE

IN A VIEW TO COMBAT THE ORIGINAL PROBLEMS LEADING TOWARDS THE EXODUS, ACQUIRED KNOW-HOW AND EXPERIENCE - GAINED IN THE COMMUNITY CENTRE - WILL BE RADIATED TO THE COUNTRYSIDE.

A COMMUNITY MODEL-FARM TO BE BUILT UP BY MOTIVATED, TRAINED AND EXPERIENCED RETURNING EMIGRANTS WILL DEMONSTRATE:

- EMERGENCY MEASURES AGAINST SOIL EROSION
- AFFORESTRATION OF UNPROTECTED AND WORTHLESS AGRICULTURAL AREAS
- HUMUS- AND WATER RETENTION STRATEGIES
- INCREASE OF PRODUCTION FOR SUBSISTENCE
- IMPROVED FARMING AND POST-HARVEST PROCESSING TECHNOLOGIES



THE EXODUS

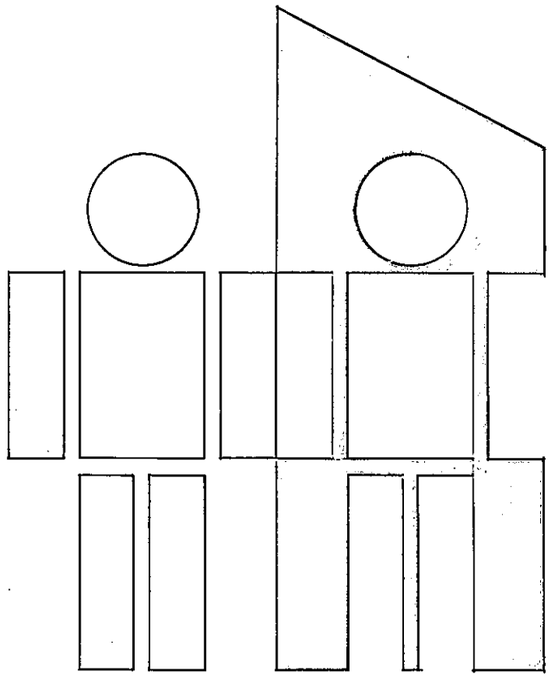
PEOPLE ARE LEAVING HOME INTO HOMELESSNESS. THE LAND NO LONGER CAN SUSTAIN THEM. INCREASED DEMANDS - FOR LOCAL AND FOREIGN MARKETS - HAVE LED TO SHORTSIGHTED PRODUCTION METHODS. LAND AND MEANS ACCUMULATED IN A FEW HANDS LED TO UNCONTROLLED EXPLOITATION OF THE REMAINING LAND. NEW AREAS INADEQUATE FOR CONSTANT CULTIVATION WERE CLEARED, EXPOSING THE LITTLE TOPSOIL TO EROSION. WATER IS NO LONGER RETAINED. FLOODS AND DROUGHTS ARE THE PAINFUL CONSEQUENCES. THE REMAINING BIOMASS HAS TO FELD AN INCREASING NUMBER OF POOR AND TO SUPPLY THEIR FUEL FOR COOKING AND HEATING.

THE LAND THEY EXPLOIT IS ALMOST NO-MANS-LAND; THERE ARE NO LEGAL TITLES. AS A RESULT THERE IS LITTLE RESPONSIBILITY FOR LAND-USE: THE TREE ONE MAN SPARES TODAY, IS CUT DOWN BY ANOTHER MAN TOMORROW. THE PEASANT FEELS THE GROUND DISAPPEAR FROM UNDER HIS FEET (IN HAITI 10 000 T OF TOPSOIL EACH YEAR). SINCE HE HAS NO SECURITY FOR HIS DAILY BREAD, HE NEEDS MONEY. HE LEAVES HOME FOR THE CITY AND JOINS THE TEN-THOUSANDS ALREADY THERE. TOGETHER THEY POSE THE PROBLEM.

AND THEY CANNOT RETURN: THE SOIL IS ERODED, THERE ARE IMPENDING CATHASTROPHIES, NO WOOD AND MOST IMPORTANT NO PLACE IN A DEFLATED AND DESCOURAGED COMMUNITY.

section I
Concept of Habitation...

PREMISE **Process** not Product



INTERNATIONAL COMPETITION
FOR SOLUTIONS ON NEW
TECHNOLOGIES FOR SOCIAL
HOUSING
CINTUS

1

INTRODUCTION

Continuing appalling conditions in less industrialised countries generally and housing in particular, have raised many questions, especially how to solve the problem. National governments have been largely incapable of resolving the problem on a large scale. Thus for most low income workers to whom the housing market is inaccessible, the alternative is to improvise, with their available resources - mainly labour. But can this approach resolve the world's problems in the long term?

This paper addresses the issues on the premise that housing should be seen as a process and not a product. The physical housing object is really an expression of dynamic processes, as well as a base for a multitude of activities peculiar to man's way of life.

It is by understanding the various processes and activities - the 'context' in which the current housing situation has originated and is maintained, that considerable progress can be made by willing governments, institution and agencies in collaboration with people to resolve the world's problems in the long term.

By far the greatest problem today, is the attempt to resolve the housing situation without modifying the 'context' in which it occurs.

Appalling conditions where people live and generate their livelihoods.

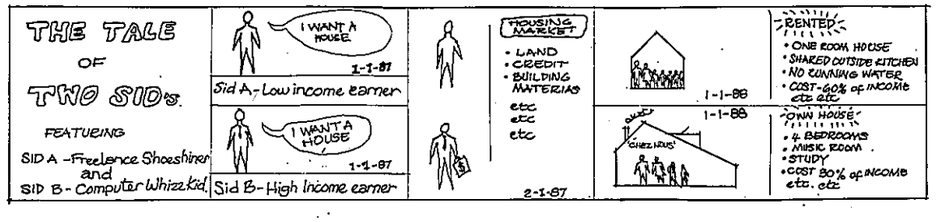
THE HOUSING PROBLEM 'CONTEXT' ANALYSED

Assessment through analysis, as well as awareness through communication are the most significant keys to positive action. However, too often in this area of social reality, effect and symptoms are confused with causes and problem, vital issues are blurred and not addressed by defect or by design.

The essential housing problem is not the slums, shanty towns, poor rural housing etc., (which are 'solutions' to their inhabitants). These are merely the effect or manifestation of a more fundamental problem - the inability of a largely profit-motivated production system to satisfy the needs of a section of society. Obviously, because their housing needs cannot be translated into 'effective demand'.

National Housing 'context' analysed.

The housing production market generally, is beset with basic contradictions, which are more pronounced in less industrialised countries. These contradictions are essentially the private ownership of land and the long period required to realise capital invested in the production of the housing object. These are coupled with the backward nature of most housing production, low income for a significant majority, poor credit facilities, building materials cost and diseconomy of technology. Despite these setbacks the housing production system survives by operating in various spheres such as credit, land, etc., in the profit motivated system, catering for those with effective demand.



The alternative for those without the finance is to satisfy their housing needs outside of the profit-motivated production system. But, they are still faced with a profit-motivated land market which they overcome by renting or illegal occupation as a last resort.

Thus, except there is a significant change in the context in which the profit motivated commercial housing production system operates, there can be no substantial change in the ability of the low income to obtain their housing from that sector.

2

FRAMEWORK FOR ACTION

Policies that only touch the tip of the problem will never achieve substantial results. Policies that will reach the root are what will achieve long term progress.

The new concept of habitation based on realism presents a framework for progress, which is applicable in virtually all 'contexts'.

1. Housing production existing and desired is part of a dynamic process, influenced by local, national and international factors. Many of these factors can be influenced by national governments but others cannot. This 'overwhelming' political/economic/social process has a dynamism of its own fuelled by the conscious and unconscious decisions and actions of individuals, families, communities and nations. Policies, concieved in a vacuum ignoring these processes can at best be a 'hit or miss' game.

2. Houses and their production are part of this process, and because of man's way of life cannot remain just another product - an object for shelter. They are a base for life's activities some of which are essential to the sustainance of life and so will be acquired by all possible means legal or illegal, based on personal, family and community decisions taken within the existing general and particular housing production context.

3. Policies for progress in housing must address not only the limited context of housing production, e.g. building material technology, land, but the general political and economic context. In this general real world context, resources are limited, they need to be economically utilised for maximum benefit and most important decisions have to be made on how to allocate them and whom will benefit. National policies in other areas of this general context, economic and social, such as employment, economic growth, education, etc., should be complimentary with housing policies for short and long term positive progress.

4. Most national governments policies and resultant actions influenced by internal or external factors and decisions are interventions on the dynamic political/economic/social process to enable the achievement of an intended 'goal'. The 'goal' of resolving the housing crisis is achievable with political will, relevant policy, implementary tools-organisation, feedback, etc., and the involvement of the people - used to create a 'context for enablement'.

5. Awareness of the relevant strategy policies and programme required for each national context will come not from appropriate analysis alone but from communication with the people. Government institutions and other implementary bodies, need to acknowledge and develop the existing networks and survival strategies of the various low income communities who operate largely outside the commercial and formal profit motivated production system. This can be done by moving closer to the people in a two way learning process.

6. Human resource is the greatest asset of less industrialised countries. Full allowance must be made for its maximum utilisation in strategy, policies and programmes.

ACTION FOR PROGRESS

It is essential to be continually aware that all actions are taken to directly or indirectly contribute towards achieving a 'context of enablement' for housing production and maintenance. The 7 areas of action outlined below are by no means conclusive. They are merely areas identified which may not be relevant in all the various national context. They need to be constantly reviewed for their continuing relevance.

1. POLITICAL - Genuine political will and commitment, not just rhetoric goes a long way, as it is the basis for achieving major institutional change.

2. LEGAL - Changes in the law, based to a large extent on social justice can affect the nature of land tenure, land cost and invariably access to land.

3. ECONOMIC - Higher family incomes through more general economic policies are most desirable in the long term. Ways to raise finance for housing credit need to be devised such as no taxes and preferential interest rates. Available credit should be administered flexibly to cater for those who desire variable repayments. Incentives to the private sector national and international need to be made as well as the formation of housing co-operatives. Traditional means of credit generation by the low income should be developed.

4. ADMINISTRATION AND ORGANISATION - Existing government institutions will need to be adapted to operate within the new concept. Analysis may reveal that new agencies and bodies are required, which can effectively co-ordinate policies, programmes and methods, keeping them flexible, responsive to change and feedback. An indirect action that can be swiftly implemented is the inclusion in all government policy, planning and programme documents and reports a section for 'housing enablement' implication. Methods adopted for implementing must leave scope for personal preferences and choice.

5. COMMUNITY IDENTIFICATION - This raises the issue of top-down or bottom-up community mobilization. There is usually a tradition of community organisation in less industrialised countries, but it is most important to note that it is organisation for achievement. Many of the low income work long hours and cannot or will not spend time participating in a programme that might not succeed. Success and not promises are essential. The existing networks, vertical and horizontal can be mobilized when required. It is helpful for the community to elect or propose their preferred technical guidance. The rural community and a growing number of middle income should not be ignored.

6. APPROPRIATE TECHNOLOGY AND RESEARCH - A large amount of relevant research is being carried out world wide. Unnecessary duplication can be avoided. The compilation of a comprehensive international directory, regularly updated is long overdue. To ensure the benefits accrue to all most likely to benefit, the information should be easily retrieved and widely dispersed. There are various powerful communication mediums and presentation should be appropriate to the 'targeted' groups with economic benefits if any emphasized.

7. BUILDING AND PLANNING REGULATIONS - Regulations and standards often create a legal obstacle to a large number of the low income. Their rational is essentially to act as a means to an end - which is to improve life socially, culturally (e.g. zoning, density) and scientifically (health and safety). They become a problem when they become an end in themselves, the original rational forgotten and are irrelevant or unachievable by a large section of the population. They need to be reviewed and revised in the various national context. Aspects like distance from roads in the context of future road widening improvements and height from ground to avoid flooding are acceptable. Regular review is necessary.

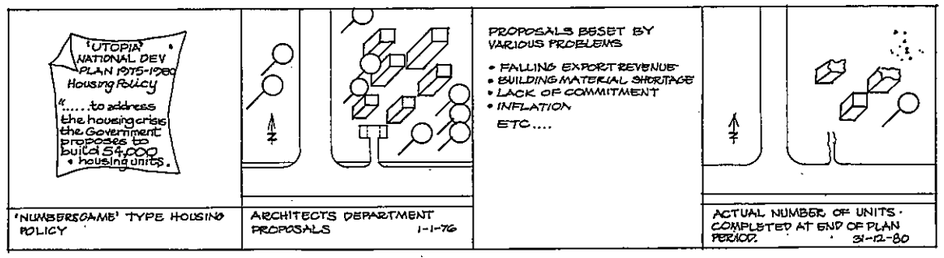
Notes

1. The author acknowledges the influence of Otto Koenigsberger.
2. The phenomenon of 'Institutional Surplus' is entirely originated by the author, developed in an unpublished paper.

TRADITIONAL CONCEPTS AND RELATED POLICIES

Shanty towns and slums were once seen as a temporary phenomenon which will 'disappear' when their inhabitants mostly migrants, no longer marginalised themselves, adapting to the urban way of life. Yet another school of thought saw the housing problem as a product of under-development/low industrialisation, difficult to resolve without increased development and so a hopeless situation. Policy - to await 'development'.

Traditionally, housing has been viewed by the institutions responsible for policy as merely a product. Thus the housing 'problem' has been treated as a 'numbers game', with the compilation of housing deficit figures and policies were to produce X number of units within certain periods.



These proposed units as well as those existing and acknowledged as so in the 'numbers game' where built to the acceptable standard. Anything below this standard was really unacceptable, usually a slum, or shanty town and had to be demolished and properly redeveloped, (the rural counterparts out of sight were rarely affected). This was the 'slum clearance' era, sadly still occurring in some places.

It had one advantage, it produced new housing, but, the disadvantages outweighed this. It destroyed communities, livelihoods and made more people homeless. The new housing proclaimed for the low income inevitably were allocated to the middle income.

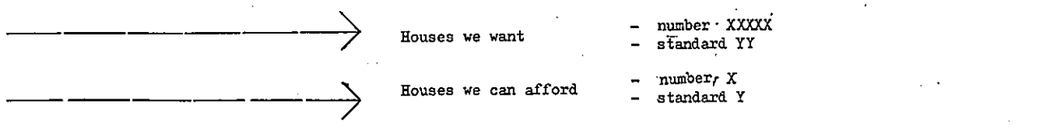
The 'turnkey' policy of house building not always connected with slum clearance resulted in sometimes peculiar outcomes such as the phenomenon of 'institutional surplus' - where in situations of housing shortages government produced housing were difficult or impossible to let. This highlights the mismatch between problem identification, policy intentions, programs implemented, target groups and often access rules.

Outcry from displaced communities, academics and special loans from foreign institutions as well as the realisation that only limited houses could be produced with available resources facilitated and reinforced the next era of slum upgrading as well as site and services. By producing less than the whole housing object, more could be achieved for less or similar outlay.

This was proclaimed by governments and some academicians as the way forward and the long awaited solution. But over 15 years later the situation is still the same. The upgraded slums brought in a higher income group as rents increased and the credit requirement, building standard required, high cost of materials used in demonstration and preferred dwellings etc., removed a significant number of low income from the sphere of competition for these programmes. More important, the actual provision could not satisfy demand.

Obviously, the two major areas of policy have not been the successes envisaged as they did not substantially deal with the fundamental problem. In fact they were not evolved to change the 'real' context, they were simply meant to eradicate the effects.

The fundamental question here is whether the houses we (planners, policy makers, architects, etc.) want are the same as the houses we can afford. As long as they remain on different planes it's the old story of parallel lines ..... 'continuously equidistant.'



NEW CONCEPT AND EVOLVING POLICIES

The new concept of housing acknowledges the 'context' of housing. It strives to recognise the various factors - the dynamic processes involved in housing production and maintenance. It is based on realism. National governments are unable to resolve the housing situation by producing housing complete, half complete or otherwise. In fact the majority of the houses for the low income is produced by the people themselves. Either by self build or by organising their relevant resources to achieve this.

The context in which the low income achieve their housing is often outside of the established profit-motivated system and they achieve better value from their limited resource, deciding how to utilise it within the existing context. But this could be improved upon, especially in the areas of health and sanitation, legality of tenure of land, ease of credit facility, economy of building materials, relevant appropriate technology, etc. The context can be altered to achieve an increase in the real value of the existing low income in the short as well as long term.

Many national governments in the less industrialised countries are beginning to alter their site and services policies and programmes to provide site only initially, reducing costs and increasing to an extent access to land. However modifying policies based on the traditional concept of habitation can only go a little way towards resolving the problem. What is required is a new and comprehensive approach to policy formation based on the new concept of habitation, to modify the context and 'oil the wheels' of the production process.

INTERNATIONAL COMPETITION FOR SOLUTIONS ON
NEW TECHNOLOGY FOR SOCIAL HOUSING

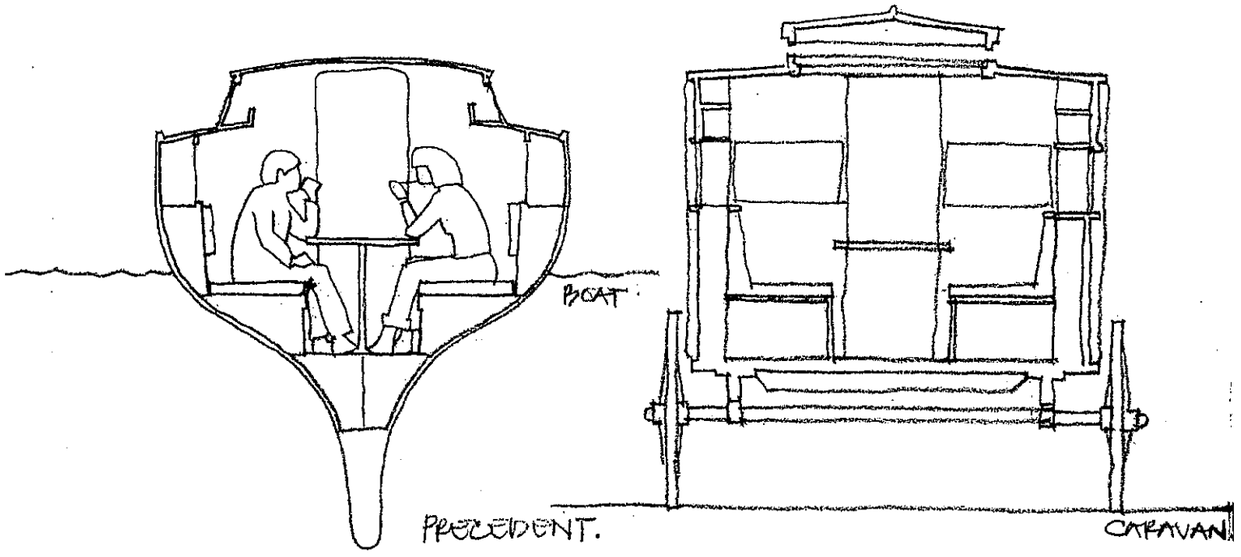
The submissions made under Section 1

The concept of habitation which is to be explored is we believe an area which has at the present time no legal definition. It is that area of housing which is to provide accommodation for the homeless prior to their being able to establish a permanent residence in housing provided either by the private or public sectors either for purchase or rent.

The group of people who are in need of this housing vary in their needs. The group in the study are those that in the developed world face homelessness through problems of location, unemployment or social circumstances that cause them to be unable to enjoy the comfort andprotection of their families and other supporting groups.

It is an interesting paradox that the problems of such homeless people are very often found in the very centre of which could be regarded as modern civilisation.

The people involved either young or old can find themselves trapped without family means or money in cities throughout the world. Many will have moved in the hope of finding employment and happiness. The concept of Dick Whittington or the Midnight Cowboy are two examples in a well recognised, all too real fictional depiction.

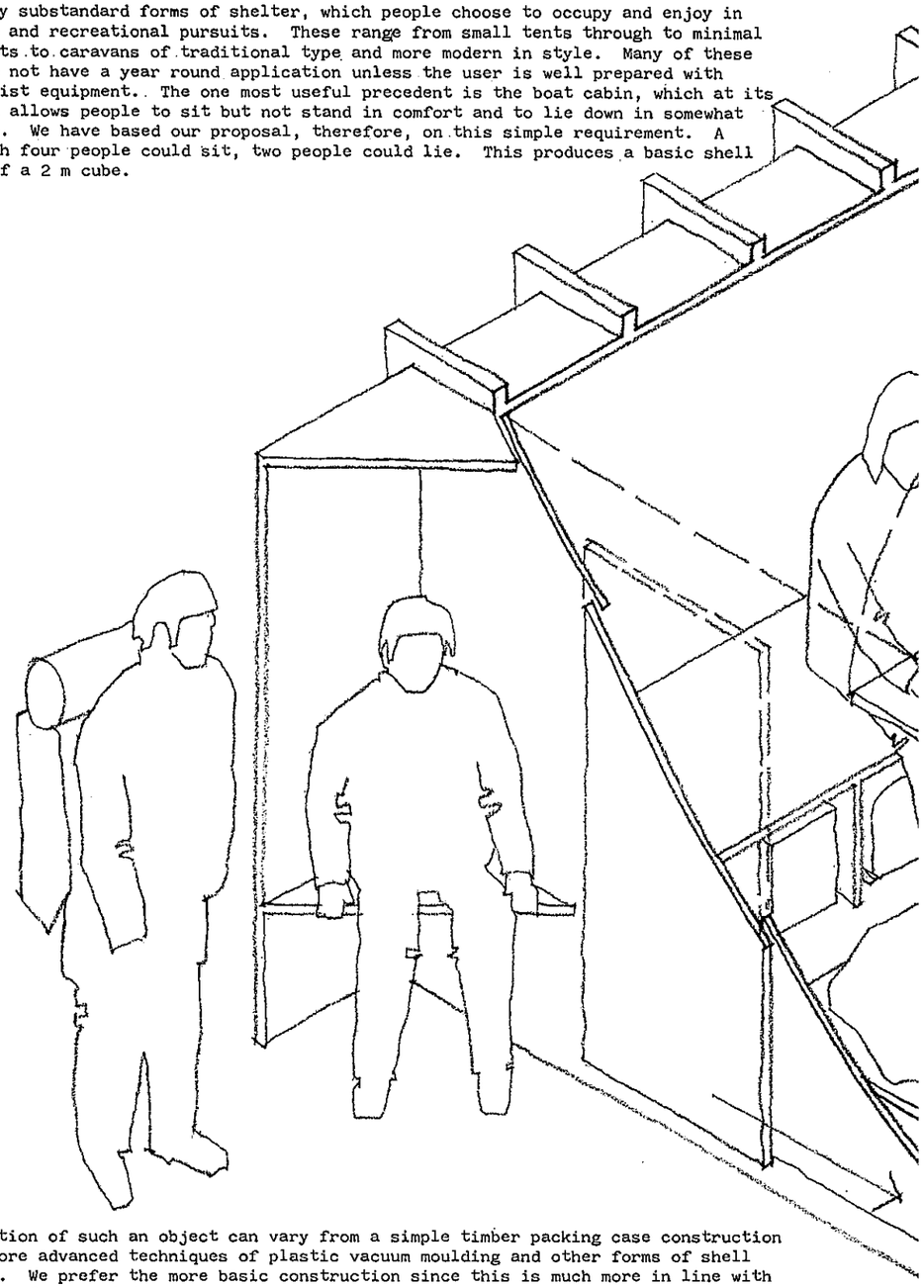


The traditional solution to their problems is sleeping in the open air under a minimal shelter of a railway arch, subway or disused building. Small communities develop in such places on a self-governing basis controlled at a distance by the standard forms of law and order, welfare and charities. It is this group for which we now design.

The group is initially transient and without some encouragement and basic support may drift in an ever downward spiral into a long term social problem. It has lead in other places to the creation of shanty towns. The solution proposed is not, therefore, a permanent one but the first step on the very bottom of the ladder on providing both the social and economic needs whilst giving an incentive to find a more permanent and lasting solution within the existing fabric of permanent housing.

The proposal is for a type of housing which must always be regarded as substandard but provides a basic shelter within which the individual can maintain the most precious asset of any man, self-respect. We are therefore proposing a place to sit and talk and to lie down to sleep. This place must be compact and mobile and can be placed quickly in any location where needs arise. The unit must be cheap to produce, tough but also disposable. It must not be too comfortable and yet must preserve a basic quality of life.

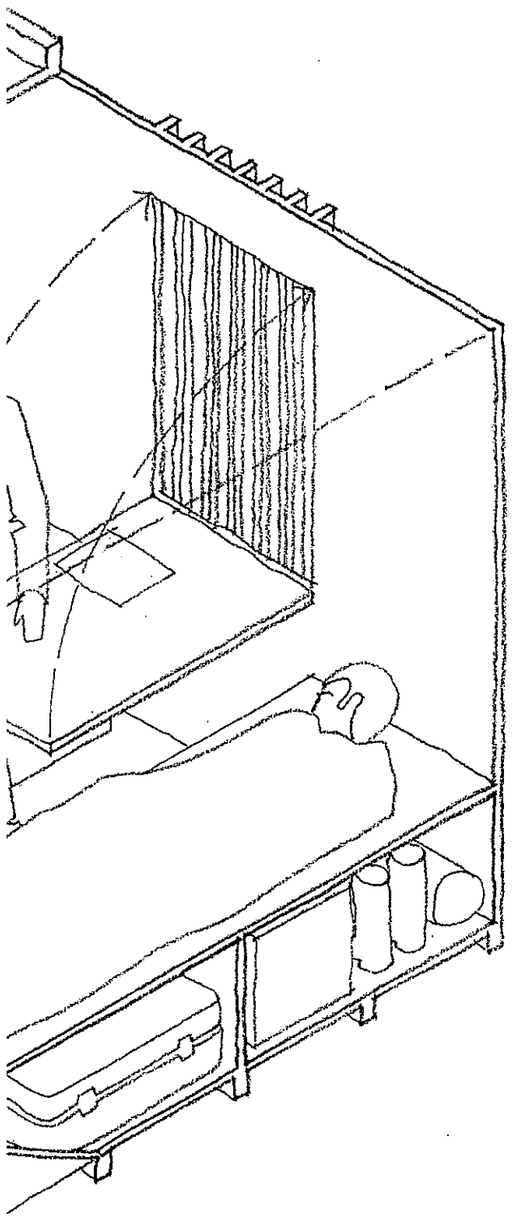
There are many substandard forms of shelter, which people choose to occupy and enjoy in their leisure and recreational pursuits. These range from small tents through to minimal cabins on boats to caravans of traditional type and more modern in style. Many of these precedents do not have a year round application unless the user is well prepared with other specialist equipment. The one most useful precedent is the boat cabin, which at its minimal level allows people to sit but not stand in comfort and to lie down in somewhat cramped style. We have based our proposal, therefore, on this simple requirement. A space in which four people could sit, two people could lie. This produces a basic shell in the form of a 2 m cube.



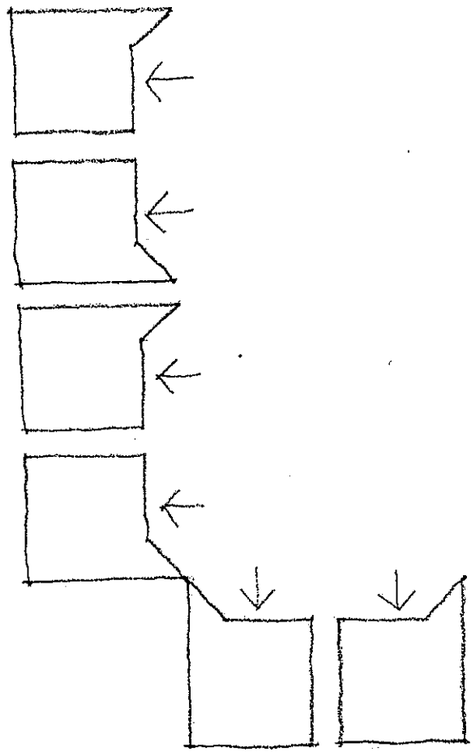
The construction of such an object can vary from a simple timber packing case construction through to more advanced techniques of plastic vacuum moulding and other forms of shell construction. We prefer the more basic construction since this is much more in line with other aspects of use and development.

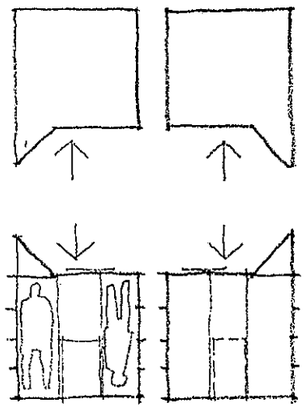
In addition to the basic requirements of sitting and lying there should be some ability to store possessions in a reasonable way since we envisage many of the occupiers may have a limited amount of clothing and other possessions, which are essential to enable them to present themselves to society in gaining employment and being convincing in recovery from their distress.

We envisage that the location of the units proposed could be anywhere where basic shelter is provided, beneath bridges, undercrofts of public buildings, derelict industrial buildings and many other places of basic shelter. It is not proposed to provide servicing of any kind to the units. Their size and insulating qualities should enable heat from two human beings to maintain a survival temperature.



THE BASIC UNIT.





LAYOUT.

Sanitary accommodation and provision of food would be provided within public systems or if a small community grows up, by the use of portable equipment. Our investigations show that in most places of basic shelter, drainage and water supply is found close by.

In providing this accommodation for those in dire need, one must also look ahead to their potential recovery and success and we have, therefore, developed a number of scenarios that might be applied to occupiers.

The first of these is the example of a person who has maintained a level of self-respect and presentation by being housed in this way and has found employment in a traditional form. Over a period of time such a person should be able to use this basis to find more permanent accommodation in a hostel or traditional lodgings. It is the ability to buy time and maintain self-respect that we seek in this solution.

The second scenario might be a traditional form of self-help starting with a small business repairing bicycles, making simple objects or other forms of servicing. Such an activity might require space and shelter, which could be found within a disused building or by the simple addition of some level of shelter adjacent to the basic housing unit. The development of such accommodation will again enhance self-respect and be a springboard to a more permanent style of life.

What are the pitfalls for this provision, how is it financed and how is it controlled? What is the long term future?

We envisage that these units would be financed by sponsorship within the normal commercial network of our society. We believe that many firms throughout the developed world would sponsor a pilot scheme and maintain its continuity.

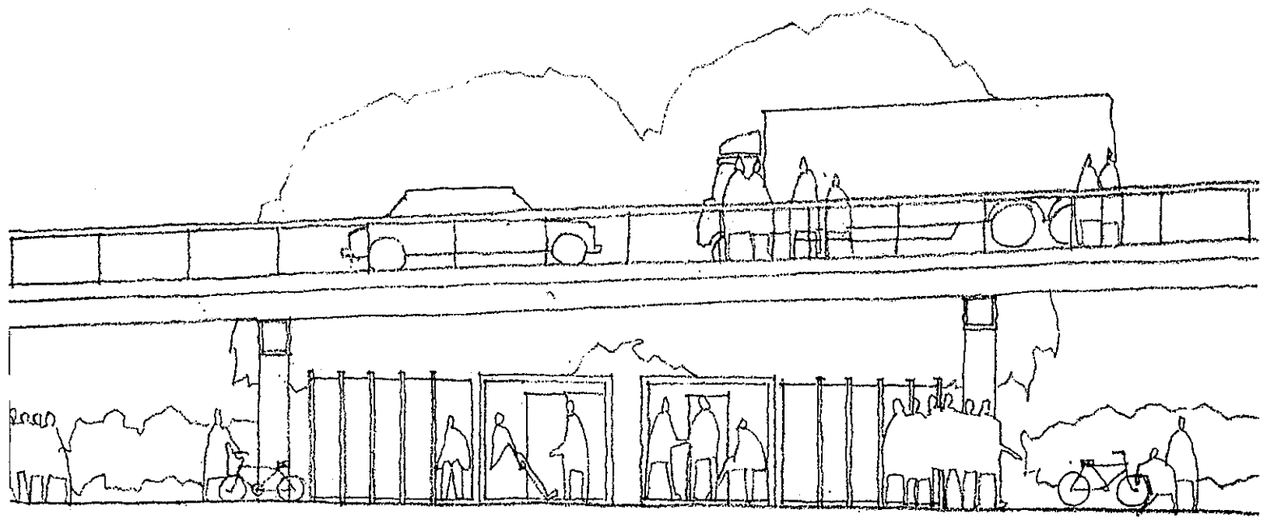
We do not believe that there is any need for control by any new agency or an existing housing agency since the proposals is to do no more than maintain people in an established state, prior to being involved in permanent housing. We, therefore, believe that the fprces of law and order and the welfare and charitable bodies that currently concern themselves with this area of need would continue their activities but with the asset of an improved form of shelter.

It is essential that communities that develop should be self-governing and deal with any misdeameanours by peer group decisions, which may result in explusion of any person that breaks the basic rules of life, such as theft, damage or injury. This basic social control is very strong.

We, therefore, feel that risks in use are low but risks of misuse by governments could be high and that if success is maintained, the pressure to solve the long term problems may be disguised.

The social acceptability of the idea and the communities that may follow are of some concern. However, the social attack on such groups as gypsies would be less likely since the groups that we are attempting to help already exist in similar locations whereas travelling gypsies apply their problems usually to areas in the countryside where social acceptability has a very different face. In any case, the gypsy is not seeking a stepping stone to a permanent residence but merely a location to maintain his present lifestyle and method of commercial support.

We believe that the provision of this basic form of shelter will do much to eleviate problems of acceptability in existing locations.



APPLICATION

COMPETITOR 328

31031035

30426365

SECTOR I

UNA CASA PARA LAS PERSONAS SIN HOGAR

El modo de vivir de hoy se debe a las increíbles oportunidades que nos brindan la ciencia y la técnica.

Olvidando una experiencia acumulada durante muchos años de historia, el hombre moderno parece que se conforma con satisfacer sus exigencias prácticas: aparcamientos, almacenes, supermercados, grandes edificios residenciales que agotan en sí mismos su finalidad de "contenedores", todo sumergido en el ruido y en el olor del tráfico automovilistico.

Los más optimistas opinan que se puede conseguir un resultado más satisfactorio mediante la estética y una cuidada organización. Se alcazaron exitos positivos, pero a costa de tal despilfarro de energías y recursos económicos que es impensable ofrecer soluciones de este tipo a quienes aún no poseen su propia casa.

*

Segun nuestro parecer hay que plantearse el problema con una perspectiva más amplia y de una manera indirecta: trabajando en el plan de la temática arquitectónica y urbanistica en general se puede abrigar la esperanza de resolver también un problema práctico.

Esta propuesta pretende ser un medio adecuado para restablecer esa "vida de relación" entre los hombres que hoy día queda reducida a "comunicación de masas": persiguiendo este objetivo esperamos ayudar a las "Personas sin Hogar".

UNA PERSPECTIVA COMUN

Puesto que las reflexiones que siguen pueden interesar a los diferentes tipos de sociedad, de economías y de áreas geográficas, el punto de partida de esta investigación es el reconocimiento de los derechos elementales del individuo, sin distinguir, a nivel concentual, entre el rico y el pobre, entre quien ha recibido formación cultural y quien carece de ella. También el punto de llegada prescindirá de estas distinciones, así como se hizo para la cama o la silla o la mesa.

Este criterio es fundamental para la autenticidad de una propuesta que tiene como fin el dar casa a quien no la tiene: de no ser así este viviría su "diversidad" como una injusticia, por tener un tipo de casa sí especial ..... pero sólo para los pobres!

Además, el que un sistema constructivo afecte a todos los ámbitos sociales es motivo suficiente para inducir a la investigación y a la experimentación práctica, pero sobre todo a favorec

*

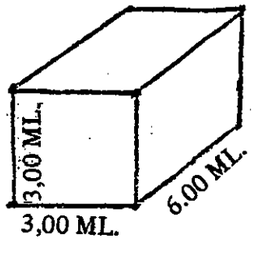
Este ensayo, que en su parte ilustrativa para una nueva tecnologia (SECTOR III) ofrece eyemplos que se ajustan a sociedades ricas y otros que tienen vigencia para sociedades sin muchos recursos, se desarrolla en tres niveles distintos: individual, colectivo y social.

LO INDIVIDUAL

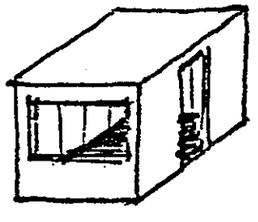
Si una persona quiere sentirse libre de los angustiosos condicionamientos que le produce el no tener su propia casa, su máxima aspiración se podrá satisfácer realísticamente sólo pensando en un espacio vital, es decir en el espacio mínimo para sobrevivir.

Desde un punto de vista dimensional este espacio habitable mínimo se define en el dibujo que sigue; el cuerpo geométrico se realiza y adquiere forma como una caja equipada con servicios, instalaciones, complementos, puertas y ventanas.

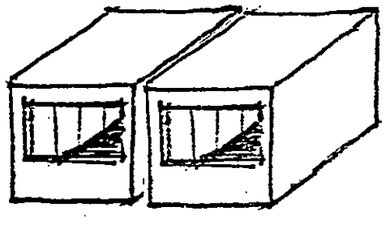
DIBUJO DIMENSIONAL DEL ESPACIO HABITABLE MINIMO



EL PARALELEPIPEDO REALIZADO
EL PAR. . . . . DO = PARDO



PARDAS UNIDAS

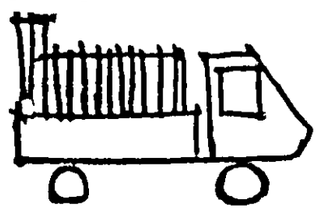


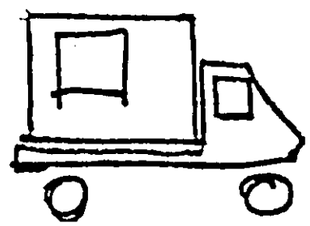
Para que el derecho a la casa se pueda ejercer efectivamente, es necesario cumplir con dos condiciones fundamentales:

A- EL COSTE DEL PARDO DEBE SER ACCESIBLE A CUALQUIERA, por lo tanto tendrá que ser:
- 1°- espacialmente reducido;
- 2°- proyectado con cualquier tipo de material presente "en el sitio": cartón, mimbre, tela, madera, plástico, cemento, hierro, vidrio, aluminio, acero inoxidable, aleaciones, combinaciones;
- 3°- transportado entero o en piezas para ensamblar;
- 4°- producido con o sin complementos;
- 5°- prefabricado industrialmente y con costes de gran serie;
- 6°- realizado por artesanos con costes variables;
- 7°- perfeccionado artísticamente con costes elevados.

B- EL PARDO DEBE PODER SEGUIR A SU PROPIETARIO, por lo tanto tendrá que:
- 8°- tener una estructura modular para permitir la unión con otras pardas;
- 9°- transportar estáticamente sólo a sí mismo para no tener vínculos y poder ser transladado de un sitio a otro.

El dibujo que sigue esquematiza las dos condiciones A y B.





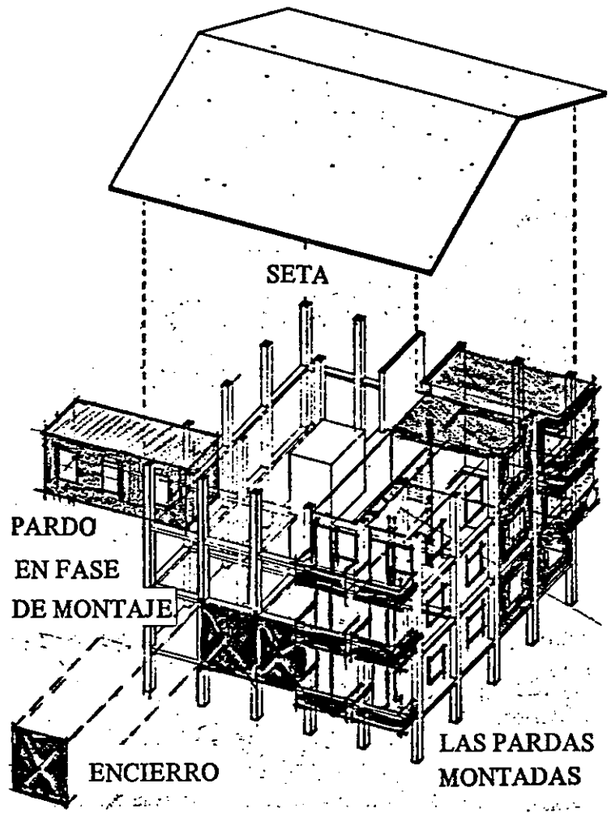
LO COLECTIVO

El pardo es libre pero no autosuficiente. Como una barca necesita el puerto que abandona tan sólo para trasladarse a otro sitio, así el pardo necesita una estructura adecuada que lo cobije y que él también abandona sólo para trasladarse de lugar.

Esta estructura es la SETA, estructura tridimensional de ensamblaje. Se realiza con materiales duraderos como la madera, el hormigón, el hierro, las aleaciones o el aluminio, puede ser autoconstruída, desmontable y transladable, permite la conexión de los servicios tecnológicos de las pardas y los abriga de la intemperie.

Sus características fundamentales son:
1°- permitir la formación de organismos complejos constituídos por más pardas unidas;
2°- permitir la evolución de estos organismos mediante su reducción o su expansión, la división o la parcial sustitución.

El dibujo al lado esquematiza un ejemplo de SETA.



LO SOCIAL

La fase más delicada en el desarrollo de dicho sistema es el paso del nivel colectivo al social, es decir del nivel "contenedor", edificio de las "cosas", al de edificio de las "personas", dos grados de "calidad de la vida" profundamente distintos.

Este paso se hace posible limitando la utilización de la tecnología paralelepípeda a las porciones o partes de edificio que se presentan como las "invariantes arquitectónica" del mismo. En una casa unifamiliar son invariantes los dormitorios, la cocina y los servicios; en un hotel las habitaciones y los servicios; en una escuela las aulas y las oficinas. Dicho de otro modo las invariantes arquitectónicas son esos ambientes que pueden ser repetitivos, estandarizados y por lo tanto "pardizados".

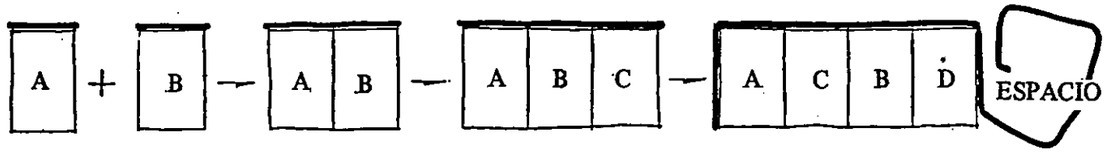
Agregadas de varios modos a la SETA, las "pardas" llegan a constituir unos "conjuntos" que hay que sensibilizar y orientar, disponer alrededor de algo o cerca de algo, o encima, debajo, al lado, enfrente de una referencia cultural, identificado simbólicamente come un ESPACIO arquitectónico o urbanístico o naturalístico, lo que no es invariante arquitectónica.

El organismo así constituido por SETA más PARDAS más ESPACIO se llama el PUERTO de las pardas.

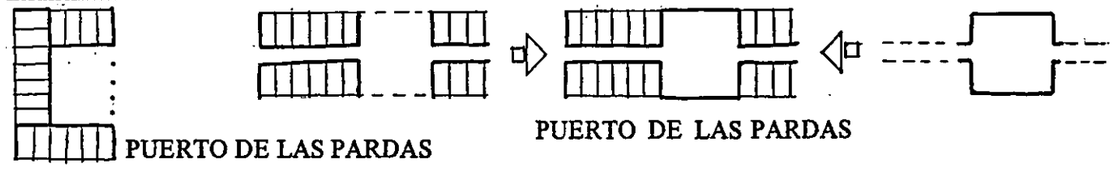
Combinaciones elementales de puertos se ilustran en los esquemas que siguen:

Dentro de la problemática de la vivienda, el estar aparcado en un puerto le da al pardo la orientación deseada (también por su propietario) y ese "sentido de las cosas" que el hombre moderno busca ansiosamente. Perdiendo su estaticidad la casa sigue la evolución de la vida y entra en la historia: el ESPACIO es el medio a través del que surge la vida de relación entre las personas.

El esquema que sigue ilustra las etapas por las que pasa una casa unifamiliar, desde las primeras fases hasta la madurez de puerto de las pardas: el "espacio", en este caso, se identifica con el cuarto de estar.



El esquema que sigue se refiere a una casa multifamiliar: en el ESPACIO se encuentran los servicios colectivos, lavandería, servicio de plancha, cocina y comedor comun para quien lo desee, guardería infantil.....



Cuando el ESPACIO falta temporalmente, los servicios colectivos pueden ser provisionalmente sustituídos por pardas especializadas: p. cocina, p. lavandería, p. primeros auxilios, p. biblioteca, p. capilla.....

*

También el puerto de las pardas, sin embargo, no es autosuficiente.

Necesita integrarse en una estructura de orden superior que le permite entrar en contacto con otros puertos..... con los que irá constituyendo más "conjuntos" que hay que sensibilizar y orientar, disponer....

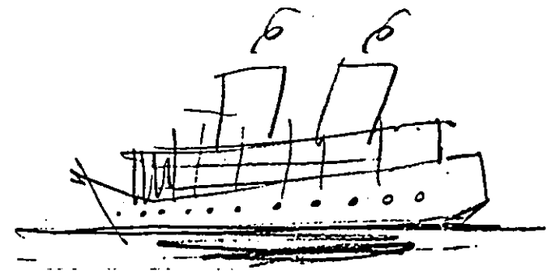
CONCLUSIONES

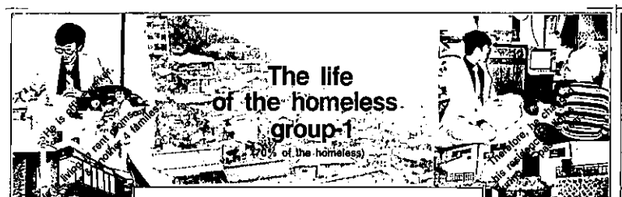
La filosofía de la vivienda se va profundamente modificada y su estrategia tendrá que variar "según los lugares y las condiciones": de todas maneras el interés por la propiedad o la ocupación del suelo para la construcción de la casa queda sustituído por el interés por el PUERTO DE LAS PARDAS como lugar ideal y deseado para permanecer con la propia casa.

Los puertos, montados por la colectividad, ayudan a reanudar la vida de relación, libran al ciudadano del terror de quedarse sin casa porque se le da la oportunidad de creársela poco a poco según sus posibilidades económicas, le libran por fin del miedo a quedarse para siempre en un lugar determinado no grato a su físico o a su espíritu.

La colectividad puede garantizar a cada niño que nace su pardo.

A la vejez un ocaso deslumbrante: el barco como puerto de las pardas.





This Project is Not for TOMMORROW But for TODAY

goal

We are faced with serious housing problem today. We seek a feasible & practical solution rather than ideal solution for tommorow, within the government financial difficulty.

DICESION MAKING PROCESS

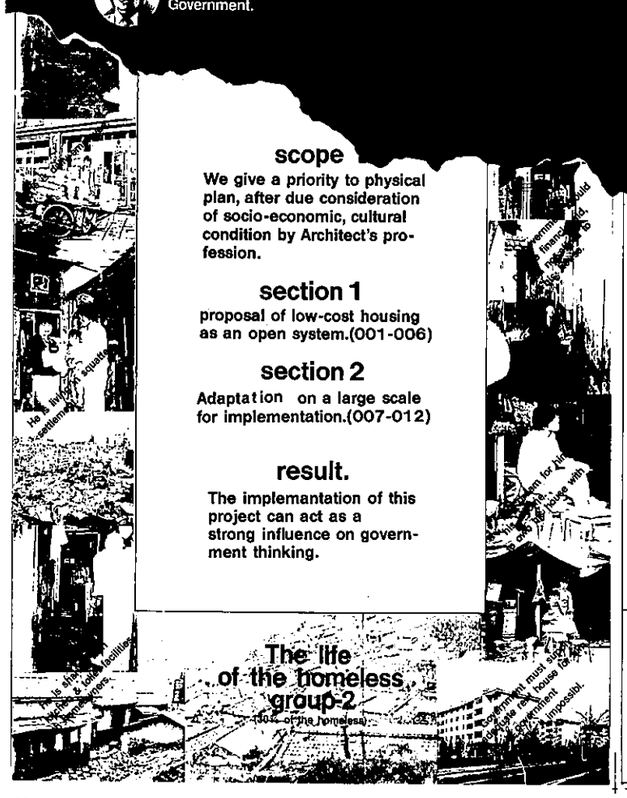
Architect

The homeless Group-1
70% of the homeless. He is office-worker. After 20 years, he can afford to obtain his own house with his income.

The homeless Group-2
30% of the homeless. He is daily employee. To obtain his own house is dream.

Developer
K.H.C.C (Korean National Housing Corporation)

Government.



scope

We give a priority to physical plan, after due consideration of socio-economic, cultural condition by Architect's profession.

section 1

proposal of low-cost housing as an open system.(001-006)

section 2

Adaptation on a large scale for implementation.(007-012)

result.

The implementation of this project can act as a strong influence on government thinking.

001
THE HOUSING PROBLEM IN TODAY

Who is homeless?
Classification of the homeless

Group 1
70% of the homeless.
Most of these family are office worker.
They live in rent rooms sharing the space of dwelling unit with homeowners and another family; They are able to obtain their own house with saving of 18% income for 20 years.

Group 2
30% of the homeless.
Most of these family are poor living in squatter settlement with daily employment. They can not afford to obtain their own house even with savings of 8% income for 20 years.

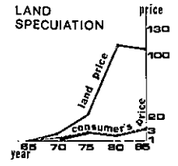
Serious Housing Shortage. Rapid urbanization.

During the past 20 years Korea has been rapidly changed in various fields – rapid urbanization, industrialization, economic development and collapse of traditional familily system. For example, Seoul – the capital city of Korea – has grown one of the largest city in the world with 10 million population, occupying 50% of national wealth.
In spite of rapid development, Seoul has a serious housing shortage. That is, within 607 km² of acrage 1,836 million households shared 994 thousand dwelling unit in 1985.
This means that adequate dwellings for 842 thousand households (46%) in Seoul are not provided.
Therefore, the most of the homeless are living in rent rooms sharing kitchen and toilet with homeowners.

In Our country the 46% of urban people is the homeless. Therefore most of them live in rent rooms sharing the space with homeowners. And because of land speculation in 1970's, the housing price increased rapidly. For the homeless to own his house with his income is dream.

Unique rental system in Korea.

Room rent is the unique rental system in Korea. Most of the homeless – the renter have money on deposit as much as 30-50% of market value of the dwelling unit at the time of occupancy for 1 year.
The deposit is refundable in full as the rent contract expires, and the deposit is most often upwardly adjusted whenever the rent contract is renewed.



Problem of existing law.

So the rental occupants are little protected under the existing law and regulations.
; rents are always subject to being raised at homeowner's direction.

High price of housing.

The increase of housing price caused by land speculation in 70', is 10 times over as fast as increase of the consumer's price. In this regard, it is next to impossible for the homeless to obtain his own house.
In order to purchase his own house, the homeless must save for 36 years.

EXISITING CONCEPT

Housing Policy has been led by government & Without participation of Architect & User.

1, PROBLEM DEFINITION
Problem of housing shortage: 46%

Existing squatter settlement

Seoul is the capital city of Korea with concentration of 30% of nation-wide population and 50% of national wealth.
As of 1985, there were 160,806 dwelling unit of sequatter housing in Seoul.
This mean that approximately17% of the housing stocks in Seoul is squatter settlement.

Site Selection criteria.

For encouraging the application of proto-typical housing type, we select a certain area with following criteria.
– A depressed area in Metropolitan.
– A site which has impending demands of society, government and inhabitant for improvement.
– A site that is expected maximum implementation effect within the government's financial difficulty & a limit of user's affordability.

For encouraging the application of new housing type, we select a certain area with following criteria. epressed area in urban with a urgent demands for improvement. As an pilot project, the area that will be expected maximum implementation impact. So, user needs in housing market is highly considered in selecting a site.

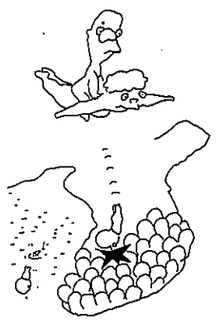
THE SITE SELECTION CRITERIA, 007

What is good housing site?
Housing market analysis-2 (user requirement)

In our country people evaluate the housing environment as following criteria.
• A site which has good surroundings.
• A site which has a good transportation from C.B.D.
• A site which has a good high-school in the neighbourhood.
This is unique situation in Korea. Because most of people has deep interest in their children's education.

002
THE ORIGIN OF PROBLEM

What can government do?
Present housing policy
• The present housing policy is mass supply of low-cost housing for homeless.
But because of government financial difficulties, government can not even fulfill a deficient housing demand by natural increase of population.
Therefore, housing shortage has continued to be part of the homeless' problem.
So, only a little part of the government planned housing & financial aids.



Collapse of traditional family system

Because of evolution of nuclear family caused by collapse of traditional family system, housing demand rapidly increased.
On the other side, existing government planned housing is suitable to live only one family in one unit.
So government recently changes housing policy – the development of new housing type adaptable to traditional family system.

These housing problem is caused by shortage & high price of land, collapse of traditional family system-rapid increase of housing demands, lack of government finance and a limit of the homeless's affordability. The answer is mass supply of decent & low-cost housing for the homeless.

Lack of land resource.

The population density of Korea is the 2nd highest in the world. 1,374 person-/km²) Furthermore 70% of national land is mountainous terrain. So the lack of buildable and for housing is serious.

High price of land.

And because of rapid increase of land price caused by speculation, at present, land price occupies 50-70% of housing price.
Therefore efficient use of land resource is highly considered in order to solve housing problem.

Limit of government's financing & user's affordability

In the process of solving the housing problem, the major constraints is government's financial difficulty & limit of the homeless's affordability.
But these constraints can not be risen immediately as same as other developing country.

VARIOUS NEEDS

therefore, housing problem is difficult to solve.
Government: Mass housing supply within the limit of finance.
Developer: Economic benefit.
The homeless: Decent & low-cost housing.

2, NEEDS AND GOAL
Mass supply of decent & low-cost housing

THE OPPORTUNITY & PROBLEM 008

Potentiality of Jamsil.

Jamsil has a many potentiality for improvement as follow.
– Interesing requirement of existing inhabitants for improvement.
– Government's requirement for improvement in relation to 88 Seoul Olympic game.
– Maximum economic effect by high density development because existing density of Jamsil is low.
– After improvement this site is evaluated as the best housing area because of good surroundings.

Selected area. Jamsil is low density depressed area adjacent to 88 Seoul Olympic complex & sub center in Metropolitan area. This site is expected economic effect by high density development. Furthermore, there are active demands for improvement by inhabitants & goverment in relation to 88 Olympic game.

Problem of Jam Sil.

Jamsil is a depressed area located adjacent to 88 Olympic Complex & Sub center in Metropolitan Seoul.
But as compared with surroundings, the housing condition of Jamsil is deteriorated, because of cheap construction of minimum housing.
So Jamsil have a harmful influence on surroundings by intercollison.

History of site area
Resettlement area for the scattered people.
In early 70' Jam-sil was developed by government as a resettlement area for the scattered people.
On the contrary of rapid development of surroundings, Jamsil is still deteriorated.
Because most government planned housing is composed of minimum housing by cheap construction-can't meet the future needs.

THE OPPORTUNITY & PROBLEM 008

003
THE PROBLEM SOLVING APPROACH

What is good housing?
Housing market analysis (user-requirement)
• Sunlight condition. In Korea, the south-oriented housing is highly valued traditionally, in housing market.
Because most of apartment price & quality is controlled by government. Therefore the same condition of housing system. • Less expense for purchase.
The most of apartment price & quality is controlled with less public consideration. Because most of the housing type changable price ≤5,000 according to the housing type).

1 F.A.R: Floor Area Ratio F.A.R: 70%

Existing low-density housing type.
The most of homeless family live in these housing type that is in-effective in land use.

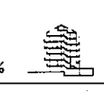
2 160%

Existing single-loaded high rise Apt.
Existing single-loaded high-rise Apt. occupies 70% of housing developed during the past 15 years. As compared with 6 times increase of hight, increase of density is only twice.

3 320%

Limit of double-loaded high rise Apt.
As compared with existing single-loaded high-rise Apt. Double-loaded Apt is highly effective – 200% – "increase" of density.
But it is impossible to persuade user to live in a north-oriented housing.

4 250%



Proposal: Skip-floor type
Double-loaded Apt by skip floor is effective in land use (150% increase of density more than existing single-loaded Apt.)
And all dwelling unit is south oriented so this type meet the basic requirement of user.

5

Problem of existing parallel block plan.
Existing parallel block plan that occupies 80% of high-rise Apt. is not only effective in land use but also inhumane.

6 280%

Improvement of existing block plan.
By mixing a high-rise & low-rise skip floor housing type, good sun-light condition, good visual environment is expected.

The population density of Korea is the second highest in the whole world. Under the present conditions that land price share 50-70% of housing price, efficent use of land resource-development of high density housing type is directly connected with realization of low-cost housing that meets user's basic requirement.

WHAT CAN ARCHITECT DO?

Seek solution under the condition of government's financial difficulty & limited resources.

3, DESIGN CRITERIA.
Efficient use of land resource.

THE DEVELOPMENT STRATEGY 009

1

Existing inhabitants provide their own land.
Being concerned with political issus in 70', government authorized properietary right of land to illegal squatters. Existing inhabitants of project area provide land to Korea National Housing Corporation.

2

Architect's proposal: High density type housing.
Architect propose high density housing type & site design method, because this proposal can adapt to increase of family income & size. So regardation caused by minimum housing will be prevented.

3

Utilization of Economic effect for the homeless.
Government-K.H.C.C. will develope existing squatter settlement into decent & high density housing-environment. Economic benefit result from increase of density will be used for the homeless.

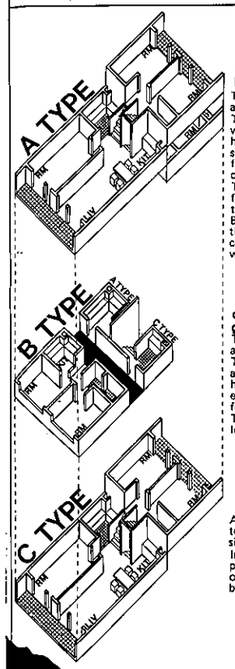
4

Development by government.
Existing inhabitants will obtain a decent & new housing without additional expense. To the homeless, government will supply a house for installment sale or rent house with financial aids.

Because the lack of buildable land is serious in Korea, existing squatters provide their own land to government-K.H.C.C for high density development, instead, they will obtain a decent & new housing without additional expense. The remainder houses caused by increasing density is supplied for the homeless.

Failure of government policy.
The Change of policy to squatter settlement.
1971: Resettlement out of urban area.
The scattered ge back to ur ban for job opportunity.
By cheap construction, the housing is deteriorated.
1975: removal & readjustment
1978: Authorizing ownership of land.
The ownership of land is only changed, there is no significant improvement.

004
THE PROTO-TYPICAL HOUSING SYSTEM



A type

A house for installment sale accommodation of the home less group-1. with large family.

The 70% of the homeless is classified as the homeless group-1.
The homeless group-1 is families who are able to obtain their own houses, suitable for their families, so under the existing government financial aid, they can obtain their own house, if the housing is provided.
The large family means that a nuclear family live with his grand parents as traditional family system.
By accommodation of large family, the increase of housing demand caused by evolution of nuclear family will be constrained.

B type

A house for rent accommodation of homeless group-2.

The 30% of the homeless is classified as the homeless group-2.
The homeless group-2 is families who are not afford to obtain their own houses, suitable for their families, even with the condition of 8% interest for 20 year reimbursement.
Therefore, government have to provid long-term rent house for them.

C type

A house for installment sale accommodation of the homeless group-1.

As same as A type, C type is adaptable to furture change-increase of family sizes and income.
In order to cut down the purchase price of housing, the future home-owner-present homeless people will be able to rent rooms in early stages.

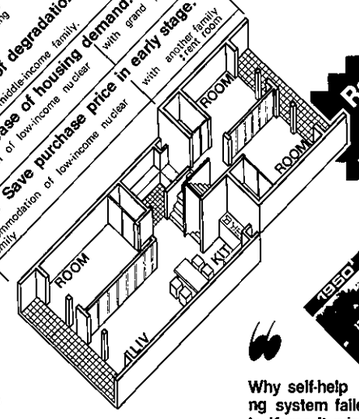
Adapt to future change

This housing type is flexible according to the increase of family income & size in the future. But the past government planned housing is suitable minimum housing (23.96M²), is suitable to live only one family in one dwelling unit. Therefore, these housing that could not meet future change, is being rapidly degraded.

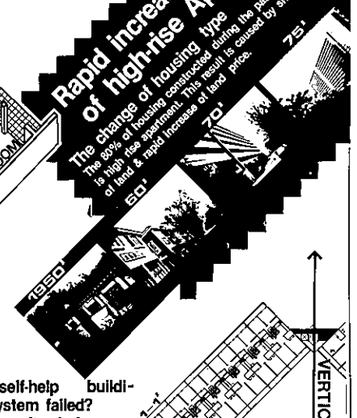
ALT1 Protection of degradation.
Accommodation of middle-income family.

ALT2 Decrease of housing demand.
Accommodation of low-income nuclear family.

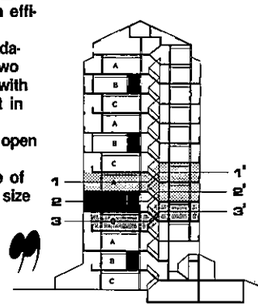
ALT3 Save purchase price in early stage.
Accommodation of low-income nuclear family with another family / rent room



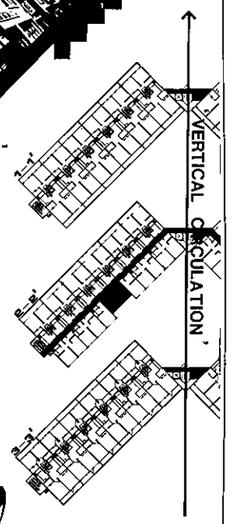
Rapid increase of high-rise Apt.
The change of housing type
The 80% of housing constructed during the past 15 years is high rise apartment. This result is caused by shortage of land & rapid increase of land price.



"This housing type is aimed at decent & low-cost housing. To reduce user's affordability, we proposed maximum utilization of land, high efficiency of livable space, accommodation of another two families sharing with one dwelling unit in the early stage. And this type is open system that can adapt to increase of family income & size"



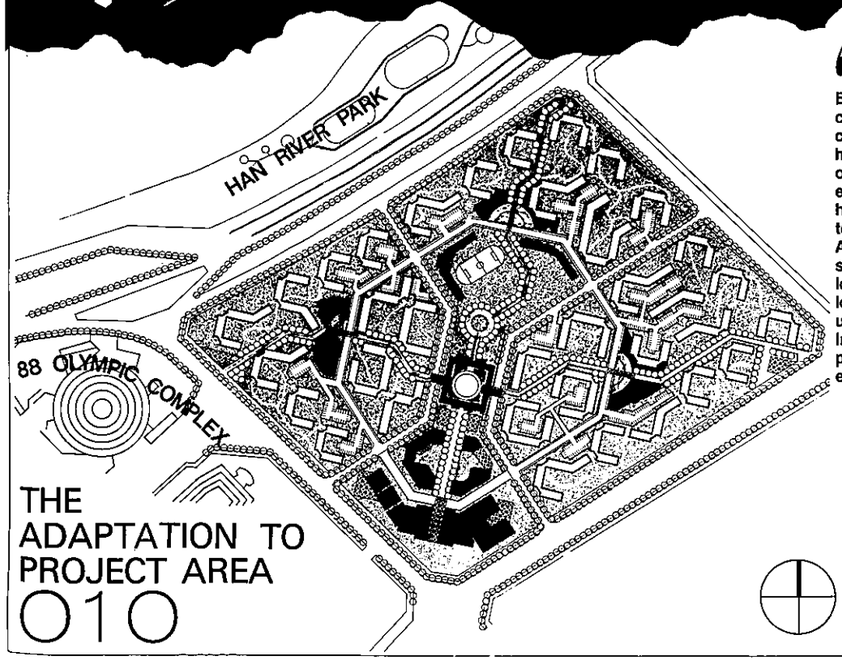
"Why self-help building system failed? In Korea it needs a heating system for 6 month in winter. The most of housing type constructed since 1970 is high-rise Apt. So it is impossible to build a high-rise apartment with heat insulated by self-help. In spite of government's land supply, self-help improvement of squatter settlement have failed."



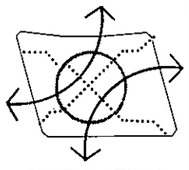
ARCHITECT'S PROPOSAL

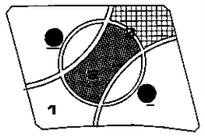
4, HOUSING SYSTEM
High-density flexible housing type.

5, SITE DEVELOPMENT
Joint development with government and inhabitant.



"By developing a adjacent area to sub-center in Seoul as high density, various opportunities for employment & decent housing is provided to homeless. As compared with self-help new town-long term needed-located in outskirt of urban area, implementation impact of this project is expected instantly."

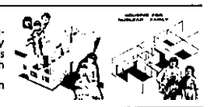
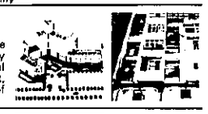
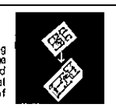




LAND USE
1 COMMERICAL ZUNE
2 COMMUNITY CENTER
3 SCHOOL PARK
4 SUB CENTER

THE ADAPTATION TO PROJECT AREA
010

005
THE COMPARISION & EVALUATION-1

1	Reduction of user's expense $5,000	**Efficient land use.** In our country the price of land is major part of housing price. As compared with existing government planned housing for homeless, Architect's proposal is able to increase twice of density, so lowcost housing can be realized.	
2	Reduction of user's expense $3,800	**Less public corridor space.** As compared with existing single-loded Apt, architect's proposal skip-floor double-loaded APT. can save public corridor space. So proposal can save user's affordability as much as $3,000.	
3	Reduction of user's expense $7,500	**Possibility of rent rooms** As compared with existing government planned housing for 1 family in 1 unit, architect's proposal is suitable to rent rooms-share with space. So future user-existing homeless can save purchase price in early stage.	
4	Restraint of increasin-g housing demand.	**Accommodation of traditional family system.** As compared with existing flat type Apt. proposal is suitable to live with grand-parents and nuclear family by using a skip floor. So proposal have a possibility that decrease housing demand by increasing a nuclear family	
5	Decent housing	**Good sun-light condition & good visual environment** As compared with existing high-rise Apt. by parallel block plan. By mixing high-rise & low-rise, proposal have a good visual environment, good sun light condition, sense of neighbourhood.	
6	Adaptation of future change	**From mimimum housing to adquate housing** Existing government planned housing can not adapt to future change as minimum housing with a rigid structure. But Architect's proposal to adquate house by increase of family size & income.	

BENEFIT ANALYSIS

6, COMPARISION & EVALUATION

7, IMPLEMENTATION IMPACT

SATISFACTION

The homeless Group-1
I can purchase a decent house with less expense.

The homeless Group-2
I can live a adquate, rent house provided by government.

Developer K.H.C.C
(Korean National Housing Coporation)
As a public organization, we utilize economic effect caused by high- density development.

Government
We can solve housing problem within the limit of government finance.

006
THE IMPLEMENTATION IMPACT

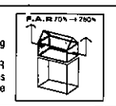
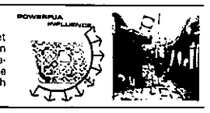
Saving of user's expenses for a house
REALIZATION OF LOW-COST HOUSING
:$16,300/unit

Adaptation to future change
ADAPTATION TO INCREASE OF FAMILY SIZE AND INCOME

Control of housing demand
ACCOMM ODATION OF TRADITIONAL FAMILY SYSTEM

DECEANT & LOW-COST HOUSING

This project receive a grand prize of National competition of Architecture by K U I A (Korean Institute of Architecture), and expect to be taken force

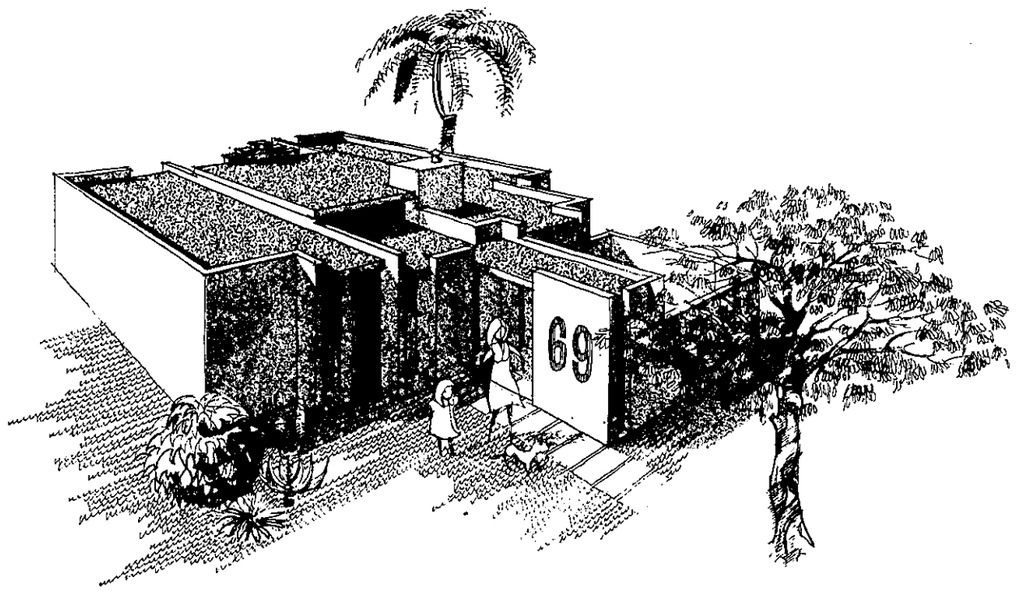
1	Maximum economic effect $6875,000	**Increased density (F.A.R 70%→280%)** F.A.R (floor area ratio) of existing project area is 70%. By high density development, F.A.R of this proposal increase 4 times as high as that of existing site, Therefore economic effect is expected	
2	Powerful influence to Surroundings.	**Improvement of depressed area** The improvement of site area meet government's requirement in relation to 88 Seoul Olympic, the implementation impact will be spread over the neighbouring depressed area with same condition.	
3	Prevention of deterioration	**From low-income to middle income.** This proposal is developed as adaptable to future change. In the early stage of development, the most of resident are low-income family, but, with the lapse of time, this housing environment will be fit to the middle income.	
4	User participation.	**Joint development with government** Existing site was developed by government as a resettlement area for voluntarily scattered people. But in this project, inhabitants participate at the beginning of planning stage.	

THE COMPARISON & EVALUATION-2
011

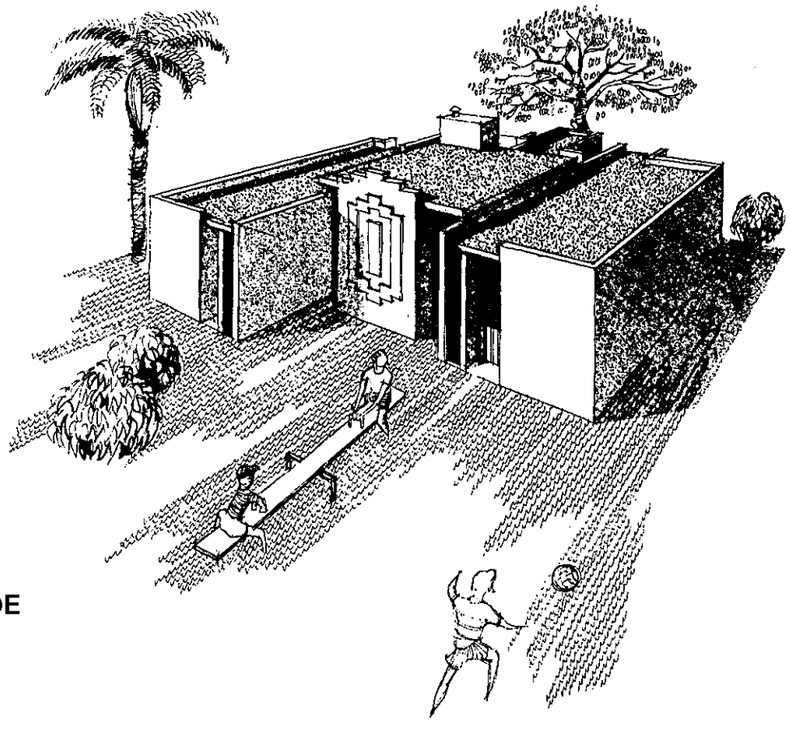
THE IMPLEMENTATION IMPACT
012

SECTION II

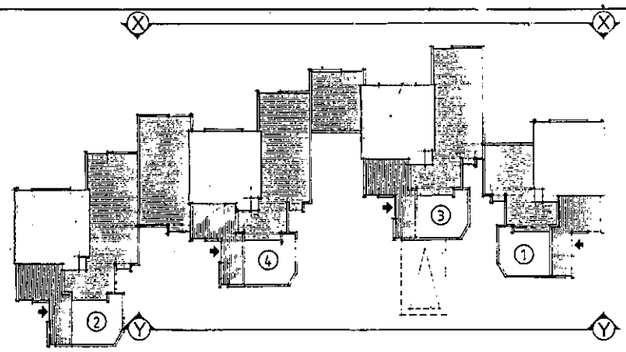
I·Y·S·H··SECTION··II



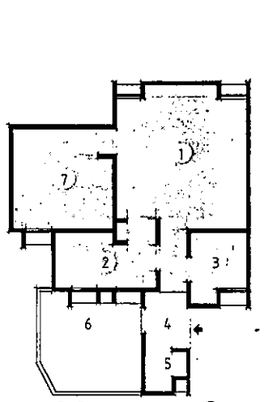
VIEW OF ENTRANCE SIDE



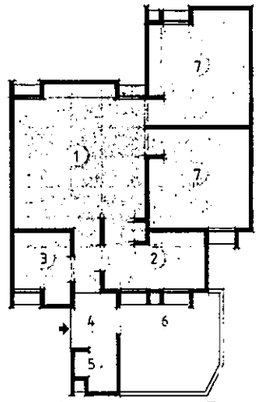
VIEW OF SUN SIDE



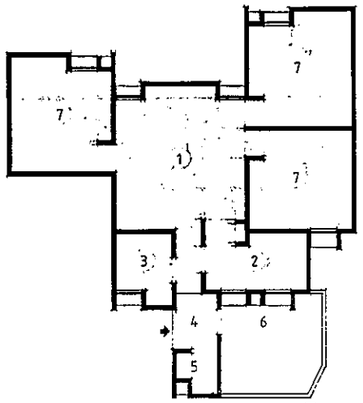
ROW DEVELOPMENT



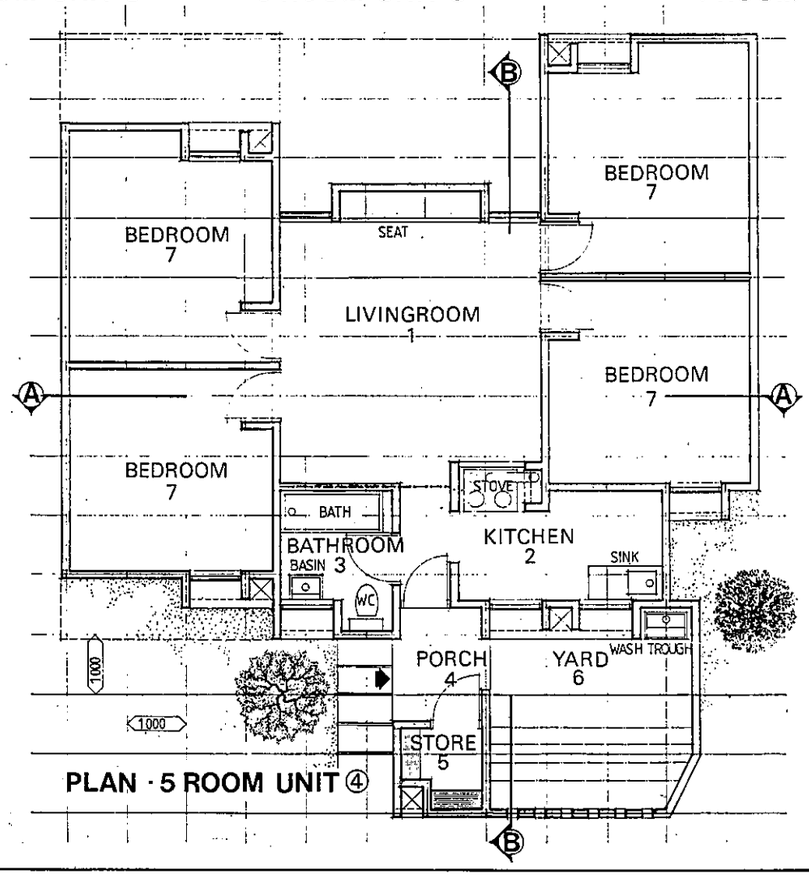
2 ROOM UNIT ①



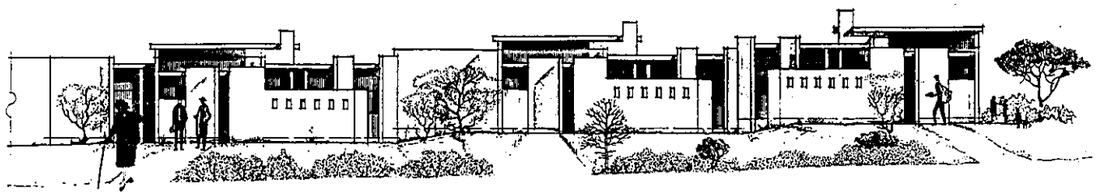
3 ROOM UNIT ②



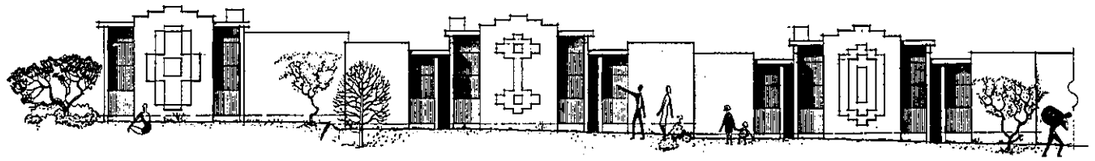
4 ROOM UNIT ③



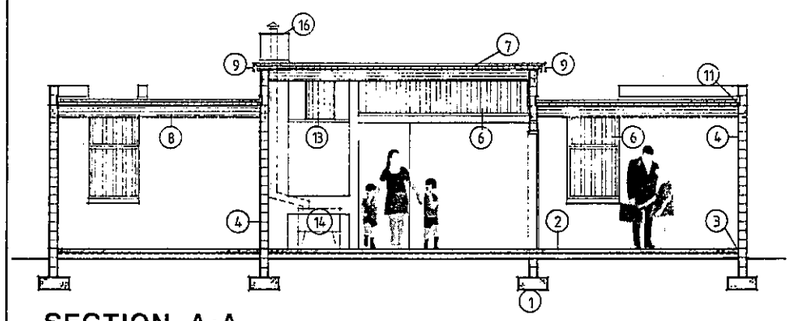
PLAN · 5 ROOM UNIT ④



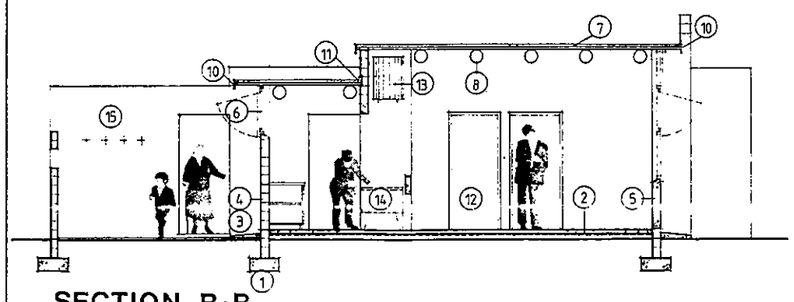
ELEVATION Y·Y



ELEVATION X·X



SECTION A·A

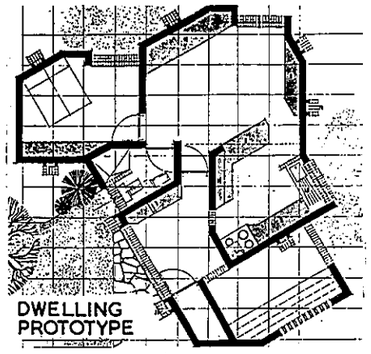


SECTION B·B

1. CONCRETE STRIP FOOTINGS 500mm WIDE x 230mm DEEP.
2. CONCRETE SURFACE BED 85mm THICK CAST ON POLY-ETHYLENE MEMBRANE ON WELL-RAMMED FILL AND FLOATED TO FINISH.
3. DAMPPROOF COURSE.
4. SAND-CEMENT HOLLOW BLOCK WALLS WITH CEMENT BAGGED FINISH INTERNALLY AND EXTERNALLY.
5. IN-SITU CONCRETE SPANDREL PANELS PROFILED TO MATCH WITH RESIN-BONDED GLASS FIBRE SHEET WINDOWS.
6. PROFILED GLASS FIBRE SHEET WINDOWS.
7. GRAVEL LAYER, 50mm DEEP, LAID ON 500 MICRON POLY-ETHYLENE MEMBRANE OVER TREATED SPLIT-POLE ROOF DECK.
8. ROOF BEAMS OF TREATED POLES 200mm IN DIAMETER BUILT INTO WALLS.
9. OPEN FASCIAS OF 150 x 15mm ASBESTOS-CEMENT SPACED 30mm FROM ROOFING AND FORMING WEEP-SLOT FOR RAINWATER.
10. CLOSED OVERFLOW FASCIA OF ASBESTOS-CEMENT WITH CEMENT BENCHING TO REAR SIDE.
11. CEMENT BENCHING PROTECTING MEMBRANE IN 25mm WALL RECESS.
12. STANDARD TIMBER DOOR AND FRAME TO FIT INTO 850mm WIDE OPENING.
13. INSULATED HOT WATER STORAGE CYLINDER.
14. COAL/WOOD-BURNING STOVE SUPPLYING HOT WATER TO CYLINDER.
15. GALVANISED WIRE WASH LINES IN YARD.
16. CEMENT BLOCK CHIMNEY WITH STOVE PIPE AND COWL.

GENERAL NOTES

THE DWELLING EVOLVED FROM A PROTOTYPE DEVELOPED AS A MARRIED QUARTERS FOR A PAPER MILLING COMPANY WHICH EMPLOYS ZULU LUMBERJACKS IN ONE OF THEIR NATAL FORESTS, SITUATED SOME 1800 METRES ABOVE SEA LEVEL WHERE WINTER TEMPERATURES OFTEN FALL BELOW 0° C. ALTHOUGH THE ANGULAR PLAN WAS SIMPLIFIED TO RATIONALISE THE INTERNAL AREAS, ALLOW FOR EXTENSIONS AND TO ADAPT TO HOLLOW SAND-CEMENT BLOCK CONSTRUCTION, THE SPIRIT OF THE DESIGN WAS CARRIED OVER IN THE BASIC PLANNING, THE USE OF PARAPETS, RAINWATER WALL DUCTS AND VARYING ROOF LEVELS.

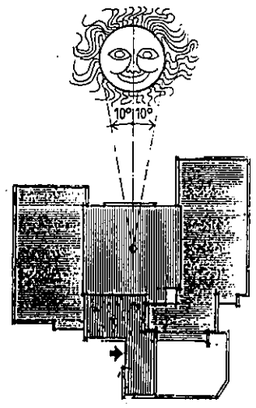


THE SINGLE ACCESS TO THIS FULLY EXTENDED DWELLING AND THE EXPRESSION OF GEOMETRICAL DESIGNS ON THE WALLS IS AN ETHNIC TRAIT FOUND IN MOST OF THE SIMPLE INDIGENOUS ARCHITECTURE BOTH IN OUR PROVINCE AND THE COUNTRY AT LARGE. TRADITIONALLY THE PRIMITIVE STRUCTURES, FOR REASONS OF SECURITY AND PRIVACY ARE EITHER WITHOUT OR HAVE VERY SMALL WINDOWS. THIS CONCEPT HAS BEEN EMBODIED IN THE RESIN-BONDED GLASS-FIBRE WINDOWS WHICH BEING PROFILED AND TRANSLUCENT ARE MORE ROBUST AND OBSCURE THAN THE USUAL GLASS PANE. OPENING SECTIONS ARE TIMBER-FRAMED AND TOP PIVOTED WITH INTERNAL TIMBER BEADS TO CLOSE OFF THE VERTICAL GAPS.

WITH THE EXCEPTION OF THE ELECTRICAL AND PLUMBING TRADES THE DWELLING MAY BE CONSTRUCTED BY UNSKILLED HANDS AND LENDS ITSELF TO CORE-UNIT, SELF-HELP DEVELOPMENT.

BETWEEN THE KITCHEN AND THE LIVINGROOM A SLOW COMBUSTION STOVE PROVIDES HOT WATER WHICH IS STORED IN AN INSULATED TANK. A SOLAR PANEL MAY BE INTRODUCED INTO THE SYSTEM TO MAINTAIN TEMPERATURES WHEN THE STOVE IS NOT FIRED. BEDROOMS AND KITCHENS ARE DESIGNED WITH RECESSES FOR CUPBOARDS, HANGING SPACE AND FITTINGS. THE STOVE FLUE AND STORAGE TANK PLUMBING ARE RETICULATED ON THE SURFACE IN THE WALL RECESS WHICH BECOMES A CLOSED STACK ONE COURSE BELOW THE KITCHEN CEILING.

ORIENTATION



THE DWELLING, FOR EFFECTIVE SEASONAL SUN CONTROL, SHOULD, ACCORDING TO THE HEMISPHERE, BE ORIENTATED TO WITHIN 10° EAST OR WEST OF A NORTH-SOUTH AXIS TO MINIMISE THE POSSIBILITY OF PARTS OF THE DWELLING BECOMING UNCOMFORTABLE DURING THE DAY. PENETRATION OF THE SUN'S RAYS THROUGH THE WINDOWS IS DESIRABLE DURING THE WINTER AND THE HEAT RETENTION QUALITY OF THE SOLID WALLS WILL BEST BE REALISED BY THE PRESENTATION OF A SINGLE ASPECT TO MAXIMUM RADIATION EXPOSURE IN THE WINTER AND A MINIMUM IN THE SUMMER. WITH HOUSES COUPLED IN ROW THIS ORIENTATION IS IMPERATIVE.

FLOORS

FLOORS ARE 85mm THICK 1:3:6 x 20mm Ø CEMENT, SAND AND STONE CONCRETE MIX, SMOOTH-FLOATED ON WELL-RAMMED FILLING WITH A POLY-ETHYLENE MEMBRANE UNDERLAY LAPPED ONTO THE DAMP-PROOF COURSE IN THE WALLS. THE WALLS ARE FOUNDED ON CONCRETE STRIP FOOTINGS OF THE SAME MIX AS THE SURFACE BEDS.

WALLS

THE SAND-CEMENT HOLLOW BLOCKS ARE SIZED ON THE METRE SQUARE GRID TO ALLOW 850mm CLEAR OPENINGS FOR DOORS AND WINDOWS. CEMENT BLOCKS WERE CHOSEN FOR THEIR AVAILABILITY (MANUFACTURED ON SITE IN STEEL MOULDS) AND EASE OF CONSTRUCTION WHICH CAN BE EITHER DRY-JOINTED, WEDGED AND FILLED WITH A SAND-CEMENT GROUT OR BUILT WITH TRADITIONAL MORTAR JOINTS BEFORE FILLING. CONCRETE PROFILED CILLS AND SPANDREL PANELS ALLOW THE FIBRE-GLASS WINDOWS TO LAP OR CLOSE WITH A TIGHT SEAL.

WHERE SOILS ARE UNSTABLE THE WALLS MAY BE BROKEN UP INTO SEPARATE PANELS WITH SEALED VERTICAL STRAIGHT JOINTS IN SPANDREL PANELS BELOW WINDOWS AND TIMBER IN-FILL PANELS OVER DOORS. IF MORTAR JOINTS ARE USED THE WALLS MAY BE REINFORCED BOTH HORIZONTALLY AND VERTICALLY INTO CRACK-RESISTANT PANELS.

ROOF

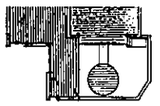
THE ROOF IS CONSTRUCTED OF TREATED TIMBER SPLIT-POLES SUPPORTED ON TREATED TIMBER BEAMS, COVERED WITH A 500 MICRON POLY-ETHYLENE MEMBRANE WHICH IS GLUED AND BENCHED TO FASCIAS AND WEDGED UP INTO PARAPET RECESSES WITH CEMENT MORTAR. A 50mm LAYER OF GRAVEL IS SPREAD OVER THE MEMBRANE WHICH, IF NECESSARY (DEPENDING ON THE TYPE OF GRAVEL) MAY BE PROTECTED AGAINST PUNCTURING BY A LAYER OF STRAW OR CORRUGATED CARDBOARD. RAINWATER IS DISCHARGED FROM THE UPPER DECK BY WAY OF A WEEP-SLOT BEHIND THE FASCIAS AND AGAIN FROM THE LOWER ROOFS INTO BITUMEN-PAINTED WALL RECESSES. SLIGHT FALLS ENCOURAGE WATER TO PERCOLATE TOWARDS THE DUCTS. FASCIAS OVER THE WINDOWS SERVE AS OVERFLOWS.

GOOD THERMAL AND SOUND INSULATION LEVELS ARE OBTAINED FROM THE GRAVEL, MEMBRANE AND TIMBER SANDWICH, WHICH AS A RESULT OF THE MASS AND DENSITY OF THE GRAVEL IS BOTH HAIL AND STORM RESISTANT. THE SPLIT-POLE TIMBER CEILING IS VISUALLY PLEASING AND SHOULD THE MEMBRANE BE PUNCTURED THE LOCATION OF THE RUPTURE MAY EASILY BE DETERMINED FROM THE INSIDE. IF SO DESIRED, WHERE THE UNITS ARE DEVELOPED SINGLELY PARAPETS MAY, TO A LARGE DEGREE BE OMITTED IN LIEU OF FASCIAS BUT THE PRACTICAL AND AESTHETIC ASPECTS WOULD NEED TO BE CONSIDERED IF THIS WAS DONE.

SERVICES

WATER

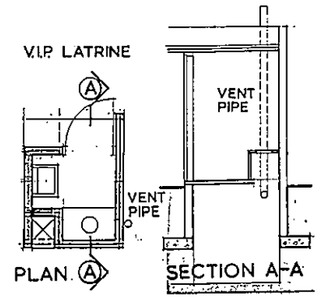
IN CASES WHERE COMMUNITY WATER POINTS ARE CENTRALISED A WATER STORAGE TANK, TO AUGMENT THE SUPPLY, MAY BE LOCATED IN THE YARD AND WATER BRIDGED OVER FROM THE KITCHEN RAIN-WATER DUCT IN TROUGH EXTENSION OF THE ROOF CONSTRUCTION.



STORAGE TANK

SEWERAGE

SHOULD WATER BOURNE SEWERAGE, EITHER TO A MAINS CONNECTION OR SEPTIC TANK AND FRENCH DRAIN COMBINATION BE UNAVAILABLE, THE EXTERNAL STORE MAY SERVE AS A VENTILATED IMPROVED PIT-LATRINE AS ILLUSTRATED BELOW, WITH A POUR-FLUSH WASH HAND BASIN. WHERE RUNNING WATER IS NOT AVAILABLE POUR-FLUSH TOILETS WITH SOAKAWAYS MAY BE USED EITHER HERE OR MORE APPROPRIATELY, IN THE BATHROOM.

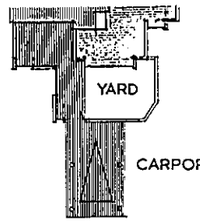


ELECTRICITY

WITH AN ENERGISED HOUSE, BULKHEAD LIGHTING MAY BE NEATLY RETICULATED ON THE SURFACE OF THE WALLS, FOR EASE OF ACCESS, AND LOCATED IN POSITIONS OF OPTIMAL LIGHTING. WHEN ELECTRIC STOVES ARE USED THE STACK FALLS AWAY AND THE HIGH ROOF EXTENDS OVER THIS SPACE.

EXTENSION

THE UNIT, AS SHOWN, IS FULLY DEVELOPED BUT WHERE NECESSARY A CAR-PORT OR SINGLE GARAGE, ORIENTATED EAST-WEST OR NORTH-SOUTH, MAY BE TACKED ONTO THE STORE AND YARD WITH THE LOW ENTRANCE ROOF EXTENDING OUT TO COVER THIS SPACE. TREATED POLES MAY BE USED TO SUPPORT THE FORMER AND CEMENT BLOCKS THE LATTER.



DESIGN & AESTHETICS

THE UNIT, WITH ITS FLAT ROOF, READILY LENDS ITSELF TO DESIGN MODIFICATIONS, VARIOUS ALTERNATIVE CONSTRUCTION METHODS AND SYSTEMS AND CAN EASILY BE ADAPTED TO CHANGES IN THE TERRAIN. ALTHOUGH THE PLAN FORM IS PLAIN THE USE OF DIFFERENT ROOF LEVELS, JUXTAPOSED FASCIAS AND PARAPETS, SET-BACK AND PATTERNED WALLS AND RECESSED DUCTS AND WINDOWS PRESENT A LIVELY PLAY OF LIGHT, SHADE AND FORM ON THE ELEVATIONS. THE INTERNAL SPACES ENJOY THE VARIATION OF CEILING HEIGHTS, INTRODUCTION OF NATURAL LIGHT BY CLERESTOREY INTO THE DEEP SPACE AND THE FEMALE EXPRESSION OF THE PROUD MALE EXTERNAL PATTERNS ON THE WALL PANELS.

THE MAIN THRUST OF THIS DESIGN IS AN ATTEMPT TO DEMONSTRATE THAT LOW-COST HOUSING, ALTHOUGH CONSTRUCTED OF RELATIVELY INEXPENSIVE MATERIALS MAY BE PRESENTED IN AN INTERESTING WAY WHEN, AT THE PLANNING STAGE, THE EFFORT IS MADE TO INCORPORATE ELEMENTS THAT ARE NOT ONLY UTILITARIAN BUT ALSO ALLOW FOR A DEGREE OF AESTHETIC EXPRESSION. IT IS OUR BELIEF THAT NOT ONLY IN THE RELM OF POLITICAL ENDEVOUR SHOULD THE STRUGGLE FOR HUMAN RIGHTS PERSIST BUT ARCHITECTURE SHOULD DEMONSTRATE THAT IT HAS THE RESOURCES, INGENUITY AND SENSITIVITY TO CREATE DWELLINGS THAT ENHANCE HUMAN DIGNITY, HOWEVER HUMBLE THEY MAY BE.

VILLAGE ATLANTA

A REHABILITATION CENTER FOR MOTHERS AND THEIR CHILDREN

MINISTRIES TO WOMEN, U.S.A., INC.

For hundreds of women with children in the Atlanta Metropolitan area life on the razors edge of poverty is a daily reality. Abandoned, unwed, battered, or disabled by drug or alcohol abuse, women with children are the hidden homeless. Through a combination of social stigma and a natural tendency to withdraw in a crisis, the plight of these women is rarely seen, their cries are rarely answered.

Most emergency shelters are designed to accommodate transients, usually only at night and only during winter months. Before a homeless mother can hope to get her family off the street she must find a job to support her children and herself. Her unique problems may present an obstacle to immediate employment. Her children may need medical or psychological attention and many are experiencing a grieving process over the loss of their home and their father.

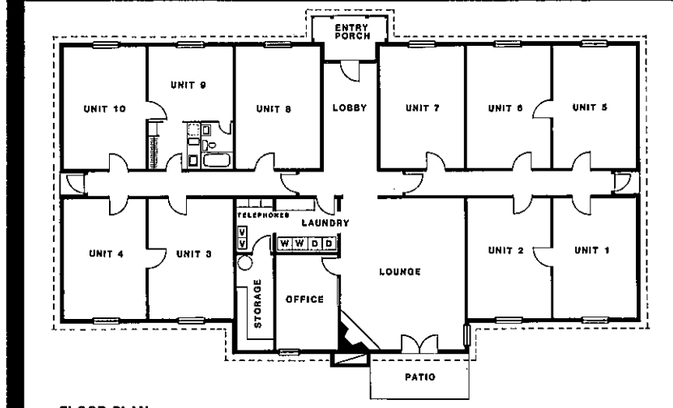
There are virtually no comprehensive rehabilitation programs for women and their children in Atlanta or the entire Southeast at this time.

VILLAGE ATLANTA is a bold new concept to fill the need for such a comprehensive program. By combining the physical necessities--food, shelter, clothing--with an in-depth rehabilitation program and spiritual support VILLAGE ATLANTA will bring these "lost" families through the crises that have left them homeless and enable them to re-enter society as productive and responsible citizens. The program will operate at three levels:

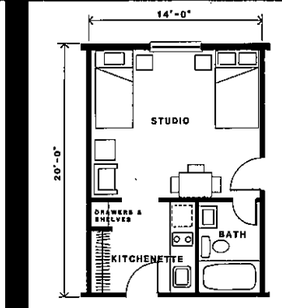
INTAKE	Provide emergency shelter and evaluation for further treatment and determination of program requirements. 30 families, 90 persons.
INTERMEDIATE	A small, but private, housing unit where the family can begin to function while participating in intense counseling and social services. 50 families, 150 persons.
INDEPENDENT	A larger, but yet spartan, housing unit affording privacy for the mother while the family is preparing for life in the community. Mothers will be involved in vocational training and further counseling. 20 families, 60 persons.
	TOTAL 100 families, 300 persons.

VILLAGE ATLANTA has been designed to incorporate the simple, spartan "grass-roots" atmosphere of the small village. Rather than a large, institutional building it will have several small buildings of simple construction methods allowing a phasing of construction, if necessary. The scale is not intimidating and the simplicity will allow the "villagers" to contribute to the maintenance as part of their rehabilitation therapy. It is central to the philosophy of the program that when families leave the village their process will be upward.

VILLAGE ATLANTA represents a salvation and a means of recovery for hundreds of women and their children who would have no alternative but to continue in a cycle of destitution and despair.

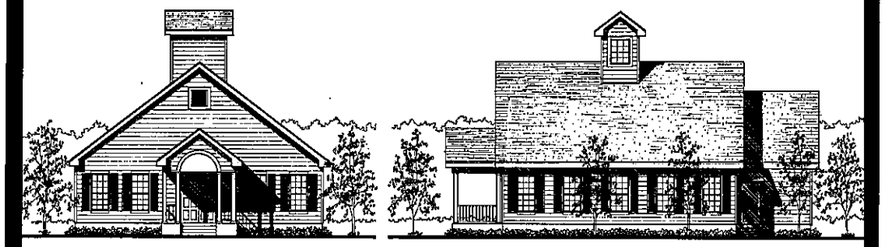


FLOOR PLAN



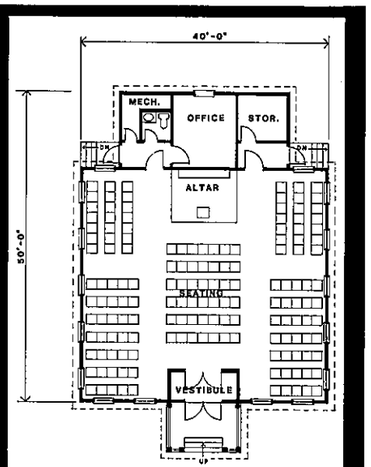
TYPICAL INTERMEDIATE LEVEL UNIT

INTERMEDIATE LEVEL

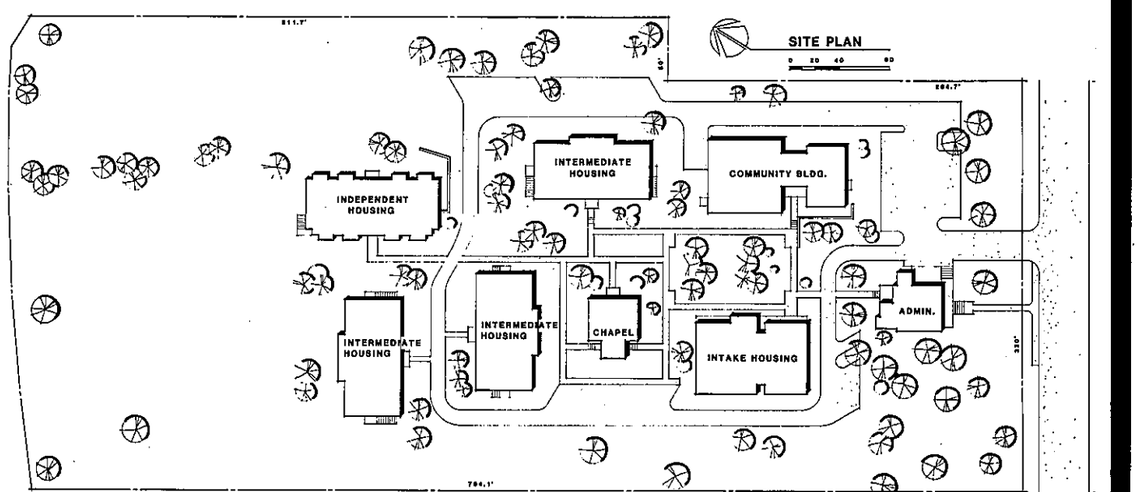


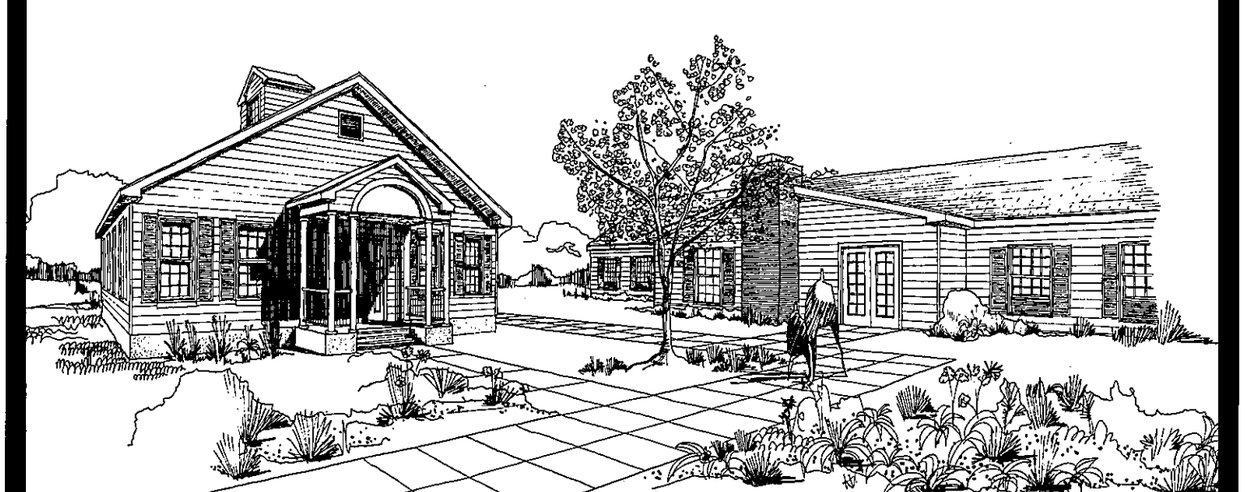
FRONT ELEVATION

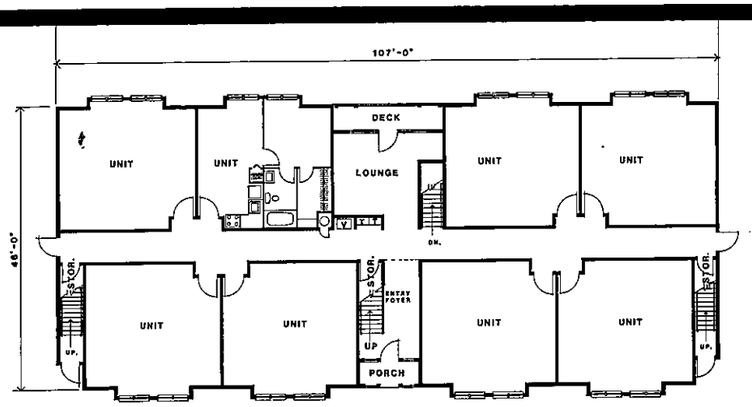
SIDE ELEVATION



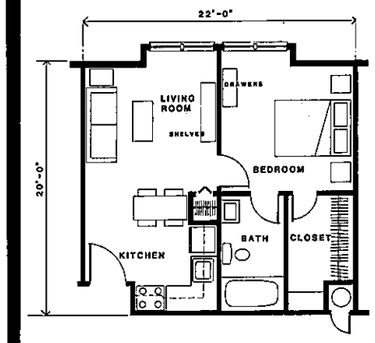
FLOOR PLAN







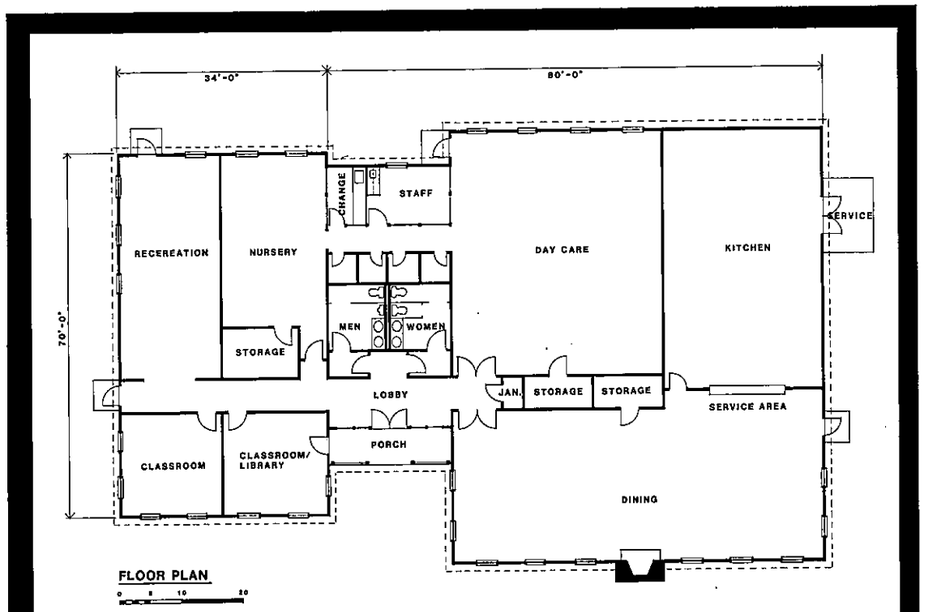
FIRST FLOOR PLAN



TYPICAL UNIT

FRONT ELEVATION

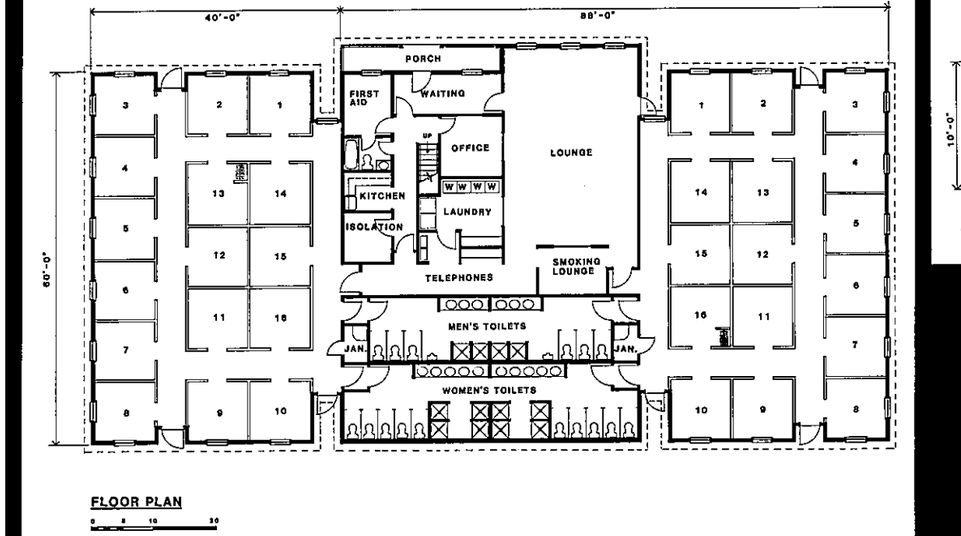
INDEPENDENT LEVEL



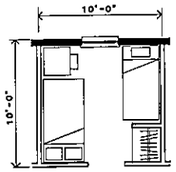
FLOOR PLAN

FRONT ELEVATION

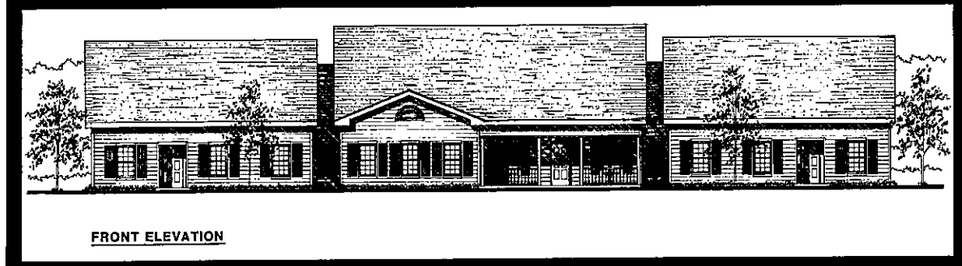
COMMUNITY ACTIVITIES BUILDING



FLOOR PLAN

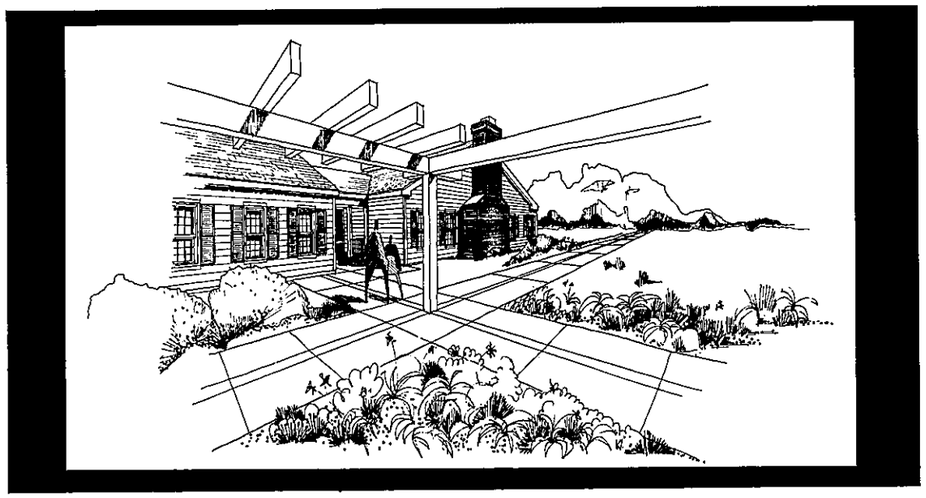


TYPICAL INTAKE LEVEL CUBICLE



FRONT ELEVATION

INTAKE LEVEL



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section II

bubble system for housing

report

INTEGRATION OF FORM

IN TRADITIONAL ISLAMIC ARCHITECTURE THE DOMINANT ELEMENT IS THE ARCH. IT EXCEEDS ALL OTHER ELEMENTS IN HIERARCHY AND IMPORTANCE.

RECOGNIZING THE ARCH AS SUCH, WITH ITS SENSE OF PROPORTION, SYMBOLIC VALUE, AND TRADITIONAL ROLE IN BOTH NOMADIC AND BUILT FORM, THE INTENTION WAS TO USING CURRENT TECHNOLOGY TRANSFORM THE ARCH ELEMENT INTO AN ECONOMICAL BUILDING CONSTRUCTION.

THE RESULT WAS THE ONE STORY CUPOLA FORM, OR BUBBLE SYSTEM.

HUMAN SCALE

THE SUITABILITY OF THE BUBBLE SYSTEM FOR DENSE URBAN HOUSING LIES IN ITS SCALE AND POSSIBLE SPATIAL ARRANGEMENTS. IN PARTICULAR IT MAINTAINS THE SAME SCALE IN BOTH THE INTERIOR AND AND EXTERIOR SPACES. FURTHERMORE THESE EXTERIOR SPACES AND COURTYARDS WHICH ARE PRODUCED HAVE A SIMILARITY WITH TRADITIONAL ISLAMIC URBAN SPACE, AND OFFER PRIVACY AND AN INTIMATE MILIEU.

CLIMATE ACCOMODATION

AS FOR THE CLIMATIC CONSIDERATIONS, THE HEATING EFFECT OF THE SUN IS AT A MINIMUM WITH THE CUPOLA FORM, GEOMETRICALLY THIS FORM OFFERS A MINIMUM OF SURFACE AREA FOR A MAXIMUM OF VOLUME, ALL WINDOWS AND DOORS ARE PROTECTED BY SHADING ELEMENTS, AND THE ARRANGEMENT OF THE CUPOLAS ALSO OFFER THE PRIVATE COURTYARDS AND NEIGHBOURING CUPOLAS, SHADE.

ALL UNITS POSSESS CROSS VENTILATION. THE TOP OF THE CUPOLAS ARE PIERCED BY A SKYLIGHT WHICH SERVES AS AN AIR VENT, AND THEY ARE ALSO VENTILATED BY A LARGE STORAGE UNIT WHICH RISES ABOVE THE HOUSE, FORMING A DISTINCTIVE ARCHITECTURAL FEATURE, AS WELL AN AIR DUCT.

ECONOMY OF SPACE

THE BUBBLE SYSTEM FOR HOUSING OFFERS AN OPTIMUM OF FLEXIBILITY. IT CAN BE ERECTED AS AN INDIVIDUAL OR GROUP HOUSING SYSTEM. THE TUBULAR INFRASTRUCTURE UNIT WITH KITCHEN, BATH, AND HEATING EQUIPMENT IS ERECTED FIRST, AND THE CUPOLA UNITS ARE THEN JOINTED ACCORDING TO NEED. (THE FLOOR AREA FOR EACH CUPOLA UNIT IS 30 M2, AND 36 M2 FOR THE TUBULAR UNIT.) THE ECONOMY OF THE SYSTEM LIES IN THE EFFECTIVE FLEXIBILITY OF THE INTERIOR SPACE. THE UNITS HAVE NO INTERAL BEARING WALLS, AND CAN THEREFOR BE SUBDIVIDED WITH PARTITIONS AND SLEEPING LOFTS.

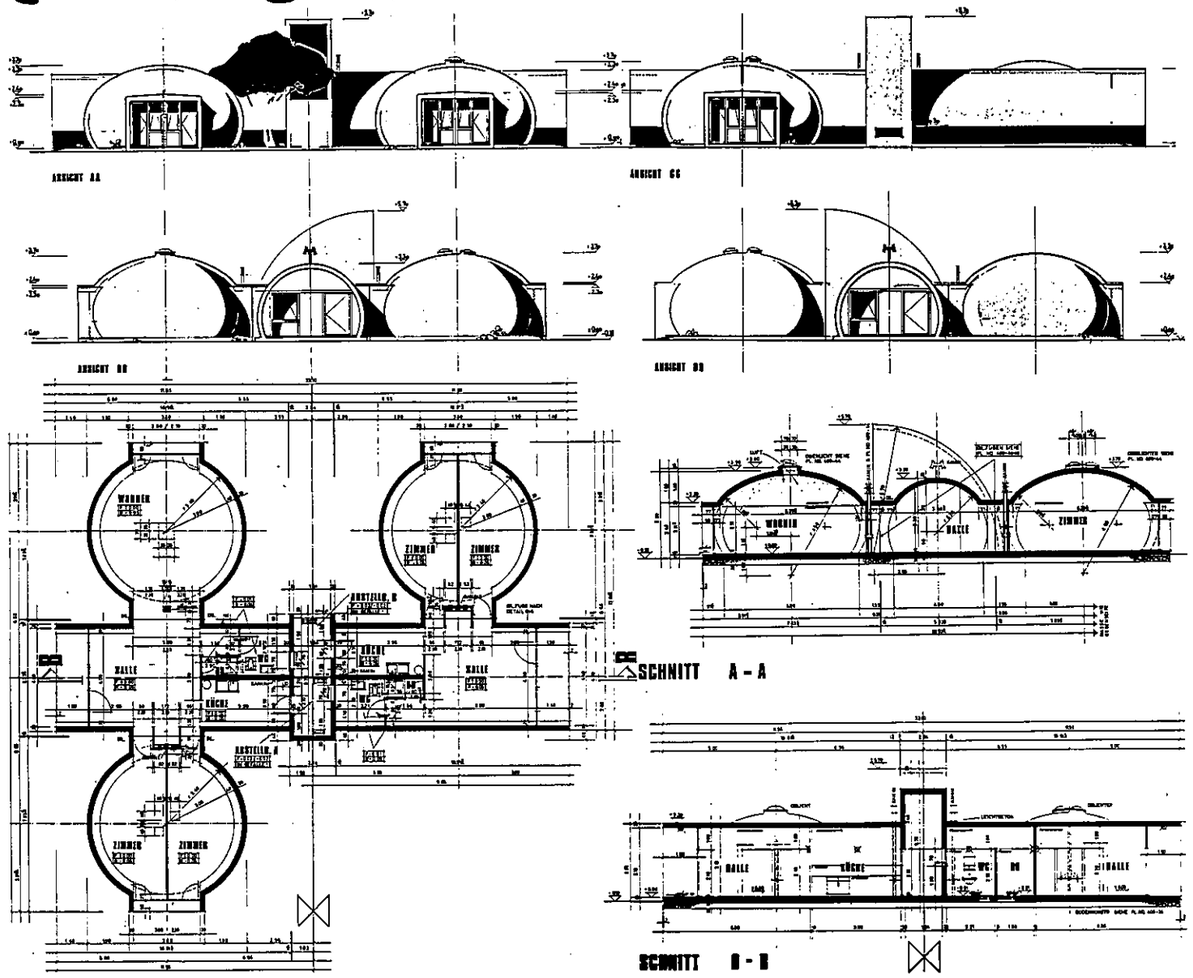
BUILDING METHOD

- THE BUBBLE SYSTEM ALLOWS AN EXTENSIVE APPLICATION OF LOCAL MATERIAL AND LABOUR, SAND, WATER, AND CLAY ARE ALL ON THE SITE AND THE COMPLEXITY OF THE TECHNICAL PROCESS IS REDUCED BY REPETITION.
- THE CUPOLA AND TUBULAR FORMS ARE PRODUCED ON SITE USING A PNEUMATIC FORMWORK, I.E. A PLASTIC MEMBRANE FILLED WITH COMPRESSED AIR, AND IT IS NEEDED FOR ONLY A FEW HOURS PER APPLICATION.
- THE CUPOLA CONSTRUCTION IS A SERIES OF LAYERS THAT ARE APPLIED TO THE FORMWORK. THE FIRST AND INNER LAYER IS OF A GYPSUM/CLAY MIXTURE AND SERVES TO STABILIZE THE FORMWORK, AND AS A NATURAL SURFACE, IMPROVES THE ROOM CLIMATE. THE SECOND LAYER CONSISTS OF A CONVENTIONAL REINFORCED MORTAR-SPRAY AND THE THIRD AND FINAL LAYER, PROTECTING AGAINST WATER AND AIR EROSION, IS A PLASTIC-FILM WITH 300 % FLEXIBILITY. USING THIS SYSTEM IT IS POSSIBLE TO PRODUCE ONE CUPOLA OR TUBULAR FORM PER WORKING DAY.
- THE FOUNDATION AND FLOOR FOR THE SYSTEM IS A POURED ON SITE CONCRETE SLAB WITH MESH REINFORCEMENT, WINDOWS, DOORS, AND KITCHEN APPLIANCES, AS WELL AS PLUMBING AND ELECTRICAL INSTALLATIONS WILL HAVE A TYPICAL DEGREE OF NATIONAL INDUSTRALIZED FINISH, AND WILL REQUIRE PLACING AND FIXING ON SITE.

EARTHQUAKE STABILITY

THE CUPOLA FORM OF THE BUBBLE SYSTEM GUARANTEES AN EXCELLENT EARTHQUAKE STABILITY WITH A MINIMUM OF CONSTRUCTIVE MEANS. THE CONNECTING LINKS BETWEEN THE TUBULAR AND CUPOLA FORMS ACT AS FLEXIBLE JOINTS.

planning

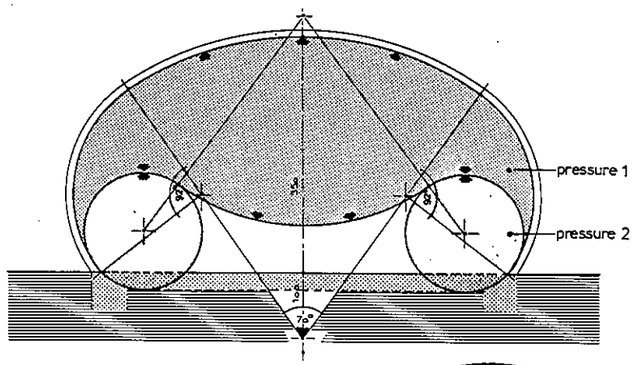


construction

shuttering principle

air cushion membranes as shuttering for the shell construction

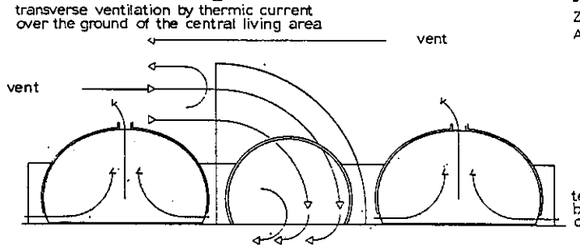
easy to remove - quick assembly and dissembly - simple transport



climate

ventilation 'chimney'

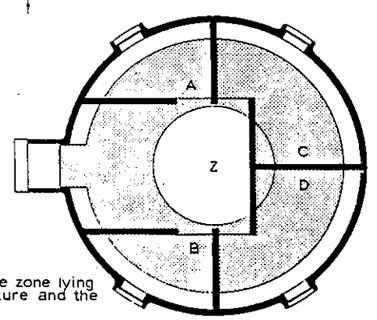
transverse ventilation by thermic current over the ground of the central living area



room disposition

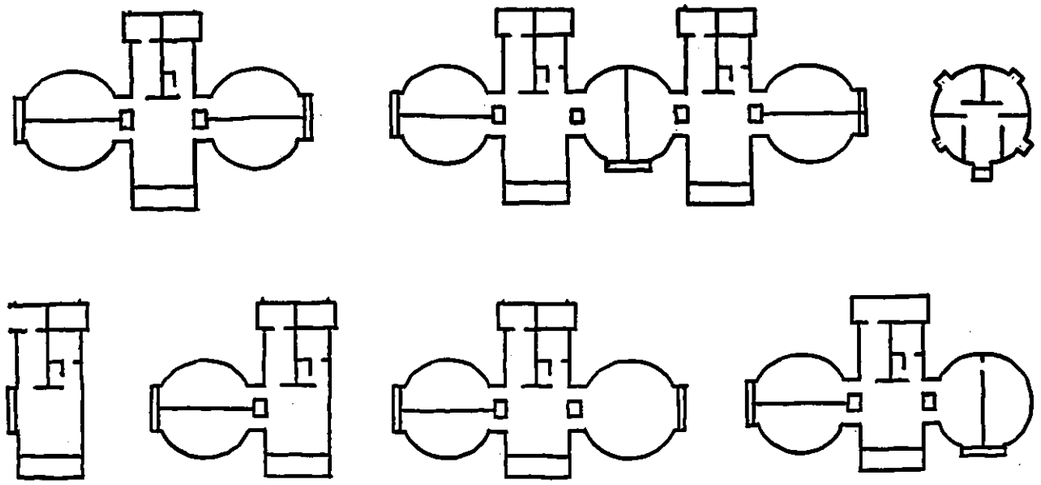
Z – central zone

ABCD – intermediate zone



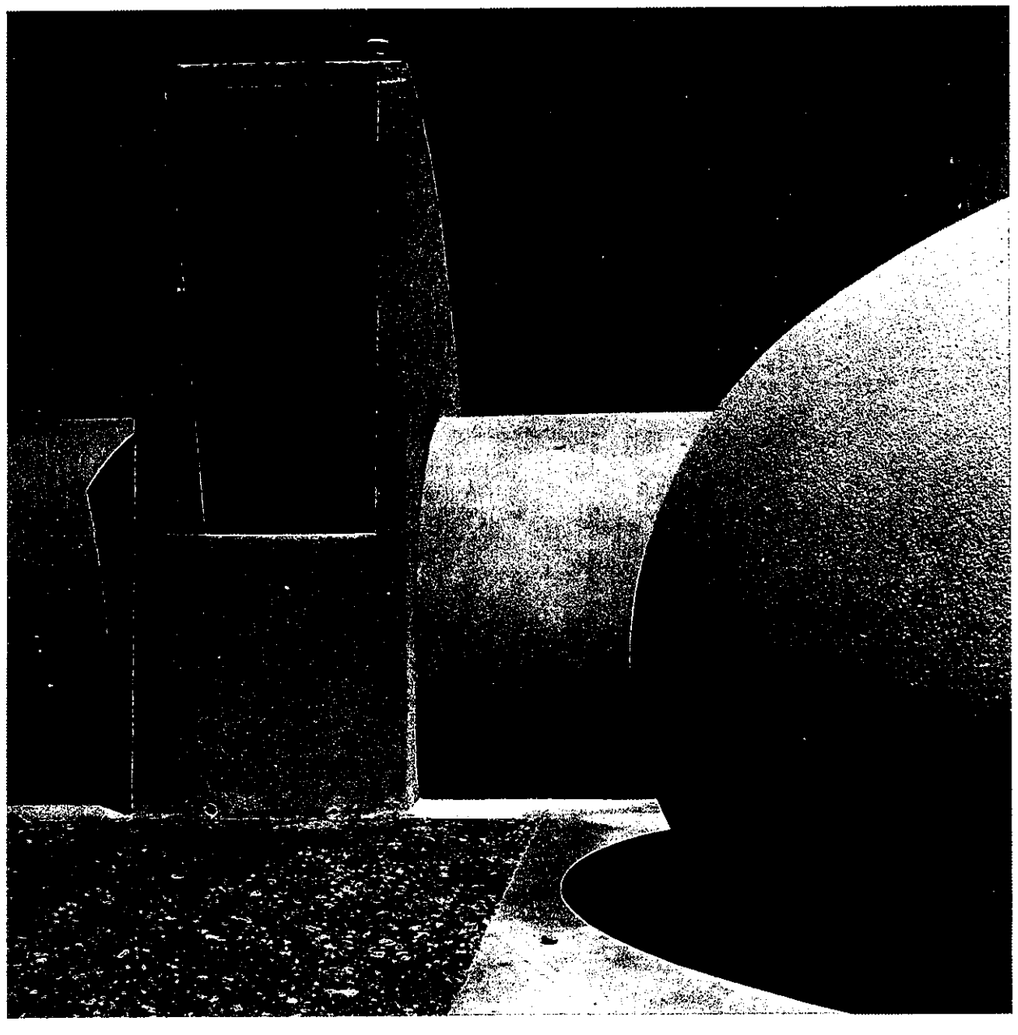
temperature of the intermediate zone lying between the exterior temperature and the one of the central zones

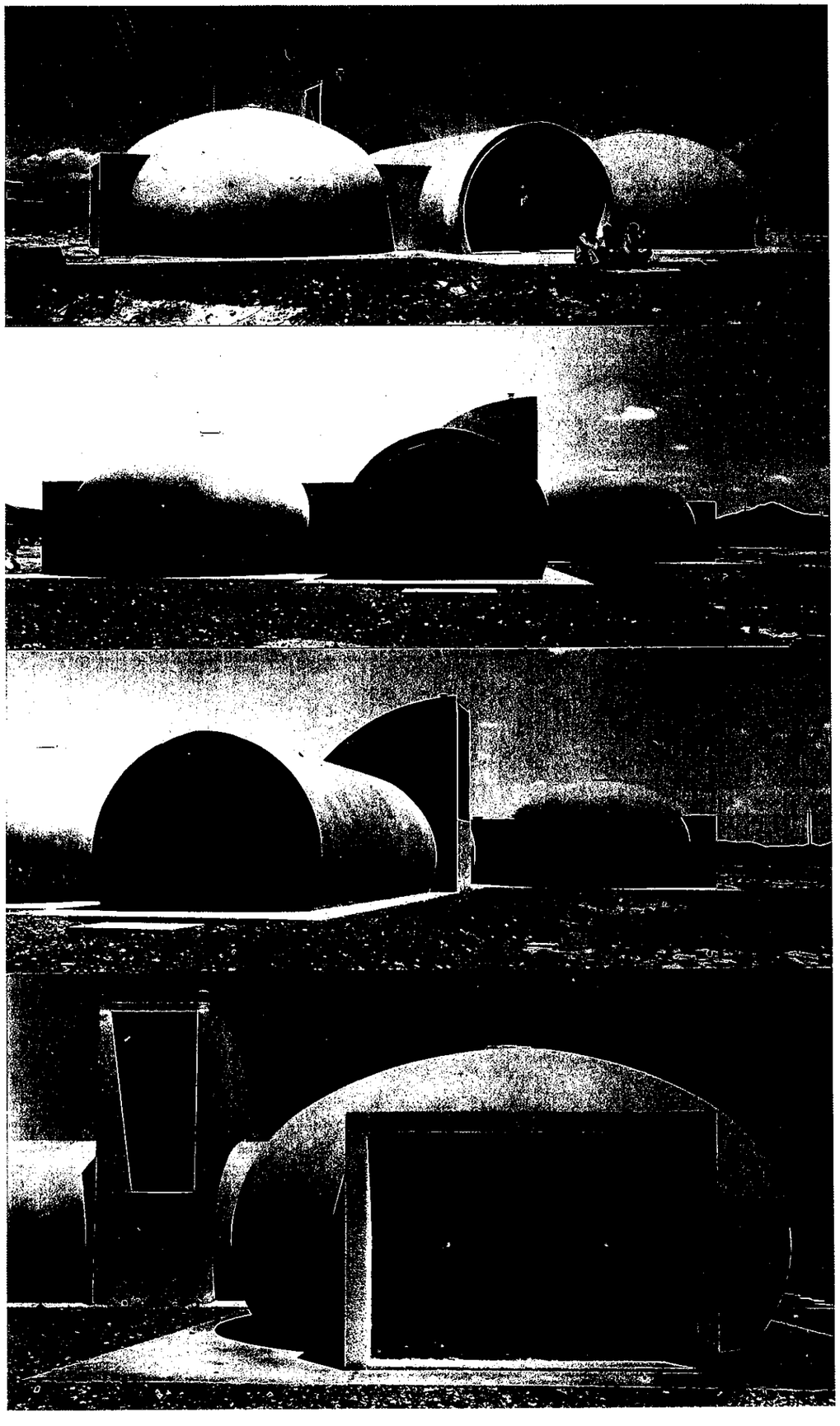
flexibility

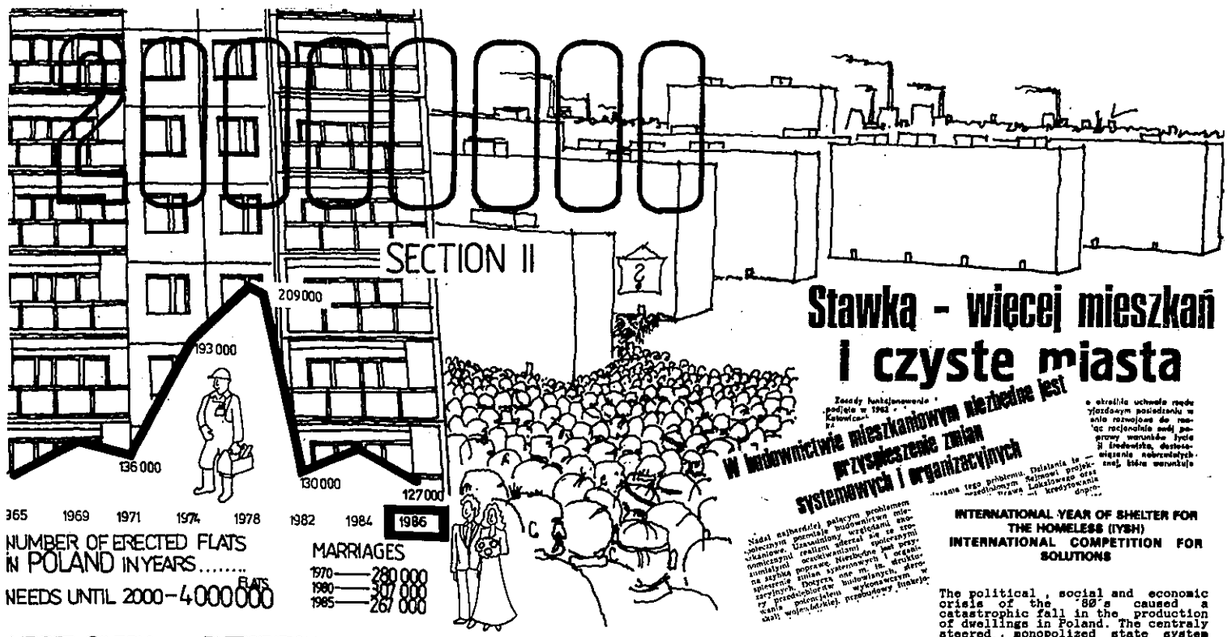


realisation

habitat iran







Stawką - więcej mieszkań i czyste miasta

W budownictwie mieszkaniowym niezbędne jest przyspieszenie zmian systemowych i organizacyjnych

INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS (IYSH)
INTERNATIONAL COMPETITION FOR SOLUTIONS

The political, social and economic crisis of the 80's caused a catastrophic fall in the production of dwellings in Poland. The centrally steered, monopolized state system of building housing broke down completely. The waiting time for a flat lenghtened to unrealistic 15-20 years.

HUNDREDS OF THOUSANDS OF MAINLY YOUNG PEOPLE, OFTEN WITH FAMILIES ARE FORCED TO LIVE FOR MANY YEARS IN WORKERS HOSTELS, BOARDING HOUSES, WITH PARENTS OR IN FLATS WITH VERY POOR STANDARDS OF SANITATION AND SIZE.

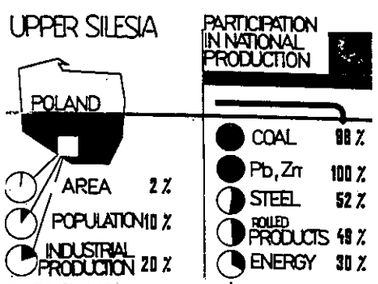
The price of a flat on the free market is about 100 monthly salaries.
The lack of stabilisation in housing of a large proportion of society leads to such negative proces as: the growth of delinquency, low work efficiency, frustration break down of families, emigration abroad. Thouse problems are especially apparent in Upper Silesia. The housing crisis is augmented here by such specific problems as:
- high urbanisation, luck of space for new hosing developments
- high industrialisation / heavy industry, mining / and resulting catastrophic pollution.

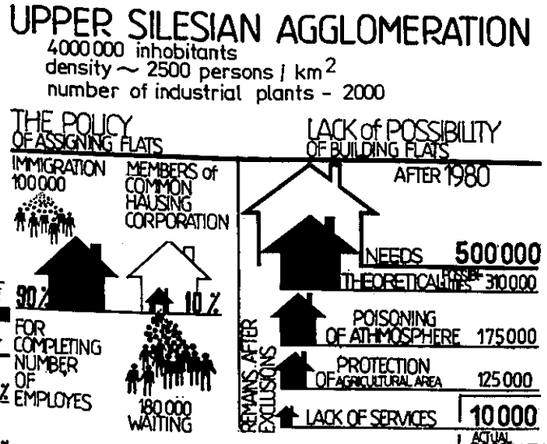
Big industrial plants with polution-creating technology are often in the immediate neighbourhood of housing estates. Because of their aged technology they should be closed down. What used to be the reason of development and the wealth of the region - coal - is running out. The exploitation of old mines stope being profitable.
The worn out buildings are very valuable from the historic curtural and architectural points of view.
To keep the majority of them as museums is impossible. But it is possible to give them a new function, to revitalize them as places of habitation, especially as there is a total lack of space for new housing.

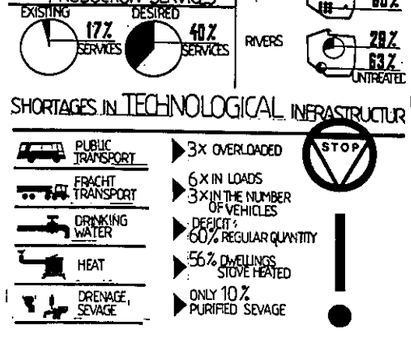
A WORN OUT COAL MINE AS A BASE FOR CREATING SPACE FOR LIVING AND WORKING, A CHANCE FOR REALISING IDEAS AND USING THE ENERGY OF THE HOMELESS, AN OPPORTUNITY TO CREATE A NEW MODEL OF SOCIAL TIES.

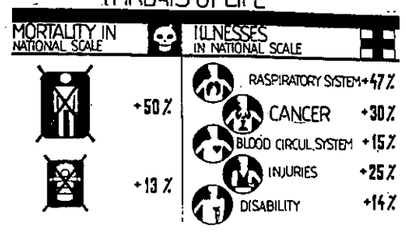
A coal mine is an extremely interesting object - from the architectural and technological points of view, both on the surface and underground. There are buildings there of various sizes and functions, there are the production halls, changing rooms, offices; there are also many accompanying buildings such as: power station, brickworks sewage treatment works, carpentry, mechanical workshops, railway line, heating plant etc.
A newly created community, applying democratic rule, would aim at such transformation of the mine, which would: provide housing and then economic independence through:
- creating of dwellings through adapting the buildings of the mine, and later on the buildings of new housing units in various technologies and forms
- the use of the technical infrastructure of the mine in order to achieve energy independence (using unconventional sources of energy)
- the use of existing buildings for the creation of production places for goods and services
- the use of adjoining areas for agricultural production aiming at food self sufficiency
- creation of the cultural base, building of the school
- creation of the perspective for development for all units of the community

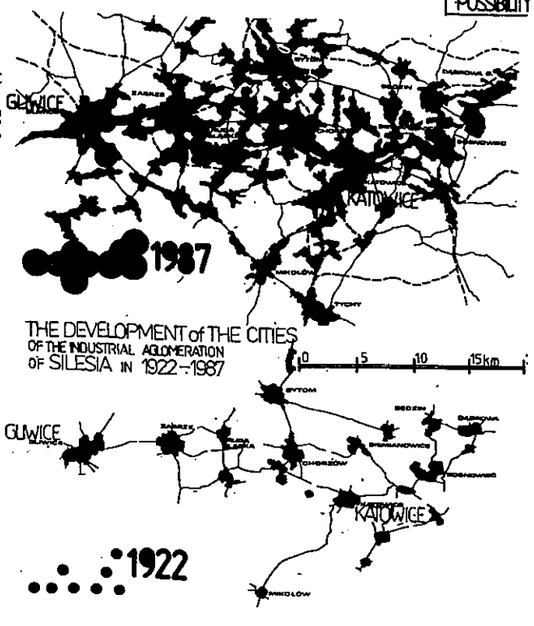
The method suggested can be realistically used in Silesia, giving a chance for reformation and modernising of the settlement structure and for the improvement of living conditions in the region.



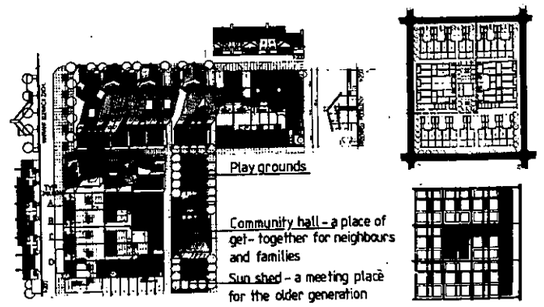


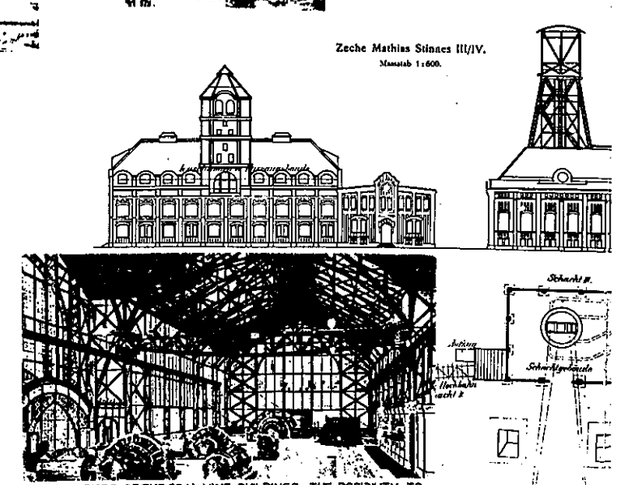




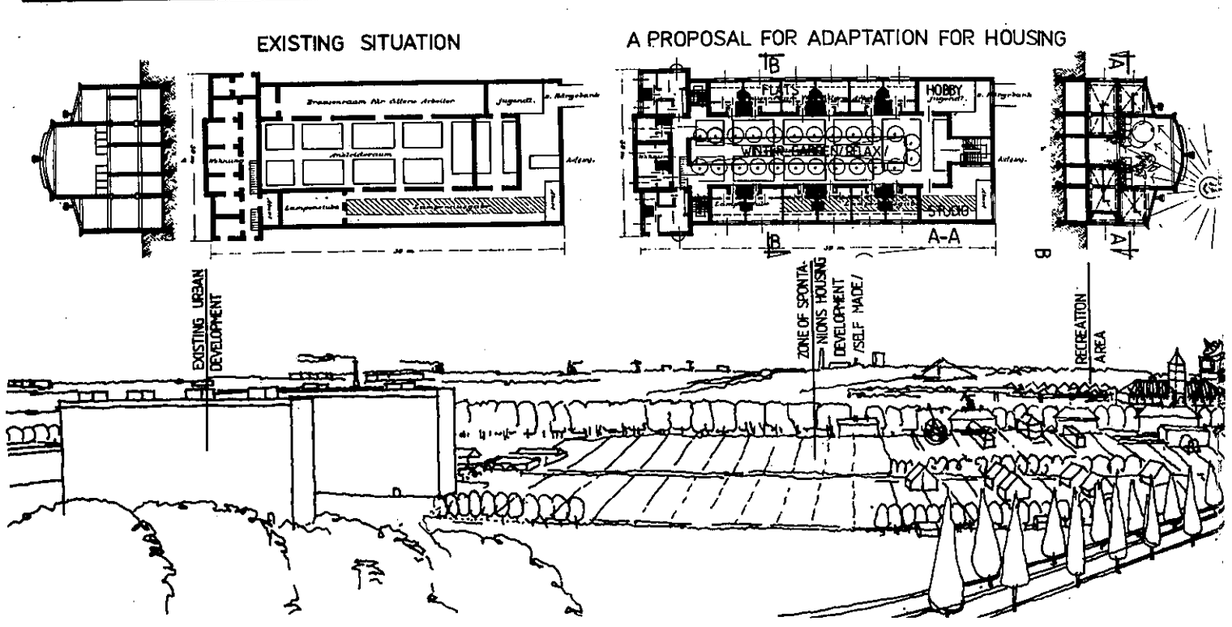


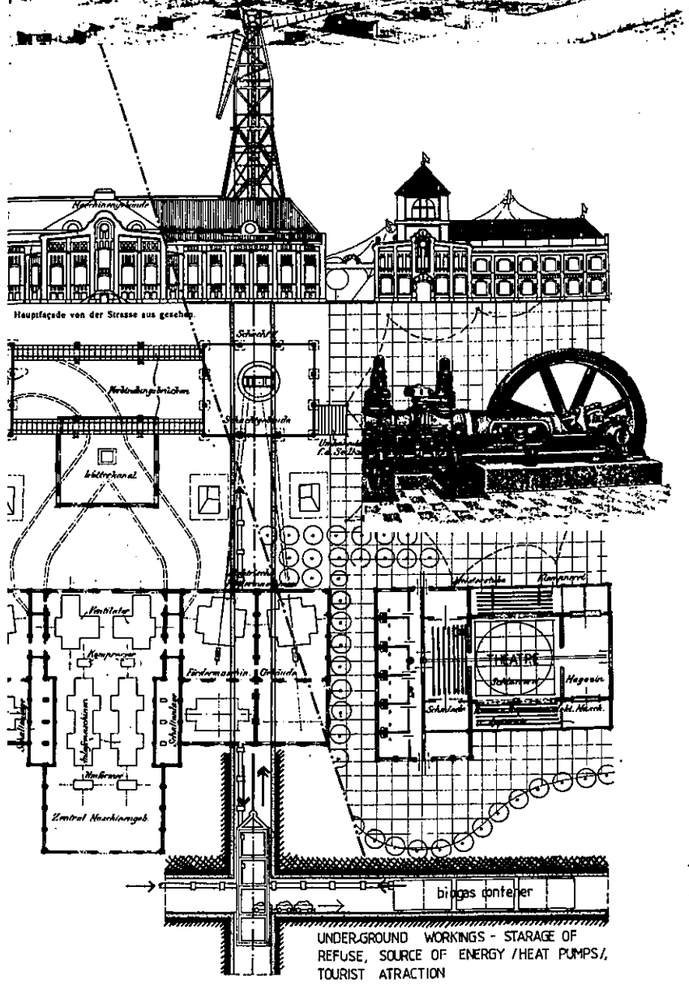
A VIEW OF THE COUNTRY SIDE WITH ADAPTED COAL MINE

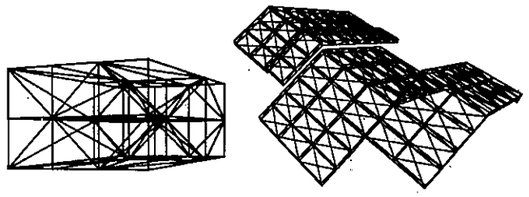




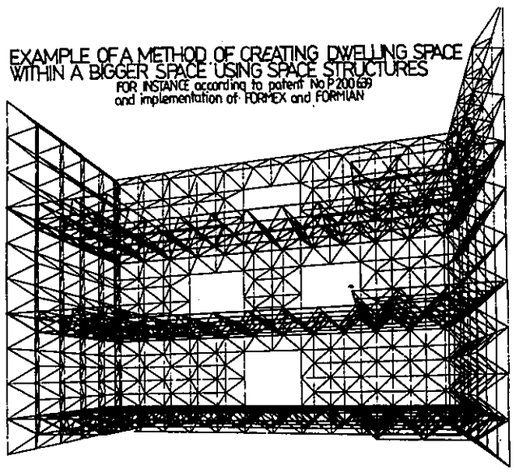
THE INTERIORS OF THE COAL MINE BUILDINGS - THE POSIBILITY TO ADAPT FOR SOCIAL PURPOSES / CULTURE, SPORTS, SCHOOL/

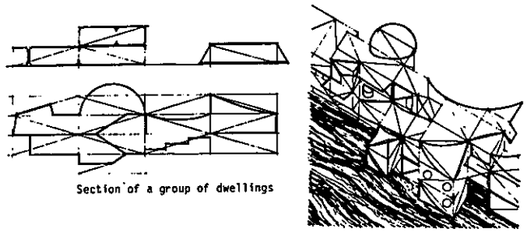


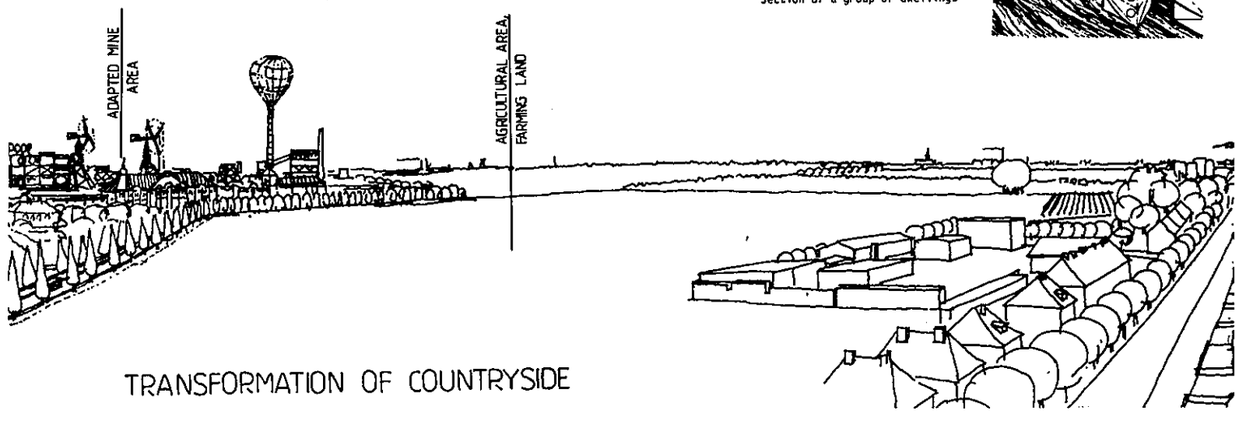




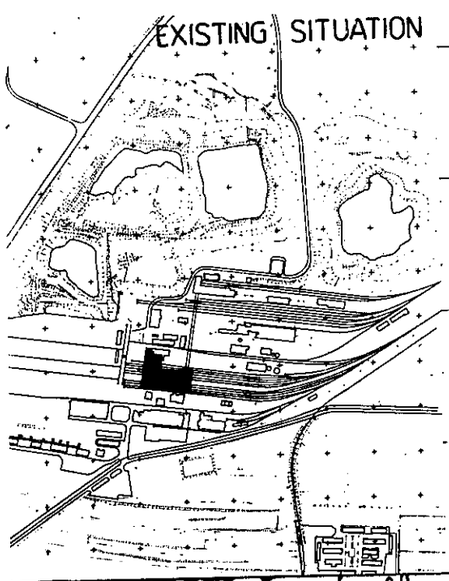
EXAMPLE OF A METHOD OF CREATING DWELLING SPACE WITHIN A BIGGER SPACE USING SPACE STRUCTURES
FOR INSTANCE according to patent No P 200659
and implementation of FORMEX and FORMIAN

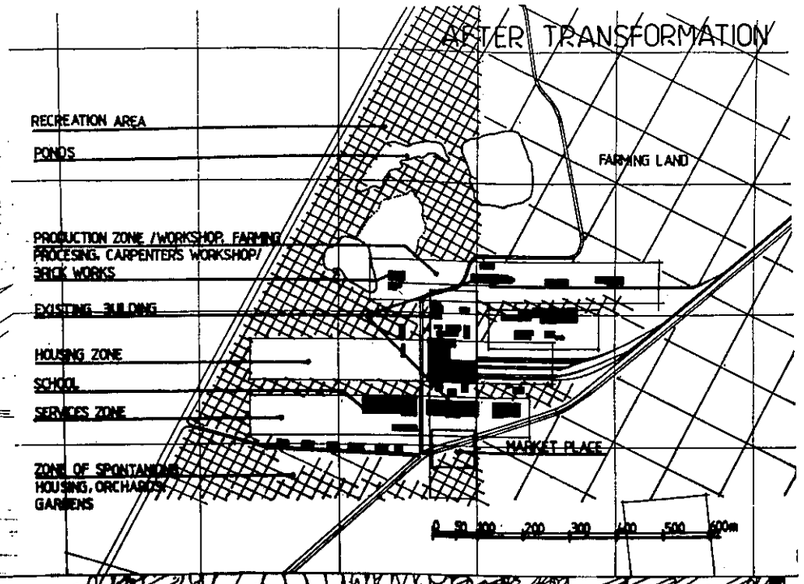


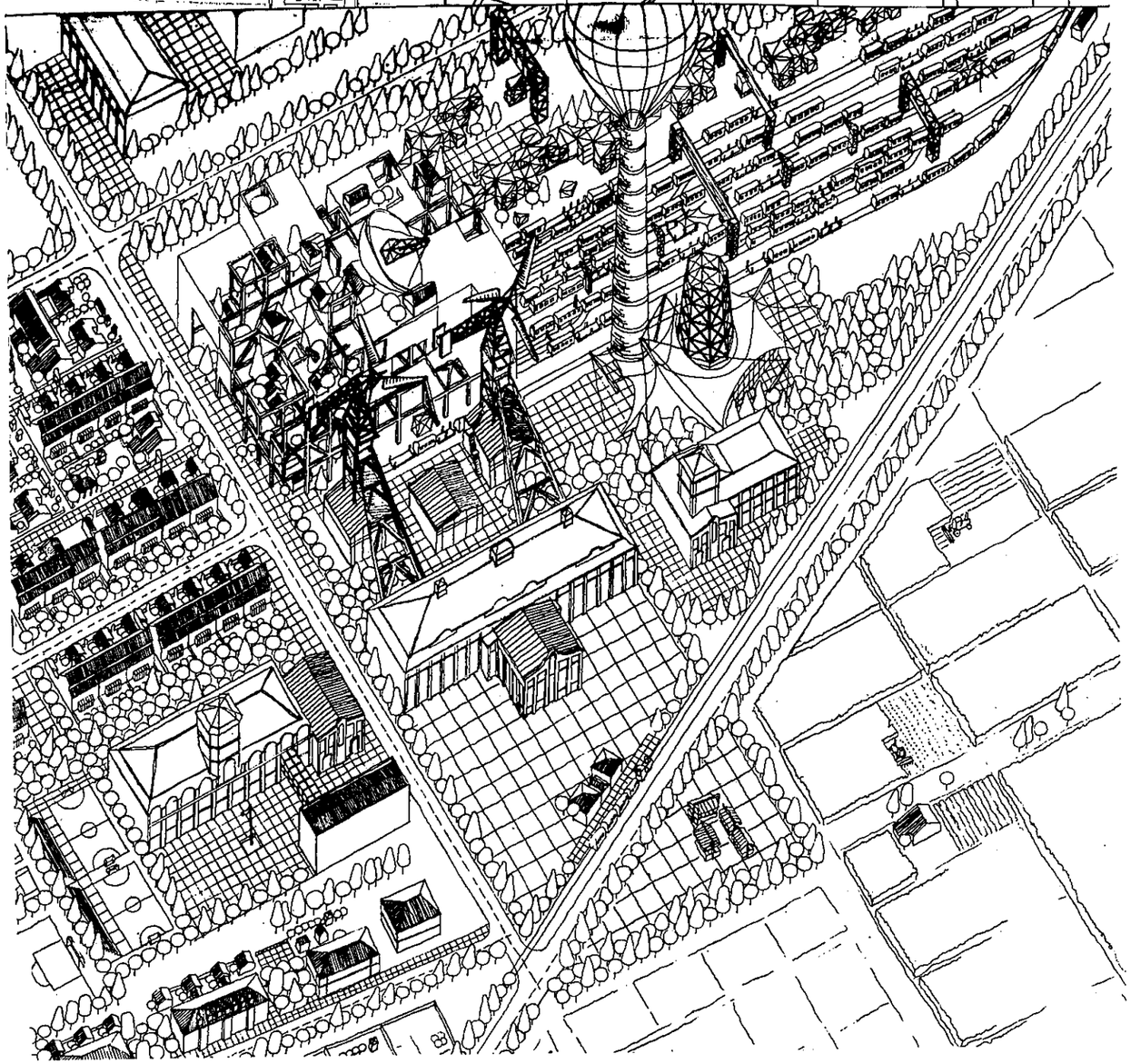




TRANSFORMATION OF COUNTRYSIDE







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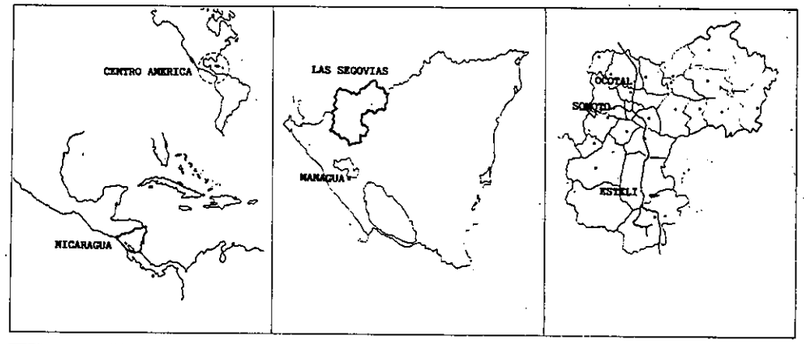
SECTOR II : SOLUCION ARQUITECTONICA PARA LA REALIZACION DE VIVIENDA RURAL
EJEMPLO : ASENTAMIENTOS AGRICOLAS EN LA REGION I , LAS SEGOVIAS. NICARAGUA

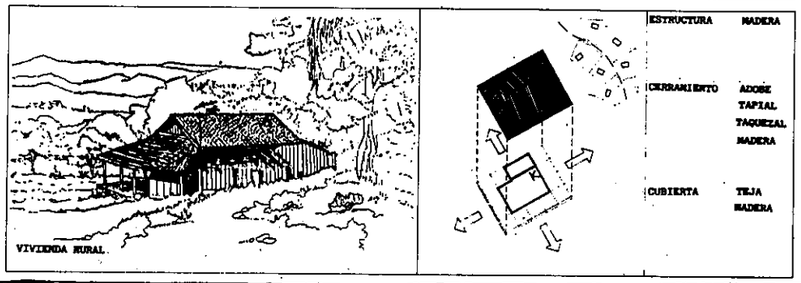
"...No regales un pez, enseña a pescar..."

Se propone una solución arquitectónica para proyectar y autoconstruir vivienda.

El método, aplicable a cualquier lugar concreto consiste en diseñar:

1. UN MANUAL DEL TÉCNICO, que define formal y dimensionalmente el espacio, permitiendo su agregación y subdivisión, así como la adaptación a las situaciones más elementales y más complejas, tanto iniciales como evolutivas en el tiempo. Que propone las posibles morfologías urbanas, parcelas, equipamientos, viviendas y espacios que las componen así como los materiales, elementos y tecnologías utilizables. Y que permite elegir, adaptar y proyectas con la participación del usuario. Un único técnico, con el manual puede asistir a la construcción de varios pueblos.



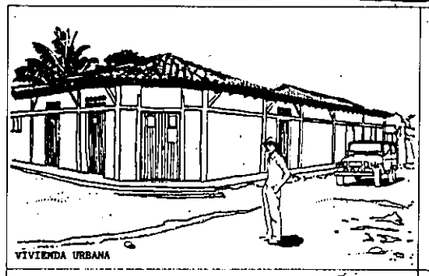


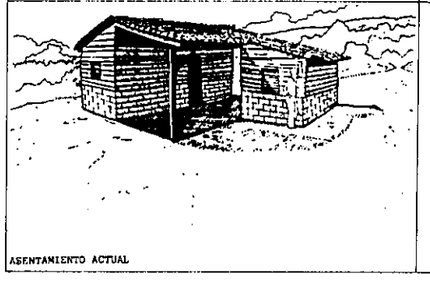
2. UN MANUAL DEL USUARIO, que le dice como construir lo seleccionado.

3. UNOS ELEMENTOS CONSTRUCTIVOS que, compatibles con los materiales y tecnologías autóctonas, sin dependencia tecnológica, faciliten la construcción y su crecimiento.

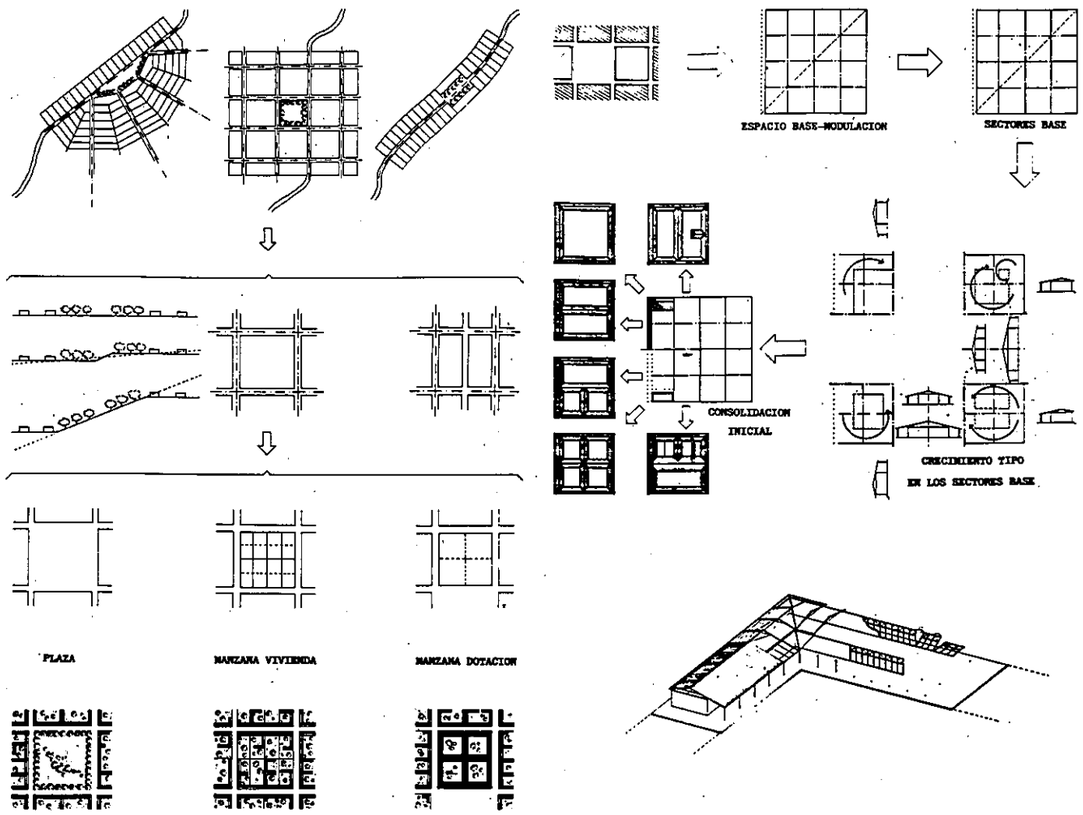
El diseño se realiza a partir de las condiciones físicas, sociales y económicas del lugar, de la manera de ser, de hacer y de vivir de su población, de sus tipologías edificatorias, de sus materiales y tecnologías, obteniendose distintos pueblos con personalidades propias; vivos, evolutivos.

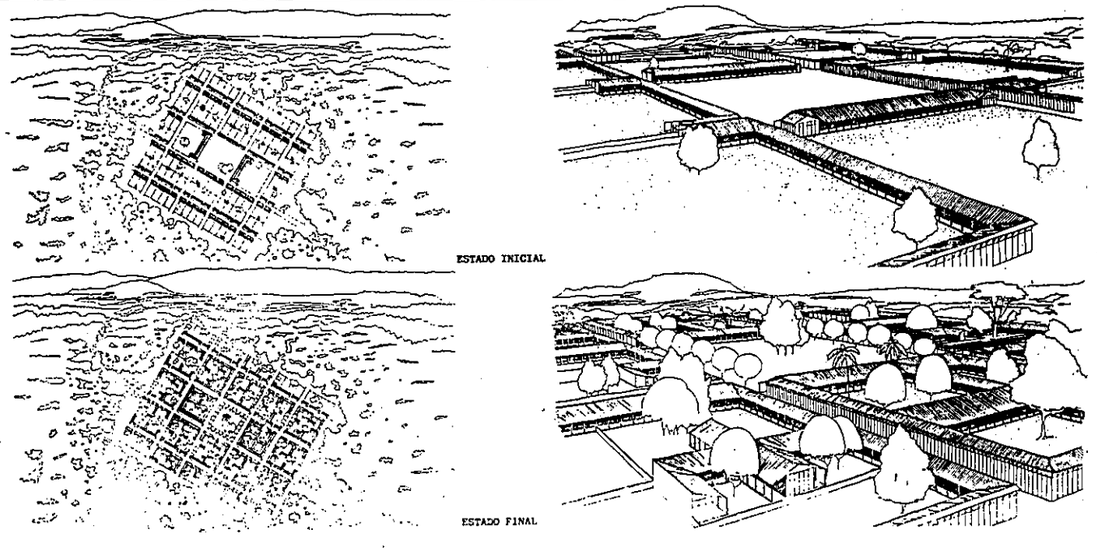
Para este concurso se aplica, como ejemplo, a la construcción de nuevos asentamientos agrícolas en la REGION I, "Las Segovias", en Nicaragua.



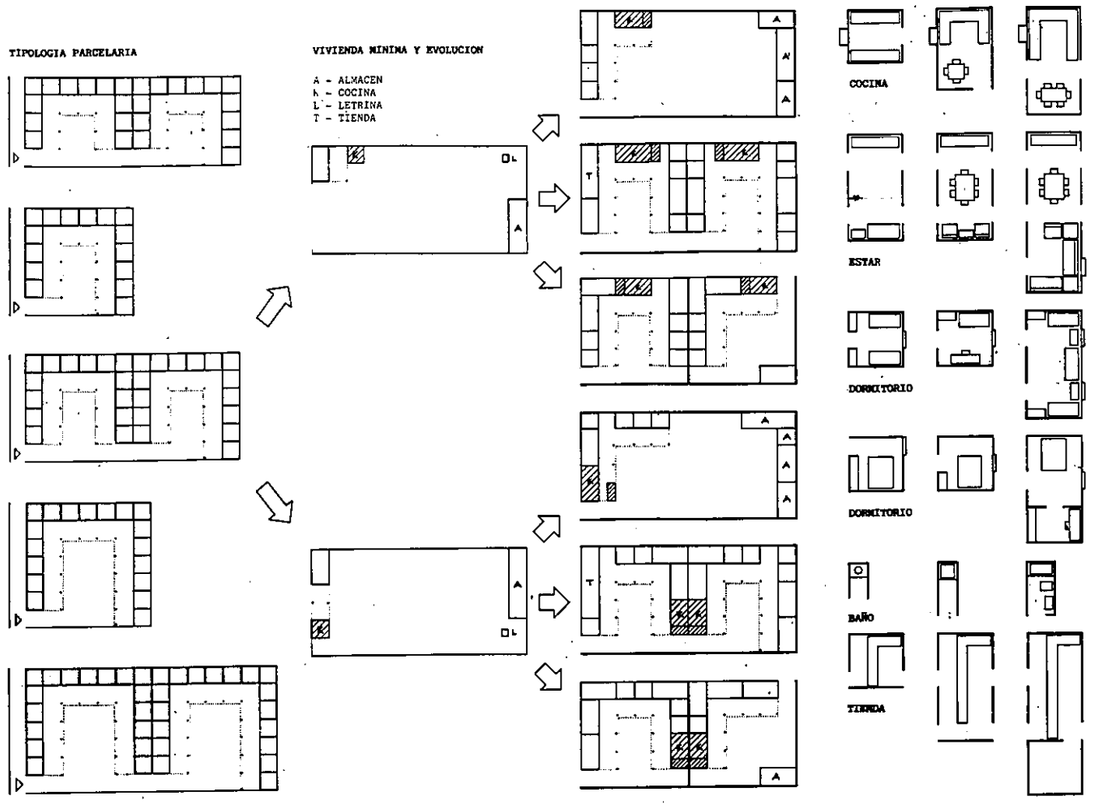


Asentamiento - Dotacion

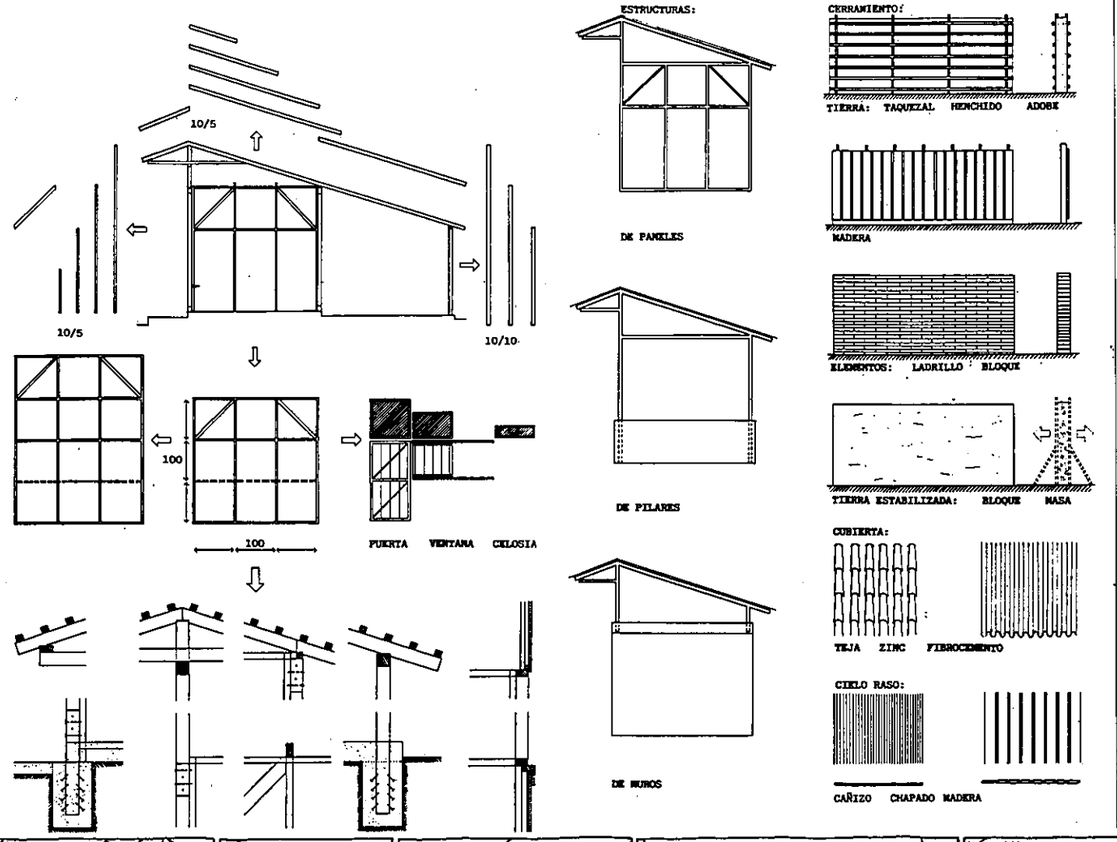


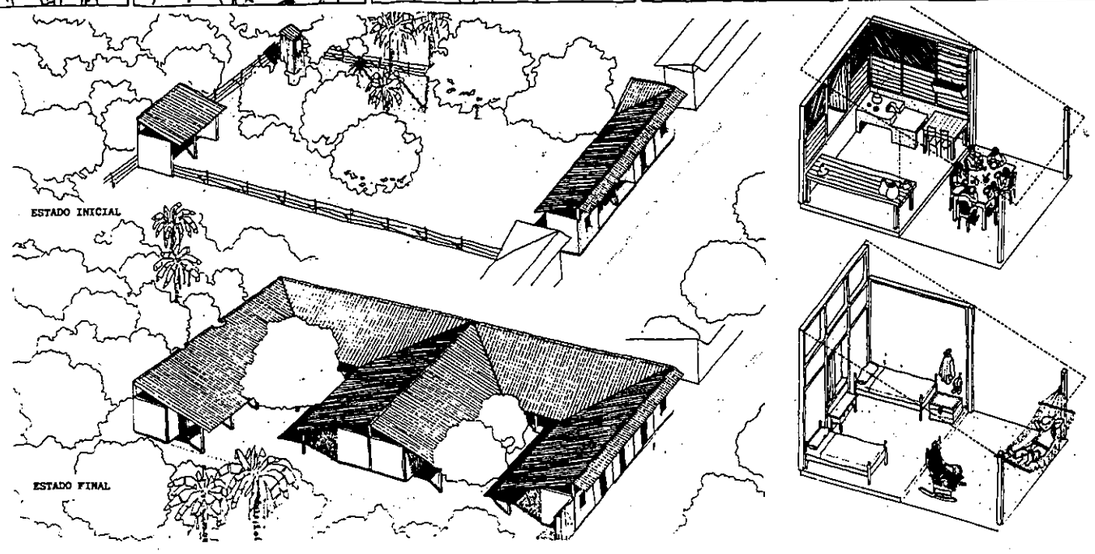


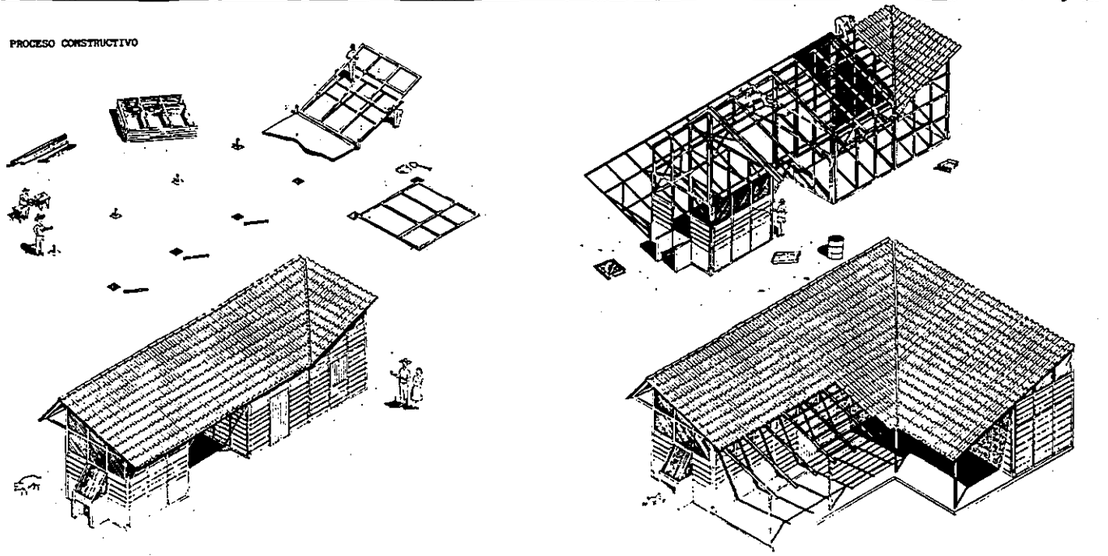
Vivienda - Espacios base



Elementos - Tecnologia







CINTUS 1986/87

Certámen Internacional de Soluciones sobre Nuevas Tecnologías de la Vivienda Social

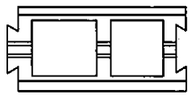
CONTRIBUCION A LAS NACIONES UNIDAS
AÑO INTERNACIONAL DE LA VIVIENDA PARA LAS PERSONAS SIN HOGAR

SISTEMA
SISTEMA DE AUTOCONSTRUCCION SISMO-RESISTENTE
Que se basa en el engarce mecánico, tanto horizontal como vertical, de bloques modulares de hormigón para conformar mamposterías, tanto portantes como divisorias.

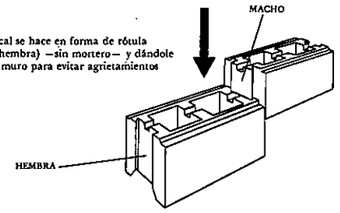
Sistema Técnico de Vanguardia para Programas de Autoconstrucción

- Guía para proyectos de Construcciones Sismo-Resistentes
- Sencillo • Rápido • Económico

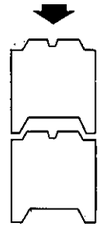
ALTERNATIVA A LA CIUDAD ESPONTANEA

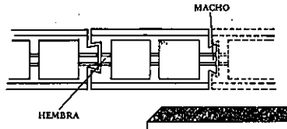


El sistema de engarce vertical se hace en forma de rótula en cola de milano (macho-hembra) —sin mortero— y dándole la flexibilidad suficiente al muro para evitar agrietamientos y fallas por el sismo.



- Ideal para viviendas populares y planes de autoconstrucción
- No requiere mortero de pega
- 30% más económico, 4 veces más rápido que los sistemas tradicionales
- Recuperable en un 90% en obras provisionales
- Simplifica la ejecución de instalaciones
- Aislante acústico-isotérmico-evita humedades
- Permite el uso intensivo de mano de obra no especializada

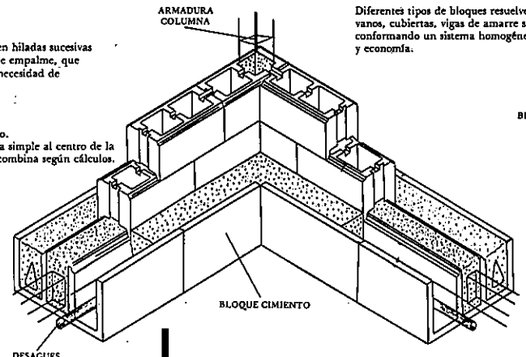




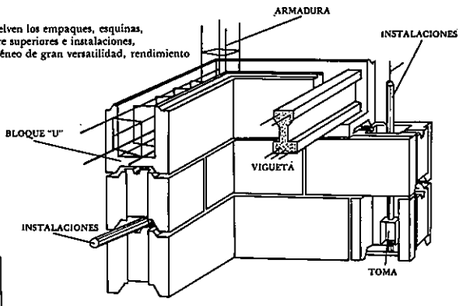
EL DESARROLLO CONSTRUCTIVO

Horizontalmente los bloques se apoyan en hiladas sucesivas que encajan entre sí, formando juntas de empalme, que absorben las presiones horizontales, sin necesidad de mortero.

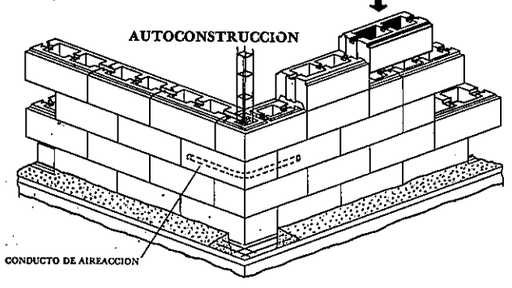
CIMENTACION
Según capacidad portante del suelo.
Se utiliza una viga o zapata corrida simple al centro de la triple "U" (Bloque-cimiento) o se combina según cálculos.



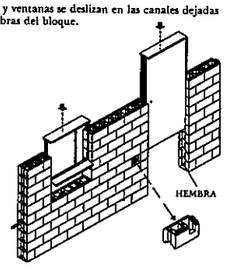
Diferentes tipos de bloques resuelven los empaques, esquinas, vanos, cubiertas, vigas de amarre superiores e instalaciones, conformando un sistema homogéneo de gran versatilidad, rendimiento y economía.



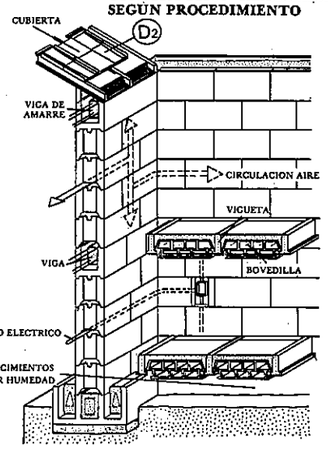
AUTOCONSTRUCCION

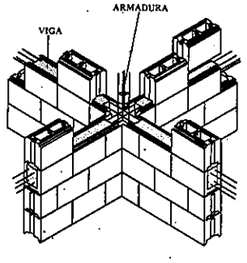


Las puertas y ventanas se deslizan en las canales dejadas por las hembras del bloque.



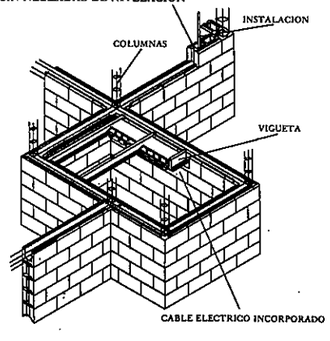
CORTE PARCIAL/EJEMPLO CONSTRUCCION REALIZADA SEGUN PROCEDIMIENTO

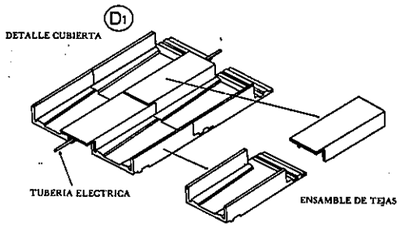




OTRO EJEMPLO DE CONSTRUCCION INTERSECCION Y EL ESBOZO DE UN PISO SUPERIOR

ARRANQUE DE UN PISO SUPERIOR SIN NECESIDAD DE NIVELACION

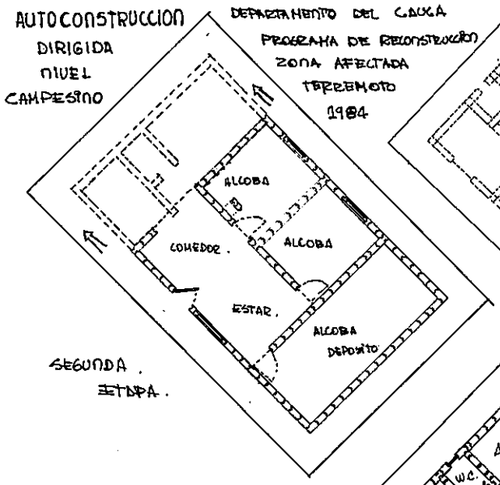




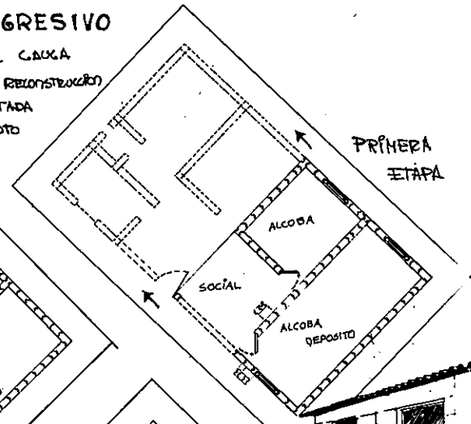
DESARROLLO RURAL PROGRESIVO

AUTOCONSTRUCCION DIRIGIDA NIVEL CAMPESINO

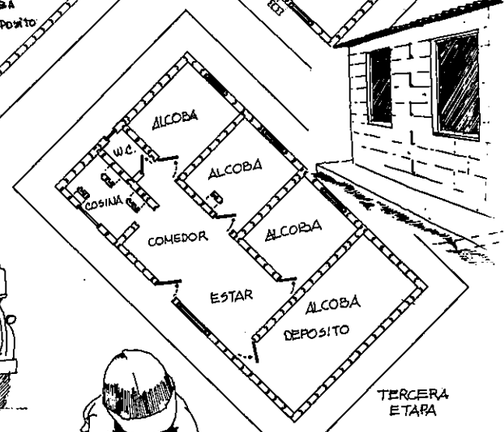
DEPARTAMENTO DEL CAUCA
PROGRAMA DE RECONSTRUCCION
ZONA AFECTADA
TERREMOTO
1984



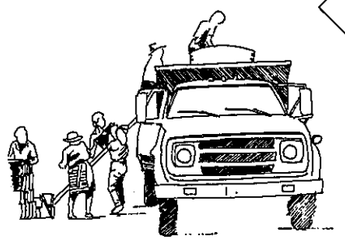
SEGUNDA ETAPA.



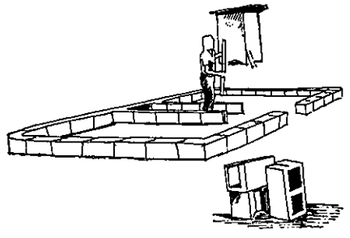
PRIMERA ETAPA



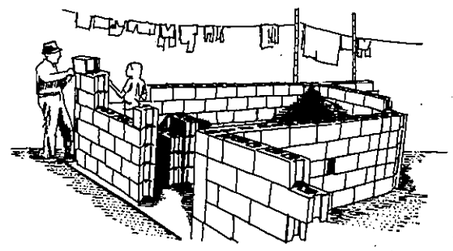
TERCERA ETAPA

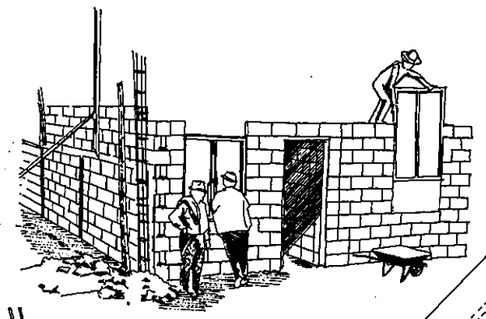


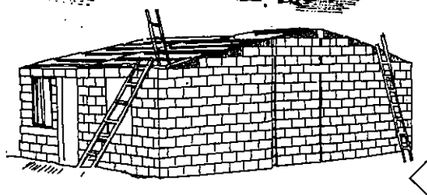
ACCION COMUNITARIA. PARTICIPACION GRUPO FAMILIAR

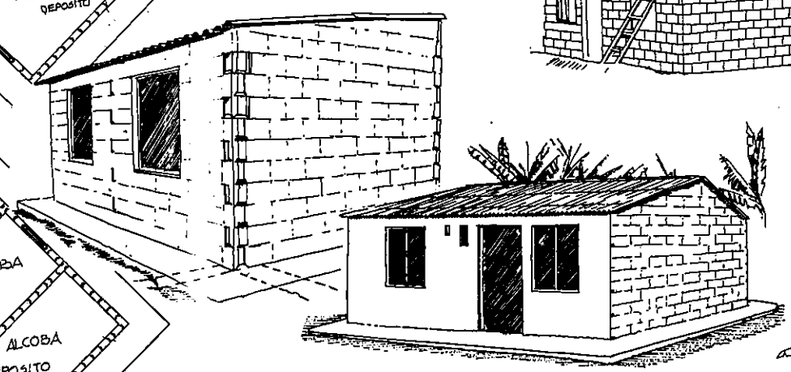


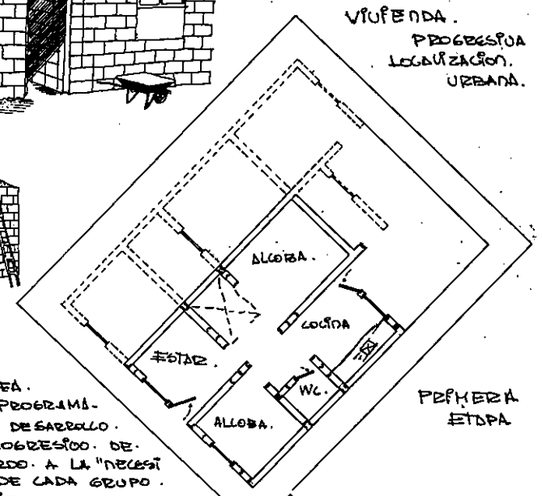
- SE CONSTRUYEN ANILLOS PERIMETRALES HILADA POR HILADA.



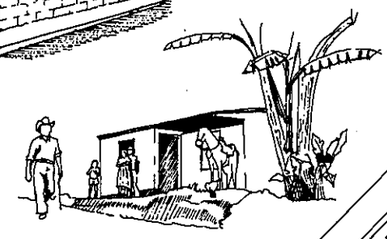


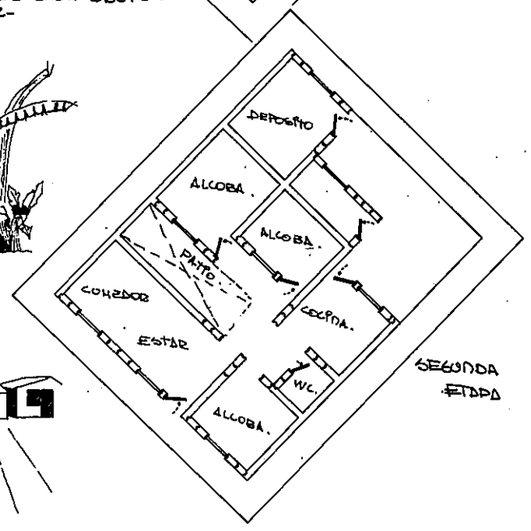


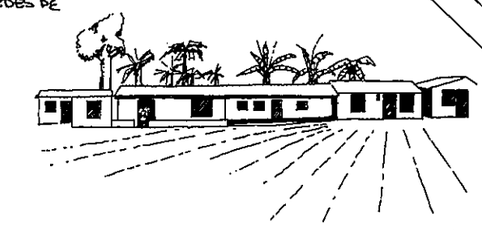




SE PLANTEA. LA PROGRAMACION CON UN DESARROLLO. PROGRESIVO. DE ACUERDO. A LA "NECESIDAD" DE CADA GRUPO. FAMILIAR.







"SISMORESISTENCIA"

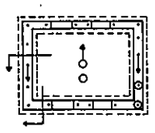
1º) LAS FUERZAS DEL TERREMOTO SE RESISTEN. CON UN SISTEMA DE CAJA.
- LAS PAREDES DEL PERIMETRO FUNCIONAN. COMO PAREDES DE ESFUERZO DE CORTE. Y COMO MUROS DE CARGA.
- LAS FUERZAS. HORIZONTALES. EN EL NIVEL DE TECHO SE DISTRIBUYEN A LOS ELEMENTOS RESISTENTES VERTICALES, HACIENDO USO. DE LA CUBIERTA Y SU REDONDEZ COMO UN DIAFRAGMA.

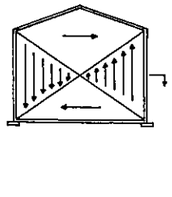
2º)- EL CENTRO DE MASA Y EL CENTRO DE RIGIDEZ. SE MANTIENEN. CERCA. UNO DEL OTRO PARA MINIMIZAR. LA TORCION.

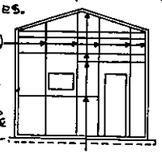
3º). LOS CIMIENTOS PAREDES Y TECHO SE. MANTIENEN JUNTOS, CON BARRAS DE REFUERZO COLOCADAS EN CELDAS RELLENAS. DE CONCRETO Y EN HUELLAS DE ANDARE.

4º). LAS CAJAS NORMALES A LAS PAREDES SE MANTIENEN. - (RESISTEN) CON REFUERZO. VERTICAL QUE DISTRIBUYE LAS FUERZAS AL TECHO ENTREPISO - Y FUNDACIONES.

5º) EL REFUERZO VERTICAL A LAS FUNDACIONES. (HORIZONTAL) EN LAS PAREDES. - DE CORTE RESISTEN. LAS FUERZAS. DE MOMENTOS. Y DE ESFUERZOS DE CORTE. SE COLOCA REFUERZO EN LAS ESQUINAS DE LAS PAREDES, ALREDEDOR DE LOS HUECOS Y ADYACENTES. AL TECHO Y FUNDACION

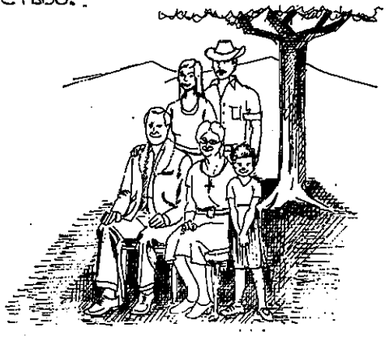






"CONCLUSION"

VEMOS REFLEJADO EL SISTEMA PROPUESTO, TANTO EN EL "SECTOR II" COMO EN EL "SECTOR III" POR SU FORMA Y CONDICION DE APLICACION EN DOBLE ESCALA. Y POR EL METODO SENCILLO DE EDIFICACION. QUE PERMITE LA PARTICIPACION INTEGRAL DE UN GRUPO HABITACIONAL DIRECTAMENTE. AFECTADO.



- **ANTECEDENTES**

CONCIENTES DEL DÉFICIT HABITACIONAL QUE AÑO TRAS AÑO, HA VENIDO INCREMENTÁNDOSE EN ESTE PAÍS Y QUE CON EL TRÁGICO SINIESTRO ACAECIDO EN FECHAS RECIENTES, LO HA ACRECENTADO AÚN MÁS, LO CUAL HA ALEJADO SUSTANTIVAMENTE LA POSIBILIDAD DE OFRECER A LA MAYORÍA DE NUESTROS HERMANOS DE UN HABITAT: DECOROSO —DIGNO Y HUMANO— QUE LOS REHABILITE SOCIOECONÓMICAMENTE Y LOS INTEGRE AL PROCESO DE DESARROLLO SOCIAL.

"UN HOMBRE SIN TECHO ES UN HOMBRE SIN PATRIA".

POR LO CUAL SOMETEMOS A LA OPINIÓN GENERAL UN SISTEMA DE "AUTOCONSTRUCCIÓN TOTAL" QUE PERMITA LA INTERACCIÓN E INTEGRACIÓN FAMILIAR COMO ÚNICO MEDIO DE APROVECHAR ESE GRAN POTENCIAL HUMANO QUE EN BUENA MEDIDA HA SIDO DESAPROVECHADO PARA SOLUCIONAR SU PROPIO PROBLEMA.

"EL PUEBLO RECONSTRUYE SU PUEBLO".

- **AUTOCONSTRUCCIÓN**

LA SENCILLEZ DE LOS ELEMENTOS QUE COMPONEN EL SISTEMA. COMPARÁNDOLO A UN MECANNO DE LA CONSTRUCCIÓN, PERMITEN UNA IDENTIFICACIÓN CLARA Y PRECISA, QUE FACILITAN EL PROCESO CONSTRUCTIVO.

— SE ELIMINA LA UTILIZACIÓN DE EQUIPOS SOFISTICADOS —HERRAMIENTAS TÉCNICAS— ENCOFRADOS O FORMALETAS DE MADERA.

— SE SIMPLIFICA Y ESTANDARIZA LA ESTRUCTURA E INSTALACIONES EN GENERAL (HIDRAULICA-ELÉCTRICA).

— LA COLOCACIÓN DE PUERTAS Y VENTANAS SE REALIZA POR ENSAMBLE.

— SE ELIMINA LA UTILIZACIÓN DE MANO DE OBRA ESPECIALIZADA.

"LA CONSIDERACIÓN DE ESTOS FACTORES, UBICAN AL SISTEMA DE CONSTRUCCIÓN PROPUESTO COMO ÓPTIMO PARA EL DESARROLLO MASIVO HABITACIONAL POR **AUTOCONSTRUCCIÓN PROGRESIVA.**

- **ECONOMIA**

AL MINIMIZAR TODO EL PROCESO CONSTRUCTIVO EN SUS DISTINTAS FASES:

— NO REQUERIR MORTERO DE PEGA (MEZCLA) ENTRE JUNTAS.

— AL REDUCIR EL MANEJO DE INSUMOS: CEMENTO - ARENA - AGUA - HERRAMIENTAS.

— AL ELIMINAR LOS DESPERDICIOS.

— LA MANO DE OBRA ESPECIALIZADA.

— Y AL REDUCIR EL TIEMPO DE EJECUCIÓN DE OBRA 3 VECES, SE CONVIERTE EL SISTEMA PROPUESTO EN "ÓPTIMO" POR OFRECER UNA ECONOMÍA GLOBAL DEL 30%. COMPARADA A LOS SISTEMAS TRADICIONALES.

1234527

Los nuevos pobres

La extrema pobreza ya tiene otro rostro. En [illegible] Montevideo, vía de los [illegible] corrió esta semana se refugian ahora obreros y empleados, hombres y mujeres jóvenes con trabajos e ingresos fijos, en su mayoría provenientes del área metropolitana.

Es gente pauperizada por el deterioro del salario real, acorralada [illegible] del transporte [illegible] que ahora [illegible]

BANCO HIPOTECARIO DEL URUGUAY

Padres que Caminan 20 km. al día

La inocencia infantil no [illegible] social al [illegible]

MANTENIMIENTO DEL STOCK DE VIVIENDAS

AUMENTO DEL NUMERO DE UNIDADES HABITACIONALES

¿El BHU ha decidido suprimir las cooperativas de usuarios?

INFORMATIVO DE PRESTAMOS

"Si te quedás, la miseria te gana"

Hay que pregonar con ganas la mercancía para atraer a los que pasan y asarle un jornal a la suerte. Si no se grita no se vende y si no se vende no se come ni se paga el alquiler.

Vivienda: un problema que se agrava

El frío aumenta y los desalojos se multiplican en el corazón de la ciudad. No se trata de trabajadores cuyos jornales no alcanzan para pagar un alquiler. [illegible] paralelamente, otros aspectos del problema entre ellos [illegible]

Los desalojados explicaron: "Era una casa enorme, abandonada. Nosotros estábamos en la calle. No teníamos dónde vivir. ¿Qué íbamos a hacer? Entramos y chau. Estuvimos 18 meses y al final nos echaron, ya viste. Pero es injusto. ¿no? Una casa sin nadie y nosotros sin casa. ¿Qué te parece?

LINEAS DE CRE[illegible] O/S 8020 - Of.

El techo se llama felicidad

—Un techo... ¿sabés qué es —dijo Nilda T. de Amo[illegible]

EL PAIS — Lunes 11 de Marzo de 1985

El cantegril ya está en la ciudad

En este mismo momento, aquí en Montevideo, 12 familias compuestas por 24 mayores y 37 niños están viviendo [illegible] calle, soportando lluvia, frío [illegible] venientes imaginab[illegible] diador[illegible]

Miles de Niños Entre la Basura

Miles de niños uruguayos, como éste, viven actualmente entre la basura que [illegible]

FLORIDA Y MERCEDES: el desamparo a la luz del día

INQUILINOS DE PENSIONES DENUNCIAN PRECIOS ALTOS Y PESIMAS CONDICIONES

[illegible] cha quedó constituida la Comisión de Inquilinos de Pensiones, la que ha formado a los efectos de luchar en defensa [illegible]

[illegible] dos por decenas de personas, los inquilinos [illegible] ca[illegible] tas pen[illegible]

[illegible] tuación que atraviesan cientos de estos inquilinos, al tiempo que plantearon sus solicitudes, que apuntan fundamentalmente al cese de de[illegible]

[illegible] diariamente, de 19 a 20 horas, a ADEOM (Canelones 1539) [illegible] de Inquilinos.

El techo

Desalojados: otra vez de un lado a otro...

FOTOGRAFIA DE NANCY URRUTIA

PROPUESTA DE MEJORAMIENTO DE LAS CONDICIONES DE HABITACION EN LAS AREAS CENTRALES DE MONTEVIDEO

Año Internacional de la Vivienda para las Personas sin Hogar

UNA REALIDAD CRITICA

1. *El acentuado descenso del salario real, la contracción del empleo, la liberalización de precios en los rubros de alimentación, vivienda, salud, han empujado en los últimos años a miles de familias uruguayas al deterioro de sus condiciones de vida hasta límites extremos de pobreza.*

2. *La búsqueda de alternativas de sobrevivencia ha supuesto para muchas de estas familias la lucha por permanecer o afincarse en las áreas centrales de la ciudad lo cual significa:*

Una posición más competitiva de su oferta de trabajo hacia un área que contiene mayores y más variadas oportunidades de empleo.

Una posición más competitiva para el desarrollo de actividades dentro del sector informal de la economía (venta callejera, recolección de basura, etc.)

La posibilidad de permanecer integrado a una trama de relaciones sociales y una forma de vida barrial.

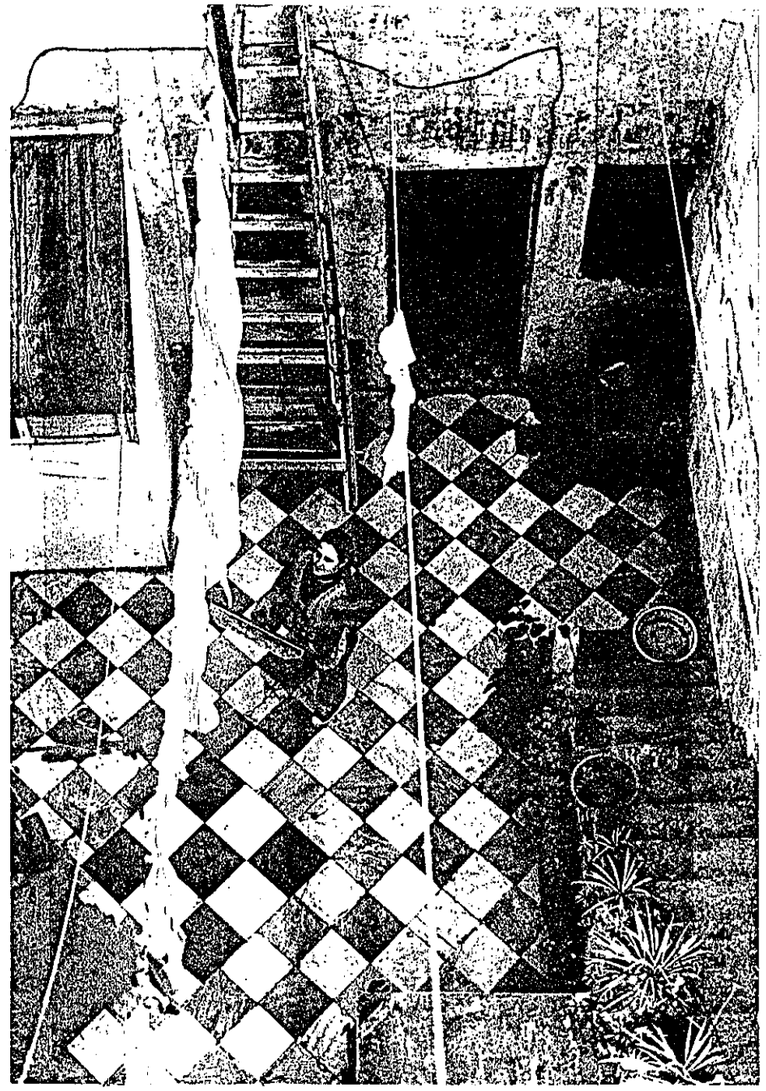
3. *La existencia de un importante stock de viviendas antiguas en las áreas centrales constituye el soporte físico capaz de dar cabida a las aspiraciones de permanencia o afincamiento en el área.*
Con diferentes estados de mantenimiento y en diversas situaciones legales, estas tipologías de vivienda son el común denominador de una amplia gama de situaciones que dan lugar a diferentes formas de vivienda colectiva, ("inquilinato", "pensión", vivienda "invadida").

LA VIVIENDA INVADIDA

La existencia de numerosas fincas desocupadas supone la posibilidad de ser ocupada por una o más familias. La probabilidad de permanencia en ella por un período más o menos prolongado de tiempo, dependerá de la actitud del propietario que oscila entre la permisividad y el desalojo compulsivo mediante el uso de la fuerza pública.
Las condiciones de habitabilidad son muy deficientes debido a las carencias de energía eléctrica y agua potable, y se ven acentuados por la depredación efectuada por el propio usuario.

PENSIONES E INQUILINATOS

Una demanda creciente de alojamiento ha convertido a muchas viviendas antiguas en un redituable negocio. Transformados en "casas de inquilinato" se alquilan en condiciones abusivas por piezas, en cada una de las cuales se aloja un núcleo familiar completo, debiéndose compartir con muchas otras familias, los escasos y por lo general deficientes servicios higiénicos, el núcleo familiar se ve obligado a pagar por la "pieza" el equivalente al alquiler de una vivienda individual localizada en zonas atractivas de la ciudad. El no contar con el respaldo de las "garantías" exigidas por las empresas inmobiliarias explica tan paradojal situación.

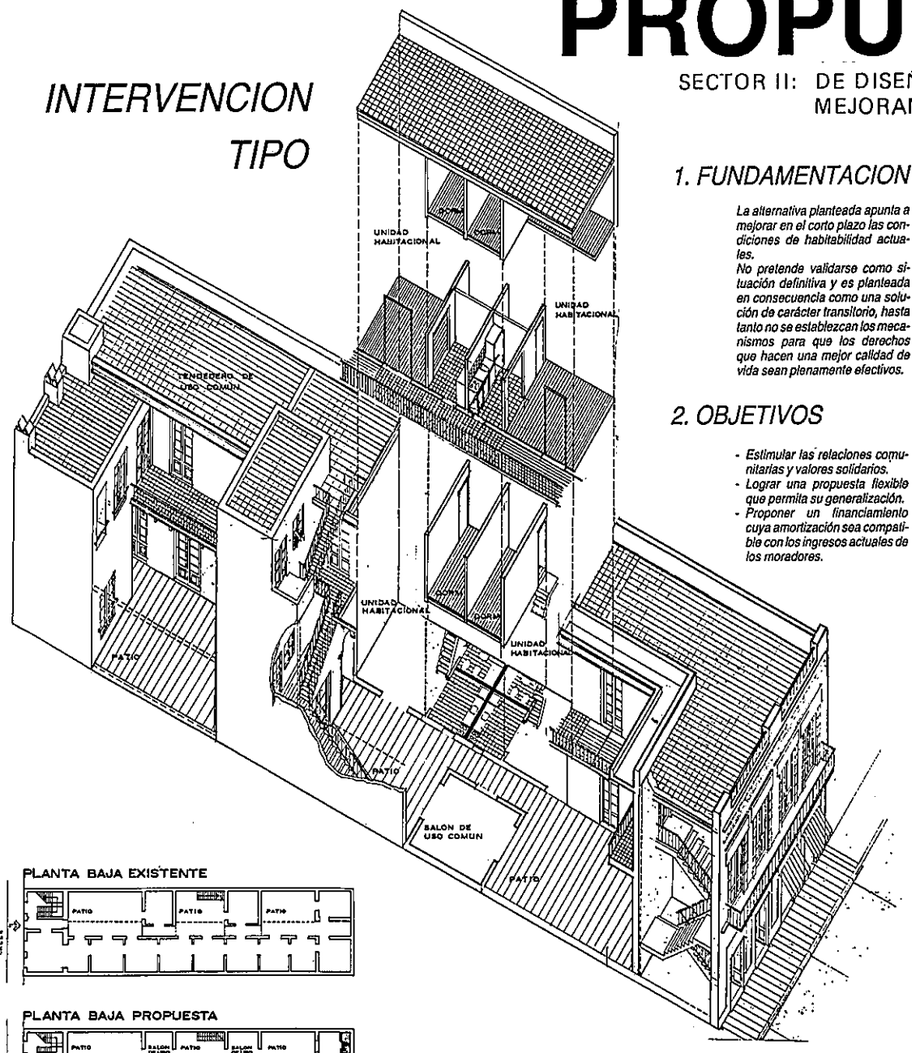


En la "Ciudad Vieja", casco antiguo de la ciudad de Montevideo la situación es particularmente crítica. Según datos de un relevamiento reciente se contabilizaron 52 viviendas invadidas, con un total de 1.211 habitantes, de ellos 562 niños. En pensiones e inquilinatos se contabilizaron 604 familias.

PROPUESTA

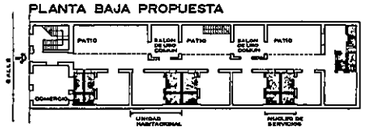
SECTOR II: DE DISEÑO Y METODOLOGIA DE MEJORAMIENTO DEL HABITAT.

INTERVENCION TIPO

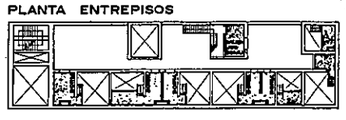


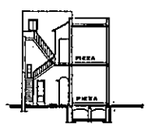
PLANTA BAJA EXISTENTE

PLANTA BAJA PROPUESTA



PLANTA ENTREPISOS





1. FUNDAMENTACION

La alternativa planteada apunta a mejorar en el corto plazo las condiciones de habitabilidad actuales.
No pretende validarse como situación definitiva y es planteada en consecuencia como una solución de carácter transitorio, hasta tanto no se establezcan los mecanismos para que los derechos que hacen una mejor calidad de vida sean plenamente efectivos.

2. OBJETIVOS

- *Estimular las relaciones comunitarias y valores solidarios.*
- *Lograr una propuesta flexible que permita su generalización.*
- *Proponer un financiamiento cuya amortización sea compatible con los ingresos actuales de los moradores.*

3. LINEAMIENTOS DE LA PROPUESTA

- *Incorporar baños y cocinas a la unidad de alojamiento, aislando un área de dormitorio para la pareja mediante la utilización de entrepisos.*
- *Lograr una solución flexible a efectos de contemplar las necesidades diferentes a partir de un nucleo de servicios, con distintas combinaciones de dormitorios en los entrepisos.*
- *Revalorizar patios y circulaciones como espacios de uso común, así como destinar las habitaciones entre patios para usos colectivos como reuniones, juegos, estudio, lavadero y tendederos de ropa en la azotea.*
  Racionalizar el proceso de construcción para lograr costos mínimos, mediante la reutilización de materiales como pisos de madera en entrepisos o como encofrados en casos de losas de hormigón armado.

4. VIABILIDAD

El crédito estatal es la única alternativa generalizable para atender la demanda de vivienda popular. El mismo debe contemplar la capacidad económica del prestatario a través de plazos, intereses y subsidios adecuados.
Para analizar la viabilidad financiera se consideró:

- *Una presupuestación en base a precios unitarios de empresas de mediano porte actuantes en el mercado local.*
- *El precio del inmueble en base al análisis del mercado inmobiliario y a los parámetros utilizados por el Banco Hipotecario del Uruguay para tasaciones en la zona.*
- *La capacidad de pago de los prestatarios tomando como hipótesis el que podrían disponer de un monto equivalente al destinado al pago del arrendamiento de la "pieza".*

Con estas consideraciones y tomando las mejores condiciones en cuanto a plazos e intereses, la propuesta se evidencia como capaz de atender al grueso de los núcleos familiares residentes en las áreas centrales, obteniéndose costos más bajos que para la construcción de vivienda nueva.

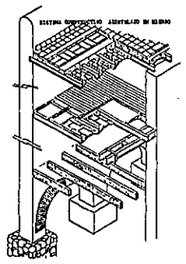
BHU – BANCO HIPOTECARIO DEL URUGUAY. Entidad estatal que monopoliza la financiación y administración del Plan de Vivienda.

LA VIVIENDA TIPO PREDOMINANTE

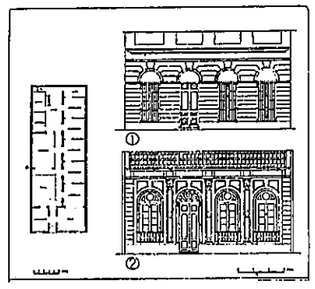
Generadas hacia fines de siglo y principios del presente las casas "standard" constituyen un importante valor patrimonial de Montevideo, tanto desde el punto de vista económico como testimonial.

La tipología predominante se estructura en base a la existencia de uno o más patios, rodeados de habitaciones, en la doble variante de patio central o lateral a cielo abierto o con claraboya, en uno o dos niveles.

Su flexibilidad para incorporar otros usos es constatable en la medida que no ha sufrido alteraciones espaciales importantes cuando ha sido utilizada para vivienda colectiva, oficina, comercio, talleres, etc.



Los agrupamientos aún existentes suelen configurar espacios urbanos de marcado valor ambiental.



Casa "Standard" — Planta y fachadas.

El tipo de intervención propuesta no ha sido aún motivo de aplicación real. Ha ido sin embargo, desde el momento de su formulación inicial conquistando creciente aceptación en los distintos niveles o sectores que deben coordinarse para viabilizar su efectiva concreción.
En cada uno de esos niveles se han registrado avances significativos a través de un largo proceso, que podrían permitir el inicio de experiencias a corto plazo.
En ese sentido se puede señalar:

A NIVEL ESTATAL

Las políticas de vivienda ensayadas en el país en el correr del siglo no consideraron el problema del mantenimiento del stock existente. Es recién a partir del II Congreso Nacional de Arquitectos(1983) y las instancias posteriores de la CONAPRO que el problema es motivo de atención y reconocimiento por parte de autoridades políticas y de gobierno.*
Desde ese momento comenzaron a implementarse políticas específicas y las consiguientes líneas de crédito, aunque sin contemplar plenamente a los sectores de bajos ingresos.
En el recientemente aprobado "Plan de Recuperación Urbana Prioritaria" para el área de la Ciudad Vieja se preveen condiciones más favorables en los préstamos. Un importante núcleo de familias hasta ahora imposibilitada de acceder a préstamo alguno podrían hacer frente a amortizaciones por montos que resultan similares a las que actualmente destinan al pago del arrendamiento de una "pieza".

Subsisten sin embargo limitaciones significativas:

- *Carencia de mecanismos de gestión colectiva y solidaria.*
  Es señalable que ha existido en el país desde 1968 una importantísima experiencia de vivienda cooperativa que posibilitó el acceso de amplios sectores populares a una vivienda decorosa y a darle conciencia de su capacidad de gestión.
- *Los montos de préstamos para la adquisición de vivienda usada no llegan a los valores reales del mercado, así como tampoco se contempla la posibilidad de adquisición del inmueble por varios núcleos familiares actuando conjuntamente.*
- *Carencia de mecanismos que regulen el precio de las casas antiguas, sujetas a la acción de la especulación privada. Una acción planificada y decidida por parte del Banco Hipotecario del Uruguay, adquiriendo en el mercado o por vía de expropiación un conjunto de fincas, podría amortiguar los efectos de tal situación.*
- *Carencia de alojamientos temporarios que permitiesen poner en funcionamiento una experiencia autosostenida en materia de realojamiento popular.*

A NIVEL MUNICIPAL

Las recientes disposiciones municipales (Dcto. Nº 22600 del 19/12/85) "Plan piloto experimental para rehabilitación de vivienda") al flexibilizar la aplicación de las normas referentes a las condiciones de habitabilidad e higiene de la vivienda, posibilitan el reciclaje de antiguas viviendas.

A NIVEL DE USUARIOS

La capacidad de participación demostrada a nivel popular en diversos planos se ha expresado también en la lucha por la mejora de las condiciones de vida en pensiones, inquilinatos y casas invadidas. Al respecto la formación de COPENCO (Coordinadora de Inquilinos de Pensiones y Casas Invadidas) y diversas acciones de Comisiones Barriales o Vecinales, son elocuentes testimonios de la capacidad ciudadana a pesar del insuficiente apoyo estatal.

Algunas experiencias concretas son particularmente reveladoras de las posibilidades del accionar colectivo. Tal el caso de un grupo de vecinos, que asume el compromiso colectivo del pago del alquiler mediante el concurso de una institución de promoción social que le sirve de garantía inmobiliaria. Esta experiencia desarrollada en el Barrio Sur es promovida por el "Instituto del Hombre" que brinda además su asesoramiento y apoyo para procesar una nueva modalidad de convivencia. A la disminución del costo del alquiler de cada pieza (al contratarse el arrendamiento del total de la finca) se suman otros logros. El uso compartido de habitaciones por adolescentes del mismo sexo permite un aprovechamiento más racional del espacio disponible que redunda en un mejoramiento de las condiciones de privacidad de la pareja. Complementariamente debe señalarse que la apropiación de los espacios comunes se resuelve de forma conjunta sin mediar la desición unilateral del arrendador.

A NIVEL TECNICO

La circunstancia de tener que operar con el stock de viviendas existentes, particularmente significativas en el Uruguay (1) ha implicado en primer término la revisión de la doctrina y las prácticas arquitectónicas tradicionales.
Los esfuerzos realizados por entidades privadas y por la Sociedad de Arquitectos del Uruguay en la profundización del debate en torno al tema hace que el cuerpo profesional esté en mejores condiciones y cuente con suficientes elementos a nivel teórico, proyectual y tecnológico-constructivo.
La acumulación de experiencias permitirá verificar la viabilidad económica y social de tipo de intervención.

* *CONAPRO – Concertación Nacional Programática. Instancia de discusión y acuerdo entre partidos políticos, fuerzas sociales y sindicales desarrollada en el contexto de la reinstitucionalización del país. (1984-1985)*

(1) – El problema del mantenimiento del stock existente cobra mayor importancia relativa en la problemática habitacional del país, debido al escaso crecimiento demográfico producido en las últimas décadas.

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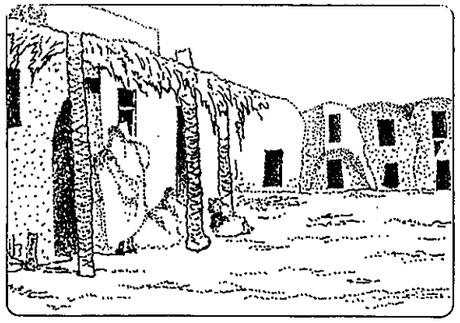
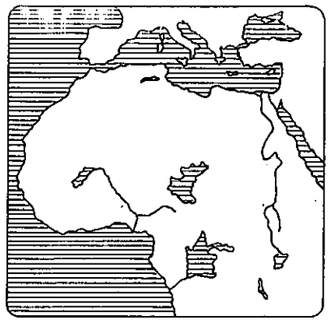
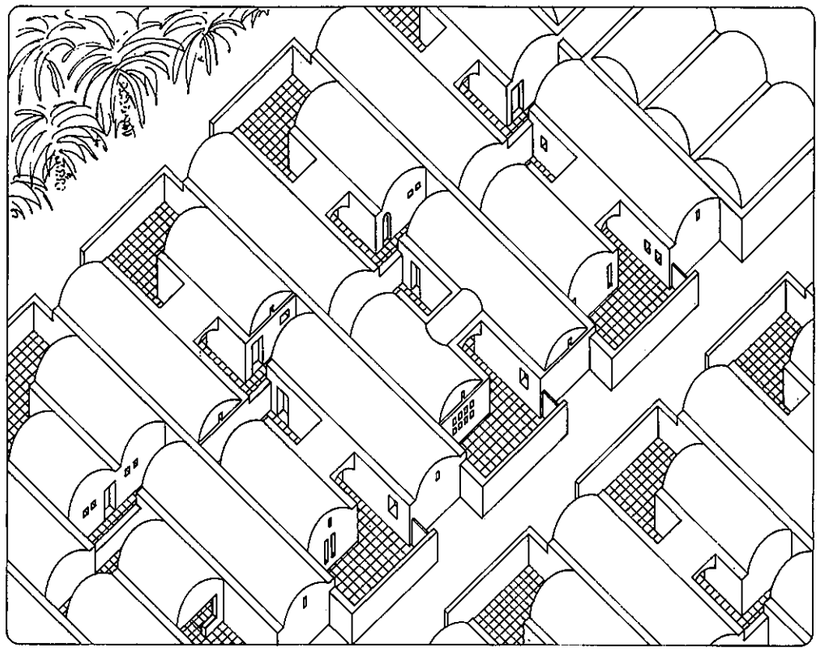
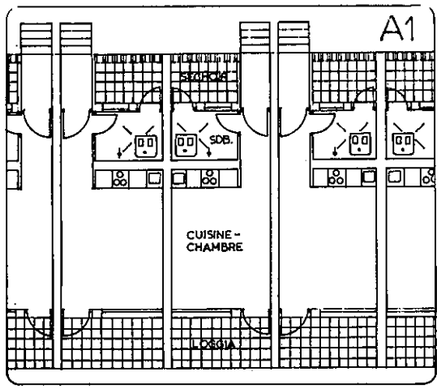
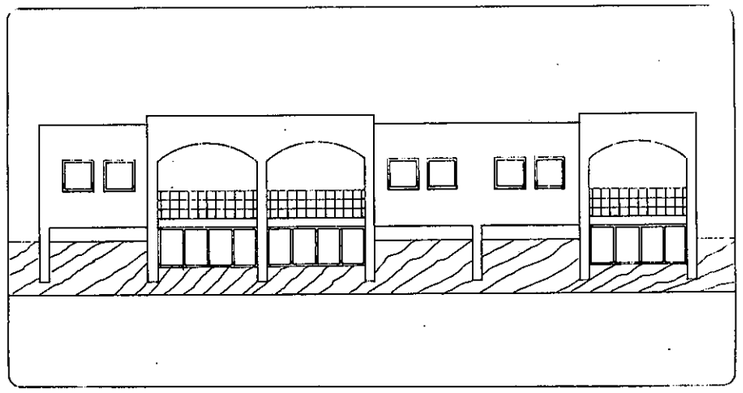


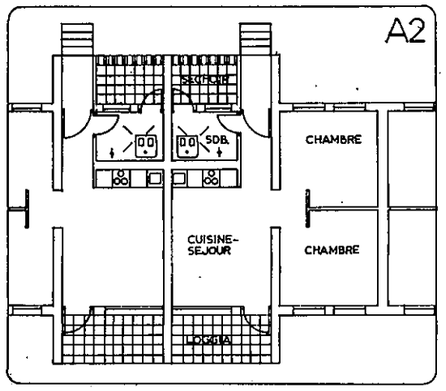


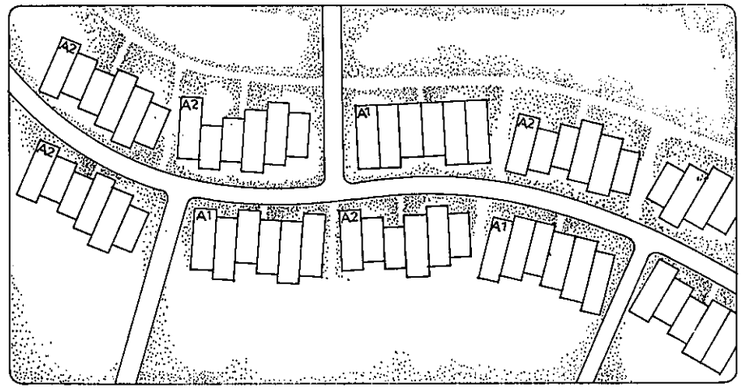


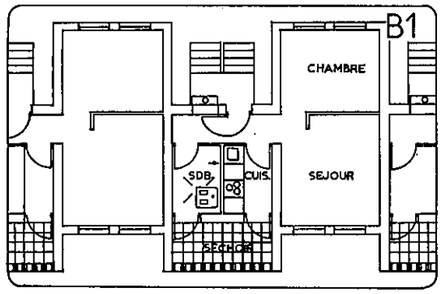
FOYER POUR SANS-ABRI II. SECTION

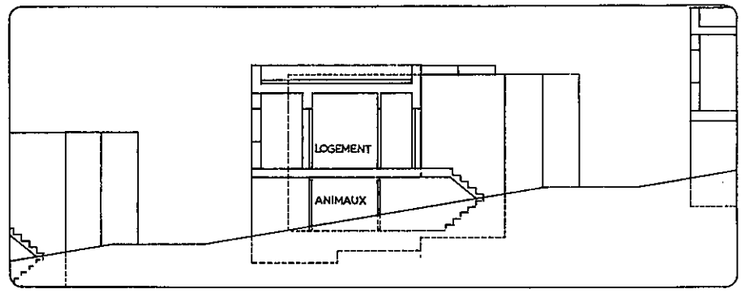


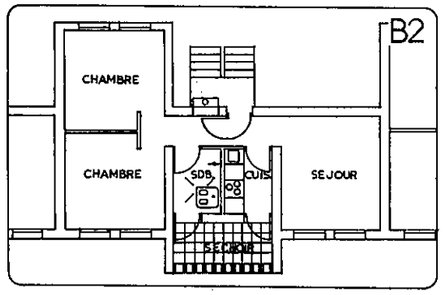


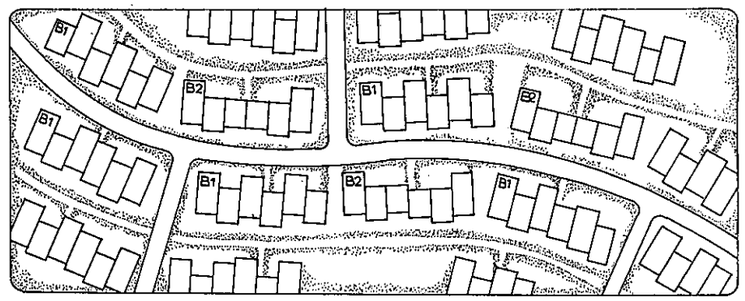


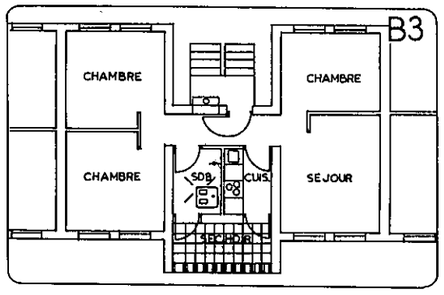


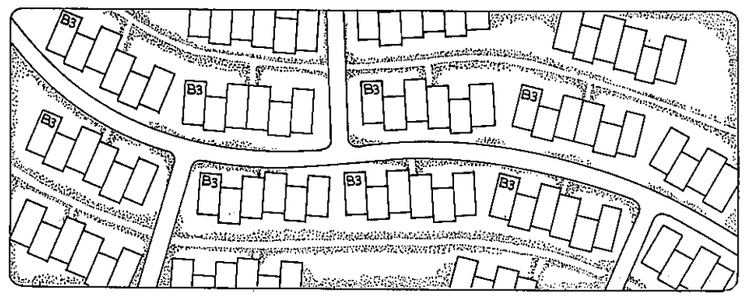


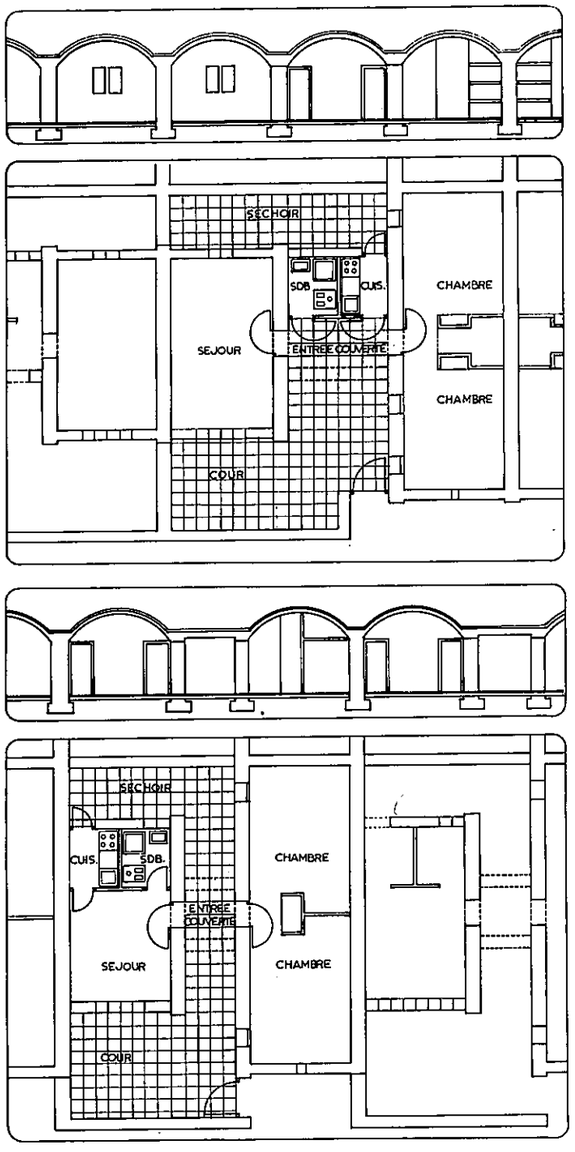












L'AFRIQUE DU NORD EST UNE REGION TRES VARIEE LE LITTORAL MEDITERRANEEN EST SEPARE PAR DE VASTES CHAINES DE MONTAGNES DE LA ZONE DE SABLES DE PIERRES, A LAQUELLE SE RATTACHE VERS LE SUD UNE GRANDE ETENDUE DE SABLE.

TOUTES CES CONTREES SONT HABITEES DE PEUPLES QUI ESSAIENT D'ORGANISER LEUR VIE SUIVANT LES POSSIBILITES QUI LEUR SONT OFFERTES PAR LE MILIEU TANT POUR LES VIVRES QUE POUR L'HABITATION.

LA ZONE LITTORALE DE RELIEF ACCIDENTE EST LA REGION DES GRANDES AGGLOMERATIONS DANS LESQUELLES ON TROUVE EN GENERAL EN OUTRE DE BELLES ET RICHES VILLAS AUSSI DES BIDONVILLES, CONSTRUITES DE BIDONS, DE PNEUS ET D'AUTRES MATERIAUX DE FORTUNE, SANS HYGIENE, SERVANT D'ABRIS POUR LES FAMILLES NOMBREUSES LES PLUS MISERABLES.

LE BUT DE NOS PROJETS DE LOGEMENTS EST D'ASSURER DES CONDITIONS D'HABITATION PLUS HUMAINES AU LIEU DES BIDONVILLES. LES LOGEMENTS DE TYPE A ET B SERONT IMPLANTES PARALLELEMENT AUX COURBES DE NIVEAU DU TERRAIN SUR UN REZ-DE-CHAUSSEE LIBRE, COMME S'ILS ETAIENT SUR PIEDS. CET AMENAGEMENT A PLUSIEURS AVANTAGES IL PERMETTRA LE LIBRE ECOULEMENT DES EAUX PLUVIALES QUI ARRIVENT EN GRANDS VOLUMES PAR SUITE DES AVERSES TORRENTIELLES, TRES FREQUENTES DANS CETTE REGION. PAR CONSEQUENT, L'ISOLATION DU SOL DES LOGEMENTS NE SERA PAS NECESSAIRE – ELLE N'EST PAS D'AILLEURS HABITUELLE SOUS CE CLIMAT, ET LES TUYAUX DE DECHARGE POURRONT ETRE MONTES HORS DES BATIMENTS. EN OUTRE, L'ESPACE LIBRE AU-DESSOUS DES BATIMENTS SUR PIEDS POURRA ETRE AMENAGE EN TERRAIN DE JEUX POUR LES ENFANTS OU EN ABRIS COUVERT POUR LES ANIMAUX DOMESTIQUES.

LES LOGEMENTS D'UNE TRAVEE DE 3,20 M SERONT DISPOSES ENTRE DEUX MURS TRANSVERSAUX.

LA SALLE DE BAIN SERA EQUIPEE D'UN WC A LA TURQUE ENFONCE DANS LE PLANCHER SERVANT AUSSI DE SIPHON. LA PRISE D'EAU POUR LA DOUCHE ET LES ABLATIONS SE FERA A UN POINT COMMUN. LA SALLE DE BAIN COMMUNIQUERA AU SECHOIR OU, CONFORMEMENT AUX COUTUMES LOCALES, ON POURRA FAIRE LA LESSIVE. DANS L'ENTREE IL SERA INSTALLE UN APPAREIL DE CHAUFFAGE ALIMENTE PAR UNE BOUTEILLE A GAZ OU PAR LE RESEAU URBAIN.

LA STRUCTURE PORTANTE VERTICALE SERA CONSTRUITE EN PARPAINGS A PREFABRIQUER SUR PLACE. LA STRUCTURE PORTANTE HORIZONTALE SERA CONSTITUEE DE PLANCHERS PREFABRIQUES AVEC POUTRELLES HOURDIS ET DALLES DE COMPRESSION.

LES DIFFERENTS TYPES DE LOGEMENTS POURRONT ETRE GROUPES, JUMELES, JUXTAPOSES A VOLONTE.

MATERIAUX ET ENGINS – CES DEUX FACTEURS CONSTITUENT LE PLUS GRAND PROBLEME DES CONSTRUCTIONS DANS LE DESERT. POUR PORTER DU REMEDE AUX PROBLEMES D'HABITATION DE TOUS CEUX QUI VIVENT DANS CETTE REGION, NOUS PRESENTONS CI-APRES UNE TECHNOLOGIE SIMPLE POUR LA CONSTRUCTION DES VOUTES EN BERCEAU AINSI QUE QUELQUES EXEMPLES POUR LES LOGEMENTS REALISABLES AVEC CE PROCEDE. A LA CONCEPTION DES LOGEMENTS DE TYPE C, D ET E NOUS AVONS PRIS EN CONSIDERATION LA PROTECTION DES LOGEMENTS CONTRE L'ENSOLEILLEMENT ET LES INTEMPERIES TOUT EN RESPECTANT LA TRADITION. C'EST POURQUOI LES LOGEMENTS SE PRESENTENT TRES FERMES DE L'EXTERIEUR, MEME LEURS COURS SONT ENTOUREES DE MURS ELEVES. LA FORME DE VIE TRES RENFERMEE DES GENS DU DESERT SE REFLETE DANS LEURS HABITATIONS.

LES CROQUIS DONNENT DES PROPOSITIONS POUR L'AMENAGEMENT D'ABRIS HUMAIN AU-DESSOUS DES VOUTES CYLINDRIQUES JUXTAPOSEES ET LA SEPARATION D'ESPACE PAR PAROIS SELON L'EXIGENCE.

DES RIDEAUX EN JONC, DES PORTES AINSI QUE L'AMENAGEMENT DE LA CUISINE ET DU LOCAL DE TOILETTE A L'ARRIERECOUR, GARDENT L'INTIMITE DE LA VIE INTERIEURE.

LES LOGEMENTS-TYPES AVANT DES ELEMENTS INTERCHANGEABLES PEUVENT ETRE AUSSI JUMELES, JUXTAPOSES ET GROUPES A VOLONTE.

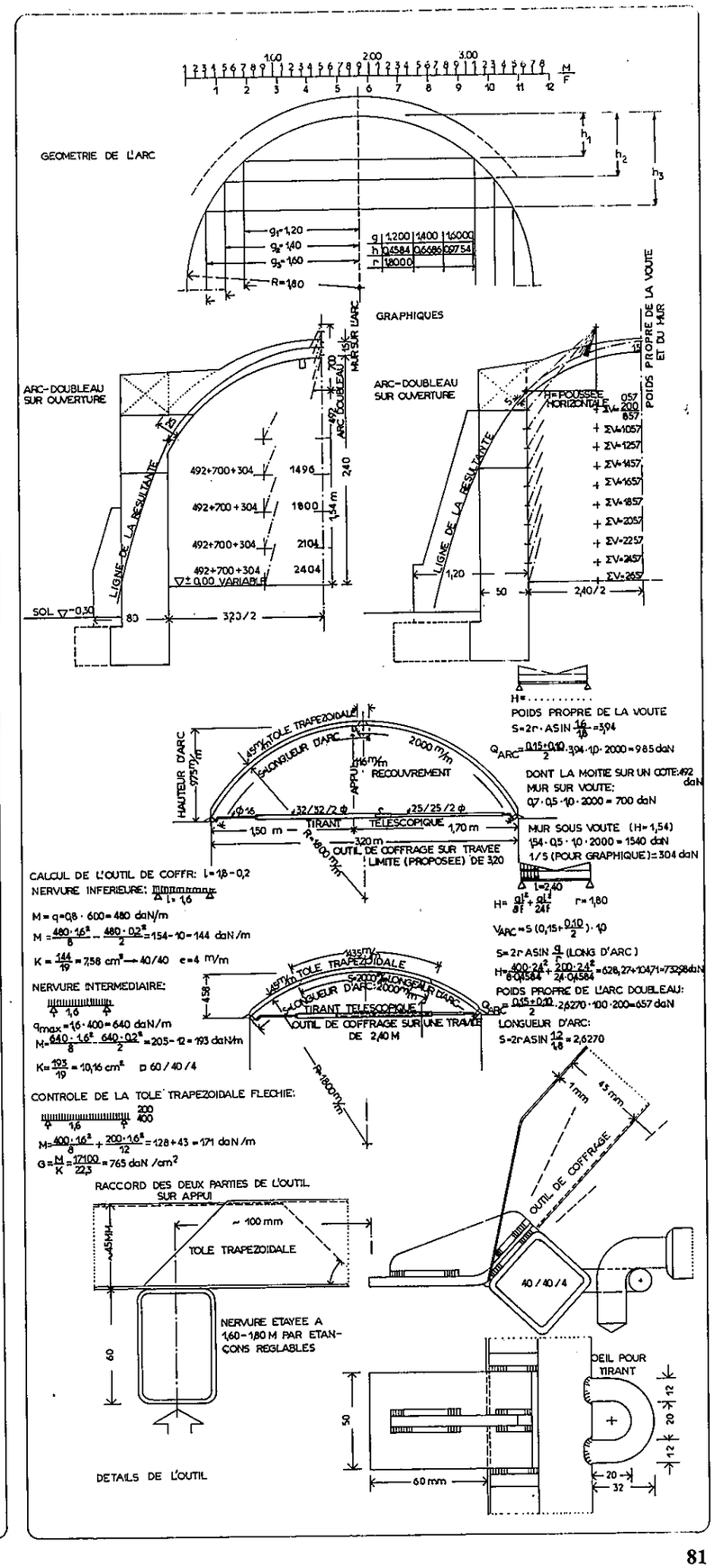
FORME SECULAIRE PAR TECHNOLOGIE NOUVELLE.

NOUS PRESENTONS ICI UNE TECHNOLOGIE TRES SIMPLE PAR UN OUTIL DE COFFRAGE QUI FACILITE LA CONSTRUCTION DES VOUTES CYLINDRIQUES. L'OUTIL (C.A.D REMPLOYABLE PLUSIEURS FOIS) PERMET LE CINTRAGE D'UNE TRAVEE DE 2,00 A 3,20 M (PROPOSITION). LE MONTAGE DE L'OUTIL DE COFFRAGE SE FAIT A MAIN COMME MATERIAU DE CONSTRUCTION: A PARTIR DE L'ARGIL JUSQU'AU BETON TOUTE LA GAMME DE MATERIAU A LIANT HYDRAULIQUE OU AERIEN EST POSSIBLE AINSI QU'UNE VOUTE EN PIERRE MAÇONNEE AVEC DU MORTIER A LIANT HYDRAULIQUE.

REALISATION:

- CONSTRUCTION DU MUR (SUR FONDATION AVEC ARC-BOUTANT) JUSQU'A LA RETOMBEE.
- MONTAGE DE L'OUTIL APPUYE SUR MUR ET SUR ETANÇON REGLABLE.
- RACCORD DES DEUX PARTIES DE L'OUTIL PAR TIRANT TELESCOPIQUE.
- CONSTRUCTION DE LA VOUTE SUR COFFRAGE.
- DECOFFRAGE ET REGAIN DE L'OUTIL APRES PRISE (SECHAGE) DU MATERIAU DE CONSTRUCTION.

D'APRES NOS IDEES L'OUTIL DE COFFRAGE SERA FABRIQUE EN SERIE. LE MANIEMENT DE L'OUTIL EST FACILE A APPRENDRE AVEC UN ASSISTANCE A L'ENTRAINEMENT.



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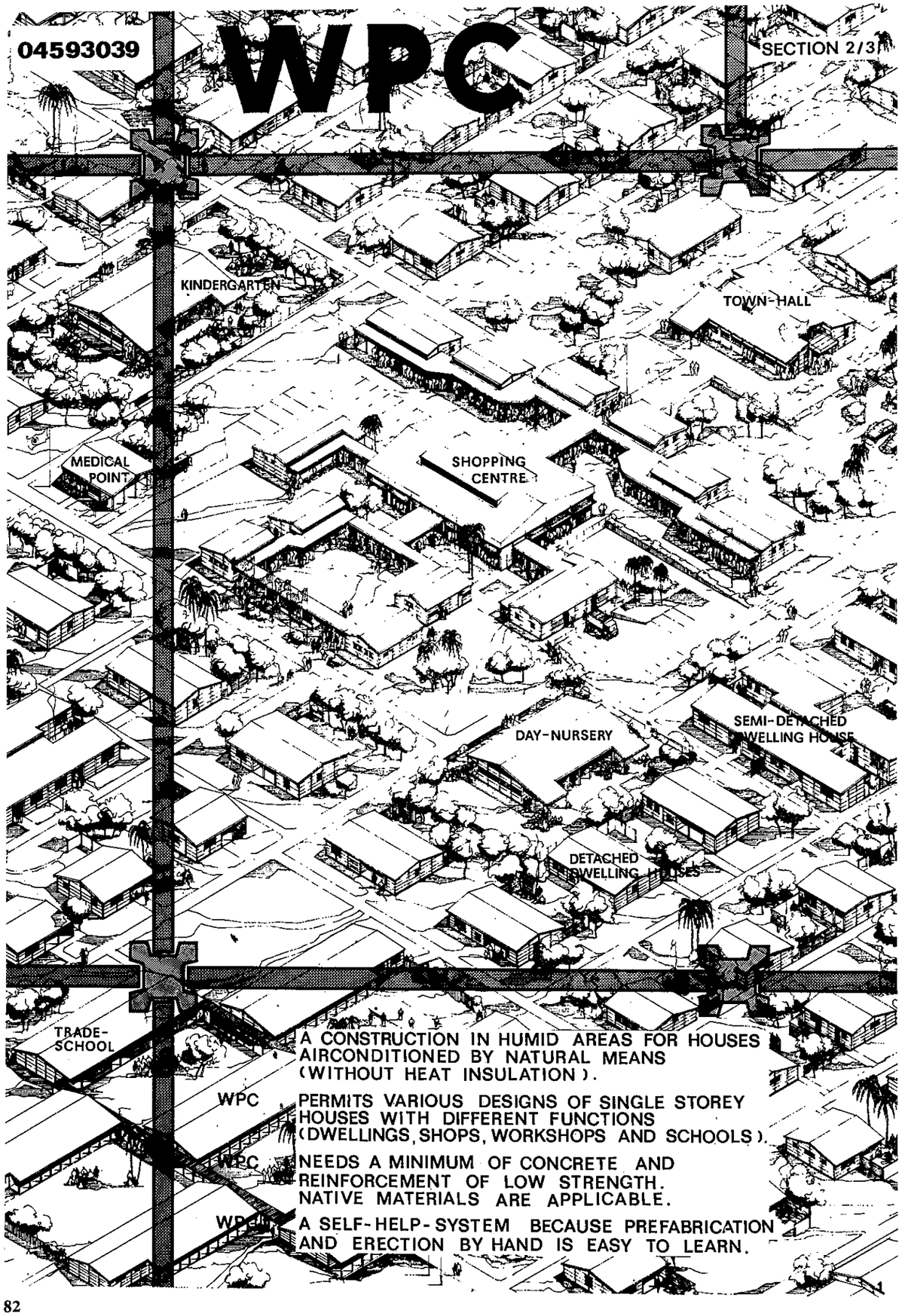
WPC

SECTION 2/3



A CONSTRUCTION IN HUMID AREAS FOR HOUSES AIRCONDITIONED BY NATURAL MEANS (WITHOUT HEAT INSULATION).

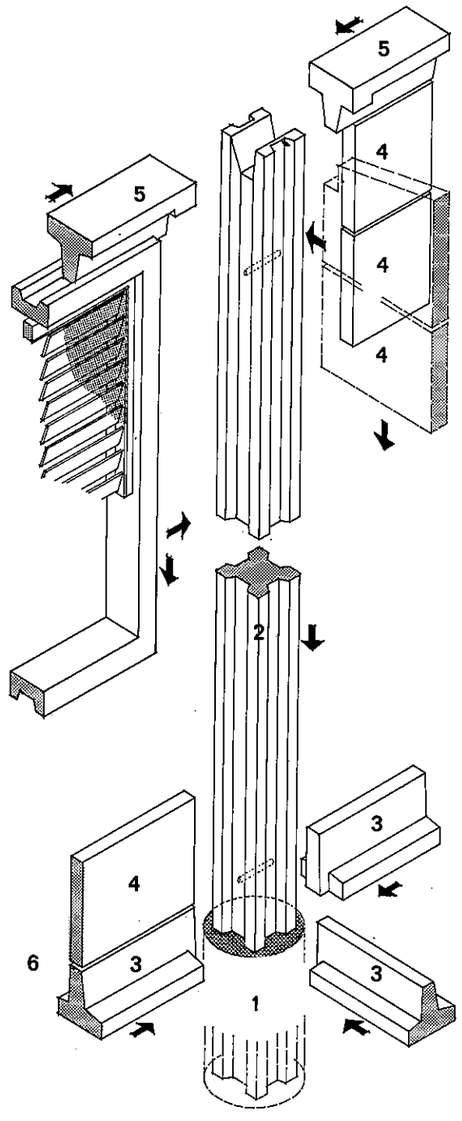
WPC PERMITS VARIOUS DESIGNS OF SINGLE STOREY HOUSES WITH DIFFERENT FUNCTIONS (DWELLINGS, SHOPS, WORKSHOPS AND SCHOOLS).

WPC NEEDS A MINIMUM OF CONCRETE AND REINFORCEMENT OF LOW STRENGTH. NATIVE MATERIALS ARE APPLICABLE.

WPC A SELF-HELP-SYSTEM BECAUSE PREFABRICATION AND ERECTION BY HAND IS EASY TO LEARN.

WALL PANELS AND COLUMNS ARE THE BASIC UNITS

JOINING OF UNITS

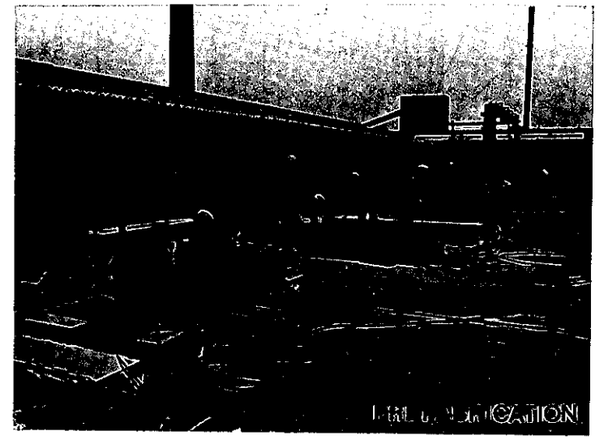


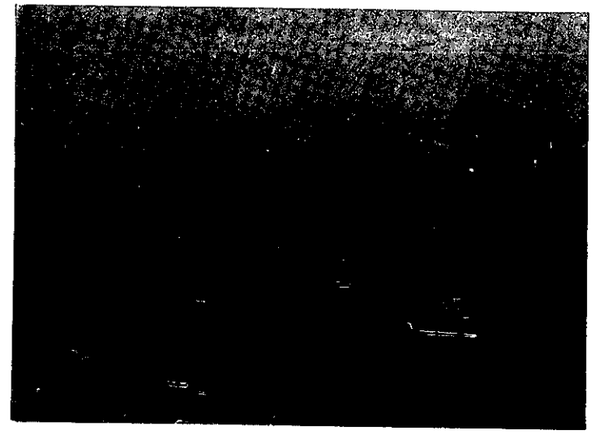
1 FOUNDATIONS
2 RESTRAINED COLUMN
3 LOWER BEAM
4 INFILLED PANEL
5 UPPER BEAM
6 JOINT CEMENT

COLUMNS WITH CROSS-SHAPED SECTION AND
BEAMS WITH T-SHAPED SECTION ARE CAST IN MULTIPLE MOULDS
THE 50mm THICK PANELS ARE PRODUCED IN STAPLES

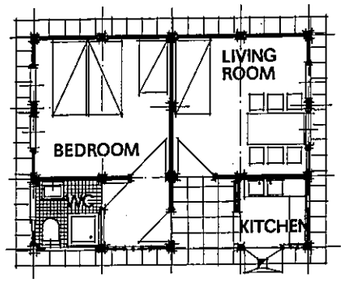
SPECIAL UNITS COMPLETE WPC:

WALL | DOOR FRAME | WINDOW FRAME | VENTILATION FRAME | SHADOW WALL



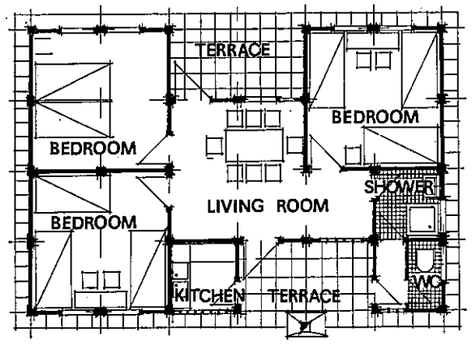


THE PREFERED USE ARE DWELLING HOUSES IN VARIATIONS



GROUND PLAN 0 1 2 3m

VIEW



GROUND PLAN 0 1 2 3m

VIEW

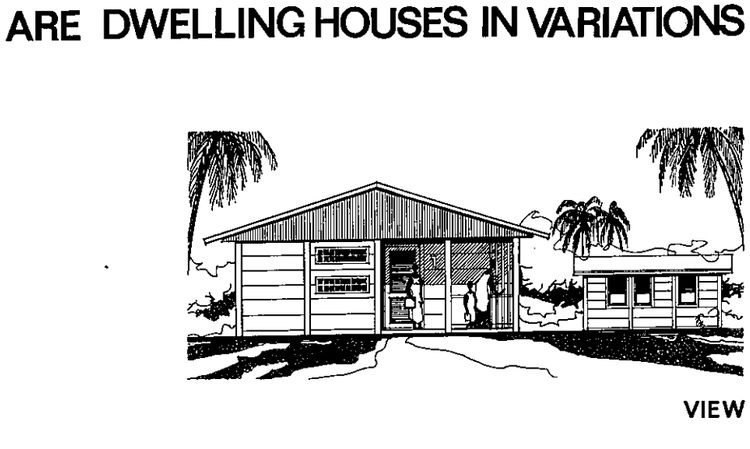
THE SIZE OF THE DWELLINGS IS NOT LIMITED. MINIMAL SIZE 39 m².

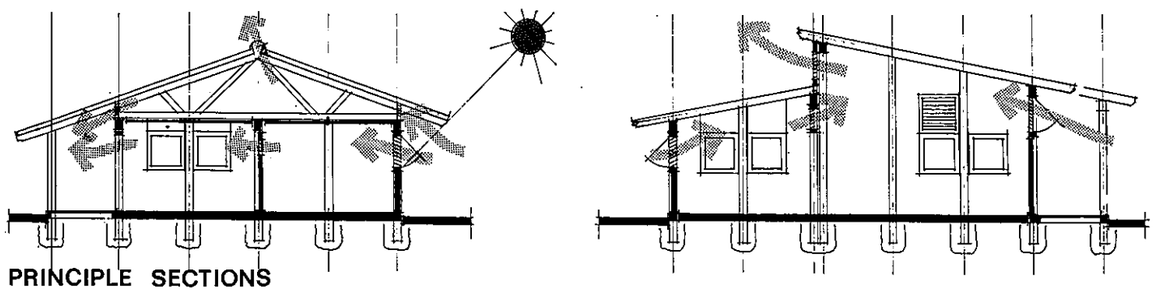
THE DWELLINGS CAN BE BUILT AS DETACHED, SEMI DETACHED OR TERRACE HOUSES.

IT IS POSSIBLE TO ADAPT THE LAYOUT TO THE LIVING CONDITIONS IN THE DIFFERENT COUNTRIES.

PREFABRICATION, ERECTION AND DESIGN WERE TESTED BY A PROTOTYPE BUILDING.

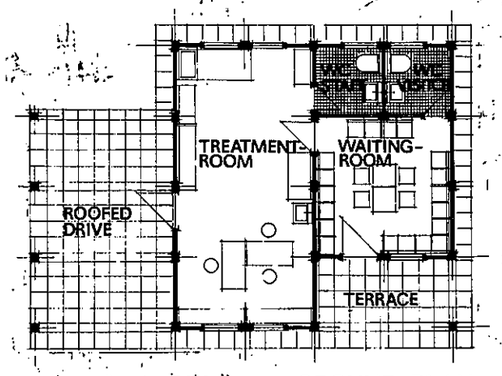
THE CHOSEN CROSS SECTION FAVOURITS VENTILATION BY NATURAL MEANS.



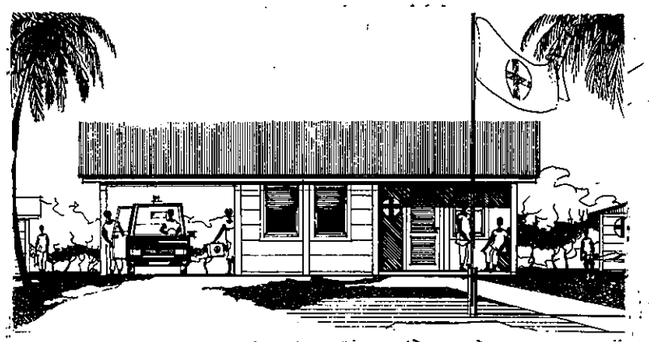


PRINCIPLE SECTIONS

MANY OTHER FUNCTIONS CAN BE FULLFILLED BY THE WPC



MEDICAL POINT GROUND PLAN 0 1 2 3m



VIEW

TRADE SCHOOL

1 CLASS ROOM
2 WORKSHOP
3 PREPARATION / TEACHING AID
4 TEACHING STAFF
5 OFFICE
6 WC/ LAVATORY
7 ENTRANCE
8 WALKWAY

ADDITIONAL POSSIBILITIES ARE

SCHOOLS
INFANT SCHOOLS AND DAY-NURSERIES
MEDICAL UTILITIES
ADMINISTRATIVE BUILDINGS
BUILDINGS FOR TRADE
SHOPPING CENTRES
RESTAURANTS
SHELTERS

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SOCIAL HOUSING FOR GIPSIES IN EUROPE

SECTION II

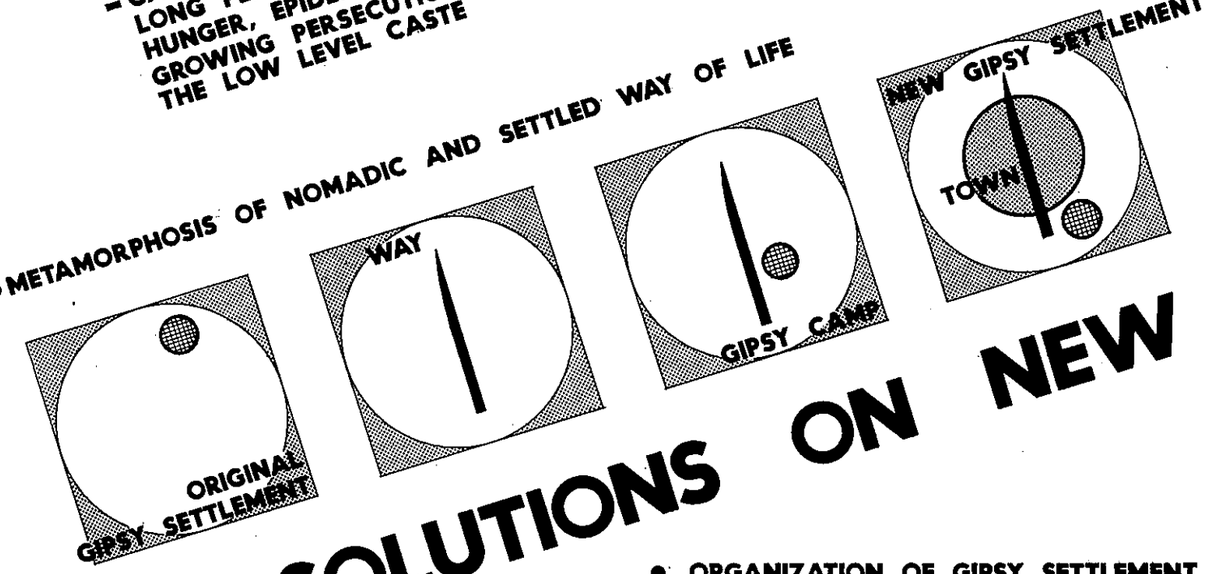
INTERNATIONAL COMPETITION

- MIGRATION OF GIPSIES TO EUROPE
  - IN THE 7TH AND 8TH CENTURIES FROM INDIA, THE CENTRAL REGION OF FRONT INDIA
  - TWO MAINSTREAMS OF MIGRATION THROUGH MINOR ASIA, TURKEY, BALCAN PENINSULA TO CENTRAL WEST AND NORTH EUROPE
  - THROUGH MINOR ASIA, EGYPT, NORTH AFRICA TO SPAIN

- ORIGIN OF GIPSIES
  - ETHNICAL GROUP EXISTING IN THE FORM OF DIASPORA ALMOST ALL OVER THE WORLD
  - NOMAD TRIBE /SOCIAL GROUP MADE UP OF PEOPLE OF THE SAME RACE, BELIEFS, CUSTOMS, LANGUAGE UNDER THE LEADERSHIP OF A CHIEF
  - GIPSIES REPRESENT THE LAST PHASE OF MIGRATION FROM EAST ASIA TO EUROPE
  - CAUSES OF MIGRATION LONG PERIOD OF DROUGHT, HUNGER, EPIDEMIC GROWING PERSECUTION OF THE LOW LEVEL CASTE

- GIPSIES AND SETTLEMENT
  - UNABILITY TO MERGE WITH THE ORIGINAL INHABITANTS
  - EXPULSION FROM THE DOMILICATIONS TO THE OUTSKIRTS
  - FORMATION OF THE GIPSY SETTLEMENT AND CONTINUATION OF THE NOMADIC WAY OF LIFE
  - THE PERMANENT ISOLATION OF GIPSIES

- METAMORPHOSIS OF NOMADIC AND SETTLED WAY OF LIFE

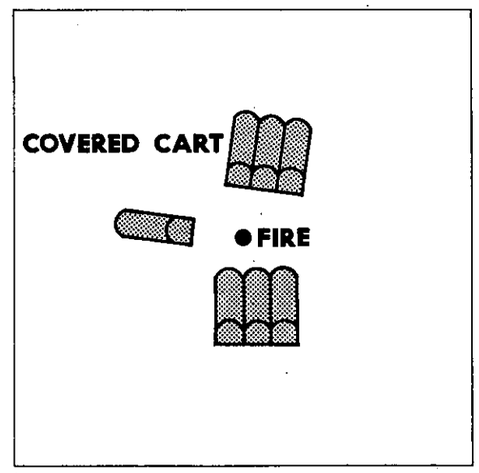


FOR SOLUTIONS ON NEW

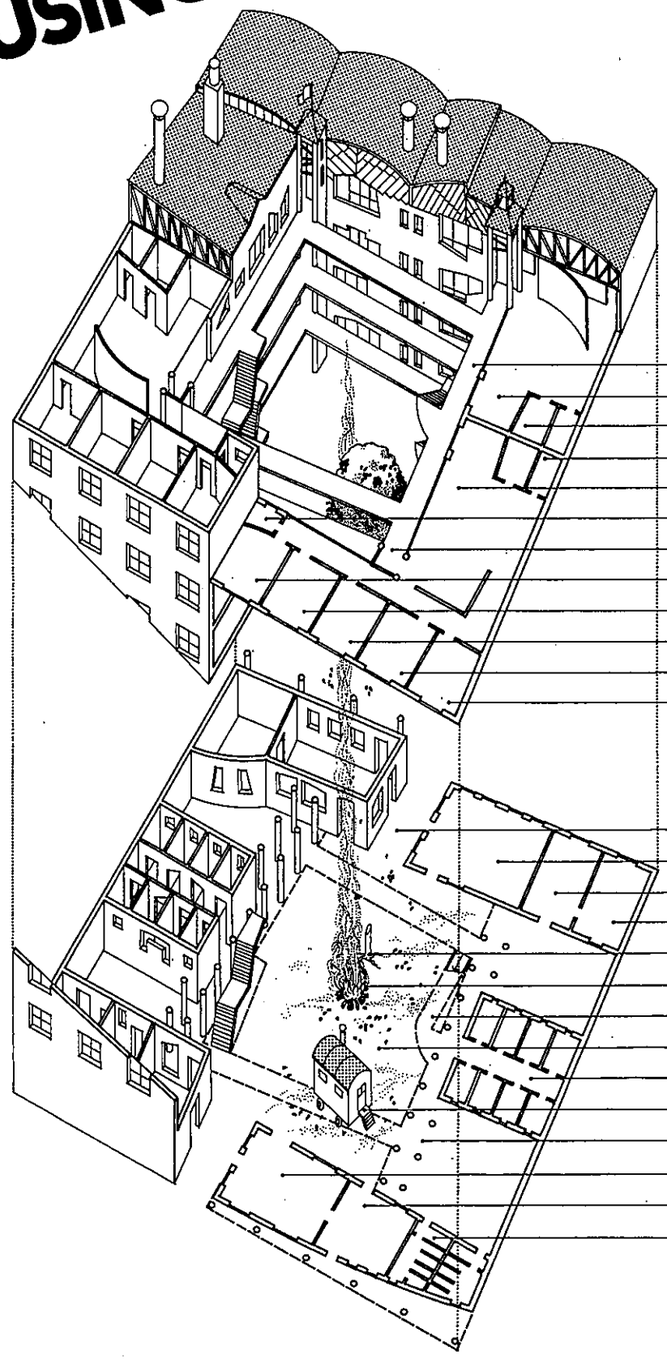
- WAYS OF SOLUTION THE GIPSY PROBLEMS
  - HISTORICAL, SOCIAL, CULTURAL, DEMOGRAPHIC, ECONOMIC, ETHNIC, LANGUAGE AND URBAN FACTORS
  - THE EDUCATION OF GIPSY CHILDREN AND THE YOUTH
  - THE EMPLOYMENT OF GIPSIES
  - THE DEVELOPMENT OF GIPSIES ATTITUDES TOWARDS THE REST OF INHABITANTS AND VICE VERSA
  - THE SOLUTION OF HOUSING PROBLEMS

- ORGANIZATION OF GIPSY SETTLEMENT

A BEGINNING OF ORGANIZATION

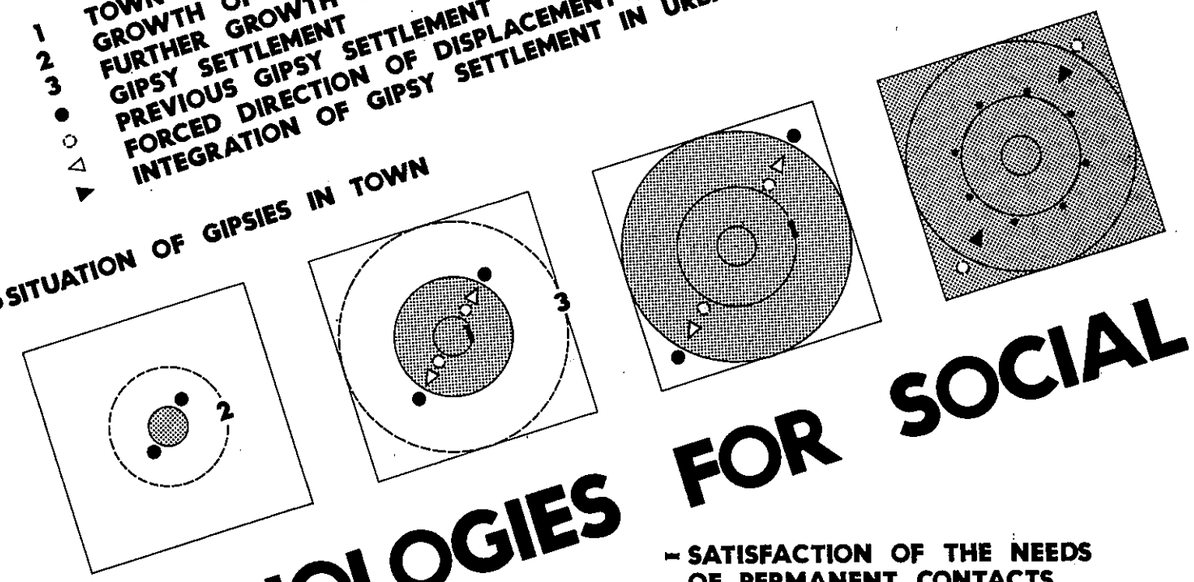


HOUSING 1986/87



1 TOWN CENTRE
2 GROWTH OF TOWN
3 FURTHER GROWTH OF TOWN
● GIPSY SETTLEMENT
○ PREVIOUS GIPSY SETTLEMENT
◁ FORCED DIRECTION OF DISPLACEMENT
▶ INTEGRATION OF GIPSY SETTLEMENT IN URBAN PLAN OF TOWN

●SITUATION OF GIPSIES IN TOWN



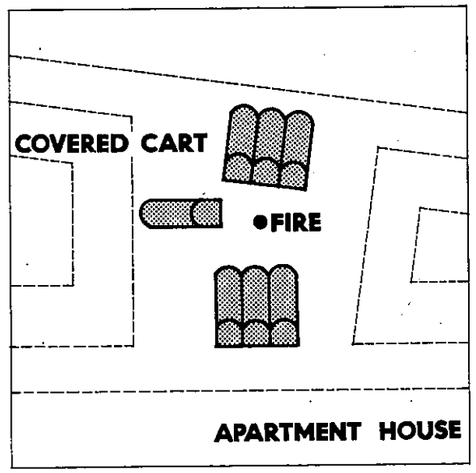
TECHNOLOGIES FOR SOCIAL

- SATISFACTION OF THE NEEDS OF PERMANENT CONTACTS AND COMMUNICATIONS AMONG THE MEMBER OF A GIPSY FAMILY AND TRIBE GROUP
- 50% OF GIPSY POPULATION ARE THE CHILDREN UP TO 15 YEARS
- RESPECT FOR THE COLOURFULNESS OF THE ENVIRONMENT
- SPACE FOR COMMON LIFE /COURTYARD, GALLERY/
- ATAVISTIC ADORATION FOR THE FIRE /FIREPLACE, CAMPFIRE/
- LACK OF THE SYSTEM OF HABITATION, CLOSED TO OTHER INHABITANTS OF THE CITY

● SOLUTION OF THE PROBLEMS OF HOUSING

- LIVING IN GIPSY LOCALITIES IS NOT GOOD FROM THE POINT OF VIEW OF SOCIAL, HYGIENICAL HUMAN AND URBAN CONDITIONS
- RESPECT FOR THE SPECIAL VALUE SYSTEM AND EMOTIONAL NATURE OF GIPSIES

B ORGANIZATION IN URBAN TYPOLOGY

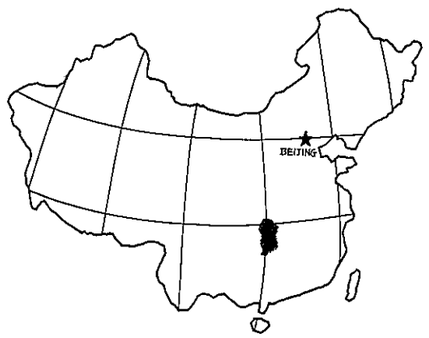


C CONTEXTUALIZATION WITH EXISTING SPATIAL URBAN SYSTEM

FOCUS SECTION II

SHELTER FOR A LARGE & GROWING MINORITY IN CHINA:

I A CULTURALLY RESPONSIVE METHOD FOR GENERATING MIAO HOUSING



THE MIAO AREAS

The Miao is one of the largest minority groups in China (over 5,000,000 people), and their numbers are rapidly growing because China's national birth control policy does not apply to minorities.

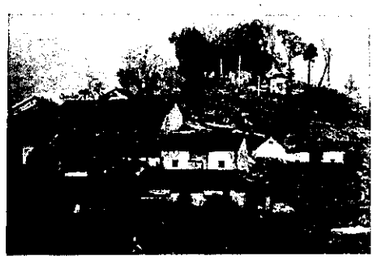
The Miao is one of the oldest nationalities of China. Their ancestors in remote antiquity were Manyi. They inhabit many areas in Southwest China, areas rich in stone and China Fir. The Miao culture of Wu-shamanism devotes much attention to imagination. It explains the world and nature romantically in its philosophy, which is not based on Western principles of rationality. It is accidental, forthright, and romantic.

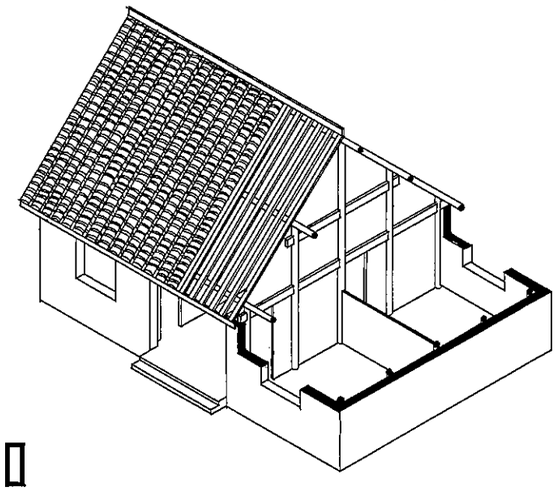
The typical Miao house in a village is of wood construction. Adobe and stone are used to make walls. In general, the interior space is laid out in standard bays which are each about the length of a Miao bed. Usually a house has three such bays. There is a long table for sacrificial rites in front of the rear wall of the Tangwu Hall, which is in the middle bay; this is flanked by a bedroom on each side. One bedroom is for the old, the other for the young, as the Miao minority favors a small family system generally containing not more than three generations. In the bedroom for the old, there is a fireplace called Huotang at the center. The fire in it burns continuously day after day and year after year regardless of night and summer. There is a small steel frame in the fire symbolizing the family's ancestry. The whole family crowds around the fire to avoid what they imagine to be the dangerous world outside.

Eaves are very short and walls are plastered in a grey-yellow color using a mixture of lime and loess. The edges of the walls are decorated with a white line. This typical house is called tiger mouth, for the elevation looks just like the mouth of a tiger. The kitchen and toilet stretch out from one end of the house, so the plan of the house takes the shape of an L. A low soil wall encloses the house garden. Where this wall stands facing the door of the house, it rises in elevation to keep out evil ghosts and spirits.

There are two kinds of typical house in the towns of the Miao. One of them is a timber house called Ganlan, which is supported on stilts beside the river. Ganlan stand on both sides of the river, forming two long elevations. The other typical house, called Jintang, is composed of a series of halls one by one. Its entrance, center hall, atrium, and the hall for sacrificial rites are arranged along the central axis. The elevation imitates the Han house in painting patterns of brick on the adobe wall. Obviously this kind of house is affected by Han culture. Actually the masters of these houses were officials appointed by the government of the Han emperor. But these two kinds of house both maintain the three-bay interior layout.

In recent years, the traditional culture of the Miao has been challenged by modernization. The original villages have become small towns. Large numbers of peasants have entered cities and towns, changing the structures of cities and towns. And, as mentioned above, the policy of birth control is not applied in minority areas. All this has resulted in the populations of Miao cities and towns growing too fast, and the cities and towns themselves expanding uncontrollably - which causes high densities, the destruction of traditional ethics, and increasing numbers of homeless. Furthermore, the Miao lack advanced technologies and sufficient capital to solve these problems.

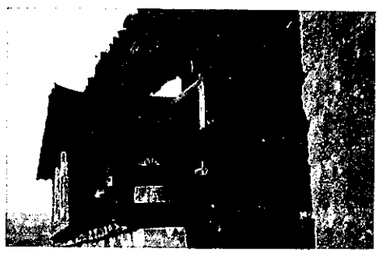




1:100

THE CONCEPT OF THE CORE HOUSE

We divide the typical Miao house into two parts: variable and invariable. The invariable includes the wood frame (size of the space enclosed by columns: 1800 x 3600 mm), the roof, and the area of the site. Other elements, for instance the number and size of rooms, walls and their materials, elevations, etc. are variable. We call the invariable elements the Core House. It is very significant that not only is our method of building the Core House the same as the traditional Miao building method, but also we focus on the influences of the Miao life-style. Based on preliminary anthropological research conducted among the Miao, we think this kind of Core House will be accepted easily by Miao people.



- WU-SHAMANISM AND THE MIAO LIFE-STYLE
- THE MIAO CONCEPT OF DWELLINGS
- HELPING EACH OTHER IN THE MIAO'S KINSHIP AREAS

POSSIBILITIES

- GENEROUS SUPPLY OF MANPOWER
- VILLAGE INDUSTRY
- TRADITIONAL TECHNOLOGY
- LOCAL MATERIALS

- FINANCIAL SUBSIDY FROM THE STATE
- COORDINATION BY LOCAL GOVERNMENT
- NATIONALIZATION OF LAND
- OFFICIAL PLANNING ORGANIZATIONS

2 MEASURES FOR SOLVING THE PROBLEMS

STATE

- FORMULATE A POLICY FOR DEVELOPING VILLAGE INDUSTRY
- FORMULATE A POLICY OF BIRTH CONTROL IN THE AREAS OF MINORITIES
- DISBURSE FINANCIAL SUBSIDIES TO MINORITY PEOPLES
- PROVIDE "SITE AND SERVICES" INFRASTRUCTURE

LOCAL GOVERNMENT

- DEVELOP VILLAGE INDUSTRY
- IMPLEMENT POLICY OF BIRTH CONTROL
- ORGANIZE PLANNING AND DESIGN; POPULARIZE THE METHOD OF THE CORE HOUSE
- ORGANIZE THE VILLAGE INDUSTRY TO PRODUCE CORE HOUSES
- ACCEPT CORE HOUSE APPLICATIONS FROM CONSUMERS; ALLOT THE CORE HOUSES
- COLLECT THE VIEWS OF CONSUMERS; DO POST-OCCUPANCY EVALUATIONS

CONSUMERS

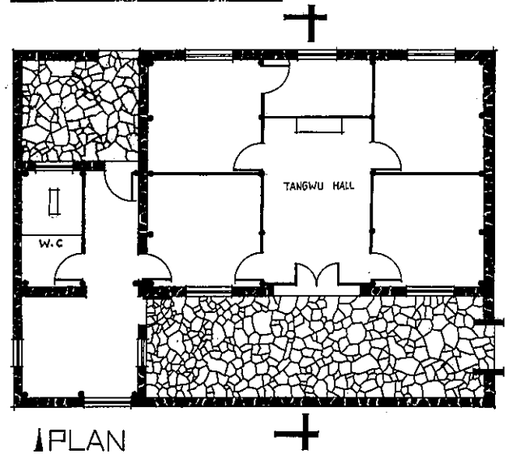
- APPLY FOR CORE HOUSES, PURCHASE THE CORE HOUSES
- HELP EACH OTHER TO PREPARE THE LOCAL MATERIALS; FINISH THE CORE HOUSES WITH THE LOCAL MATERIALS; MAKE THEM MEET THEIR OWN NEEDS
- PUT FORWARD PROPOSALS FOR IMPROVING THIS SYSTEM

THE CORE HOUSE DESIGN

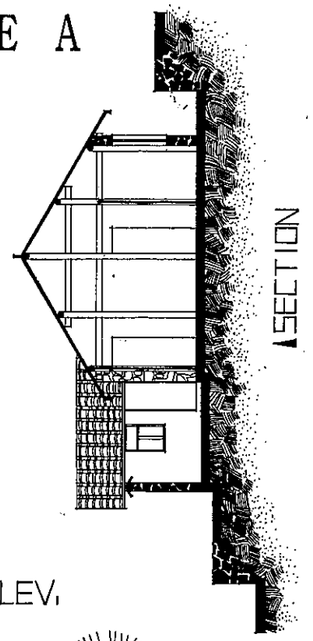
TYPE A

1:100

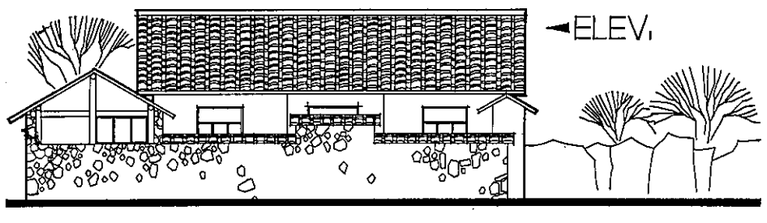
3



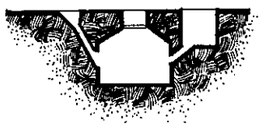
PLAN



SECTION

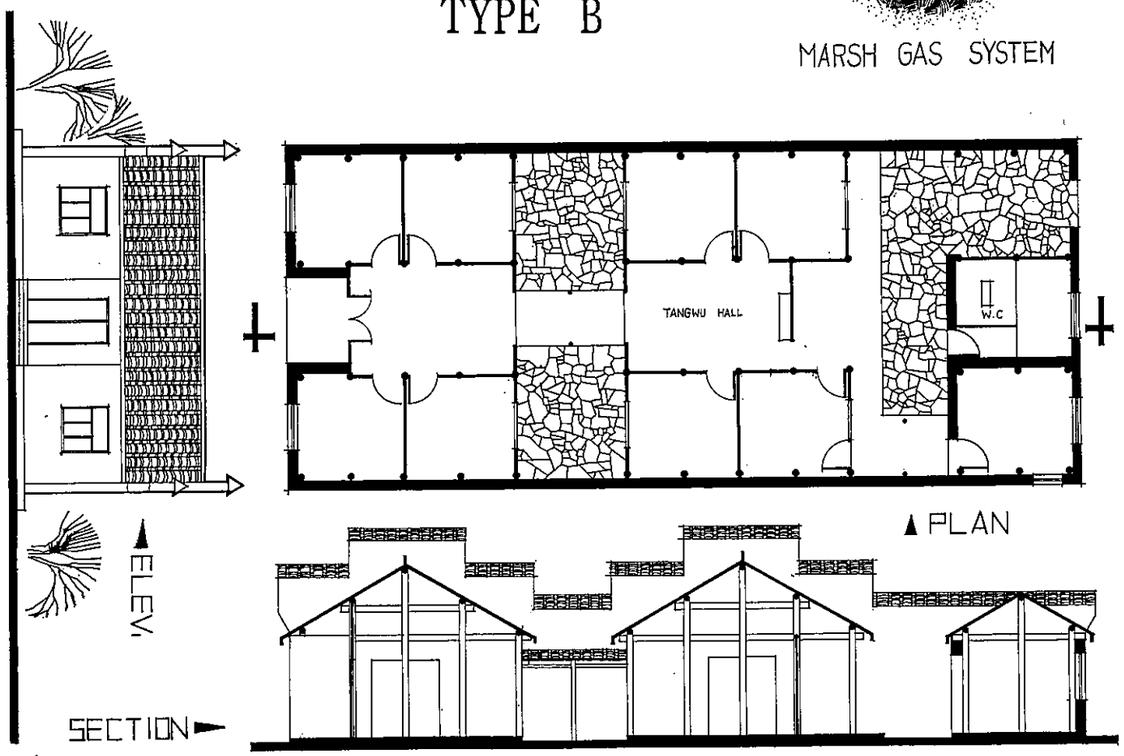


ELEV.



MARSH GAS SYSTEM

TYPE B



PLAN

ELEV.

SECTION

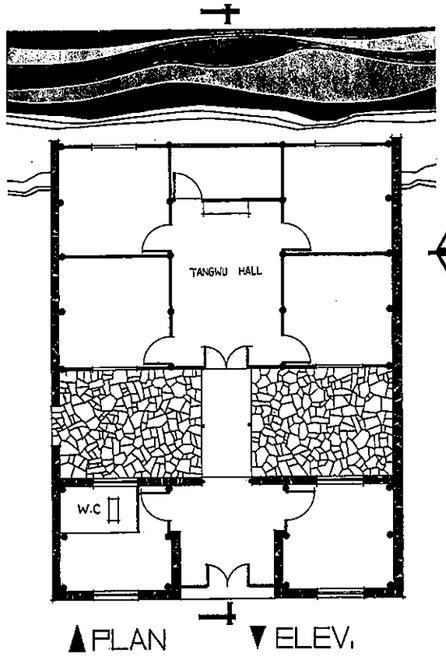
THE CORE HOUSE DESIGN

TYPE C

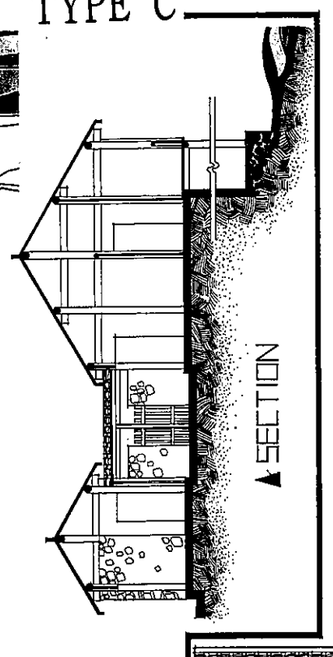
TYPE D

1:100

4

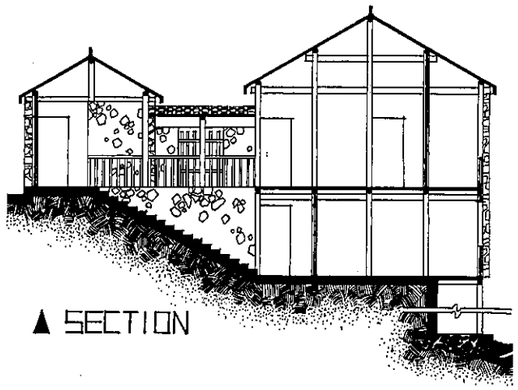


PLAN

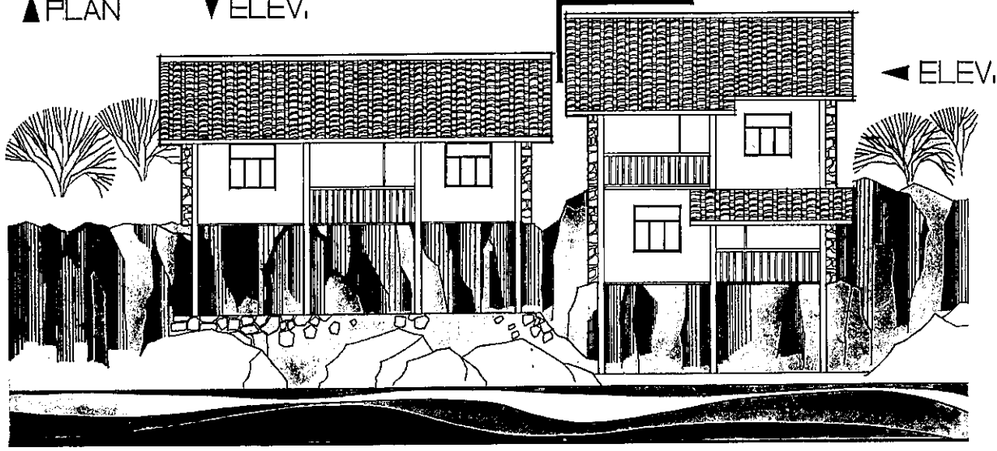


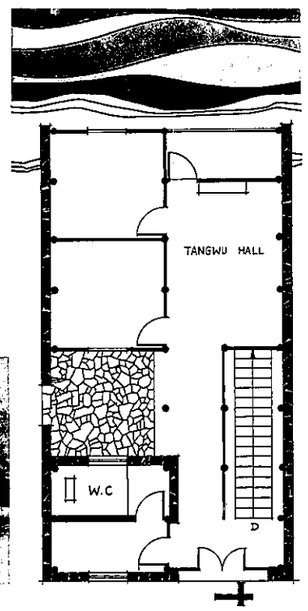
SECTION

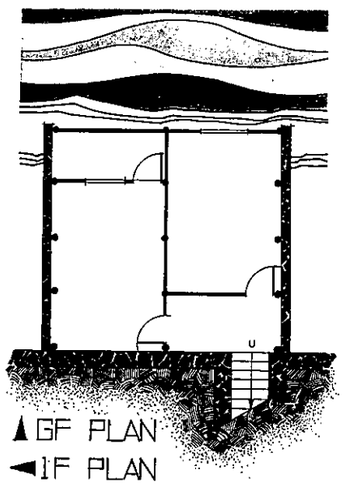
ELEV.



SECTION



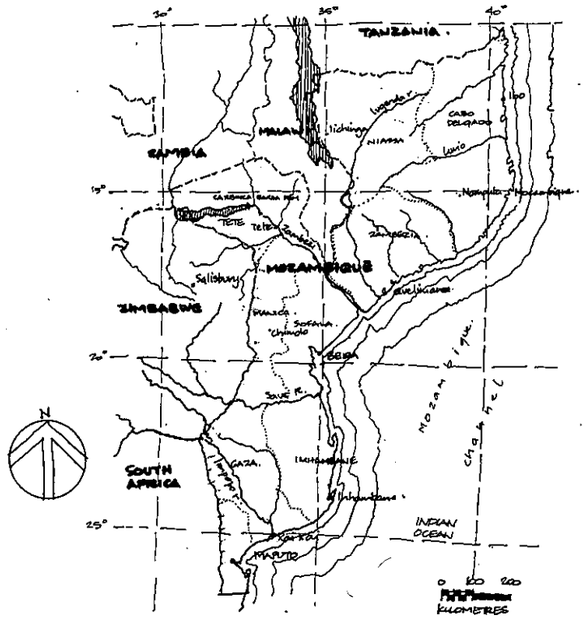


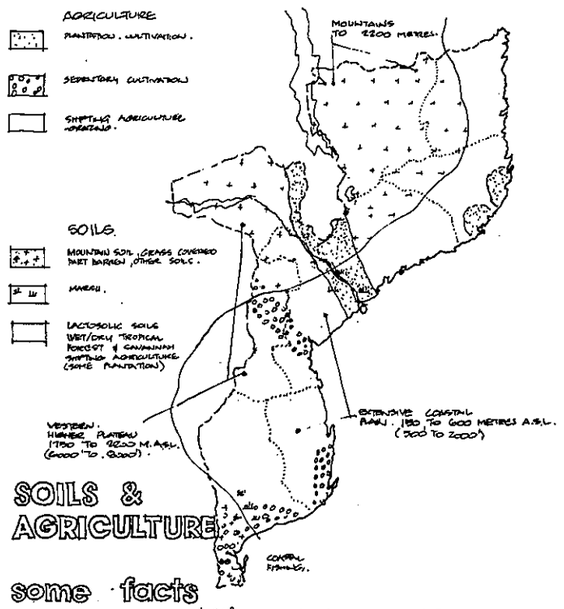


GF PLAN

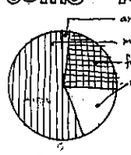
1F PLAN

MOZAMBIQUE





some facts



LANDUSE — AREA 783,030 km.sq.

POPULATION (1976) 10,200,000 est

Minorities"
98% AFRICAN
CHINESE ? 20 000
GOAN
PAKISTANI
PORTUGUESE 15 000
EURO AFRICANS 150 000

VEGETATION.
COCONUT PALM
DATE PALM.
IRON WOOD,
MOPANI
BAOBAB
MANGROVE
BAMBOO + SPEARGRASS.

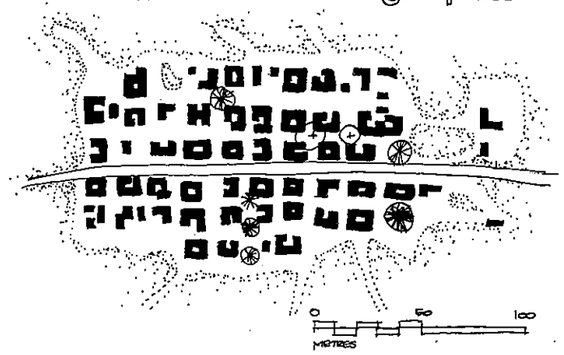
AGRICULTURAL PRODUCTS
SUGAR.
COTTON
COPRA
SISAL
CASHEW NUTS
TEA
GRAIN

LIVESTOCK.
CATTLE
PIGS
SHEEP.

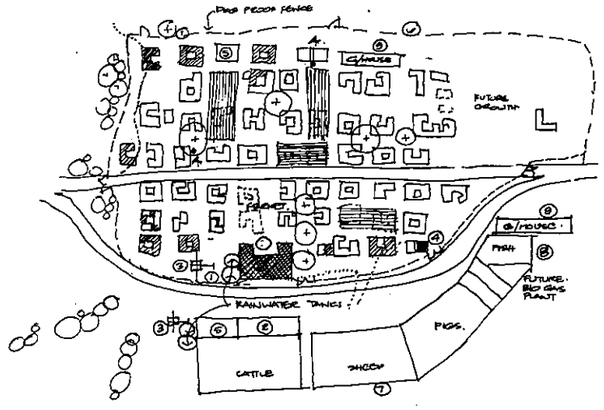
INDUSTRY
PROCESSING
CONSUMER GOODS.
LEATHER
KAPE
COTTON TEXTILES
SOAP.
BEER/SOFT DRINKS.
OIL REFINING.
FOODSTUFFS.
FISHING.

(Source: E. Britannica at a Glance)

a traditional village plan



suggested improvements



PROPOSED IMPROVEMENTS

1. VILLAGE HALL/WORKSPACE CRAFT CENTRE / AMENITIES + LAUNDRY.
2. WAREHOUSE / STORE
3. WIND MILL
4. DRY MULTIUM TYPE COMPOSTIBLE TOILET
5. GRANARY. / BAG ROOM.
6. DOG, ANIMAL ENCLOSURE.
7. LIVESTOCK ENCLOSURES.
8. FISHPONDS & ALGAE BEDS.
9. PLASTIC GREENHOUSES.

LIMITED CLEARING & ESTABLISHMENT OF INTENSIVELY CULTIVATED MARKET GARDENS.

Housing

Housing treated without reference to industrialization or land use reform cannot be fully understood: housing solutions are a fragment of complex interrelated economic & social developments.

> "The attempt to answer sociological questions by means of highly sophisticated technology and methodology cannot be more than an exercise. Social systems still elude this form of analysis. At the beginning of any search for viable social goals must come a commitment which can be simply stated and easily understood and then be demonstrated." (1)

Conceptions of the preferred mode of social change through acquired technology vary widely.

Historically most attention has been focussed on heavy industrialization and the concurrent development of centralized infrastructures usually these have tended to occur with simultaneous displacement of large agrarian populations into cities seeking employment and thereby creating other needs housing services, welfare etc. There follows specialization and concentration of wealth, power and dominance of national economic and political spheres in these cities and thus planning, design, architectural urban forms and education are heavily urban in their expression.

Whilst being historically determined these practices have had some unwholesome and unforeseen by products: depletion of human resources, urban blight, overcrowding pollution and so forth.

This is the starting point of the brief.

The extreme non urban tradition is the vision of farms, fields and factories[2] dispersed across the land relying on a mix of human involvement in 'manual and brainwork' to maximize productive yields without large urban accretions. This approach is exemplified in the Chinese commune system allowing sizeable domestic production and a mixed economy: in part state directed; in part free market: in other parts of the world this has not been the norm to date.

Mumford[3] and others "de-urbanists" have argued forcefully for smaller scale green networks of cities of lower population densities and suitable transit systems of a scale to maximize benefits of living in or near rural and industrial sites.

Urban Planning (in centralized economies) is determined by the ruling class ideological concerns and is obliged to favour the status quo: Pragmatism suggests that only (comparatively) slow change is achievable in a democratic process. That is humanizing planning usually precludes radical change, by the same token it avoids imposed solutions from above.

Appropriate technology may be viewed as an indirect brake on the rate of urbanization: its impact in rural areas has been amply demonstrated, though still not in large measure. In recent years appropriate technology applications to urban situations have begun in earnest: systemic impetus has been given since the oil crisis of 1973-74. A.T. is an aid to development of infrastructure without immediate large scale employment consequences: its attempts to creat wealth without causing large scale migration or deprivation.

Poverty can be defined partly as lack of opportunity: A.T. is creative as a catalyst but not a substitute for the desired changes.

Implicitly self-help is the immediate use of human resources available. Group consciousness is employed as a means of self regulation: common goals, an agreed starting point and suitable agenda within a mutualy acceptable framework of rules are the instruments. Community involvement functions below the level of local government.

Squatter groups seek access to power the right to equitable and full social participation and thereby opportunities for creative self expression.

1. Chermayeff + Tsolin "Shape of Community". (1967)
2. Peter Kropotkin (ed Colin Ward) "Farms Fields & Factories Tomorrow". (1975)
3. Mumford Lewis "The City in History". (1961)
4. ILO. Report III "Appropriate Technology for employment creation in the food Geneva. Processing & Drink Industries of Developing Countries." (1978)
5. Kalbermatten J, Deanne J, Mara D.D, Gennerson C. World Bank. (Dec 1980) "Appropriate Technology for Water Supply and Sanitation" : A Planners Guide (1980)
   Oliver ed. "Shelter & Society" (1969, 1976)
7. Seelig M. ed. "The Architecture of Self Help Communities". (1976)

Criteria of Appropriate Technology

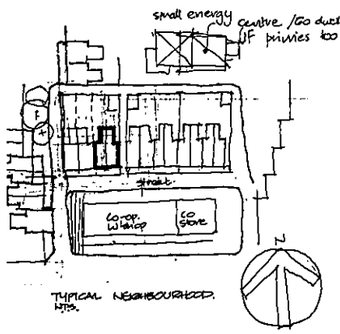
As defined by the I.L.O. and others[5] these are as follows

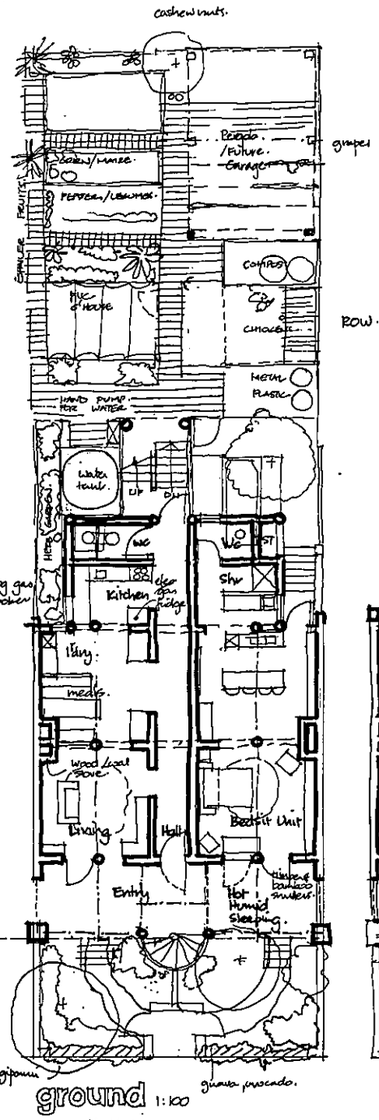
- should build upon local skills and traditional technology
- should lead to creative involvement of the worker (by way of worker participation, co-operative societies etc)
- be simple, be easily managed by small communities in a self reliant way
- Make economical use of energy resources, preferable renewable.
- Reduce depletion of non-renewable resources
- Reduce pollution of the natural environment, the atmosphere, the land
- Increase use of local raw materials rather than imported ones
- Be generally not patented technologies
- Be generally underused technologies in developed countries
- Require low investment capital by assuming higher labour inputs.
- Creat products which enhance future options for A.T.
- Ensure health & safety of users & workers
- Ensure adequate remuneration
- Not require substantial 'national' government intervention.

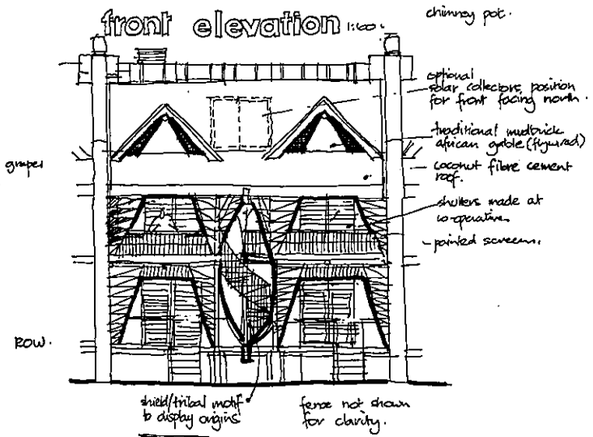
Market prices should not favour inappropriate technologies: Correct shadow prices need to be included.

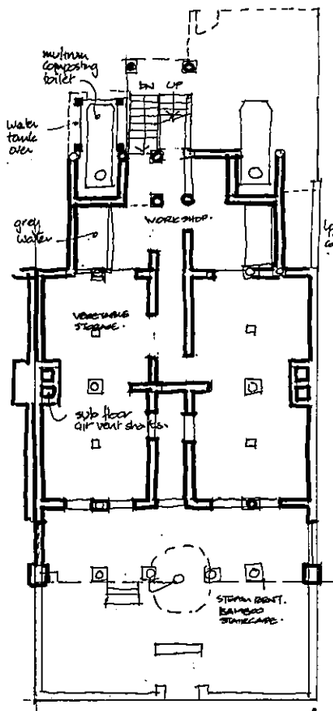
Shadow Cost[5] Because Governments often have socio-political goals that may be only indirectly related to economic objectives. Some market prices may bear little or no relation to economic costs. For this reason it is necessary to adjust market prices in economic costing exercises so that they represent more realistically 'real unit costs (in the sense of reflecting their impact on the national economy) instead of using actual market prices which may be fixed for socio political reasons. This adjustment of market prices to reflect opportunity cost is sometimes known as shadow pricing.

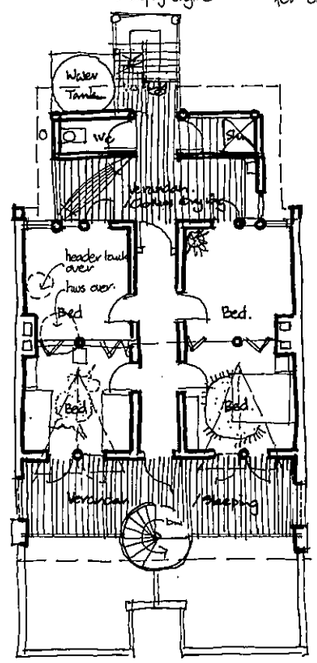
Information about the range of technological alternatives, precise characteristics and implications re 'appropriateness' are needed for policy making this is difficult to acquire: The efficiencies of A.T. are obliged to be evidenced[4] yet all historic technological change has an element of the unforeseen, the intuitive leap. Experiment is fine provided it does not obliterate the object of change ie the prospective societies using the A.T. Technological adaptions have been the stuff of small businesses for most applications.











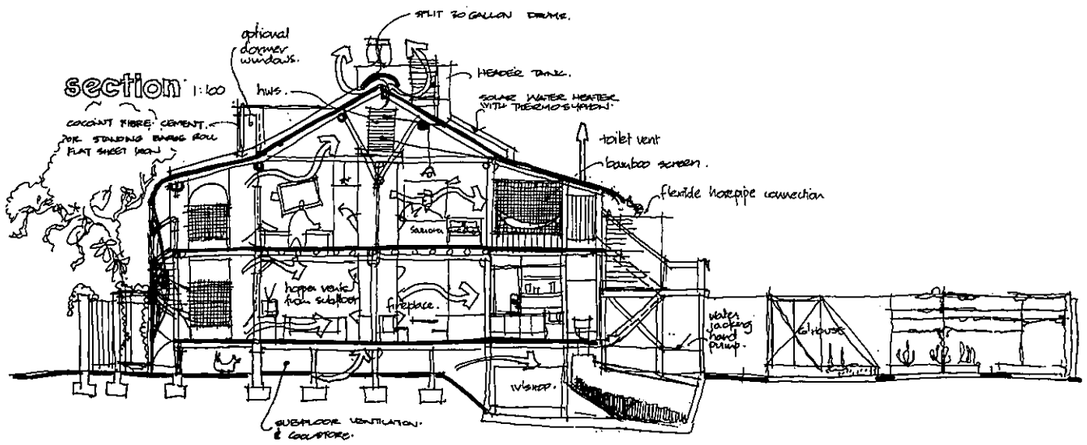
cement stabilized sand/mud brick

sub floor 1:100

ground 1:100

9mm x 25 black.

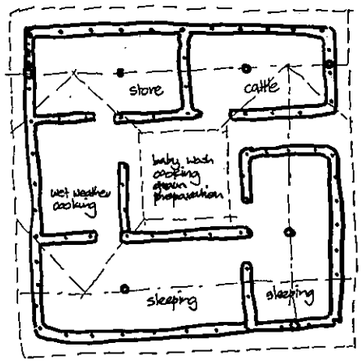
first 1:100



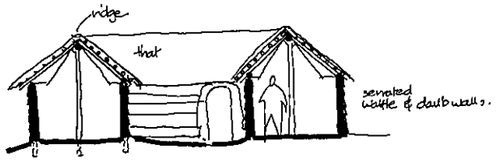
URBAN ROW TERRACES

3

TRADITIONAL CONSTRUCTION



plan



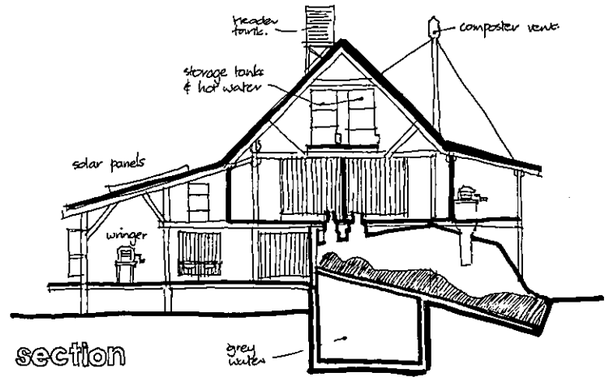
section

METHOD 'WATTLE & DAUB'.
construct during the dry season november to march

1. Posts into ground at 900 crs. (to walls)
2. Horizontal perimeter beam at 1800 above ffl.
3. Insert split bamboo & palm frond lattice between posts
4. Vertical forked poles at centre and ends of rooms (and intermediate points)
5. Fit ridge pole
6. Connect ridge to eaves with sloping rafter poles at 450 crs.
7. Fix purlins of split raffia palm fixed to rafters.
8. Tie thatching to purlins.

Walls.

- Balls of mud/moist earth to frame in 300 high courses.
- end walls (gables) built up to ridge but struck at steeper angle than roof pitch. leaves 2 triangular openings for ventilation.
- lean to verandahs often attached.
- walls stepped externally at courses like weatherboards to minimize soil erosion.
- waterproofing agent obtained by boiling up common ground creeper cucurbitaceae.



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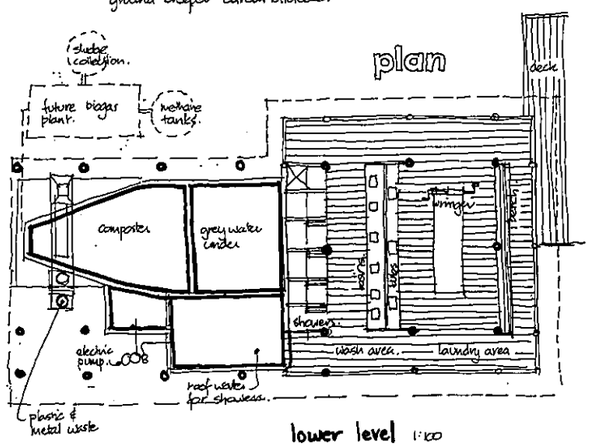
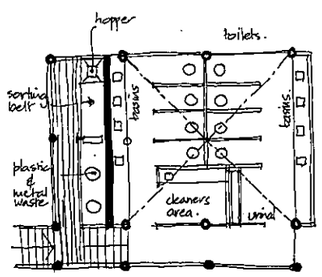


lower level 1:100

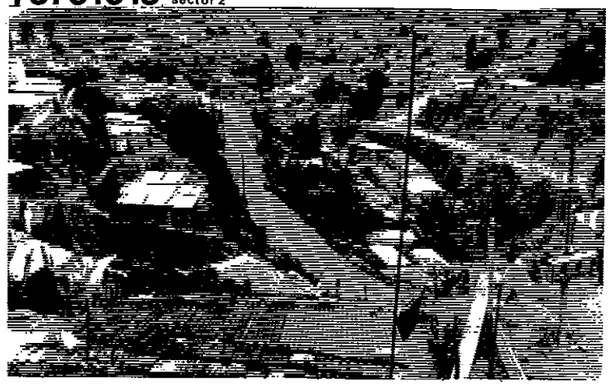


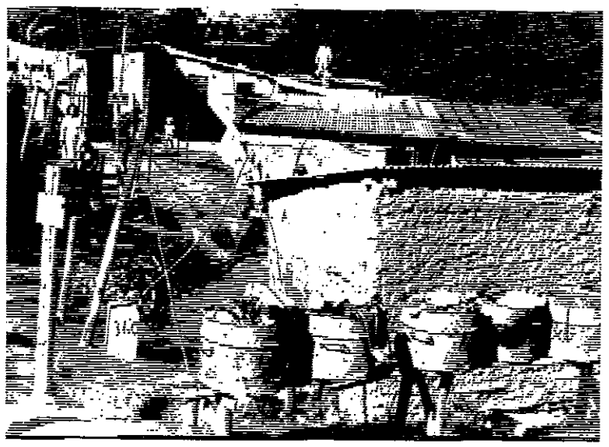
upper level 1:100.

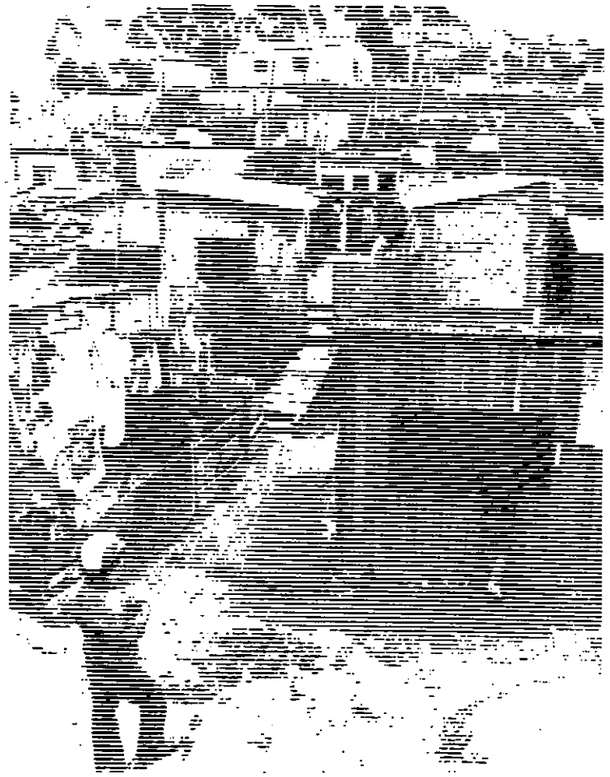
(after Ahfeld)[7]

SMALL ENERGY CENTRE FOR RURAL & URBAN APPLICATIONS.

4







SÃO PAULO 1987: LA MITAD DE LA CIUDAD NO TIENE HOGAR, NO ÉS CIUDAD.

ONCE MILLONES DE PERSONAS
UN MILLÓN Y MÉDIO DE FAVELADOS
TRES MILLONES Y MÉDIO EN
CONVENTILLOS

Declaración de un integrante del Movimiento de Lucha por la Vivienda del Parque Santo Antonio. (SP)

"En los años 70, las gentes fueron abandonando el campo, animados por la propaganda del gobierno y con eso dando paso al latifundio. Se decia que la ciudad necesitaba gente y que habia mucho más gente que empleos y que por eso los sueldos eran bajos. La ciudad se fué llenando de gente y las "favelas" fueron creciendo. Por cerca del 1978 el asunto fué de mal a peor. Las gentes se quedaron sin empleo y los alquileres en alta. Por eso se decia: O casa, o comida..."

1970/1980. El numero de "favelas" aumenta en São Paulo en un 45% En este periodo la población urbana aumenta en el 46% y la población sin hogar crece en 446%.

1980/1984. La industria de São Paulo pierde en ocupación 500.000 empleos.
El problema de vivienda se agraba.
El número de "favelas" crece en 182%, el de barracas en 713% y la población en 648% sin hogar.

1981 Enpienzan las primeras invasiones de tierras - acciones colectivas y organizadas de millares de "Sin Tierra" - que desprecian y desafian la presencia de un Estado inpotente y por veces insensible a los problemas de la vivienda y la ciudad.

Las invasiones, aunque hayan logrado por su acción rebelde importantes avances a nivel de la conciencia por parte de expresivos sectores de la poblacion, no apuntan hacia una perspectiva de transformación: su trayectoria las lleva de nuevo a la favela, testimonio físico de su fracaso como acciòn politica organizada, al carecer de un proyecto politico capaz de modificar la situaciòn. La obsesión por la tierra, justa por lo demás, tiene arraigo en las luchas del campo y mueve una población de fuerte raiz rural. Poco a poco, se va poniendo de manifiesto que ubicarse en la ciudad significa mucho más que poseer tierra. Enpiezan a organizarse movimientos de lucha por vivienda con um fuerte sentimiento de autonomia frente al Estado.

Declaración de una integrante del Movimiento de Lucha por la Vivienda de Grajaú. (SP)

"Luchar en el movimiento ya hace parte de mi vida. Yo no lucho solamente por mi casa... Si no tenemos casa és porque algunos se quedan con todo el dinero y són los que estan al lado de gobierno. Creo que no exite un gobierno que pueda darle soluciónes al pueblo. És el pueblo que tendra que buscarlas. El pueblo és el que tiene que gobernar".

Con esta nueva perspectiva, al tener que opoñer-se a la acción del Estado en algunos momentos o adelantarse a ella en otros, los movimientos empiezan a laborar sus propuestas con la participación de asesorias tecnicas autonomas: son los llamados "Tecnicos de la Comunidad". Algunos resultados concretos empiezan a produirse reforzando y dando aliento a las propuestas autonomistas que visan el control y la gestión de la comunidad en todos los aspectos de la producción de viviendas.

Declaración de un integrante del Movimiento de Lucha por la Vivienda del Recando da Alegria. (SP)

"Este lugar no se llamará "Conjunto Habitacional" que és cosa del gobierno. Tanpoco se llamará ni Parque, ni Jardin que es cosa del especulador. Se llamará "Recanto da Alegria" que és el nombre que el pueblo le dió.

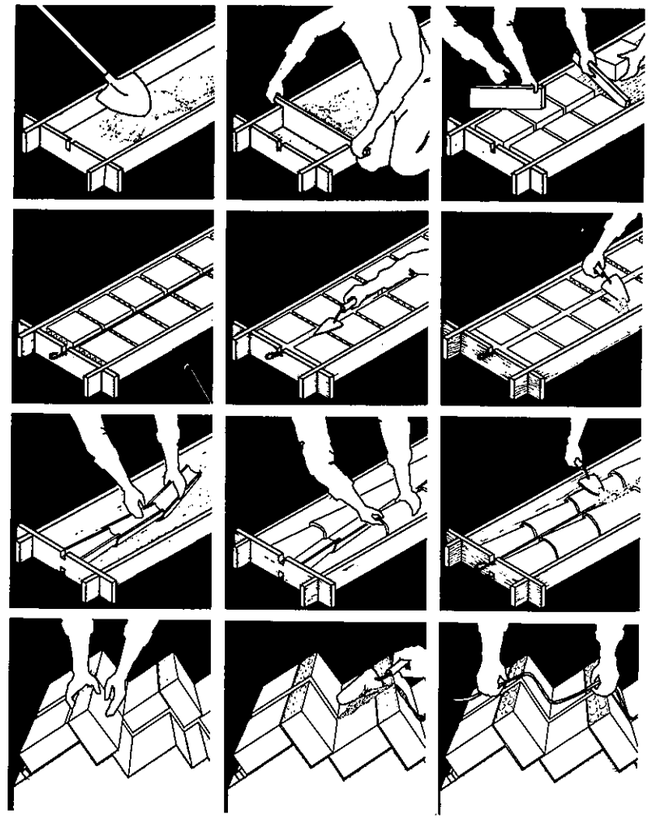
1984 Se realiza el 1º Encuentro de Movimientos de Lucha por la vivienda que sienta las bases de una articulación de diez movimientos por un "Cooperativismo de ayuda mutua y autogestión". És elegida una coordinadora. Poco a poco la idea de ayuda mútua y de autogestión se va concretando y la lucha por la vivienda adquiere contornos más amplios. La coordinadora se encarga de las gestiones junto al Estado para la obtensión de tierras, prestamos, etc. Al mismo tiempo los proyectos, presupuestos, cronogramas bien como los contactos de prestamos, sus condiciónes, plazos etc. se van produciendo en los movimientos resultado de un trabajo conjunto de participación de las asambleas, comisiones etc y las asesorias técnicas autonomas. Las luchas de los movimientos de unifican y fortalecen. Un proyecto politico transformador se pone en discusión y va madurando entre ellos.

1985 Un año despues del primero, se realiza el 2º Encuentro de movimientos de lucha por la vivienda.
En el se plantea la participación popular en la elaboración de los programas gobernamentales de la vivienda con propuestar que tienen origen en la experiencia de la coordinadora y de los movimientos en su relacionamento con el estado.
Otras cuestiones se plantean:
La mayoria de los movimientos estan abocados en sus trabajos de construcción. En todos los canteros la organización popular se va desarollando y fortaleciendo: cocinas comunitárias, guarderias, centrales de compras y subministros, etc.
Hay por otro lado, cuestiones presentadas por los movimientos y por las asesorias técnicas autonomas sobre los trabajos de cantero, los resultados obtenidos proyectos, tecnologia, etc. concretamente:
- baja capacitación de la mano de obra
- desperdicio de materiales
- bajo rendimiento resultante de un gran número de niños, ancianos y sobretodo mujeres, en geral aprovechados en servicios auxiliares de obra.
- deficiências de calidad en los resultados obtenidos
- encargados sobre los integrantes y de los hombres sobre las mujeres.

Se empiezan a delinear a todos los niveles, propuestas para la superación de estas cuestiones.

Declaración de un integrante del Movimiento de Lucha por la Vivienda del Sector Sur. (SP)

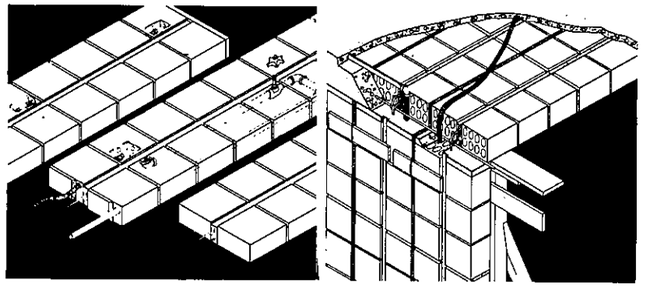
"Si al construir nuestras casas queremos construir una nueva comunidad, tendremos que eliminar las diferencias entre nosostros. Y esta tarea empieza ahora, en el cantero de obras."

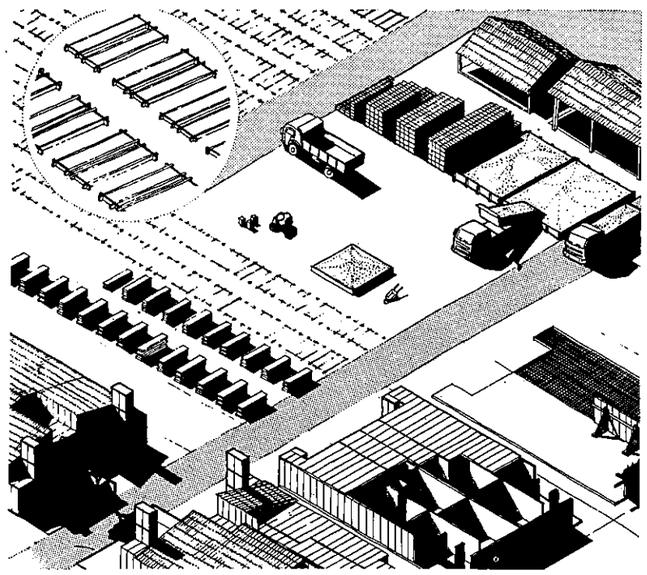


Producción de los paineles de plancha-forro, piso, tabiques y estructurales

Producción de los paineles de cobertura

Producción de los paineles de escalera





EL TRABAJO

Perseguimos la práctica de una arquitectura de extramuros del taller y del gabinete, forjada en el contacto intimo con la realidad de las ciudades y de sus poblaciones. Una arquitectura nacida de la acción solidaria de los técnicos con los movimientos sociales, y que al romper con los límites estrechos de la plancheta del dibujo integre la investigación y la práctica arquetectónica a las necesidades y deseos de la población, transformando el proyecto en un instrumento libertário, al antecipar de los deseos que todos tienen sobre el espacio edificable, precediendo así a la construcción de su imaginario.
Procuramos avanzar para eliminar la diferencia entre el "saber" y el "hacer".

Particularmente queremos considerar dos aspectos: El del plano y el de la Tecnología.

En la casa, el plano que la contruye busca rescatar la dignidad de la casa del trabajador, perdida en el hacer tecnocrático, que, bajo la óptica de eliminar déficits habitables permanentes a pesar de todo ha rebajado la morada, transformándo la en un instrumento utilitário, resultado de un processo de producción masificada dentro de normas cuantitativas de calidad:

La calidad cuantificada por el salario y la renta familiar...

No vendrán por ahí las soluciones al "problema de la vivienda", esto lo sabemos todos: jamás será posible que con recursos limitados y desigualmente distribuidos haya viviendas de calidad en cantidad suficiente.

Lacuestión del diseño permanece, mientras permanece la expectatica de belleza como calidad no cuantificable en el ideal de todos.

Otro aspecto, intimamente ligado al primero, es el de la Tecnología.

Procuramos desarrollar y aplicar tecnologías adecuadas a nuestros materiales, nuestra mano de obra, nuestro instrumental y nuestros recursos de capital.

Escogemos la cerámica roja, no sólo por sus calidades tradicionales como material, sinó tambiém porque es con ella como se construye la casa de albañilería, que es "la casa de la ciudad", en la visión de pueblo que llega a ella para vivir. Por eso entendemos el rechazo que él tiene en relación a las técnicas desarrolladas con la intención de reducir costos de construcción y que para eso se utilizan de chatarra industrial, subproductos vegetales, etc., debidamente reciclados, incluso cuando presentan resultados y desempeño satisfactorios.

Procuramos reflejar las condiciones de producción y de relación de trabajo extra del fin de semana exigiendo esfuerzos físicos difíciles de recuperar en un tiempo sin descanso. La poca o ninguna capacitación de la mano de obra en la práctica de un ofício, el de albañil, que no se improvisa ni se adquiere en poco tiempo.

Procuramos, pues desarrollar una tecnología de fácil aprendizaje, que al eliminar los instrumen tos de albañil la plomada, nivel, la regla, la escuadra, elimina en gran parte la necesidad de conocimientos de su hacer tradicional.

Desarrollamos un instrumental adecuado a la condiciones de uso y manejo de una mano de obra de poca o ninguna capacitación en los trabajos de construcción, de fácil ejecución y cumplimento en el cantero, con vistas al trabajo en serie de producción en escala.

Finalmente en cuanto a los recursos de capital empleados en la aplicación de la tecnologia, procuramos por diversos medios la reducción de las inversiones. Como consecuencia de la racionalización del proceso constructivo resultará la eliminación del despercicio de materiales, substitución por otros de menor coste e igual desempeño, la eliminación de equipamentos caros, comunes en procesos de pré-fabricación, la concentración de los materiales, de la mano de obra y de los instrumentos en una fábrica instalada en centro de producción, permitiendo así la utilización óptima de aquellos recursos.

Procuramos, por fin, situarnos siempre en la perspectiva del Tercer Mundo que condiciona de modo contraditório nuestro quehacer diario y nuestro país, y, a partir de la Universidad, nuestro espacio, desarrollar caminos para su recuperación; ¡ Qué las condiciones de vida del Tercer Mundo no sobrevivan en el Tercer milenio!

LA TECNOLOGIA Y LOS COMPONENTES

La tecnología desarrollada para la construcción por Ayuda Mútua se basa, a partir de uma concentración modular, en el empleo de componentes prefabricados con cerámica roja.

Éstos componentes son:
1. Paineles de plancha-forro y piso
2. Paineles de tabiques y estructurales
3. Paineles de cobertura
4. Paineles de escalera

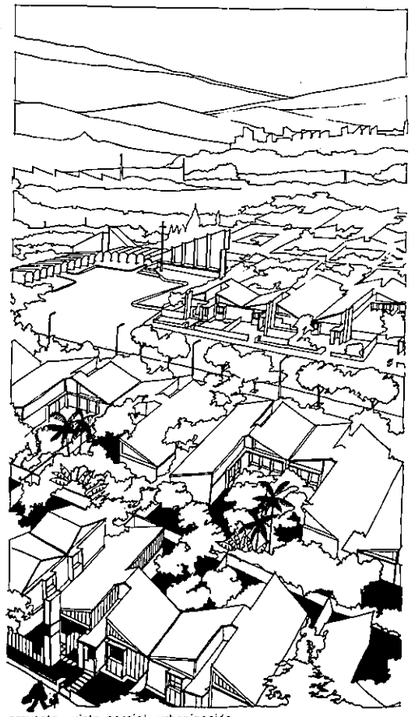
Todos estos componentes tienen como caracteristicas básicas:
a) Su produción es realizada en fábrica, de forma concentrada dentro del cantero de obras.
b) Su ejecución es horizontal y en el suelo, mediante formas y gabaritos simples, obteniéndose paineles acabados o semiacabados, listos para su montaje final.
c) A partir de la modulación que resulta en una medida horizontal (anchura, su altura o longitud es variable, ajustándose a las necesidades del espacio a construir.
d) Su peso no sobrepasa los 80 kg. en qualquier caso, permitiendo que su manejo y transporte en el cantero de producción sea hecho normalmente.

Observaciones:
1. Los textos y ensaios de los diversos componentes se desarrollan en el espacio de nueve meses, dentro de un contexto físico y social concreto, lo que permitió verificar, entre otras cuestiones, la fácil asimilación de la tecnologia por la mano de obra no especializada.
2. El prototipo fue construído en doce dias por un equipo de diez hombres.

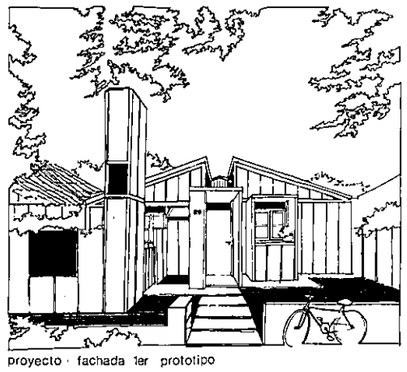
Se partió de los materiales a granel, se produjeron los componentes, se efectuó el montaje y finalmente se ejecutaron los acabados finales.

Fueron computados 100 horas/hombre en la ejecución de los trabajos para la construcción del prototipo.
3. en el caso de paineles de plancha se verifica una economía substancial en relación a los cortes a una plancha prefabricada, tipo B12, del orden de 60%.
4. En el caso de los paineles de pared se comprueba una mayor rapidez de ejecución, una significativa reducción de pérdidas de material y un producto acabado de mejor calidad.
5. En el caso de paineles de escalera se verifica una notable simplificación en la construcción de un elemento que normalmente exige una experiencia mayor de la mano de obra.
6. En el caso de paineles de cobertura se verifica sensible reducción de su coste por la eliminación total de ma madera presente en una carpintería de tejados.
7. El coste final del prototipo con área de 40 m² fue de U$ 2.700.

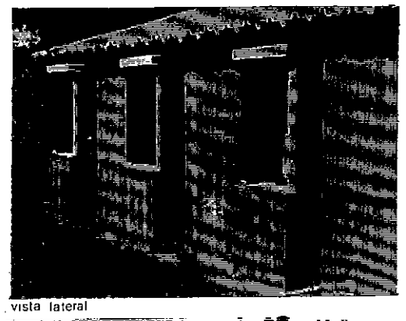
PROTOTIPOS DE LAS UNIDADES RESIDENCIALES
GRAJAU
SECTOR SUR
SÃO PAULO



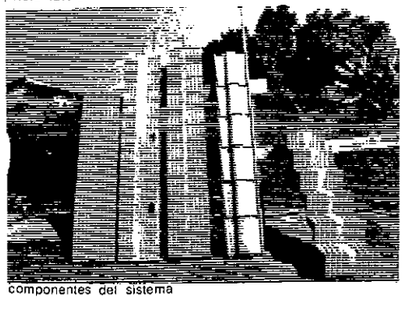
proyecto · vista parcial urbanización



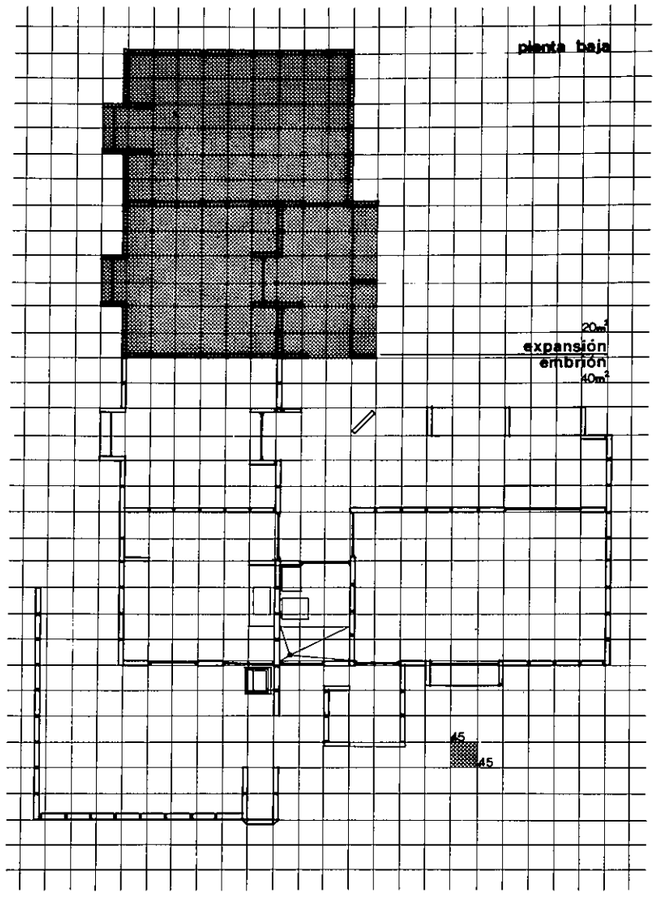
proyecto · fachada 1er prototipo



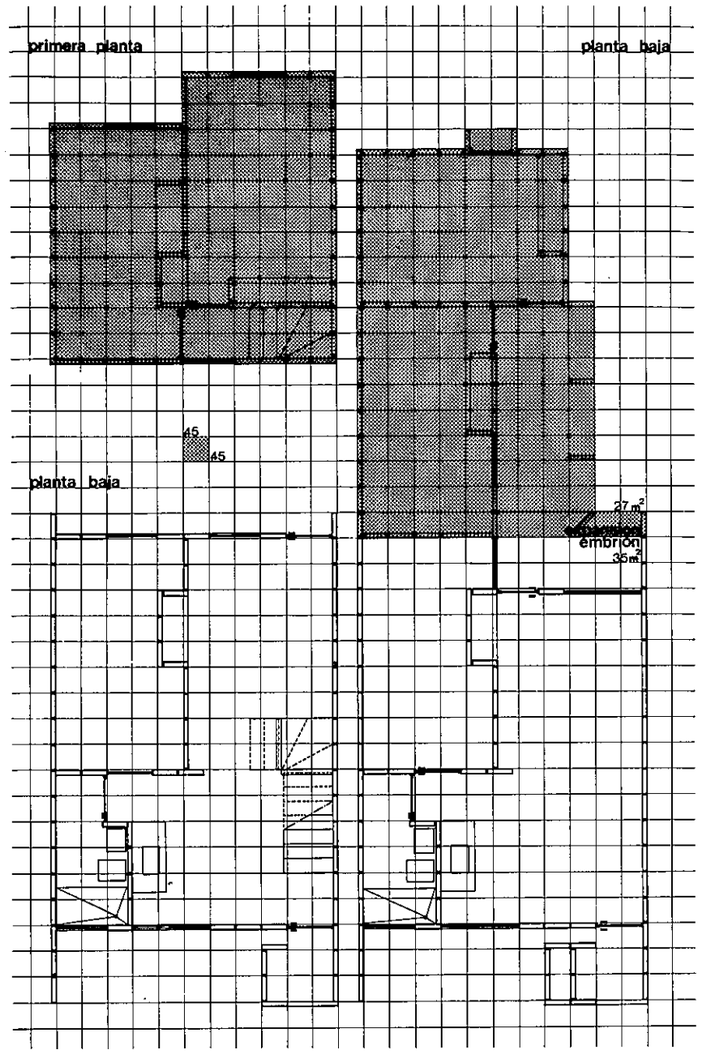
vista lateral



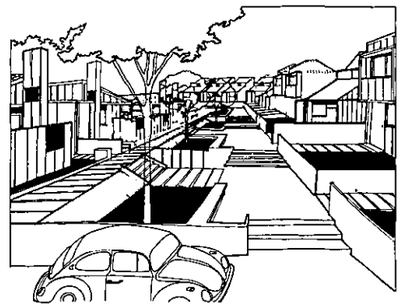
componentes del sistema



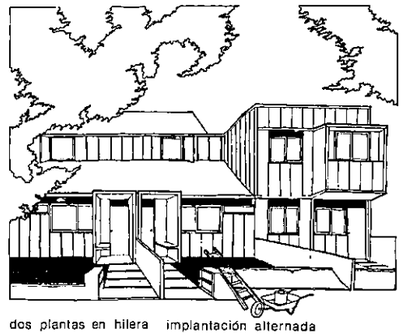
1er prototipo



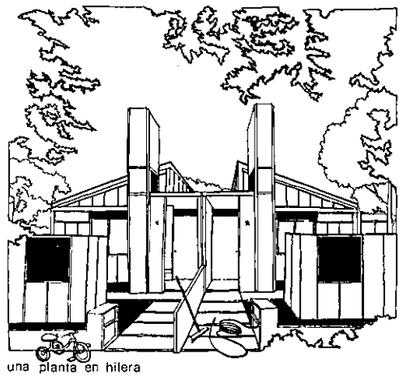
prototipo dos plantas



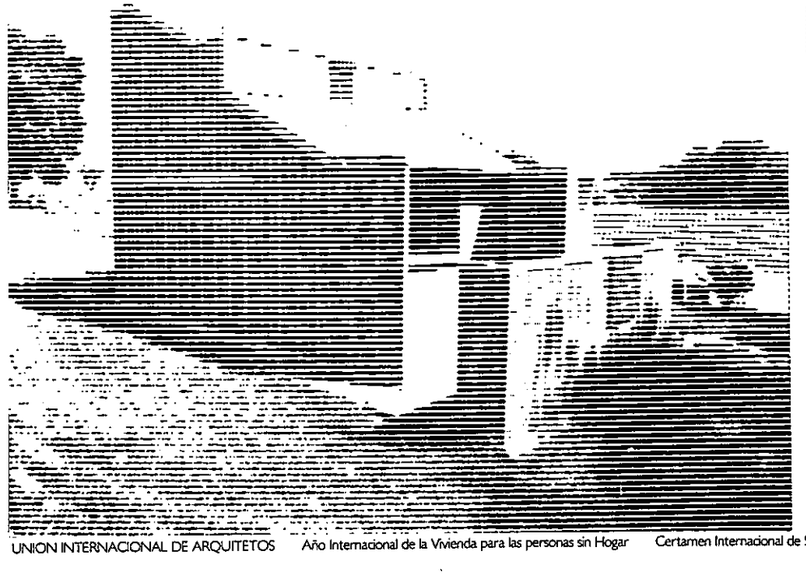
plaza y paseo peatonal

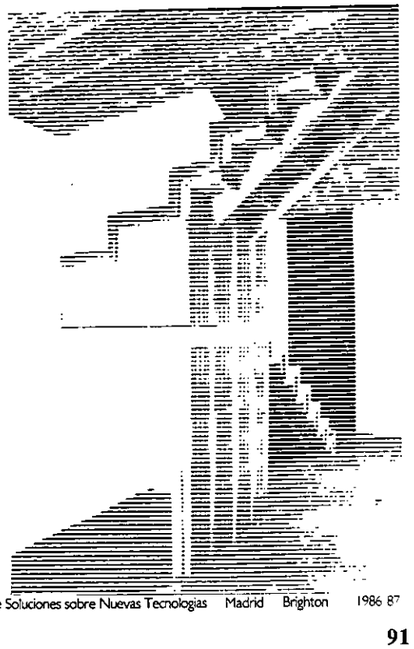


dos plantas en hilera implantación alternada



una planta en hilera





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SECTION 2

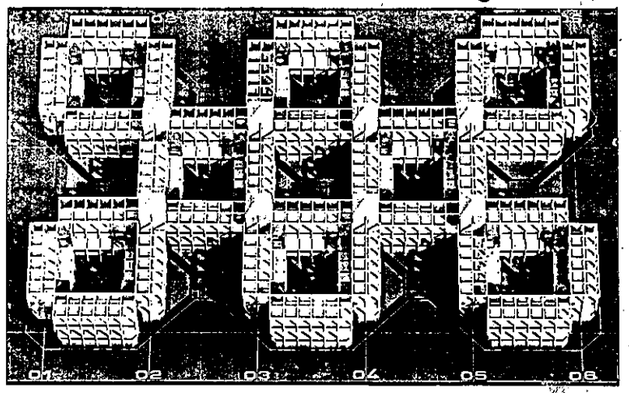
THIS PROJECT DESIGN MIGHT WELL HAVE BEEN SUBMITTED FOR COMPETITION IN ANY OF THE SECTIONS, INCLUDING EVEN SECTION V. THE AUTHOR, HOWEVER, AS THE RULES OF COMPETITION REQUIRE, DECIDED ON SECTION II, CONFIDENT THAT THE JUDGES WILL RECOGNIZE AND APPRECIATE ITS ASPECTS PERTINENT TO SECTION I, SECTION III AND SECTION IV.

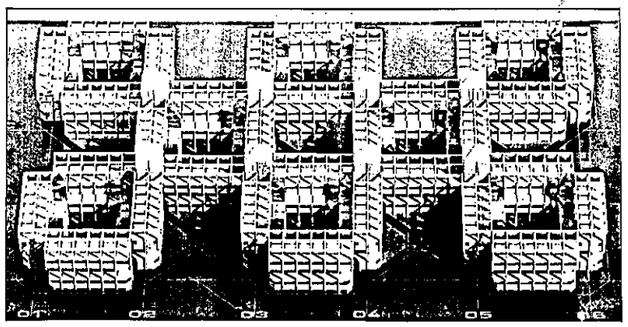
THE FUNDAMENTAL CONCEPT BEHIND THE DESIGN IS THAT HUMAN NEEDS ARE UNIVERSAL, REGARDLESS OF THE MERIDIAN OF DAY-TO-DAY LIFE. THE AUTHOR'S ENDEAVOR HAS BEEN TO IMPART THIS UNIVERSALITY THROUGH A CLEAR ARCHITECTURAL FRAMEWORK, WHILE LEAVING THE POSSIBILITIES OPEN WITHIN THIS FRAMEWORK FOR ADJUSTMENT TO LOCAL TRADITIONS AND CONTRUCTION METHODS.

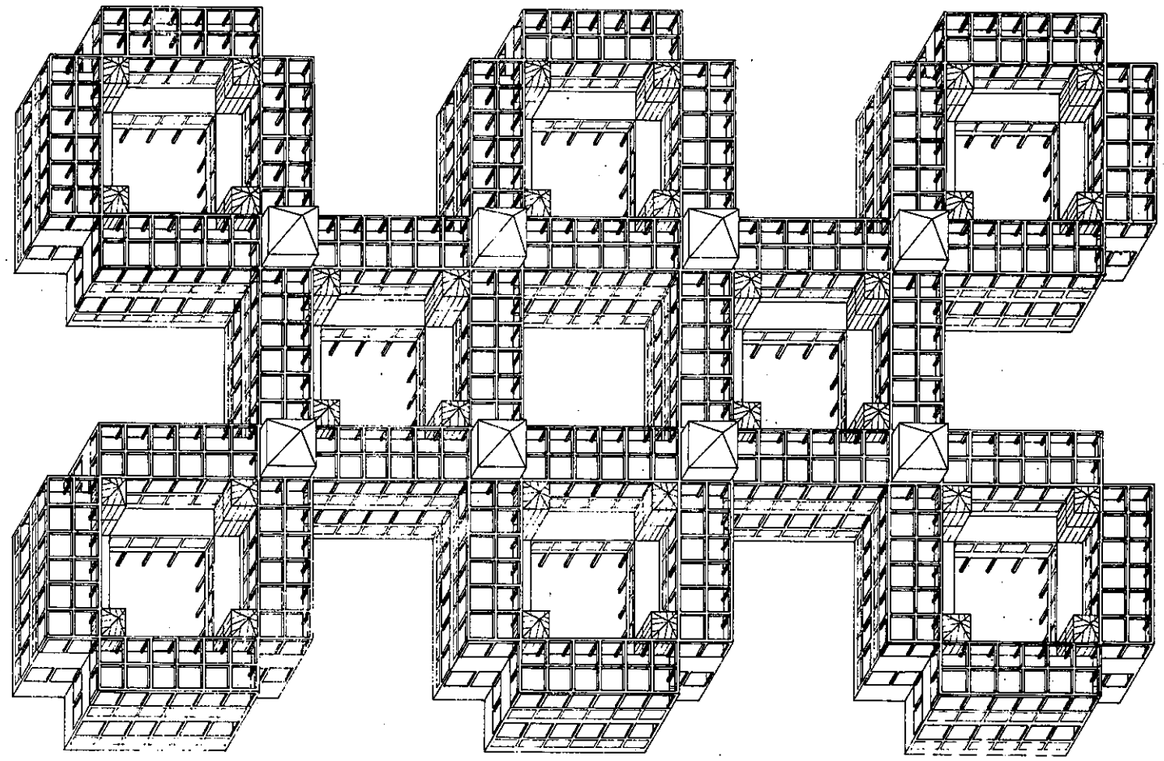
THEMATICALLY, THE ATRIUM IS HISTORICAL. IT CAN BE TRACED FROM THE FIRST DWELLINGS IN KNOSSOS OR POMPEII UP THROUGH THE PRESENT. THE AUTHOR IN THIS PROJECT TAKES THE ATRIUM AND ATTEMPTS TO INTEGRATE IT INTO THE BASIC IDIOM OF TODAY'S URBAN LIVING – THE MULTI--FAMILY DWELLING. HIS PRESENTATION IS OF A MODEL FOR COMMUNITY LIVING CONSISTING OF 192 UNITS, 128 OF 99 m^2 AND 64 OF 66 m^2. OBVIOUSLY, THESE UNITS ARE INTENDED FOR 5-MEMBER FAMILIES AT THE MOST. THE MODEL PRESENTED IS STRICTLY DEFINED, BUT ITS MODULAR STRUCTURE PERMITS WIDE FLEXIBILITY. THE 24-UNIT MODULES COULD BE DISPOSED QUITE DIFFERENTLY IN A NEIGHBORING CONSTRUCTION.

THE NUCLEAR THEME OF THE DESIGN IS THE ATRIUM; THE OTHER FEATURES ROUNDING OUT THE SYSTEM IT DEFINES ARE THE FOLLOWING:

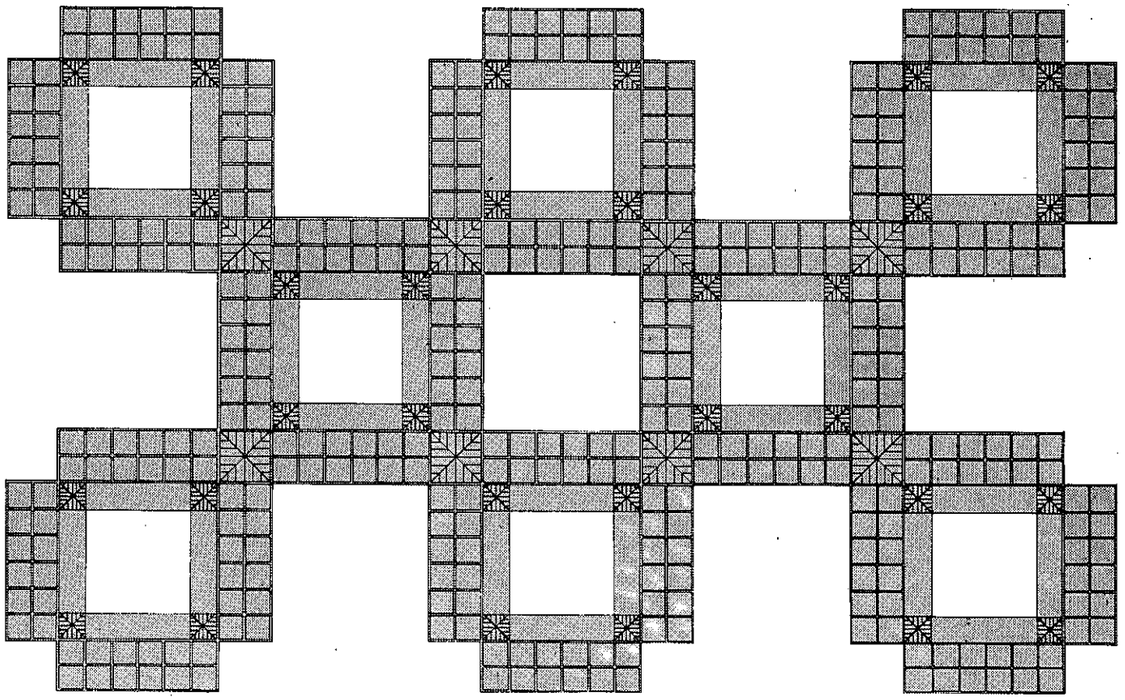
1) STRUCTURALLY THE CONSTRUCTION USES A UNIDIMENSIONAL 420 cm X 420 cm GRID. IN OTHER WORDS, THERE IS ONLY ONE FLOOR-PLAN DIMENSION, OR ITS MULTIPLE, REGARDLESS OF WHETHER THE INTERIOR CONSTRUCTION ELEMENTS ARE OF REINFORCED CONCRETE, STEEL OF WOOD. THE 66 m^2 UNITS ARE ON FOUR SQUARES AND THE 99 m^2 UNITS ARE ON SIX. CONSTRUCTION CAN BE ENTIRELY OF PREFABRICATED ELEMENTS (SUPPORTS, BEAMS, CEILINGS, EXTERIOR AND INTERIOR WALLS) OR TRADITIONAL.
2) THE SEWAGE AND WATER MAINS (BATHROOMS) AT THE CENTER OF EACH LIVING UNIT ARE A FUNCTIONAL INNOVATION. EACH UNIT HAS ALSO BEEN GIVEN TWO EXPOSURES (EAST AND WEST) AND THE POSSIBILITY OF A THIRD (NORTH OR SOUTH).
3) THE MULTI-FAMILY ARCHITECTURAL DESIGN REST ON THE WELL THOUGHT THROUGH PLACEMENT OF THE STAIRWELLS AROUND WHICH THE LIVING UNITS ARE LAID OUT WITH THEIR ENTRY LANDINGS ON OPPOSITE SIDES, INTERNALLY OR EXTERNALLY DEPENDING ON THE FLOOR. THE MULTI-DWELLING STRUCTURE GIVES A SENSE OF BEING "STRUNG TOGETHER". THE PROJECT MODEL HAS DWELLINGS ON THE GROUND FLOOR PLUS TWO FLOORS ABOVE, A TOTAL OF THREE STORIES.
4) THE AUTHOR IN HIS PROJECT DESIGN HAS GONE FAR BACK INTO HISTORY TO WHEN PEOPLE LIVED AND PURSUED THEIR DAILY ACTIVITY IN THE SAME PLACE. HIS CHOICE WAS TO MEET THE NEEDS OF PEOPLE WITH CLOSE BONDS, BY CHOICE OR BY TRADITION, TO THE SOIL, FOR WHOM GARDENING IS A REMUNERATIVE ACTIVITY OR PREFERRED HOBBY. THE MODULE ROOFS ARE INTENDED AS TERRACES ON WHICH VEGETABLES CAN BE GROWN, VINEYARDS OR DWARF FRUIT TREES RAISED, WHEAT SOWN TO BAKE BREAD FROM THE HOME-GROWN GRAIN. SOME RESIDENTS MIGHT PREFER TO RAISE FLOWERS: ROSES, CHRYSANTHEMUMS, TULIPS . . . THE CHOICE OF OTHERS COULD BE TO RAISE CHICKENS OR RABBITS, OR EVEN SOME LARGER DOMESTIC ANIMALS – OR PERHAPS BREED FISH. A FAMILY COULD DECIDE TO HAVE A POOL. THE FUNCTIONAL ADAPTABILITY TO DIFFERENT CLIMATES OF THE TERRACE GARDENS IS ENSURED BY THE PERGOLA-LIKE FRAMES PROVIDED IN THE PROJECT DESIGN ON WHICH GLASS OR SHEET PLASTIC CAN BE MOUNTED TO MAKE THE GARDENING SEASON YEAR-ROUND. THE LAYER OF EARTH ON THE TERRACES IS AT LEAST 40 cm. DEEP, AND THE TOTAL GARDENING SPACE ON THE ROOF OF EACH MODULE IS 800 m^2. RELATED TO THESE "HOUSEHOLD PLOTS" ARE THE STORAGE TOWERS WHICH INTERCONNECT THE 24-DWELLING MODULES, PROVIDING VENTILATED STORAGE SPACE FOR EACH FAMILY'S HARVEST AND AT THE SAME TIME THE SPACE NEEDED FOR KEEPING TOOLS, SMALL MACHINES AND GARDENING SUPPLIES (FERTILZERS, SEEDS, PESTICIDES, ETC.). IN SHORT, EACH FAMILY IN ADDITION TO A 33 m^2 PLOT, IS PROVIDED WITH A 20 m^2 SHED.
5) THIS PROJECT DESIGN HAS BEEN SUBMITTED FOR COMPETITION IN SECTION II BECAUSE OF ITS ADAPTABILITY TO DIFFERENT GEOGRAPHICAL AND CLIMATIC REGIONS AND SUITABILITY FOR DIFFERENT IDEOLOGICAL AND SOCIAL ENVIRONMENTS. THE EXTERIOR LENDS ITSELF TO LOCAL MATERIALS AND THE INTERIORS OFFER MAXIMUM FLEXIBLE. THE MODEL PRESENTED IS ONLY ONE OF MANY POSSIBILITIES. IN TERMS OF CONSTRUCTION, THE DESIGN IS MULTI-NATIONAL BECAUSE ITS FOREMOST FEATURES ARE SIMPLICITY AND ECONOMY OF SPACE. ITS ONLY INVARIABLE PROPOSAL IS A NEIGHBORHOOD LIFESTYLE. IT IS CONCEIVED TO MEET THE NEEDS OF FAMILIES WHO FIND SATISFACTION IN CLOSE PERSONAL CONTACT WITH NATURE AND IN THE CLOSENESS AND WARMTH OF COMMUNITY LIVING. IT OFFERS THEM THE OPPORTUNITY OF LIVING INDEED SURROUNDED BY NATURE, ABOVE THEM ON THEIR ROOFS AND IN FULL VIEW IN THEIR ATRIUMS, AND WITH EASY ACCESS TO NATURE FOR ALL.

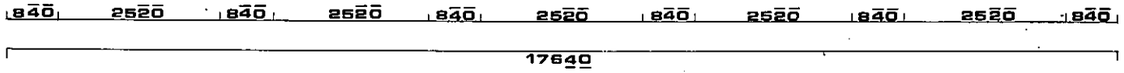


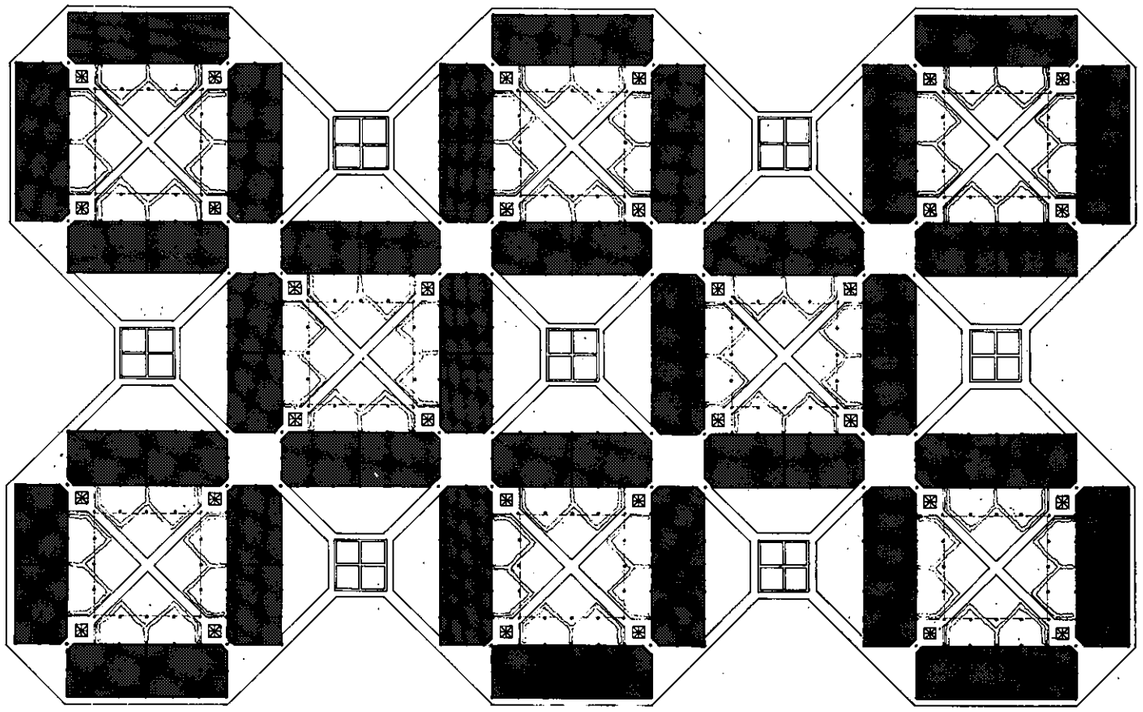




ROOF TERRACE

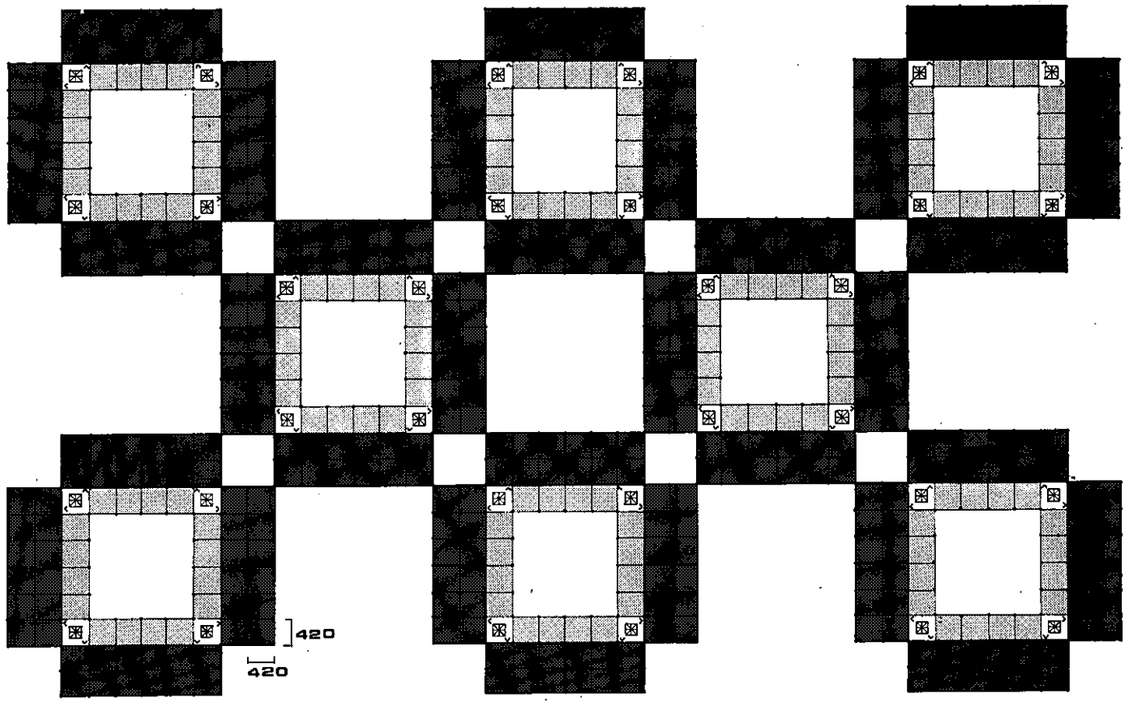


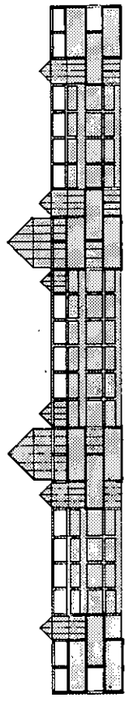


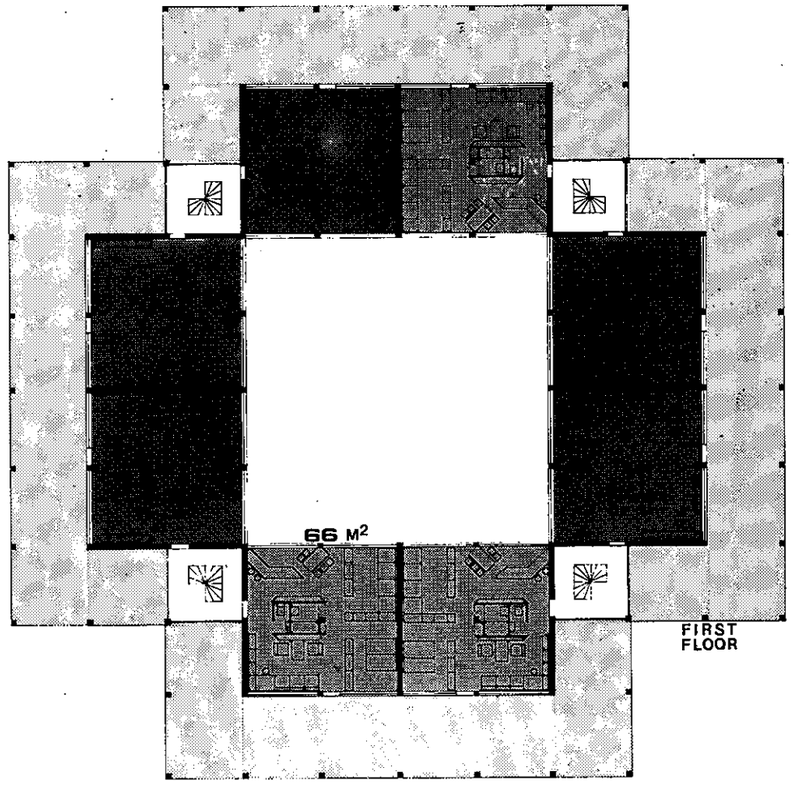


GROUND FLOOR

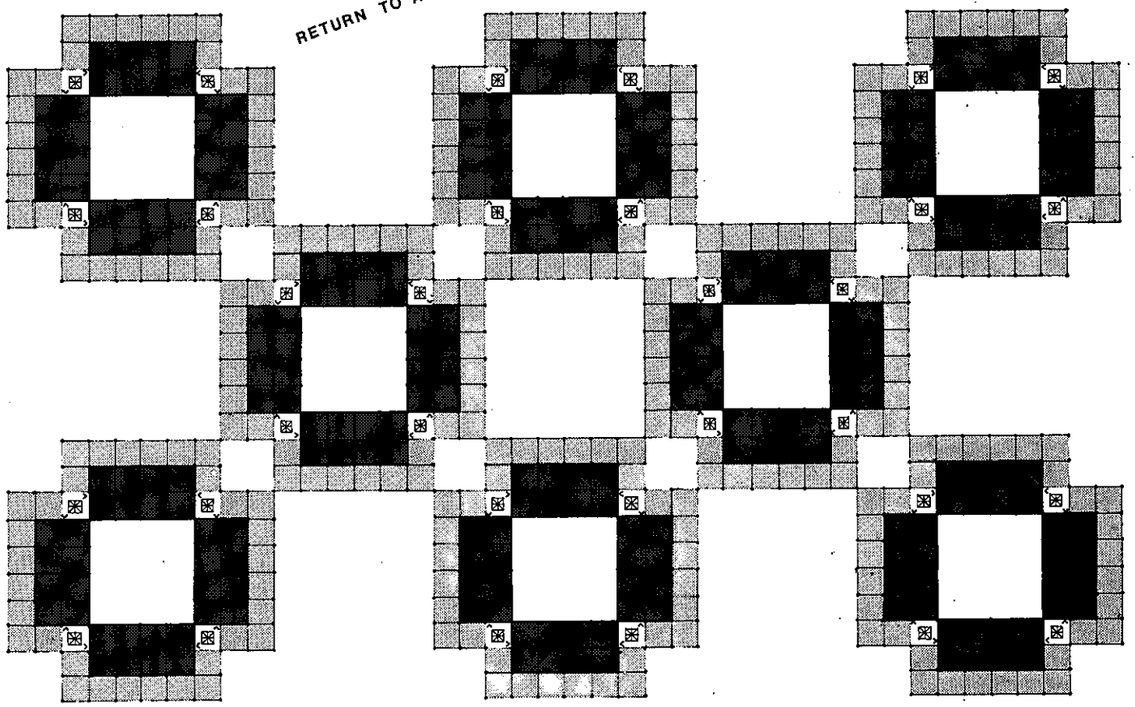
SECOND FLOOR



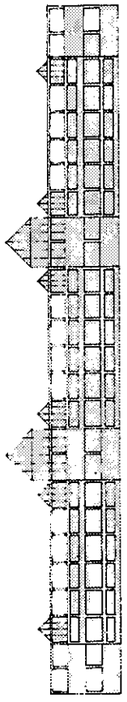


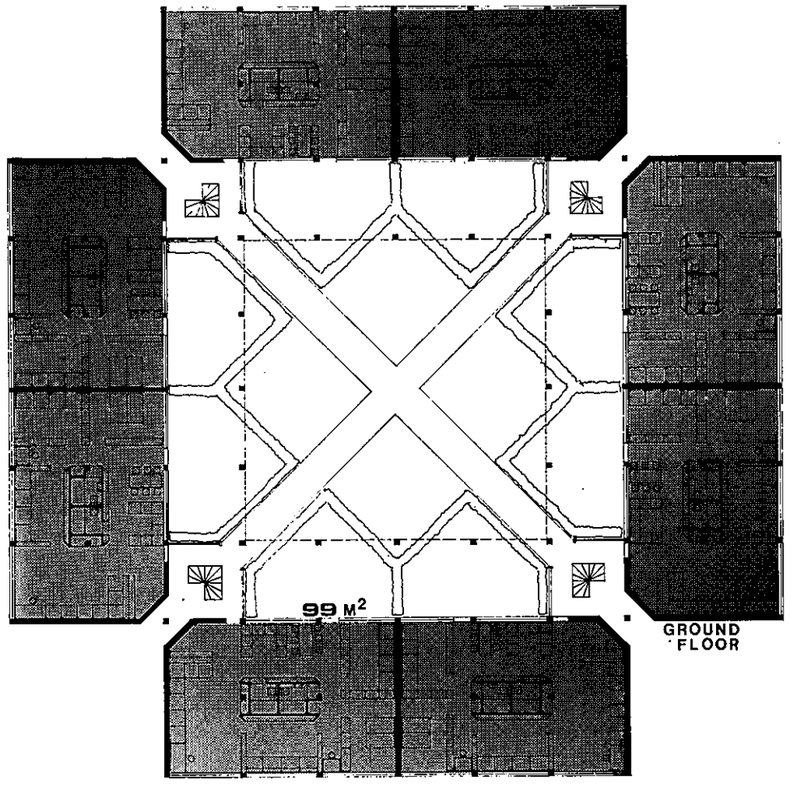


RETURN TO ATRIUM AND NEIGHBORHOOD



FIRST FLOOR





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SECTOR 10

* GENERALIDADES:

Partimos del Uruguay inserto en la realidad latinoamericana tercermundista con un sistema capitalista dependiente, agravada la situación por una pesada deuda externa.
Se trata de un pequeño País, 187.000 km2 de superficie, ubicado entre 2 potencias, Argentina y Brasil.
Sumado a las condiciones de país capitalista dependiente existe una falta de planificación territorial de estudio y diagnóstico de posibilidades de uso del suelo en cuanto a su utilización en toda su extención, llevando a que el territorio sea explotado según iniciativas e intereses de clases, inscripto en un país preponderantemente agropecuario con un subsuelo con pocos recursos y con escasa actividad en el sector de transformación e industrialización.
Esta situación conduce a que el Uruguay se caracterice por la macrocefalia de su Capital, Montevideo (1:400.000 h), en detrimento del Interior (1:500.000 h).
La emigración que en principio se da del medio rural a centros urbanos se continúa desde todo el territorio hacia la Capital, localizada en el principal puerto donde se desarrolla la mayoría de la actividad administrativa, comercial y financiera y se concentren los servicios de alcance nacional.
Desde comienzos de siglo, la falta de fuentes de trabajo en las zonas rurales y la desintegración familiar, consecuencia del sistema de explotación latifundista, conjuntamente con la oferta que produce la industrialización y centralización de actividades en Montevideo, comienza la emigración hacia la Capital.
Montevideo no responde a esta migración con una planificación territorial e integral adecuada. Consecuentemente los emigrantes del campo se asientan en zonas periféricas de la ciudad, que por sus características de grandes predios propiedad del Estado o particulares pero de bajo valor en el mercado inmobiliario, les permite ubicarse provisoriamente.
Conjuntamente a este asentamiento las poblaciones recurren a soluciones habitacionales acordes a sus posibilidades, como ser ajuste construcción, planes provisorios del Estado, etc.
A partir de la década del 50 la grave crisis económica del País, aumentada con la fuerte deuda externa posterior, impiden las soluciones de alternativa, transformándose la situación coyuntural en situación de crisis permanente. Esto trae como consecuencia el afincamiento definitivo en el cinturón de la ciudad, a lo cual el Estado responde con soluciones paliativas y benefactoras, como ser todos los planes de viviendas provisorias que en el transcurso de los años vemos que se transforman en definitivas con todas las carencias de su concepción inicial.
A esta migración campo-ciudad se superpone en las últimas décadas un fenómeno totalmente nuevo y agravante, la expulsión de población de la propia ciudad a su periferia.
Estamos así ante la presencia de gran parte de la población que se afinca en estos asentamientos conocidos con el nombre de CANTEGRILES. ¡¡¡¡
La merma del salario real de la población toda, obliga incluso a sectores de población ocupada a optar entre la subsistencia y el abandono de sus viviendas rentadas, inquilinatos, pensiones, etc. Engrosan así la población asentada en los cantegriles, transformandose éstas en poblaciones heterogeneas en cuanto a origen y nivel socio-cultural.
El incremento de viviendas precarias en Montevideo (Material de desecho y ranchos) en el período 1975-1983 es de un 76% y paralelalmente en el interior urbano del país, a pesar de la migración, en este mismo período el porcentaje de viviendas precarias aumenta de un 4,7% a un 6,3%.
Datos estos por demás ilustrativos y alarmantes dado que el Uruguay es un país con crecimiento demográfico practicamente nulo.
Esta situación no hace más que agravar el panorama de caos en el marco habitacional del país. En efecto a fin de ilustrar este caos podemos mencionar:

Número de Viviendas Precarias y "Otras" en Relación al Stock total Dic. 86

	1975		1983	
	TOTAL	PRECARIA	TOTAL	PRECARIA
Montevideo	342.500 (100,0%)	7.845 (2,3%)	386.781 (100,0%)	18.051 (4,7%)
Interior Urbano	303.200 (100,0%)	14.255 (4,7%)	322.400 (100,0%)	20.400 (6,3%)
Rural	104.100 (100,0%)	24.151 (23,2%)	128.806 (100,0%)	32.200 (25,0%)
Total	749.800 (100,0%)	46.284 (6,1%)	837.271 (100,0%)	68.651 (8,2%)

Número de Viviendas Precarias y "Otras" e Incremento del Stock entre 1975-1983 Dic. 86

	Montevideo			Interior Urbano			Rural		
	Total		Increm.	Total		Increm.	Total		Increm.
	1975	1983	1975-83	1975	1983	1975-83	1975	1983	1975-83
Rancho	685 0,7%	3.820 22,8%	3.135 38,4%	5.773 40,5%	12.533 68,7%	6.760 132 %	19.055 78,9%	28.851 89,6%	9.796 121,7%
Inquilinato	1.710 21,7%	6.886 42,5%	5.176 63,2%	299 21 %	1.285 6,3%	986 16,0%	–	–	–
Mat. Desecho	3.427 43,5%	3.435 21,4%	8 0,09%	2.723 19,1%	3.570 17,5%	847 13,8%	1.763 7,3%	1.159 3,6%	–604 – 7,5%
Otros	2.056 26,1%	1.910 11,8%	– 146 – 1,8%	5.460 38,3%	1.612 7,9%	–3.848 – 62,8%	3.333 13,8%	2.190 6,8%	– 1.143 – 14,2%
Total	7.878 100,0%	16.051 100,0%	8.173 100,0%	14.255 100,0%	20.400 100,0%	6.145 100,0%	24.151 100,0%	32.200 100,0%	8.049 100,0%

** SAN VICENTE.—"EL BARRIO"

→ LOCALIZACIÓN:

El Barrio San Vicente se emplaza en la zona noroeste de la ciudad de Montevideo, en un predio situado en la intersección de la calle Timbúes y Avda. Aparicio Saravia.
Se inserta en una de las mayores zonas de población periférica de miseria y pobreza, zona que abarca gran cantidad de "cantegriles" y "barrios de emergencia" como son San Isidro, Santa María, Marconi, Independencia, Borro, Plácido Ellauri, Unidad Misiones, Juan Acosta, etc.
Su población se asienta en este predio hace más de 30 años.

→ SITUACIÓN SOCIO-ECONÓMICA

°TRABAJO.

La mayoría se dedican a la recolección de residuos (requeche) que realizan durante la noche mediante el uso de carros de mano o tirados a caballo.
Luego realizan en los espacios exteriores de su "vivienda", la clasificación según tipo, como ser botellas, metales, trapos, etc., que venden a los acopiadores ("depósitos") los cuales venden esta materia para las industrias de transformación o rehuso.
Otro porcentaje se dedica al trabajo tipo changa, trabajo esporádico y circunstancial.
Es mínimo el número de personas que poseen trabajo estable.
Es de destacar que aún teniendo conocimientos de oficios no pueden acceder al mercado de demanda laboral.

°° SALUD:

Respecto de las condiciones de salud se verificaron importantes problemas de desnutrición por falta de calorías, proteínas y vitaminas con las lógicas consecuencias de alto grado de mortalidad infantil y problemas en el desarrollo intelectual.
Si bien está próximo en tiempo-vehículo de un centro de Asistencia hospitalaria general (Hospital Pasteur), la aislación real conlleva al uso inadecuado de este centro.
Conjuntamente los servicios de salud pública barrial son casi nulos e inoperantes a nivel de medicina preventiva y de urgencias.

°°° ALIMENTACIÓN ←

La alimentación, causa de la pobreza, es totalmente inadecuada y escasa, pudiendo afirmar que se sobrevive en el umbral del hambre permanentemente.

°°°° EDUCACIÓN.—

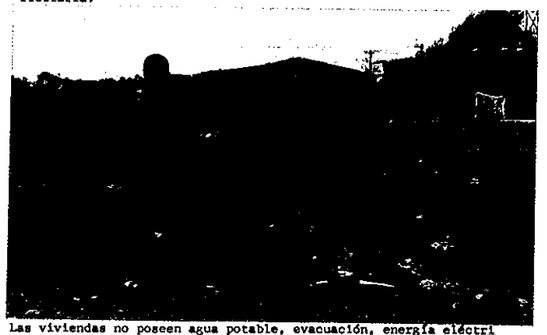
Las posibilidades de instrucción, dada la situación de pobreza y a que el esquema a nivel nacional es totalmente inadecuado a las características de estas poblaciones, son escasas o casi nulas.
La mayoría no ha terminado el primer ciclo de instrucción (primaria).

°°°°° ESPARCIMIENTO.—

No es atendido a ninguna escala. La totalidad de los pobladores permanecen toda la vida en su barrio, reduciéndose sus actividades de recreación a las posibilidades dentro de la misma zona.

°°°°°° HIGIENE AMBIENTAL.—

Las viviendas existentes son totalmente irrecuperables, construídas todas con material de desecho, palos, latas, restos de madera, nylon, etc.
Las dimensiones son exiguas, dando un elevadísimo índice de promiscuidad.
Por sus características son totalmente insalubres, frías en invierno con el agua de lluvia y arrastre siempre dentro del rancho, pisos de tierra, calientes en verano, totalmente débiles ante cualquier accidente atmosférico de la menor escala.
La higiene ambiental de la vivienda y el barrio, es totalmente deficitaria.



Las viviendas no poseen agua potable, evacuación, energía eléctrica, generalizándose esta carencia a nivel de todo el barrio.
En efecto, el agua potable se obtiene de una canilla pública que normalmente surte a una población oscilante de 40 a 200 familias, debiendo trasladarse éstas a distancias hasta de 650 mts.
El saneamiento interno es inexistente, realizándose la evacuación directamente al terreno o a pozos menos precarios, consecuencia de esto la enorme contaminación.
La energía eléctrica se destaca también por su ausencia.
Todas estas carencias se tornan en más alarmantes e indignantes pues son consecuencia de falta de voluntad política de solucionar los problemas puesto que el predio, al igual que la mayoría, estan situados en zonas perfectamente servidas a nivel de instalaciones de infraestructura general de los servicios. Destacamos que el predio de San Vicente está rodeado por calles pavimentadas de hormigón, con cañerías de agua, saneamiento, luz, alumbrado, teléfono, etc., que pasan por todo el perímetro público, por lo cual grandes problemas de salubridad dependen únicamente de la conexión a la red existente y una insignificante distribución interna al predio.
Para ejemplarizar esta desidia del quehacer del Estado, podemos mencionar que el Plácido Ellauri obtuvo, festejo mediante, la conexión de agua a sus viviendas luego de 35 años de existencia.
Referente al emplazamiento y construcción de los "ranchos" existen importantes elementos a destacar.
La invasión de tierras se realizó paulatinamente, cada núcleo familiar se instaló seleccionando su pequeña parcela, que aunque no perfectamente limitada por elementos físicos, define su propio territorio.
De común acuerdo con los ranchos existentes, dando ejemplo de respeto y solidaridad, seleccionan su ubicación de acuerdo a las necesidades y características de trabajo.
Como elemento generalizado se detecta la independencia en cuanto a la proximidad física, si bien se nota la marcada tendencia al agrupamiento en sectores definidos.
La selección si bien es espontánea, responde a un lógico ordenamiento definido por necesidades y resguardo a características físicas del predio. Dentro del caos lógico hay una razonable armonía en valores de selección, muy rescatables para una real y respetuosa planificación del territorio.
Ejemplo de esto es la vivienda unifamiliar independiente, los espacios exteriores como ampliación de la vivienda y zona de trabajo, la dimensión razonable de lotes, la implantación contemplando accesos buenos, creación de defensas de aguas de arrastre, posibilidad potencial de ampliación del rancho por mejoramiento o aumento del núcleo, cubiertas con pendientes importantes, etc.
Todo esto nos demuestra en forma cada vez más destacable la obligación imperiosa de realizar nuestro aporte técnico basado en un real diálogo, en un intercambio de vivencias y conocimientos propios, en forma tal de enriquecernos mutuamente en el proceso de elaboración y concreción de metas, metas que surjan y respondan a las necesidades verdaderas de los pobladores.

→ GRUPO DESTINATARIO:

El grupo estaba conformado por un total de 40 familias cuyos ingresos eran practicamente nulos.

** PROBLEMAS DETECTADOS.—

Los principales estan desarrollados en el item condiciones socio-económicas, pudiendo resumirlos en:
- ausencia de fuentes de trabajo
- alimentación inadecuada en cantidad y calidad
- higiene ambiental y de vivienda inadecuada
- instrucción escasa e inadecuada
- esparcimiento nulo
- elevada mortalidad infantil
- delincuencia juvenil como consecuencia de falta de posibilidades y espectativas.
- pesimismo en cuanto a reales soluciones
- descreimiento en cuanto a cualquier iniciativa, fundamentalmente cuando proviene de iniciativas del gobierno.

En contraposición a esta situación de carencias, podemos afirmar la existencia de valores potenciados, no común en otras capas sociales, como son la SOLIDARIDAD, la CONSTANCIA y ESPIRITU DE LUCHA, la HONESTIDAD de los planteos, la SENCILLEZ y CLARIDAD en cuanto a lo que se les ha impedido obtener, la COMPRENSION de su problemática y la ESPERANZA en la obtención de una estructura más justa.

* SITUACIÓN JURÍDICA:

Se invaden los predios quedando en situación de intrusos.
Ante la intimación judicial y lanzamiento, en 1979, mediante el apoyo de un sector de la comunidad montevideana, se obtiene la compra del predio en favor del Barrio.
Surge así como consecuencia de esta situación de caos, la concreción de una comunidad de 40 familias que resuelven mancomunar esfuerzos nucleándose en una cooperativa.
Una vez obtenida la propiedad de la tierra se afianzan y potencia la seguridad de permanencia, dando seguridad y esperanza a los proyectos de futuro.

⇒ OBJETIVOS:

Toda la tarea promocional en la que se inserta el trabajo de estas comunidades, actuando en forma conjunta con equipos asesores interdisciplinarios, tiene por finalidad el lograr una "convivencia más digna de los grupos humanos".
OBJETIVO GENERAL: "Lograr una toma de conciencia de la propia situación que les permita, a dichos núcleos humanos, descubrir nuevos esquemas de relaciones, a fin de ir logrando sucesivos cambios estructurales".
Dichos enunciados a largo plazo se concretan en objetivos específicos que orientan las acciones en las distintas disciplinas formando una verdadera red, mostrando el alcance y la globalidad de la tarea en su conjunto.
La enunciación de objetivos específicos en la experiencia realizada en el barrio San Vicente:
- incrementar la conciencia comunitaria y organizativa
- crear mejores niveles habitacionales
- crear fuentes de trabajo y de capacitación laboral
- elevar niveles sanitarios
- elevar nivel educacional

Orienta las tareas y en términos arquitectónicos tiene su expresión programática definida.

⇒ LINEA PROGRAMÁTICA: (BASADA EN UNA PRIORIZACIÓN)

☆ CREAR CONCIENCIA COMUNITARIA

Si bien la realización de este objetivo está presente en cada una de las tareas que se desarrollan, se visualiza en toda su dimensión en la creación del Centro Comunal.
En el Barrio San Vicente el Centro fue priorizado por la Asamblea Barrial como elemento de cohesión e integración comunitaria que visualizara el proceso de transformaciones en curso.
No menos importante fue la necesidad de dotar al Centro de todos los servicios básicos que paliaran en lo sustancial las grandes carencias de las que adolecía el Barrio.
Fue así, que además del salón multiuso y de una pequeña sala de reuniones, se dotó al Centro de:
- baños para hombres y mujeres
- duchas-vestuario para ambos sexos
- cocina
- lavadero común
- teléfono
- energía eléctrica
- espacio exterior próximo para esparcimiento

Los 200 m2 del Centro fueron culminados en Agosto de 1981.
El mismo se concretó con el aporte de la totalidad de mano de obra de los vecinos y el aporte financiero de un sector de la comunidad de Montevideo.
Sirvió como batería higiénica mientras las viviendas no contaron con sus propios servicios, sirvió y sirve hoy como comedor obrero y merendero de niños, es con su teléfono un punto de contacto con el resto de la ciudad, centro de esparcimiento y sala de reuniones del Barrio, cumpliendo una imprescindible función en el creciente grado de organización vecinal.

☆ CREAR MEJORES NIVELES HABITACIONALES !!

La solución del problema de la vivienda toma importancia prioritaria por su situación deficitaria y por su gran efecto multiplicador en cuanto a desarrollo de lazos comunitarios, organizativos, formativos etc.
Pero destacamos que es UNO de los tantos problemas, enmarcado en una situación deficitaria en todos los aspectos que permitan desarrollar una vida plena y decorosa para sus habitantes.
No concebimos una solución aislada al problema habitacional, no se trata de resolver un problema físico puntual que sirva a la familia como guarida ante los fenómenos atmosféricos.
La arquitectura, como respuesta a un hecho eminentemente social debe responder coherentemente a la realidad en estudio.
La vivienda y su solución aislada de la problemática de trabajo, salud, educación, etc., no contempla la realidad y en consecuencia es deshonesta.
Todo plan que no sea globalizador conlleva a un seguro fracaso.
"...que hacemos con una casa nueva si no tenemos comida para nuestros hijos, nos comemos la casa?..." (expresión de un poblador en un Plenario de Barrios).
Debemos olvidar los viejos esquemas de "planes de viviendas" para estos sectores que contemplan únicamente el problema físico, sin responder al resto de necesidades enumeradas y sin respetar en nada la propia cultura de sus habitantes.
Así constatamos los continuos fracasos de todas las "soluciones" dadas en Montevideo por parte del Estado.
Las necesidades son muchas, lo cual exige en todo plan priorizar y elaborar un proyecto que contemple en forma evolutiva la generalidad.
En San Vicente, mediante la metodología que trataremos más adelante, se llegó a una solución de viviendas tipo que creemos contempla los elementos claves y típicos de estos asentamientos.
Se destacan las siguientes características:

- vivienda unifamiliar aislada en una primera etapa de 24 m2. En la segunda etapa se duplica, evalúo y llego a la vivienda definida.
- tipología que permite el crecimiento en áreas y terminaciones.
- conformación de espacios exteriores como prolongación de la vivienda hacia los frentes y espacio de trabajo hacia los fondos.
- ubicación en el predio entre las dos arterias vehiculares como forma de respetar y crear la trama urbana con su facilidad de accesos. Las ubicadas en el centro del predio respetan igualmente la facilidad de llegada de los carros.
- tecnología apropiada; el procedimiento constructivo y los materiales usados son de conocimiento divulgado ampliamente en todos los sectores populares del país.
  Fabricación y uso conocido, bloques, ladrillos, chapas, etc., en forma tal de facilitar las tareas y la participación de los vecinos, tanto hombres como mujeres.

* CREAR FUENTES DE TRABAJO Y CAPACITACION

Surgen como respuesta a estos requerimientos, los pequeños talleres de:
- cestería
- herrería
- empanadas
- bloques
- escobería

Todos responden a las inquietudes del Barrio y se organizan bajo el sistema de cooperativas de producción, siendo las instalaciones y predio propiedad de la comunidad.
Su objetivo es doble, crear pequeñas fuentes de trabajo a escala y de formación de jóvenes, contemplado esto en la obligación de tener siempre jóvenes aprendices.

* ELEVAR NIVELES SANITARIOS

La asistencia primaria es atendida inicialmente en una pieza del Centro como lugar de primeros auxilios.
El resultado positivo motiva a los vecinos y asesores, se plantea la policlínica que se concreta en su local propio.
Esta se organiza bajo el sistema mutual, y es atendida por estudiantes y actuales médicos en colaboración directa con vecinos.
"...los actuales médicos, ex estudiantes que colaboraban desde sus comienzos, son de nuestro barrio". (expresiones de vecinos de la zona).
Paralelalmente surge una necesidad imperiosa, el centro de asistencia veterinaria. Este responde al cuidado de los animales, fundamentalmente caballos que son el principal medio de trabajo.
Su conformación es similar a la Policlínica.

* ELEVAR NIVEL EDUCACIONAL

La imposibilidad de acceso a centros educacionales y la inadecuación del sistema escolar, llevó a la creación del equipo de apoyo escolar, alfabetización y guardería.
Todo enmarcado en una real educación popular.

PRIORIZACION DE NECESIDADES *

Establecer prioridades teoricamente, elaborar proyectos en laboratorios desprendidos y alejados de sus destinatarios es irreal y errático.

Esta selección de necesidades y prioridades la establece el propio Barrio, respetando y fomentando el real concepto de PARTICIPACIÓN. En función de ello se desarrolló el programa.

La tierra, la vivienda, bs Centros, talleres, etc., toman distinta jerarquía según el Barrio.
Esto nos lleva a los elementos de acción más importantes:
- PARTICIPACION-AUTOGESTION
- RESPETO Y RESCATE DE LA CULTURA POPULAR

Participación como proceso histórico-social, secuencia de acciones desarrolladas por los verdaderos actores en el tiempo.
Participar en la totalidad de toma de decisiones, desde un problema de convivencia hasta en la elaboración de una política nacional de vivienda.

Apoyados en esto una de las aspiraciones básicas es priorizar el crecimiento de una conciencia crítica que permita salir del silencio y ser sujetos concientes, capaces de transformar las estructuras y la vida.

Profundo respeto por su acervo cultural, concientizar que nuestra cultura no es universal, que estamos frente a una cultura distinta pero tan o más valedera que la nuestra.
Con este respeto y el intercambio mutuo podremos apostar a una sociedad más justa.

Estos conceptos nos permiten encarar nuestra postura como profesionales, concientes de nuestros conocimientos y limitaciones.

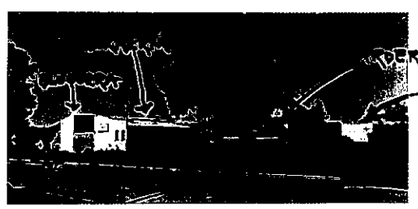
El quehacer del arquitecto, nuestros roles, se modifican, se enriquecen, debiendo priorizar nuestro sentir humano ante lo material.

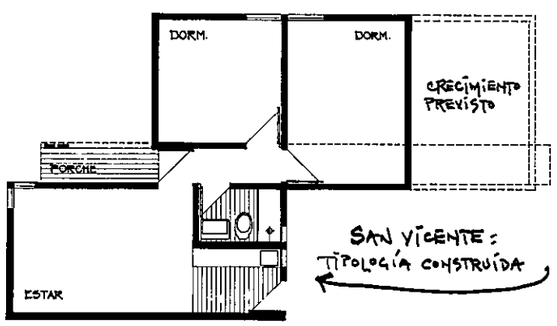
⇒ METODOLOGIA DE ACCIÓN: *

Basados en lo anterior desarrollamos el trabajo en los Barrios.
Luego del conocimiento humano y de problemas, apoyados en un trabajo transdisciplinario, se definieron necesidades arquitectónicas.
Estas necesidades y sus prioridades las elaboramos en la Asamblea General, integrada por todos los vecinos siendo la máxima autoridad.
Los criterios de evaluación son establecidos en estas reuniones y se analizaron bajo su óptica las realidades detectadas.
Asíse elaboró el plan general de acción concreta, el cual se devolvió a la Asamblea la cual corrigió, aprobó y definió prioridades.
Surgieron así las prioridades:
- Centro
- Viviendas
- Talleres
- Educación
- Policlínica médica y veterinaria

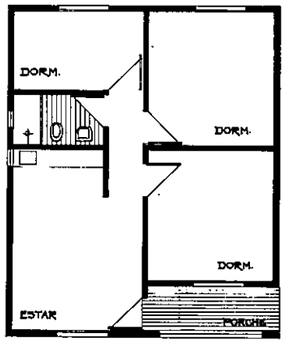
PROGRAMA!

Con éstas elaboramos los programas arquitectónicos concretos.
Detallaremos el método de elaboración de la propuesta arquitectónica de las viviendas y su implantación en el predio.

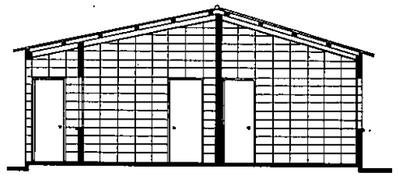




SAN VICENTE: TIPOLOGÍA CONSTRUÍDA

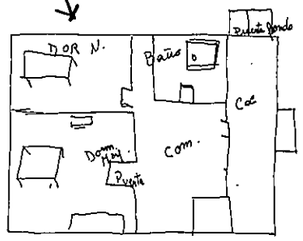


VARIANTE S. VICENTE

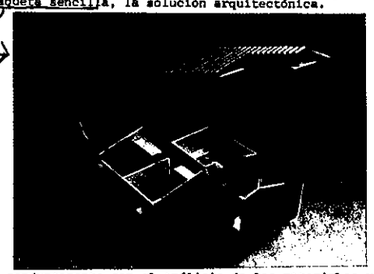


El equipo entrevistó todas las familias, recabando su visión de las viviendas en forma de dibujos propios o interpretando graficamente sus expresiones verbales.

PROCESO DE DECISIONES



Recopiladas todas sus propuestas, el equipo técnico apoyado en datos censales de familias, edades, trabajo, etc., sistematizó los elementos comunes de las sugerencias y propuso a nivel de anteproyecto, mediante una maqueta sencilla, la solución arquitectónica.



Esta propuesta, conjuntamente con el análisis de los materiales y procedimientos constructivos, se trabajan en la Asamblea.
Ésta observa, corrige, aprueba la solución definitiva. Surge así la respuesta que consideramos responde lo más fielmente posible al sentir del destinatario, atendiendo las necesidades físicas y humanas propias de su cultura. Conjuntamente y en igual forma se elabora el proyecto de distribución en el predio.

Paralelalmente el Barrio define la forma de trabajo y organización propia, crea sus reglamentos de convivencia y trabajo, régimen de bolsa de horas, su forma jurídica, los criterios de adjudicación, etc.
La construcción de la obra se resolvió hacer mediante el sistema de Ayuda Mutua, nucleados en una cooperativa de usuarios.

Resuelven aportar el 100% de la mano de obra sin costo alguno entre todos los destinatarios.
Se construyen las viviendas con el esfuerzo de todos, ignorando hasta su adjudicación, qué vivienda le corresponde al núcleo familiar.

Su costo, en valor de materiales, fue de 20 Unidades Reajustables el m2 (U$ 114/m2).
La amortización de los materiales se realiza en cuotas mensuales de acuerdo a las posibilidades reales (recordemos que todos viven con un ingreso inferior al salario mínimo actual de N$ 18.000.- mensuales, es decir U$ 90.-
La tenencia de la tierra es colectiva, dándose el uso y goce de las viviendas y sus lotes.

SAN FERNANDO: (OTRO BARRIO).

El trabajo en este cantegril se realiza en mitad del año 1985.

Todas las condicionantes y características generales son asimilables a las de San Vicente.

Un hecho es distinto, se realiza en los comienzos del régimen "democrático" y en un permanente diálogo con las autoridades de la Intendencia de Montevideo.

De acuerdo con la Intendencia nuestro equipo elabora anteproyectos, se aprueban y se presenta el proyecto completo, pronto para su ejecución (Set/85).

Pero luego de entregado viene el silencio de las autoridades y al tiempo, ante nuestro estupor y desconcierto del Barrio, todo lo elaborado se "archiva".
Reaparecen las autoridades con otro proyecto, con otro reglamento, con otra organización, es decir, todo cambia.
El Barrio, ante la opción de tomarlo o dejarlo opta por firmar.
Así se comienzan las obras, 70 viviendas en un plazo de 24 meses...

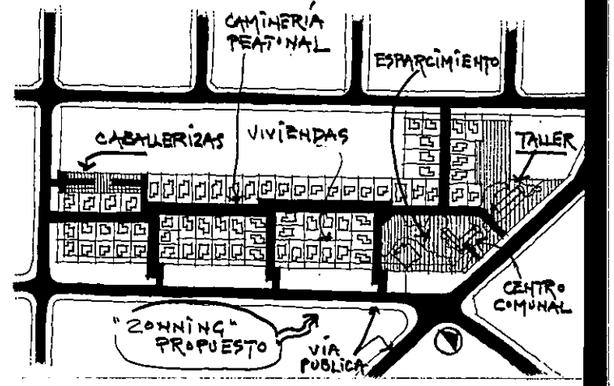
La situación actual de las obras: a 18 meses de comenzadas, lo construído no alcanza al 20% del total. Los comentarios, las evaluaciones, no son necesarias, son obvias y contundentes.
El esfuerzo inicial del Barrio, la propuesta auténtica de ellos fue acallada, sustituída por otra impuesta. Y los mismos planteos a nivel de Estado continúan en la misma línea.

CONCLUSIONES *

Nuestro camino, nuestra metodología, nuestro pequeño esfuerzo no es muy ortodoxo, está lleno de permanentes cambios, no posee rigor científico. Pero estamos convencidos que es una buena respuesta, basada en un diálogo real entre asesores y habitantes, en su trabajar con el pueblo en el esfuerzo mancomunado, en una dinámica permanente, en una acción-reflexión-acción.
Si bien no es una "receta" puesto que se basa en un criterio ante todo humanista, consideramos que su aplicación en nuestra realidad concreta de los cantegriles de Montevideo, y similares del resto del universo es valedera y ante todo RESPETUOSA y LIBERADORA de los sectores empobrecidos por la explotación.

San Vicente, fruto de esfuerzos de los propios protagonistas es hoy un barrio enclavado en el escenario del "Chueco Maciel", que se abrió a la esperanza; los niños sonríen, los jóvenes trabajan, los mayores luchan y redoblan los esfuerzos, contagiando a toda esta zona de pobreza y dominación.

Como elemento de análisis, que consideramos auténtico y único camino de salida a estos sectores, transcribimos la propuesta del plan de acción presentado ante nuestras autoridades por el movimiento que aglutina gran parte de los cantegriles montevideanos:



* CONVENIO

1. OBJETO:
El objeto de este Convenio, es la elaboración de condiciones para la construcción de viviendas y su infraestructura de servicios internos en Barrios, asentamientos precarios, dentro del área de la ciudad de Montevideo.

2. APORTES
Los aportes de cada una de las partes se ajustarán al siguiente detalle:

2.1 ESTADO
Le corresponderá realizar los siguientes aportes:
- terrenos con sus servicios y conexiones
- recursos económicos necesarios para financiar el programa
- aprobación de: proyecto
  costo
  plazo
  calidad
  certificados mensuales de avance de obra en cuanto a monto de lo realizado y la calidad.
- agilitar todos los trámites referentes a estos programas con la exoneración de todos los costos de los mismos.
- cumplir en tiempo y forma con toda acción que requiera el buen desarrollo, tales como aprobaciones, inspecciones, etc.

2.2 BARRIO
Le corresponderá realizar los siguientes aportes:
- elaborar los proyectos globales, dirección de obras y asesoramientos especiales.
- administración de los recursos
- definir y elaborar la forma organizativa propia, reglamentos, adjudicación, etc., que aseguren el buen cumplimiento del Plan.
- mano de obra benévola global no superior al 15% del costo de las obras
- pago durante 25 años, en cuotas mensuales consecutivas equivalente a los siguientes porcentajes del ingreso del núcleo familiar:
  de 0 a 1 salario mínimo nacional ... 0%
  de 1 a 2 " " " ... 4%
  de 2 a 3 " " " ... 9%
  de más de 3 " " " ...14%

3. VIVIENDAS - Tipo
- Costo
- Tipo de vivienda que cumpla con los mínimos exigidos por la ley Nacional de Viviendas.
- Costo: serán los previstos en el Plan Quinquenal de Vivienda del Poder Ejecutivo, rubro erradicación de cantegriles, con un monto de 1.372 U.R. por vivienda promedio de 50 m2. Dicho monto no incluye terreno ni infraestructura, y previendo partidas por mayores costos.
- Se incluirá en el Programa, la construcción de un Salón Comunitario según determina la Ley Nacional de Vivienda.

4. TENENCIA Y ADJUDICACION DE TIERRA Y VIVIENDA
- La adjudicación y tenencia de la tierra en propiedad a favor del Barrio se realizará simultaneamente con la firma del Convenio entre Barrio-Estado.
- Una vez finalizada la construcción de las viviendas, se dará el derecho de uso y goce de las mismas a cada núcleo familiar.

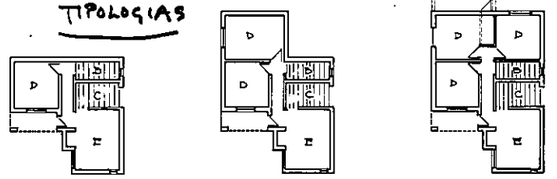
5. FORMA DE CONTRATACIO.
El Convenio será suscrito entre Barrio y Estado.

6. ASESORAMIENTO
- Los proyectos globales, dirección de obras, asistencia social y otros asesoramientos especiales serán realizados por técnicos elegidos por el Barrio.

7. EGRESO E INGRESO DE NUCLEO FAMILIAR
- En caso de retiro de un núcleo familiar del programa durante la obra o luego de finalizada la misma, tendrá derecho a que se le reconozca el total de horas aportadas como aporte en otro convenio de similares características.
- El nuevo núcleo que se integra deberá realizar el total de horas correspondiente a la vivienda que ocupa en otro Convenio de similares características, no obteniendo ningún otro beneficio extra en el programa que desarrollará sus tareas.

PROPUESTA PARA S. FERNANDO

TIPOLOGÍAS

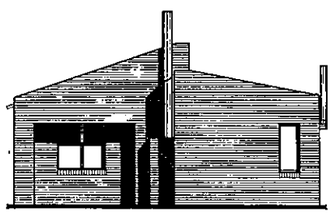


1 DORMITORIO (36m2)
CANTIDAD: 20

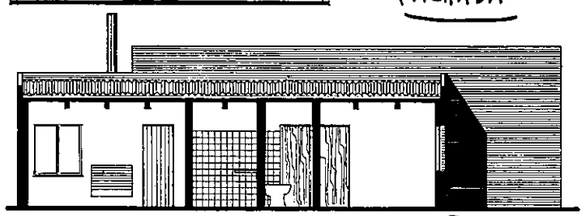
2 DORMITORIOS (48m2)
CANTIDAD: 26

3 DORMITORIOS (52m2)
CANTIDAD: 12

4 DORMITORIOS (66m2)
CANTIDAD: 6



FACHADA



CORTE

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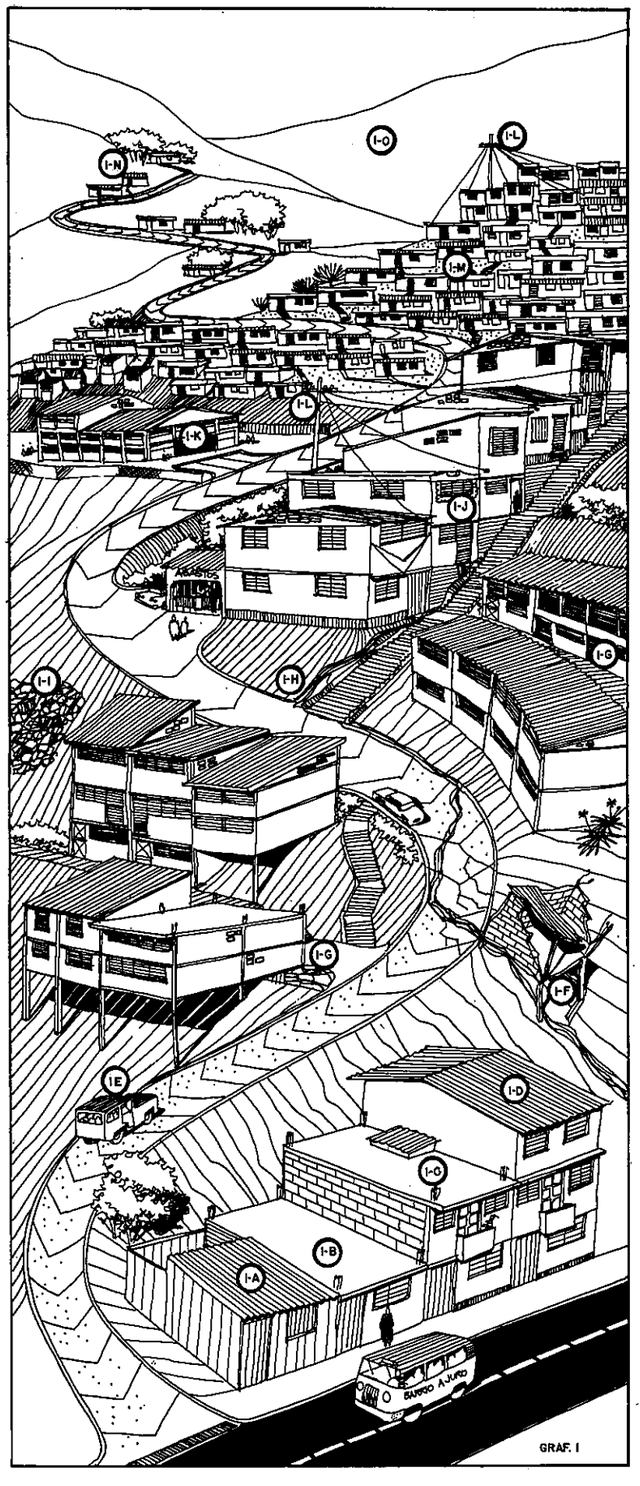


GRAF. 1

VIVIENDAS EN PENDIENTE.

TRABAJO A SER INCLUIDO EN EL SECTOR II DEL TEMARIO DEL CERTAMEN INTERNACIONAL DE SOLUCIONES SOBRE NUEVAS TECNOLOGIAS DE LA VIVIENDA SOCIAL - CINTUS.

A. EL PROBLEMA

EL PROBLEMA HABITACIONAL EN VENEZUELA, EN FORMA SIMILAR AL RESTO DE LOS PAISES EN DESARROLLO, POSEE CARACTERISTICAS ALARMANTES: UN DEFICIT ESTIMADO EN 860.000 VIVIENDAS Y LA PERSPECTIVA DE TENER QUE ALOJAR EN LOS PROXIMOS 15 AÑOS A UNOS DOS Y MEDIO MILLONES DE FAMILIAS, ES DECIR TANTAS COMO LAS QUE EXISTEN EN LA ACTUALIDAD EN EL PAIS Y HAN TARDADO 450 AÑOS EN EDIFICARSE.

GRAVES PROBLEMAS SOCIO-CULTURALES Y ECONOMICOS, IMPIDEN A LA MAYORIA DE LA POBLACION, ADQUIRIR LAS VIVIENDAS PRODUCIDAS POR EL SECTOR FORMAL: UN 72,3% DE LA POBLACION NO PUEDE ADQUIRIR VIVIENDAS CON COSTOS SUPERIORES A 160.000 BS. (8.000 $). EL SECTOR FORMAL SE VE IMPEDIDO DE PRODUCIR VIVIENDAS ECONOMICAS, POR LAS NORMATIVAS URBANISTICAS QUE RIGEN NUESTRAS CIUDADES (MUCHAS COPIADAS DE PAISES DESARROLLADOS QUE VAN "MANHATANIZANDO" NUESTRAS CIUDADES) Y SE ORIGINAN VIVIENDAS COSTOSAS QUE SE QUEDAN "FRIAS" (SIN MERCADO) Y MIENTRAS TANTO AVANZA EN FORMA IMPRESIONANTE EL MERCADO INFORMAL DE VIVIENDA, LLEGANDO A OCUPAR LOS "RANCHOS" (VIVIENDAS INFORMALES) UN 45% DEL AREA URBANA DEL PAIS CON CERCA DE 7 MILLONES DE PERSONAS.

CARACAS, ES UNO DE LOS CASOS MAS DRAMATICOS: DONDE DIARIAMENTE UNA HECTAREA DE TIERRA ES INVADIDA EN FORMA CAOTICA POR EL SECTOR INFORMAL.

EL PRESENTE TRABAJO, PRESENTA DOS ALTERNATIVAS DE VIVIENDAS, NO CONVENCIONALES, ADAPTADAS A LAS ALTAS PENDIENTES QUE RODEAN MUCHAS CIUDADES LATINOAMERICANAS (RIO DE JANEIRO, BOGOTA, CARACAS, ETC) Y A LA IDIOSINCRACIA DE NUESTRA POBLACION.

LA PRIMERA ALTERNATIVA HA SIDO CONSTRUIDA MASIVAMENTE Y EVALUADA, LA SEGUNDA SE HALLA EN PROCESO DE CONSTRUCCION EXPERIMENTAL.

A CONTINUACION DESCRIBIRE ALGUNOS ASPECTOS QUE CARACTERIZAN LOS BARRIOS POPULARES EN CARACAS:

B. LOS BARRIOS POPULARES.

LOS HABITANTES DE LOS BARRIOS POPULARES, TIENEN UNA LIMITADA CAPACIDAD DE AHORRO, UNA ACTITUD NEGATIVA AL ENDEUDAMIENTO A LARGO PLAZO, PERO CON GRAN RESPONSABILIDAD EN LOS PAGOS A CORTO PLAZO. INVADEN TERRENOS (GENERALMENTE PUBLICOS) (GRAF. 1) CON VIVIENDAS DE MATERIALES LIVIANOS RAPIDA EJECUCION Y REDUCIDO TAMAÑO (GRAF. 1-A, 1-N) QUE PROGRESIVAMENTE, VAN AMPLIANDO A TRAVES DE LA AUTOGESTION (NO AUTOCONSTRUCCION COMO ALGUNOS PRETENDEN DENOMINARLA) CON SISTEMAS DE CONSTRUCCION TRADICIONALES. ALCANZANDO A VIVIENDAS COMPLETAS DE VARIOS PISOS, (GRAF. 1-B, 1-C, 1-D) HASTA LLEGAR A CONSOLIDAR AREAS EN FORMA CAOTICA CON DENSIDADES QUE A VECES SUPERAN LOS 1.000 HAB/HA (GRAFICO 1-M) SIN SERVICIOS ADECUADOS: ESCUELAS SIN ESPACIO ADECUADO (GRAFICO 1-K), CLOACAS ABIERTAS (GRAF. 1-H), TALUDES CON BASURA (GRAFICO 1-I) LUZ ROBADA A POSTES PUBLICOS (GRAF. 1-L) DRENAJES INADECUADOS QUE PROVOCAN DERRUMBES (GRAF. 1-F) VIAS DE MUY ALTA PENDIENTE: HASTA 20% QUE DIFICULTA EL ASCENSO DE LOS VEHICULOS DE TRANSPORTE PUBLICO (GRAF. 1-E) Y FUNDAMENTALMENTE CON DOS CRITERIOS DE ORGANIZACION ESPACIAL: UNO UBICANDO LAS VIVIENDAS CON FRENTE A UNA ESCALINATA ADAPTADA A LA TOPOGRAFIA (GRAF. 1-J) Y OTRO UBICANDO LAS VIVIENDAS CON ACCESO DESDE VEREDAS PEATONALES SIGUIENDO LAS CURVAS DE NIVEL Y CON LAS VIVIENDAS DANDO FRENTE A DICHAS VEREDAS (GRAF. 1-G). LA PROPOSICION PRESENTADA EN ESTE TRABAJO, EXPONE DOS ALTERNATIVAS: UNA SIMILAR AL CRITERIO DEL GRAF. 1-J YA CONSTRUIDA HACE MAS DE DIEZ AÑOS Y DEBIDAMENTE EVALUADA Y OTRA SIMILAR AL CRITERIO DEL GRAF. 1-G EN PROCESO INICIAL DE CONSTRUCCION, PROPUESTAS QUE TRATAN DE SER UNA RESPUESTA DIFERENTE, ADAPTADAS A LA IDIOSINCRACIA DE NUESTROS PUEBLOS Y QUE EVITE QUE LOS TERRENOS LIBRES (GRAF. 1-O) SEAN INVADIDOS CAOTICAMENTE HASTA ALCANZA DENSIDADES INACEPTABLES, AGRAVADAS POR LA CARENCIA DE SERVICIOS.

C. LA PROPOSICION:

C.1. EL URBANISMO

CONSISTE EN LA EJECUCION DE UN URBANISMO DE SIMILARES CARACTERISTICAS A LAS REALIZADAS POR EL SECTOR POPULAR PERO UTILIZANDO NORMAS Y TECNOLOGIAS APROPIADAS. (GRAF. 2).

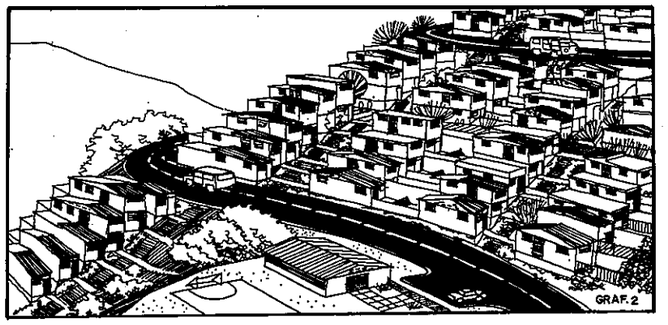
ASI, ZONAS CON PENDIENTES DE HASTA UN 80%, QUE NO SON FACTIBLES DE DESARROLLAR DE ACUERDO A LA NORMATIVA TRADICIONAL VIGENTE PUEDEN SER URBANIZADAS SIN REALIZAR GRANDES MOVIMIENTOS DE TIERRA, CON UN TRAZADO DE VIAS VEHICULARES QUE PERMITAN A TODOS LOS HABITANTES BAJAR HACIA SUS VIVIENDAS A TRAVES DE VEREDAS Y ESCALINATAS (GRAF. 3).

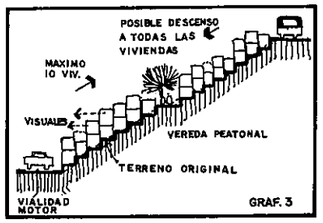
DOTANDO A LOS CONJUNTOS DE LOS SERVICIOS REQUERIDOS: ESCOLARES, ASISTENCIALES, ETC., BUSCANDO LA CREACION DE AREAS PLANAS A TRAVES DE LA UTILIZACION DE TIERRA SOBRANTE DE CORTES EN VIALIDAD Y VIVIENDAS, EVITANDO EL BOTE EN ZONAS ALEJADAS A LOS DESARROLLOS.

ES MUY IMPORTANTE EN LA DEFINICION DE LAS AREAS A SER DESARROLLADAS CON VIVIENDAS Y AREAS A SER DESTINADAS COMO ZONAS VERDES, EL ESTUDIO GEOTECNICO DETALLADO QUE ESTABLEZCA APARTE DE LA CAPACIDAD DE SOPORTE DE LOS SUELOS, LAS CARACTERISTICAS DE LAS FOLIACIONES, BUZAMIENTO DE ESQUISTOS, ETC., QUE PERMITA CON GRAN SEGURIDAD REALIZAR LOS CORTES REQUERIDOS SIN AFECTAR LA ESTRUCTURA GEOLOGICA DEL SECTOR.

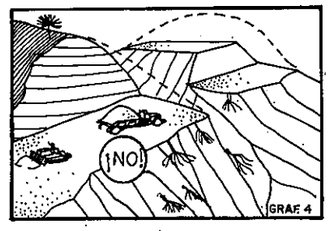
AL IGUAL QUE EN LAS INVASIONES NO CONTROLADAS EN UN DESARROLLO DE ESTA NATURALEZA DEBE RESPETARSE AL MAXIMO, LA TOPOGRAFIA Y VEGETACION ORIGINAL DE LOS TERRENOS, EVITANDOSE LAS TRADICIONALES DESVASTACIONES A QUE NOS ESTAMOS ACOSTUMBRANDO POR LA APARICION DE LAS GRANDES MAQUINARIAS "MODERNAS" (GRAF. 4).

LAS DENSIDADES BRUTAS OBTENIDAS CON ESTA TIPOLOGIA DE VIVIENDA ALCANZAN LOS 600 HAB/HA, ESTABLECIENDOSE EN LOS CRITERIOS DE ALTA DENSIDAD Y BAJA ALTURA.

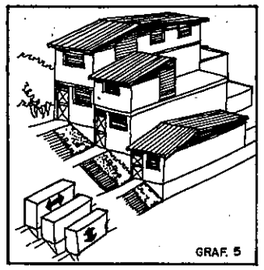

GRAF. 2

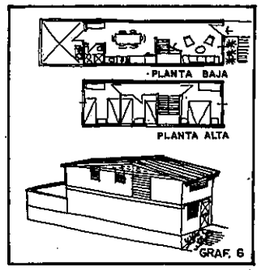


GRAF. 3

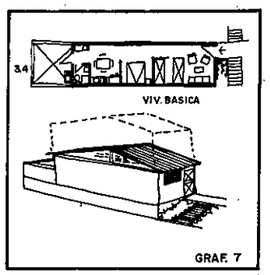


GRAF. 4


GRAF. 5



GRAF. 6



GRAF. 7

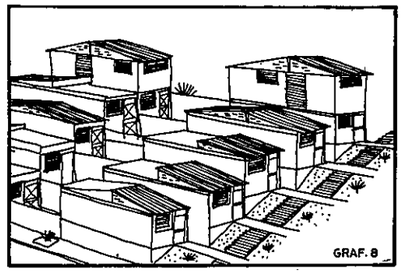
C.2. LA VIVIENDA.

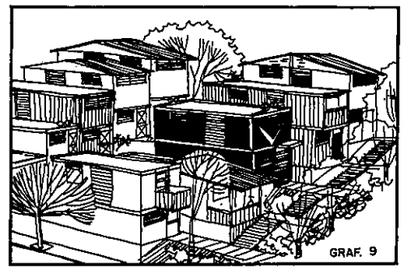
LA VIVIENDA COMPLETA CONSTA DE 3 DORMITORIOS, ESTAR, COCINA-COMEDOR, BAÑO Y PATIO CON UN AREA CONSTRUIDA DE 76 M2 Y UN PATIO POSTERIOR DE 11 M2 (GRAF. 5 Y 6) PERMITIENDO ALOJAR CONFORTABLEMENTE UNA FAMILIA PROMEDIO DE 6 PERSONAS.

A ESTA VIVIENDA PUEDE ACCEDERSE A TRAVES DE UN CRECIMIENTO PROGRESIVO DESDE UNA PRIMERA ETAPA CONFORMADA POR LA PLANTA BAJA DE LA VIVIENDA DEFINITIVA DE DOS PLANTAS, CON 2 AMBIENTES, BAÑO, LAVADERO Y PATIO POSTERIOR. (GRAF. 7).

ESTA UNIDAD PUEDE ALOJAR A UNA FAMILIA DE 6 MIEMBROS CON TABIQUES PROVISIONALES, UTILIZANDO PARA DORMIR EL AREA QUE POSTERIORMENTE SERA CONVERTIDA EN ESCALERA, LOGRANDOSE LA SEPARACION DE VARONES-HEMBRAS Y EL DORMITORIO MATRIMONIAL.

ESTA VIVIENDA BASICA DISPONE DE LAS FUNDACIONES NECESARIAS PARA SU CRECIMIENTO, ASI COMO TODOS LOS SERVICIOS DE AGUAS NEGRAS, BLANCAS Y ELECTRICOS. PUDIENDO POSTERIORMENTE A TRAVES DE CREDITOS OTORGADOS A ESTAS FAMILIAS EL LOGRAR EL MEJORAMIENTO Y AMPLIACION DE LAS MISMAS, DANDOLE A CADA UNA SU INDIVIDUALIDAD Y ENRIQUECIENDO LOS CONJUNTOS CON LA RIQUEZA Y VARIEDAD DE LOS BARRIOS POPULARES. (GRAF. 9) A PARTIR DE LAS VIVIENDAS BASICAS (GRAF. 8).


GRAF. 8

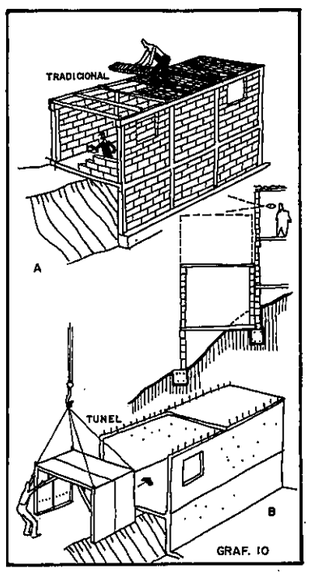

GRAF. 9

C.3. EL SISTEMA CONSTRUCTIVO.

INICIALMENTE ESTA TIPOLOGIA DE VIVIENDA SE DESARROLLO CON SISTEMA TRADICIONAL DE PAREDES DE CARGA CON BLOQUES DE CEMENTO Y ENTREPISOS CON LOSA MONOLITICA DE CONCRETO SOBRE PERFILES METALICOS, CON TECHO LIVIANO SOBRE CORREAS METALICAS. (GRAF. 10 A) CON EL OBJETO DE UTILIZAR AL MAXIMO LA MANO DE OBRA NO ESPECIALIZADA EXISTENTE EN ESOS SECTORES POPULARES.

POSTERIORMENTE Y ANTE LA GRAN CANTIDAD DE VIVIENDAS A SER CONSTRUIDAS EN CARACAS (APROXIMADAMENTE 3.000 UNIDADES), SE OPTO POR UTILIZAR UN SISTEMA DE RACIONALIZACION DE LA CONSTRUCCION CON ENCOFRADOS METALICOS DESLIZANTES, QUE DIO UN EXCELENTE RESULTADO (GRAF. 10 B).

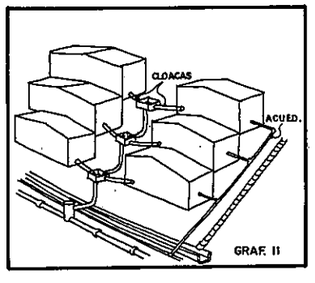
ES DE DESTACAR LA INDEPENDENCIA ESTRUCTURAL DE CADA VIVIENDA, PUDIENDO CRECER AISLADAMENTE SIN AFECTAR LAS ESTRUCTURAS VECINAS. ADAPTANDOSE TOTALMENTE A LA TOPOGRAFIA NATURAL.



GRAF. 10

C.4. LOS SERVICIOS.

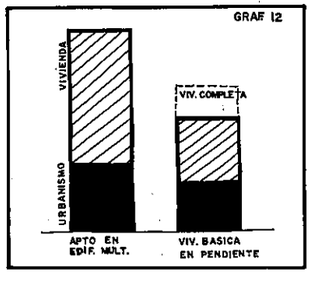
LOS SERVICIOS DE AGUAS BLANCAS Y ELECTRICIDAD, SON DIRECTOS A LAS VIVIENDAS, EL SERVICIO DE AGUAS NEGRAS PRESENTA LA PARTICULARIDAD DE SER INTERDOMICILIARIO A TRAVES DE LOS PATIOS POSTERIORES DE LAS VIVIENDAS, CON TANQUILLAS ROMPE-CARGAS (GRAF. 11) HASTA ALCANZAR EL COLECTOR GENERAL EN LA VIALIDAD PRINCIPAL.



GRAF. 11

C.5. LOS COSTOS.

EL COSTO DE LA VIVIENDA COMPLETA EN RELACION A UNA VIVIENDA DE SIMILARES CARACTERISTICAS EN AREA Y DENSIDAD EN EDIFICACIONES MULTIFAMILIARES DE BAJA ALTURA SUPONE UN 30% DE REDUCCION Y CASO DE UTILIZARSE LA VIVIENDA EN ETAPA BASICA SUPONE UN 50% DE REDUCCION. (INCLUYENDO EN LOS COSTOS LA INCIDENCIA DEL VALOR DEL TERRENO, OBRAS DE URBANISMO Y EDIFICACION). (GRAF. 12).



D. EJEMPLOS.

ESTA TIPOLOGIA DE VIVIENDA HA SIDO UTILIZADA PRINCIPALMENTE EN EL AREA METROPOLITANA DE CARACAS, EN CONJUNTOS TALES COMO BRISAS DEL PARAISO, CORRAL DE PIEDRA, PRIMERO DE MAYO, OBSERVATORIO, SAN ANTONIO, LA BOMBILLA, UP3 CARICUAO; DE LOS CUALES ME PERMITIRE DESTACAR EL ULTIMO DE ELLOS QUE CONSTA APROXIMADAMENTE DE 1.400 UNIDADES DESARROLLADAS EN UNAS COLINAS DE ALTA PENDIENTE (GRAFICOS 13 Y 14), HALLANDOSE DOTADAS DE ESCUELAS, LOCALES COMERCIALES, KINDERS, AREAS VERDES. DESARROLLADA CON SISTEMA CONSTRUCTIVO TRADICIONAL, FUE INAUGURADA EN EL AÑO DE 1974 Y DE LA CUAL HAN SIDO REALIZADAS DOS EVALUACIONES: UNA EN 1976 A TRAVES DE LA ESCUELA DE PSICOLOGIA DE LA UNIVERSIDAD CENTRAL DE VENEZUELA Y OTRA EN 1984 A TRAVES DE UNA TESIS DE GRADO EN LA CARRERA DE URBANISMO DE LA UNIVERSIDAD SIMON BOLIVAR; A CONTINUACION DESCRIBIRE ALGUNOS RESULTADOS DE DICHAS EVALUACIONES.

E. EVALUACIONES.

E.1. EVALUACION ESCUELA DE PSICOLOGIA UCV. 1976.

DE ACUERDO AL ANALISIS REALIZADO, SE OBSERVO UN PROMEDIO DE SEIS (6) PERSONAS POR FAMILIA EN CARICUAO, CON UNA POBLACION INFANTIL DEL 50%.
SIENDO MUY IMPORTANTE OBSERVAR UNA SATISFACCION CON LA VIVIENDA DEL ORDEN DEL 87%.

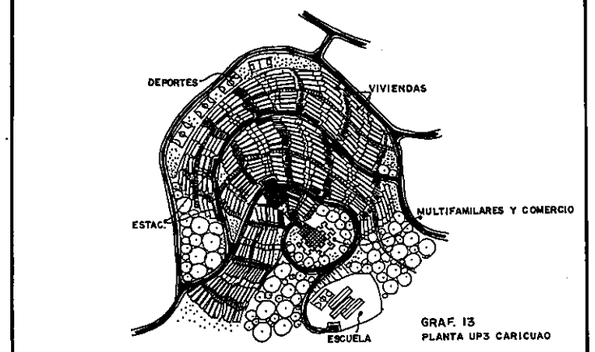
E.2. EVALUACION UNIVERSIDAD SIMON BOLIVAR. 1984.

PARA ESTE AÑO, UN 66,67% HABIA REALIZADO AMPLIACIONES Y MEJORAS A SUS VIVIENDAS, HALLANDOSE DE NUEVO UN ALTO PORCENTAJE SATISFECHO CON LA VIVIENDA (APROXIMADAMENTE 80%), ESTABLECIENDOSE EN ESTA EVALUACION QUE: "LOS RESIDENTES ENCUENTRAN UNA GRAN SATISFACCION DEL BARRIO EN QUE VIVEN POR EL AMBIENTE QUE EN EL ENCUENTRAN. EN CUANTO A LA VIVIENDA, EL NIVEL DE SATISFACCION ES AUN MAYOR POR EL HECHO DE PODER REALIZAR EN ELLA CAMBIOS DE ACUERDO A SUS PREFERENCIAS".

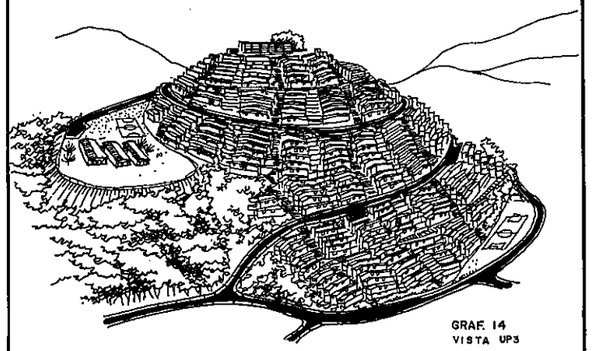
"LAS RELACIONES VECINALES QUE SE DAN ENTRE LAS FAMILIAS DEL SECTOR UP3 DE CARICUAO, RESPONDEN A UN IMPORTANTE GRADO DE FAMILIARIDAD Y SI A ESTO LE SUMAMOS EL CONFORT QUE LAS VIVIENDAS LES OFRECEN ADAPTADAS A SUS GUSTOS PERSONALES, SE PUEDE ASEGURAR QUE LA IMAGEN IDEAL DE LA VIVIENDA DE LOS USUARIOS ES UNA CASA".

F. CONCLUSION

ESTA TIPOLOGIA DE VIVIENDA, YA CONSTRUIDA Y EVALUADA HA MOSTRADO SER UNA ALTERNATIVA VALIDA PARA ENFRENTAR LA INVASION CAOTICA DE LAS AREAS DE ALTA PENDIENTE QUE RODEAN MUCHAS CIUDADES, Y ESTABLECE UN HABITAT DE CARACTER EVOLUTIVO DE GRAN RECEPTIVIDAD POPULAR EN PAISES EN DESARROLLO POR SU GRAN SIMILITUD AL HABITAT POPULAR DESARROLLADO POR EL SECTOR INFORMAL DE LA POBLACION.

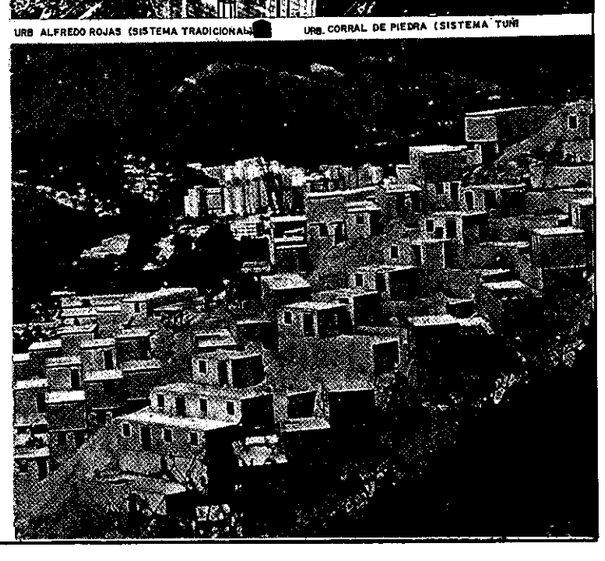


GRAF. 13
PLANTA UP3 CARICUAO


GRAF. 14
VISTA UP3


EL NARANJAL I. CARACAS


URB ALFREDO ROJAS (SISTEMA TRADICIONAL)


URB. CORRAL DE PIEDRA (SISTEMA TUNI

G. SEGUNDA SOLUCION DE VIVIENDA EN PENDIENTE.

UNA SEGUNDA SOLUCION DE VIVIENDA EN PENDIENTE, ACTUALMENTE EN PROCESO DE CONSTRUCCION EN LA CIUDAD DE CARACAS, DA RESPUESTA A LA OTRA FORMA DE URBANIZAR DEL SECTOR POPULAR (VER GRAF. 1-G) ESTABLECIENDO LAS VIVIENDAS EN FORMA PARALELA A LAS CURVAS DE NIVEL TOPOGRAFICO.

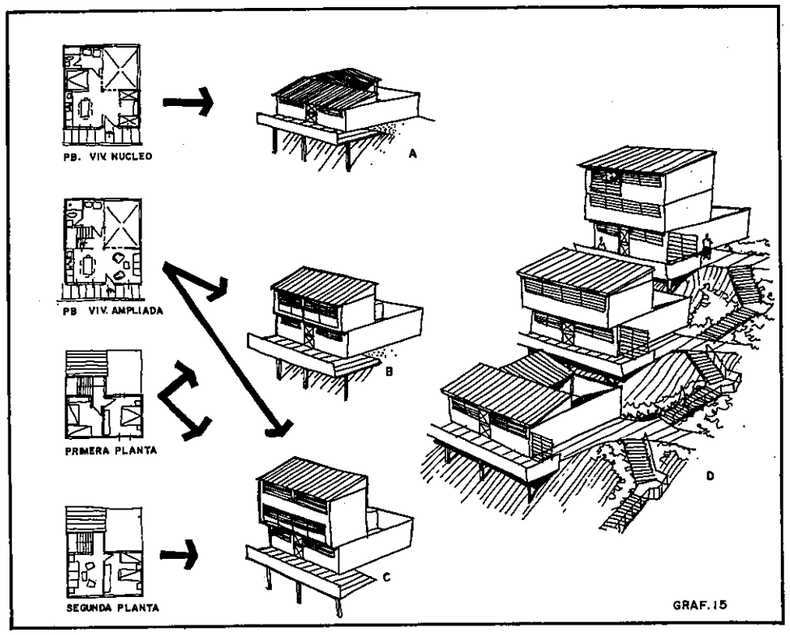
LAS VIVIENDAS QUE SE ADAPTAN A PENDIENTES ALTAS (HASTA UN 80%), EN FORMA SIMILAR A LAS CONSTRUIDAS POR EL SECTOR INFORMAL, TIENEN AL IGUAL QUE ESTAS LA POSIBILIDAD DE CRECIMIENTO PROGRESIVO PARA ADAPTARSE A LA CAPACIDAD ECONOMICA Y COMPOSICION FAMILIAR.

ASI, PARTIENDO DE UNA VIVIENDA BASICA DE 32,32 METROS CUADRADOS, CON ESTAR-COMEDOR, COCINA, LAVADERO, AREA DORMIR, BAÑO Y PATIO (GRAFICO 15-A) PUEDE ALCANZARSE UNA VIVIENDA COMPLETA DE 93,12 METROS CUADRADOS, CON ESTAR-COMEDOR, COCINA, LAVADERO, BAÑOS, CUATRO DORMITORIOS Y PATIO DE SECADO (GRAFICO 15-C), PUDIENDO UTILIZARSE ETAPAS INTERMEDIAS DE 62,72 METROS CUADRADOS, CON DOS DORMITORIOS (GRAFICO 15-B).

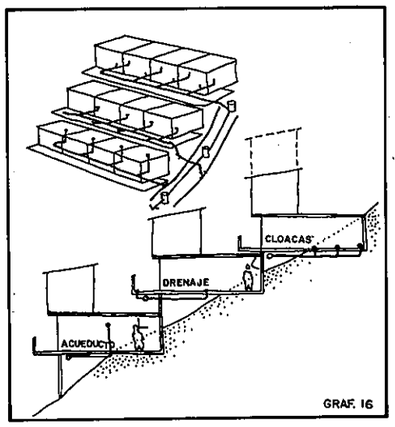
LA VIVIENDA BASICA PUEDE SER UTILIZADA PARA ALOJAR FAMILIAS DE MUY ESCASOS INGRESOS UTILIZANDO INICIALMENTE, COMO AREA DE DORMIR ADICIONAL, EL ESPACIO DONDE SERA CONSTRUIDA POSTERIORMENTE LA ESCALERA (GRAFICO 15-A)

EL DISEÑO DE ESTAS VIVIENDAS, PLANTEA LA UBICACION DEL AREA DE LA COCINA HACIA LA VEREDA DE ACCESO PEATONAL CON EL PROPOSITO DE OBTENER UN CONTROL VISUAL POR PARTE DE LAS AMAS DE CASA.

LAS VIVIENDAS SE CONSTRUYEN ADAPTANDOLAS TOTALMENTE A LA TOPOGRAFIA, PERMITIENDO DE ESTA MANERA NO SOLAMENTE LAS VISUALES DE UNA SOBRE OTRA SINO ADEMAS UNA ADECUADA ILUMINACION Y VENTILACION.



GRAF. 15



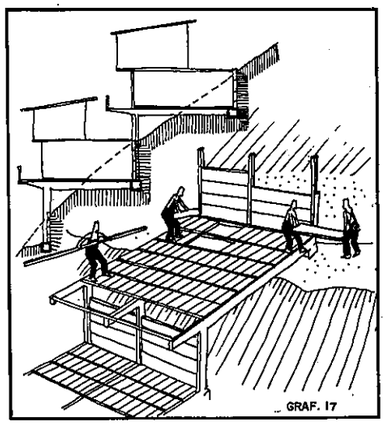
GRAF. 16

G.1 LOS SERVICIOS.

LOS RAMALES LOCALES DE SERVICIOS DE ACUEDUCTO, CLOACAS Y DRENAJES, SE HAN UBICADO EN LA PARTE INFERIOR DE LAS VIVIENDAS CON LO CUAL SU REVISION SE PUEDE REALIZAR DESDE LAS VIVIENDAS UBICADAS EN LA PARTE INFERIOR, FACILITANDO SU MANTENIMIENTO. PREVIENDOSE LA INCORPORACION DE ESTOS RAMALES A LAS REDES PRINCIPALES CONSTRUIDOS EN LAS VIAS VEHICULARES (GRAFICO 16).

G.2 ESTRUCTURA.

SE HA DISEÑADO UNA ESTRUCTURA TRADICIONAL RACIONALIZADA, CON EL PROPOSITO DE QUE SE ADAPTE A LA FORMA DE CONSTRUCCION POPULAR, FACILITANDOSE ASI LAS AMPLIACIONES A SER REALIZADAS POR LOS USUARIOS. LA ESTRUCTURA CONSTA DE VIGAS Y COLUMNAS DE CONCRETO ARMADO, LOSAS DE PERFILES DOBLE TE CON TABELONES DE ARCILLA CON VACIADO FINAL DE CONCRETO, MURO POSTERIOR DE LOSETAS MODULARES PREFABRICADAS DE CONCRETO, DE POSIBLE MONTAJE SIN GRUA, ADAPTABLE A DIFERENTES ALTURAS DE MUROS REQUERIDAS PARA SU TOTAL ADAPTACION A LA TOPOGRAFIA. FUNDACIONES DIRECTAS O MICROPILOTES, CON EL PROPOSITO DE EVITAR EL MOVIMIENTO DE TIERRA.


GRAF. 17

H. EL URBANISMO.

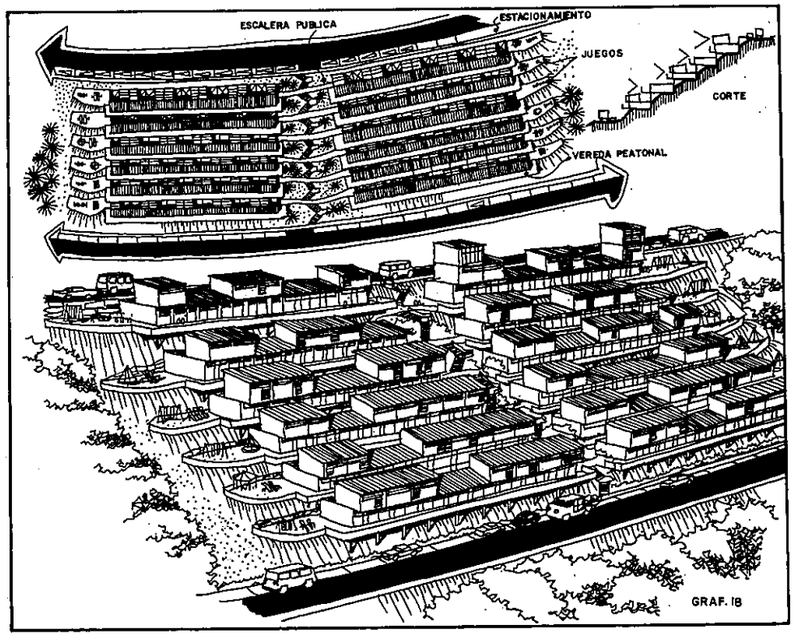
COMO PUEDE APRECIARSE EN EL GRAFICO 18, SE ESTABLECE UNA COMUNICACION PEATONAL ENTRE LAS VIAS VEHICULARES (DONDE SE UBICAN LOS ESTACIONAMIENTOS DE LOS AUTOMOVILES PRIVADOS Y LAS PARADAS DE LOS TRANSPORTES DE SERVICIO PUBLICO). A TRAVES DE ESCALERAS QUE DAN ACCESO A LOS GRUPOS DE VIVIENDAS A TRAVES DE VEREDAS PEATONALES SEMIPRIVADAS, QUE PUEDEN SER CONTROLADAS VISUALMENTE DESDE LAS VIVIENDAS Y CERRADAS CON PUERTAS EN HORAS NOCTURNAS. AL FONDO DE ESTA VEREDAS SE UBICA UN AREA SEMIPRIVADA PARA JUEGOS INFANTILES O REUNIONES PARA UN GRUPO MAXIMO DE DIEZ FAMILIAS, QUE PERMITE UN ADECUADO MANTENIMIENTO Y CONTROL.

ESTA ALTERNATIVA, QUE ORIGINA DENSIDADES BRUTAS DE APROXIMADAMENTE SEISCIENTOS HABITANTES POR HECTAREA, POR SU CARACTER DE VIVIENDA DE CRECIMIENTO PROGRESIVO, ESTABLECE COSTOS DE VIVIENDAS NUCLEO, INFERIORES AL CINCUENTA POR CIENTO DE LAS MULTIFAMILIARES TRADICIONALES DE IGUAL DENSIDAD, ORIGINANDO UNA OFERTA QUE ALCANZA AL NOVENTA POR CIENTO DE LA POBLACION.

ESTE TIPO DE URBANISMO Y VIVIENDA EN PENDIENTE ESTA FUNDAMENTADO EN LA FORMA EN QUE NUESTRO PUEBLO CONSTRUYE SUS PROPIAS VIVIENDAS.

I. CONCLUSION.

LAS DOS PROPUESTAS PRESENTADAS DE VIVIENDAS EN PENDIENTE CONSTITUYEN ALTERNATIVAS NOVEDOSAS, POR PRIMERA VEZ INTENTADAS A NIVEL INTERNACIONAL. ABREN EL CAMINO PARA PROFUNDIZAR SOLUCIONES DE VIVIENDA PARA EL SECTOR POPULAR EN TERRENOS DE ALTA PENDIENTE QUE HASTA AHORA ERAN CONSIDERADOS NO UTILIZABLES, FORMALMENTE, Y ERAN INVADIDOS EN FORMA DESORDENADA EN NUESTRAS PRINCIPALES CIUDADES.



GRAF. 18

39051787

CINTUS
SECTOR II
U.I.A. FCARM

AÑO INTERNACIONAL
DE LA VIVIENDA
PARA LAS PERSONAS
SIN HOGAR. IYSN 1987

LA VIVIENDA DE TIERRA COMO MEDIO DE EXPRESION CULTURAL DE LOS PUEBLOS.

1 ANTECEDENTES

EL MUNDO VIVE EN CRISIS

- LOS VALORES SOCIALES, POLITICOS Y ECONOMICOS, ESTAN EN CONSTANTE PUGNA, DEJANDO LA MAYORIA DE LA POBLACION EN LA POBREZA.
- LA FALTA DE TRABAJO Y SU BAJA REMUNERACION SON FACTORES DETERMINANTES EN EL DEFICIT DE VIVIENDA.
- LAS POLITICAS GUBERNAMENTALES SOBRE VIVIENDA, SOLO BENEFICIAN A LAS PERSONAS QUE SON SUJETOS DE CREDITO.

2 DIAGNOSTICO

- LA MAYORIA DE LA POBLACION RURAL EN EL MUNDO, VIVE EN CHOZAS DE UN SOLO CUARTO Y EN MALAS CONDICIONES, YA QUE LOS PROGRAMAS DE VIVIENDA RARA VEZ LLEGAN AL CAMPO.
- MAS DE LA MITAD DE LA POBLACION EN EL MUNDO VIVE EN CASAS CONSTRUIDAS CON TIERRA.
- LAS ESPECIFICACIONES GUBERNAMENTALES INDICAN Y FAVORECEN LA CONSTRUCCION DE VIENDA CON LADRILLO Y CONCRETO, MATERIALES QUE ACTUALMENTE SON COSTOSOS.

10,000 AÑOS DE CULTURA DEL ADOBE NO PUEDEN SER BORRADOS POR LA LLAMADA CIVILIZACION-COMERCIALIZACION.

DIGNIFICAR LA MORADA DEL HOMBRE EN EL MEDIO RURAL, ES TAREA DE ORGANIZACION COMUNAL... REALICEMOSLA... HAGAMOSLO...

3 PROPUESTA

CONSTRUIR LA VIVIENDA CON UN COSTO MINIMO.

- UTILIZANDO LA MANO DE OBRA COMUNITARIA Y RESPETANDO LA PERSONALIDAD DEL USUARIO.
- UTILIZANDO LOS PROCESOS DE CONSTRUCCION TRADICIONALES, COMO MEDIO PARA PROTEGER LOS VALORES HUMANOS, CULTURALES Y MEDIO AMBIENTE.
- IMPULSANDO LA UTILIZACION DEL USO DE LA TIERRA SIN COCER, COMO ELEMENTO BASE PARA QUE TRANSFORMADA O NATURAL, SE APROVECHE EN LA CONSTRUCCION DE LA VIVIENDA.
- LA TIERRA EN EL MEDIO RURAL NO CUESTA.
- LA TIERRA Y SUS SIMILES COMO PIEDRA, TEPETATE, XALNENE; Y LOS MATERIALES COMO MADERA, TEJAMANIL, ZACATE, CARRIZO, SON PARTE DE LA CULTURA DE LA VIVIENDA.

4 ESTRATEGIAS

MOTIVAR EL ESPIRITU PARTICIPATIVO, ORIGINANDO CON ESTO SOLIDARIDAD Y DEMOCRACIA.

- CONJUGAR TECNOLOGIA Y TRADICION POPULAR, PARA INTEGRAR EL DESARROLLO DEL BIENESTAR COMUN.
- CONSTRUIR LA VIVIENDA, CON LA PARTICIPACION FAMILIAR O COMUNAL.
- ORGANIZAR Y APROVECHAR EL TIEMPO LIBRE.
- EL USUARIO PARTICIPARA EN LA DECISION DEL DISEÑO DE SU ESPACIO POR VIVIR.
- UTILIZAR LOS MATERIALES REGIONALES.

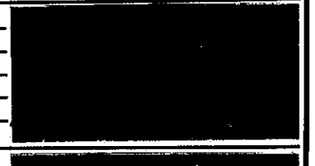
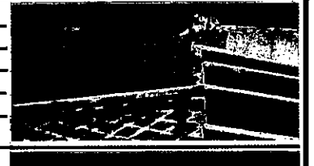
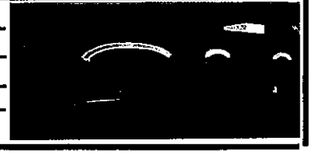
EN RESUMEN: ORGANIZACION COMUNAL Y USO DE LOS MATERIALES EXISTENTES.

5 LOS MEDIOS

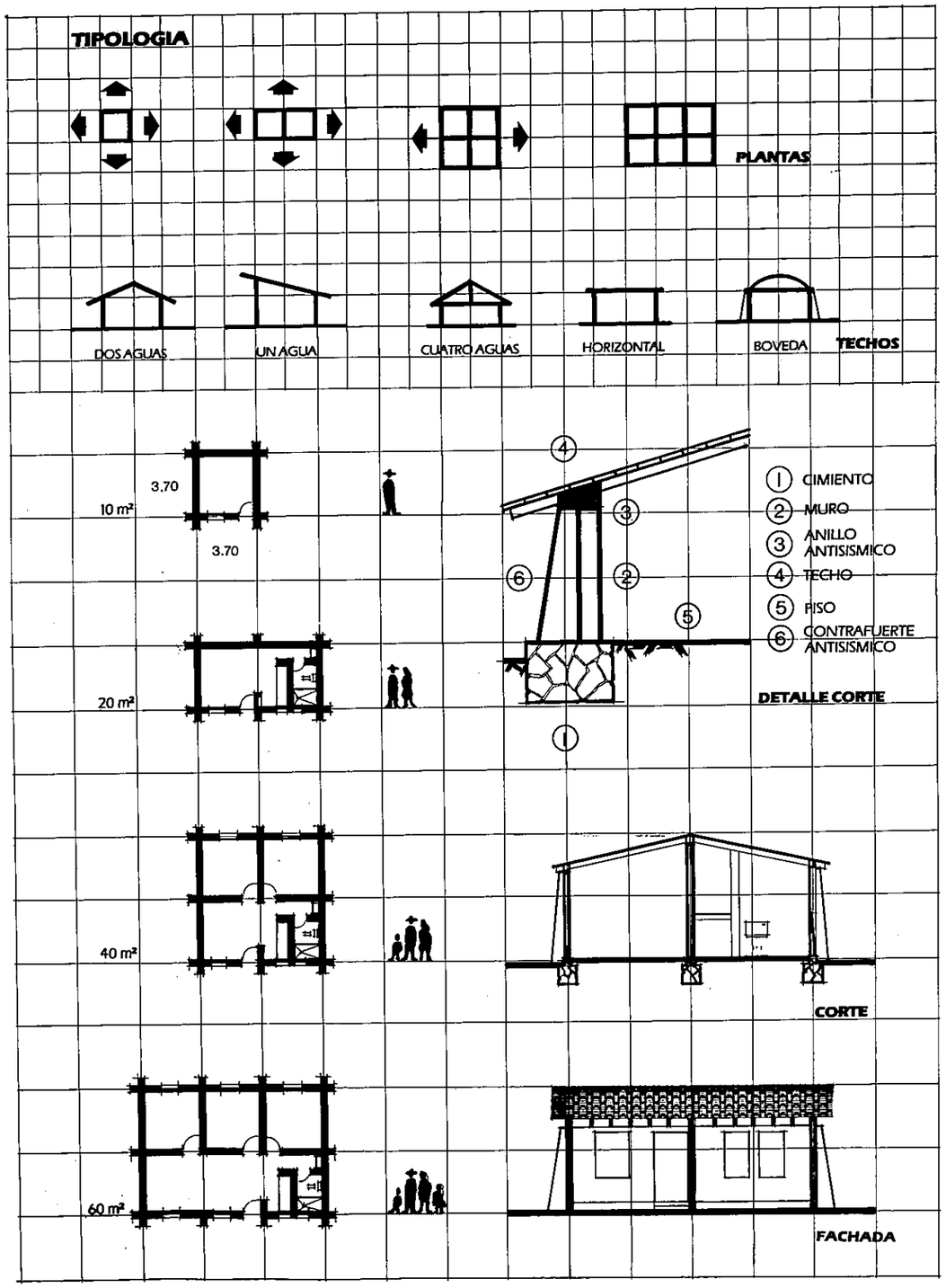
LA TIERRA Y EL HOMBRE.

- EL ADOBE ES EL ELEMENTO TIERRA TRANSFORMADO, SIENDO PARTE DE LA TRADICION MANUAL DE LOS PUEBLOS.
- LA TAPIA, ES OTRO ELEMENTO CONSTRUCTIVO NATURAL.
- EN EL MUNDO, LOS NECESITADOS DE VIVIENDA, TIENEN QUE TRABAJAR 10 DIAS, PARA ADQUIRIR UN BULTO DE CEMENTO.
- UN HOMBRE EN 10 DIAS PUEDE FABRICAR 1,000 ADOBES.
- CON 1,000 ADOBES SE CONSTRUYEN 30 m² DE VIVIENDA.
- UNA FAMILIA PUEDE CONSTRUIR SU VIVIENDA A LARGO PLAZO.
- 10 FAMILIAS ORGANIZADAS, CONSTRUYEN UNA VIVIENDA EN MENOS TIEMPO.

6 LOS MATERIALES

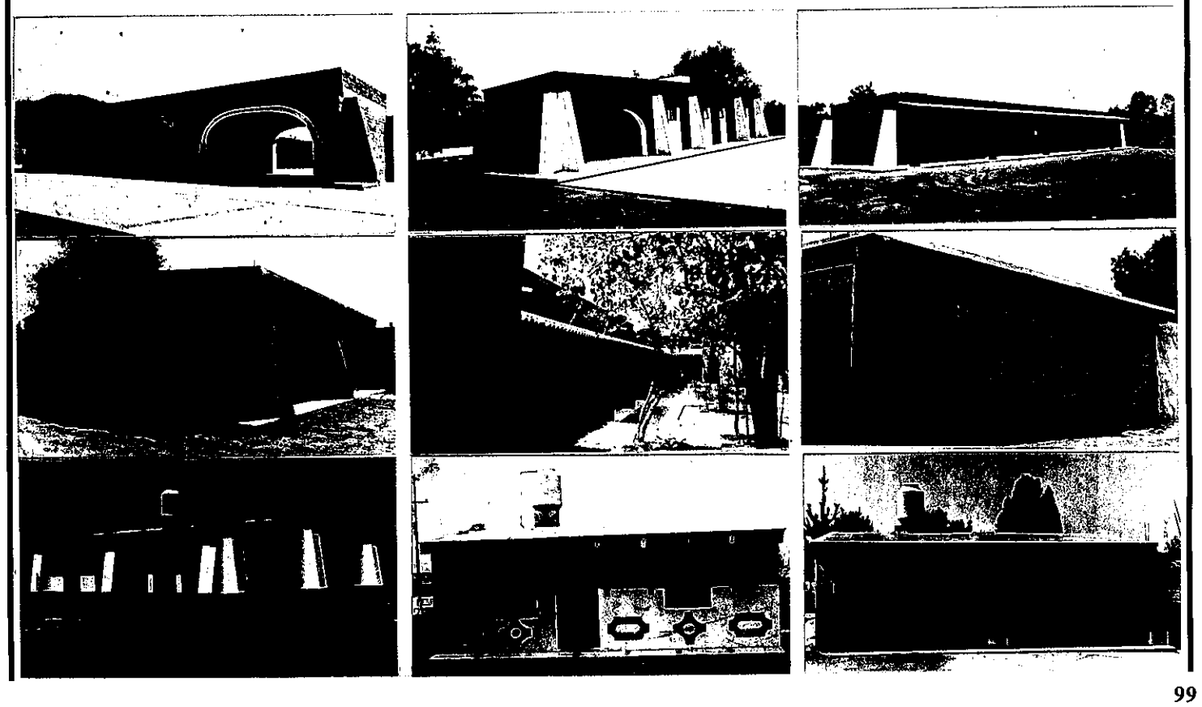
CIMIENTO	TIERRA	COMPACTADA / MEJORADA	
	PIEDRA	BRAZA / BOLA O LAJA	
	MADERA		
MURO	TIERRA	ADOBE / TAPIA / BAJAREQUE	
	PIEDRA		
	CARRIZO		
	MADERA		
TECHO	ZACATE		
	TEJAMANIL-MADERA, CARRIZO-TERRADO		
	TEJA		
	BOVEDA	CATALANA / CAÑON	
PISO	TIERRA	APISONADA / MEJORADA	
	CEMENTO		
	LADRILLO		
	MOSAICO		

7 PROYECTO



8 LA PARTICIPACION COMUNITARIA

9 LOS RESULTADOS

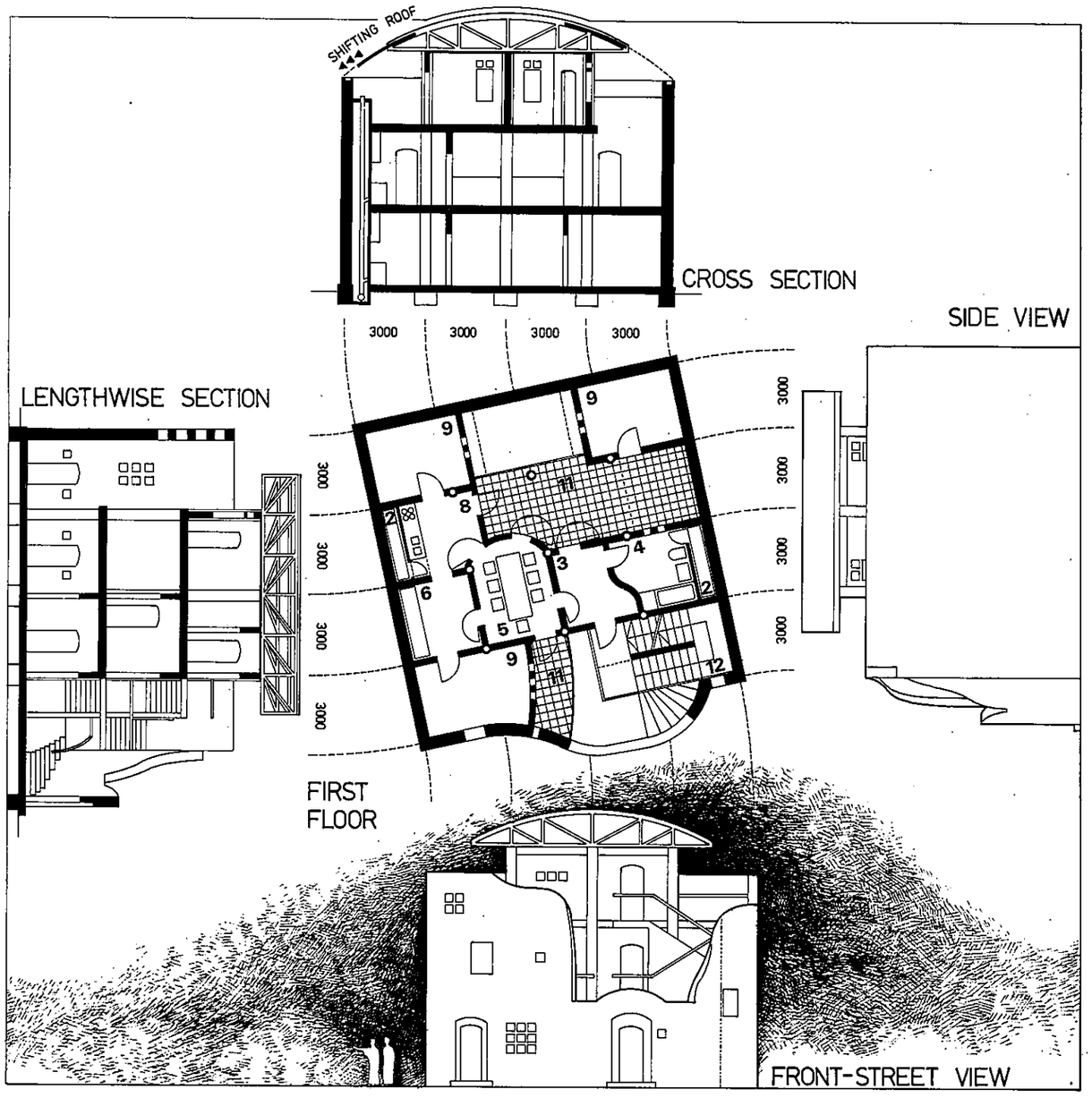


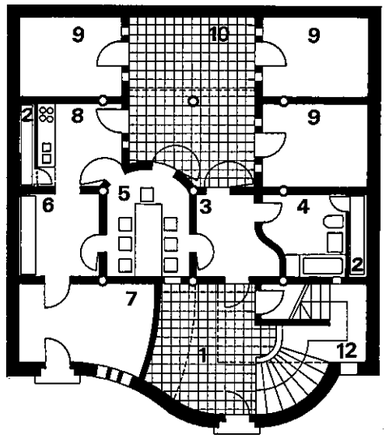
THE ROOF OVER THE HEAD - FOR MILLIONS OF INHABITANTS OF OUR PLANET IT IS DESIRE ONLY FOR ITS REALIZATION THEY HAVE ONLY THEIR HANDS AND INSUFFICIENT MEANS. THE COMMON DESTINY AND HARDSHIP UNITE PEOPLE TOGETHER AND ALSO IT WAKES UP THE BIG POWER OF SELF-PRESERVATION AMONG THEM. THEREFORE IT IS NECESSARY TO GIVE THIS POTENCIAL POWER THE REAL INTEREST OF SOCIETY (GOVERNMENTS) AND TO GRANT IT THE ELEMENTARY MATERIAL MEANS. THE INFORMATION AND EDUCATION DEVELOPMENT CAN BRING TOGETHER SOLUTIONS WHICH ALONE NEED NOT IMMEDIATELY AND GLOBALLY ANSWER TO THE PROBLEMS OF PEOPLE WITHOUT THE ROOF.BUT CERTAINLY THESE CAN CREATE THE ASSUMPTIONS. OUR CONCEPTION CATCHES THESE IDEAS AS FOLLOWS: IT STARTS WITH THE GEOGRAPHICAL CONDITIONS OF COUNTRIES WITH THE ISLAMIC CULTURE, THE INSPIRING IDEA IS AN UNDER-TREE SHELTER AS A LIFE SYMBOL WHERE TREE GIVES A SHADOW AS WELL AS A SUPORTING STRUCTURE. A MAN BUILDS DWELLING FROM MATERIALS ACCESSIBLE IN SURROUNDINGS AND THESE ARE LEANT ON THE CORE OF STRUCTURE - THE TREE. OUR DESIGN IN THE TRANSFORM POSITION QUOTES THE ABOVE MENTIONED SHELTER AS FOLLOWS:

THE SKELETON WHICH IS MADE OF CERAMIC SEGMENT COLUMNS AND WHICH IS COMPLETED BY THE SHELTER IS THE CONSTRUCTION CORE, THE PERIPHERAL WALLS ARE MADE OF ADOBE BRICKS WITH A FIXATIVE (E.G. 2 OR 3 PER CENT OF CEMENT) AND HAVE SUBSIDIARY BEARING FUNCTION FOR THE CERAMIC CEILINGS. THE ADOBE BRICKS WILL BE PRODUCED FROM ACCESSIBLE RESOURCES IN THE SURROUNDINGS. THE USE OF THEM AFFORDS INDIVIDUAL ADAPTATION OF A DISPOSITION AROUND THE INNER CONSTRUCTION CORE AS WELL AS A STREET FACADE. A SINGLE CONSTRUCTION OF THE BUILDING WILL BE EXECUTED BY A FORM OF SELF-HELP WITH REGARD OF EASY MOUNTING OF PROPOSED BUILDING ELEMENTS. SHIFTING ROOF PROTECTION FROM RAIN AND A SUN. MANAGEMENT - MANUAL, TECHNICAL DISTRIBUTING MAINS ARE CONCENTRATED IN INSERTED PREFAB CORES OF A BATHROOM AND A KITCHEN ROOM. DISPOSITION OF THE INTRODUCED BUILDING IS CONSIDERED FOR 2 FAMILIES.

WE SUPPOSE THIS IDEA IS ENTIRELY HUMAN BY MEANS OF BUILDING PARTS PROPORTION LEVEL, USED MATERIALS LEVEL AND ALSO CULTURAL TRADITIONS LEVEL. THE SHELTER'S ARCHITECTURE IS THE OLDEST BUILDING PROBLEM. TECHNICALITY WE HAVE BROUGHT INTO OUR DESIGN, WE SUPPOSED TO BE MINIMAL AS A REQUIRED AMOUNT IN ORDER TO IMPROVE THE PRESENT STATE WITHOUT CULTURAL TRADITIONS BREAKING. TOGETHER WITH THE IMAGINATION OF FUTURE THIS COULD BE THE PRESUMPTION OF NEXT CREATIVE APPROACH OF PEOPLE BUILDING UP THEIR DWELLINGS.

SECTION II

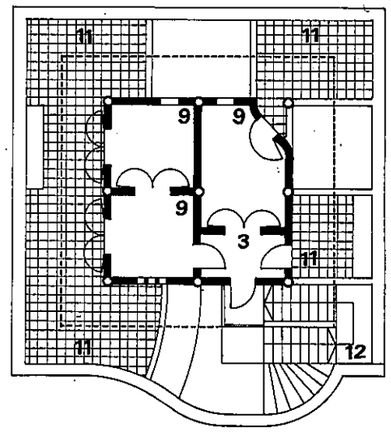




1 ENTRY COURTYARD
2 TECHNICAL DISTRIBUTING MAINS
3 ENTRY SPACE (HALL)
4 BATH ROOM + WC
5 DINING ROOM
6 STORE ROOM
7 WORK SHOP, SHOP, WORK ROOM
8 KITCHEN ROOM
9 ROOM
10 INNER COURTYARD
11 TERRACE
12 STAIRCASE

SCALE 1 : 100

0 5 10 m

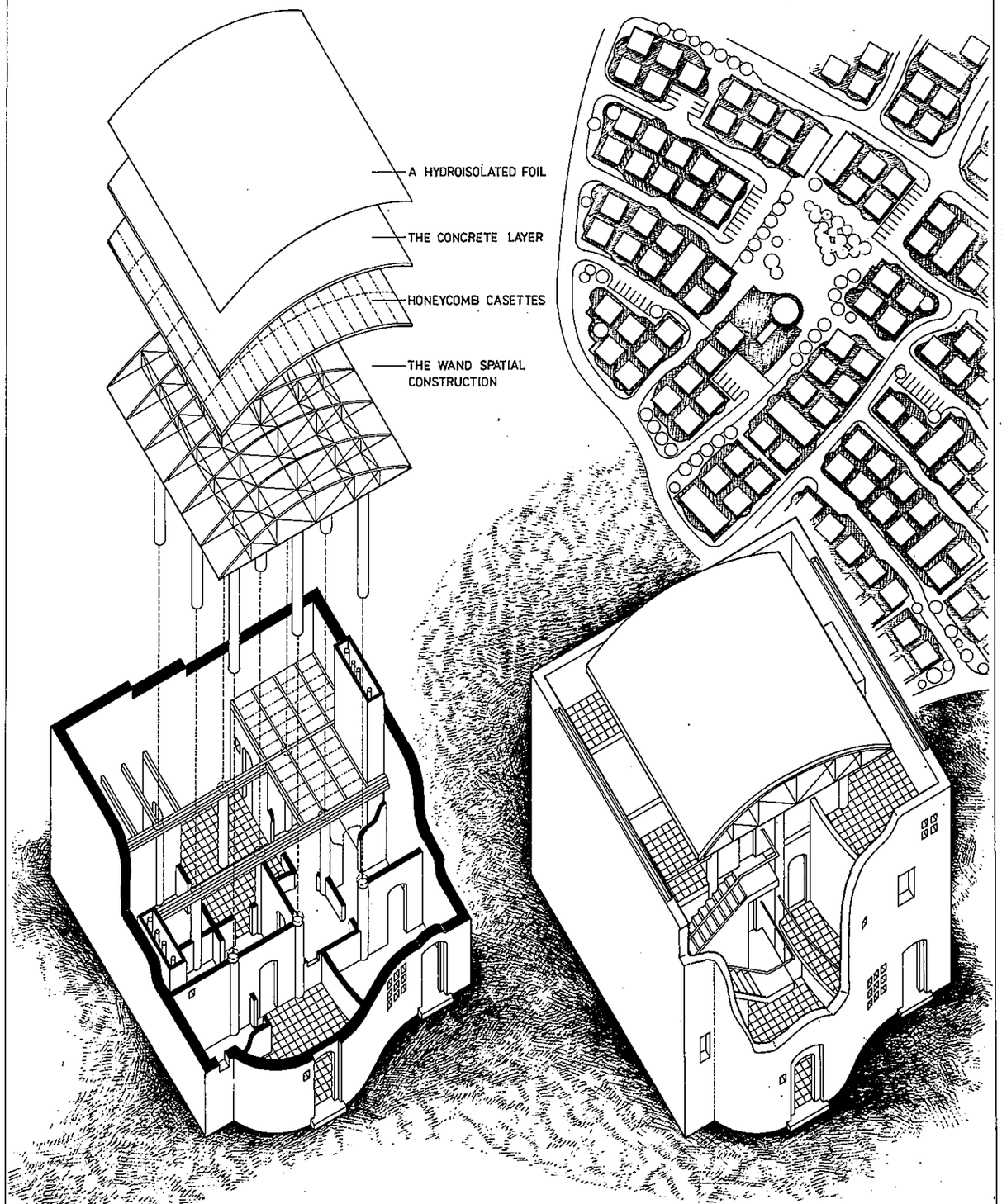


NEW TECHNOLOGIES FOR SOCIAL HOUSING

LAYERS OF THE ROOF

TOWN PLANNING STRUCTURE

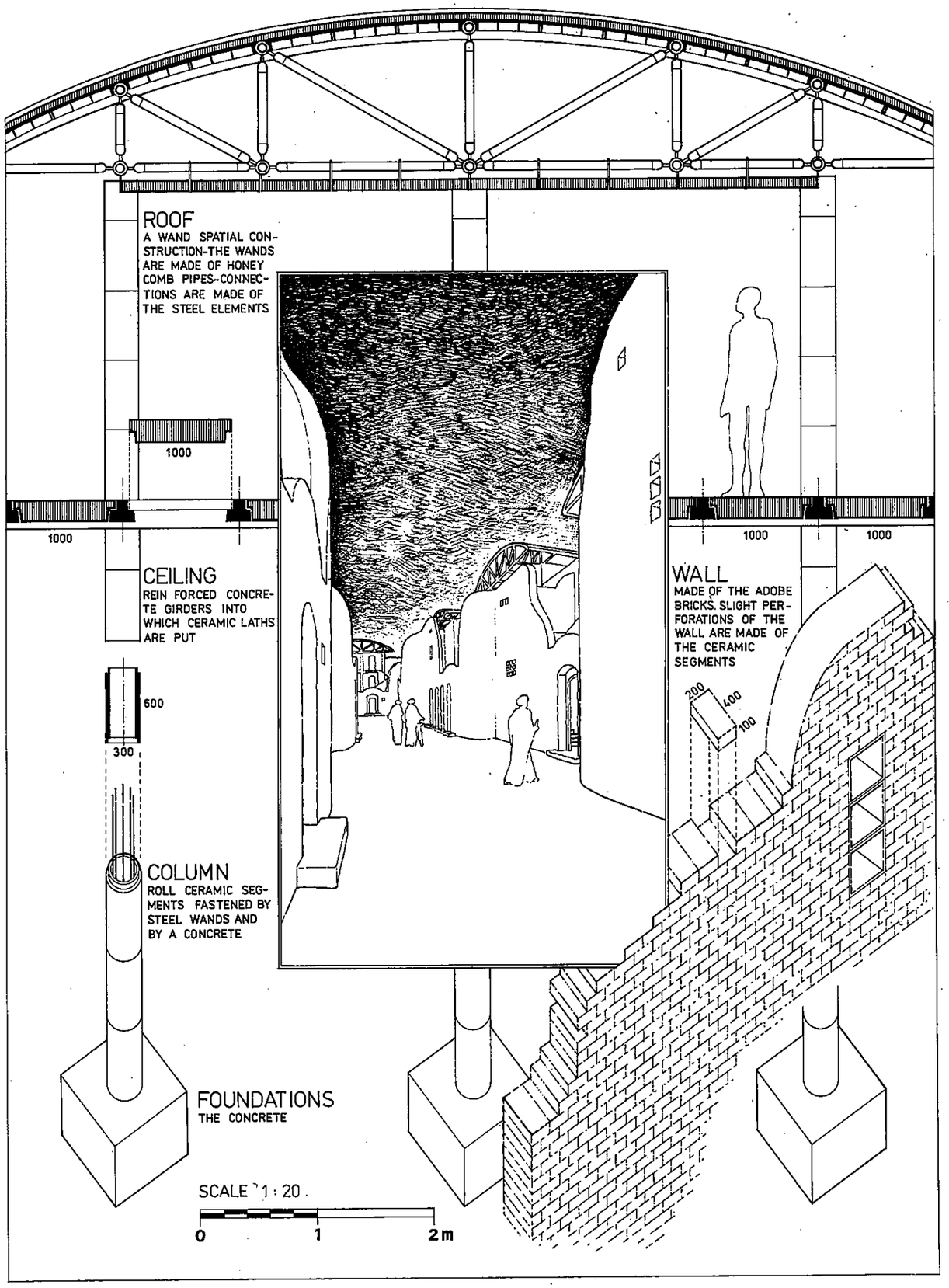
SCALE 1 : 1000



BUILDING PROCESS - AXONOMETRIES

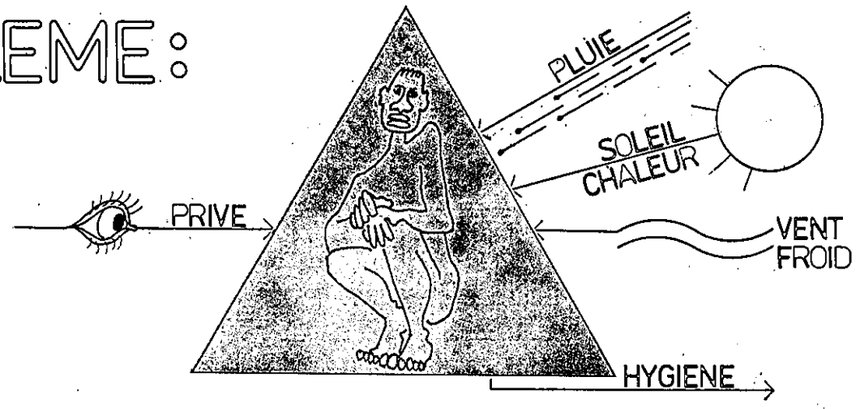
SCALE 1:100

0 5 10 m

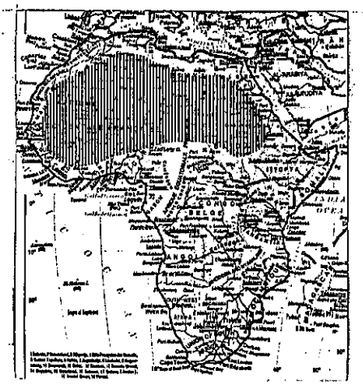


SECTION II

PROBLEME:

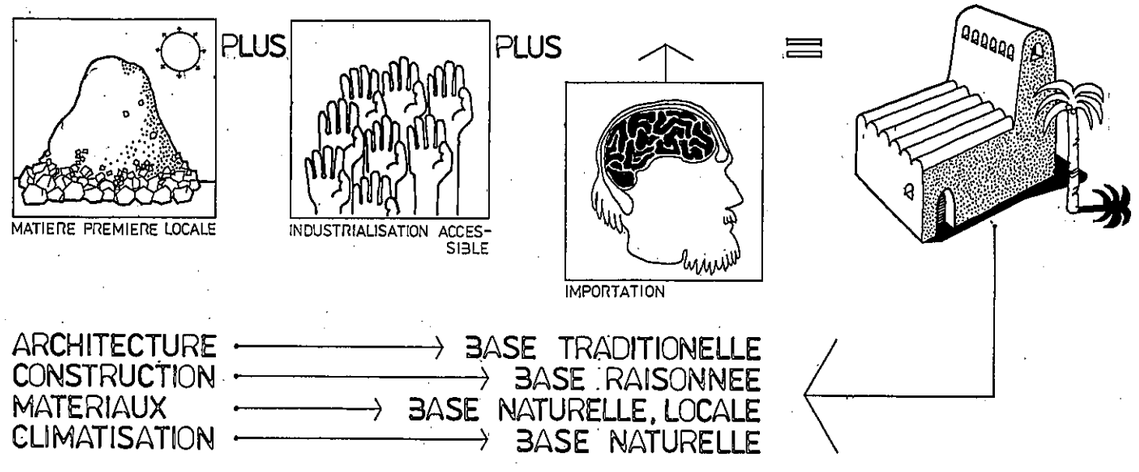


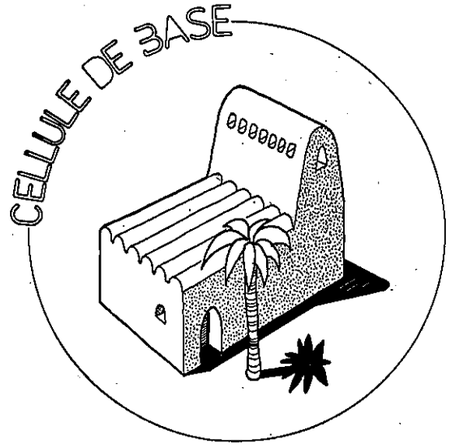
CONDITIONS:



PRINCIP DE SOLUTION:

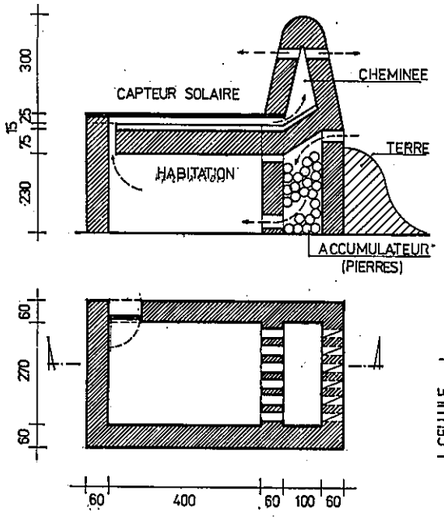
IL FAUT EFFECTUER DES TRANSFORMATIONS DANS LA MANIERE TRADITIONNELLE DE CONSTRUIRE, AFIN DE FACILITER LA VIE DES HABITANTS SANS ABANDONNER POUR CELA L'ANCIENNE ARCHITECTURE SI BELLE ET EN MÊME TEMPS, SI CONFORME AUX BESOINS

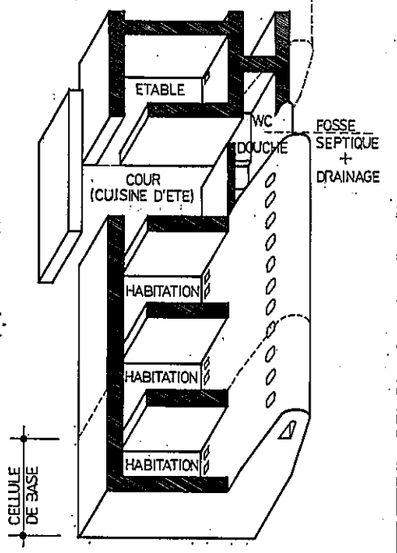


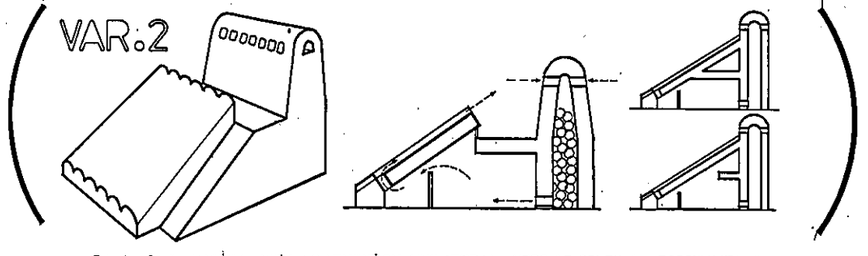


AVANTAGES

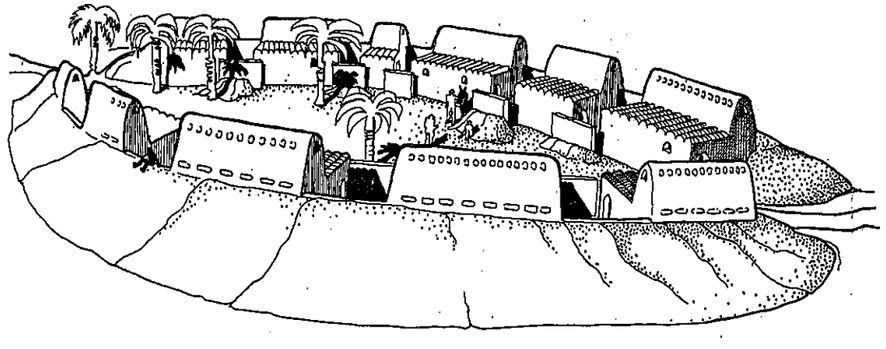
- TRADITION
- RELATION PERSONELLE D'AUTO-CONSTRUCTEUR
- VOLUME APPROPRIABLE AUX BESOIN
- BIOCLIMAT IDEAL
- ECONOMIE
- ARCHITECTURE ADAPTABLE AU DECOR TRADITIONEL
- PROTECTION CONTRE LA SPECULATION AU MARCHE NOIR



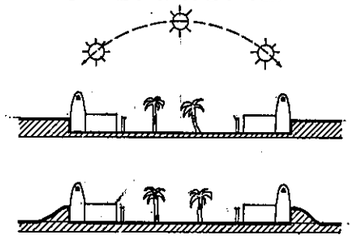


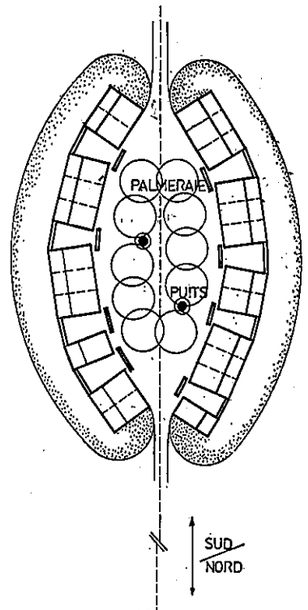


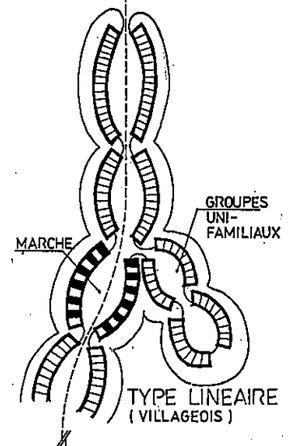
RANGEES DE MAISONS AVEC L'ORIENTATION UNILATERAL (VERS LE SOLEIL) - POSSIBILITE DE HABITER LA TERRASSE

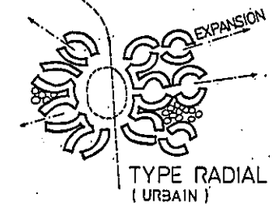


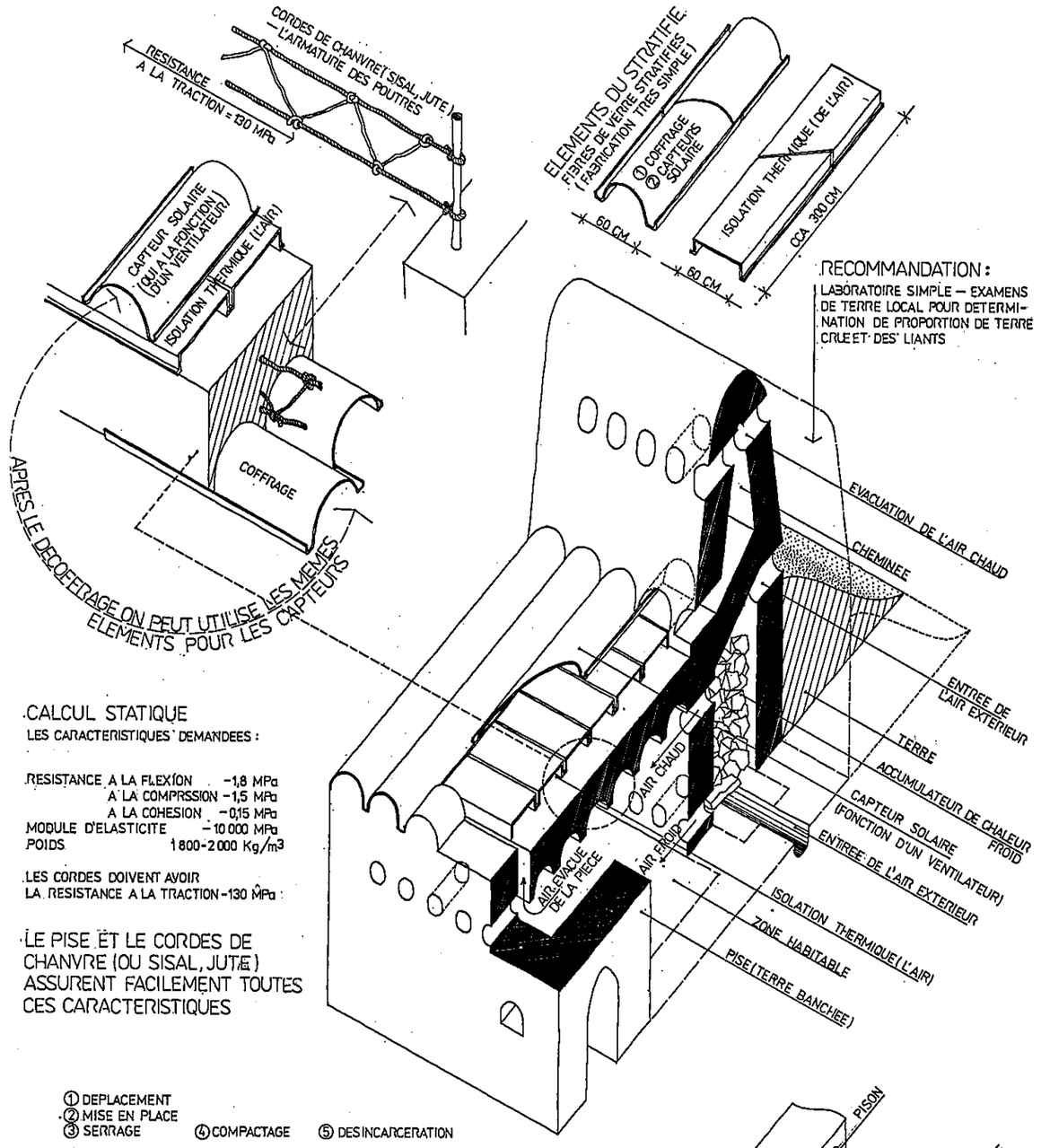
URBANISME











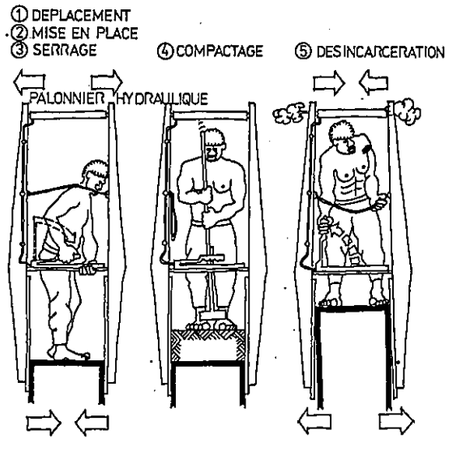
CALCUL STATIQUE

LES CARACTERISTIQUES DEMANDEES :

RESISTANCE A LA FLEXION	–1,8 MPa
A LA COMPRSSION	–1,5 MPa
A LA COHESION	–0,15 MPa
MODULE D'ELASTICITE	–10 000 MPa
POIDS	1800–2000 Kg/m³

LES CORDES DOIVENT AVOIR LA RESISTANCE A LA TRACTION –130 MPa

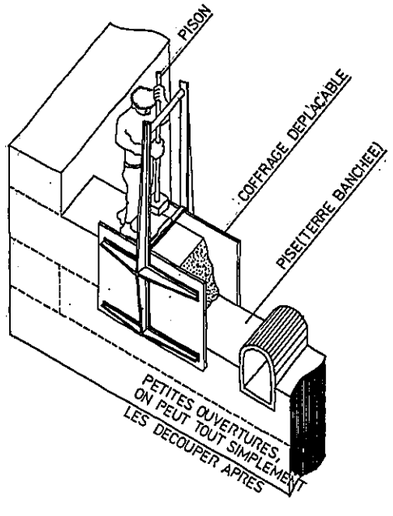
LE PISE ET LE CORDES DE CHANVRE (OU SISAL, JUTE) ASSURENT FACILEMENT TOUTES CES CARACTERISTIQUES



LE PISE

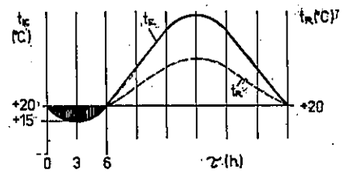
(TERRE BANCHEE-PRISE) A PROXIMITE

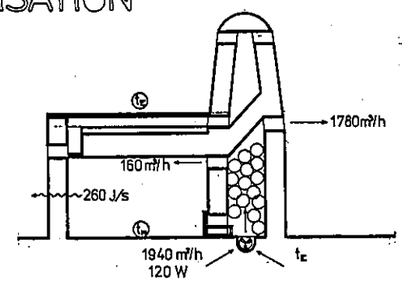
TECHNOLOGIE TRADITIONNELLE AMELIOREE :
- COFFRAGE DEPLAÇABLE MANUPORTABLE (PAR LE PISEUR)
- LIANTS ET HYDROISOLANTS NOUVEAUX (OLIGOSIALATES + RETICULATION GEOPOLYMERIQUE)



PRINCIPE DE LA CLIMATISATION

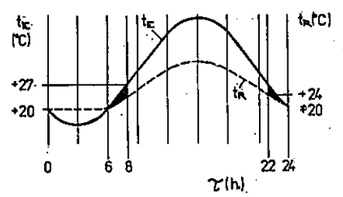
REGION „IN SALAH" 27°l.n. 2,5°l.e.

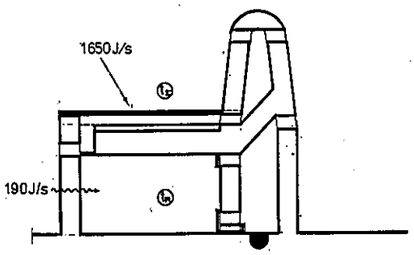




L'ETE – AOUT
0 – 6 HEURES

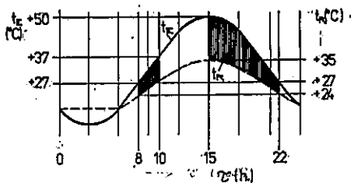
– REFROIDISSEMENT D'ACCUMULATEUR
– CHAUFFAGE D'INTERIEUR

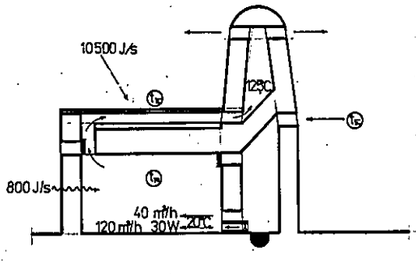




L'ETE – AOUT
6 – 8 , 22 – 24 HEURES

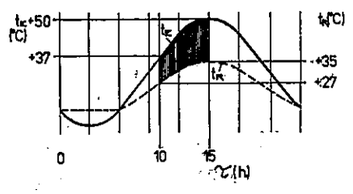
– LES TEMPERATURES D'INTERIEUR ET D'EXTERIEUR EN EQUILIBRE

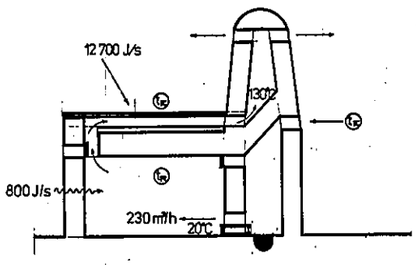




L'ETE – AOUT
8 – 10, 15 – 22 HEURES

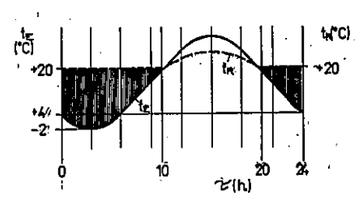
– REFROIDISSEMENT D'INTERIEUR PAR L'AIR FROID D'ACCUMULATEUR (AVEC L'AIDE DU VENTILATEUR)

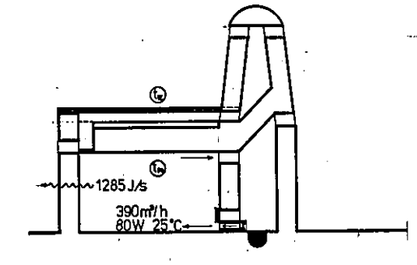




L'ETE – AOUT
10 – 15 HEURES

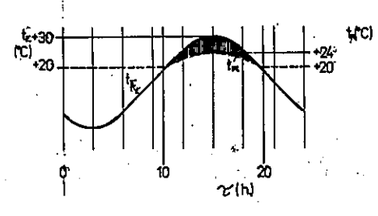
– REFROIDISSEMENT D'INTERIEUR PAR L'AIR FROID D'ACCUMULATEUR (NATUREL)

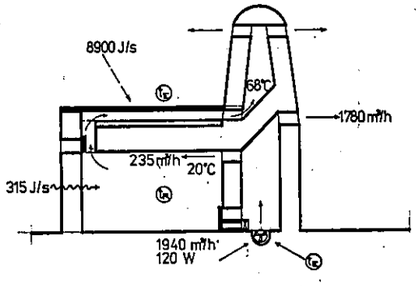




L'HIVER – FEVRIER
0 – 10, 20 – 24 HEURES

– CHAUFFAGE D'INTERIEUR PAR L'AIR CHAUD D'ACCUMULATEUR





L'HIVER – FEVRIER
10 – 20 HEURES

– CHAUFFAGE D'ACCUMULATEUR
– REFROIDISSEMENT D'INTERIEUR

40712212

SECTION II

L'HABITAT N'EST PAS UN ABRI MAIS

L'ELEMENT FONDAMENTAL DU DEVELOPPEMENT HARMONIEUX

DE LA FAMILLE

DANS LA SOCIETE

HABITAT = LOGEMENT
+ EQUIPEMENTS TECHNIQUES
+ EQUIPEMENTS SOCIO CULTURELS

Il doit être individualisé
par rapport à la collectivité
par ses caractéristiques : internes / externes
par son contenu sociologique

niveaux de réflexion

I_ AMENAGEMENT GENERAL : il faut préparer une grille d'extensions dont la flexibilité permet d'envisager tous les cas de figure :

orientations nouvelles
plan sectoriel évolutif
modifications ponctuelles

II_ LA COMMUNAUTE : a des besoins profonds :

indépendance familiale
interdépendance des espaces communautaires
relations entre toutes les couches sociales
intégration dans le tissu urbain

III_L'ESPACE DE VIE : individualisé pour la famille et pour chacun de ses membres

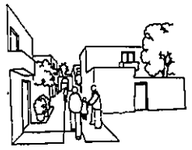
les parents qui doivent pouvoir s'isoler
les enfants qui doivent disposer d'un espace personnel dont il vont prendre possession

LA FLEXIBILITE : est souhaitable

L'HABITAT EVOLUTIF : est la reponse sociale

AU DROIT AU LOGEMENT

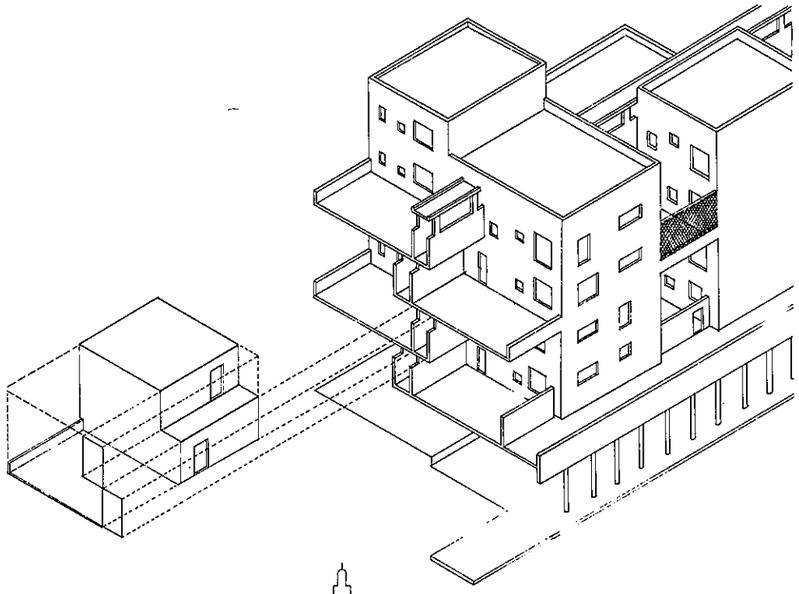
évolution du tissu urbain traditionnel

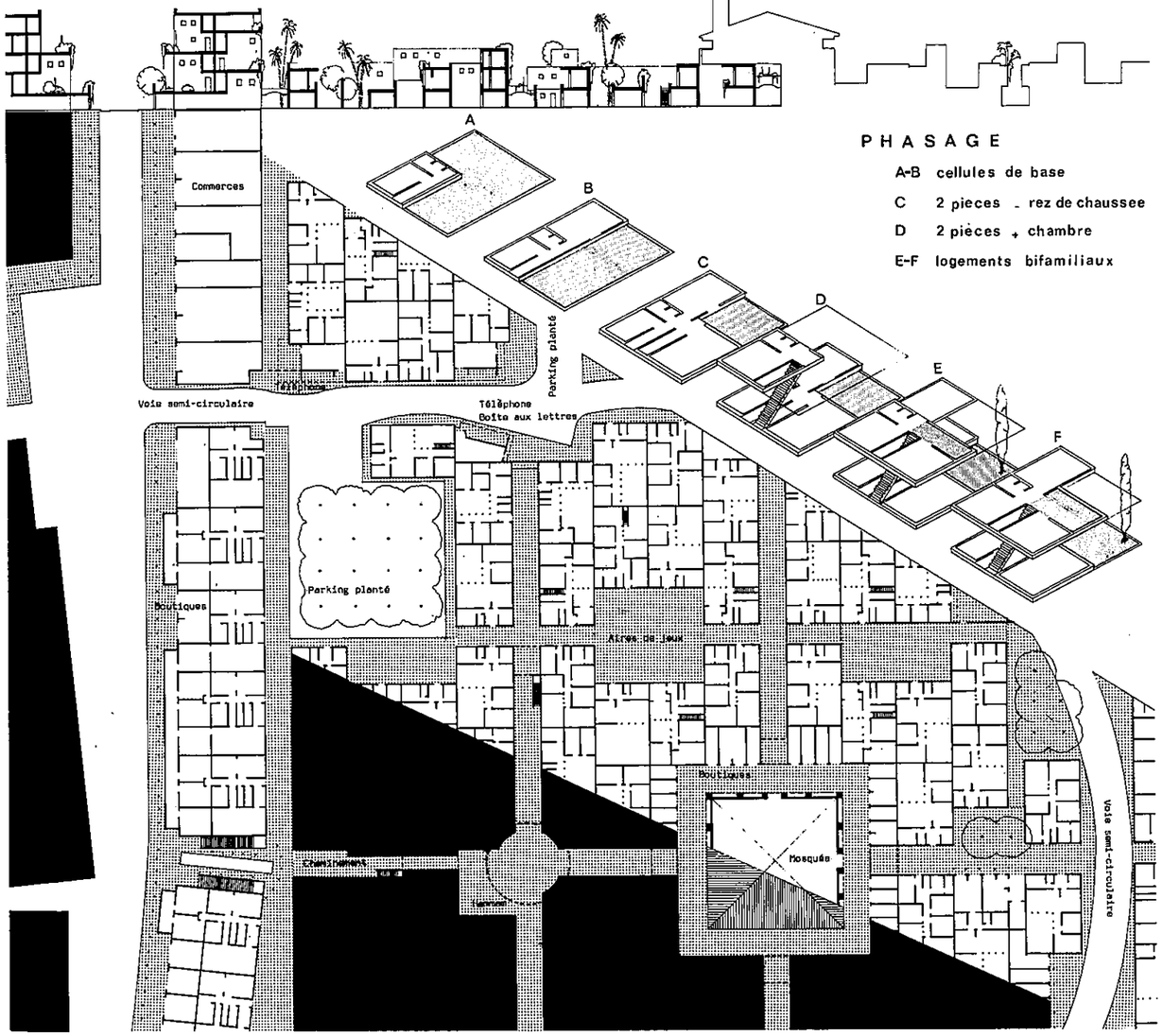


LES PORTES TRADITIONNELLES
créent la séparation :
piétons - véhicules

LE CHEMINEMENT TRADITIONNEL
est ombragé par les immeubles
collectifs, les auvents et
les toiles tendues

PASSAGES COUVERTS
le commerce traditionnel
crée un espace linéaire
abrité





PHASAGE

A-B cellules de base

C 2 pieces - rez de chaussee

D 2 pièces + chambre

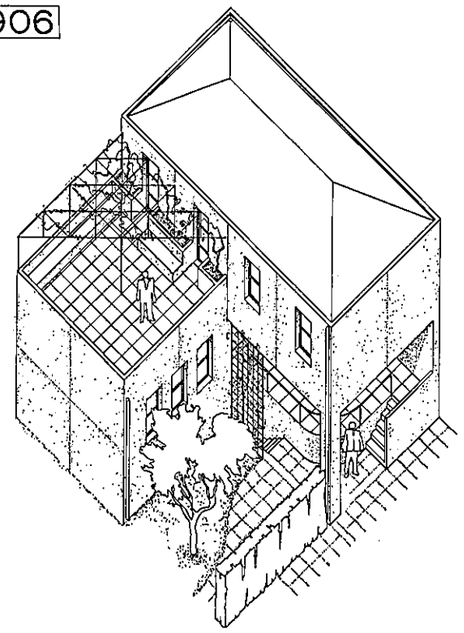
E-F logements bifamiliaux

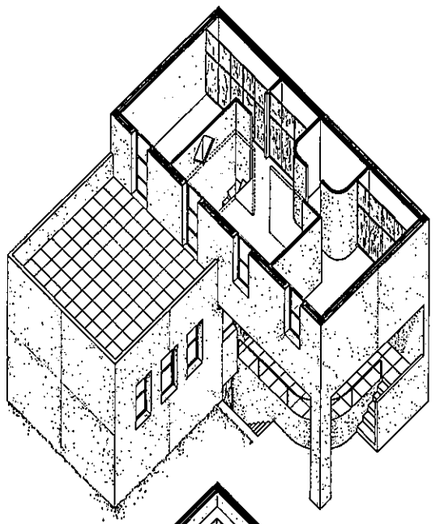
pas de zoning mais
un ensemble de communautes
la croissance est biologique
chaque communaute
dispose de centres
et d'equipements

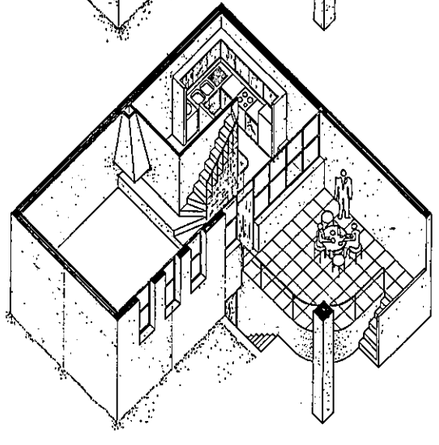
UNE NOUVELLE VILLE TRADITIONNELLE

37012906

SECTION II

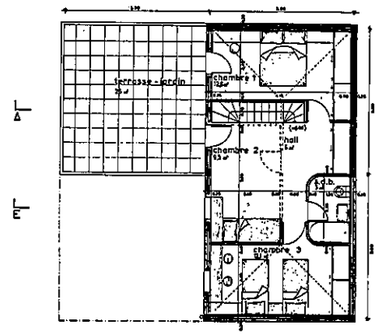






CELLULE DE BASE

-un volume de 600m³ (10m X 10m X 6m de haut), construit sur une trame de 5m X 5m (possibilité de préfabrication simple). Dans ce volume-unité de synthèse sont inclus:
1. ESPACE PRIVATIF
   300m³ d'espace clos (5m X 10m X 3m de haut, sur deux niveaux)
2. ESPACES SEMI-PUBLICS, SEMI-PRIVES
   a. 75m³ d'espace couvert au RDC (5m X 5m X 3m de haut)
   b. 75m³ d'espace ouvert sur terrasse à l'étage (5m X 5m X 3m de haut)
   c. 150m³ d'espace ouvert au RDC (5m X 5m X 6m de haut)
-cette cellule de base peut correspondre à:
1. un logement F4 de 100m² en duplex ou
2. deux logements F2 de 50m² chacun ou
3. un logement F3 de 75m² + un studio de 25m²
-la composition de deux cellules de base donne la possibilité de création d'autres types de logements: F5 de 112,5m²
F6 de 125,0m² etc
-en demi sous-sol de chaque cellule de base sont prévus 125m² d'espace semi-public semi-privé (5m X 10m X 2,5m de haut) destiné aux garages, caves, dépôts collectifs, chauffage central.

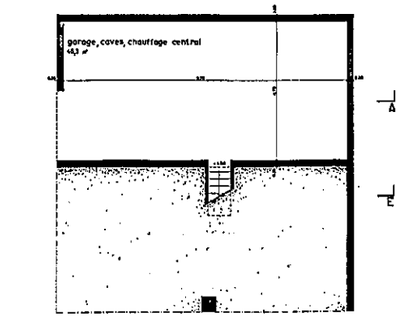


S.H.O. = 50 m²
S.U. = 45 m²

ETAGE

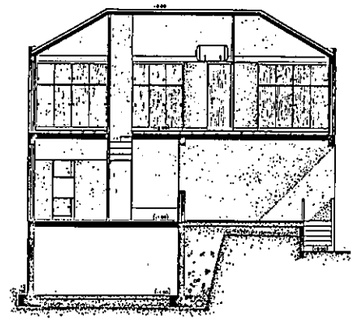
S.H.O. = 50 m²
S.U. = 45 m²

R.D.C.



S.H.O. = 50 m²
S.U. = 46 m²

SOUS-SOL



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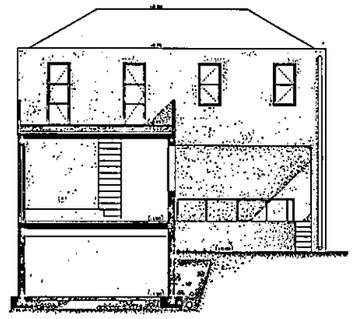

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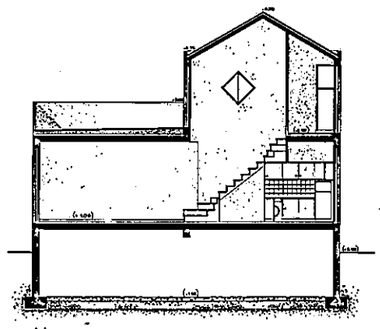
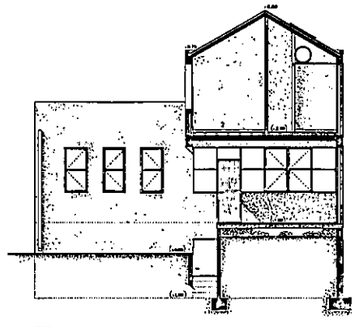
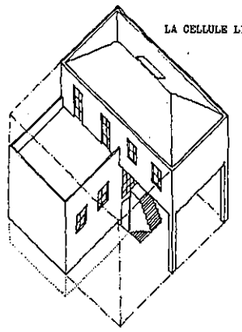


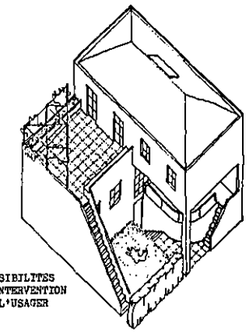
ΔΔ



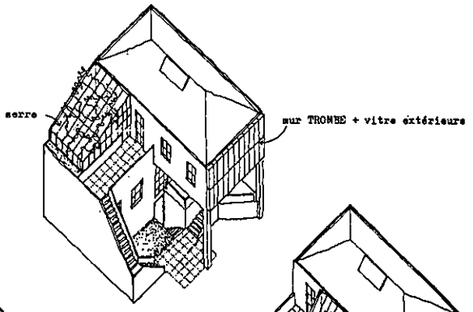
EE

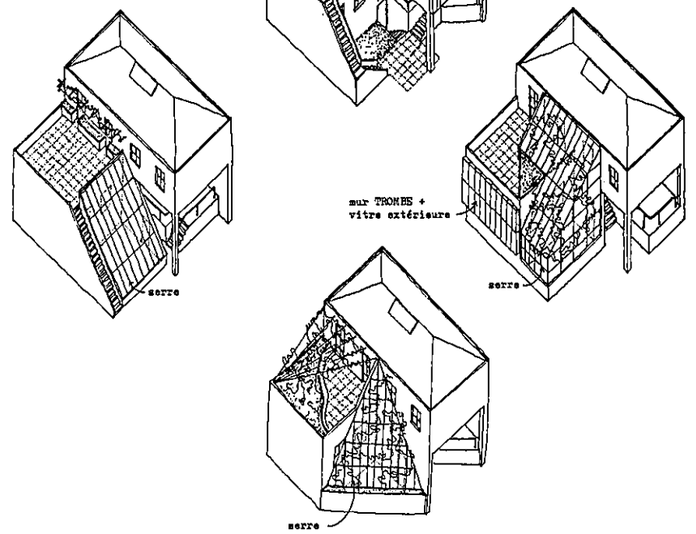
LA CELLULE LIVREE A L'USAGER

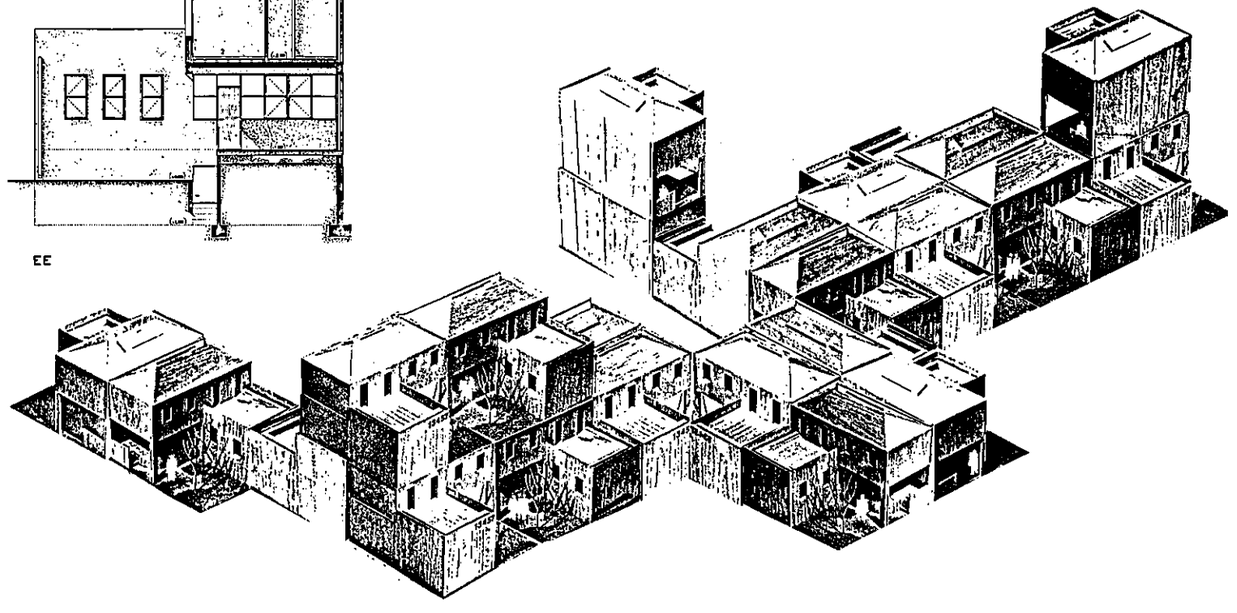




POSSIBILITES D'INTERVENTION DE L'USAGER







LA CELLULE - LE QUARTIER

Pour faire "de l'Habitat", les cellules d'Habitation ne doivent pas se présenter comme des bâtiments autonomes dans un vide qu'on appelle par abus de langage "le quartier". Mais cette dernière notion très caractéristique dans l'architecture populaire grecque, mais aussi méditerranéenne, résulte de la composition de trois éléments-clefs :a)l'espace "public",b)l'espace "semi-public" (ou semi-privé),c)l'espace "privé".

a) L'espace public du quartier doit être restitué à l'échelle humaine, comme espace "positif" et non pas "négatif", en même temps, les volumes construits des habitations doivent pouvoir créer des espaces vivants (des rues, des places, etc...), où l'individu, enfant ou adulte, retrouvera la possibilité de la vie sociale, les rencontres inattendues, le contact avec la nature.

Par contre, il faut rompre avec la pratique "moderne", où l'espace public résulte comme le vide nécessaire entre deux maisons pour des questions d'ensoleillement, de vis-à-vis, de circulation automobile ...

En même temps, l'espace public d'un quartier ne doit pas se considérer comme "clos", attribué uniquement aux quelques unités d'habitation qui l'entoure; il faudra l'imaginer comme lieu de transition vers le "centre-ville" qui accompagnera l'extension des quartiers d'habitation. De cette façon, on évitera le morcellement de la ville en "nouveaux quartiers" isolés et autonomes, mais on obtiendra le rattachement de chaque zone d'extension à la ville existante, avec toujours le seul soucis : de faire la ville. Ce sera la ville qui se développe en faisant encore de la ville.

b) Une importance particulière doit être donnée au traitement de l'espace semi-privé, semi-public. Il s'agit justement de l'élément qui tend à disparaître dans les projets actuels de la commercialisation des logements. Et pourtant, c'est cette transition du privé au public, avec les mille expressions qu'elle peut avoir selon les pays et les cultures qu'on admire dans l'architecture populaire méditerranéenne. En Grèce, à cause du climat tempéré, cet espace est très important du fait qu'une grande partie de la vie familiale, et même collective au niveau du quartier, s'y organise. Sa forme et ses caractéristiques varient selon les cas, ses noms aussi : cour, jardin, terrasse couverte, terrasse en plein air. Son emplacement par rapport à la "maison" proprement dite varie aussi selon la composition des maisons entre elles. Il peut se trouver au sol à couvert, au sol en plein air, ou encore surélevé (couvert ou découvert). Dans tous les cas, c'est autour de cet espace que la vie familiale s'organise et au niveau du plan, on s'aperçoit que pratiquement toutes les pièces y donnent. Et cela parce que la plupart des fonctions de la maison se prolongent dans cet espace intermédiaire : vivre en famille et recevoir les amis pendant six mois par an, faire la cuisine parfois même en hiver (poisson ou viandes grillées), faire la lessive, dormir en été et même prendre une douche. Aussi cultiver des plantes, des salades et des fleurs à petite échelle, bricoler, élever des animaux. La négligence de toutes ces conditions nous amenerait aux tristes résultats des familles agricoles qui viennent travailler à l'usine et qui sont obligées de s'entasser dans des "appartements de ville". Pour la grand majorité d'entre elles, cette transition de la ferme à "l'immeuble" est dure à supporter et entraîne tous les problèmes sociologiques connus.

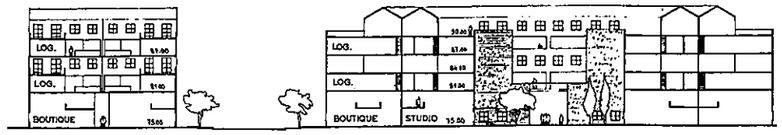
c) Au niveau de la cellule, un élément de la tradition populaire est à conserver: l'intervention de l'individu sur l'espace qu'il occupe. Il s'agira donc, au niveau de la structure, de différencier le mail porteur des éléments portés, de manière à aboutir 1) à l'expression du système porteur d'une maison ou d'un ensemble de maisons financé par les organismes promoteurs et 2) à la possibilité de "clore la maison" par une série d'éléments portés, en grande variété, industrialisés ou traditionnels. De cette façon, les habitants eux-mêmes pourront choisir certains éléments portés et même faire , ou faire faire des extensions limitées à l'intérieur de leurs "concessions" (abris, tonnelles, murets, petites pièces supplémentaires, serres vitrées, etc...). Il y aura ainsi une personnalisation très imaginées des cellules, phénomène courant dans les ensembles analogues construits par l'Etat qui deviennent par la suite de vraies "propriétés spirituelles" des utilisateurs. L'existence de l'espace semi-privé offrira naturellement ces possibilités. Mais aussi l'intérieur de la cellule doit pouvoir se prêter aux adaptations nécessaires par les changements des conditions familiales.

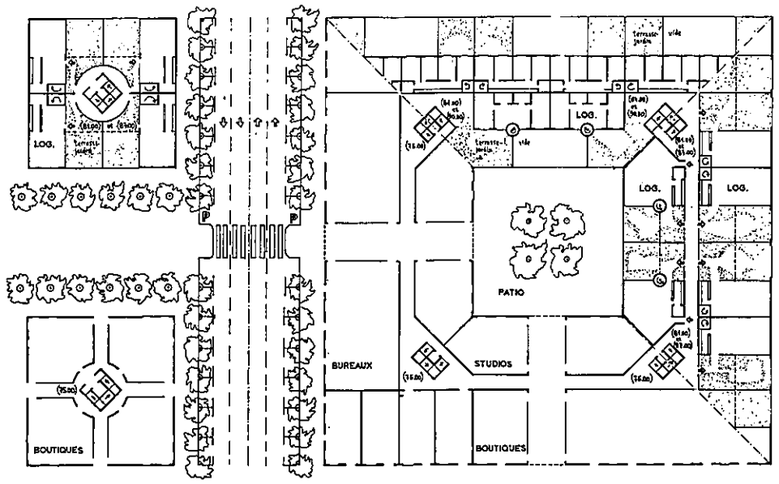
Les limites financières de ces opérations obligent à l'économie extrême des plans ; les installations des fluides doivent être permanentes, dans la mesure du possible, alors qu'une grande liberté d'aménagement peut être donnée aux "pièces sèches". En général, les matériaux employés doivent être ceux de la fabrication régionale. Le beton armé, pour le mail porteur, avec des principes élémentaires de standardisation en vue d'une préfabrication possible à proposer; les briques ou les parpaings comme éléments de remplissage, restés apparents ou peints ou enduits (en ciment blanc ou colorés, à la chaux, etc...).

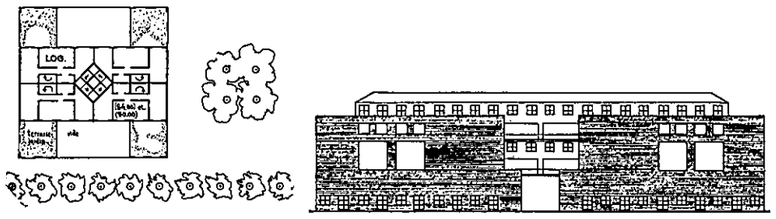
Les panneaux démontables, intérieurs ou extérieurs, sont encore au stade embryonnaire en Grèce, donc inaccessibles, même pour des opérations à grande échelle qui se veulent économiques.

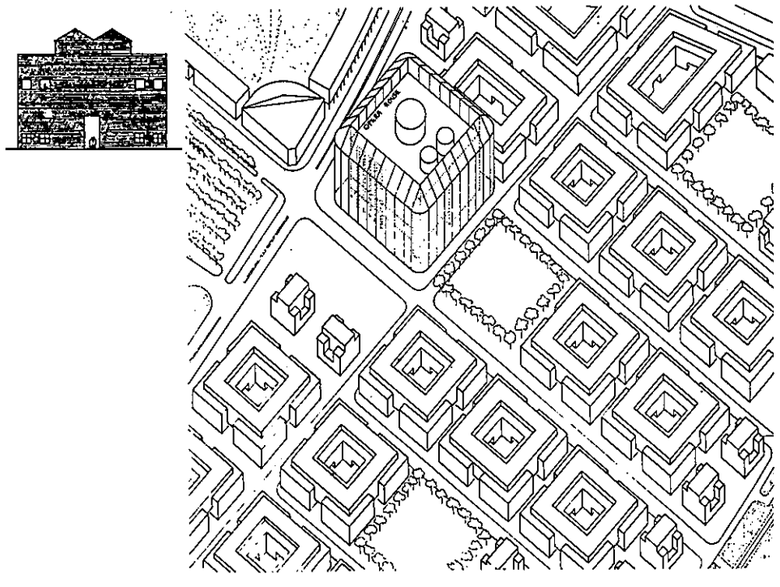
ECONOMIE D'ENERGIE

1. chauffe-eau solaire
2. chauffage collectif, au niveau d'un quartier de l'ordre de 80 logements
3. interventions de l'usager:
   - serre sur la terrasse à l'étage pour chauffage partiel de l'étage
   - serre dans la cour au RDC pour chauffage partiel du séjour
   - " " " " " " " "
     et de l'étage
   - mur TROMBE avec vitre extérieure pour chauffage partiel du séjour
   - mur TROMBE avec vitre extérieure pour chauffage partiel de l'étage
   - combinaisons des solutions ci-dessus et possibilité de leur standardisation.



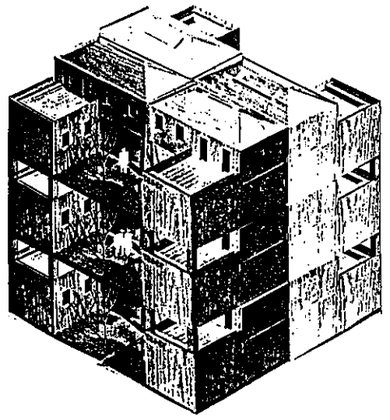


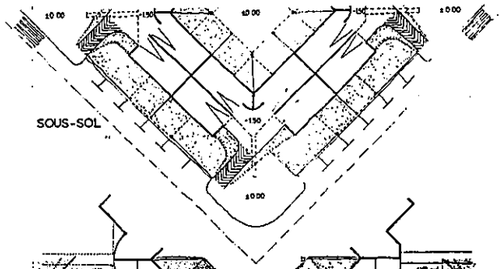


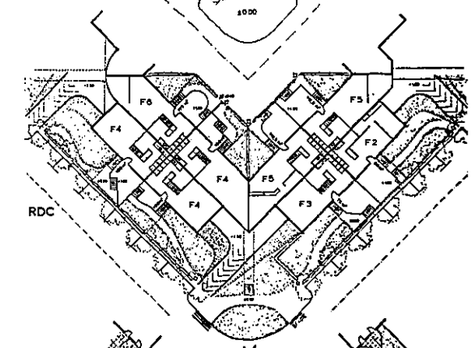


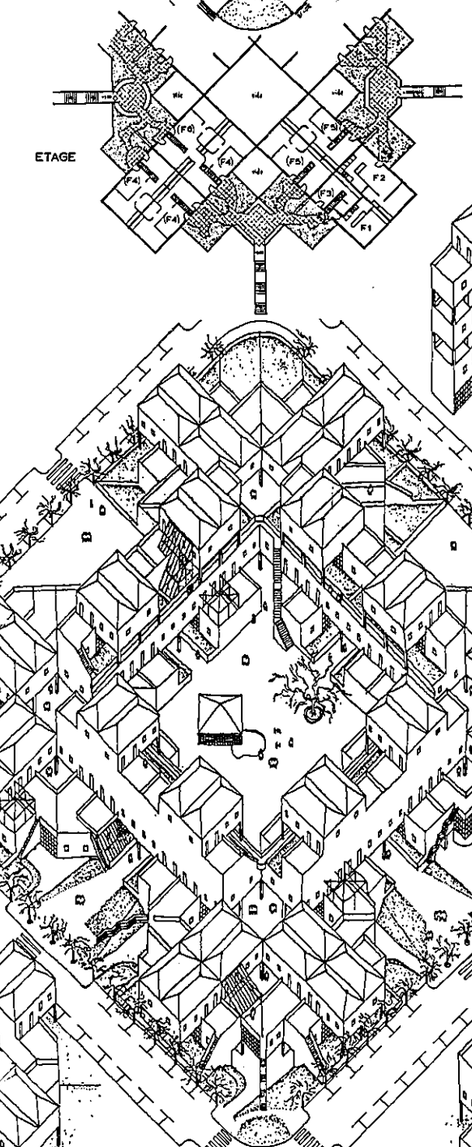
EXEMPLE D'URBANISATION

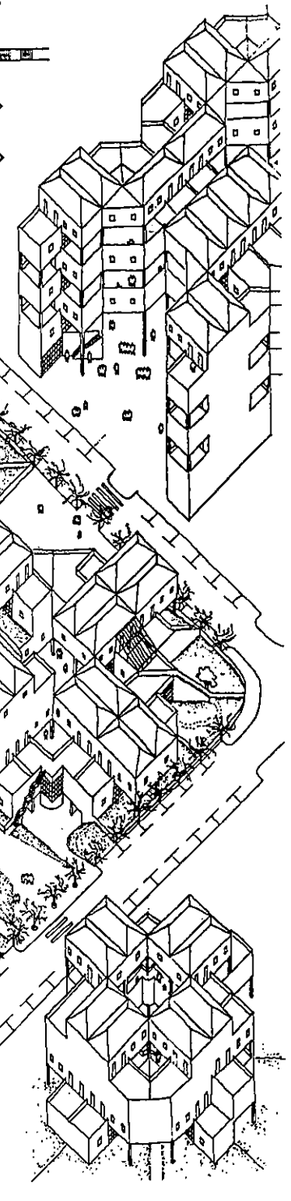
surface du terrain:100m X 100m
cellules d'habitation:80 de 100m² ob.(indicatif)
-8000m² d'espaces clos +
-2000m² d'espaces couverts
C.E.S.:0,5 (coefficient d'emprise au sol)
C.O.S.:1,0 (" d'occup. ")
garage couvert:48 pl.) 96 places:1,2 pl/log
parking couvert:48 pl.)

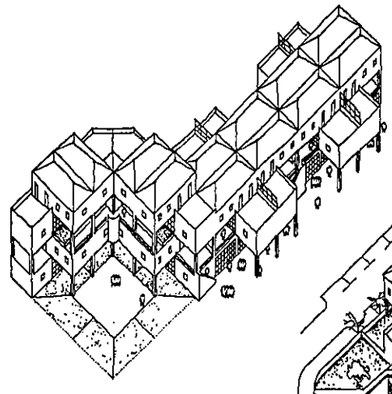


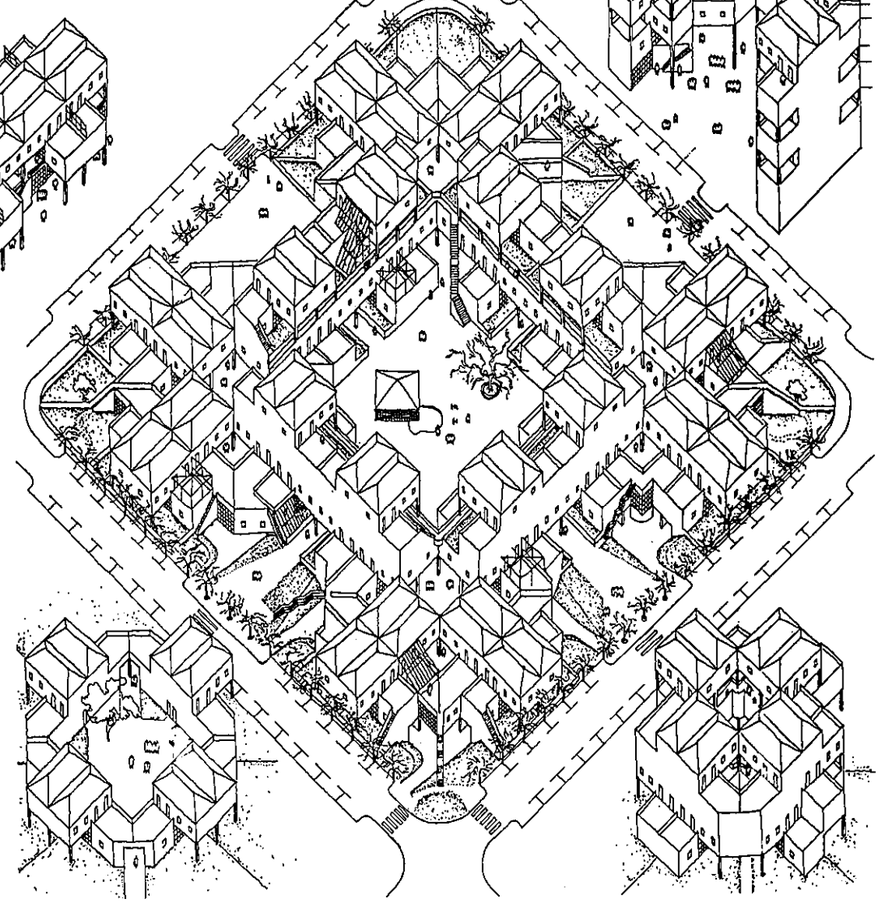












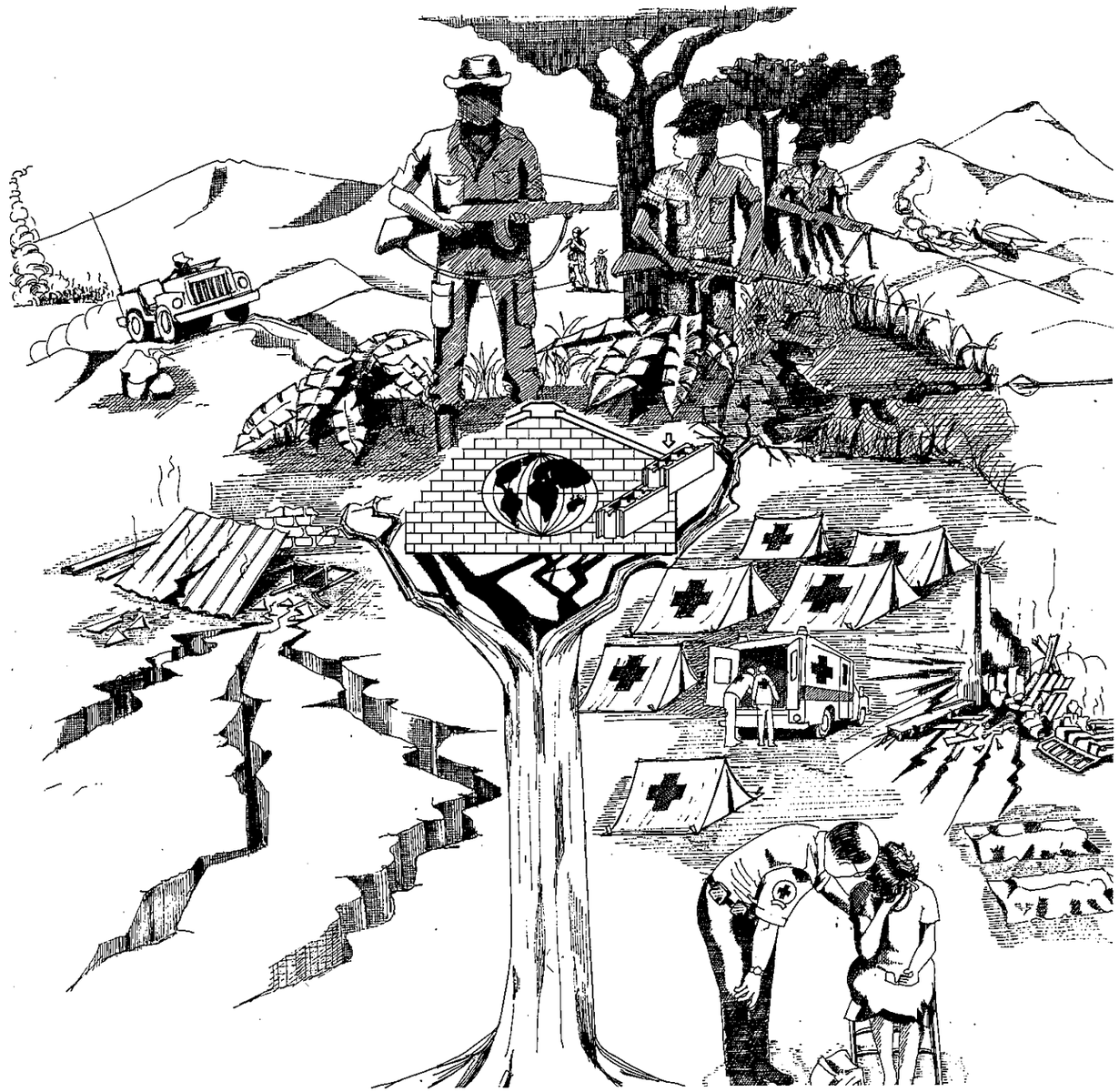
SECTION III

22222222

CINTUS 1986/87

Certámen Internacional de Soluciones sobre Nuevas Tecnologías de la Vivienda Social

CONTRIBUCION A LAS NACIONES UNIDAS
AÑO INTERNACIONAL DE LA VIVIENDA PARA LAS PERSONAS SIN HOGAR



SISTEMA

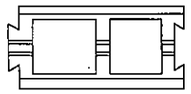
SISTEMA DE AUTOCONSTRUCCION SISMO-RESISTENTE

Que se basa en el engarce mecánico, tanto horizontal como vertical, de bloques modulares de hormigón para conformar mamposterías, tanto portantes como divisorias.

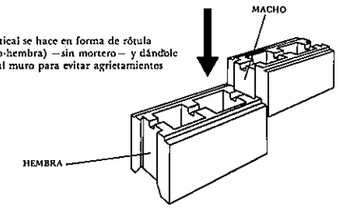
Sistema Técnico de Vanguardia para Programas de Autoconstrucción

- Guía para proyectos de Construcciones Sismo-Resistentes
- Sencillo • Rápido • Económico

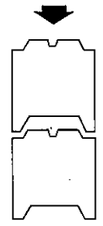
ALTERNATIVA A LA CIUDAD ESPONTANEA

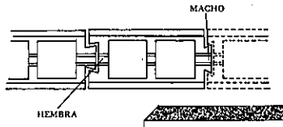


El sistema de engarce vertical se hace en forma de rótula en cola de milano (macho-hembra) —sin mortero— y dándole la flexibilidad suficiente al muro para evitar agrietamientos y fallas por el sismo.



- Ideal para viviendas populares y planes de autoconstrucción
- No requiere mortero de pega
- 30% más económico, 4 veces más rápido que los sistemas tradicionales
- Recuperable en un 90% en obras provisionales
- Simplifica la ejecución de instalaciones
- Aislante acústico-isotérmico-evita humedades
- Permite el uso intensivo de mano de obra no especializada



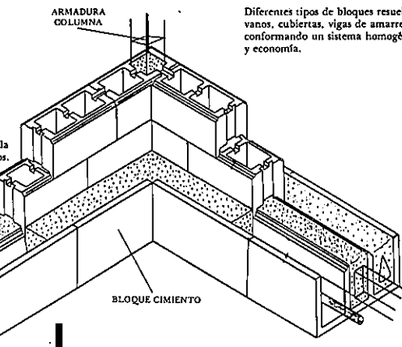


EL DESARROLLO CONSTRUCTIVO

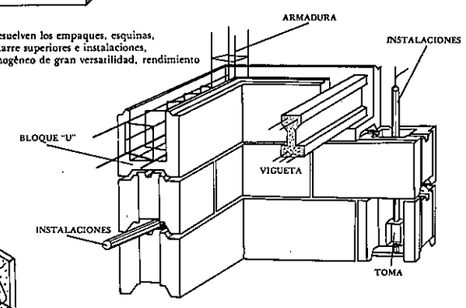
Horizontalmente los bloques se apoyan en hiladas sucesivas que encajan entre sí, formando juntas de empalme, que absorben las presiones horizontales, sin necesidad de mortero.

CIMENTACION

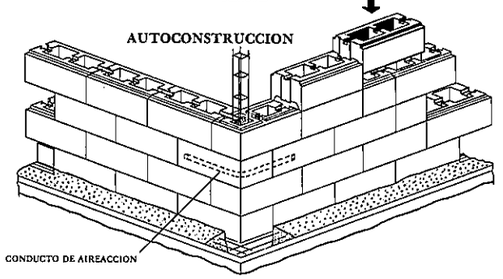
Según capacidad portante del suelo.
Se utiliza una viga o zapata corrida simple al centro de la triple "U" (Bloque-cimiento) o se combina según cálculos.



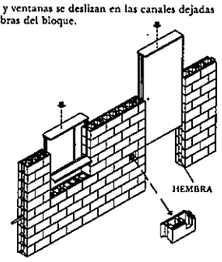
Diferentes tipos de bloques resuelven los empaques, esquinas, vanos, cubiertas, vigas de amarre superiores e instalaciones, conformando un sistema homogéneo de gran versatilidad, rendimiento y economía.



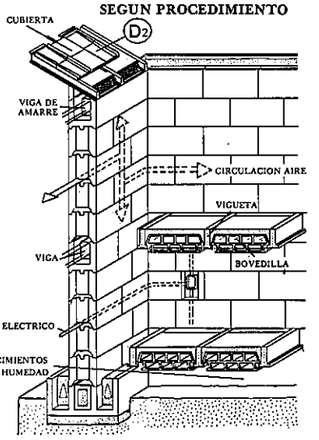
AUTOCONSTRUCCION

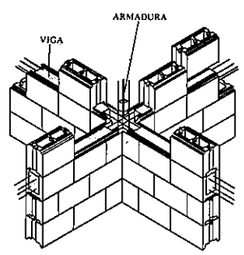


Las puertas y ventanas se deslizan en las canales dejadas por las hembras del bloque.



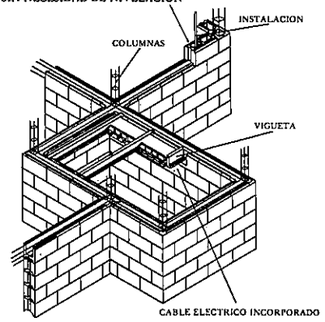
CORTE PARCIAL/EJEMPLO CONSTRUCCION REALIZADA SEGUN PROCEDIMIENTO

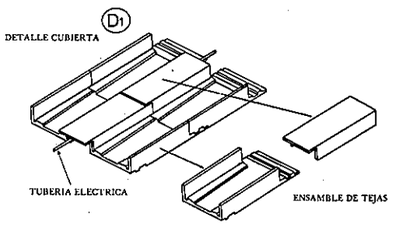




OTRO EJEMPLO DE CONSTRUCCION
INTERSECCION Y EL ESBOZO
DE UN PISO SUPERIOR

ARRANQUE DE UN PISO SUPERIOR
SIN NECESIDAD DE NIVELACION





EL SALVADOR
ZONA ORIENTE.

• ANTECEDENTES

CONCIENTES DEL DÉFICIT HABITACIONAL QUE AÑO TRAS AÑO, HA VENIDO INCREMENTÁNDOSE EN ESTE PAIS Y QUE CON EL TRÁGICO SINIESTRO ACAECIDO EN FECHAS RECIENTES, LO HA ACRECENTADO AÚN MÁS, LO CUAL HA ALEJADO SUSTANTIVAMENTE LA POSIBILIDAD DE OFRECER A LA MAYORÍA DE NUESTROS HERMANOS DE UN HABITAT: DECOROSO —DIGNO Y HUMANO— QUE LOS REHABILITE SOCIOECONÓMICAMENTE Y LOS INTEGRE AL PROCESO DE DESARROLLO SOCIAL.

"UN HOMBRE SIN TECHO ES UN HOMBRE SIN PATRIA".

POR LO CUAL SOMETEMOS A LA OPINIÓN GENERAL UN SISTEMA DE "AUTOCONSTRUCCIÓN TOTAL" QUE PERMITA LA INTERACCIÓN E INTEGRACIÓN FAMILIAR COMO ÚNICO MEDIO DE APROVECHAR ESE GRAN POTENCIAL HUMANO QUE EN BUENA MEDIDA HA SIDO DESAPROVECHADO PARA SOLUCIONAR SU PROPIO PROBLEMA.

"EL PUEBLO RECONSTRUYE SU PUEBLO".

• AUTOCONSTRUCCIÓN

LA SENCILLEZ DE LOS ELEMENTOS QUE COMPONEN EL SISTEMA, COMPARÁNDOLO A UN MECANNO DE LA CONSTRUCCIÓN, PERMITEN UNA IDENTIFICACIÓN CLARA Y PRECISA, QUE FACILITAN EL PROCESO CONSTRUCTIVO.

— SE ELIMINA LA UTILIZACION DE EQUIPOS SOFISTICADOS —HERRAMIENTAS TÉCNICAS— ENCOFRADOS O FORMALETAS DE MADERA.

— SE SIMPLIFICA Y ESTANDARIZA LA ESTRUCTURA E INSTALACIONES EN GENERAL (HIDRÁULICA-ELÉCTRICA).

— LA COLOCACIÓN DE PUERTAS Y VENTANAS SE REALIZA POR ENSAMBLE.

— SE ELIMINA LA UTILIZACIÓN DE MANO DE OBRA ESPECIALIZADA.

"LA CONSIDERACIÓN DE ESTOS FACTORES, UBICAN AL SISTEMA DE CONSTRUCCIÓN PROPUESTO COMO ÓPTIMO PARA EL DESARROLLO MASIVO HABITACIONAL POR AUTOCONSTRUCCIÓN PROGRESIVA.

• ECONOMÍA

AL MINIMIZAR TODO EL PROCESO CONSTRUCTIVO EN SUS DISTINTAS FASES:

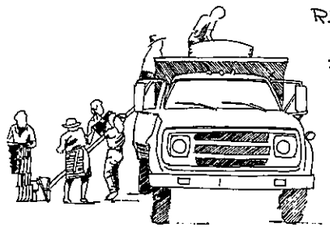
— NO REQUERIR MORTERO DE PEGA (MEZCLA) ENTRE JUNTAS.

— AL REDUCIR EL MANEJO DE INSUMOS: CEMENTO - ARENA - AGUA - HERRAMIENTAS.

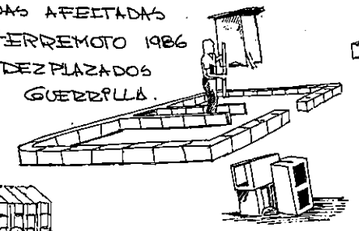
— AL ELIMINAR LOS DESPERDICIOS.

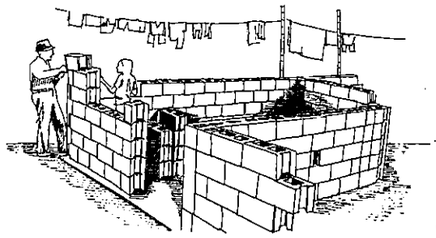
— LA MANO DE OBRA ESPECIALIZADA.

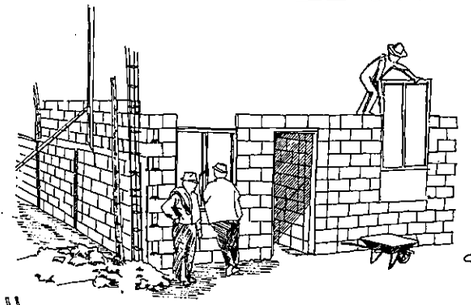
— Y AL REDUCIR EL TIEMPO DE EJECUCIÓN DE OBRA 3 VECES, SE CONVIERTE EL SISTEMA PROPUESTO EN "ÓPTIMO" POR OFRECER UNA ECONOMÍA GLOBAL DEL 30% COMPARADA A LOS SISTEMAS TRADICIONALES.

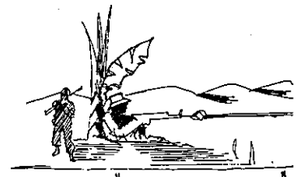


RECONSTRUCCION PROGRESIVA
ZONAS AFECTADAS
- TERREMOTO 1986
- DEZPLAZADOS GUERRILLA.





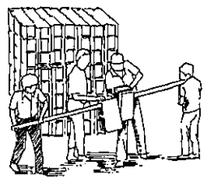


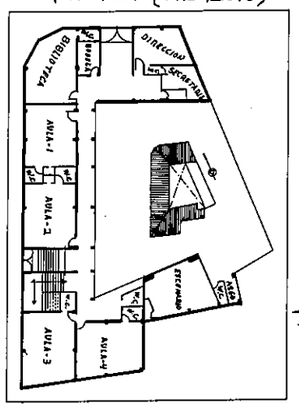


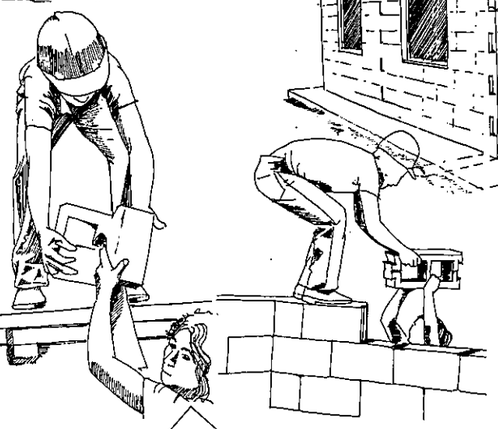
PROBLEMA: "ZONA DE GUERRILLA"
CONSECUENCIAS: 500.000 PERSONAS DEZPLAZADAS.

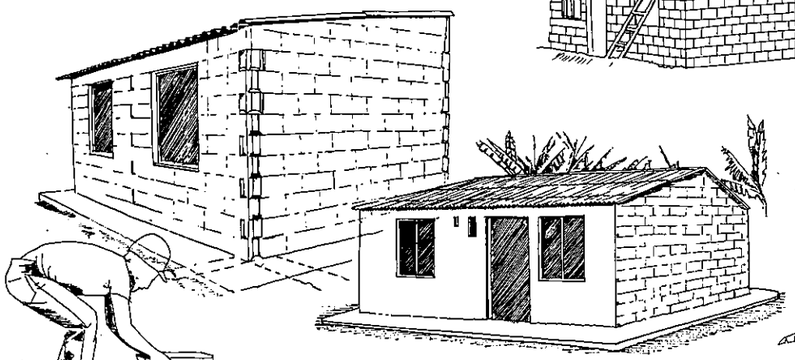
SITUACION: CAOS - SOCIO-ECONOMICO - FAMILIAR - MORAL.

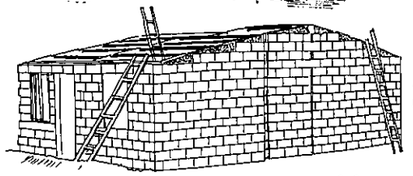
RECONSTRUCCION ESCUELA "SANTA CATALINA".
DESARROLLO CONSTRUCTIVO POR ETAPAS.
REALIZADO POR.
AUTOCONSTRUCCION TOTAL.
EFECTUADO POR ALUMNOS. Y PADRES.- (PROYECTO)











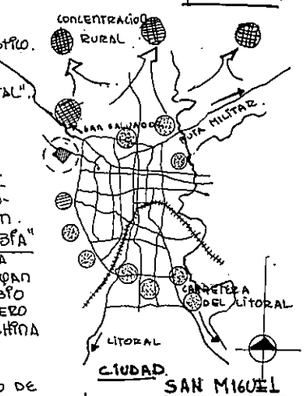
UTILIZANDO LOS PROGRAMAS DE INTER-ACCION E INTEGRACION SOCIAL QUE OFRECE NUESTRO SISTEMA. SEGUN EXPERIENCIAS LOGRADAS EN "COLOMBIA"
- CUCUTA
- POPAYAN
- CAJIBIO
- ARMERO
- CHINCHINA

PLANTEAMIENTO:

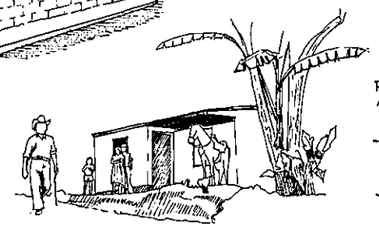
*. URBANO:
DESARROLLO URBANISTICO POR ETAPAS DE "AUTOCONSTRUCCION" "TOTAL".

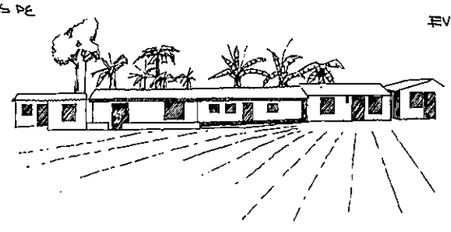
SE PLANTEA LA PROGRAMACION CON UN DESARROLLO PROGRESIVO. DE ACUERDO A LA "NECESIDAD" DE CADA GRUPO FAMILIAR.

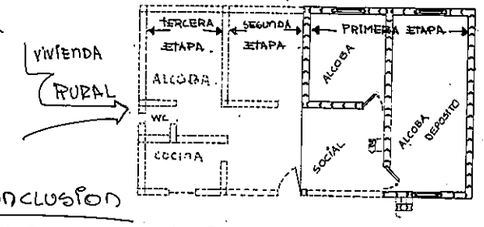
*. RURAL
- DESARROLLO DE CONCENTRACIONES RURALES → POR NUESTRO SISTEMA DE:
"AUTOCONSTRUCCION TOTAL"
- PROGRAMADAS SG. NECESIDAD LOCAL Y RECURSOS DE LA ZONA.
"LA CONCENTRACION. TENDRA PARCELAS DE EXPLOTACION AGRICOLA COMUNITARIA EVITANDO EL EXODO A LA CIUDAD → LOGRANDO → LA INTEGRACION SOCIAL AL CAMPO



CIUDAD. SAN MIGUEL
POBLACION: 300.000 HA.
DEZPLADOS GUERRA
URBANIZACION. PROPUESTA
LOTIFICACIONES. PERIMETRALES DE INTERES SOCIAL



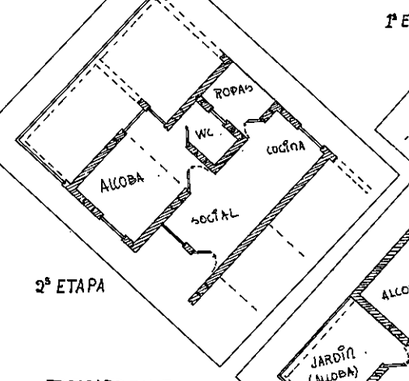


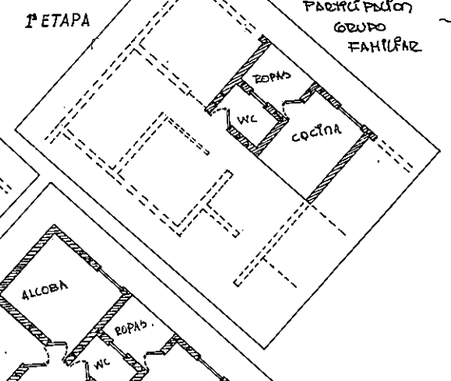


VIVIENDA RURAL

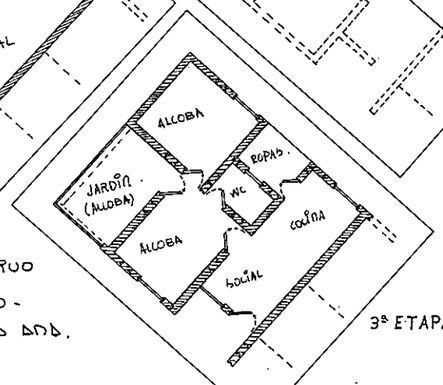
1ª ETAPA

ACCION COMUNITARIA. PARTICIPACION GRUPO FAMILIAR





2ª ETAPA



3ª ETAPA

DESARROLLO URBANO PROGRESIVO
SAN JACINTO - SANTA ANA.

"SOBREEXISTENCIA

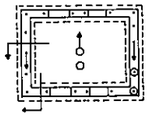
1º) LAS FUERZAS DEL TERREMOTO SE RESISTEN CON UN SISTEMA DE CAJA.
- LAS PAREDES DEL PERIMETRO FUNCIONAN, COMO PAREDES DE ESFUERZO DE CORTE. Y COMO MUROS DE CARGA.
- LAS FUERZAS HORIZONTALES EN EL NIVEL DE TECHO SE DISTRIBUYEN A LOS ELEMENTOS RESISTENTES VERTICALES, HACIENDO USO DE LA CUBIERTA Y SU REFORDEZ COMO UN DIAFRAGMA.

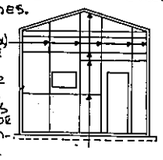
2º) EL CENTRO DE MASA Y EL CENTRO DE RIGIDEZ SE MANTIENEN CERCA UNO DEL OTRO PARA MINIMIZAR LA TORSION.

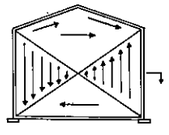
3º) LOS CIMIENTOS PAREDES Y TECHO SE MANTIENEN JUNTOS, CON BARRAS DE REFUERZO COLOCADAS EN CELDAS RELLENAS DE CONCRETO Y EN LOSAS DE AMARRE.

4º) LAS CAJAS NORMALES A LAS PAREDES SE MANTIENEN. - (RESISTEN) CON REFUERZO VERTICAL QUE RESISTE JUNTO LAS FUERZAS AL TECHO ENTRE PISO - Y FUNDACIONES.

5º) EL REFUERZO VERTICAL A LAS FUNDACIONES. (HORIZONTAL) EN LAS PAREDES - DE CORTE RESISTEN. LAS FUERZAS DE MOMENTOS Y DE ESFUERZOS DE CORTE. SE COLOCA REFUERZO EN LAS ESQUINAS DE LAS PAREDES, ALREDEDOR DE LOS HUECOS Y ADYACENTES. AL TECHO Y FUNDACION.

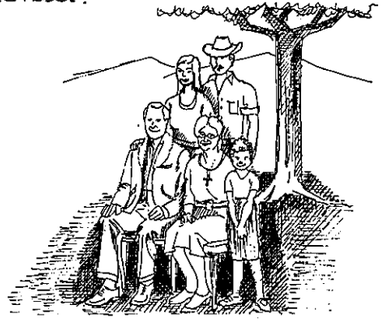






"CONCLUSION

VEMOS REFLEJADO EL SISTEMA PROPUESTO TANTO EN EL "SECTOR II" COMO EN EL "SECTOR III" POR SU FORMA Y CONDICION DE APLICACION EN DUPLA ESCALA Y POR EL METODO SENCILLO DE EDIFICACION. QUE PERMITE LA PARTICIPACION INTEGRAL DE UN GRUPO HABITACIONAL DIRECTAMENTE AFECTADO.



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SISTEMA DE CONSTRUCCION DE VIVIENDAS (Sector III)

A BASE DE HORMIGON PROYECTADO SOBRE MALLAS METALICAS

RESUMEN DEL PROCEDIMIENTO

SE TRATA DE CONSTRUIR UNAS "MEMBRANAS" DE HORMIGON ARMADO ENVOLVIENDO ESPACIOS HABITABLES.

PARTIENDO DE UNA CIMENTACION TRADICIONAL EN ZANJA CORRIDA, SE CONSTRUYE UN ENTRAMADO DE BARRAS DE ACERO, QUE SIRVEN DE SOPORTE A UNA MALLA METALICA, LA CUAL PERMITE EN SU SUPERFICIE -EN GENERAL DE DOBLE CURVATURA-- ASENTAR UNA TELA DE ARPILLERA, SOBRE LA QUE SE VA A PROYECTAR EL HORMIGON.

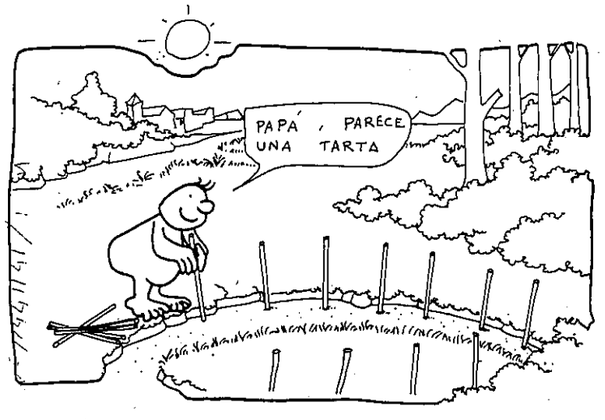
ESTA PRIMERA LABOR DE "CESTERIA" VA A CONFORMAR, LO QUE EN LA CONSTRUCCION TRADICIONAL ES ESTRUCTURA, TABIQUERIA, CUBIERTA, CERRAMIENTOS, CHIMENEAS, JARDINERAS, DETALLES DECORATIVOS E INCLUSO MOBILIARIO.

SE REALIZA DE FORMA SENCILLA, DEJANDO INSTALADOS LOS PREMARCOS DE VENTANAS, PUERTAS Y LUCERNARIOS ASI COMO LAS INSTALACIONES.

SOBRE ESTA PREPARACION Y CON LA AYUDA DE UNA MAQUINA DE PROYECTAR, CONFORMAMOS UNA PRIMERA CAPA DE HORMIGON RESISTENTE E HIDROFUGO Y LUEGO UNA SEGUNDA CAPA INTERIOR DE HORMIGON AISLANTE.

EL RESULTADO ES UNA MEMBRANA IMPERMEABLE, RESISTENTE, AISLANTE Y MONOLITICA, QUE INCLUYE INSTALACIONES Y QUE SE CARACTERIZA POR LAS SIGUIENTES VENTAJAS:

-ADAPTABILIDAD-
-RAPIDEZ Y FACILIDAD-
-GRAN RESISTENCIA-
-ECONOMIA-



EL PROCEDIMIENTO CONSTRUCTIVO ES VALIDO PARA CUALQUIER LUGAR DONDE SE ELIJA UN ASENTAMIENTO HUMANO

SE UTILIZAN SIEMPRE LOS MISMOS MATERIALES, EN MAYOR O MENOR CUANTIA.

FACTOR CLIMATOLOGICO:

ADAPTABLE A CUALQUIER CLIMA, SIN MAS QUE VARIAR EL GROSOR DE LA CAPA DE AISLAMIENTO.

FACTOR ECOLOGISTA:

IDONEIDAD CONSTRUCTIVA PARA REALIZAR CUALQUIER FORMA, SIN LA LIMITACION COSTOSA QUE SUPONE EN LA CONSTRUCCION TRADICIONAL CREAR ESPACIOS CURVOS.

NO HAY CASI NINGUNA LIMITACION ESTETICA

SE CONSIGUE UNA GRAN ADAPTACION ECOLOGISTA DE LA CONSTRUCCION

FACTOR SISMICO Y EOLICO:

LA ESTRUCTURA, CONFORMADA POR EL CERRAMIENTO, LA TABIQUERIA Y LA CUBIERTA, COMO SISTEMA DE MEMBRANAS UNIDAS DE HORMIGON ARMADO, CREA UN SISTEMA MONOLITICO, DONDE PREDOMINA LA FORMA DE TRABAJO A COMPRESION. EL HORMIGON, AL SER PROYECTADO, ALCANZA UNAS RESISTENCIAS MUY SUPERIORES AL HORMIGON TRADICIONAL VIBRADO O APISONADO.

FACTOR RADIOACTIVIDAD:

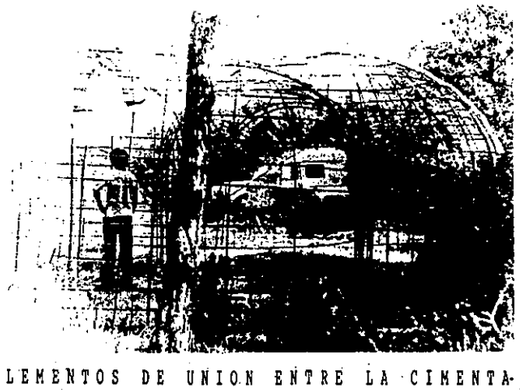
COMPLEMENTANDO EL SISTEMA CON OTRA CAPA A BASE DE PROYECTAR UN MORTERO ESPECIAL CON PERDIGONES DE PLOMO, SE CONSIGUE UN CONFORT ANTIRRADIOACTIVO.

CIMENTACION

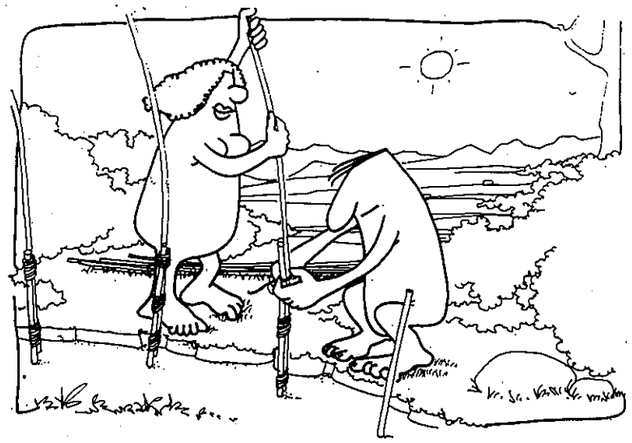
SISTEMA TRADICIONAL EN ZANJA CORRIDA

HORMIGONADO

AL SER TODOS LOS MUROS DE LA VIVIENDA RESISTENTES, SE CONSIGUE UN BUEN REPARTO DE CARGAS EN LOS CIMIENTOS, ORIGINANDO UN AHORRO DE MATERIAL, TIEMPO Y COSTO.



ELEMENTOS DE UNION ENTRE LA CIMENTACION Y LA ESTRUCTURA

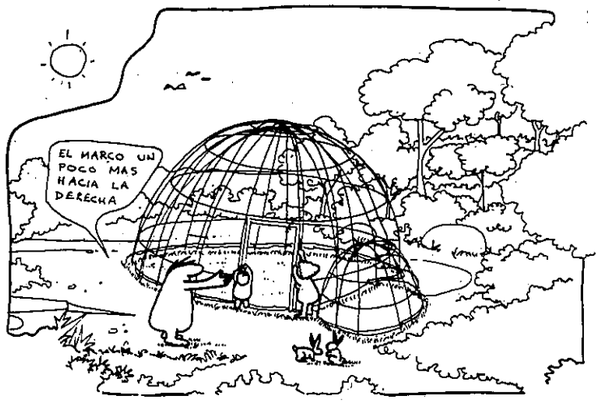


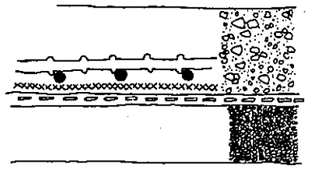
ARMAZON

CON ELEMENTOS LINEALES (POR EJEMPLO, CON VARILLAS DE LAS USADAS EN EL HORMIGON ARMADO) SE DA FORMA A LOS DISTINTOS ELEMENTOS,TALES COMO CERRAMIENTOS, CUBIERTA, TABIQUERIA, JARDINERAS, VALLAS, ARCOS VOLADIZOS etc....

MALLA SOPORTE

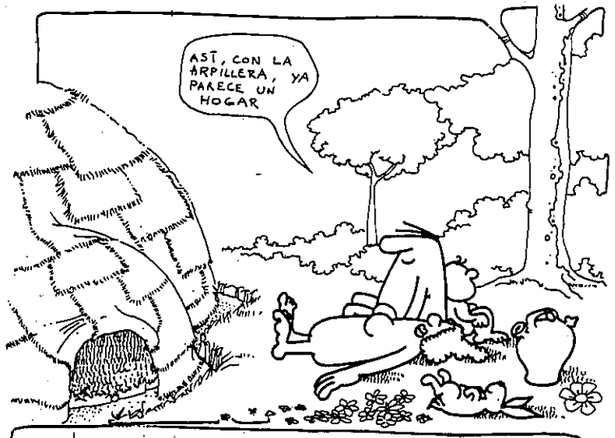
EL ARMAZON, SE RECUBRE CON UNA MALLA (POR EJEMPLO TELA METALICA DE "GALLINERO")





HORMIGÓN RESISTENTE E IMPERMEABILIZANTE INCLUYE REDONDOS Y MALLA ARPILLERA (EFECTO CÁMARA)

HORMIGÓN AISLANTE (DÁNDOLO PRIMERO HACE DE ENCOFRADO.)

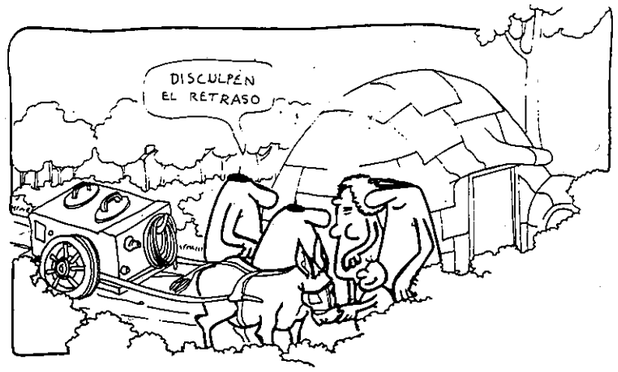


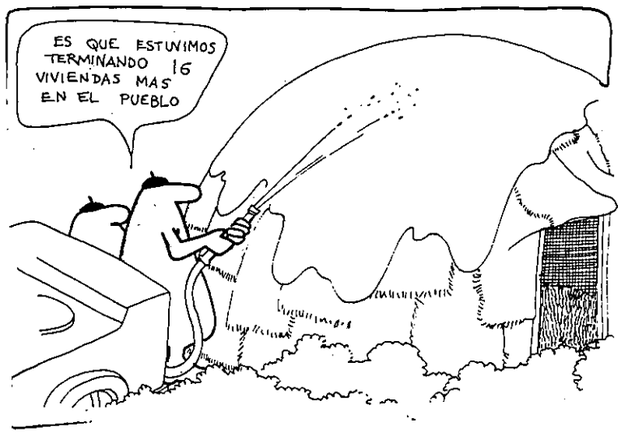
SERIABILIDAD

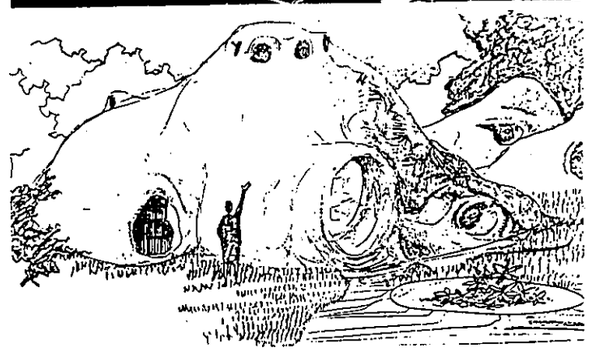
LA FABRICACION DE VIVIENDAS EN SERIE ELIMINA LOS PROBLEMAS DE ESPERA EN EL ABASTECIMIENTO DE MATERIAL Y EN LA CONTINUIDAD DE LAS DISTINTAS PARTES DEL EDIFICIO.

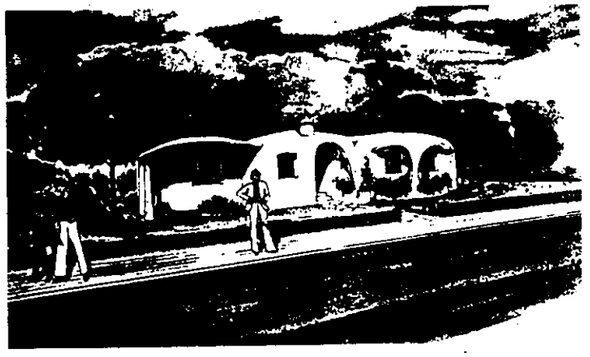
MALLA TUPIDA

SUPERPUESTA A LA MALLA SOPORTE SE COLOCA UNA TELA DE ARPILLERA O SIMILAR, QUE ORIGINA FACIL ADHERENCIA AL HORMIGON PROYECTADO.









SECTION 3

CONSTAT

LA SOLUTION QUE NOUS APPORTONS N'EST PAS A PROPREMENT PARLER UN SYSTEME CONSTRUCTIF. NOUS NOUS PLACONS EN AMONT DE TOUS LES SYSTEMES.

NOTRE BUT EST DE CREER LE PREMIER POTEAU DE LA MAISON AVEC L'AIDE DE COFFRAGES EN POLYETHYLENE HAUTE DENSITE DE FAIBLES DIMENSIONS. LES AVANTAGES DE CE SYSTEME EN SONT:

* LE MOINDRE COUT.
* LA REUTILISATION (100 A 150 FOIS).
* LA LEGERETE.
* LA SOLIDITE.
* L'UTILISATION SANS ADJUVANT.

LA PENURIE DE LOGEMENTS DANS LES PAYS DU TIERS MONDE, A POUR CONSEQUENCE L'ABSENCE DU BIEN LE PLUS PRECIEUX D'ENTRE TOUS: LA SANTE.

LE PREALABLE A TOUTE LUTTE VISANT AU MAINTIEN OU AU RETABLISSEMENT DE CE BIEN, PASSE PAR L'EAU, SA DISTRIBUTION, SON EVACUATION, SON TRAITEMENT.

LA PRESENTE ETUDE A POUR BUT D'APPORTER UN ELEMENT DE REPONSE AU NIVEAU DE LA "FAMILLE". LA COLLECTIVITE POUVANT OU NON, PRENDRE LE RELAI EN AMONT (DISTRIBUTION), OU EN AVAL (TRAITEMENT EAUX USEES, EAUX VANNES).

LE TRAITEMENT DES EAUX USEES ET DES EAUX VANNES POUVANT AISEMENT SE REALISER PAR L'INTERMEDIAIRE D'UNE FOSSE SEPTIQUE RACCORDEE, SOIT A UN EPANDAGE PAR DRAINS SEPTO-REPARTITEURS (TECHNIQUE BIEN CONNUE EVITANT LA POLLUTION DE LA NAPPE PHREATIQUE), SOIT A UN PLATEAU FILTRANT (RECUPERATION ET RECYCLAGE DES EAUX POUR PLANTATIONS.

REPONSE

NOTRE PROPOSITION DE BASE CONSISTE DONC A FOURNIR UN ELEMENT DE COFFRAGE DE FAIBLES DIMENSIONS, QUI PERMETTRA PAR STRATES SUCCESSIVES, DE COULER UN POTEAU EN BETON JUSQU'A LA HAUTEUR DESIREE.

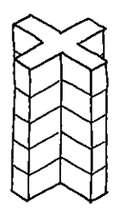
CET ELEMENT NOUS OFFRE LA POSSIBILITE:

* DE DISPOSER D'UNE BASE SIMPLE, SOLIDE ET BON MARCHE, A PARTIR DE LAQUELLE, TOUTE CONSTRUCTION EST POSSIBLE. (ACCROCHAGE D'UNE CHARPENTE, DE CLOISONS, D'ELEMENTS SANITAIRES...)

* DE RESOUDRE A LA FOIS LES PROBLEMES D'ALIMENTATION EN EAU DE LA "FAMILLE" ET D'EVACUATION DES EAUX USEES ET DES EAUX VANNES.

* D'INTEGRER DES ELEMENTS SANITAIRES AU FUR ET A MESURE DES BESOINS ET DES POSSIBILITES DE CHACUN.

LE PRINCIPE

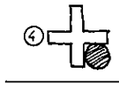


UN POTEAU SUPPORT A HAUTEUR VARIABLE COULE PAR ELEMENTS DE 0.50M. ET INTEGRANT LES CANALISATIONS D'EAU.

UNE RESERVE D'EAU AU NIVEAU DU SOL (FUT DE 200 L.) AVEC POMPE A MAIN.

UN BAC A LAVER AU NIVEAU DU SOL SERVANT DE BAC A DOUCHE.

UN W.C. A LA TURQUE AVEC ROBINET.

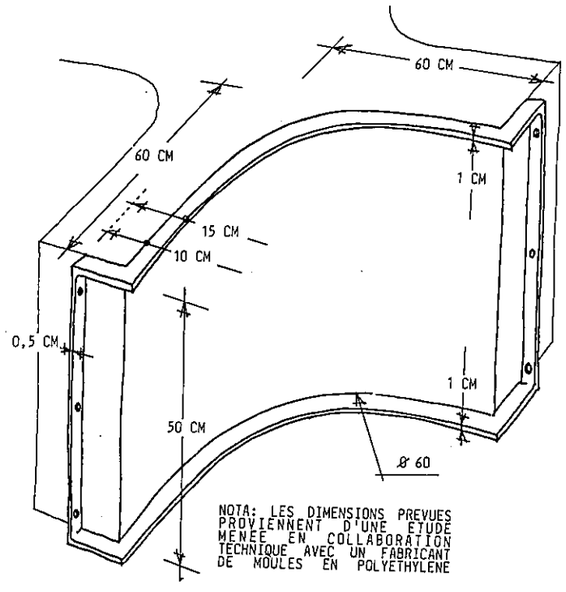


LA PLAQUE FOYERE A HAUTEUR VARIABLE AVEC CONDUIT DE FUMEE ET HOTTE.

LA RESERVE HAUTE, ALIMENTEE PAR ① ET DISTRIBUANT PAR GRAVITATION ② ET ③.

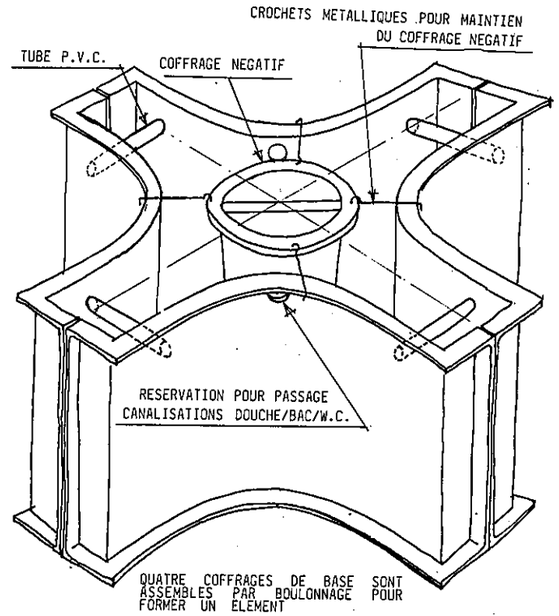
LE POTEAU

COFFRAGE DE BASE



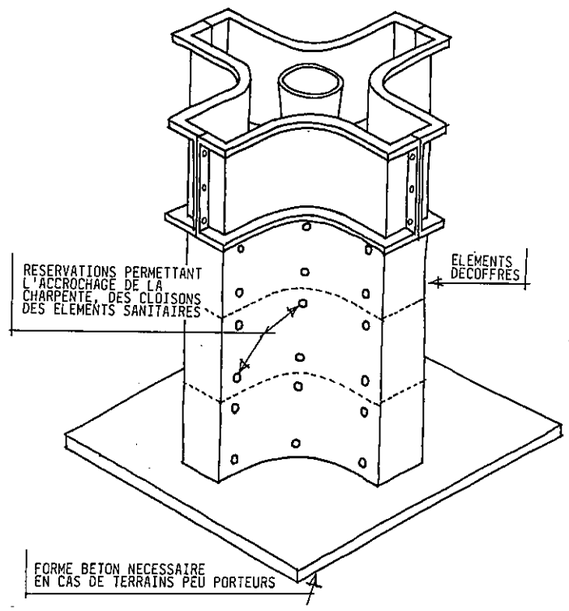
NOTA: LES DIMENSIONS PREVUES PROVIENNENT D'UNE ETUDE MENEE EN COLLABORATION TECHNIQUE AVEC UN FABRICANT DE MOULES EN POLYETHYLENE

ASSEMBLAGE D'UN ELEMENT



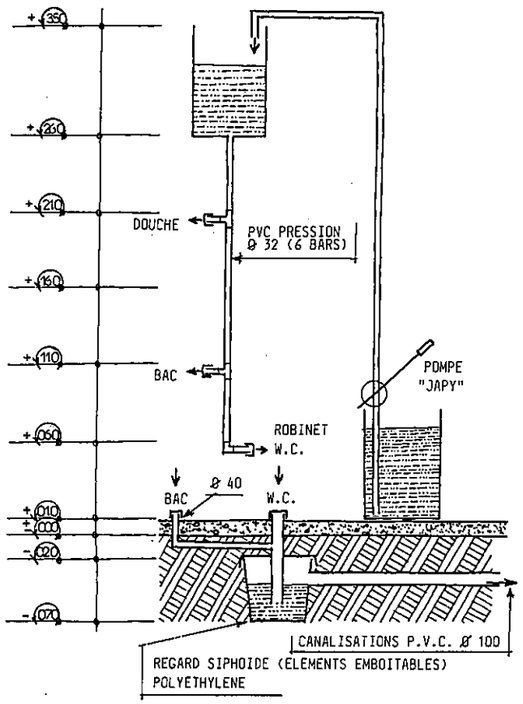
QUATRE COFFRAGES DE BASE SONT ASSEMBLES PAR BOULONNAGE POUR FORMER UN ELEMENT

REALISATION DU POTEAU

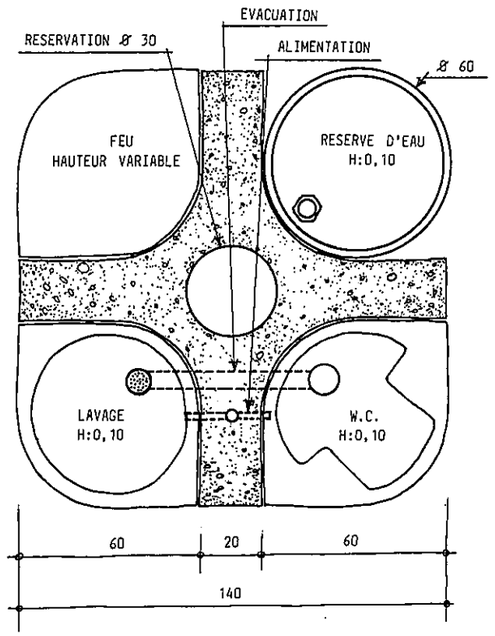


LES EQUIPEMENTS

ALIMENTATION EVACUATION

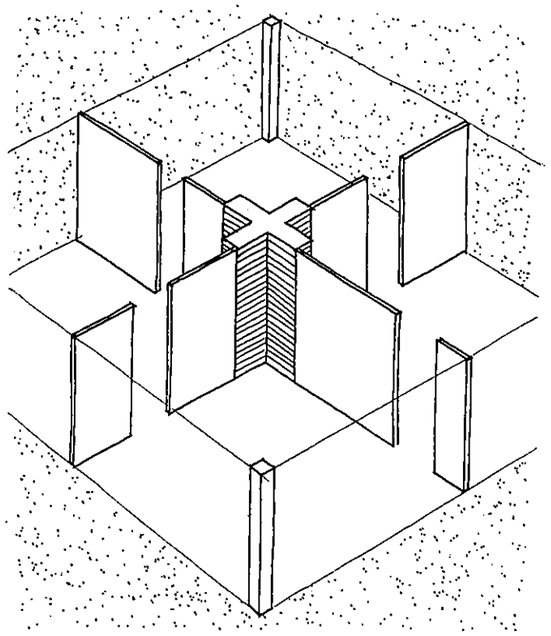


DISPOSITION

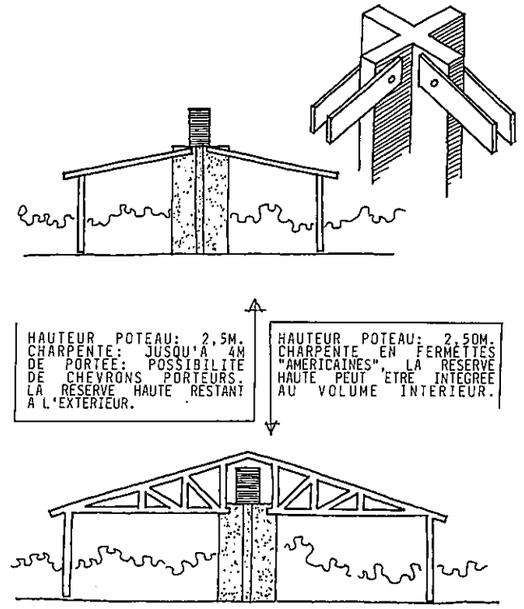


EXEMPLES

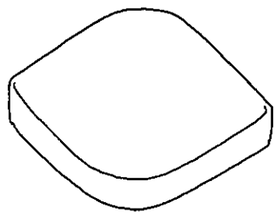
EXTENSIONS



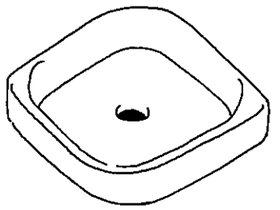
SHEMAS DE REALISATIONS



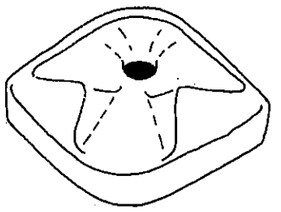
INVENTAIRE DES ELEMENTS



LA PLAQUE FOYERE: ELEMENT EN BETON COULE DANS UN COFFRAGE REUTILISABLE IL PEUT ETRE POSE SUR LE SOL, OU FIXE A N'IMPORTE QUELLE HAUTEUR (RESERVATIONS DANS POTEAU) SUIVANT LES DIFFERENTES COUTUMES.



LE BAC A LAVER: EN POLYETHYLENE HAUTE DENSITE (EPAISSEUR: 6 MM) PEUT ETRE POSE SUR LE SOL (SERVANT EGALEMENT DE BAC A DOUCHE) OU FIXE A N'IMPORTE QUELLE HAUTEUR (RESERVATIONS DU POTEAU)



LA CUVETTE W.C.: POSEE SUR LE SOL, ELLE S'ENCASTRE DANS LE PVC Ø 100 PLONGEANT DANS LE REGARD. UN ROBINET FAIT OFFICE DE CHASSE ET DE NETTOYAGE.

EQUIPEMENTS COMPLEMENTAIRES

DE PAR SA CONFIGURATION ET SES RESERVATIONS, LE POTEAU PEUT SERVIR DE SUPPORT:

* A UNE EOLIENNE ENTRAINANT UNE POMPE MECANIQUE.
* A UN PLUVIUM ALIMENTANT DIRECTEMENT LA RESERVE HAUTE.

IL PEUT ETRE EQUIPE EN MONO-ELEMENTS (4 W.C., 4 BACS...) ET UTILISE EN SERVICE PUBLIC, SUR UNE PLACE, PAR EXEMPLE.

EN AVAL, SI DES EQUIPEMENTS SANITAIRES SONT EN FONCTIONNEMENT, IL EST NECESSAIRE DE TRAITER LES EAUX USEES ET VANNES PAR PASSAGE DANS:

* UNE FOSSE SEPTIQUE RACCORDEE A:
  - UN DRAINAGE. LE PROCEDE DE DRAINAGE SEPTO-REPARTITEUR PERMET DE TROUVER A UN METRE EN DESSOUS, DES EAUX EPURRES.
  - OU UN PLATEAU FILTRANT, SERVANT D'EVAPORATEUR ET D'IRRIGATION A UN CARRE DE LEGUMES.

LES AUTRES EXTENSIONS CONCERNENT DES PROCEDES CONSTRUCTIFS PERMETTANT DE REALISER CHARPENTES, COUVERTURES, MURS CLOISONS ETC...

COUTS

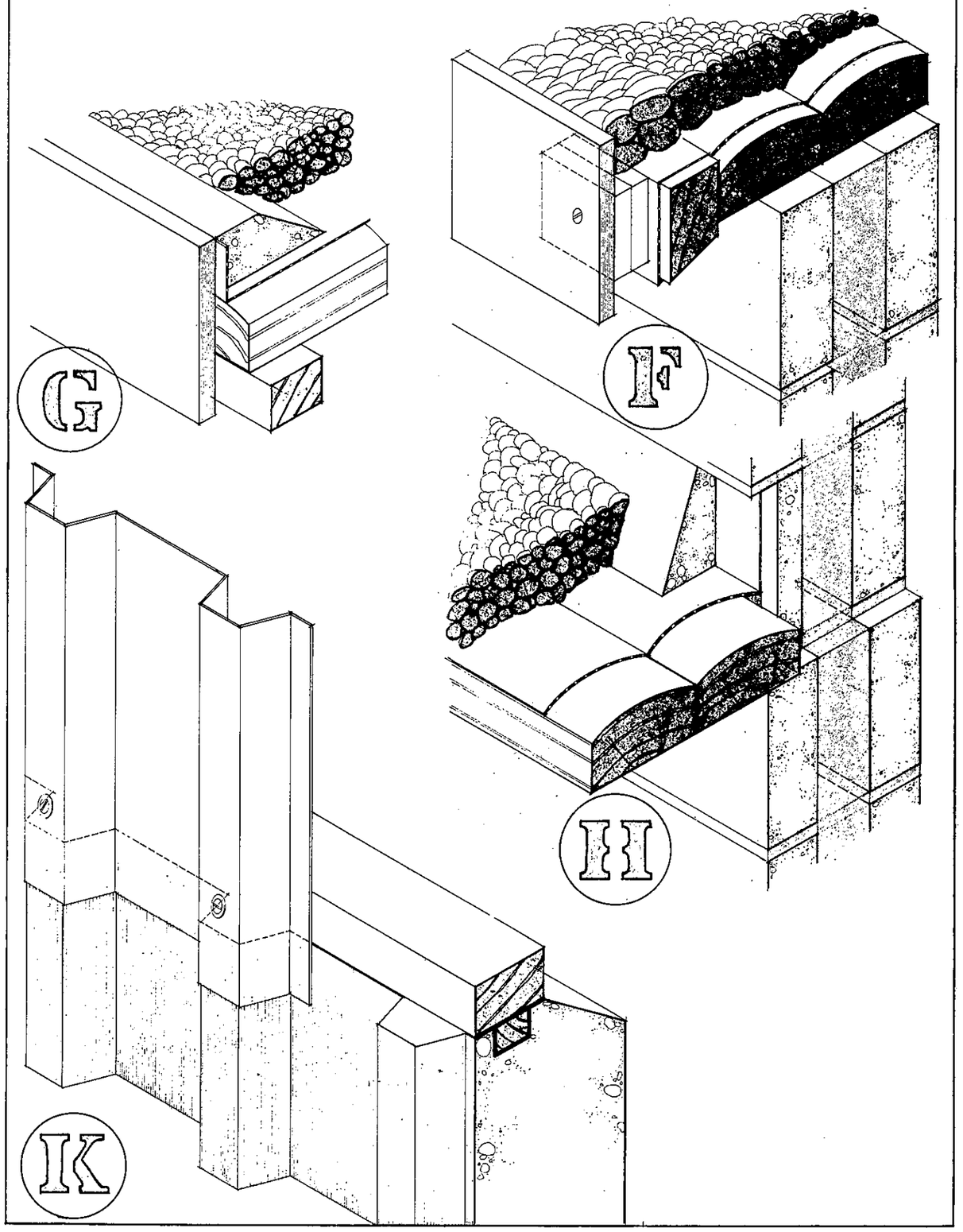
COUTS POUR UNE MAISON
FOURNITURES DEPART USINE

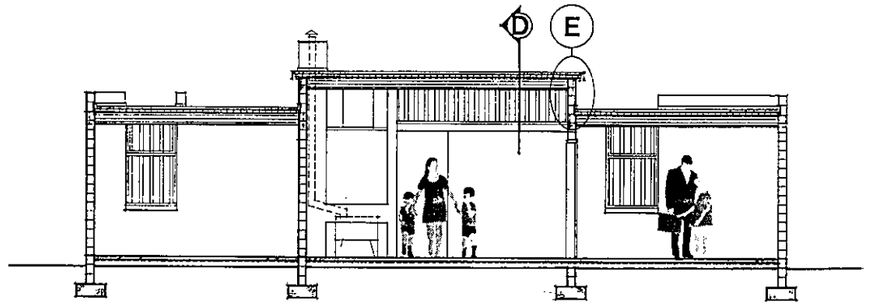
ELEMENTS NECESSAIRES A LA FABRICATION DU POTEAU	
COFFRAGE POUR UN ELEMENT	40 FF HT
MOULE NEGATIF	12 FF HT
REGARD SIPHOIDE ET COUVERCLE	180 FF HT
ALIMENTATIONS ET EVACUATIONS	630 FF HT
TOTAL	862 FF HT

ELEMENTS SANITAIRES EN POLYETHYLENE HAUTE DENSITE EPAISSEUR: 6 MM.	
CUVETTE W.C.	480 FF HT
BAC A LAVER	480 FF HT
ROBINETTERIE W.C.	50 FF HT
BAC	50 FF HT
DOUCHE	55 FF HT

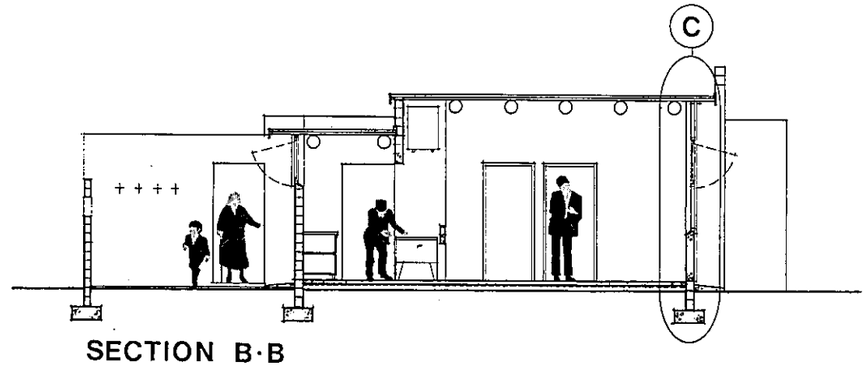
EXTENSIONS	
FOSSE SEPTIQUE 2000 LITRES	1390 FF HT
DRAINS SEPTO-REPARTITEURS	210 FF HT

I·Y·S·H··SECTION··III

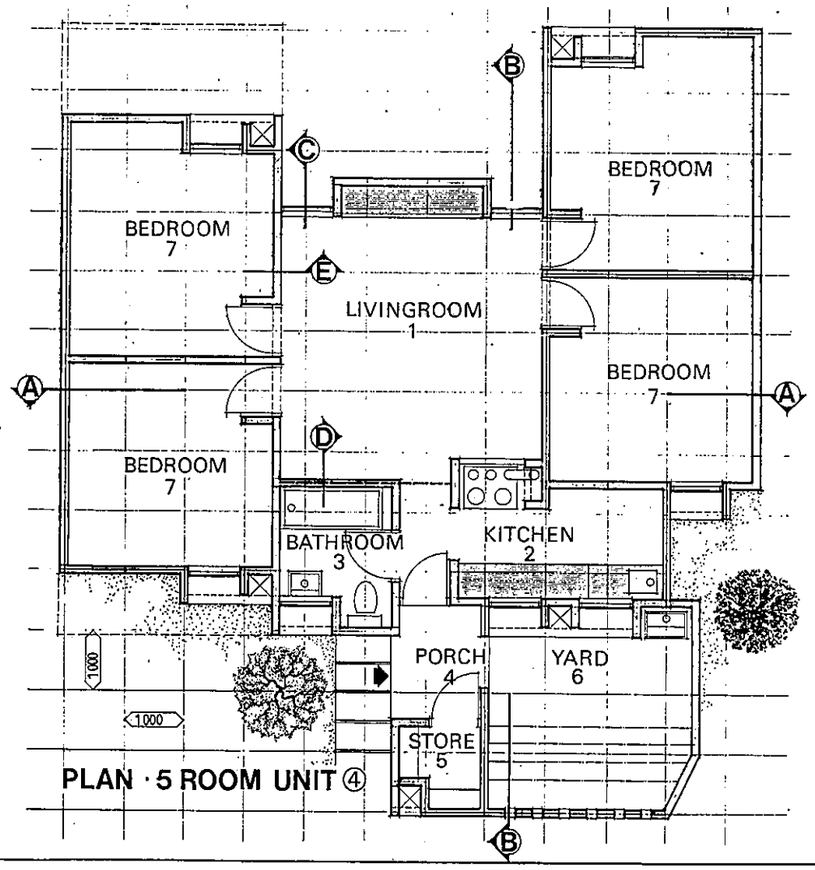




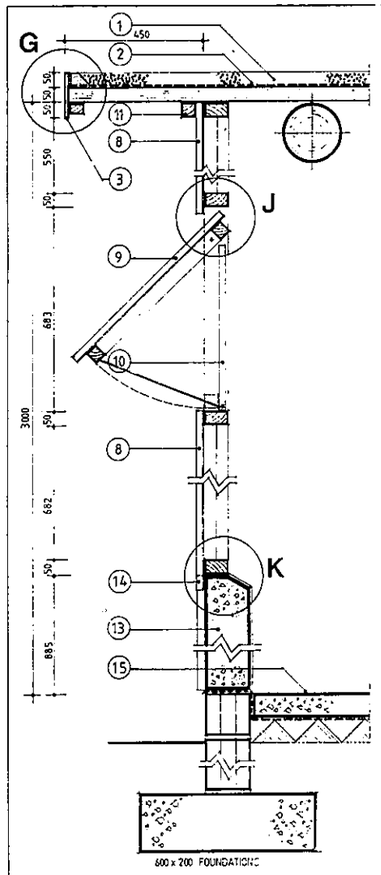
SECTION A·A



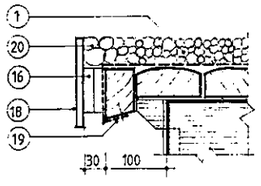
SECTION B·B



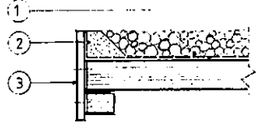
PLAN · 5 ROOM UNIT ④



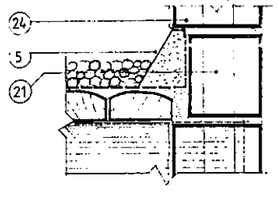
DETAIL C



DETAIL F

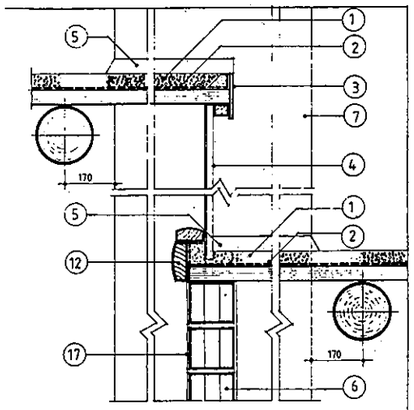


DETAIL G

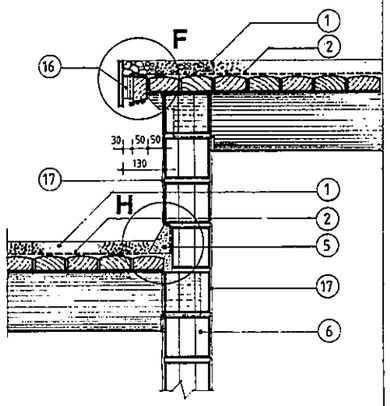


DETAIL H

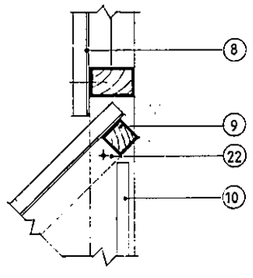
1. 50mm GRAVEL LAYER ON POLY-ETHYLENE MEMBRANE.
2. 500 MICRON POLY-ETHYLENE MEMBRANE LOOSE-LAID OVER 50mm TREATED SPLIT-POLE DECK ON 200mm Ø TREATED TIMBER BEAMS. MEMBRANE BENCHED INTO PARAPET RECESS AND GLUED AND BENCHED TO FASCIAS.
3. 15 x 150mm ASBESTOS-CEMENT FASCIA BOARDS SCREW-FIXED TO TIMBER CLEATS AND ENDS OF SPLIT-POLES.
4. TRANSLUCENT PROFILED RESIN-BONDED GLASS-FIBRE PANELS FIXED TO TIMBER TOP AND BOTTOM.
5. CEMENT BENCHING TO VERTICAL D.P.M. TUCK IN 25mm PARAPET RECESS.
6. 280 x 150 x 140mm CEMENT BLOCKS LAID WITH 10mm MORTAR JOINTS.
7. STACK OVER FLUE AND PLUMBING RECESS.
8. TRANSLUCENT PROFILED RESIN-BONDED GLASS-FIBRE FIXED LIGHT ON 75 x 50mm TIMBER FRAMING.
9. TRANSLUCENT PANELS FIXED ON 44 x 44mm TIMBER FRAMING - OPENING SECTION TOP-PIVOTED.
10. 20 x 12mm TIMBER BEADING.
11. 50 x 50mm TIMBER CLOSER.
12. 130 x 50mm TIMBER EDGE TRIM SPIKED TO ENDS OF SPLIT-POLES.
13. IN SITU CONCRETE SPANDREL WALL WITH EXTERIOR FACE PROFILED TO MATCH TRANSLUCENT SHEETING.
14. TRANSLUCENT SHEETING LAPPED 50mm OVER RIBBED CONCRETE SPANDREL WALL.
15. 85mm THICK FLOATED CONCRETE SURFACE BED LAID ON DAMP-PROOF MEMBRANE ON COMPACTED FILL.
16. 30mm WEEP-SLOT BEHIND SPACED FASCIA DISCHARGES WATER FROM GRAVEL DECK.
17. WALLS BAGGED INTERNALLY AND EXTERNALLY WITH CEMENT PLASTER.
18. ASBESTOS-CEMENT FASCIAS DRILLED AND SCREW-FIXED THROUGH 2/75 x 75 x 15mm ASBESTOS-CEMENT SPACER BLOCKS. ASBESTOS-CEMENT BLOCKS PINNED TO EX 80 x 50mm TIMBER FIXED TO SIDE EDGE OF SPLIT-POLES.
19. POLY-ETHYLENE MEMBRANE TAKEN OVER EX 80 x 50mm TIMBER AND PINNED TO UNDERSIDE.
20. 40mm Ø STONES PLACED OVER WEEP-SLOT AS STRAINER AND RETAINER FOR THE LIGHTER GRAVEL LAYER.
21. BLOCK SIZE REDUCED BY 25mm TO CREATE RECESS FOR MEMBRANE TUCK.
22. TOP HUNG OPENING SECTIONS FIXED TO SIDES OF TIMBER FRAME WITH STEEL PIN PIVOT.
23. PROFILED CONCRETE SPANDREL PANEL WITH SPLAYED INTERNAL CILL.
24. 1:8 CEMENT-SAND HOLLOW BLOCKS LAID WITH 1:5 CEMENT-SAND MORTAR JOINTS AND FILLED WITH 1:15 CEMENT-SAND SLURRY MIX.
25. TRANSLUCENT PANELS FIXED TO TIMBER FRAME WITH ROOFING SCREWS AND WASHERS.



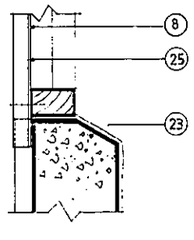
DETAIL D



DETAIL E



DETAIL J



DETAIL K

SPECIFICATION NOTES

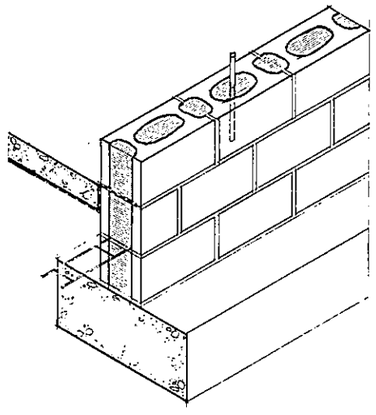
THE DWELLING HAS BEEN DESIGNED TO BE CONSTRUCTED OF READILY AVAILABLE, LOW-COST MATERIALS AND ALLOWS FOR VARIOUS CONSTRUCTION SYSTEMS, METHODS AND SERVICES THAT RANGE FROM RUDIMENTARY TO SOPHISTICATED. THIS PAPER WILL, IN THE MAIN, EXPAND ON THE MATERIALS AS SELECTED.

FOUNDATIONS

FOUNDATIONS ARE FORMED OF 1:3:6 x 20mm Ø CEMENT-SAND AND STONE CONCRETE MIX AND ARE CAST IN STRIPS, STEPPED TO FOLLOW CHANGING LEVELS IN THE TERRAIN. WHERE SOILS ARE UNSTABLE A 50mm BASE LAYER OF SAND BENEATH THE FOOTING MAY SERVE TO REDUCE CRACKING IN THE SUPERSTRUCTURE.

WALLS

THE HOLLOW BLOCKS ARE MADE IN-SITU WITH A 1:8 CEMENT-CRUSHER RUN OR COARSE SAND MIX. THE 280 x 150 x 140mm HIGH BLOCKS ARE SIZED HORIZONTALLY ON A METRE SQUARE MODULE TO ALLOW A 850mm OPENING ON THE RETURNS FOR DOORS AND WINDOWS. 10mm JOINTS ARE FORMED FLUSH WITH 1:5 CEMENT-SAND MORTAR. A 1:15 CEMENT-SAND SLURRY MIX IS POURED INTO THE CAVITIES AND RODDED INTO A UNIFORM CORE. WHERE DIFFICULTY IS EXPERIENCED WITH SOIL MOVEMENT THE WALLS MAY BE HORIZONTALLY AND VERTICALLY REINFORCED WITH STEEL INTO CRACK-RESISTANT PANELS, SEPARATED AT OPENINGS BY STRAIGHT, SEALED JOINTS WITH CENTRAL PANELS ABOVE DOORS AND BELOW WINDOWS.



FOOTING & WALL DETAIL

WHERE THE PARAPETS COMMENCE A COURSE OF BLOCKS, 25mm NARROWER THAN THE GENERAL THICKNESS OF THE WALL, FORMS A RECESS FOR THE POLY-ETHYLENE MEMBRANE TO BE TAKEN UP AND WEDGED INTO POSITION WITH A CEMENT MORTAR BENCH. CEMENT COPINGS WITH SLIGHT FALLS TO THE DECK SIDE ARE FORMED ON THE TOP OF THE PARAPETS.

GEOMETICAL DESIGNS ARE EXPRESSED BY LAYING SELECTED BLOCKS 20mm PROUD OF THE EXTERNAL SURFACE. IN THIS WAY THE PATTERN IS READ ON EITHER SIDE OF THE WALL AND IF LONG STRAIGHT VERTICAL JOINTS ARE FORMED IN THE PROCESS THE BONDING MAY BE REINFORCED WITH STEEL TIES IN THE HORIZONTAL JOINTS. INTERNAL AND EXTERNAL SURFACES ARE BAG-WASHED WITH A 1:5 CEMENT-SAND PLASTER AND FINISHED WITH 2 COATS OF AN ACRYLIC PVA INTERIOR-EXTERIOR PAINT.

WINDOWS

WITH THE SUBSTITUTION OF RESIN-BONDED GLASS-FIBRE PROFILED TRANSLUCENT SHEETING ON TIMBER FRAMES FOR THE MORE COMMON STEEL AND GLASS WINDOWS, IT IS POSSIBLE TO ELIMINATE APPLIED INTERNAL AND EXTERNAL CILLS, THE NEED FOR CURTAINS AND PELMETS AND THE NECESSITY TO REPLACE BROKEN PANES FROM TIME TO TIME. THE FIXED AND OPENING SECTIONS LAP ONTO PROFILED CONCRETE SPANDREL PANELS AND CILLS AND THE TOP-HUNG OUTWARD-OPENING SECTIONS PIVOT ON STEEL PINS FIXED TO THE FRAMES AND CLOSE FIRMLY INTO THE

ROOF

PROFILES OF THE UPPER AND LOWER SECTIONS. THE SHEETING IS FIXED TO THE FRAME WITH ROOFING SCREWS AND WASHERS.

THE MAIN INNOVATION LIES IN THE ROOF CONSTRUCTION WHERE A DECK OF TREATED TIMBER SPLIT-POLES, SUPPORTED BY TREATED 200mm Ø TIMBER BEAMS IS COVERED WITH A 500 MICRON POLY-ETHYLENE MEMBRANE, LOOSE-LAID AND DRESSED INTO WALL RECESSES AND BEHIND FASCIAS FORM A SHALLOW DAM. TO SHIELD THE MEMBRANE AGAINST ULTRA-VIOLET DETERIORATION, A LAYER OF 20mm Ø GRAVEL IS SPREAD TO A THICKNESS OF 50mm AND WHEN NECESSARY, DEPENDING ON THE NATURE OF THE GRAVEL, THE MEMBRANE MAY BE PROTECTED AGAINST RUPTURE BY A THIN LAYER OF STRAW OR CORRUGATED CARDBOARD. THE DECKS ARE LAID TO FALLS OF 1,5° TO ENCOURAGE WATER TO PERCOLATE TOWARDS THE FASCIAS WHICH ARE FIXED TO SPACER-BLOCKS TO FORM A WEEP-SLOT OR OPEN FASCIA OVER THE FULL LENGTH ON THE HIGHER ROOFS. ON THE LOWEST DECKS THE OPEN FASCIAS DISCHARGE WATER INTO BITUMEN-PAINTED WALL RECESSES AND THE CLOSED FASCIAS OVER WINDOWS SERVE AS OVERFLOWS.

THE POLY-ETHYLENE MEMBRANE IS STUCK TO THE BACK OF THE FASCIAS WITH CONTACT ADHESIVE AND SECURED WITH CEMENT MORTAR BENCHING WHICH IS ALSO USED TO PIN THE MEMBRANE INTO WALL RECESSES. WHERE OPEN FASCIAS OCCUR THE MEMBRANE IS DRESSED DOWN BEHIND THE ASBESTOS-CEMENT AND PINNED TO THE UNDERSIDE OF THE SPLAYED TIMBER FILLET.

THE ROOF HAS EXCELLENT THERMAL AND SOUND INSULATION QUALITIES AND BECAUSE OF THE MASS AND DENSITY OF THE GRAVEL THE RESISTANCE TO WIND AND HAIL DAMAGE IS GOOD. IN COLD CLIMATES WHERE EXTENSIVE SNOW FALLS OCCUR THE ADDITIONAL WEIGHT COULD RESULT IN STRUCTURAL FAILURE AND THE ROOF, IN THIS FORM IS NOT RECOMMENDED. THE SAWN SIDE OF THE SPLIT-POLES FORM A VISUALLY PLEASING CEILING AND SHOULD THE MEMBRANE BE PUNCTURED THE LOCATION MAY BE EASILY BE DETERMINED FROM THE INSIDE.

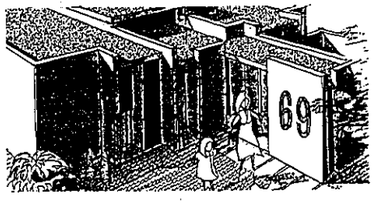
THE FLAT ROOF-DECKS ALLOW FOR FREEDOM OF PLAN FORM AND MAKE ADDITIONS TO THE UNIT A RELATIVELY SIMPLE EXERCISE. THE VARIOUS ROOF LEVELS AND THE JUXTAPOSITION OF PARAPETS AND FASCIAS ARE ELEMENTS WHICH SERVE TO LIVEN UP THE ELEVATIONS.

SERVICES

SEWERAGE, WATER AND ELECTRICAL SERVICES MAY, DEPENDING ON THE AVAILABILITY, RANGE FROM BASIC TO QUITE SOPHISTICATED SYSTEMS. AN IMPROVED VENTILATED PIT-LATRINE, WHICH ATTRACTS AND TRAPS FLIES IN THE VENT MAY BE LOCATED IN THE OUTSIDE STORE. OTHER POUR-FLUSH AND WATER BOURNE SYSTEMS MAY BE INSTALLED IN THE BATHROOM. WHERE WATER SUPPLIES ARE REMOTE FROM THE DWELLING A RAINWATER STORAGE TANK MAY BE INSTALLED IN THE YARD WITH A WATER DUCT OVER FROM THE KITCHEN ROOF. WHERE WATER IS PIPED TO THE DWELLING IT CAN BE HEATED EITHER BY AN OPEN HEARTH, COMBUSTION STOVE, OR ELECTRICALLY WITH THE TEMPERATURE IN STORAGE CYLINDER BEING BOOSTED BY A SOLAR PANEL.

WALL-MOUNTED PARAFFIN LAMPS OR SURFACE-RETICULATED BULKHEAD FITTINGS COULD SERVE AS INTERNAL LIGHTING. DURING THE DAY THE DEEP SPACE OF THE LIVINGROOM RECEIVES DIFFUSED DAY-LIGHT THROUGH THE CLERESTORE OVER THE BATHROOM AND ENTRANCE. ORIENTATION OF THE UNIT ON A NORTH-SOUTH AXIS, FACING THE SUN WILL PROVIDE SEASONAL SUN CONTROL AND ENHANCE THE THERMAL PERFORMANCE OF THE UNITS.

THE DWELLING, DEVELOPED FROM A MORE COMPLICATED PLAN-FORM PROTOTYPE HAS BEEN ADAPTED TO LOW-COST AND READILY AVAILABLE MATERIALS AND AS A SELF-HELP CORE UNIT DEVELOPMENT COULD, WITH GUIDANCE AND SENSITIVE HANDLING, PRODUCE SOME RELEVANT, INTERESTING AND AFFORDABLE ARCHITECTURE.



INTERNATIONAL COMPETITION FOR SOLUTION ON NEW TECHNOLOGIES FOR HOUSING 1986 / 87 SECTION III.

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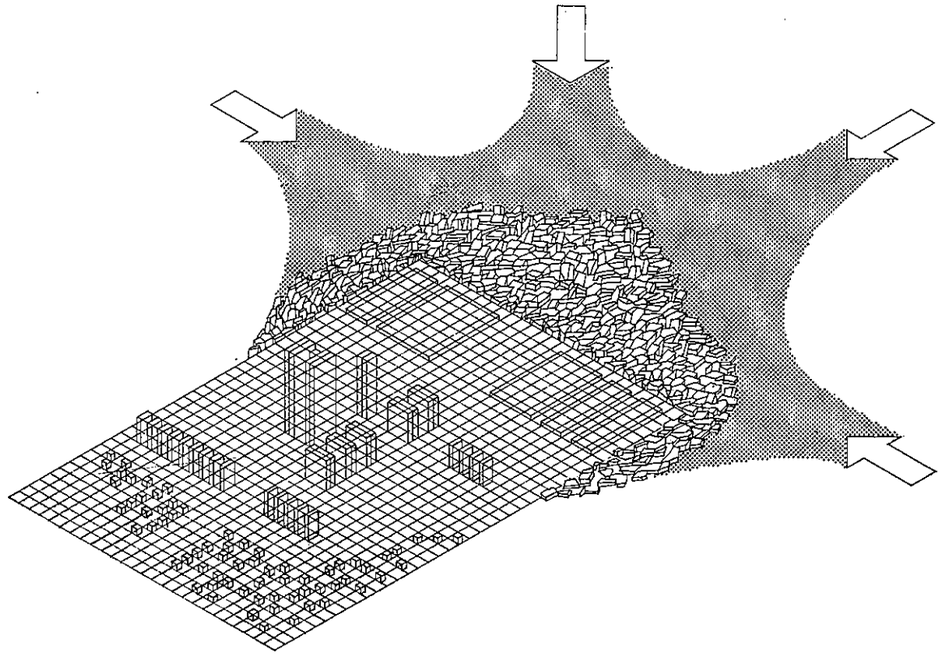
ANALYSIS



THE CONTEMPORARY SITUATION :
A BACKWARD AGRICULTURE, HARD LIVING CONDITIONS IN THE COUNTRY.
MIGRATION TO THE CITIES FOR JOB.
UNQUALIFIED LABORE.
THE POPULATION OF THE CITIES IS ALWAYS EXPECTED TO ENCREASE.
IGNORANCE OF MODERN AND CIVILIZED STYLE OF HABITATION.
UNEMPLOYMENT, MISERY, ILITERACY, CRIMINALITY.
PROVISIONAL SHELTERS WITHOUT ANY SANITARY EQUIPMENT.

THE AIMS OF THE PROPOSAL'S REALISATION
THE PROBLEM OF HABITATION WOULD BE UMPUZLED IN 2 PHASES:
1. PHASE: THE HABITATION FOR CONTEMPORARY GENERATIONS OF THE POPULATION, MIGRATING TO THE CITIES FROM THE COUNTRY.
2. PHASE: THE HABITATION IN A LARGE SCALE BUILDINGS OF THE HIGH TECHNICAL STANDARD.
THE OBJECT OF OUR SOLUTION IS 1. PHASE, BASED ON THE FOLOWING PRINCIPLES:
1. EMPLOYMENT OF LOCAL MATERIALS (TIMBER, CLAY, SAND ET.C.)
2. TO LINK UP IN TO A TRADITIONAL MODEL OF THE HABITATION IN THE ONE STORE HOUSES, WITH THE POSSIBILITY OF A LITTLE FARMYARD.
3. SECURING OF THE MAIN PRINCIPALS OF THE HYGIENIC HOUSING
4. THE POSSIBILITY OF APLICATION IN SEISMIC TERRITORIES, FOR CONSTRUCTION IN THE COUNTRY AND IN OTHERS TECHNOLOGIES.
5. CHANCE TO OBTAIN A WORK FOR HOMELESS DURING THE MAKING OF THE SHELTERS.

RÉSUMÉ OF THE ANALYSIS :
THE PROPOSAL OF A LIGHT AND EASY PREFABRICATED ELEMENT, WHICH WILL OBTAIN EMPLOYMENT FOR ALL KINDS OF CONSTRUCTIONS IN THE INDIVIDUAL AND COLLECTIVE BUILDING, WITH THE POSSIBILITY OF BUILDING „MAKE IT YOURSELF".

IDEA

THE FUNDAMENTAL UNIT OF CONSTRUCTION IS HONEYCOMBED BOARD - HB

HB

WHY HB?
1. SERIAL, LARGE SCALE PRODUCTION WITH MINIMUM OF MATERIAL REQUIREMENTS
2. EASY TRANSPORT AND MANIPULATION
3. PROVIDES EMPLOYMENT OF LOCAL MATERIALS (CLAY OR WOOD)
4. EASY ASSEMBLY, WITHOUT REQUIREMENTS ON EXPANSIV MEANS OF ASSEMBLY AND QUALIFICATION OF WORKERS
5. EASY MUTUAL CONNECTION
6. EASY CONNECTION WITH OTHER MATERIALS
7. BIG STRENGH AND LOW WEIGHT
8. PERFECT SURFACE, PERFECT BASE
9. LOW DIFFUSION RESISTANCE

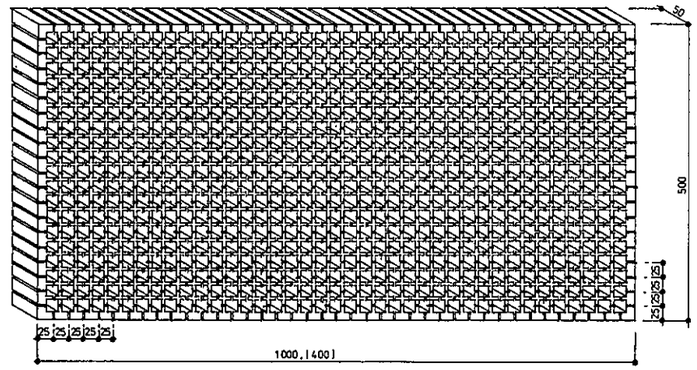
EMPLOYMENT OF HB:
1. A „LOST FORMS" FOR CLAY WALS FROM RAMMED CLAY (ALSO FOR BUILDINGS FROM CAST CONCRETE)
2. SHEATING OF TIMBER GRILLAGE WALLS
3. PARTITION WALLS
4. CEILINGS AND LOWER CEILINGS
5. FLOORS
6. FILLING OF OPENING (GRATINGS, SOLAR LOUVERS E.T.C.)

MAKING OF HB:
MOULDINGS - MATERIAL ON BASE
1. WOOD - CEMENT
2. THERMOSETTING PLASTIC

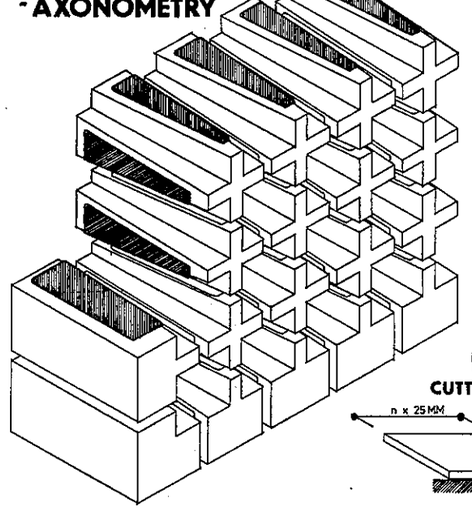
DIMENSION OF HB:
1 000 × 500 × 50 mm
400 × 500 × 50 mm - FILLING UNIT
(MODULE 1000 MM-POSSIBLY TO MAKE CUT SIZES BY 25 MM.)

WEIGHT OF HB: 12,5 kg ; 5 kg

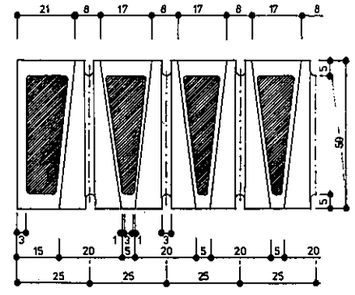
HONEYCOMBED BOARD - THE FUNDAMENTAL UNIT



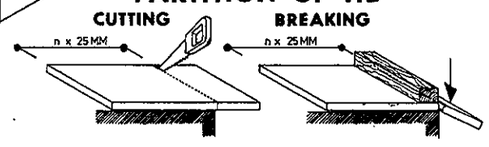
FRAGMENT OF HB - AXONOMETRY



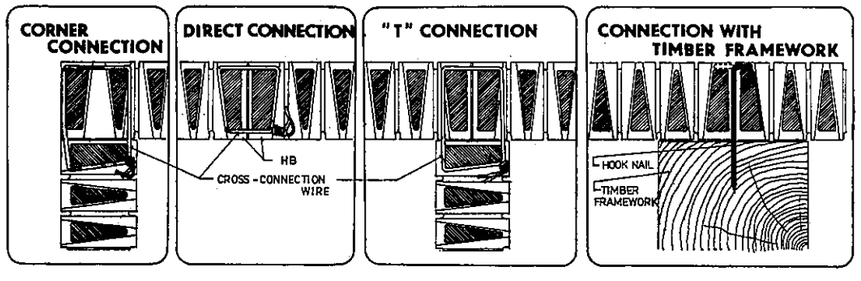
FRAGMENT OF HB - SECTION



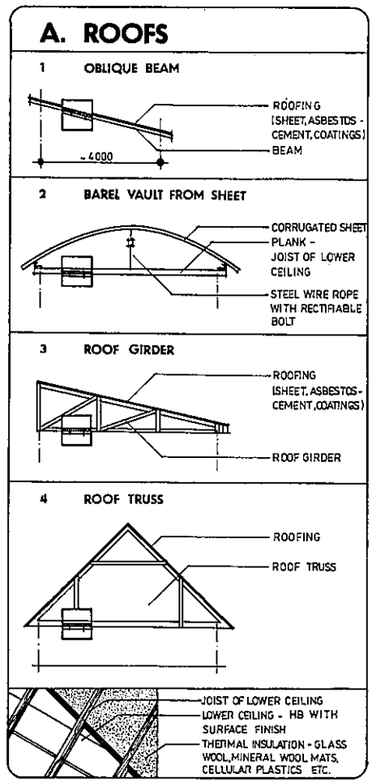
PARTITION OF HB



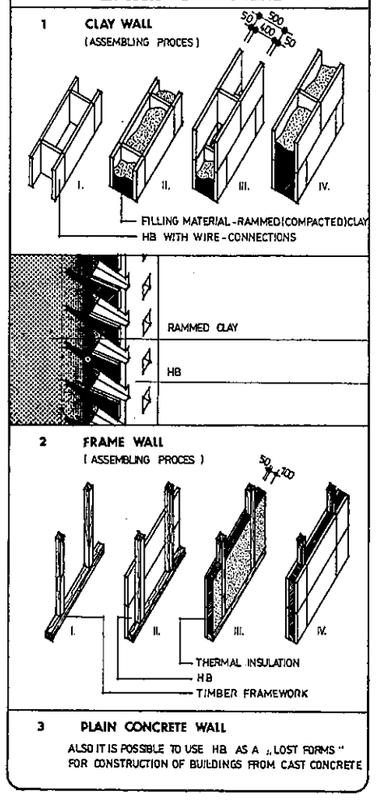
DETAILS OF CONNECTION



A. ROOFS

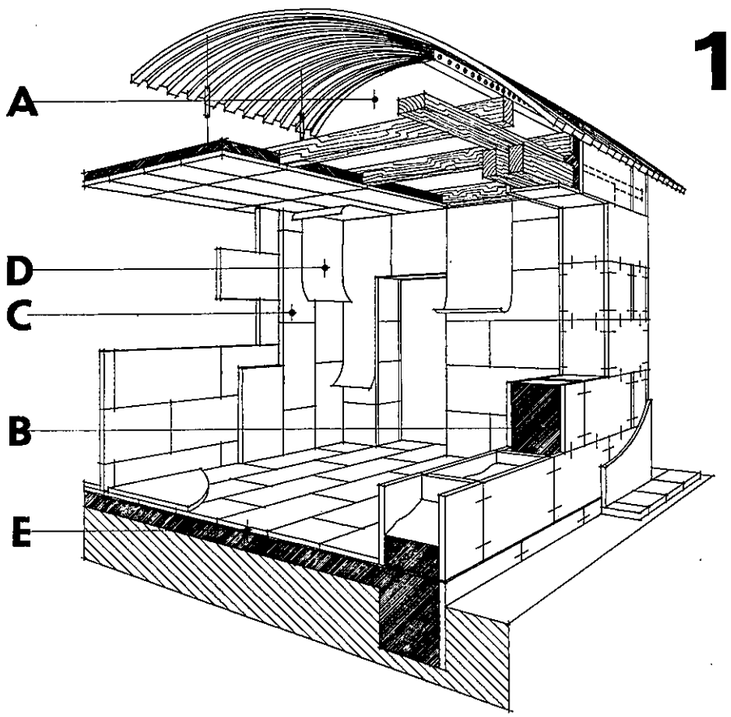


B. BEARING WALLS

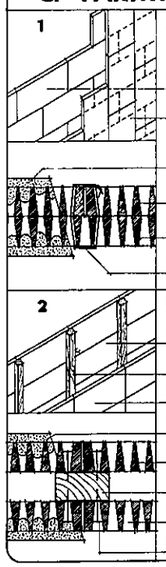


APPLICATION

1 HB HOUSE FROM CLAY



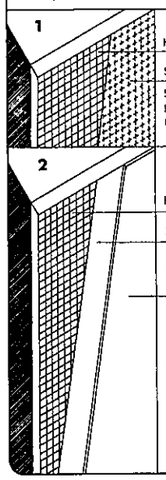
C. PARTITION WALLS



1 — PARTITION DOUBLE WALL FROM HB
- 1st LAYER OF HB
- 2nd LAYER OF HB
- SURFACE
- 1st LAYER OF HB
- 2nd LAYER OF HB
- WIRE-CONNECTION

2 — PARTITION WALL WITH TIMBER GRILLAGE
- 1st LAYER OF HB
- TIMBER GRILLAGE
- 2nd LAYER OF HB
- SURFACE
- 1st LAYER OF HB
- TIMBER
- 2nd LAYER OF HB
- HOOK NAIL

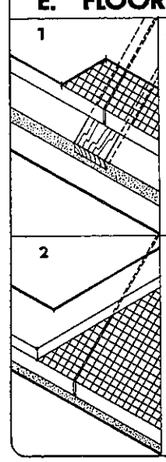
D. SURFACES



1
- HB
- SURFACE FINISH
- SMOOTHING WITH CLAY MORTAR, KEEPING HONEY COMB STRUCTURE OF SURFACE + PAINT

2
- HB
- BOTTOM LAYER
- A - CEMENT GROUT SPRINKLE
- B - PATCHING WITH MASTIC SEAL
- TOP LAYER
- A -
  1. PARGET
  2. CERAMIC WALLTILING INTO MORTAR BED
- B -
  1. THIN-LAYER PARGET
  2. WALLPAPER
  3. SICKY CERAMIC WALL TILING

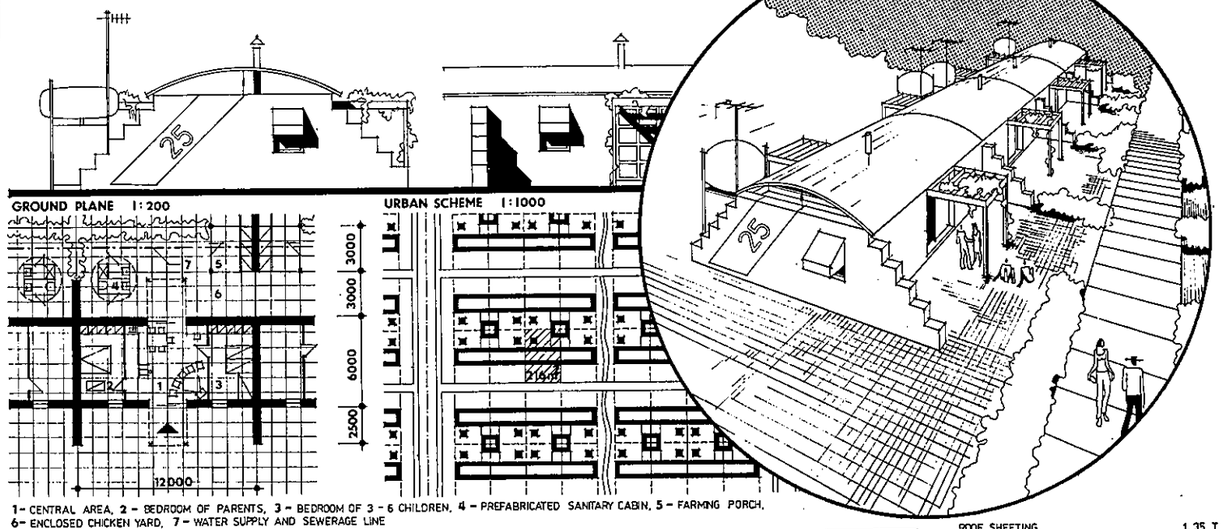
E. FLOORS



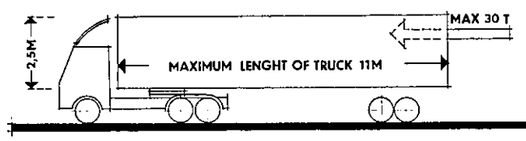
1
- FLOOR FINISH - CARPET, FLOOR MAT LINO, PAVEMENT
- HB FILLED WITH CLAY (CEMENT) MORTAR - SMOOTH FINISH
- FLOOR BEAMS IN FILLING (OF CINDERS SAND, RUBBLE)
- DAMP-PROOF COURSE - ASPHALT BOARD, FOIL, ETC

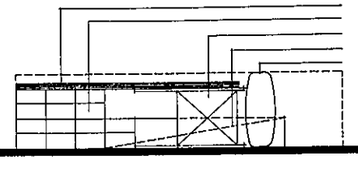
2
- FLOOR FINISH - DTTO 1.
- CLAY (CONCRETE) LAYER WITH SMOOTH FINISH
- HB FILLED WITH CLAY (CEMENT) MORTAR
- SAND BED
- DAMP-PROOF COURSE - DTTO 1.

THE HOUSE FROM CLAY



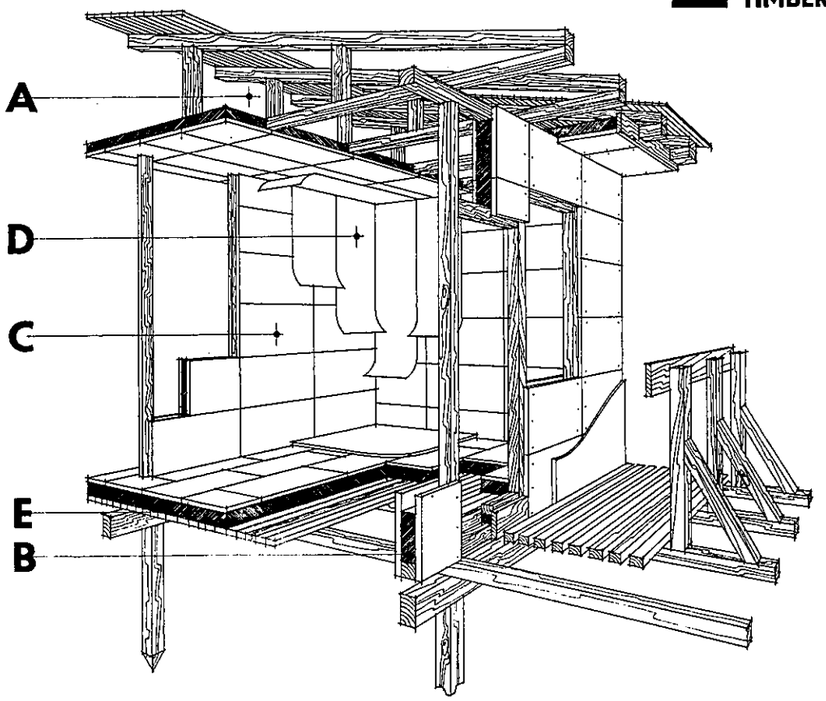
1 - CENTRAL AREA, 2 - BEDROOM OF PARENTS, 3 - BEDROOM OF 3 - 6 CHILDREN, 4 - PREFABRICATED SANITARY CABIN, 5 - FARMING PORCH, 6 - ENCLOSED CHICKEN YARD, 7 - WATER SUPPLY AND SEWERAGE LINE



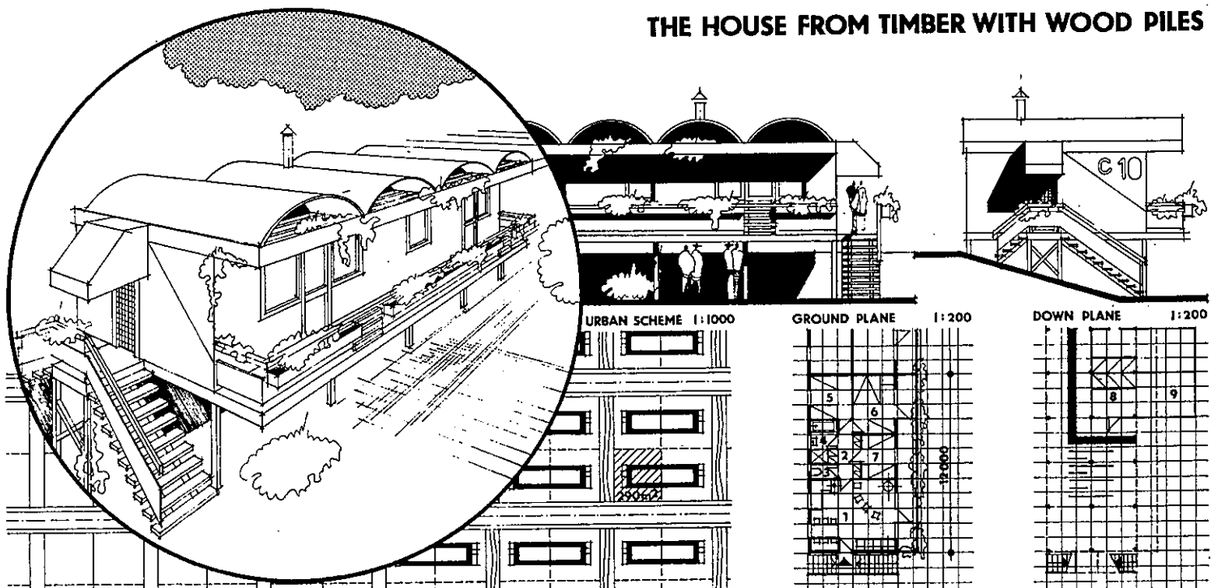


ROOF SHEETING	1,35 T
HB (660 P x 16,5 M^3)	8,25 T
SANITARY CABIN	0,35 T
TIMBER (1,5 M^3)	1,20 T
TANK FOR SOLAR HEATING OF WATER	0,20 T
	11,35 T
THE REST PETTY MATERIAL	0,65 T
THE GROUND STORE OF MATERIAL FOR ONE BUILDING	12,00 T

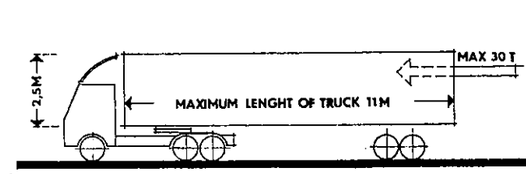
2 HB HOUSE FROM TIMBER

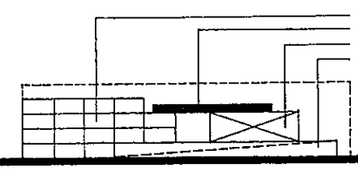


THE HOUSE FROM TIMBER WITH WOOD PILES



1 - CENTRAL AREA, 2 - PASSAGE, 3 - W.C., 4 - WASHROOM, 5 - BEDROOM OF 2 - 4 CHILDREN, 6 - BEDROOM OF PARENTS, 7 - BEDROOM OF 2 - 4 CHILDREN, 8 - FARMYARD, 9 - ENCLOSED CHICKEN YARD





HB (800 P x 20,0 M^3)	10,00 T
ROOF SHEETING	1,50 T
THE REST PETTY MATERIAL	1,10 T
TIMBER (8 M^3)	6,40 T
THE GROUND STORE OF MATERIAL FOR ONE BUILDING	19,00 T

1212121

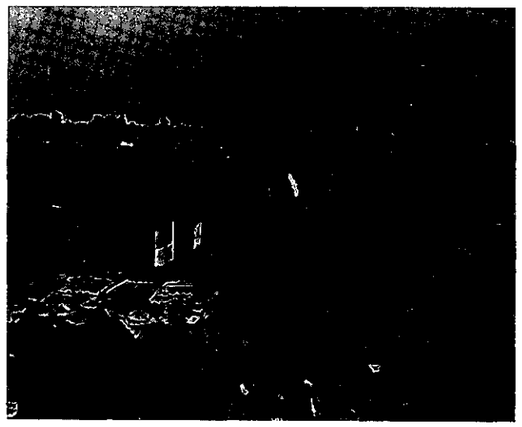
SOLUCION CONCRETA A LA EDIFICACION MASIVA

SECTOR III

■ PROPUESTAS EN LAS QUE, PATENTE UNA ACTITUD ORIGINAL EN LA SELECCION, USO O DISPOSICION DE LOS ELEMENTOS CONSTRUCTIVOS, SE SUGIERA ALGUNA NOVEDAD TECNICA ESENCIAL EN CUANTO A LOS MATERIALES, SISTEMAS ESTRUCTURALES Y METODOS DE EDIFICACION.

INTRODUCCION.

■ LA VIVIENDA NO DEBE SER UN OBJETO DE CONSUMO SUBSIDIADO QUE SIRVE SOLAMENTE DE APOYO AL PODER POLITICO; SINO, SE DEBE DE CONVERTIR EN UNO DE LOS MAS PODEROSOS INSTRUMENTOS, DEL DESA — RROLLO SOCIAL.



EL PROBLEMA

CONSIDERACIONES

■ EL ARQUITECTO A TRAVES DE LA HISTORIA SOLO PUEDE CONSTRUIR DESTRUYENDO, EMPECEMOS A DESTRUIR LOS OBSTACULOS CADUCOS DE NUESTRA SOCIEDAD Y CONS — TRUYAMOS LOS NUEVOS PROCEDIMIENTOS, DONDE EL USUARIO FORME PARTE DEL PROCESO CONSTRUCTIVO.

■ EL ARQUITECTO DE LOS PAISES SUBDESARROLLADOS, NECESITA CREAR SUS PROPIOS DISEÑOS ORIENTADOS A RESOLVER SUS PROPIOS PROBLEMAS.

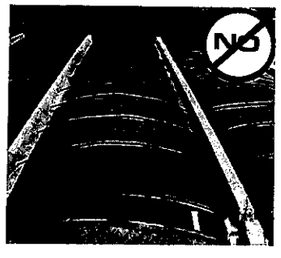
■ EN LA EDIFICACION DE HOGARES MASIVOS PARA LOS PAISES SUBDESARROLLADOS, NO SE DEBERA DE UTILIZAR LA CHATARRA TECNOLOGICA DE LOS PAISES INDUSTRIA- LIZADOS, QUE SOLO PERMITEN AUMENTAR SU DEPENDENCIA.

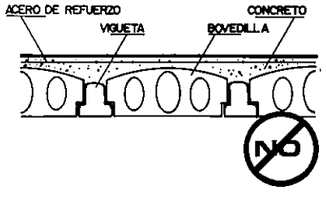
■ LA NUEVA CREACION TECNOLOGICA DEL ARQUITECTO DEBERA CONTEMPLAR EL PROBLE- MA INFLACIONARIO Y SUS INNOVADORES SISTEMAS DEBERAN SERVIR PARA FOMENTAR PEQUEÑAS INDUSTRIAS QUE DEN TRABAJO PERMANENTE A LOS DESOCUPADOS.

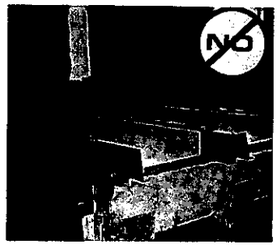
PARTICIPACION CIUDADANA. AUTO-CONSTRUCCION.

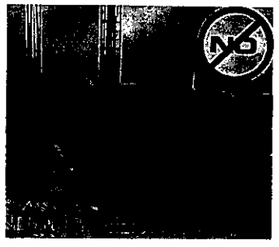
■ UTILIZACION DE MANO DE OBRA DESOCUPADA, PUES AL — CONSTRUIR SU PROPIA CASA HABRA MENOS GUERRILLAS Y MENOS TERRORISMO.

ANTECEDENTES



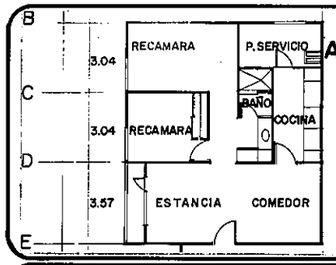




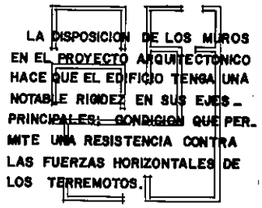


HEMOS UTILIZADO ESTOS SISTEMAS MISMOS QUE HOY HEMOS SUPERADO.

METODO DE EDIFICACION



ANTISISMICO LA DISPOSICION DE LOS MUROS EN EL PROYECTO ARQUITECTONICO HACE QUE EL EDIFICIO TENGA UNA NOTABLE RIGIDEZ EN SUS EJES — PRINCIPALES; CONDICION QUE PER- MITE UNA RESISTENCIA CONTRA LAS FUERZAS HORIZONTALES DE LOS TERREMOTOS.

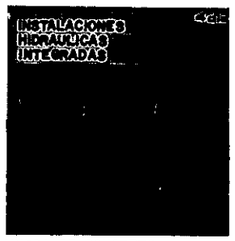


LIGEREZA. UN EDIFICIO DE 4 DEPARTAMENTOS POR PLANTA EN 5 NIVELES TIENE UN- PESO DE 30.5 TONS./DPTO X 20 DPTOS = 610 TONS. QUE REPRESENTA PARA EL SUELO UNA FATIGA DE:

$$f = \frac{610 \text{ TONS.}}{54 M^2 \times 4 \text{ DPTOS}} = 2.82 \text{ TONS}/M^2.$$

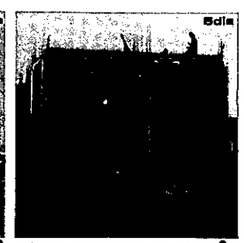
QUE DA COMO RESUTADO UNA:

CIMENTACION ECONOMICA



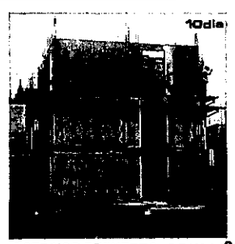
MUROS DE CONCRETO ESPESOR DE 10 CM.

ACERO DE REFUERZO 4.2 KG/M^2 EN MUROS DE CONCRETO.

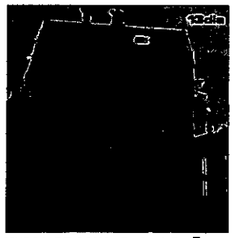


f'c DEL CONCRETO 150 KG/CM^2

LOSAS DE CONCRETO, ESPESOR CON NERVADURAS 6 CM.

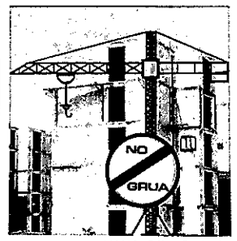


ACERO DE REFUERZO 2.5 KG/M^2 EN LOSA DE CONCRETO



MUROS DE CONCRETO 9.5 M^3/DPTO
LOSA DE CONCRETO 3.24 M^3/DPTO

TOTAL DE M^3 DE CONCRETO/DPTO = 12.74
TOTAL DE PESO POR DPTO = 12.74 X 2400 = 30.5 TONS.



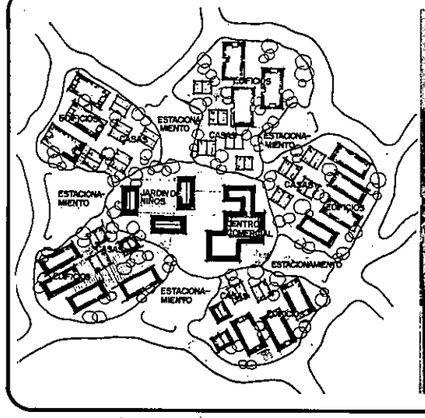
MANO DE OBRA NO CALIFICADA.
PARA EDIFICAR MUROS Y ENTREPISO, BASTAN SOLO 24HORAS HOMBRE/M^2

ESTA NOTABLE VELOCIDAD DE CONSTRUCCION, ES DESPUES DE TERMINADA LA CIMENTACION, QUE DEPENDE DE LOS DIFERENTES TIPOS DE SUELO. LA RAPIDEZ, NOS GARANTIZA EL ABATIMIENTO DE LA INFLACION.

ESTE METODO DE EDIFICACION PERMITE, AUN EN CONSTRUCCIONES VERTICALES LA

AUTOCONSTRUCCION

CONCLUSION



NUESTRO PROYECTO ARQUI — TECTONICO CONTEMPLA EL USO RACIONAL DE LOS MATERIALES QUE COMBINADO CON EL EFI — CAZ SISTEMA ESTRUCTURAL Y SUMADO AL NOTABLE METODO DE EDIFICACION; DA COMO RE — SULTADO QUE LAS VIVIENDAS CONSTRUIDAS CON ESTA TEC — NOLOGIA RESULTEN:

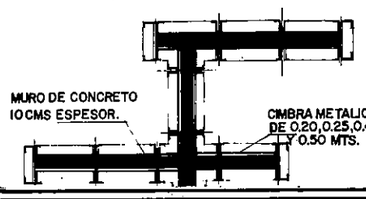
ECONOMICAS,

ANTISISMICAS Y DE

CALIDAD

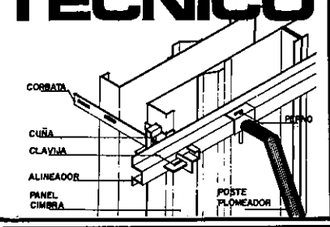
LA TECNICA

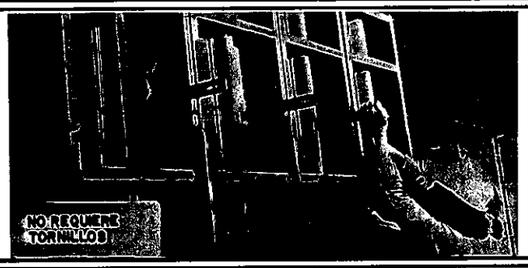
VERSATIL



- EL PROCEDIMIENTO CONSTRUCTIVO SE ADAPTA A LA MAYORIA DE LOS PROYECTOS ARQUITECTONICOS.

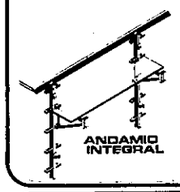
TECNICO

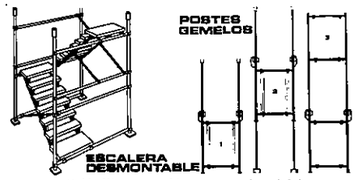


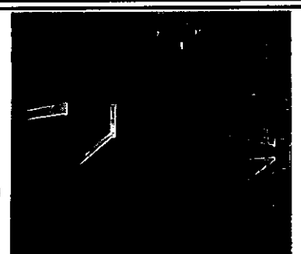


- EL METODO DE EDIFICACION ES MANUAL Y NO REQUIERE NINGUNA MANO DE OBRA CALIFICADA.
- CON SOLO DOS PAREJAS DE OBREROS NO ESPECIALIZADOS SE CIMBRAN 130M²/DIA EN MUROS.

COMPLETO

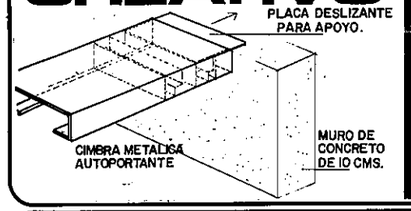


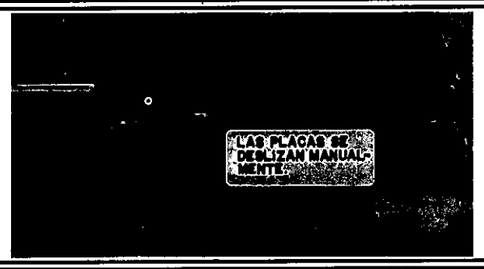




- EL ENCOFRADO DE LOS MUROS YA TIENE SOLUCIONADO TODOS SUS ACCESORIOS COMPLEMENTARIOS PARA CONSTRUIR RAPIDAMENTE.

CREATIVO

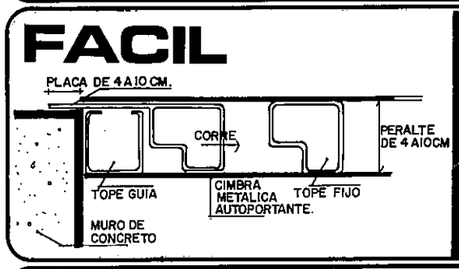


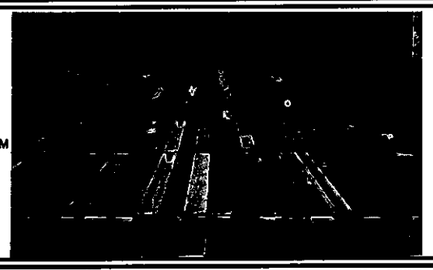


- LA CIMBRA METALICA AUTOPORTANTE NO REQUIERE PARA SU COLOCACION:
- NI ANDAMIOS.
- NI PUNTALES.
- NI MADERA.
- NI CLAVOS, NI ALAMBRES.
- SE SUJETAN POR GRAVEDAD.

ES UNA INNOVACION MUNDIAL.

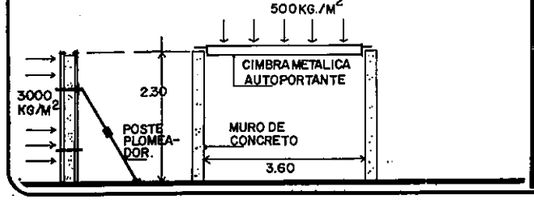
FACIL

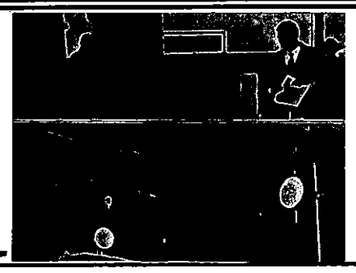




- CON SOLO DOS PAREJAS DE OBREROS NO ESPECIALIZADOS SE CIMBRAN: 384 MTS² DE LOSA. POR DIA.

RESISTENTE





- LA CIMBRA METALICA ESTA PROBADA EN LABORATORIOS DE PRESTIGIO.

CAPACIDAD DE CARGA DE LA CIMBRA.

EN MUROS 3,000 KG/M²

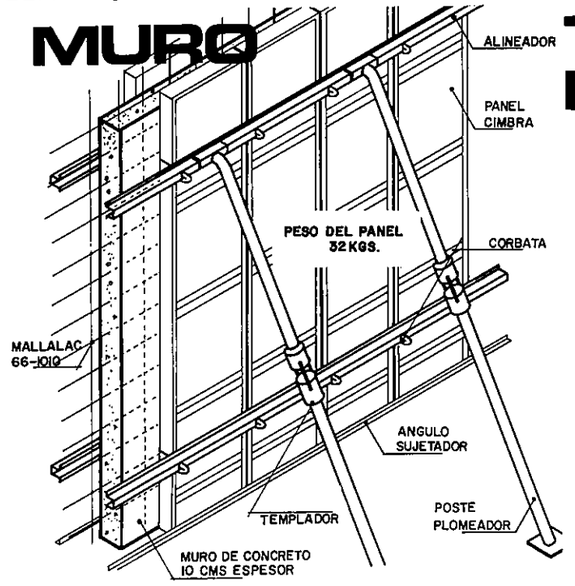
EN LOSA 500 KG/M²

LA DURACION DE LA CIMBRA = 2,000 USOS.

SISTEMA ESTRUCTURAL

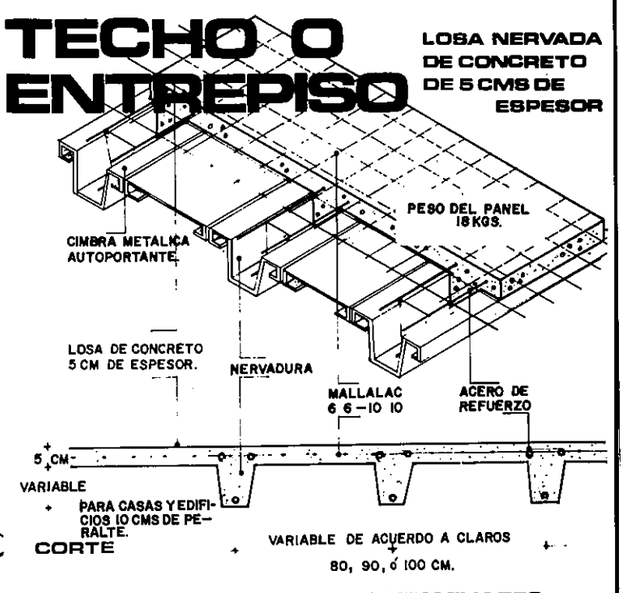
DESDE NUESTRO PUNTO DE VISTA TECNICO, PARA HACER CONSTRUCCION MASIVA ECONOMICA, UTILIZAMOS COMO INSTRUMENTOS, DOS ELEMENTOS FUNDAMENTALES DE CONCRETO, BIEN RESUELTOS, UN MURO Y UN TECHO A BASE DE CIMBRA METALICA RACIONALIZADA.

MURO



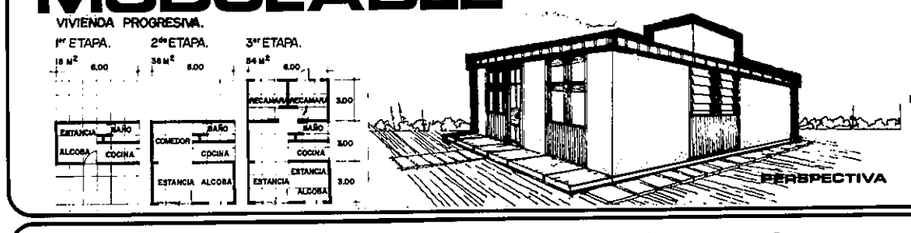
TECHO O ENTREPISO

LOSA NERVADA DE CONCRETO DE 5 CMS DE ESPESOR



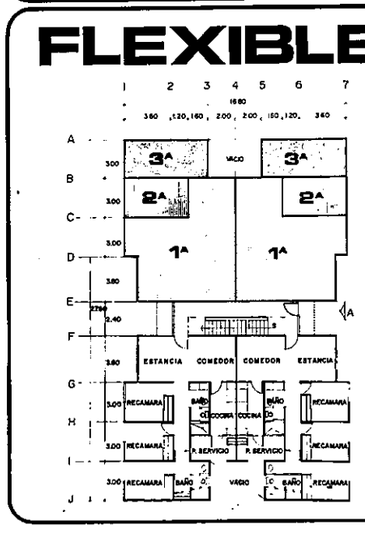
QUE SIRVEN INDISTINTAMENTE PARA EDIFICAR HOGARES UNIFAMILIARES Y MULTIFAMILIARES.

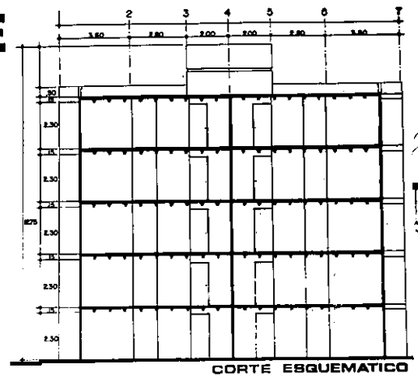
MODULABLE

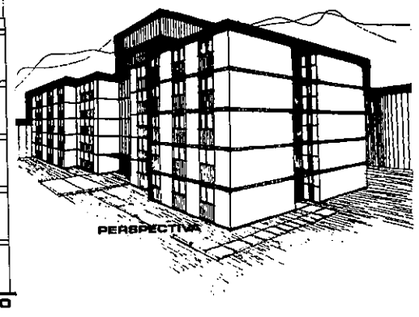


- SE MODULA EL PROYECTO ARQUITECTONICO EN UNIDADES DE 0.60, 0.90 Y 1.00 MTS.
- LOS MODULOS DE LA CIMBRA DEL MURO: 0.20, 0.40, 0.45 Y 0.50 MTS.
- LOS MODULOS DE LA CIMBRA DEL TECHO: 0.20, 0.225, Y 0.25 MTS.

FLEXIBLE







EDIFICIO PROGRESIVO

- NUESTRO SISTEMA DE EDIFICACION PERMITE CRECIMIENTOS PROGRESIVOS VERTICALES.
- CONSIDERAMOS QUE ESTO ES UNA INNOVACION.

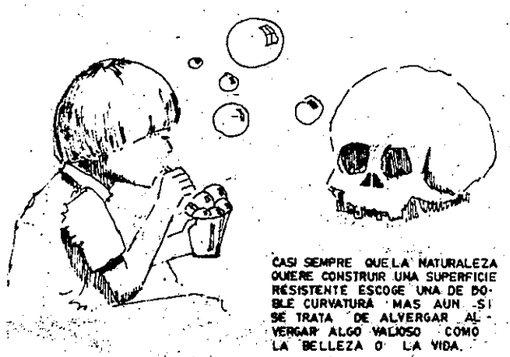
19911689

SECTOR III

ANTECEDENTES

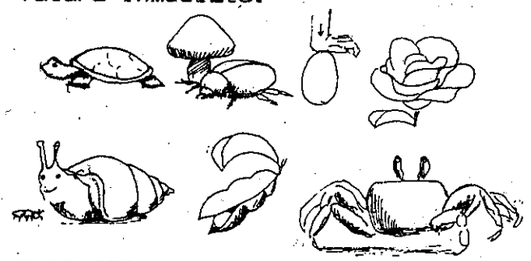
Cuando se vive en un pais en el que la mayoria de la poblacion carece de los medios para adquirir la mas modesta de las viviendas, es facil comprender que el logro mas importante que puede obtenerse radica en el aspecto economico y de costos, quedando relegados a un segundo plano las conquistas en otros aspectos por muchos meritos que pueda tener una vivienda, si no es barata no es para vivienda economica.

Otra posibilidad que desde fuera parece ser la "panacea", es el uso de las "Tecnologias" tradicionales como el adobe, el adobe mejorado, el tapial, el bajareque y las tecnologias en terrocemento. Pero resulta que en la practica, especialmente cuando se usan en construcciones urbanas, se han conseguido disminuciones sustanciales en los costos en comparacion con las construcciones de ladrillo o bloques de concreto que son las mas comunes, sino que mas bien, en la mayor parte de los casos resultan mas costosas. Y en la actualidad estas tecnologias mas bien se estan usando para viviendas de lujo, para aquellos que pueden costearse el lujo de tenerlas. Es justo, eso si, reconocer las ventajas obtenidas en aspectos como los climaticos, ambientales, ecologicos, en el rescate de valores culturales,etc. Pero cuando se trata de conseguir viviendas economicas, si una tecnologia produce viviendas costosas, no es la adecuada. Es importante aclarar que cuando se trata de viviendas rurales, tecnologias como el adobe tradicional, si producen viviendas mas baratas que las otras tecnologias usadas. Esto se debe principalmente al hecho de disponer de la materia prima, en el sitio mismo de la construccion,y no requerir un transporte costoso, como en el caso de las construcciones con este material a nivel urbano. A este factor se suma el de las "mingas", costumbre ancestral de nuestros pueblos en la que todos trabajan en la construccion de la vivienda de cada uno, costumbre que subsiste a nivel rural, mientras que a nivel urbano,los jacales, villas miseria, suburvios, callampas, o como se las llame, son el resultado de migraciones totalmente heterogeneas en las que se ha perdido esta practica.



CASI SIEMPRE QUE LA NATURALEZA QUIERE CONSTRUIR UNA SUPERFICIE RESISTENTE ESCOGE UNA DE DOBLE CURVATURA MAS AUN -SI SE TRATA DE ALVERGAR ALGO VALIOSO COMO LA BELLEZA O LA VIDA.

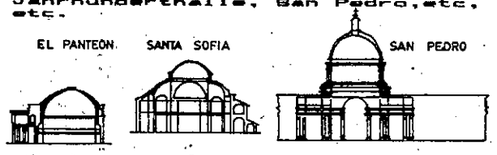
Es facil desde estos paises, plantear alternativas como la prefabricacion de las viviendas con paneles y otros sistemas, que en muchos lugares con otro nivel de tecnologia es realmente una alternativa importante, pero en un pais "subdesarrollado" de aquellos en los que el problema se da con "real" intensidad, donde se carece de la experiencia, la tecnologia, la capacidad de inversion necesarios, etc, no se puede pensar en la prefabricacion ni en la industrializacion para un futuro inmediato.



PROPUESTA

Por estas consideraciones hemos creido que la busqueda de soluciones economicas para la vivienda, debe ampliar su campo de accion.

La alternativa que proponemos tiene su antecedente y su fuente en la vivienda de millares de seres vivos y de estructuras naturales, como las burbujas, las conchas , los caparazones de tortugas e insectos,las cabernas,el huevo,los petalos de las flores,los caracoles, las vainas de las gramineas, etc,etc. Muchas de las construcciones artesanales de nuestros antepasados,como ollas de barro y utensilios,se basan en los mismos principios, y en la historia de la humanidad existen muchos ejemplos de obras de arquitectura basados en los mismos principios, como las bobedas y cupulas persas y romanas, el Panteon romano, Sta. Sofia en Constantinopla, Jahrhunderthalle, San Pedro,etc, etc.



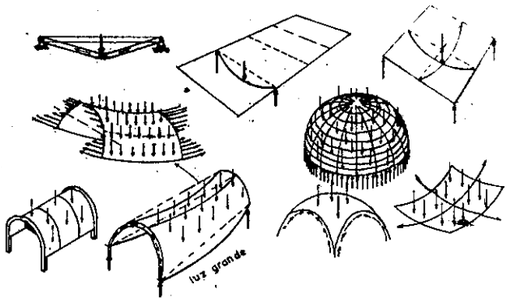
En base a alagunas experiencias hemos considerado conveniente ensayar con Cascarones de Hormigon Armado, aplicados a la vivienda economica. Este tipo de estructuras se ha utilizado con alguna frecuencia para otro tipo de edificaciones, como fabricas, estaciones de gasolina, iglesias, etc., y esporadicamente como viviendas, los resultados observados, nos han permitido detectar el hecho de que este tipo de estructuras es mas barato que las tradicionales, y que esos costos podrian reducirse aun mas si hacemos que el encofrado,que es un factor fuerte en los costos,sea reutilizable cientos de veces, construyendolo metalico por ejemplo, o neumatico, de esta manera su costo al prorratearse entre cientos de viviendas , seria practicamente nulo o muy bajo.

Por otra parte, los cascarones son superficies curvadas, que por condicion inherente a su forma, son mucho mas resistentes que las superficies planas, mas aun cuando tienen doble curvatura, requiriendo en estos casos una cantidad muy reducida de material para su construccion, que determina espesores minimos en comparacion con las losas planas por ejemplo, y refuerzos casi nulos cuando se trata de luces pequenas , como las que son frecuentes en vivienda. Todo esto hace que la lamina propiamente tenga un costo muy reducido, y sea una estructura muy resistente, ya hemos dicho que la naturaleza, la biologia tienen infinidad de ejemplos de este tipo de construccion , para superficies resistentes.

RESISTENCIA ADQUIRIDA POR LÁ FORMA

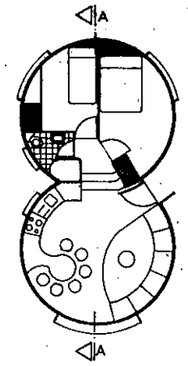
Con estos antecedentes, hemos iniciado una experiencia concreta, con el fin de establecer con mayor grado de certeza el nivel de economia que se puede obtener, asi como aproximarnos a detectar otros aspectos ventajosos o problematicos de esta propuesta, tanto en el proceso constructivo, como en los resultados obtenidos.Para este fin, el diseno de la vivienda experimental,arquitectonica y funcionalmente tendria una superficie de construccion de 36m2, con el proposito de poder hacer mas factible la evaluacion de los costos y otros aspectos al compararla directamente con las viviendas producidas por las instituciones viviendistas de nuestro Pais, que con la tecnologia de ladrillo, realiza programas de vivienda con unidades de 36m2 en algunos casos.

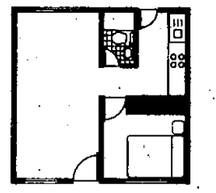
El diseño estructural que esta determinado y determina el aspecto formal y funcional, esta constituido por dos secciones de esferas ensambladas, con un diametro de 5 m cada una, y en cada una de ellas se albergaran funciones de la vivienda, en la primera el area de sala, comedor y cocina, y en la segunda , dos dormitorios y un baño. Es importante dejar claro que no se trata de obtener el diseno ideal, que por esta ocacion fue el descrito, se trata de determinar basicamente si una tecnologia da o no resultados economicos, siendo necesario dejar claro que el diseño funcional o formal de este ejemplo es secundario, y que en este aspecto se podria estudiar muchisimas otras posibilidades. Los calculos estructurales determinaron que no era necesario el refuerzo de hierro para efectos de las cargas que debia soportar la estructura, pero por razones constructivas tendientes a considerar las dialtaciones del hormigon, se la construyo con refuezos de hierro de 6mm colocados cada 25 cm. medidos en el ecuador, distribuidos en la direccion de los meridianos, y hierros de 6mm cada 25cm colocados en la diraeccion de los paralelos. Se fundio una loza de 4 cm de espesor. La fundicion de cada esfera se hizo por separado con el fin de utilizar dos veces el encofrado. Se utilizo una cimentacion de zapata corrida, ventajosa en tiempo de ejecucion y costo.



DISTRIBUCION DE ESFUERZOS

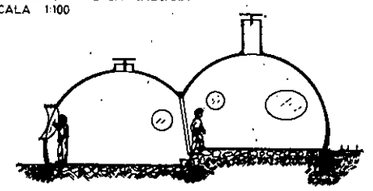
Todo lo dicho deja claro que no estamos proponiendo esencialmente nada nuevo, sino el rescate de una posibilidad, el abance sobre experiencias previas. Es esta caracteristicda de la humanidad la que le ha llevado a su estado actual de desarrollo, justamente el poder nutrirnos de las experiencias previas y abanzar cada vez un poco.



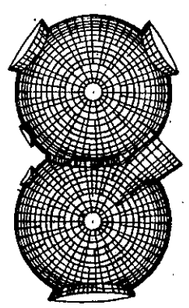


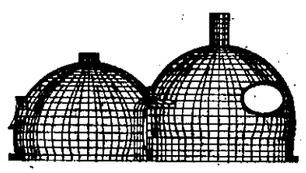
PLANTA DE LA VIVIENDA DE LADRILLO

PLANTA DE LA VIVIENDA CASCARA
ESCALA 1:100



CORTE A - A
ESCA 1:100





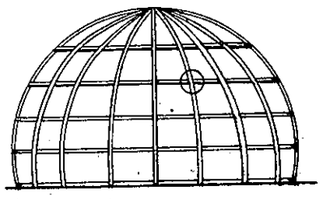
PLANTA y ELEVACION DE LA MALLA DE HIERRO DE 6mmØ NECESARIO PARA EL COLADO DEL HORMIGON

No pretendemos que nuestro diseño sea mejor que el de las viviendas de los programas del gobierno, pensamos que si pero esto es secundario frente a la comparacion de los costos obtenidos, que nos permiten afirmar que las viviendas producidas, determinan disminuciones en los costos del orden del 40 %.

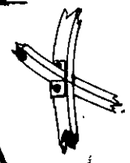
El encofrado que hemos utilizado fue construido con estructura de tubos rectangulares de hierro de 2" x 1" x 0.039" y recubrimiento de madera de 10 cm, es perfectamente desarmable y reutilizable, pensamos que al rededor de 20 veces, pero podria utilizarse casi indefinidamente si lo realizamos metalico por ejemplo.
Toda el proceso de construccion lo hemos hecho manualmente, la fundicion, el compactado y todos los procesos empleados, no han requerido de ninguna herramienta especial, incluso, por el gusto de hacerlo, la mezcla del hormigon la hemos hecho unicamente con palas. Asi mismo los obreros que hemos empleado, han sido ayudantes de albanil, con el objeto de detectar si se producia algun problema, lo que nos ha permitido determinar el hecho de que con una minima informacion inicial a los trabajadores, practicamente cualquier persona podria realizar esta fundicion. Este aspecto es a nuestro entender, muy importante, pues nos permite afirmar que este tipo de construccion es muy propicio para la AUTOCONSTRUCCION, que una vez que una institucion le preste o le arriende al interesado el encofrado, con una breve indicacion, y asi mismo con una direccion tecnica (indispensable en cualquier tipo de autoconstruccion), este podria emprender la construccion de su vivienda, lo que determinaria un abaratamiento mucho mayor todavia.

COMPARACION DE COSTOS

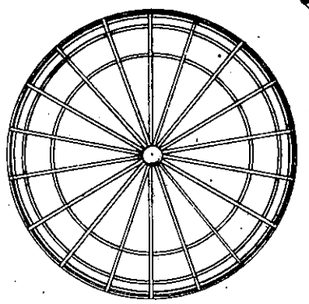
VIVIENDA DE LADRILLO		VIVIENDA CON CASCARONES DE H°A°	
RUBROS	$ USA	RUBROS	$ USA
cimientos de piedra	180,0	hierro y armado	193,8
cadenas de hormigon armado	154,5	fundicion cascara y zapato	412,9
estructura metalica	303,0	tabiqueria interior	90,
paredes de ladrillo	627,3		
cubierta de asbesto cemento	545,5		
SUBTOTAL	1810,3		695,8
cazantes de pisos	327,3		327,3
puertas y ventanas	193,9		193,9
instalaciones electric y sanit	184,8		184,8
lavamanos retrete y ducha	133,9		133,9
SUBTOTAL	839,9		839,9
		10 % de costo de encofrado	485
TOTAL	2650,2	TOTAL	1585,3
COSTO POR m² CONSTRUCC	73,6		44
		COSTOS 41,2% MAS BAJO	



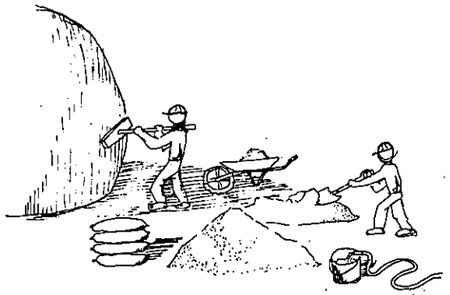
ELEVACION DE LA ESTRUTURA METALICA



DETALLE

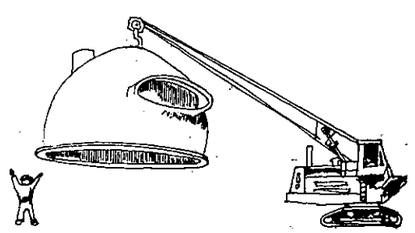


PLANTA DE LA ESTRUCTURA METALICA DEL ENCOFRADO ESC. 1: 50



Si en una construccion se utiliza un acelerante, podria fundirse una vivienda cada dos dias, mientras que con el uso de ladrillo, adobe, etc., esta duraria dos o tres meses en el mejor de los casos.
Sus caracteristicas nos hacen pensar tambien en su facil industrializacion a futuro, por ser estructuras livianas y transportables.

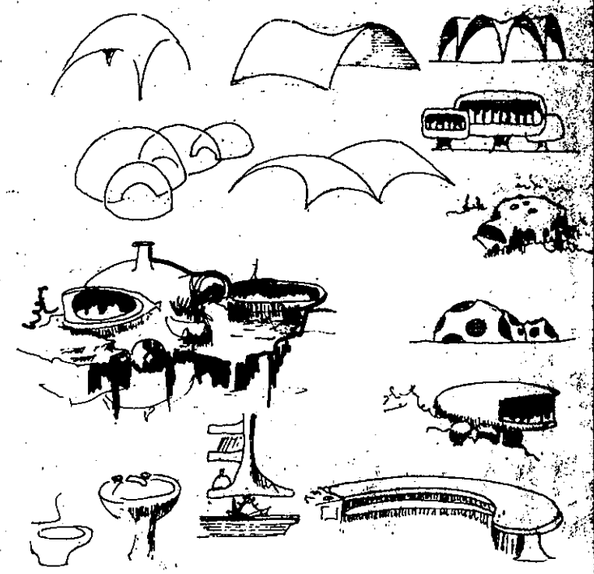
Los materiales empleados, cemento, hierro, arena, agua, se encuentran en nuestro medio, lo que evita la importacion y la dependencia del dolar americano, escaso, y en constante ascenso.
Fueden incorporarse en la fundicion tubos de PVC negro o cobre de 1/2" de diametro, para captacion del calor producido por la radiacion solar y su utilizacion en el calentamiento de agua para usos de la vivienda, o podria utilizarse tambien paneles solares para este fin. Podria pensarse en la instalacion de WC productores de abono, o generadores de metano, como complementos.
Pensamos que esta es una alternativa util, no solamente para las construcciones urbanas sino tambien, para construcciones individuales rurales, o nuevos centros poblados, por su total construccion en obra.



Es importante aclarar un hecho: Y es el de que las cascaras de hormigon armado, pueden cubrir plantas de cualquier forma, no unicamente las circulares como nuestro trabajo.

Aunque no haya sido el factor impulsor de esta busqueda, este tipo de estructuras hace posible una increible variedad y posibilidades formales y espresivas, que enriqueceria el aporte al servicio del arquitecto. Sabemos que esta misma circunstancia de la novedad formal de estas viviendas, para algunas personas, es mas bien un factor negativo debido a su caracter, en muchos casos a su edad, instruccion, etc. Por todo lo expuesto no prentendemos que esta sea la solucion final y unica a la vivienda, pero si estamos convencidos de que es una importante alternativa que no pude dejar de considerarse para la vivienda de bajo costo.

El moviliario interior de la vivienda, el mueble para la cocina, e incluso los mismos sanitarios, podrian ser moldeados a mano, con el consiguiente bajo costo, y enriquecimiento espiritual que esta labor produciria en el propietario, igual podria pensarse en elementos como la chimenea o divisiones de ambientes o libreros, etc.



VIVIVIENDA EXPERIMENTAL
VER COSTOS COMPARATIVOS

Asi mismo, en determinados climas, se hace necesaria la utilizacion de un aislante de las temperaturas exteriores, siendo el de uso mas frecuente el Poliuretano, cuya fabricacion es decididamente polucionante, y tiene el problema de que cuando se incinera despide gases venenosos de cianuro.
Nosotros planteamos el uso de vegetacion, cesped, muy abundante en nuestro medio o hiedra, por ejemplo, que no tendrian ninguno de los inconvenientes del poliuretano, y por el contrario determinan un respeto por el paisaje y un incremento de las areas verdes que redundan en un enriquecimiento de la calidad de vida.
Podria incluso, se nos ocurre plantear conjuntos habitacionales en sitios con pendiente, que con otro sistema serian peligrosos, cubiertos de tierra y vegetacion, etc.
La gama de posibilidades formales y organizativas es tan amplia que lo que presentamos es nada mas que una breve idea.

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SECTION III.

THE SEARCH WAS FOR AN IDEA THAT WOULD PROVIDE SHELTER AND MODEST COMFORT IN MANY DIFFERENT CLIMATES. ANY VIABLE SYSTEM WOULD HAVE TO BE FORMED FROM CHEAP MATERIALS WITH THE APPROPRIATE PHYSICAL AND STRUCTURAL CHARACTERISTICS MANUFACTURED INEXPENSIVELY AND TRANSPORTED AND ERECTED EASILY.

THIS SYSTEM IS DEVELOPED AROUND A BUILDING BOARD FORMED BY LAMINATING PLYWOOD AND CORK INSULATION. THE BOARD IS A SANDWICH CONSISTING OF TWO OUTER LAYERS OF 4MM. THICKNESS PLYWOOD PROTECTING A CORE OF 60MM. OR 104MM. CORK. THE PRODUCT USES NATURAL MATERIALS WHICH WITH GOOD HUSBANDRY WILL BE PERMANENTLY REPLENISHED GLUEING AND LAMINATION IS CARRIED OUT USING ESTABLISHED PROCESSES.

THE BOARD IS LIGHTWEIGHT, HIGHLY INSULATED AND STRUCTURALLY VERSATILE AND IS USED AS A SINGLE SKIN WALL, ROOF, FLOOR AND PARTITION OR AS PART OF LONGER SPANNING STRUCTURAL ELEMENTS.

IN PANELS OF UP TO 3600MM. IN LENGTH AND 600MM. WIDE IT HAS GOOD SPANNING CAPABILITIES. THE CORK CORE GIVES GOOD SOUND REDUCING QUALITIES AND A HIGH RESISTANCE TO FIRE IS ACHIEVED WITH THE TREATED PLYWOOD. THE PRODUCT IS RESISTANT TO TERMITE ATTACK. THE BUILDING BOARD HAS A HIGH TENSILE AND COMPRESSIVE STRENGTH. SHELTERS FORMED IN EARTHQUAKE AREAS BENEFIT FROM ITS RESILIENT QUALITIES.

SHELTERS ARE PRODUCED EMPLOYING THE PRINCIPLE OF HALVING OR SLOTTING THE BUILDING BOARD AT THE CORNERS OF THE STRUCTURE, FOLLOWED BY THE STIFFENING OF THESE ELEMENTS WITH PLYWOOD CHANNELS, ANGLES OR STRIPS, WEDGED OR BOLTED INTO PLACE TO GIVE STABILITY. THE LONG EDGES OF THE BOARD ARE REBATED IN MANUFACTURE TO GIVE ADDITIONAL STIFFENING WHEN INTERLOCKED.

THIS LOW COST BUILDING SYSTEM CAN BE DELIVERED THROUGHOUT THE WORLD FROM THE FACTORIES IN FLAT PACKS, READY FOR QUICK ASSEMBLY ON SITE. THE PANELS CAN BE EASILY CUT, DRILLED AND ADAPTED TO INDIVIDUAL REQUIREMENTS WITH THE MINIMUM OF SKILL AND TOOLS.

THE SYSTEM, WITH ONLY BASIC FINISHES IS IDEALLY SUITED FOR THE CONSTRUCTION OF TEMPORARY AND EMERGENCY BUILDINGS. THE BUILDINGS ARE EASILY DISMOUNTABLE FOR RE-ERECTION OR ADAPTION TO SUIT CHANGING ACCOMMODATION REQUIREMENTS.

THE BASIC SHELTER FORM CAN BE EXTENDED IN ALL DIRECTIONS TO DEVELOP INTO A LARGER SHELTER COMPLEX OR VILLAGE. THE BUILDINGS WHEN PREFABRICATED CAN BE ERECTED BY AN UNSKILLED PERSON WITH THE AID OF A HAMMER OR A ROCK TO LOCATE THE PANELS. THE SYSTEM DOES NOT NECESSARILY REQUIRE PREPARATION OR PROVISION OF FOUNDATIONS. INDIGENOUS BALLAST OF ROCKS OR SAND IS SUFFICIENT TO ANCHOR THE BASE UNITS TO THE GROUND. WATER WILL HAVE NO EFFECT ON THE TREATED PANELS.

FOR FAMILY HOUSING THE INTERLOCKING BOARD IS SHOWN PROVIDING A BASIC THREE ROOMED HOME WITH A PITCHED ROOF. THIS TYPE IS THEN SHOWN DEVELOPING FURTHER INTO A MORE SOPHISTICATED PRE-FABRICATED FAMILY HOME, WHICH CAN BE SIMPLY DETAILED TO TAKE A WIDE RANGE OF CONVENTIONAL WALL AND CLADDING MATERIALS FOR LONG LIFE AND GOOD LOOKS.

THE SYSTEM LENDS ITSELF TO RAPID BULK TRANSPORTATION THROUGHOUT THE WORLD IN EMERGENCY SITUATIONS WHERE BUILDINGS ARE REQUIRED QUICKLY AND THE DISMOUNTABLE QUALITIES ARE IMPORTANT. PANELS WILL FLOAT ON RIVER SYSTEMS TO ASSIST TRANSPORT IN DIFFICULT TERRAIN.

WHERE LOCAL AUTHORITIES ARE UNABLE TO PROVIDE OTHER FORMS OF HOUSING, THE SHELTERS COULD REPLACE THE SHANTY TOWN ACCOMMODATION OF LARGER CITIES.

HOMES PRODUCED BY THIS SYSTEM HAVE THE POTENTIAL TO EXTEND AND BE ADAPTED AND IMPROVED INTO MARKETABLE PERMANENT HOMES, WHICH, WITH THEIR LOW TECHNOLOGICAL APPROACH, COULD BE USED WITH HUMOUR AND DIGNITY TO COLONISE, AT LOW COST, THE LARGE AREAS OF DERELICT LAND WHICH ABOUND IN THE CITIES.

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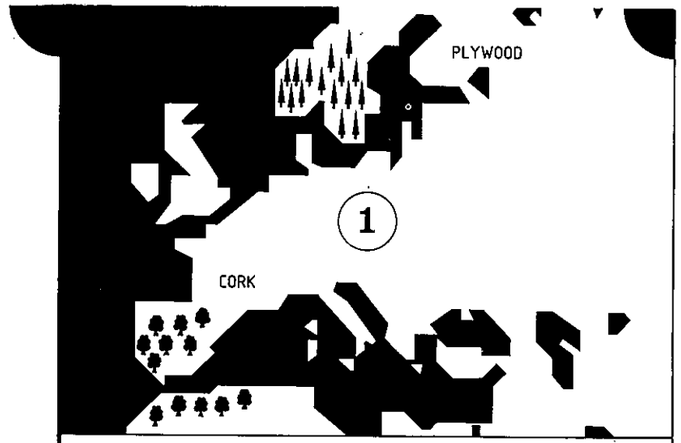

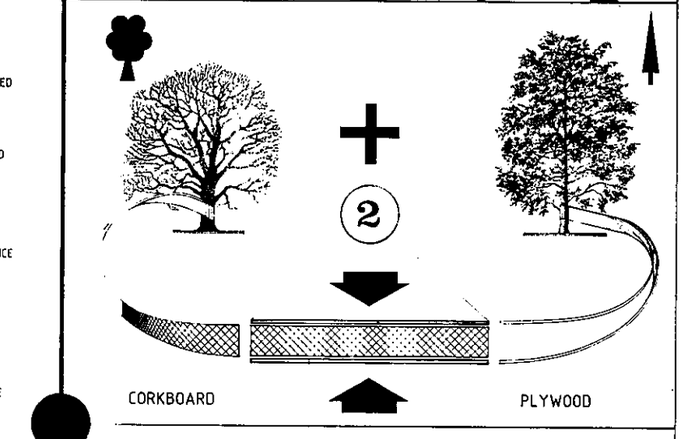

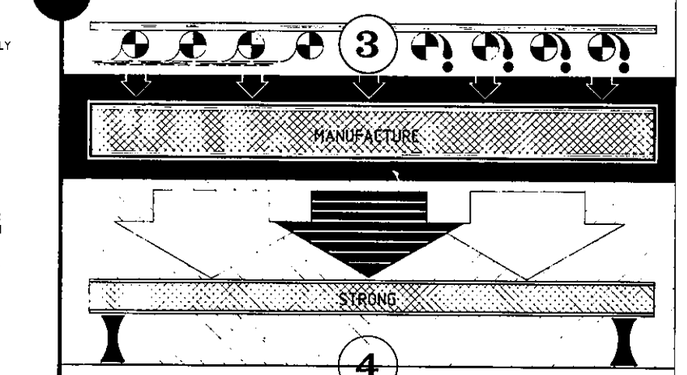

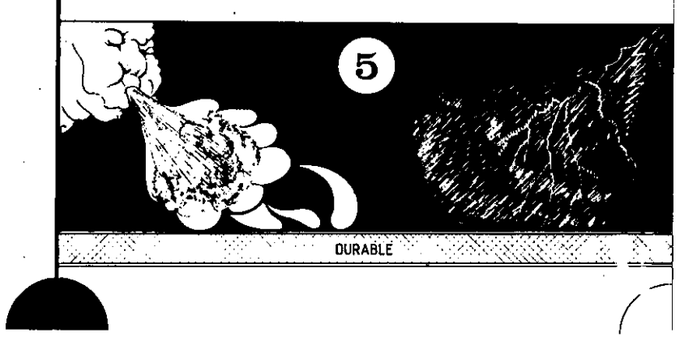

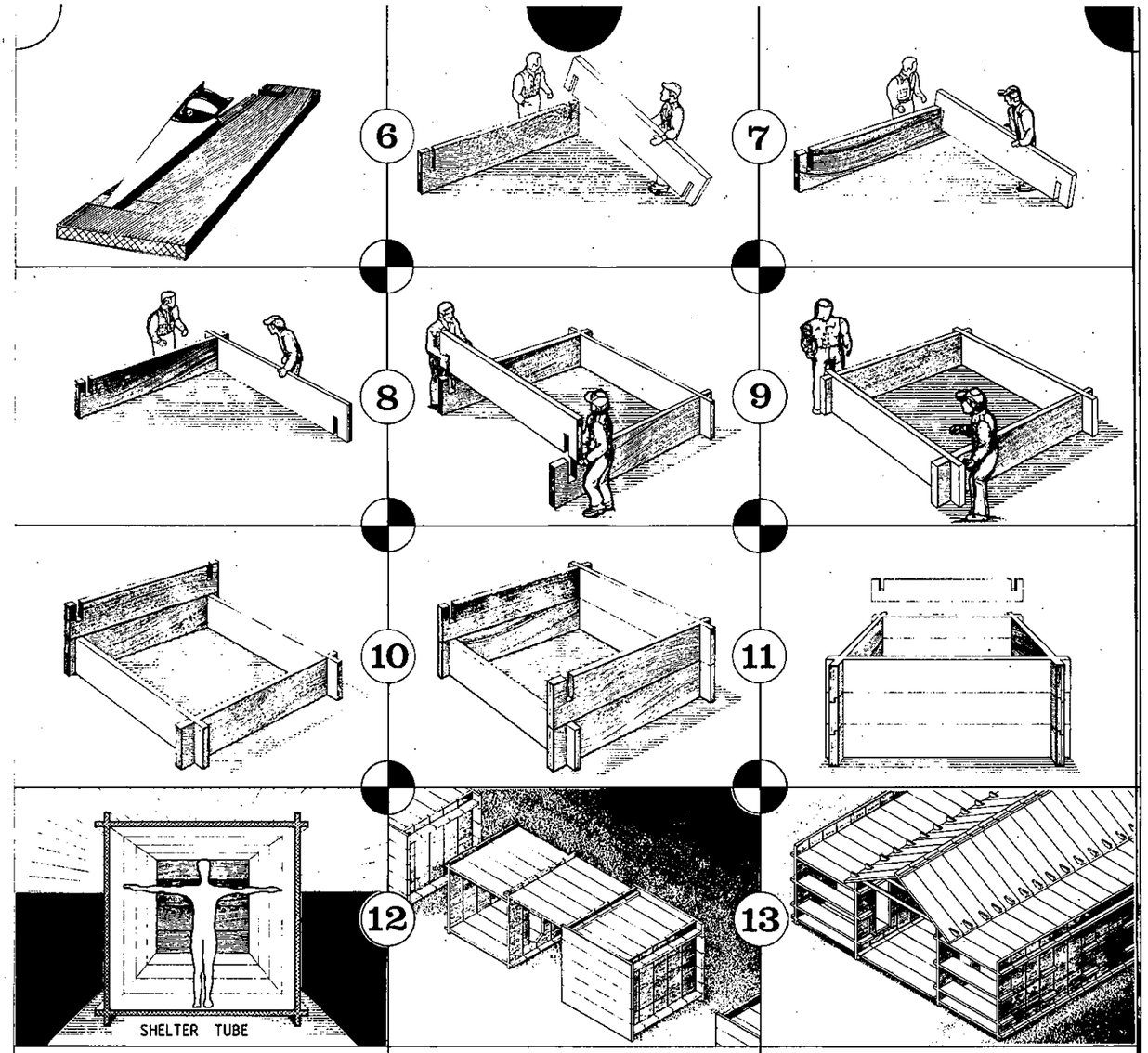

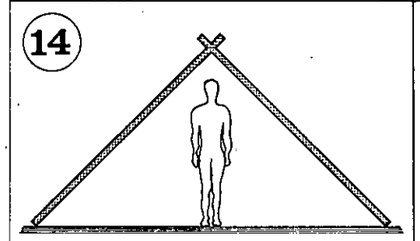

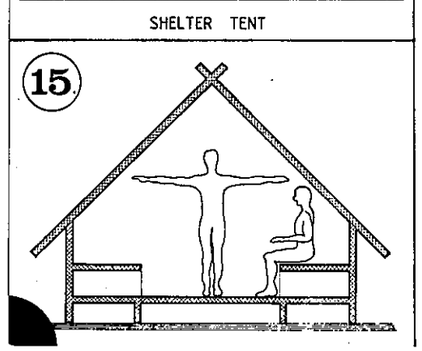

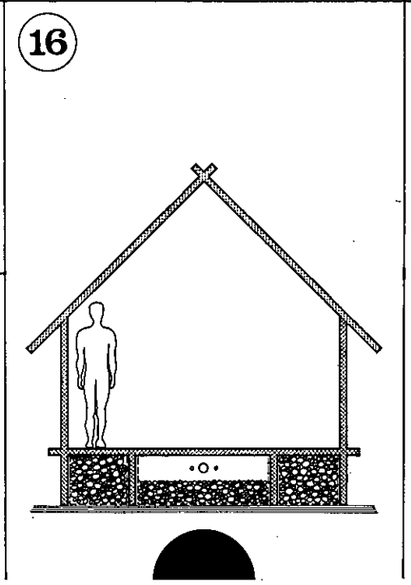

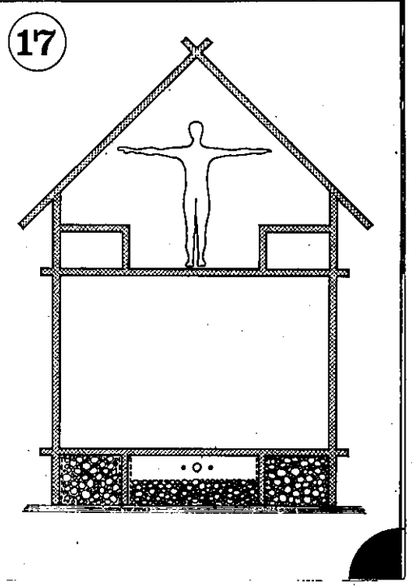

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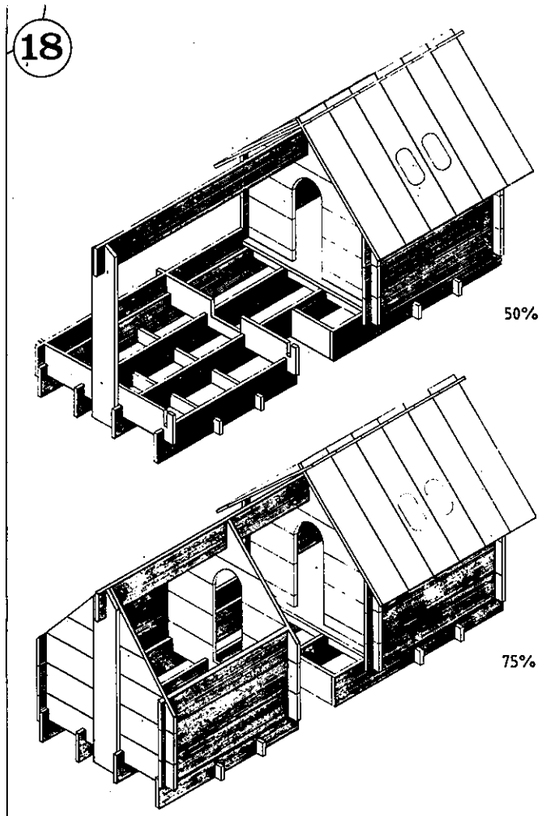

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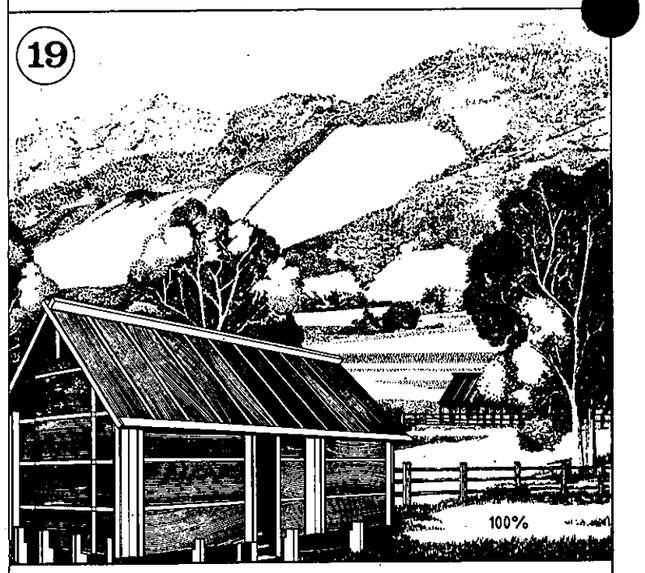

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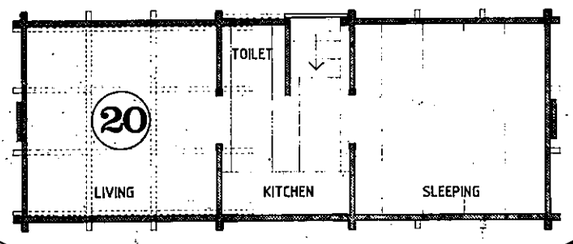

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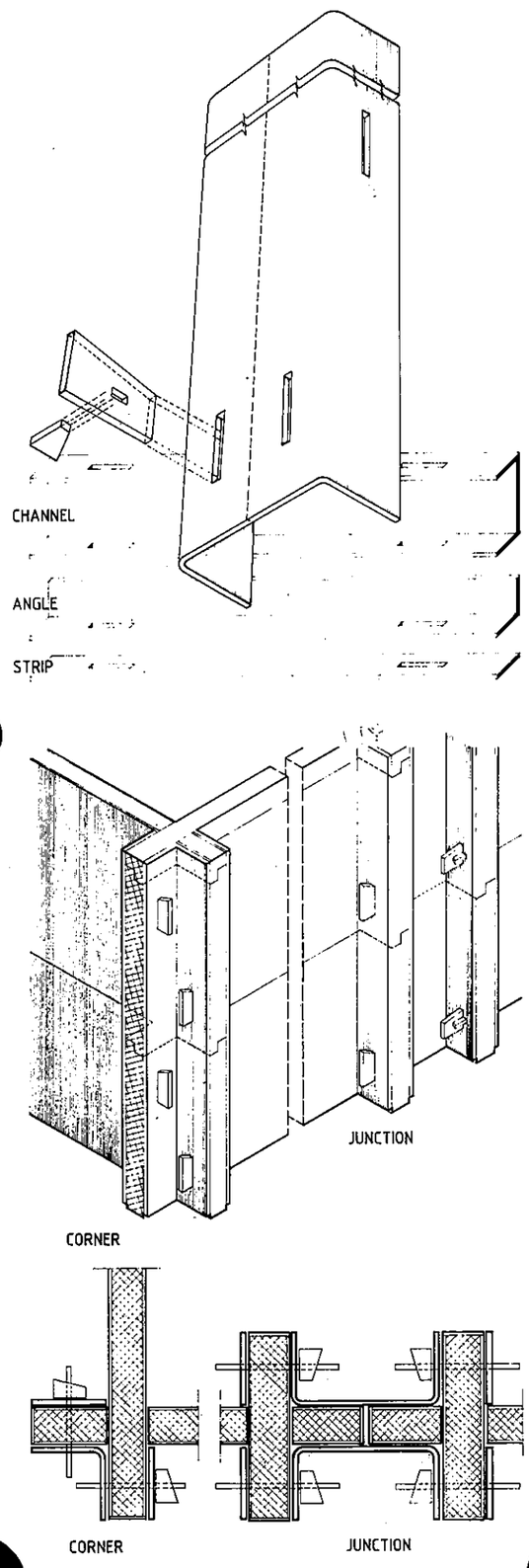
PLYWOOD COMPONENTS



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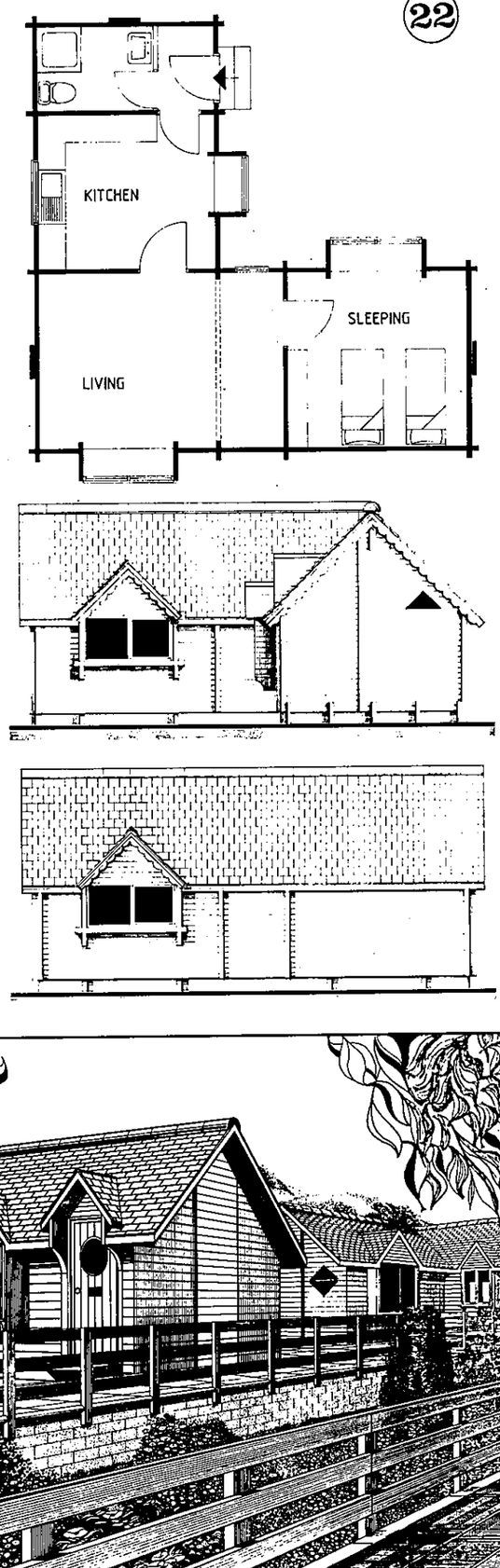
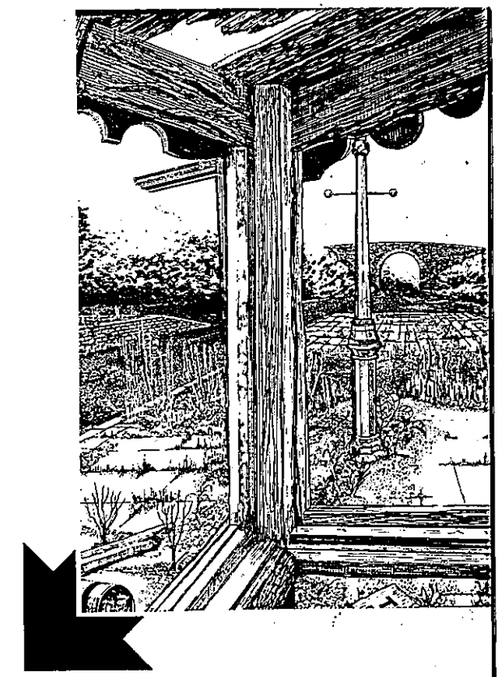
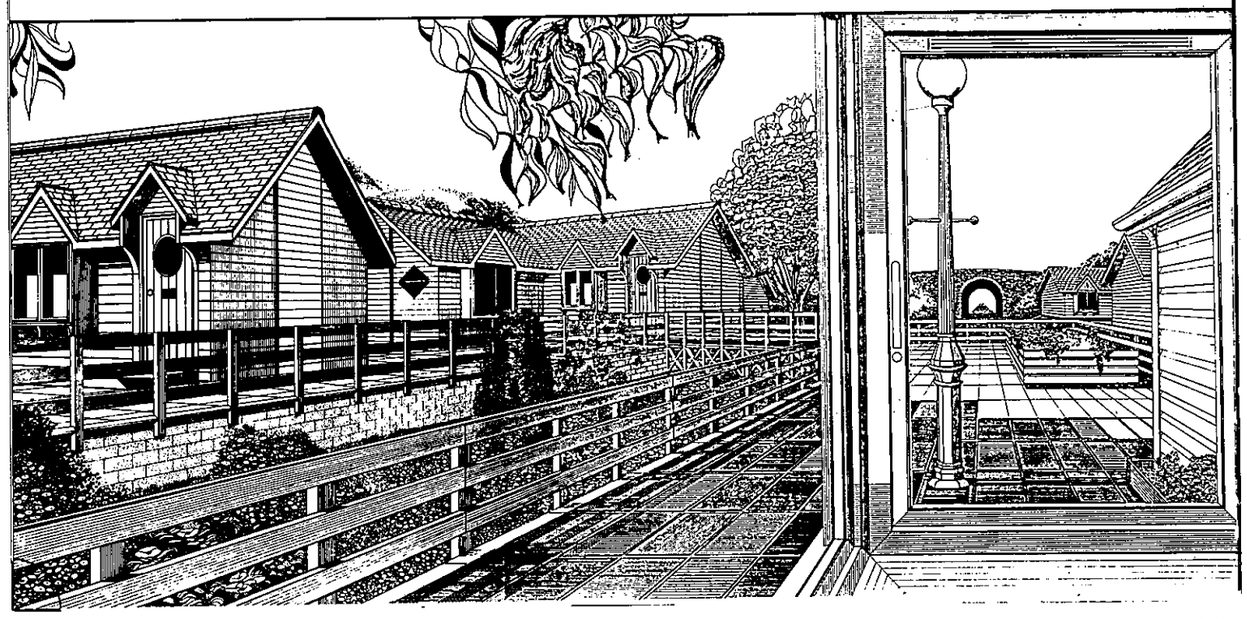
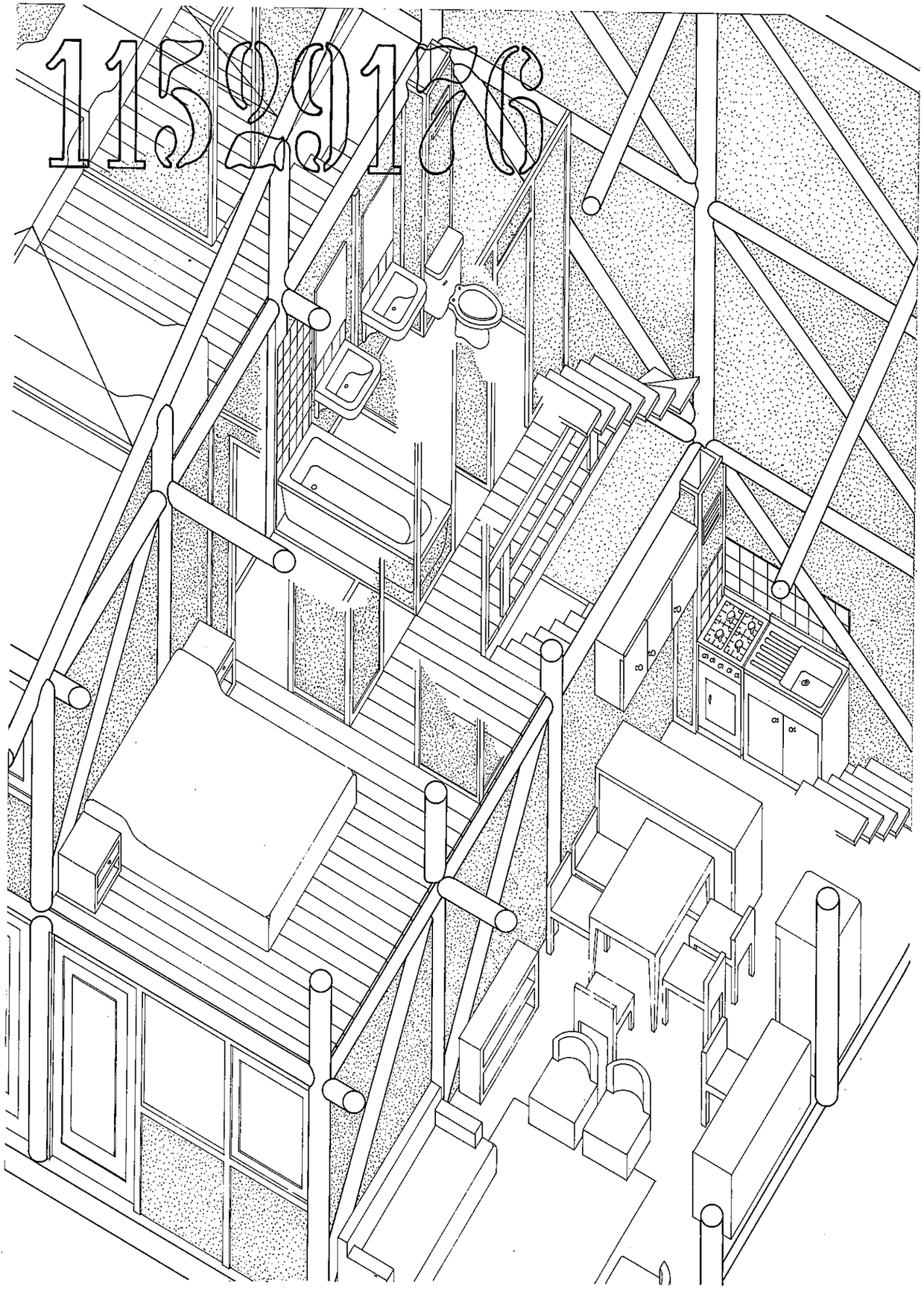




DEVELOPMENT OF A DERELICT SITE





MEMORIA

1-1 EL PROBLEMA

EL NUMERO DE PERSONAS QUE VIVEN EN LA INDIGENCIA Y EN LA MISERIA CRECE CONSTANTEMENTE Y SIN LIMITES, ALCANZANDO APROXIMADAMENTE A UN CUARTO DE LA POBLACION DEL MUNDO.

SE PUEDE AFIRMAR QUE CIEN MILLONES DE ESTAS PERSONAS CARECEN DE VIVIENDA DE CUALQUIER CLASE.

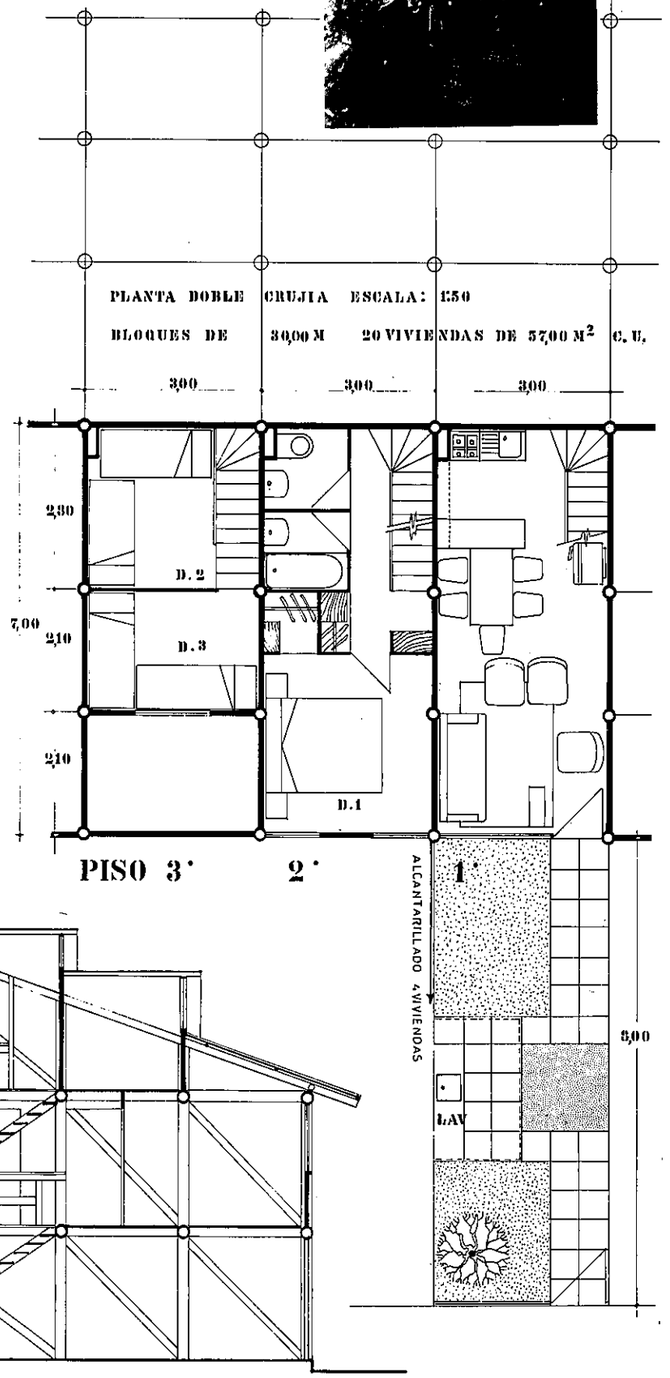
ES EVIDENTE QUE EL PROBLEMA NO TIENE SOLUCION TOTAL, PERO LOS GOBIERNOS JUNTO CON LOS PARTICULARES, INCLUSIVE CON CONVENIOS ENTRE PAISES, PODRAN CON POLITICAS DE GRANDES ESFUERZOS Y SOSTENIDAS, PALIAR ESTA NECESIDAD MUNDIAL, COMO LO SON EL HAMBRE Y LA IGNORANCIA TAMBIEN EN GRAN MEDIDA.

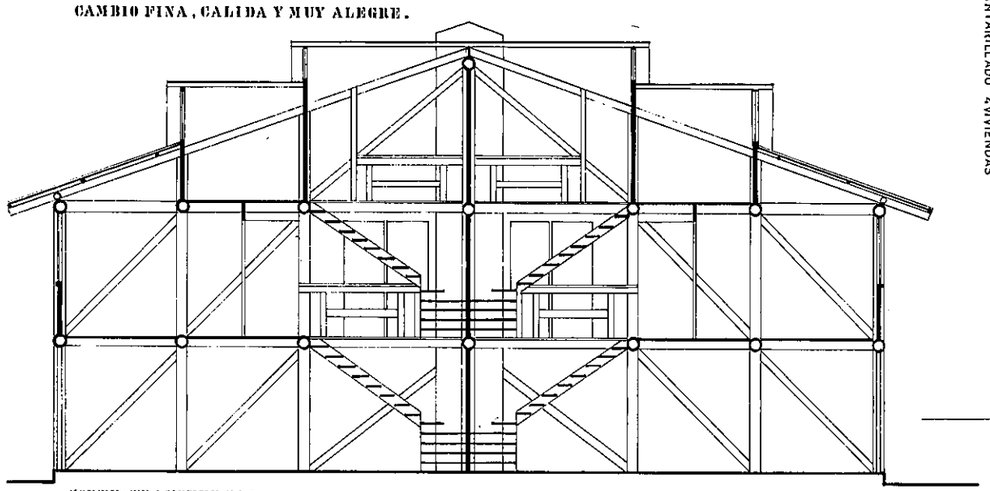
2-1 EL PROYECTO

EL SISTEMA CONSTRUCTIVO PROPUESTO, DENOMINADO «T Q» (TRONCO Y QUINCHA) ESTA SIENDO EXPERIMENTADO POR 20 AÑOS EN COMUNIDADES Y ESPECIALMENTE EN ZONAS RURALES Y BALNEARIOS.

SE PONE ESPECIAL ENFASIS EN LA **AUTOCONSTRUCCION**, YA QUE LA SENCILLEZ DEL SISTEMA, LO HACE FACIL DE ASIMILAR Y NO ES EXIGENTE EN LAS TERMINACIONES, SIENDO EN CAMBIO FINA, CALIDA Y MUY ALEGRE.

TRES PISOS





CORTE TRANSVERSAL

EL SISTEMA "TQ" SE APOYA EN LAS ANTIGUAS TRADICIONES CONSTRUCTIVAS, UTILIZANDO LOS MATERIALES PROPIOS DE CADA ZONA COMO SON TRONCOS, MADERAS SEMI-ELABORADAS, QUINCHAS DE BARRO, TAPA (CORTEZA) EN REVESTI MIENTOS Y PAJA EN TECHOS. ESTOS MATERIALES HAN TRABAJADO MUY BIEN, DE LARGA DURACION Y SOPORTANDO VARIOS SISMOS.

3'1 ESPECIFICACIONES

1- TRONCOS, VARAS, MADERAS DE DEMOLICION

2- PLANCHAS DE PLUMAVIT

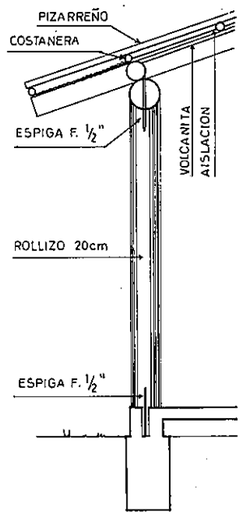
3- MALLA O MATERIAL DESPLEGADO METALICO

4- ESTUCO DE CEMENTO Y ARENA

5 -ALTERNATIVAS

1' TRONCOS - LA ESTRUCTURA DE CASAS Y DEPARTAMENTOS SE HACE CON TRONCOS (ROLLIZOS) Y MADERAS DE DEMO_ LICION. PIE DERECHOS DE 18 A 20 CM DE ESPESOR ASENTADOS EN CIMIENTOS DE CONCRETO.

LA UNION SE HACE CON ESPIGAS DE FIERRO DE 12 MM CLAVADA AL TRONCO Y EMBUTIDA CON CONCRETO EN HUECO DEJADO EN EL CIMIENTO Y EN LA PARTE SUPERIOR LA SOLERA SE ASIENTA EN HORCAJA Y SE UNE IGUALMENTE CON ESPIGA. SE COMPLETA LA ESTRUCTURA CON DIAGONALES. LA ENMADERACION DE TECHUMBRE SE HACE CON VARAS DE 15 CM DE ESPESOR Y COSTANERAS DE 5 A 6 CM DE DIAMETRO PARA CUBIERTA DE PIZARREÑO U OTROS MATERIA - SEGUN LAS CUBIERTAS (DETALLE N°1) LAS MADERAS SE ACEITAN Y SE BARNIZAN.

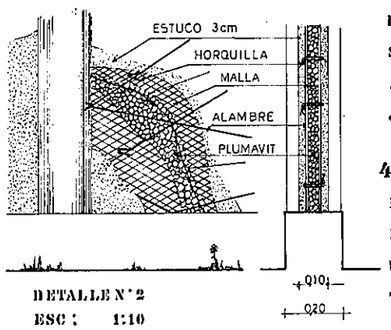


DETALLE N°1 ESC:1:20

2' MUROS - ENTRE LOS TRONCOS IRA MURO DE 10 CM DE ESPESOR Y DE LAS SIGUIENTES CA - RACTERISTICAS:

2-2 -PLANCHAS DE POLIESTIRENO EXPANDIDO (PLUMAVIT) DE 40MM DE ESPESOR COLOCADA MUY AJUSTADA Y CLAVADA A TRONCOS.

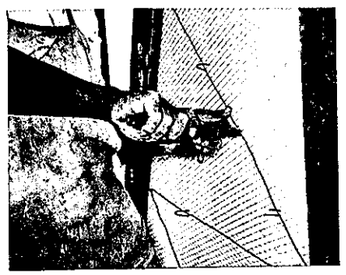
3- -MALLA, MATERIAL DESPLEGADO O PLANCHAS DE TAPA CORONA, POR AMBOS LADOS. A LOS TRONCOS SE FIJA CON CLAVOS Y SE TEN SA CON ALAMBRE Y HORQUILLAS DE ALAMBRE, QUE APRISIONAN EL PLUMAVIT ENTRE LAS MALLAS DE_ JANDO UNA FIRME BASE PARA RECIBIR ESTUCOS.



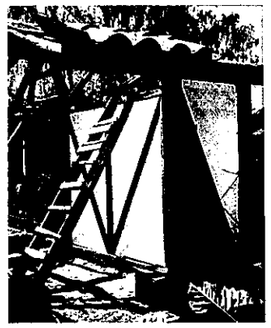
DETALLE N°2
ESC: 1:10

4 - ESTUCOS DE CEMENTO Y ARENA. SE COLOCAN EN DOS CAPAS, SIENDO LA PRIMERA DE PROPORCION 1 A 5 Y ESPARCIDA CON PLANA EN DELGADA CAPA. LA SEGUNDA SE CHICOTEA AL DIA SIGUIENTE, HASTA DAR UNA CAPA DE 3 CM. POR AMBOS LADOS. SE PINTA CAL DE ESPUMA CON 10 % DE CEMEN TO.


SE ASEGURAN....


SE APRISIONAN.....


SE ESPARCE....

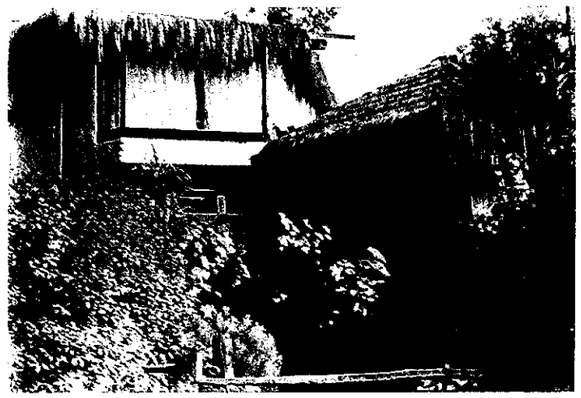

EN OBRA GRUESA....

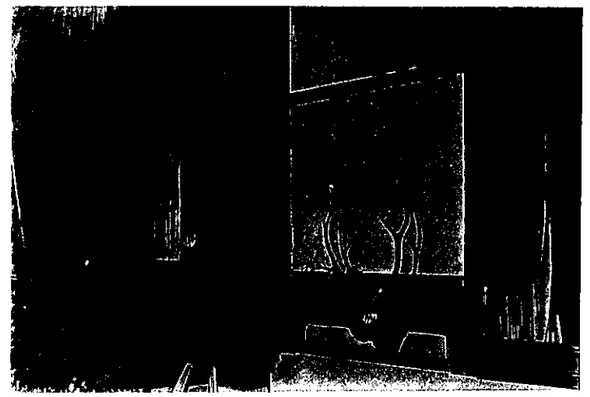
2-3 - TABIQUES. INTERIORMENTE LOS TABIQUES TIENEN 5 CM DE ESPESOR CON ARMAZON DE MADERA ELABORADA DE 5 X 5 CM, PLANCHA DE PLUMAVIT DE 25 MM MALLA Y ESTUCO DE 12 MM.

3 - ALTERNATIVAS. EL MURO DESCRITO SE PUEDE REEMPLAZAR POR TABIQUE DE MADERA CON ARMAZON INTERIOR O REVESTIMIENTOS DE PIZARREÑO, METALICOS O PRENSADOS.

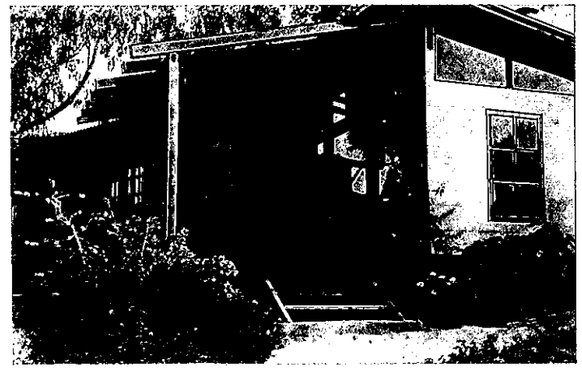
3-1 TERMINACIONES. EL NUMERO COMO LA CALIDAD DE TERMINACIONES E INSTA_ LACIONES, DEPENDERA MUCHO DE LOS DINEROS DESTINADOS A CADA VIVIENDA. EN TODO CASO EL SISTEMA PRESENTADO REQUIERE POCAS TERMINACIONES, YA QUE QUEDARA MUY COMPLETA Y GRATA EN OBRA GRUESA. SON SUS OCUPANTES LOS QUE IRAN TERMINANDO SUS CASAS SEGUN SUS NECESIDADES Y HABERES.

3-2 COSTOS. EN RELACION CON LAS CONSTRUCCIONES EJECUTADAS; CON LA VARIACION DE COSTOS DE INSTALACIO NES Y VARIEDAD DE TERMINACIONES. SE PUEDE ESTIMAR EL COSTO DEL M^2 EN DOLARES $ 90.






SE CHICOTEA....



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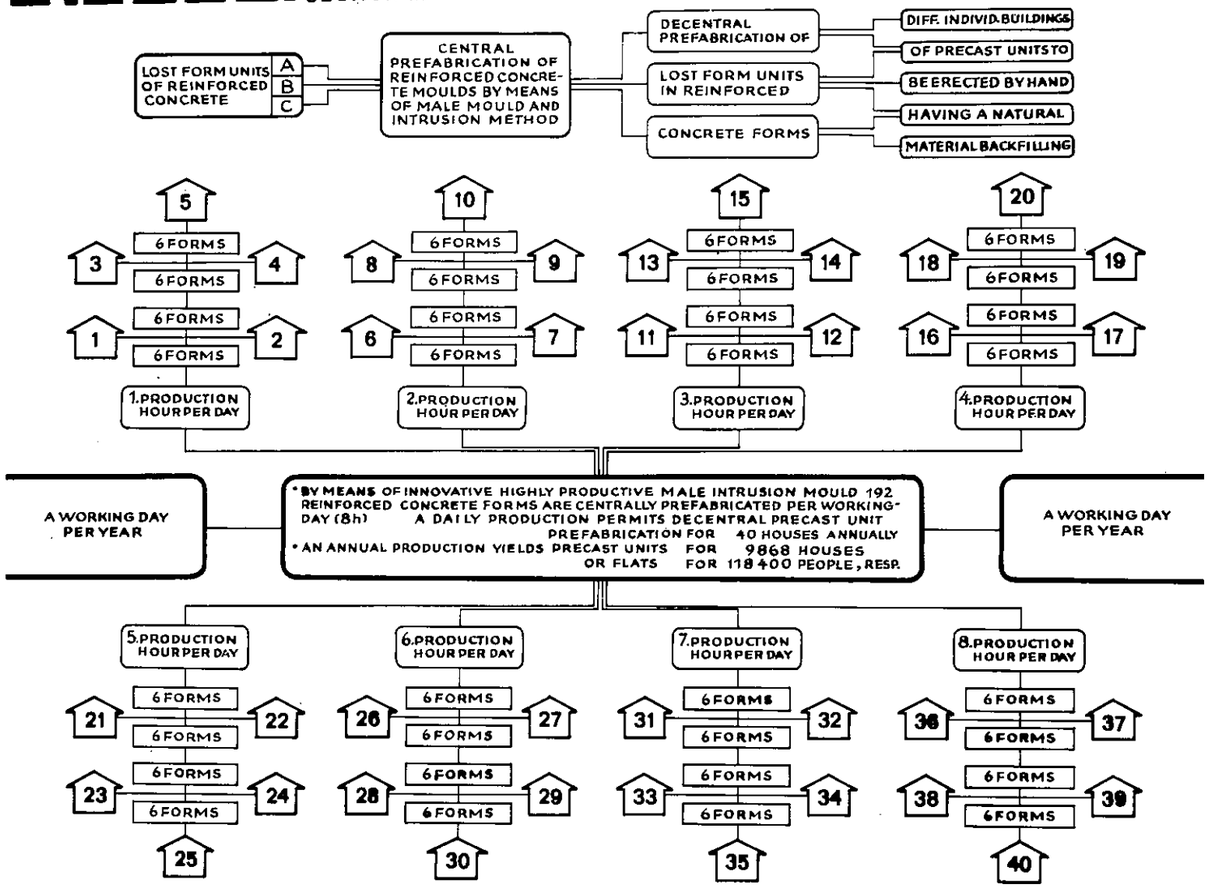
SECTION III

INNOVATIVE CONSTRUCTION FOR SIMPLE RESIDENTIAL BUILDING IN DEVELOPING COUNTRIES



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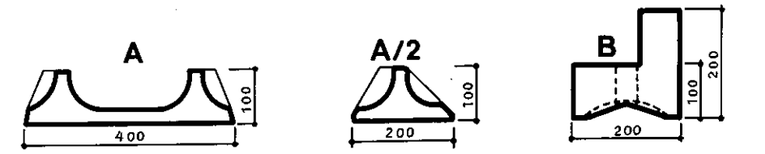
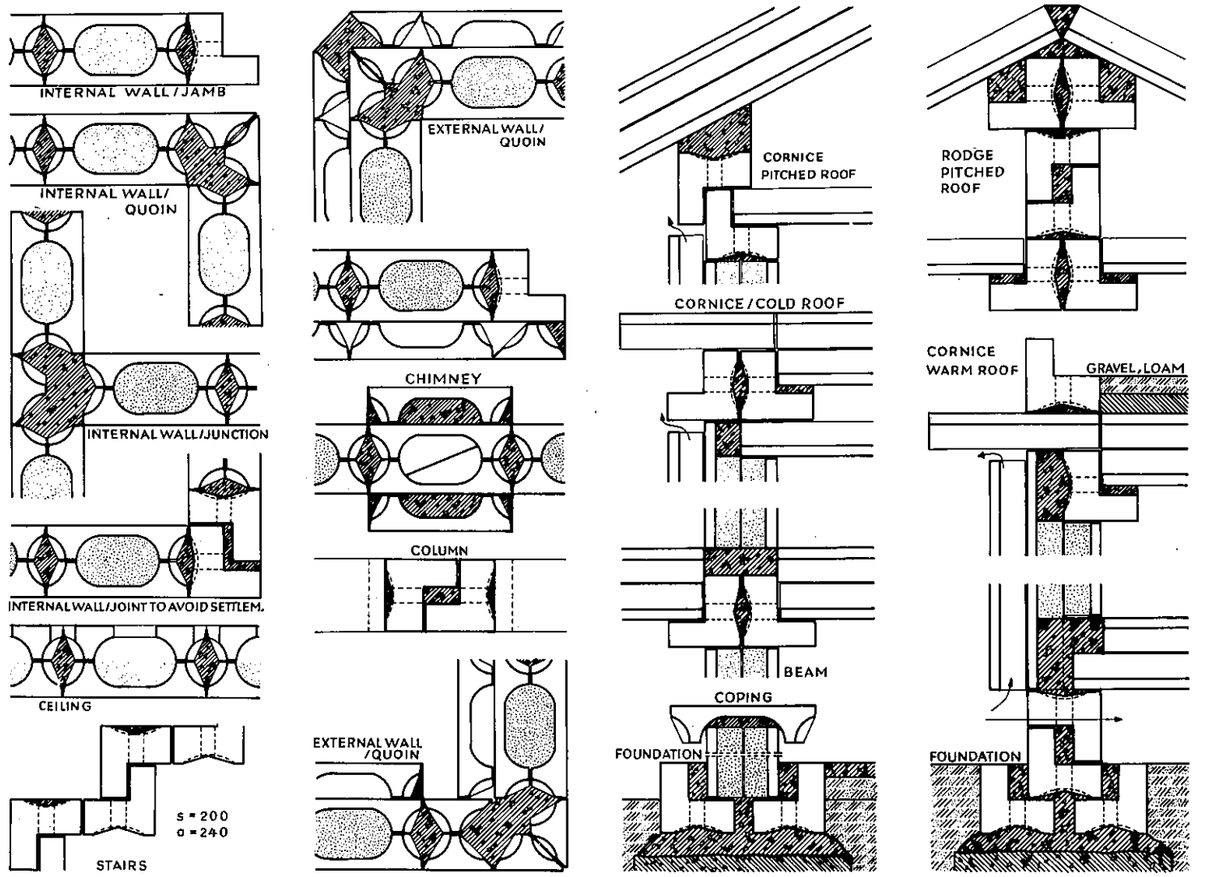
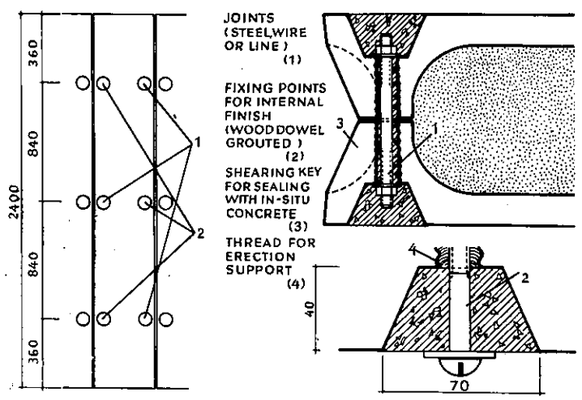




STRATEGIC CONCEPT

- BY MEANS OF 3 CROSS SECTION GEOMETRIES FOR PRECAST CONCRETE UNITS TO BE ERECTED BY HAND, WHICH ARE SELFCENTRING, CONNECTED IN A SHEAR-STRENGTH RESISTANT WAY AS A LOST FORM BY MEANS OF MINIMUM IN-SITU CONCRETE AND FILLED WITH NATURAL MATERIAL ANY ≤ TWO-STOREY RESIDENTIAL BUILDING STRUCTURES WITH FLAT OR PITCHED ROOFS IN 200mm GRADATION FOR MOIST-WARM OR ARID-HOT CLIMATIC ZONES CAN BE ESTABLISHED EMPLOYING ABOUT 85% UNSKILLED WORKERS FOR PRECAST UNIT MANUFACTURE AND ERECTION OF BUILDING
- THE PRECAST UNIT GEOMETRY IS NOT EXPENSIVE AND FREE OF SUBJECTIVE INFLUENCES DUE TO THE TUB-LIKE SHAPE OF THE FORMS CENTRALLY MADE AVAILABLE CONSISTING OF HIGH-STRENGTH CONCRETE. 6 REINFORCED CONCRETE FORMS HAVE AN ANNUAL CAPACITY OF A COMPLETE HOUSE PRODUCTION (180 m² NET AREA → SEE TABLE OF PRODUCT EXAMPLES) AT A SERVICE LIVE OF 2...3 YEARS
- THE FORMS MADE OF REINFORCED CONCRETE ARRANGED DECENTRALLY IN THE TERRITORY ARE PRODUCED CENTRALLY IN THE CORRESPONDING COUNTRY IN A HIGHLY PRODUCTIVE PRODUCTION PLANT USING INTRUSION PROCEDURES. THE TECHNOLOGICAL LINE CAN BE GRADED IN TERMS OF CAPACITY. MINIMUM CAPACITY AMOUNTS TO 192 REINFORCED CONCRETE FORMS ON AN 8-HOUR WORKING DAY. THIS IS SUFFICIENT FOR PRODUCING PRECAST UNITS FOR 40 HOUSES PER YEAR OR UP TO 120 HOUSES WITH-IN THE SERVICE LIFE, RESP. THIS PROCEDURE WILL ENABLE THE MANUFACTURE OF PRECAST UNITS FOR 9868 HOUSES PER YEAR OR OF FLATS FOR 118000 PEOPLE, RESP., AT THE MINIMUM TECHNOLOGICAL MANUFACTURING LEVEL.
- THE INNOVATIVE PROCESS TECHNOLOGY OF THE INTRUSION PROCEDURE USING INTERNAL PRESSURE FOR SUBSEQUENT IMPROVING THE W/Z VALUE OF FRESH CONCRETE CAN BE IMPLEMENTED BY MEANS OF LOW EXPENDITURE CONCERNING EQUIPMENT RESULTING IN AN INCREASED ECONOMIC EFFICIENCY. TARGET OF THIS STRATEGIC CONCEPTION: CENTRAL INDUSTRIAL EQUIPMENT IN ORDER TO PRODUCE PRIMARY EQUIPMENT OF A HIGHLY SIMPLIFIED CONSTRUCTION SYSTEM IN LARGE QUANTITIES FOR INDEPENDENT ERECTION OF DIFFERENTIATIABLE RESIDENTIAL BUILDINGS.

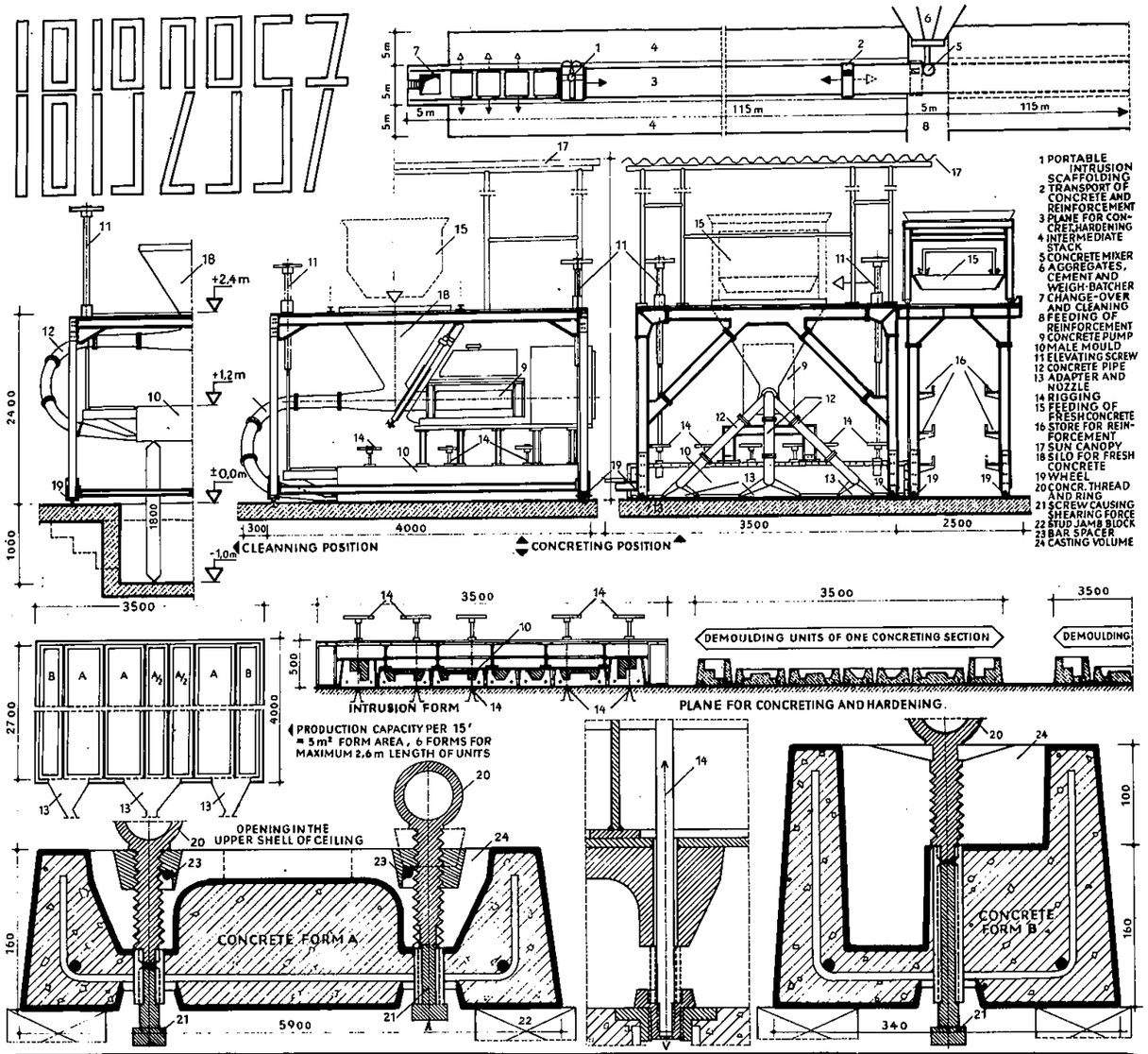
STRUCTURAL UNITS



- BASIC SET OF PRECAST UNITS = 3 SHAPE CROSS SECTIONS FOR COMPLETE ERECTION OF ≤ TWO-STOREY RESIDENTIAL HOUSES
- MAXIMUM LENGTH OF PRECAST UNITS = 2600 mm (FLOOR-TO-FLOOR HEIGHT, SPANS OF BEAMS AND CEILINGS) WITH A MAXIMUM WEIGHT PER PRECAST UNIT = 150 kg (ERECTION BY HAND)
- SHAPE OF CROSS SECTION 'A' FOR WALLS, CURTAIN WALLS, CEILINGS, PITCHED AND FLAT ROOFS, COURT-WALLS, CHIMNEYS, COPINGS
- SHAPE OF CROSS SECTION 'B' FOR JAMBS, LINTELS, BEAMS COLUMNS, FOUNDATION GIRDERS, STAIRS, PARAPETS

MATERIAL APPLICATION /m² OF BASE AREA BUILT-UP BY ONE STOREY BUILDINGS

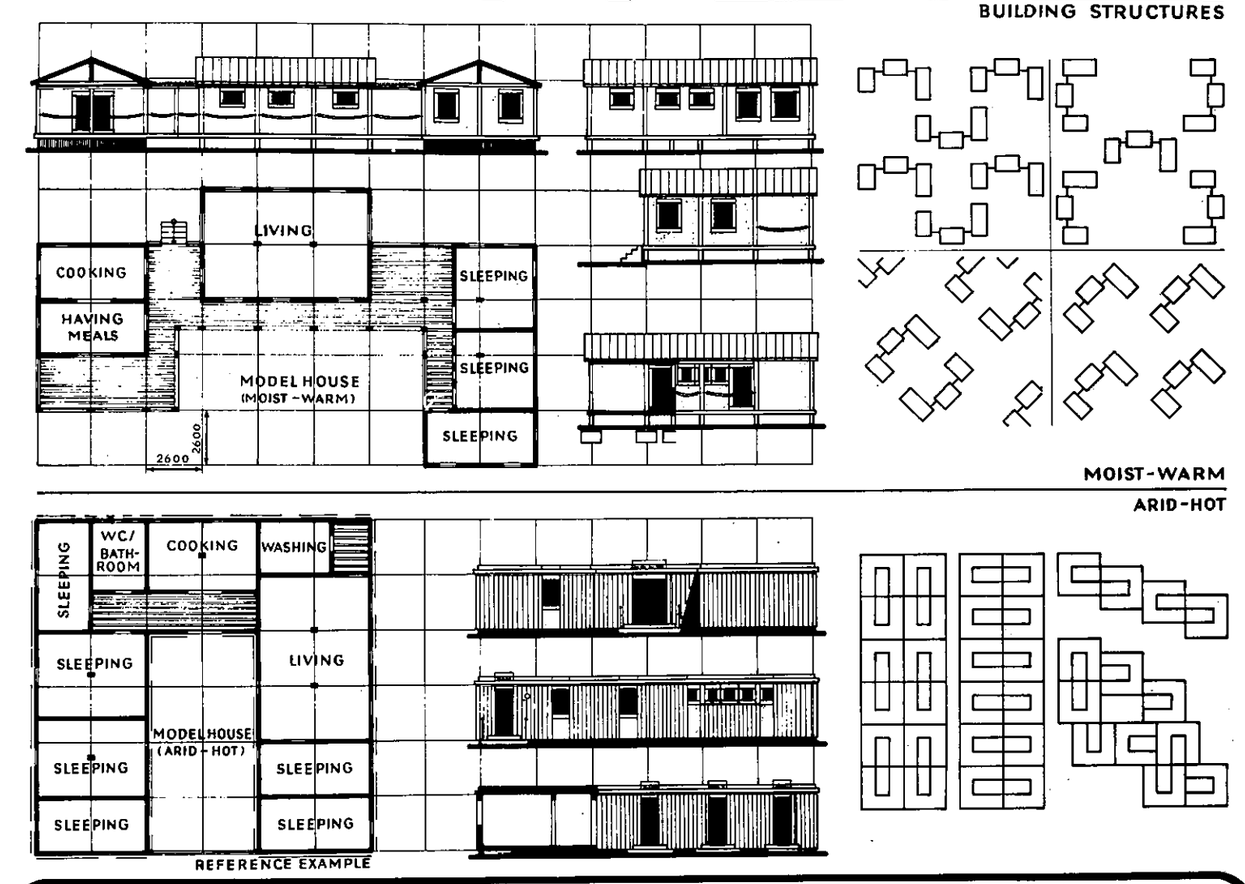
	CLIMATE ARID AND HOT		CLIMATE MOIST AND WARM	
	PREFABRICATION	BUILDING SITE	PREFABRICATION	BUILDING SITE
CEMENT	115,5 kg	20,1 kg	100,1 kg	20,1 kg
STEEL	11,3 kg	0,54 kg	12,5 kg	0,54 kg
AGGREGATE	770,0 kg	130,0 kg	670,9 kg	130,0 kg
LOADING MATERIAL	—	555,7 kg	—	275,7 kg



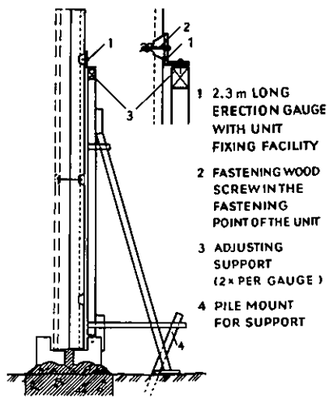
PRECASTING SYSTEM

CENTRAL TECHNOL. LINES FOR THE PRODUCTION OF CONCRETE FORMS		DECENTRAL TECHNOLOGICAL LINES FOR THE PRODUCTION OF PRECAST UNITS			
	h/d	CAPACITY m²/a	CAPACITY m²/a	CAPACITY * HOUSES/a	HOUSING SPACE FOR PERSONS
	8	42240	11151360	9868	118421
	16	84480	22302720	19738	236956
	8	84480	22302720	19738	236956
	16	168960	44605440	39473	473712
	8	168960	44605440	39473	473712
	16	337920	89210880	78947	803424
	8	168960	44605440	39473	473712
	16	337920	89210880	78947	947364
	8	337920	89210880	78947	947364
	16	675840	178421700	157894	1894728

- PER CONCRETE FORM 1 HANDLING / WORK. DAY ~23h AIR HARDENING
- DEMOULDING BY MEANS OF SCREWS CAUSING SHEARING FORCE (21) AND FASTEN TO RING BOLTS (20) IN THE CONCRETE THREAD
- HIGH-DENSE CONCRETE AND DEMOULDING BY SHEARING FORCES SECURE AN ABOUT 750 FOLD HANDLING / FORM AT A WORKING TIME FUND OF 264 d / a
- CENTRAL CONCRETE FORM PRODUCTION: INNOVATIVE INTRUSION TECHNOLOGY FOR THE OBJECTIFIED MANUFACTURE OF HIGH-STRENGTH FORMS GEOMETRICAL ABSOLUTELY EQUAL
- ONE WORKING CYCLE TIME OF THE INTRUSION „MALE MOULD" TAKES ≤15 MINUTES AND YIELDS 5m² FORM AREA
- TYPE I REQUIRES FOR:
  - CLEANING AND SPREADING THE RELEASE AGENT 2 WORKERS
  - TRANSPORTING AND INSERTING OF THE REINFORCEM. 4 WORK.
  - CONCRETE PRODUCTION AND TRANSPORT 4 WORKERS
  - OPERATING THE MALE MOULD 6 WORKERS
  - STORING AND LOADING THE UNITS 8 WORKERS
- TYPES I-IV CAN BE DELIBARATELY GROUPED AMONG EACH OTHER AND MATCHED TO ANY CAPACITY RATE



PRODUCT MODEL



SEQUENCE OF ERECTION OPERATIONS

- IN-SITU CONCRETE SINGLE OR STRIP FOUNDATIONS
- PLACING B-UNITS AS ERECTION LEVEL ON FOUNDATION
- ERECTION AND ADJUSTING OF ERECTION GAUGE (NOT REQUIRED IN ANY CASE)
- PLACING THE INTERNAL FORM UNITS AND FASTENING AT ERECTION GAUGE
- PLACING THE EXTERNAL FORM AND CONNECTING THE FORMS
- REINFORCED AND IN-SITU CONCRETE PLACING AND NATURAL MATERIAL BACKFILLING
- PLACING B-UNITS AND CEILING/ROOF PRECAST UNITS WITH ASSOCIATED IN-SITU CONCRETE OPERATION

PARAMETER PER REFERENCE EXAMPLE				
FORM UNITS	m²	m³	kg	NUMBER
EXTERNAL WALL	541,5	24,4	56000	648
INTERNAL WALL	208,3	9,4	21500	144
CEILING	190,0	8,5	19600	204
ROOF	190,0	8,5	19600	204
TOTAL NUMBER OF UNITS			1364	
ERECTION TIME OF CARCASS			20,0 d	
IN-SITU CONCRETE PORTION			12,7 m³	
STEEL PORTION AT THE BUILDING SITE			102,6 kg	
MAXIMUM WEIGHT PER PRECAST UNIT			150,0 kg	
PORTION OF NATURAL MATERIAL 95,1 t ... 105,6 t				

24687531

Le bois

SECTION III

- Matière première naturelle, renouvelable, facile à travailler
- Matière isolante, créant un climat d'habitation intérieur agréable
- Construction possible avec des moyens techniques relativement simples
- Excellent matériau pour construction de maisons de tailles petites à moyennes

DONNEES :

	bois gros et beaux	petits bois
	- raréfaction grandissante de bois de qualité → manque de bois de construction dans beaucoup de pays en voie de développement	- grande quantité de produits d'éclaircies, de qualité technique mauvaise, mals valorisés
	- longue période de production (80-200 ans)	- courte période de production (20-30 ans)
	- coûts d'approvisionnement élevés	- coûts d'approvisionnement faibles

1. bois résineux issus des grandes plantations d'après la deuxième guerre mondiale, d'Europe
2. bois issus de plantations sur place

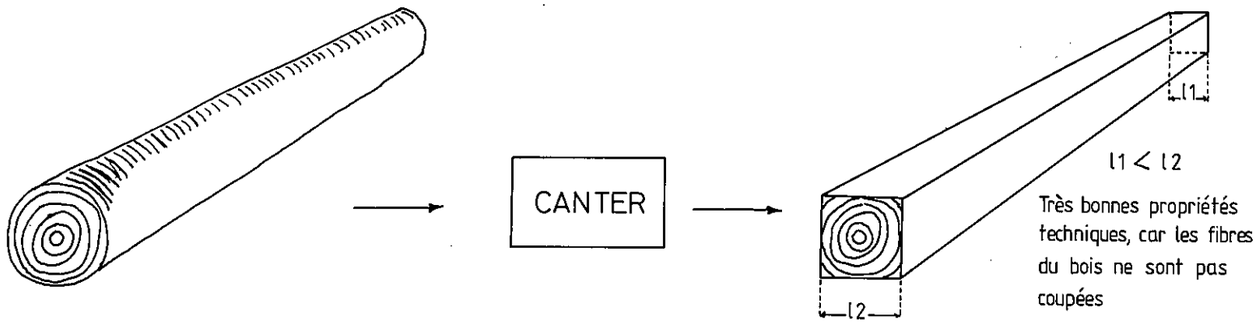
POSSIBILITES: nouvelles technologies pour petits bois

- BOIS CÔNIQUE: technologie simple, équipement de base simple et robuste: le canter
- LAMELLÉ-COLLÉ: poutres et plaques précontraintes
  technologie plus complexe, nécessite en plus du canter, une raboteuse et une presse

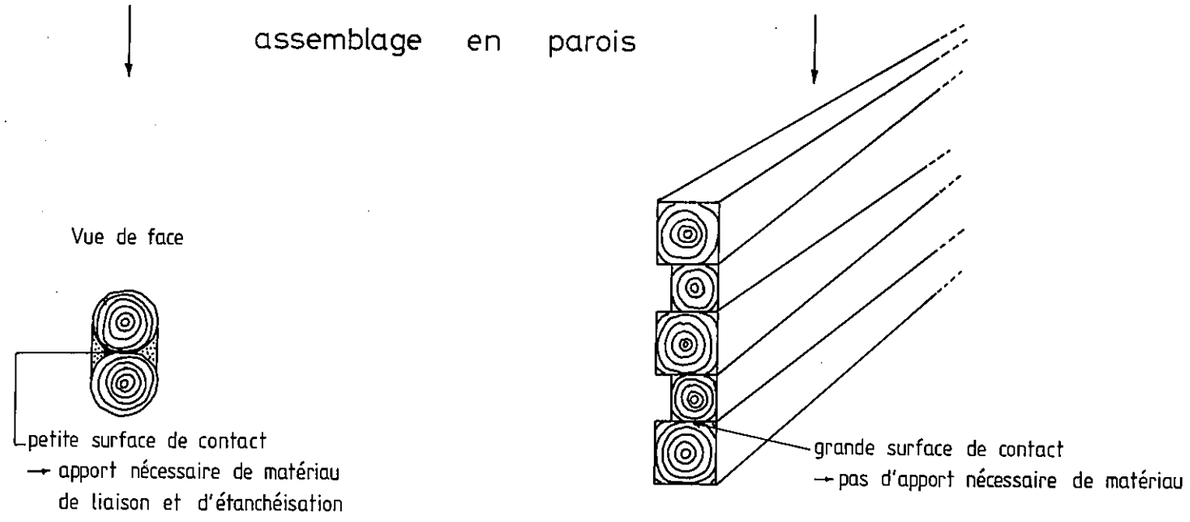
Dans les deux cas, très peu de déchets qui peuvent être utilisés pour:
+ fabriquer des briquettes → excellent combustible
+ produire du compost, source précieuse d'humus

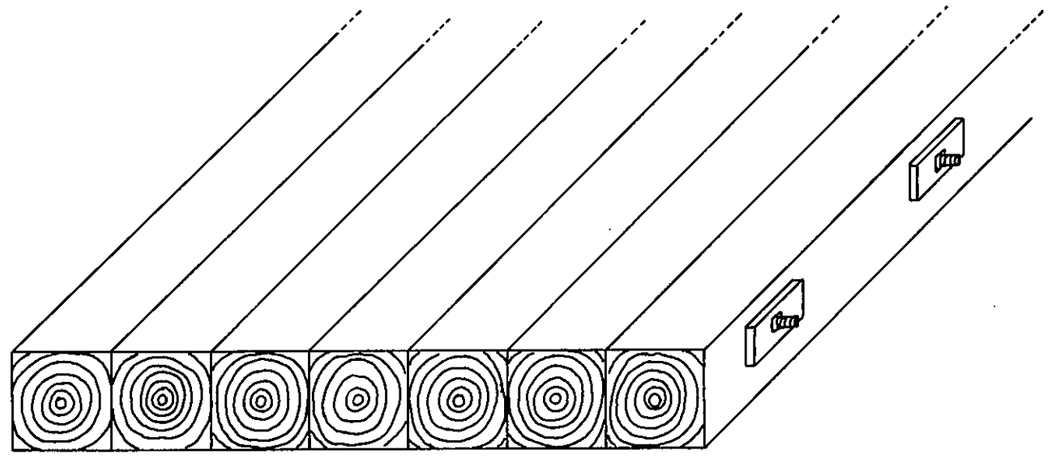
1. Technique du BOIS CÔNIQUE

PROCEDE : bois rond de petit diamètre, cônique, travaillé avec un diamètre variable au moyen d'un canter — poutres à sections variables



assemblage en parois





PLAQUE PRÉCONTRAINTE

2. Technique du LAMELLÉ-COLLÉ

Assemblage par collage de planches de dimensions variées en poutres et plaques

Les plaques peuvent être précontraintes et remplacent alors les plaques de béton. Avec une épaisseur de 25 cm, des plaques de 7m x 7m peuvent être construites.

11111115

MEMORIA

INTRODUCCION

Se presenta una propuesta concreta, completa, tecnológicamente experimentada y contrastada a nivel de prototipos construidos. Se trata de un ALFABETO CONSTRUCTIVO.
La finalidad última de esta propuesta es la de proporcionar HERRAMIENTAS TANGIBLES, al margen de elaboraciones puramente formales que poco o nada tienen que ver con la realidad del hecho de construir en los paises en vias de desarrollo (P.V.D).

El ALFABETO CONSTRUCTIVO QUE SE PROPONE (BLOQUES Y PEQUEÑOS PANELES) Y LA SINTAXIS DE USO (RESOLUCIONES CONSTRUCTIVAS NEUTRAS) NO INTENTA CONSTITUIR UN SISTEMA.

¿qué hormigones?

Hormigones: la propuesta se centrará a modo de ejemplos en dos dosificaciones concretas (valores en peso):

Dosificación A	Dosificación B.
40% de cemento P-ARI-450;	50% de ceniza de cáscara AHA
40% de ceniza volante;	15% de cal
20% de cáscara de arroz tratada;	15% de cemento P-ARI-450
	20% de cáscara de arroz tratada.

¿qué elementos?

ELEMENTOS MUY LIVIANOS Y MANEJABLES(EL PESO MAXIMO ES DE 32 KG).

ELEMENTOS NEUTROS CAPACES DE SER FACILMENTE TRANSFORMADOS Y EMPLEADOS EN DIFERENTES FUNCIONES CONSTRUCTIVAS.

ELEMENTOS QUE PUEDEN SER PRODUCIDOS A VARIOS NIVELES DE DESARROLLO TECNOLOGICO (manual-artesanal, semi-industrial e industrial)

ELEMENTOS A BASE DE MATERIALES FUNDAMENTALMENTE AUTOCTONOS, CAPACES DE DAR RESPUESTAS A REALIZACIONES CON PRESUPUESTO DE CONSTRUCCION INFERIOR A 75$ USA/m2 .

ELEMENTOS QUE PERMITAN ASUMIR, MEDIANTE SENCILLOS COMPLEMENTOS, ACCIONES EXTERNAS HORIZONTALES LIMITES (SISMOS Y CICLONES).

ELEMENTOS QUE PUEDAN EMPLEARSE CONJUNTAMENTE,CERRANDO UNA SOLUCION CONSTRUCTIVA O BIEN UTILIZARSE COMO COMPLEMENTOS.

¿qué zona geografica?

Los soluciones que se presentan se centran, para su viabilidad, especificamente, en zonas de producción arrocera intensiva.
Dada la presencia y particular interes del equipo de trabajo por el problema de la vivienda en Latinoamérica, el trabajo se dirige prioritariamente a la zona de coincidencia entre:producción arrocera/Latinoamerica.

¿qué tipo de usuarios?

El ALFABETO CONSTRUCTIVO propuesto se presta prioritariamente para ser empleado por los propios usuarios en sus distintas formas organizativas como:
-AUTOCONSTRUCTORES AUTONOMOS, familias aisladas;
-MEDIANTE AYUDA O ESFUERZO MUTUO,autoconstrucción organizada;
-AUTOCONSTRUCCION ASISTIDA, grupos sociales con apoyos institucionales.
-COOPERATIVISMO, participativo o de financiación;
-BANCOS DE MATERIALES,mediante suministro de elementos;
-EMPRESAS CONSTRUCTORAS.

SE HA ESTIMADO QUE EN EL SECTOR INFORMAL SE CONSTRUYE HOY EL 60% DE LAS VIVIENDAS URBANAS Y CASI LA TOTALIDAD DE LAS VIVIENDAS CAMPESINAS (INFORME CEPAL 1983).

¿qué marco socioeconomico?

La propuesta se dirige a un amplio estrato socioeconómico de Latinoamérica que de forma esquemática puede acotarse mediante el conjunto de las siguientes características:
- Familias con ingresos no siempre estables y comprendidos entre uno y tres salarios mínimos;
-Ubicados en los suburbios periféricos urbanos de los grandes y medianas ciudades;
-Núcleos familiares con alto índice de natalidad conviviendo en muchos casos parientes y allegados;

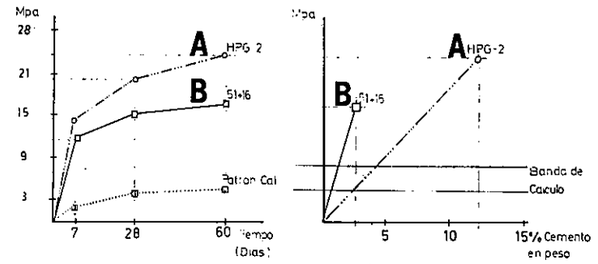
PARA EL AÑO 2000 CERCA DE LOS DOS TERCIOS DE LOS HABITANTES DE LAS GRANDES CIUDADES DE AMERICA LATINA VIVIRA EN LA POBREZA(INFORME CEPAL 1984).

alta repercusion de materiales:

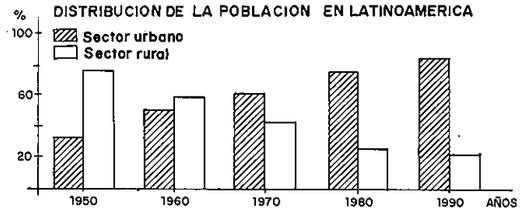
		COMPONENTES BASICOS DEL PRECIO DE LAS VIVIENDAS DE INTERES SOCIAL EN %					
		COSTE DE CONSTRUCCION			SUELO (URBANIZACION)	FINANCIACION	OTROS
		TOTAL (M.O.+MAT)	MANO DE OBRA	MATERIALES			
P.V.D.*	SECTOR "FORMAL"	50%	16,7%	33,3%	20%	10%	5%
	SECTOR INFORMAL	50%	16,7%	33,3%	5%	10%	5%
PAISES DESARROLLADOS		50%	33,3%	16,7%	25%	15%	10%

*P.V.D. —PAISES EN VIAS DE DESARROLLO

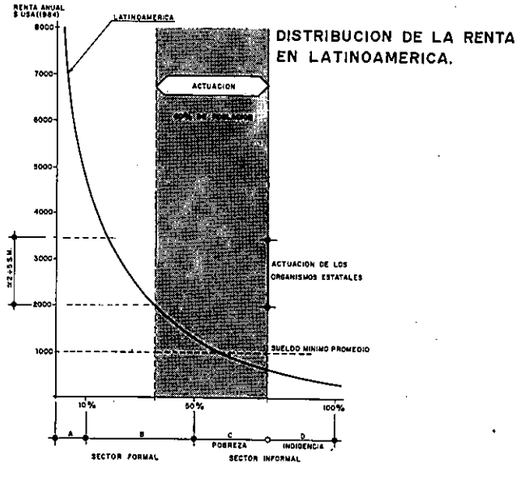
hormigones de bajo coste:



familias urbanas en expansion:



sector al que se dirige la propuesta:



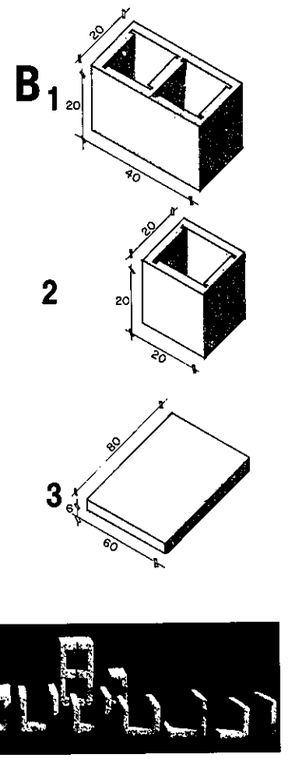
EL PROCEDIMIENTO CONSTRUCT

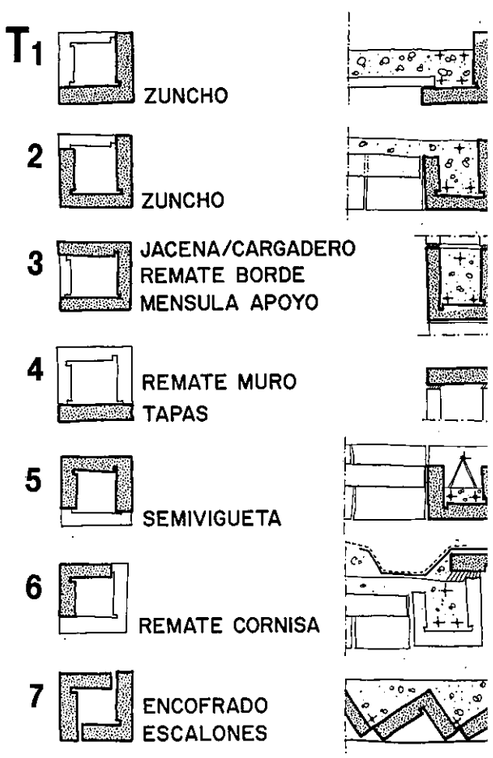
CONCEPTO

Se trata de una estructura de albañileria armada que responde a los siguientes planteamientos:
REDUCIDO NUMERO DE ELEMENTOS; tres únicas piezas concebidas para actuar con la doble función de cerramiento y/o encofrado perdido de distintos elementos estructurales.
OBTENCION DE PIEZAS COMPLEMENTARIAS: aprovechando la trabajabilidad del material y el diseño especial del elemento base B2 se pueden obtener siete piezas adicionales (T1, T2,.....T7) con distintos usos constructivos.

El conjunto de elementos básicos y complementarios, permite su empleo, como un todo, con sus propias reglas del juego (sintáxis de uso)capaces de proporcionar soluciones completas.Tambien admite múltiples soluciones mixtas a base de los elementos del alfabeto y otros ajenos pero fáciles de compatibilizar. A modo de ejemplos:
-Con bloques tradicionales (fig H)
-Con forjados a base de viguetas y paneles o bovedillas prefabricadas convencionales.(fig E)
-Con huecos independientes con sus propios refuerzos.(fig D)
-Utilización de paneles (B3) como cerramiento vertical. (fig G)

El atado vertical se obtiene mediante el relleno de algunos núcleos (cada 100 cm) en función de la intensidad de las acciones horizontales .
El atado horizontal se asegura, por el efecto de confinamiento de los núcleos y zunchos hormigonados y por medio de armadura transversal que sin intervenir en el cálculo, evita una posible rotura frágil por desplome de los elementos de cerramiento ante solicitaciones laterales criticas.

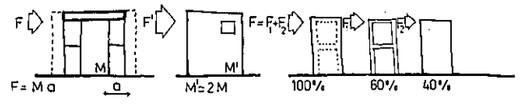


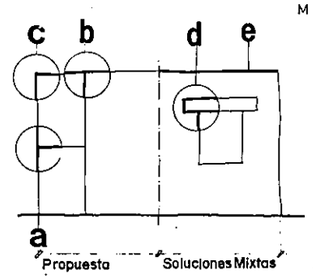


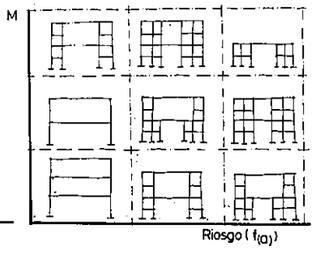
COMPORTAMIENTO

Los muros propuestos presentan una masa de la mitad que un muro equivalente realizado en adobe, por tanto ante una misma aceleración estarían solicitados por fuerzas del orden de 1/2, Esto unido a su mayor resistencia, le da un mejor comportamiento estructural.

Ante acciones horizontales la propuesta se comporta simultaneamente como pórtico y como muro, siendo considerable (40%) la proporción de esfuerzo que absorbe el cerramiento a pesar de su bajo módulo de elasticidad.

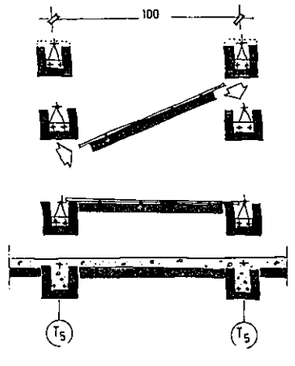




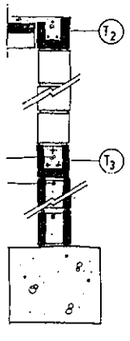


Refuerzos en funcion de M y a

FORJADO



MURO



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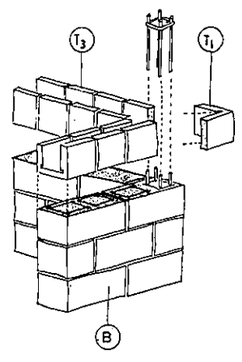


IVO: - BASES DE UTILIZACION, TIPOLOGIAS, CRECIMIENTO

BASES DE PROYECTO

urbanizacion concurso PREVI-PERU (1)

AGRUPACION LINEAL de viviendas.
LOTES RECTANGULARES.
MEDIANERAS COMUNES.
FRENTE MINIMO, para permitir un uso mas económico de las redes sanitarias.
AREA DE LOS LOTES entre 80 y 150m2.
DENSIDADES entre 36-40 viv/Hectarea y entre 220-240 hab/Hectarea.

arquitectura

ESPACIOS BASICOS; sala-comedor, dormitorios, baño, cocina y circulación vertical.
CRECIMIENTO PROGRESIVO; en función de las necesidades familiares. Las obras de ampliación se han de poder realizar por autoconstrucción.
AREA DE OCUPACION en el lote entre 45-60%.
AREA CONSTRUIDA entre 10-14 m2/habitante.

sistema constructivo

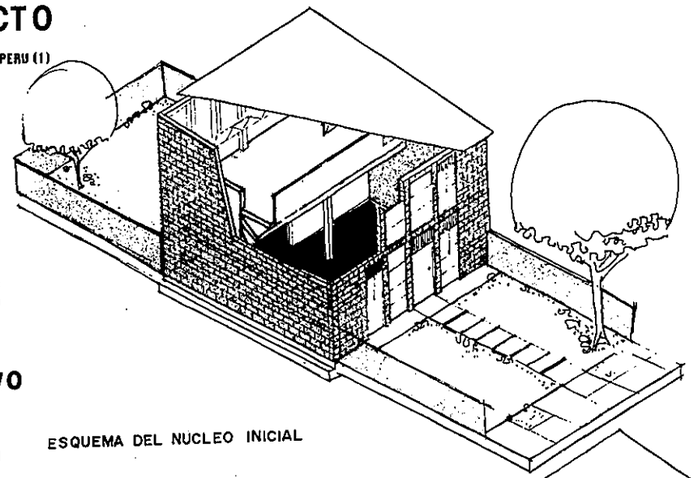
MUROS PORTANTES DE BLOQUES con espesores de 20 cm han resultado ser los más económicos.
REDUCIDO CONSUMO DE ACERO.
MUROS EN AMBAS DIRECCIONES mejoran el comportamiento sísmico.
LOS FORJADOS unidireccionales y aligerados son ventajosos por aunar ligereza y rigidez.

instalaciones

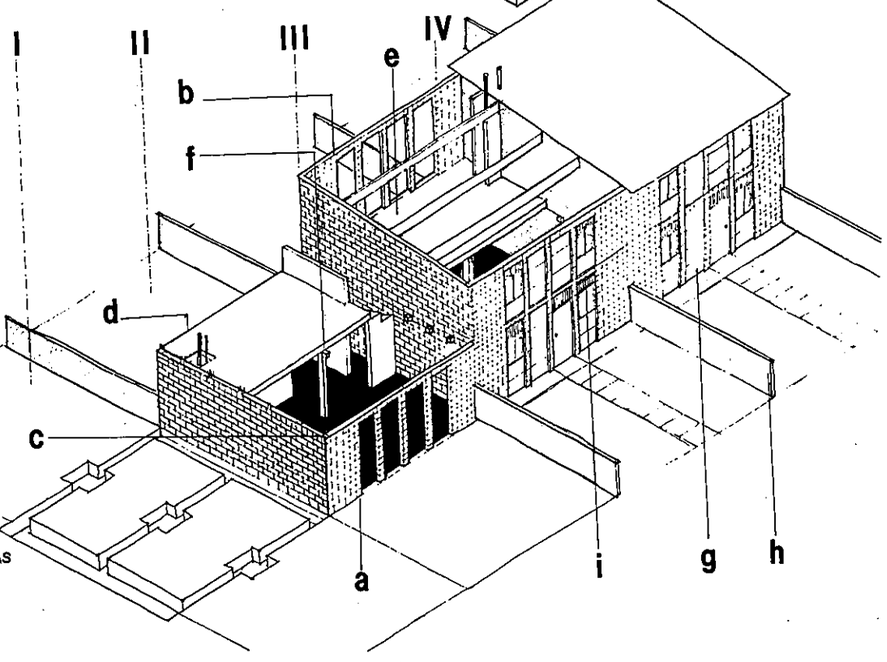
ELECTICIDAD; las instalaciones electricas deben de ser de tipo "empotrado" por seguridad y durabilidad.

SANEAMIENTO; es conveniente dejar las tuberias de desagües a la vista.
Se deben nuclearizar los servicios (baño/servicio /lavadero)
El ambiente baño compartimentado permite el uso múltiple de los aparatos sanitarios.

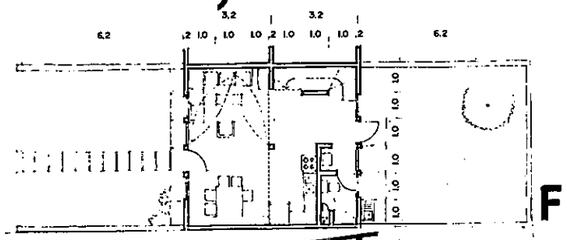
(1) PREVI.-
Concurso internacional de Proyectos de Vivienda experimental. Lima, Perú. Para 2000 familias de bajos ingresos con el objetivo de buscar soluciones que permitieran resolver el problema de la vivienda.



ESQUEMA DEL NUCLEO INICIAL

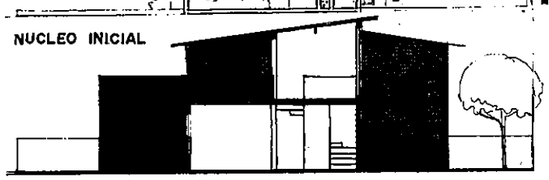


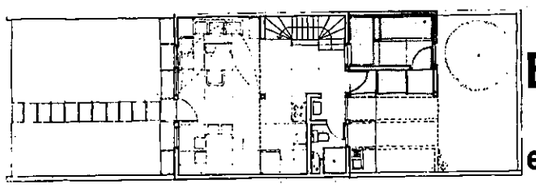
ETAPAS CONSTRUCTIVAS



F 49.5 m

NUCLEO INICIAL

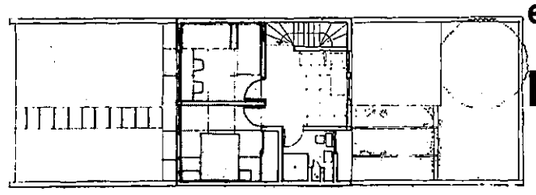




E1 58.5 m

e2 67.5 m

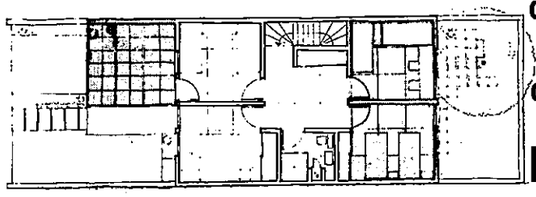
ETAPA DE EXPANSION



e3 76.5 m

E4 85.5 m

ETAPA DE DENSIFICACION

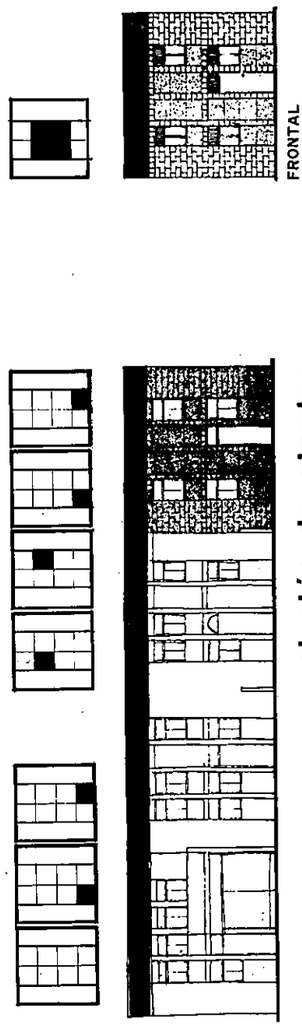


d1 94 m

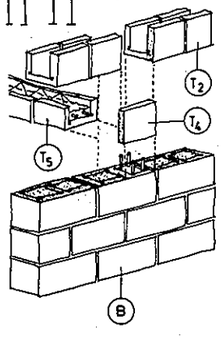
d2 103 m

D3 112 m

ETAPA DE CONSOLIDACION



NUDO b



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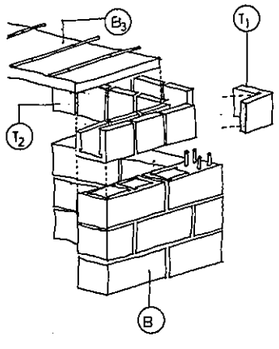

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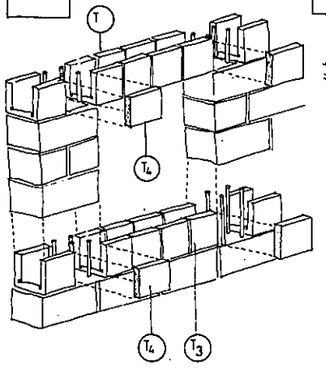

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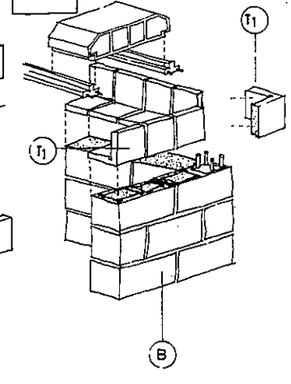

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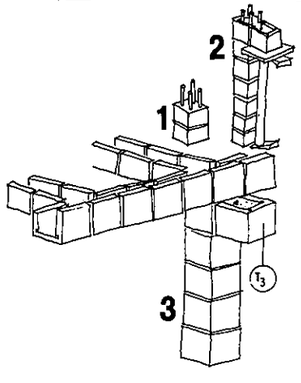

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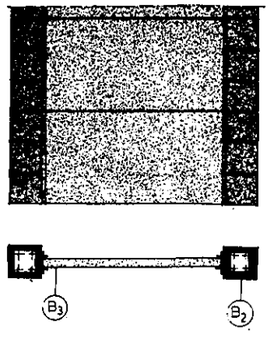

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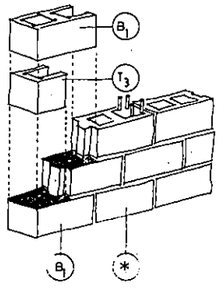

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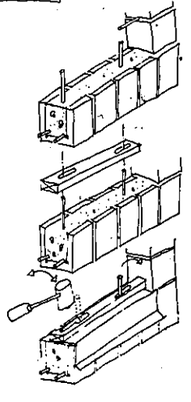

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The aim

This project will present an old technique in a new tapping adapted to a specific demand for emergency habitation for homeless. The technique is characterized as earth-covered cabins built up from thin bent shells of corrugated iron-plates.

The specific demand is defined as the situation when a great number of people have lost their homes because of catastrophes, or threat caused by politics, discrimination, contamination, war acts, etc. and are forced to settle in a new settlement.

The demand is more or less urgent and requires rapid efforts in order to organize roof shelters but also to establish satisfactory protection of the shelters withstanding particularly climatic disagreeables.

Assumed conditions for the settlement

This project is focused on the situation when an immediate demand for shelters for a large group of people occurs, for which reason a great number of shelters should be built for a reasonable low investment and with little use of imported material.

The general conditons for the settlement should include suitable land with deep soil, regulation of allotments, drinking water from wells and pipes and transportation facilities. Even if the circumstances speak for a temporary stay there is a general tendency and also an advantage that the settlement after birth grows and develops as a community.

After the first-hand demand for shelters, second-hand demands will appear for taking charge of young and old, supply, employment, community possibilities, etc.

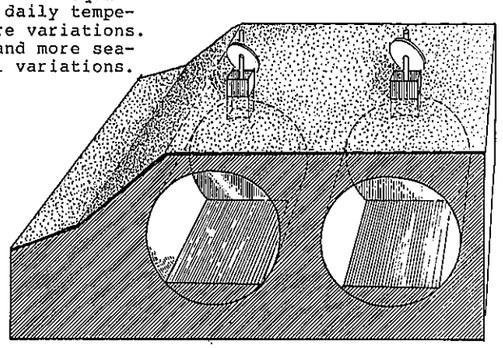
The project assumes within the individual allotment:

- o space for cultivation of vegetables, etc.
- o separat pit latrine

for a group of homes:

- o tap place for drinking water
- o area for washing clothes and bodies
- o assembly room, furnished with radio, TV, etc.
- o power supply for lighting, radio, TV, etc. in common areas from suncellbatteries
- o common ground for play and recreation.

The structure of the settlement and the construction of the shelters should be given dimensions that allows a gradual complement - of supply with electricity, water and sewage to the individual homes and additional rooms forming a more ordinary low-cost house.



The earth-covered shelter shows thermal stability. Cover of more than 0,5 m soil equalizes daily temperature variations. 5 m and more seasonal variations.

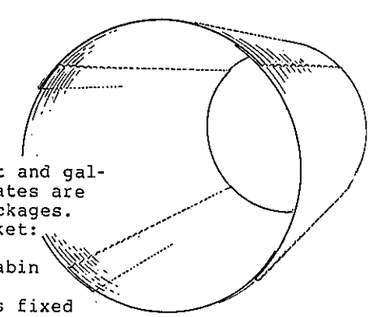
Properties of the earth-covered cabin

The earth surrounding the cabin protects the inside space from changes of outside temperature and accumulates heat, which means low or no additional heating for a pleasant inside.

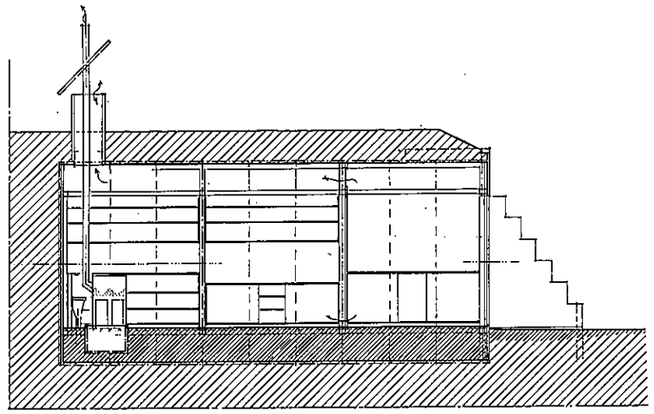
A thin shell of corrugated iron-plates keeps the earth stable around the cabin. The inexpensive plates bent circular forms a round earth-arch capable to carry load from above. The shell is very light and the iron-plates easily transported and handled. Joining of the plates on a sparce wooden frame demands no specific tools and should be done by the prospective inhabitants.

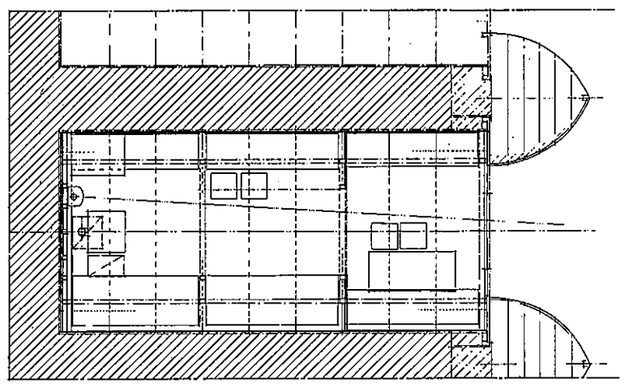
Surface treatment of the iron-plates will generally include galvanizing but should be adapted to the climatic conditions. In a developed stage corrugation and bending of the plates can be handled in a local workshop use of simple tools.

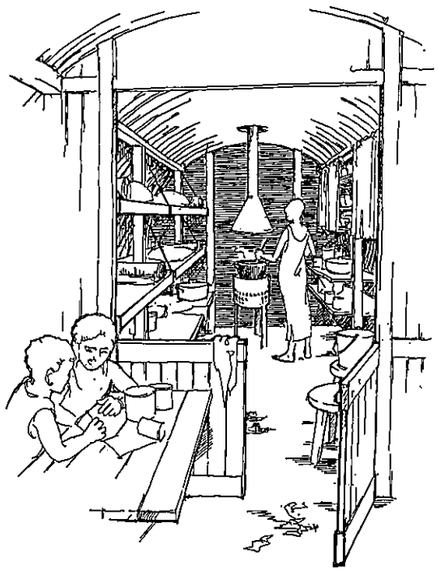
Other use of iron-plates shell for earth-covered building and for stabilization of earth-walls is presented. Other material for the shell can be used if economical.



Corrugated, bent and galvanized iron-plates are delivered in packages.
Cost in the market:
1 USD per kg
~430 USD per cabin
(exkl transport)
4x10 feet plates fixed together form a big pipe





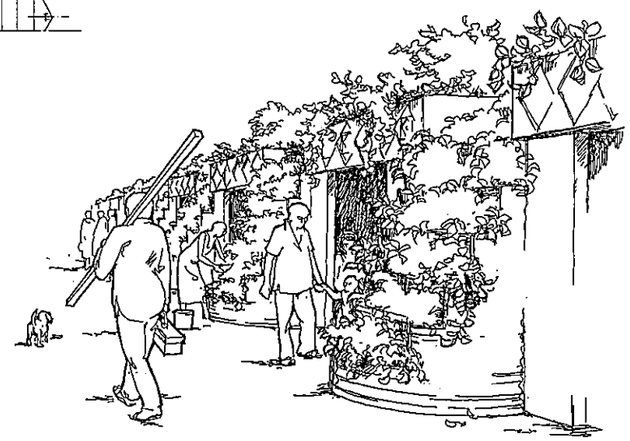


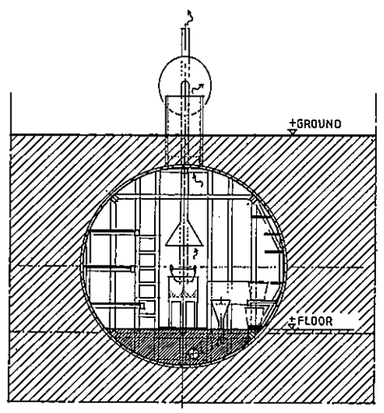
The earth-covered cabin

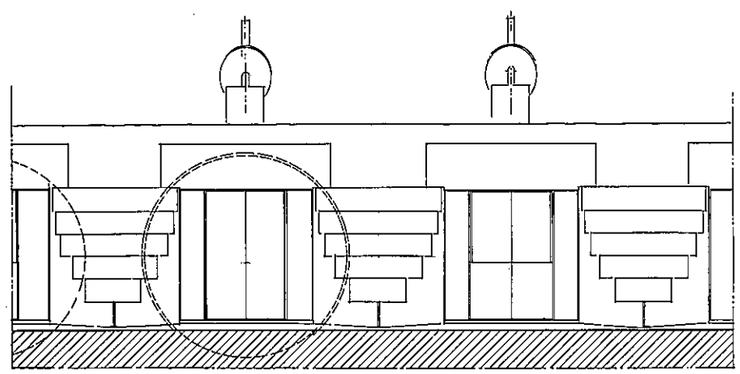
The 3.2 m wide cabin-shell has a length of 7 m, 4.5 m protected and 2.5 m open space. If necessary the wall and door between is heat-insulated. The cabin is ventilated through the wall and the sky-light in the ceiling.

Room is possible for 6 barrack-beds indoor cocking, necessities, etc. Under the floor of soil and stones is space for chilled food and drinks.

Iron-plates facing the earth are painted with asphalt. The earth slope towards the entrance is stabilized with vertical plates.





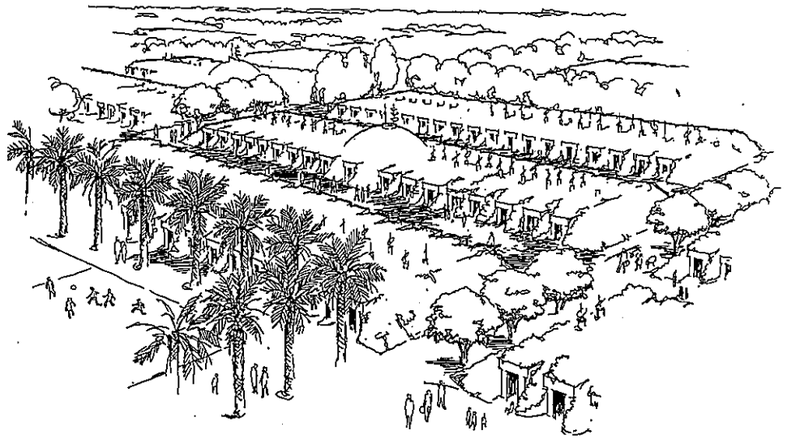


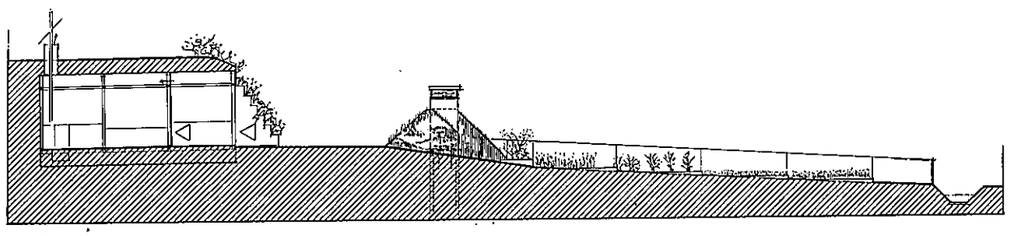
Shaping the neigbourhood

The shape of the land surface leads rain water down to ditch but is checks under way for watering the cultivation. The general picture of the settlement may grow into planted green.

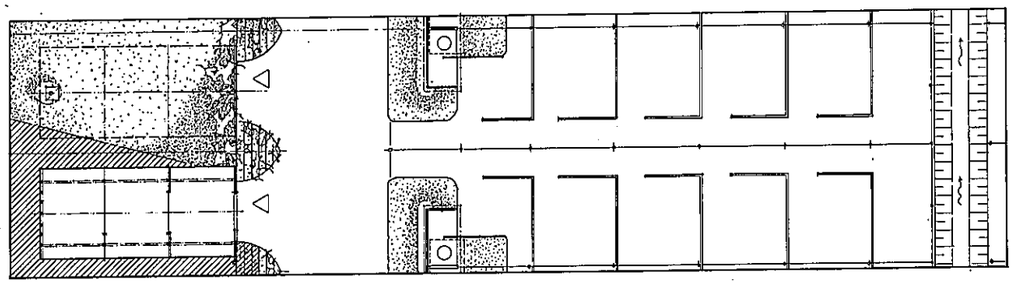
In the strip of neck to neck built cabins are alloted areas for washing clothes and bodies covered by rain roofs and for assembly room as an earth-covered dome.

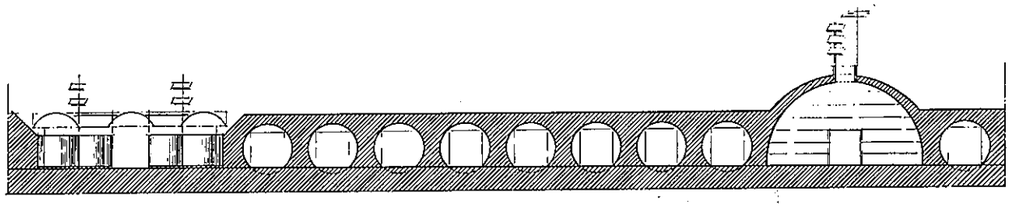
In the schematic organization is shown how groups of earth-covered cabins can fit in an ordinary settlement with zones for physical training, recreation, schools and nursery workshops within reach for the settlers.



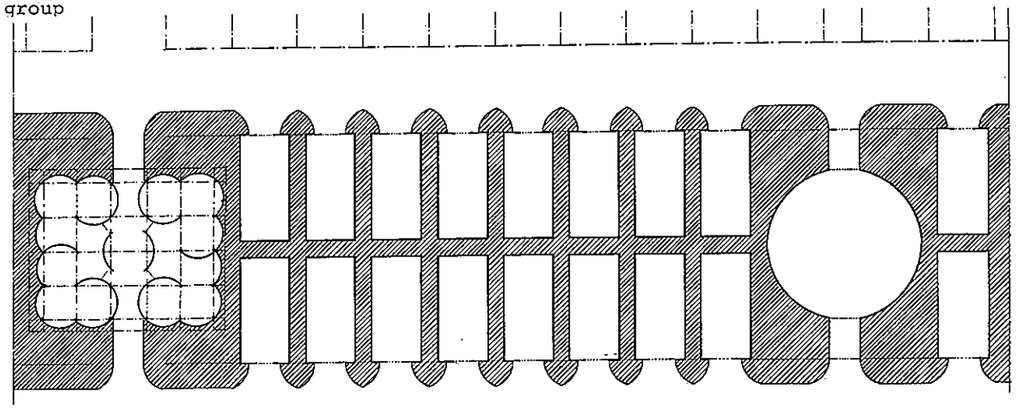


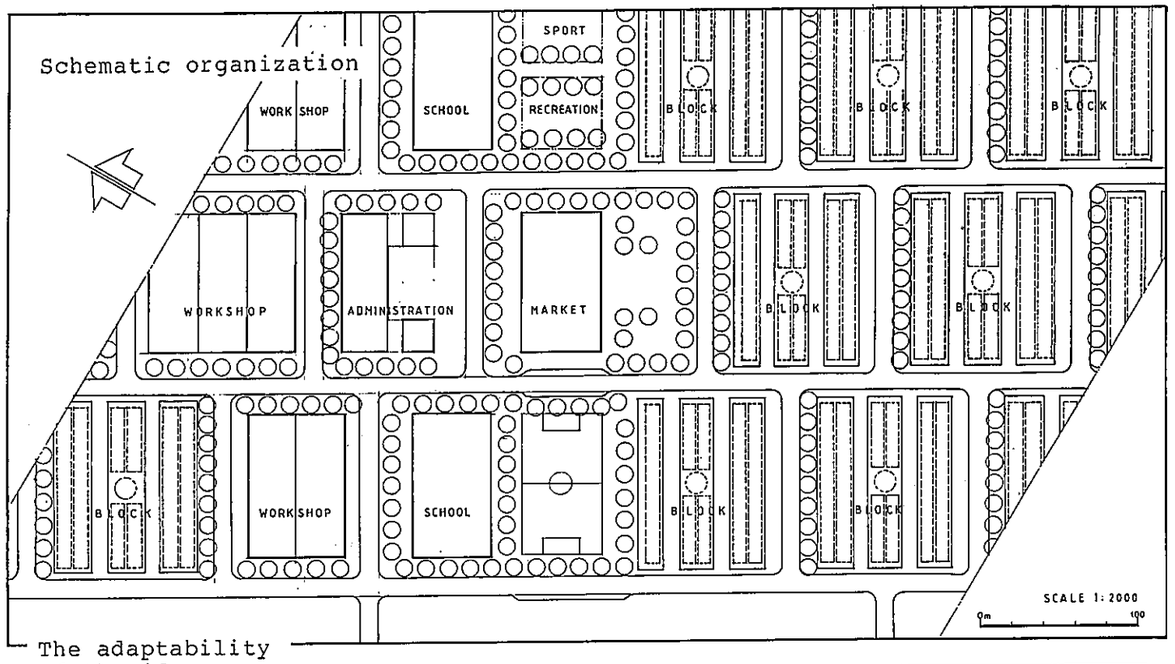
Allotment





The group





The adaptability of the idea

There is no actual tradition of living in ground although millions of people do in a few places of the world. The idea of earth-covered cabin should be observed due to the low investment. the good protection and the rapid erection. This project will try to emphasize the possible use of the idea partly in an emergency situation partly in a more developed stage of the settlement.

Future development

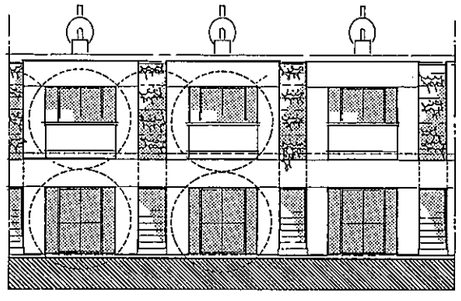
After the initial phase of the settlement and if the idea is accepted by the owners one can assume that the number of people in each shelter is reduced that the protected space will be expanded but also additional rooms are required. These possibilities are displayed following the principle for earth-covered cabin.

Even water supply and sewage system connection in the house as well as electricity etc. should be provided.

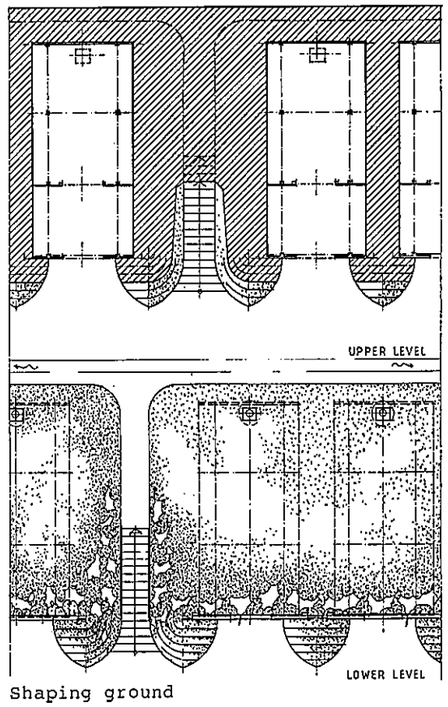
As the earth-covered cabin represents a small investment it may be replaced by a more conventional building, if desired.

Shaping ground

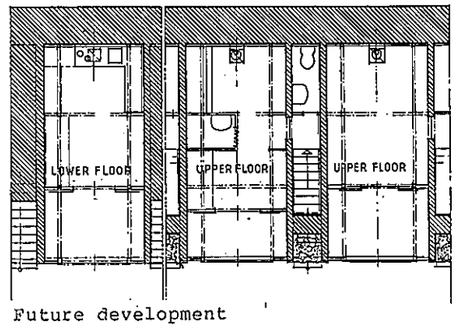
The earth-covered cabin is easily adapted to a sloaping ground where entrance is taken from the roof of the neigbouring shelter below.



Future development



Shaping ground



Future development

IYSH

INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS (IYSH)

INTERNATIONAL COMPETITION FOR SOLUTIONS
SECTION III

THE PROBLEM. AN APPRAISAL

The plight of the homeless throughout the world and in the developing countries in particular has been clearly stated in the introduction to the International Competition for Solutions for IYSH and the statistics detailed therein dictate that the international community must confront the issues squarely and with determination in order to alleviate the poverty and misery which abounds in our troubled world.

Considering the concept of housing generally, the author feels that the passage of centuries has given substance to accepted house-forms, that the standard of technology at any given period in history has given rise to adequate housing for the populace when numbers were relatively sparse, when time was relatively unimportant and when the traditional housebuilder was continually developing his craft.

The present era has brought dramatic changes in population numbers and those in need of housing. This has had a dramatic effect on time availability and consequently on the ability of builders or manufaccurers to construct or provide the necessary accommodation. Here we do not take cognisance of those important forces such as finance and the legalities which obviously play their dominant role in the provision of housing generally.

The aspect of the adequate house needs some consideration. Where indigenous materials play a total role in the provision of housing by the people for themselves without the influence of any providing authority or agency, the product of the housebuilder's own labour has resulted in what might be often considered to be a primitive dwelling. The technological deficiencies of the home builder have induced him to accept that which he had done for himself as adequate even though uncharitable weather causes him to redo or to repair his abode on a regular or ongoing basis. The technological limitations of the prospective homebuilder will always result in a less than satisfactory house product. The imposition of the traditional western house example on the individual on a self-build basis is impossible because he has not the ability to undertake and complete such a task. So, we ask, how can a balance be reached which will embrace auto-construction and still provide an abode which is

adequate on a more technological level albeit still simple| an abode that is durable, transportable, recycleable and which will provide comfort standards for the benefit of those homeless people?

And what of those who yearn just for shelter to afford them temporary relief from the elements? A place to stay until, hopefully, a more permanent abode could be built by them| some respite, a time to gather together their energies and their thoughts and their will to undertake the task of constructing a home for themselves and their families?

Could there be such a design? Something that could be undertaken successfully on a large if not massive scale? A system which could range, within its basic design, from a simple shelter to a permanent home simply by selecting the appropriate material, structural elements which could be manhandled in all its material forms. Could there be a house which is transportable so that the housebuilder might take it with him should he wish to move to a different location, something which he could demount, could reduce to its basic elements and then reconstruct again elsewhere? To recycle as a durable entity? Could there be such a system which would cater for all this merely by the simple choice of materials?

The author presents his proposals.

CONSIDERATION OF DESIGN PRIORITIES & CRITERIA

We consider the following common aspects.-

1. Unskilled Labour Resources.
The best process whereby sufficient dwellings could be constructed to house all the homeless was the utilisation of the prospective housebuilders own labour and that of his family. The building process would thus have to be simple and uncomplicated in its execution.

2. Large Scale Application.
There was no question at all that the complications of the "traditional" western-type house even in its simplest form could never be reduced to the extent that it could be mass produced in such numbers to solve the housing problems of the homeless. A simple solution lay in reducing the house building complexity to a few major basic modules or modifications thereof which could be made and prepared on site or in centrally positioned factories, which could be manhandled even in its most dense form, which could be of many different materials yet all of a single basic design,

which within the constraints of such a design could have differing dimensions if so required. And within the same configuration, communal facilities so important to the surroundings and to the neighbourhood itself could be manufactured and erected. All applicable on a massive scale for international use.

3. Simple Technology.
Such technology dictated that a new simple innovative approach to the problem should be considered and was in fact required. If the solution lay in the design of a simple single basic module then it was possible that consideration of the basic geometric shapes could provide direction to an overall solution.

4. The Surroundings to the Houses.
Quality of life is nurtured not only within the home itself but also within the community. In evolving societies or neighbourhoods the importance of the communal nodes cannot be overstressed. The author has taken cognisance of these important aspects but will not go into any further analysis thereof which in itself is a major and dominant aspect. Suffice to say that the need for such nodes and the juxtapositioning of such houses around such communal nodes was taken into account in the consideration. See 2 above.

5. Domestic Flexibilty| Expansion and Contraction.
The flexible house which could be expanded or reduced with little difficulty was an obvious preference which affected the overall design considerations.

6. Balance between New and Existing Technologies.
Taking cognisance of the fact that the passing centuries have given substance to the house form, the design proposals were further honed by what was felt to be an acceptance of the evolved historical house concept and the solution in its simplest form was regarded as a new structural innovation applicable thereto.

7. Costs.
The total cost of the final proposal was regarded as being of the utmost importance not only insofar as the manufacture of the basic module was concerned but also in its speed of construction. The solution sought was to be efficient in all its aspects.

8. Energetics| Recycling.
The avoidance of waste through efficient recycling of the building module (see 2 above) should be carefully considered as the collective impact of such an innovation would have a dramatic impact on the economies of such proposed housebuilding. That there should be no wastage of the major

basic element in its possible reusage - where the abundant availability of unskilled manpower was sufficient to override any other economic consideration concerning the re-utilisation of such elements - became an important consideration.

9. Energetics| Transport.
If consideration was to be given to the concept of recycling, it was felt that attention should be given to mobility| the possibility of moving the entire house structure from one situation to another should this be desired.

10. Dimensional Flexibility.
If a final module form was to be sought it was felt that consideration had to be given to dimensional flexibility in the sense that communal activities should be provided for in equally facile but much larger structures based on the same principals.

THE DESIGN PROCESS AND COMMENTS.

The aforementioned considerations of design priorities and criteria indeed formed the basis of the design. Taking them all into account it was felt that a simple geometrically shaped module should be sought which could be affixed the one to the other so that it might, upon erection, take upon itself a form which would become walls and roof in one. Ideally this structure would be assembled initially on an horizontal plane and would be erected or raised from its basic horizontal configuration in a matter of minutes.

It was also required that the module be suitable for manufacture in many varying materials and that the module, in even its most dense state, be manufactured off-site or in-situ, and that if manufactured off site, it would be of a size not hindered by transport limitations, e.g. size of truck or delivery vehicle.

Various geometric forms were considered and tried. The triangle was finally decided upon. This form, coupled with the introduction of simple hinge actions along all its sides - in its positive and negative movement patterns - when attached the one to the other automatically reacted to an upward lift and formed a vaultlike spatial enclosure in one simultaneous movement. But this was not all. The hinge permitted the erected structure to concertina, i.e. to be folded or squashed together when in its erected state which reduced the volume occupied by the overall expanded structure to anything between 5% and 15% of its original extended form dependant

upon materials utilised.

The triangular hinged module can be manufactured in almost any material form ranging from the triangular hinged voided frame, the triangular hinged sheet, or board or even reinforced concrete with sandwiched insulation. The permanency of the final structure being dependant upon the choice of material. For example, a reinforced concrete or aerated concrete structure would be totally weather exclusive and permanent whereas the triangular hinged frame (with void) would be covered with a weather excluding membrane. The latter would be a shelter only but still a great improvement on the makeshift shanty.

Even the permanent reinforced concrete structure example is transportable. The steel rods within the module are so designed as to form the hinge itself and these can be undone, the structure can then be lowered, demounted and transported elsewhere. This process obviously applies to all such structures in all chosen materials. Various countries or geographical locations would require varying material choices but the basic principal remains. These homes are durable, transportable and, if no longer required by the homebuilders, can be recycled.

And what of flexibility? Expansion or contraction? The proposed home can be extended by the simple addition of whatever number of required modules - there is no structural limitation in this regard - without the need to lower or demount the original structure. The basic assembly of the proposed extension and its erection process is repeated, the extended section being attached by hinge to the existing house and the extension is complete. The reverse process occurs for reducing the size of the home should this be required.

Auto-construction is the theme. The modules can easily be arranged on the ground, can easily be attached hinge to hinge and only in the heavy concrete example is there a need for a rough terrain mobile crane capable of lifting up to 20 tonne. And what of the manufacture of the modules? Even the concrete variety can be made on site by unskilled hands. Moulds are prepared, shaped steel rods are introduced and the concrete is prepared and poured, spread and levelled. There is no need for skill once the initial supervision has been completed. This applies as well to the lighter varieties except that the hinges, in all their forms, would be attached to each module of whatever selected material, by unskilled hands. The concept of unskilled hands or untrained labour does certainly not reduce the individual to an inadequate state. Simple tasks are quickly and efficiently mastered.

The concept of using only local or indigenous materials per se cannot be totally accepted. In our early discussion on the problem and its appraisal, we contended that indigenous or local construction materials, where these are not wholly suitable, do not, merely through their utilisation, produce adequate houses. The author feels however that the production of the standard module as proposed can be of whatever materials are most readily available consideration being given to requirements of permanency etc.

The described modular system and its low technological level is extremely suitable for auto-construction and answers most of the design requirements demanded of it. The physical relationship of the interior of the completed house to its inhabitants, even where sloping side walls appear to be restrictive, is entirely acceptable. Occupants have free reign. Where seating and sleeping occurs, these activities are positioned where full height is not required. This can be discerned from the interior layout plans shown elsewhere in this document.

THE SOLUTION| THE FOLDAPOD, A STRUCTURAL SYSTEM.

The descriptions which follow are geared towards describing the characteristics and means of producing a structural system capable of being used as a house form in the latter's entirety. While other documentation will provide detail of house floor plans, sections and elevations it must be appreciated that these descriptions are for one material type only as are the few details which have been included as examples of possible solutions to various incidental yet no less important aspects of housing.

The "Foldapod", the name given to the final design solution by the author, consists of a plurality of triangular structural elements or modules, isosceles triangles, which have two sides of equal length. (Refer sketch 1) Hinges connect all three sides of each module to the three sides of each adjacent module until the entire length of the proposed structure has been laid out in an horizontal plane. (See sketches 2 and 3) All diagonal sides are hinged in one direction (i.e. negative hinge action) and all remaining sides are hinged in the opposite direction (i.e. positive hinge action).

By imparting an upward lift to this described configuration, the triangular elements automatically respond to the hinge movement freedoms and begin immediately to assume a ridged

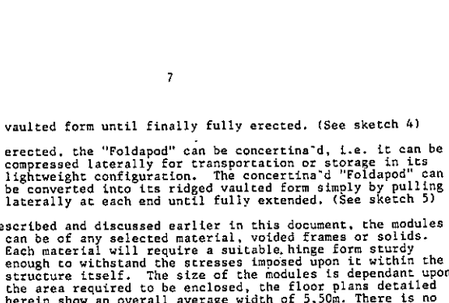
vaulted form until finally fully erected. (See sketch 4)

Once erected, the "Foldapod" can be concertina'd, i.e. it can be compressed laterally for transportation or storage in its lightweight configuration. The concertina'd "Foldapod" can be converted into its ridged vaulted form simply by pulling laterally at each end until fully extended. (See sketch 5)

As described and discussed earlier in this document, the modules can be of any selected material, voided frames or solids. Each material will require a suitable, hinge form sturdy enough to withstand the stresses imposed upon it within the structure itself. The size of the modules is dependant upon the area required to be enclosed, the floor plans detailed herein show an overall average width of 5,50m. There is no structural limitation to length. For the construction of larger structures such as communal halls and facilities, the number of modules in the basic horizontal configuration is increased accordingly. The erecting process is identical to that described earlier herein.

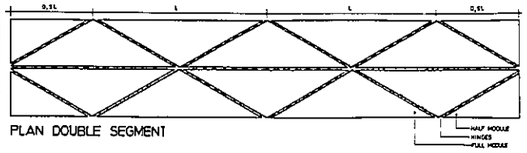
The exclusion of wind and rain is not fully described herein as the choice of material again dictates the methods to be employed. An example of weather exclusion in the concrete form is shown together with the latters hinge configuration and movement patterns.

Additional photographs further illustrate the structural system.



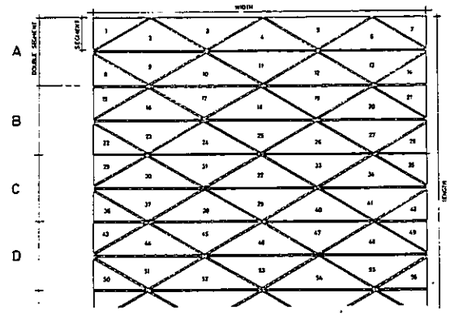
FOLDAPOD 1

PLAN OF SEGMENT

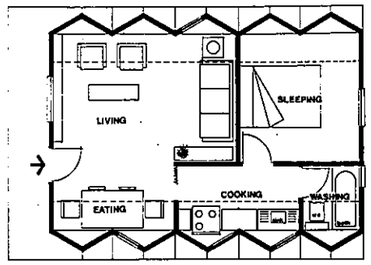


PLAN DOUBLE SEGMENT

FOLDAPOD 2

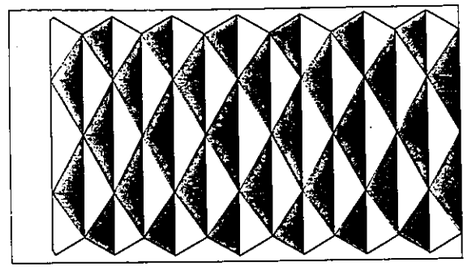


FOLDAPOD 3



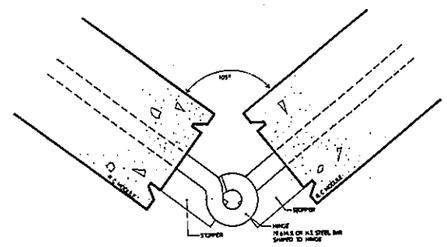
'DWELLAPOD' 4 LIVING UNIT

FOLDAPOD



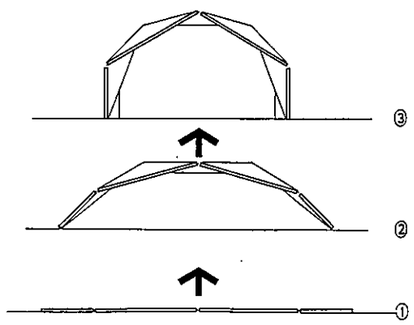
DWELLAPOD ROOF PLAN

FOLDAPOD



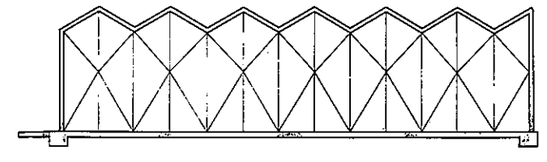
SECTION: HINGE DETAIL SEGMENT TO SEGMENT: ERECTED POSITION

FOLDAPOD



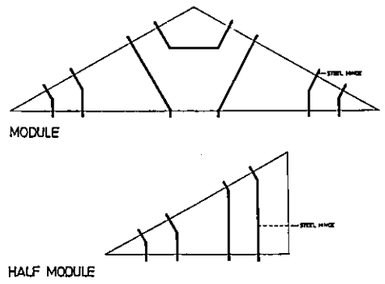
ERECTING PROCEDURE FROM FLAT POSITION

FOLDAPOD 4



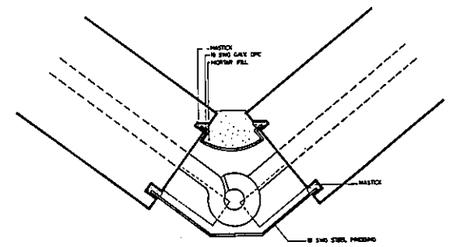
SECTIONS

FOLDAPOD



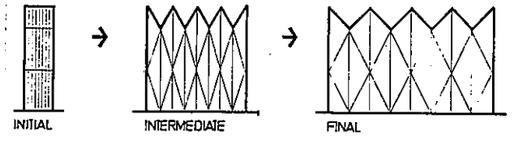
PLAN: TYPICAL HINGE FORMED STEEL ARRANGEMENT TO MODULE

FOLDAPOD



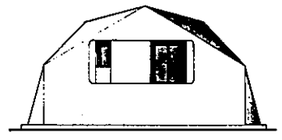
SECTION: WATER EXCLUSION DETAIL: SEGMENT TO SEGMENT

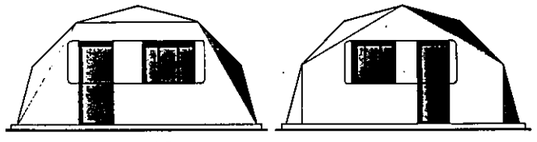
FOLDAPOD



LATERAL ERECTION METHOD FOR LIGHTWEIGHT FOLDAPODS

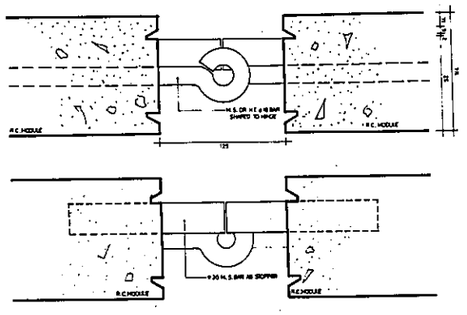
FOLDAPOD 5





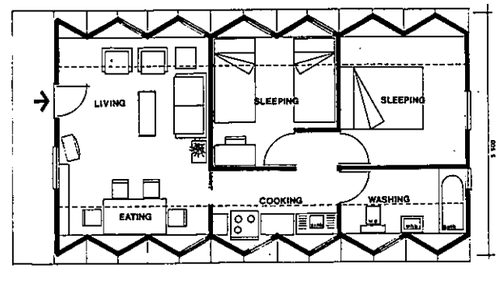
ELEVATIONS

FOLDAPOD



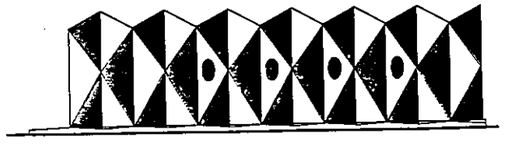
SECTION: HINGE DETAIL SEGMENT TO SEGMENT: HORIZONTAL POSITION

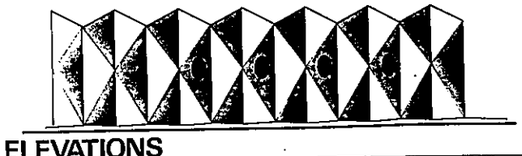
FOLDAPOD



DWELLPOD 6 LIVING UNIT

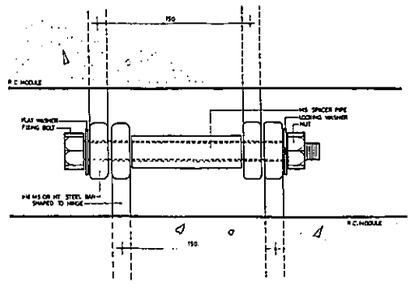
FOLDAPOD





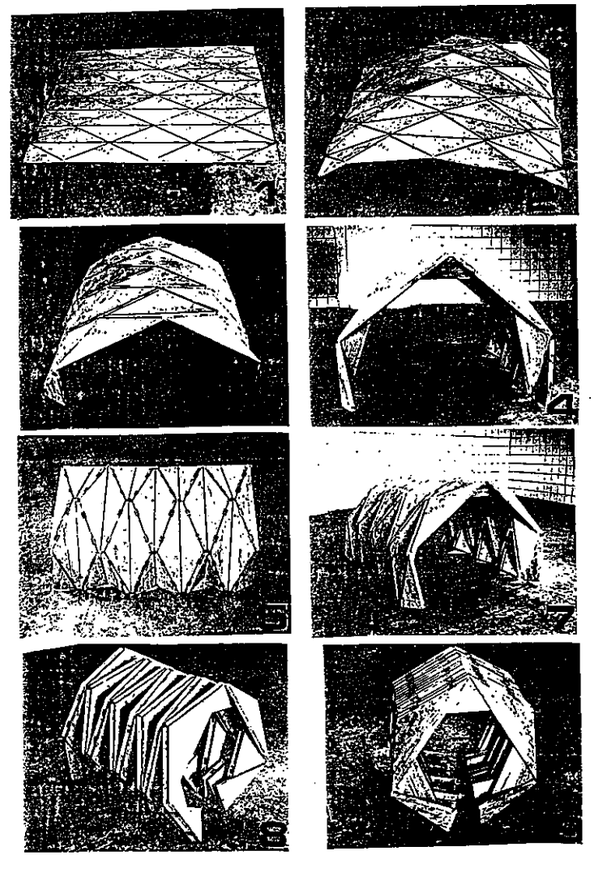
ELEVATIONS

FOLDAPOD



PLAN: HINGE DETAIL

FOLDAPOD



4226016

IVSH-1987

INTERNATIONAL COMPETITION FOR SOLUTIONS ON NEW TECHNOLOGIES FOR SOCIAL HOUSING

„CINTUS" 1986/87

III. SECTION

Proposal

for a containered transporting, communal supplying and home-building system, based mainly on local materials, traditions and live labour in course of home-building

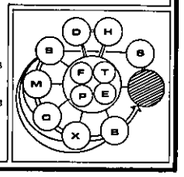
1

- o open publik tender /competitive bidding/ for any partial task, beginning from preliminary economic analysis, through technical planning upto the concrete constructional activity,
- o connecting the task of transport with the possible export of transport means,
- o assuring continuous utilization of transport means capacity by performing mutual transport resulting from compensation trade or by other transportation activity,
- o marketing in connection with proposed equiments, structures, introduction thereof into other countries too, to enhance more economical serial production,
- o participacion of the preferential, unemployed strata of the designated country.

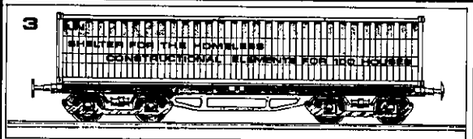
2

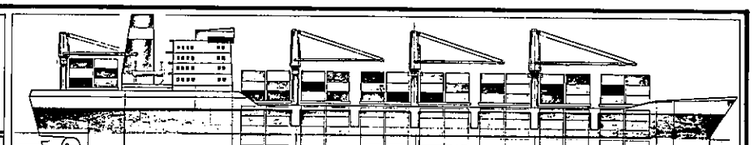
The substance of the system that there is an efficient, manager-type organisation in the center of it.

- (N) National section of HABITAT
- (C) Inter-departmental committee
- (F) Financial team
- (E) Technical team
- (T) Transportational team
- (P) Training team
- (B) Banks
- (M) Manufacturers
- (O) Foreign trade organisations
- (X) Forwarding firms
- (S) Building firms
- Receiver Country



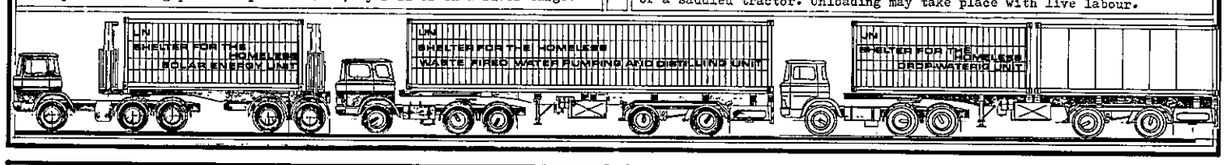
3





Due to the expectable large distance of the building-site and expedition transport represents one of the most important components of the system. The system of international transportation and re-loading of containers being in compliance with ISO, ASA standards, has been already developed.
Operation of transport begins with planned collection of products on the starting station. The place is to be determined by the optimalization of the weighted domestic transport costs, in consideration of the fact, whether transport is taking place on public roads, by rail or on a river-barge.

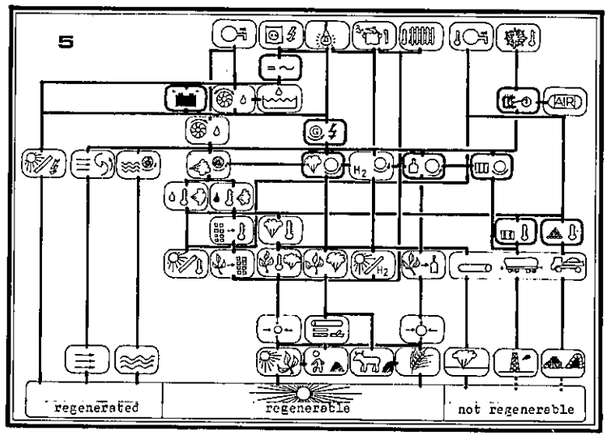
Transport of products /included containers/ is to be scheduled so, that costs of storage and losses could be reduced to the minimum. For the sake of insurance the containers are to be divided in groups according their state, in consideration of their future function. Schedule of loading should be coordinated with transport, paying attention to continuous utilization of loading machines. Course of transport is as usual. In the country of destination unloading requires a self-loading lorry of 2o t or a saddled tractor. Unloading may take place with live labour.



4

State of the container	new	used	waste	Economic aim of planning lies in that expensive containers in a good state should not be bound unutilized, while the architectural aim lies in to deliver containers in a proper state being suitable for particular functions. Under a "waste" container a container is meant which does not bear standarized load anymore and it is withdrawn from circulation
Destiny after having finished building activity	○ ●	○ ●	○ ●	
It is left in the country with an unchanged function	○	○	○	
It is left in the country with a changed function	○	○ ○	○	
It is returned home	○ ○			
It is sold in the country of destination	○	○	○	

5



1 POSSIBILITIES OF COST SAVINGS NOT TOUCHING THE BUILDING TECHNOLOGY

2 PROPOSAL FOR THE ORGANISATIONAL SYSTEM OF A NATIONAL CONTRIBUTION

3 TRANSPORT, LOADING

4 SCHEME OF CONTAINER CIRCULATION

5 SYNOPTICAL SCHEME OF THE MODES OF LOCAL COMMUNAL ENERGY PRODUCTION

Symbols

Energetics, communal supply
Primary energy carriers
- Regenerating energy sources
  - solar energy
  - energy of wind
  - hidraulic energy
- Regenerable energy sources
  - energy wood / biomass /
  - communal waste
  - animal waste
- Hot regenerable energy sources
  - natural gas
  - mineral oil derivates, coal

Secondary energy carriers
- biogas
- methanol
- biobriquette

Tertiary energy carriers
- steam
- compressed air
- water-tank / dropper /
- accumulator

Primary energy utilizers
- photovoltaic cell
- solar collector
- biochemical water decompositor
- motor
- turbine
- turbo-pump

Secondary energy utilizers
- pump
- generator / 3x380 V /
- compresseor

Converters
- inverter, transformer

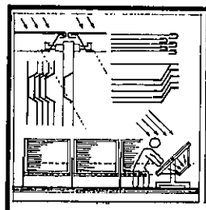
Communal systems
- current supply
- illumination
- cooking
- heating
- cooling
- water supply
- warm-water supply
- collection of surfacial water
- canalization

Technological equipment
- biogas plant
- fermentation plant
- sewage purification
- distillery
- biobriquetting equipment

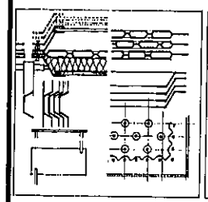
Other systems, products improving life quality
- biological destruction of insects
- irrigation systems
- fundamental hygienic equipment
- basic telecommunication
- basic educational system
- simple educational appliances
- agricultural technologies
- cheap durable hand-tools

Functions to be fulfilled with the container system, provisionally or finally / For a longer period /
- temporary sleeping-place
- common washing place
- common lavatory
- accomodation for technicians working on the building-site
- basic medical supply
- common child-welfare, nursery
- basic education
- „joinery"
- „locksmith's workshop"
- „lending" of hand-tools
- storage of food
- storage and cooling of drink-water
- people's bank
- local administration
- telecommunication
- collective room / privacy! /

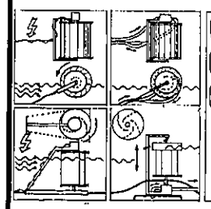
remaining built-in function
displaced transported means
new function, having been developed locally
normal / transformed container



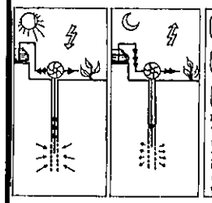
Proposal for a cheap photovoltaic system, which achieves surfacial reduction of the colar cell by means of a linear Fresnel-lens having been milled into the polyacrylic foil. The frame is constructed of a simple pressed steel-sheet to be transported easily. L-foils with soft synthetic frame 2-steel elements during transport



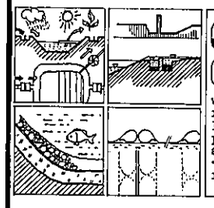
Proposal for a cheap and simple solar collector system with an absorber-sheet made of double thin steel-sheet with spot welding by hydraulical blowing-up between two hard armatures, supported by a thin pressed steel frame; it can be glazed with an optional layer-number.



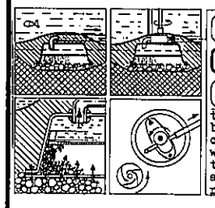
Proposal for an achorable „ever-running" miniature hidraulic power plant with an output of 10 to 50 kW, which is constructed with a closed swimming or a fixed synthetic drum, with synthetic blades, with an incorporated drive-generator or a lifting pump.



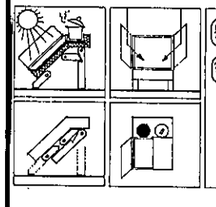
Proposal for a system supplied with current of photovoltaic cells. It is storing the energy in a linen drip-tank and returns it for evening consumption, in day time it irrigates to a slighter extent to compensate the evaporation, at night with increased effect and protects the well against silting up.



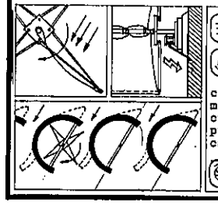
Proposal for a surfacial-water storage, for large quantities of eroding water pouring down suddenly, with the purpose of irrigation in dry periods. It consist of the sludge pan, the insulated basin and the swimming foil-mat inhibiting evaporation.



Proposal for a synthetic filter-water lift equipment, delivering potable water by means of an external or incorporated Savonius rotor-type pump. It should be established with a coarse gravel bedding, with a fine rubble filter as filling, as well as re-filling into the river bed.



Proposal for a domestic solar cooking equipment realized with heat-insulated heat-absorbing conductive plate made of aluminium, three-layer glazing, in a foldable embodiment.



Proposal for establishing a simple linen-sailed wind engine, well fitting into the built environment, constructed of bar elements, which supplies current or performes pumping activity in case of advantageous direction of wind

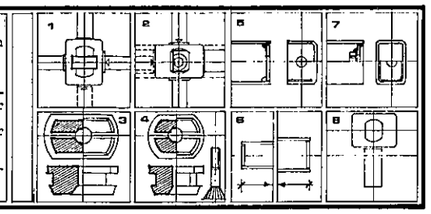
Short specification of the system

The problem of the homeless people represents a serious matter, accordingly, it cannot be solved properly in an easy way.
It cannot be disregarded that overruning of towns surpassing the ability of assimilation thereof results from the fact that in several developing countries living condition in the provinces, possibilities of employment and earnings are relatively worse, than in towns.
Accordingly, it is an abortive effort to examine matters of dwelling separated from circumstances of employment and society, as financial funds of the interested goverments is far not sufficient for a final solution, at the same time, „those with preference" will get only with difficulties into a position, to aquire a flat by economic / and no social / activity.
At the same time, on a plurality of territories inhabitants are suffering more of lack of drinking water, than inproper dwelling, people are tortured by parasites, living places are occupied by the deserts to an ever increasing extent and while trying to meet their fundamental requirements, they accelerate the process themselves.
Under said circumstances only general development of rural living conditions seems to be the only feasible way which creates the conditions of continuous work for the individual and the community for their own improvement, and at last the solvency.
That means that any technological or concrete material export must be based on a flexible system of expedition, being able to comply with any kind of limiting condition, from which - after having got aquainted with concrete circumstances - quick and efficient steps can be made, taking quasi from a reserve fund.
Another motive is the large distance. Whatever is to be transported thereto, the cost of it will make out a considerable part of the total price. These two factors led to the conception of the complex system based on the containers.
In addition to the fact that building with containers - having generally a temporary character and aim - has certain traditions, this method offers the following modes of price reductions:
- The spatial element can be used for transport on the outward way, while in the country of destination it fulfils a task of use.
- The function of location involving a reduced load enables last application of altered containers having been withdrawn from circulation and thus staying cheaply at disposal.
- Used spatial elements of container-complexes to be destroyed can serve within this system.

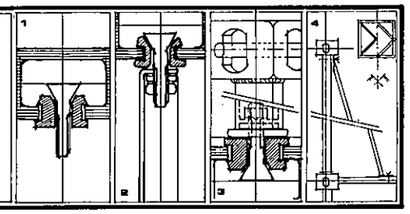
However, dwelling value of the containers is low, at the same time increasing of level is expensive. Accordingly, in course of location only those communal functions can be dealt with, which results from the installation system, materials and tool contained therein. Containers can be used as dwelling places only in combinations with local filling materials /mattings, vegetable sheave, textiles, chipboards/, paired with bar structures / steel, wood, bamboo/, or combined with special structures capable „multiplying by division".
Steel-bar constuctions seems to be a feasible way as partly effective mass production enhance metallurgy, partly because its loadability is excellent in particular in thin body-structures, being most advantageous from the point of view of transport.
However, its disadvantage lies in that it corrodes and can be expanded only within its own system.
A real and essential break through can be achieved only by means of a biomass-program, starting from the mere solar energy, supported by mechanic equipments, more accurately aquisition of water and creation of energy-wood. In this way, energetic problems, soil-erosion and problems connected to building materials can be simultaneously solved.
Possible explication of the biomass-program, the steps built-up on each other and interlocked may be the following:
- Establishing a minimal expedition settlement for the accomodation of the experts studying the site and for the provisional collective accomodation of local homeless people.
- Water aquisition for irragation, a part of it being purified for establishing self-supply.
- Establishing an irrigation system, parallel and continuous plantation of monocultures for optimal biomass-production, soil-amelioration and inhibition of evaporation, i.e. establishing a „green zone".
- Gradual expansion of the expedition settlement in compliance with the increase of the radius of the „green zone" and requirement of live labour, partly by utilizing local materials and labour force.
- Gradual withdrawal of basic technologies, transfer to new regions.
- Introduction of agricultural technologies with a higher requirement in respect to soil quality and labour for increasing capability of self-supporting.
- Voluntary settling of the population in compliance with expanded capability of self-supporting and possibilities of working, eventually from the slumhousses of towns.
- Gradual establishing of the local „building industry" for meeting the requirements of the own settlement and those of settlements being on a lower level. Wood-material and biomass of the „energy-wood" - growing meanwhile - can be also utilized.
- Integration of the „green zones" in order to change slowly macroclimate and to prevent extension of desert.

However, up to the point, where the process of „enlarged reproduction" will start, the only building material left is the adobe, eventually mixed with cement, scraps of glass-cloth and „leached" biogas-slime, in accordance with the quality required by the application.
In case of a concrete export activity after the intensive examination of the site, in knowledge of local circumstances: way of living, based on geologic, climatic, hydrologic and economic conditions, an individual solution may and must be offered.
This competition is based on said principles.

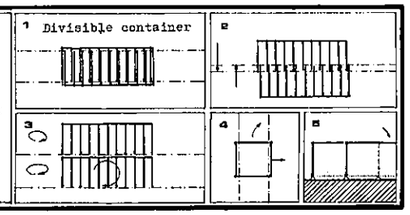
Adapter for the autochtonous extension of the container
The proposed fitting element made of a hard synthetic material is well suitable for receiving holders subjected to a smaller load, which are fitting into the structurall order of the container. Due to the different sizes of the opening, a separate element is needed for the pillar and the beam.
1-top view with the section of the new pillar
2-side view with the section of the new beam
3-4-synthetic opening element with tigthening screw 5-6-ends of the connected beam. Dimensioning: L 3: 80/50/3 L 3: 120/50/3 7-8-screwed and standarized end of the connected pillar



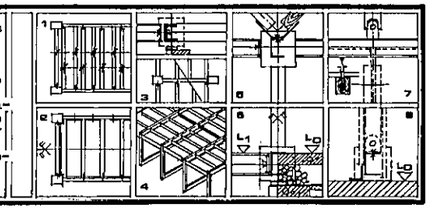
Course of connecting
1-placing of the screw, snapping in the adapter
2-lifting-in the beam, fixing by screws
3-fixing of the pillar with screws
4-stiffening of the new part



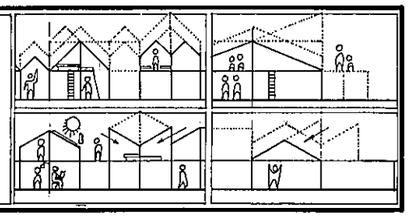
Standarized containers are made for a permissible load of 500 kg/m², in contrast to the maximal load of 200 kg/m² at the ceilings of dwelling houses. The proposed system yields the possibility to obtain specifically triple ground area, from one container floor two ceiling units, with the original ceiling plus 6 auxiliary elements /4 pillar, 2 beams/. 1-by releasing the fixation of the interlocked holders extending in a comb-like manner from the side-walls - left unchanged - 2-we move the walls apart from each other, thereafter 3-by turning and tilting the elements they are seated onto the prepared base bodies 4-connected to each other and 5-supported by the connecting elements.



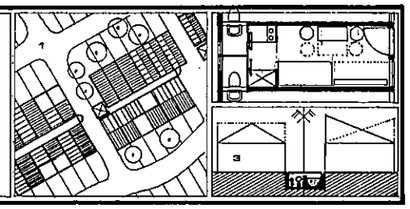
Structural solution of the divisible container
1-the floor structure. 2-the roof structure, as a "half" floor, however, with a flange support 3-4-the assembled container 5-6-7-8-structure of the floor and the high roof. Expediently the auxiliary, coating and walling materials to be delived should be chosen so, that should harmonize with the later appearning complementary local materials. It seems to be possibile to deliver open containers confined with a net, by using local surface-forming means /bass-mats, rush-mattings/. Initially thin impregnated chipboards can be used as walls, eventually in a doublelayer embodiment, but at all means with a wooden frame.



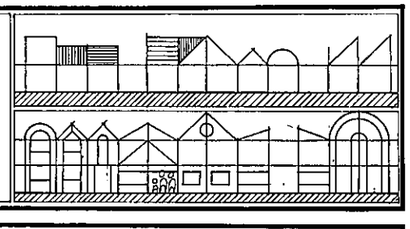
Formal-functional versions, possibilities of extension
Competeition of the basic modules having been arranged according to the principle of container division enables flexibile formation of form and space in compliance with changing demands. In such a manner terraces, bedclosets, alcoves, galleries can be obtained, eventually in a multi-level arrangement.



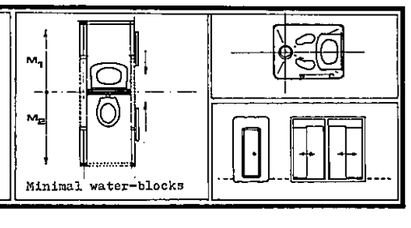
1-Building up
The outlined mode of settlement guarantees the minimalization of the costs for publik utilities. In the settlements of people with low earningss "streetorientation" is not so problematic, as with a small town street considerably loaded by traffic. Depth of the front garden depends on the available groundarea.
2-Ground-surface of a single-level basic module.
3-Some versions of the modules "stringed" on the axis of public utilities.



Versions for the street appearance
View of the building ensemble will bee determined by the number of levels applied, shape of roofs and frontal materials.
Figures illustrate but some examples of the diverse possibilities.



Introduction of fundamental sanitary function into the "house" represents a decisive element of increasing the value in use of the shelter. The two types of the illustrated "mini-water-block" yield an extremely simple possibility, which can be applied otherwhere too. The element located expediently on the canalization side /sewage discharge system/ requires a short piping arranged above the floor level.
1-module-coordinated spatial element with a steel frame, built-in with a displacement: a.-lavatory with a battery of cocks, combined with douche, with floor-drain b.-WC-stall
2-closed car-body-like block made of a synthetic material, with a combined battery of cocks



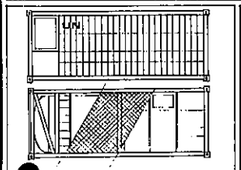
Minimal water-blocks

UN SHELTER FOR THE HOMELESS

This type is expediently used mainly for the transport of building materials, tools and systems. Combined with CO_2 cooling device it is well suitable for the delivery of perishable returned goods.

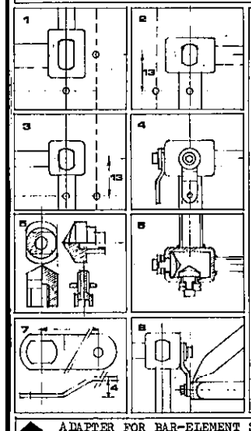
DIMENSIONS
- 40' x 8' x 8' 300kN
  12,192 x 2,438 x 2,438
  /12,020 x 2,333 x 2,145/
- 20' x 8' x 8' 200kN
  6,058 x 2,438 x 2,438
  /5,883 x 2,333 x 2,145/
- 10' x 8' x 8' 100kN
  2,991 x 2,438 x 2,438
  /2,870 x 2,333 x 2,145/

FUNCTIONS OF NORMAL CONTAINERS



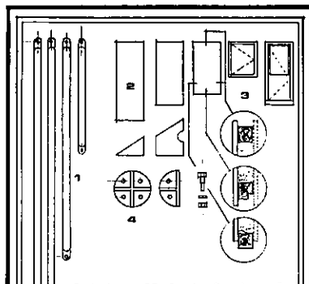
This group meets the space-requirements in respect to technologic, mechanic and manipulating spaces for communal supply. By the proper choice of the delivered equipments, systems, materials and proportion of displaced and remaining functions and space-saving loading, any not exaggerated claim in respect to communal supply can be satisfied.
In course of realisation walls can be formed - in compliance with the level of demands - of corrugated sheets, building slabs, lattices, with heat insulation, or provided with openings, traditional or special windows and doors. The character of assembly enables change of functions, flexibility to a certain extent. It becomes possible to prepare a detailed technological plan for any function having been indicated with the symbols - serving here as an example - or for any other functions or for the logical combination thereof.

TRANSFORMED AND SPECIAL CONTAINERS



ADAPTER FOR BAR-ELEMENT STRUCTURES

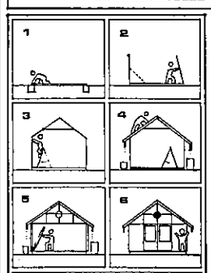
This simple adapter made of steel-enables with the releasable connection module coordination of containers and bar-structures and transfer of more considerable load. In such a manner it becomes possible to meet the requirements in respect to spaces for functions as indicated in figures and other functions.
1,2,3-views of the module points assuring wall continuity
4,5,6-mode of realisation
7- suspending plate
8- building-in and forming of the nodal point



1-thin-walled steel-pipe elements in lengths of 90-180-220-270- cm 2-single- and double layered chipboard wall elements with a wooden frame in the same nominal lengths 3-windows, doors 90/120,90/210 cm 4-connection plate for a spatiel lattice

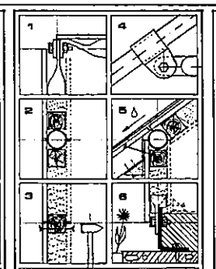
Required elements

PREFABRICATED STEEL - FRAME SYSTEM COMPOSED OF THIN WALLED PIPES



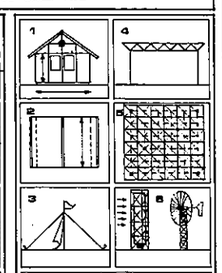
1-founding, lying of the base frame 2,3-erection of the steel frame 4-roofing elements, roof-covering 5,6-arragement of doors, windows, walls

Course of installation



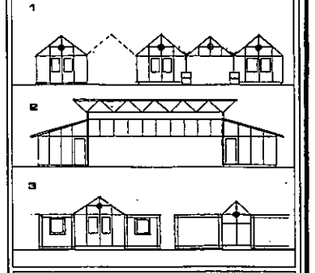
1,2,3-horizontal sectional view
4-fixing of the collar beam
5,6-vertical sectional view

Details



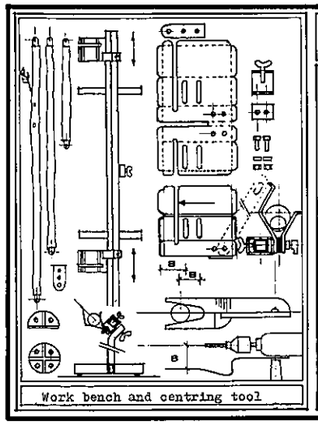
1,2-dwelling house, 5,4m x optional size 3-tent-like structure 4,5-space lattices with a large span 6-engineering structures

Fields of application



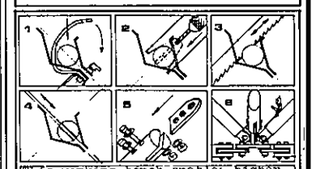
1-comb-shaped arragement with gradually coverable interspaces
2-hall/naval/-like structure
3-application as a complement of container-complexes

Modes of ranging



Work bench and centring tool

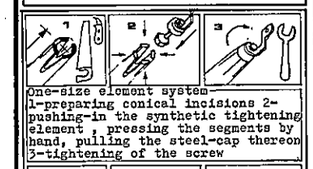
LOCALLY MADE STRUCTURE OF WOODEN BARS WORKING BENCH AND TECHNOLOGY



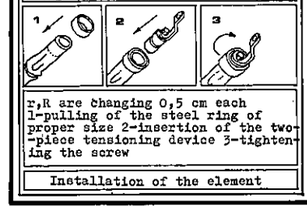
This working bench enables higher accuracy of production and thus building of more regular structures
1-placing of the rough branch and fixing it with a rubber belt 2-working out of the bores with a centring tool, made of a flexible sheet or being a slipping-in type 3-cutting to the nominal length in the groove of the tool 4-cutting of the groove to the desired depht 5-fixing of the screw-plate 6-preparing the space lattice

Processes of work

STRUCTURE OF BAMBOO - CANES NODAL POINT ELEMENT, INSTALLATION

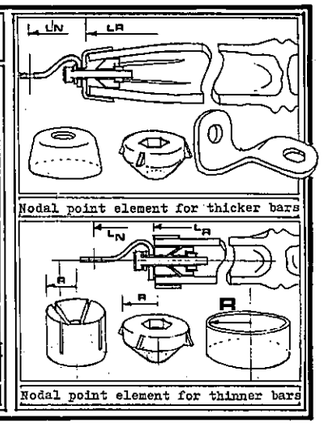


One-size element system
1-preparing conical incisions 2-pushing-in the synthetic tightening element, pressing the segments by hand, pulling the steel-cap thereon 3-tightening of the screw



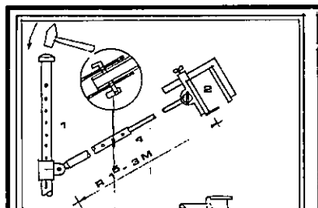
r,R are changing 0,5 cm each
1-pulling of the steel ring of proper size 2-insertion of the two-piece tensioning device 3-tightening the screw

Installation of the element



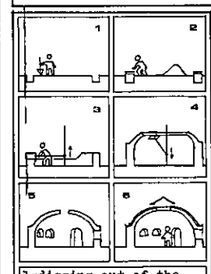
Nodal point element for thicker bars

Nodal point element for thinner bars



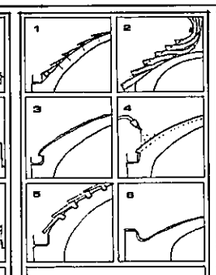
Views of the cradling device

CRADLING DEVICE FOR CONCENTRIC HOUSES AND STAVES MADE OF ADOBE



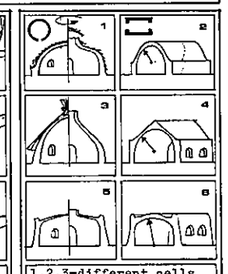
1-digging out of the foundation ditch 2-foundation, insulation 3,4-raising of the wall with a concentric motion 5-cutting out of openings

Course of building



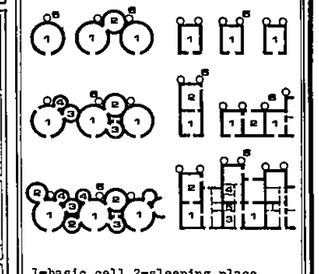
1-slate, shell, palm leaves 2-sheaves 3-multiple whitewash 4-hydrofobizing agent 5-tile 6-bitumen

Modes of roofing



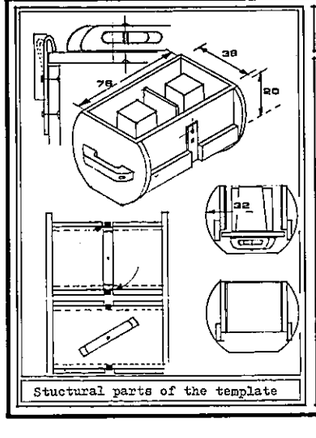
1,2,3-different cells with central ground-plan 4,5,6-structure with stave to be cradled in slanted layers, with a horizontal axis

Available forms



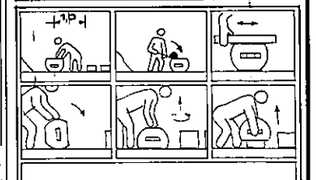
1-basic cell 2-sleeping place 3-cooking place 4-sanitary place /lavatory-basin, WC, washing-drying appliances/ 5-pantry 6-covered rainwater-tank for storing water for household-purposes

Possibility of development



Stuctural parts of the template

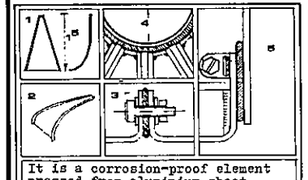
TEMPLATE FOR ADOBE BRICKS BASED ON LEGO - SYSTEM



The adobe making template to be seen here is suitable for making blocks conforming to the usual brick sizes. The sun-dried element - based on the LEGO-system - is well suitable for quick and productive building. Process of adobe making does not require a great expenditure of force in spite of the element weight.

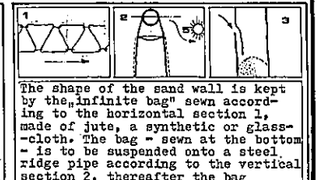
Process of adobe making

PREFABRICATED ARMATURE ELEMENT FOR ENTRAPPING THE BIOGAS



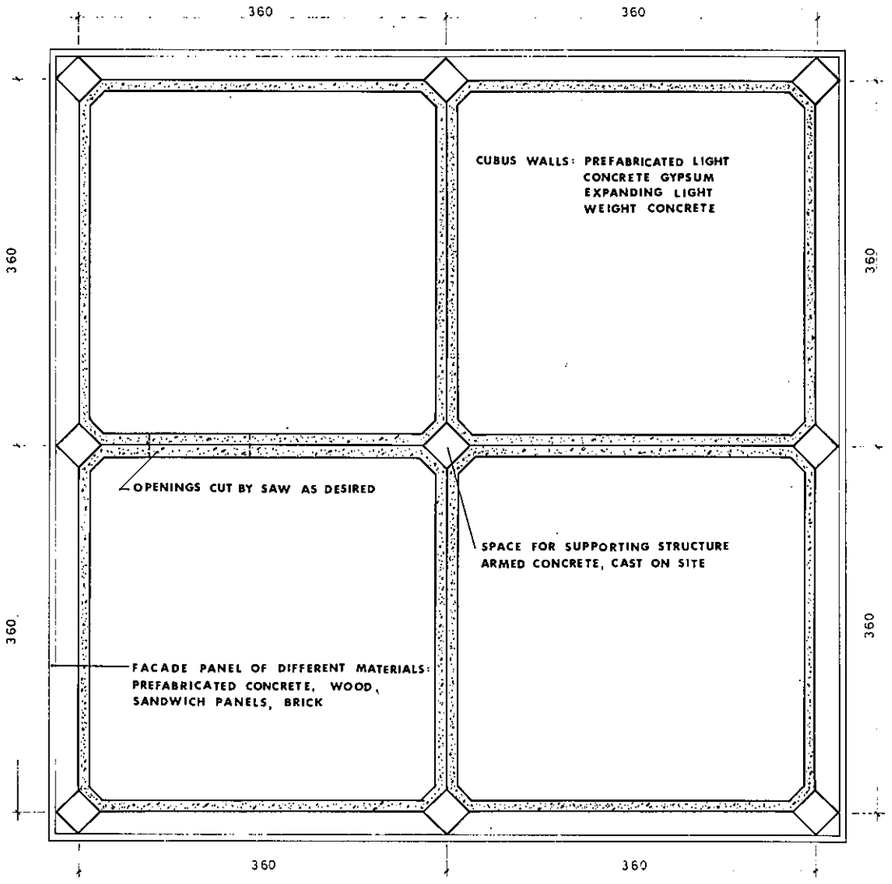
It is a corrosion-proof element pressed from aluminium sheet, which can be produced cheaply in large series.
1,2-views 3-matching 4,5 connection of the pipe stub

SAND WALL WITH A TEXTILE CRADLE



The shape of the sand wall is kept by the „infinite bag" sewn according to the horizontal section 1, made of jute, a synthetic or glass-cloth. The bag - sewn at the bottom - is to be suspended onto a steel ridge pipe according to the vertical section 2, thereafter the bag is filled with wet sand through the openings. In the next phase the cloth is to be sprinkled with cement slurry or synthetic resin.

TECHNOLOGICAL PROPOSALS FOR QUICK BUILDING METHODS BASED ON LOCAL MATERIALS OR LIVE LABOUR



SECTION III

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HOUSING IN EMERGENCY CASES

HOUSING PROVISION IN EMERGENCY CASES

1. PHILOSOPHY OF THE PROVISION

1.1. Provision as a negative position

The provision for events expected to happen in the time to come and the care which should have previously been taken for coping with such events, usually come short our society's understanding of disagreable happenings.
We usually repel from our consience the various calamities which are infact inevitable natural phenomena, coming back from time to time. Westerners even reject from their conscience the meaning of death itself though being an event corresponding to that of birth in the biological cycle and though it constitutes a daily experience since the creation of the world. Such rejection of the meaning of death as well as other natural phenomena, which we have classified among negative events, forms a shielding, which leads us to assume a defensive attitude, an attitude of expectation. It is so that we lose our creativeness and we consume our energy in activities of defensive character; which are devoid of the optimistic foundation of the positive action exerced over the world in our entourage.
We are consequently, caging all our energy in a vicious cycle of defensive «measures», which deprives of us all possibility for substantial intervention towards development. This shielding attitude is a rather general attitude of the social communities in the actual world, hindering the conscious approach to the problems and the release for the energy needed of their solution (economic crisis, crisis of environment, etc.).

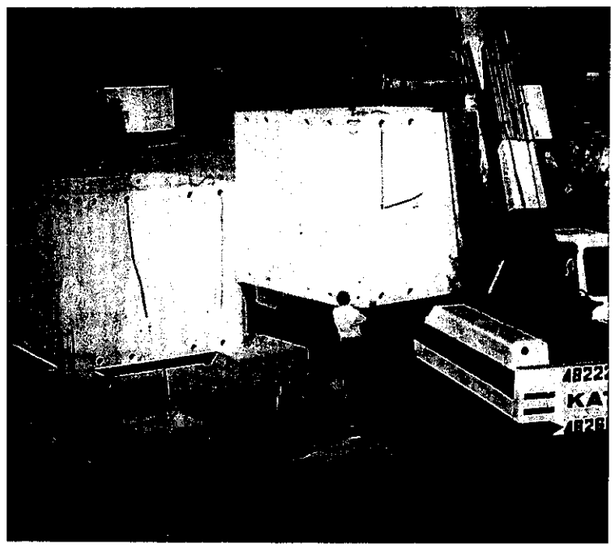
If we would observe how does nature react to any large-scale reformations, we shall find out that any variation occuring in the natural environment which might objectively be deemed as a negative one, becomes an agent for the positive reaction (development). This means that there are no negative or positive phenomena in nature, since nature possesses the mechanism of absorbing such phenomena turning them to its own advantage. If for nature this is a DE FACTO procedure, then why should there not be a respective conscious procedure for facing various events by the humans?

1.2 Provision as a positive position.
If we change our understanding of such phenomena and consider them with nature's neutrality - since we form nature's inseparable part?
If we reject our shielding against them in an endeavour to drive them to some useful perspectives? If we consider all measures for coping with any situations other than as activities of defensive character,
We shall most certainly reach a new result, of different quality which will attain objectives much more composite than the simple objective of facing some emergency case in particular.
This variation of the may of understanding things is not a simple theoretic position which may be selected among many others.
It constitutes a necessary prerequisite for coping with actual problems by introducing sophisticated solutions meeting with complexity of our times.

2. PROVISION FOR HOUSING

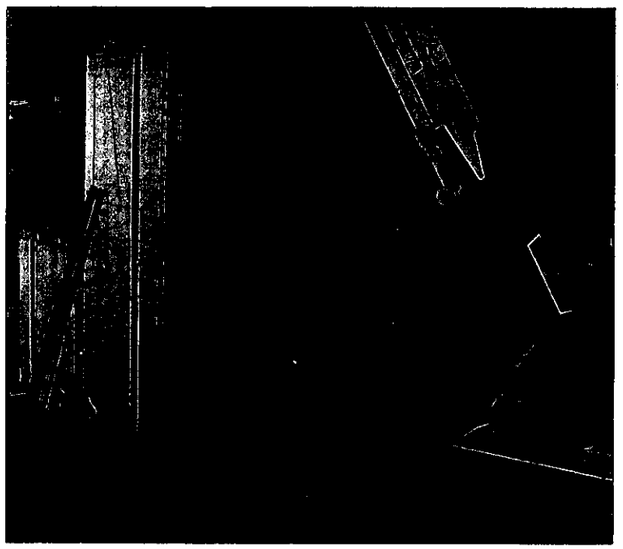
2.1. Setting of the problem
In every residential area which may eventually be stricken by a disaster (earthquake, flood, etc) possibility for fast and sufficient facing of the consequences is a must.

1



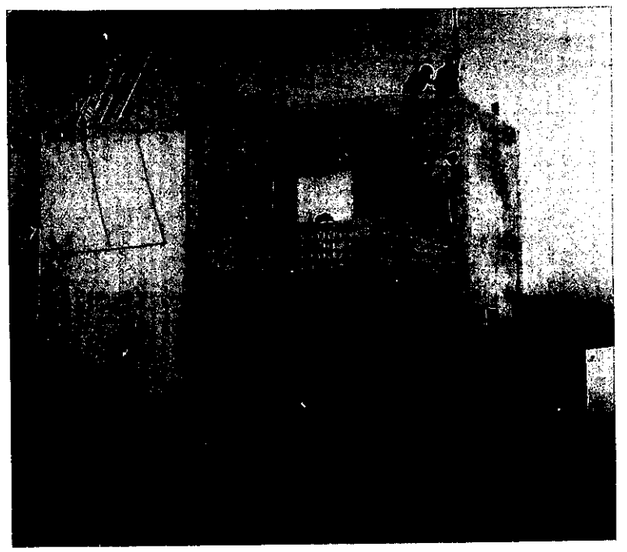
RANSPORT

3



4

FITTING OF CUBE UNITS



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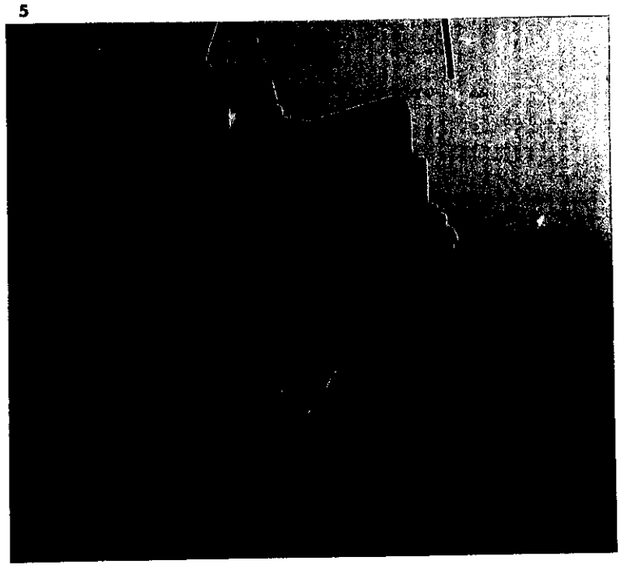
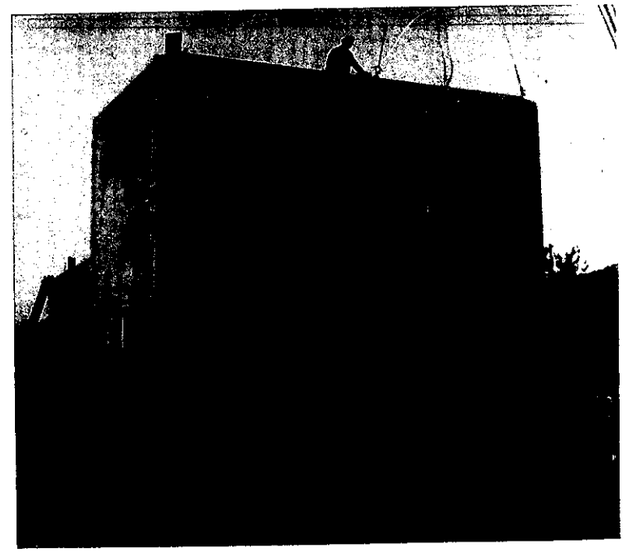


6

FITTING OF FACADE PANELS



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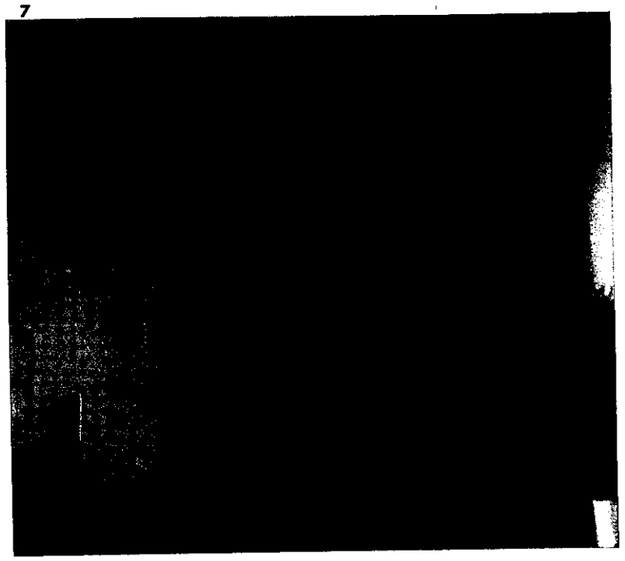


8

FINISHING

especially in urban centers, the need for accommodation facilities of either a small or large
mber of families within a limited period of time, will become a necessity.
usually such indispensable measures are taken after occurrence of the disaster, fact which
nevitably entails delay in taking assistance measures. Besides, activities made in time of panic, no
matter how well organized they are always at a disadvantage both from application urgency and
uality aspects.
urthermore, it has been observed that all assistance measures are much more effective if fortifying
e spontaneous action of all interested instead of hindering them from any activity and keeping
om waiting for assistance to come from above.
Finally, practice up to now has shown that provisory accommodation (sheds etc) extended in
emergency cases, usually becomes permanent at the expense of the existing urban environment
due to its extemporaneous quality and random position in the existing urban environment.
But setting of the problem with the purpose of finding a complex solution, should not stop at the
aforementioned admissions and verifications.
We should try to attain a more comprehensive approach so as to transform the feature of
intervention brought out, from defensive to productive.
Thus, if we consider urban centers' difficulty of function at many of those regions subject to be
eventually hit by disasters caused by natural phenomena, we shall deduce that a preceding
intervention is not a waste, if made under the criteria both of securing housing in emergency cases
and reforming the overburdened and difficult - to - function city structure.
Someone might bring up that by such reasoning we are lead to incur immediate expenses before
even the problem has arised. But let us recall that also the walls surrounding medieval cities were
erected at times when not immediately needed and by stages, covering at the same time defense
against eventual incursions and unemployment which occurred now and then at the associations of
that remote period of time.

Today, in many Mediterranean countries confronted by the problem of provision for housing in emergency cases, nobody can deny existence of unemployment to either a lower or higher degree. Consequently, since the cost of intervention will anyway occur either before or after occurrance of the eventual disaster (due to a natural cause), by choosing to face the situation in advance, we shall hit the double target: readiness to cover emergency housing requirements - coverage of unemployment.

3. THE PROPOSITION: ELEMENT STRUCTURE

3.1. Description of the process

On the basis of the above reasoning, we have elaborated a proposition consisting of the solution of the problem a priori, as briefly described here below:
- Production in series of large three - dimensional structural elements (industrial production). These structural elements are closed (cubes) and are formed by reinforced concrete slabs for floor, ceiling and wall filling with light material (gypsum, gupsum bricks, etc.)
- Such structural elements, element units, disposed horizontally or vertically, create separate houses or housing complexes. The bearing structure of the whole construction being indispensable only for complexes of three or more floors, will be made after final positionning of the element units for the complex, by pouring concrete into the cavities between cubes.
- For single - floor or two - floor complexes, - for which no reinforced concrete frame - work is required - the element units forming such complexes, maybe detached and moved over to different locations if desired or even stored temporarily and relocated to their final position when needed.
- Every urban district selects the site for the provisory or final installat in of complexes consisting of element units. Selection of the location and formation layout are performed under criteria of correct adaptation to the existing conditions.

So, we have housing rooms in storage, which may also suit some other use, temporarily, within the city's frame.
- In case an emergency would arise, the inhabitants - victims of the stricken area, may take up as many element units as corresponding to their immediate needs and complete the residence by making the necessary embrasures, unifying rooms, completing door and window frames and all other finishing works.

The element units include since construction all necessary electrical sanitary and water supply installations - where required - and users have nothing but to install the necessary accessories or equipment, at a second stage, and make the connections required, since they are given such option.
- Finally, every housing complex, after finalization of its internal function, is completed with exterior panels by elements made of reinforced concrete, which will shape its final external appearance.

The users, by installing shelters, pergolas, verandas, etc., will give the complex the shape of a permanent housing, fitting the local morphological conditions.

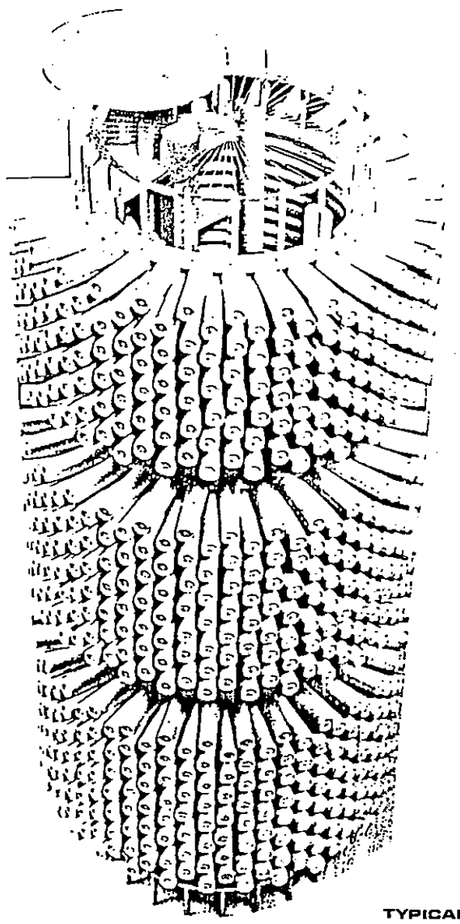
3.2. Cost information.

An investment for the continuous production of 2500 cubes per year (16 sq. m. per cube) would require a 20.000.000 dracmae capital invested in fixed installations and permanent employement of 10 labourers.
This means that the cost of labour per sq. m. of cube would be 1 work-H/sq.m. of cube.
For transportation and erection, 1 work-H should,also be added which brings the total cost to 2 work-H/sq.m. of cube.
Thiw sost is extremely low if compared with the corresponding finishing cost of a conventional building construction which is estimated to 20-25 work-H/sq.m. of residential quarters.

3.3. Advantages of the system

Reversal of the understanding of intervention from defensive to productive, presents - in combination with the low cost of the solution suggested - a series of advantages:
- First of all, securing housing prior to an eventual disaster ensures possibility for IMMEDIATE intervention.
- The solution suggested is not to be applied in time of panic and is consequently of improved quality.
- The site of housing areas has been preselected following integrated design and is combined with the whole development perspectives of the existing city.
- The low cost (industrial product cost) of the ELEMENT STRUCTURE together with coverage of the unemployment problem - when and where such problem occurts - constitutes a double advantage.
- Finally, participation of the homeless themselves in the re-accommodation procedure ensures greater effectiveness of application of the solution suggested.

IYSH 86·87 CINTUS



TYPICAL TOWER

AUTOMATED LOW COST HOUSING TECHNOLOGY FOR THE 21ST CENTURY — SECTION III

SUMMARY OF TECHNOLOGY
The technology is simple and innovative.
Prefinished metal faced insulated composite accommodation modules are rolled and assembled on an automated production line similar to the motor car industry.
This continuous process takes approx twelve minutes and results in a 30-45m^2 self contained dwelling with fixed bathroom and kitchen. All construction details are similar to the automobile.
The module is then transported to site where a slipform tower utility core has been erected. This core, which can be solid, hollow or of any form, contains lifts and rising services. The modules are then lifted by construction crane into a cantilevered position and anchored.
The services (gas, electricity, water, drainage, sprinkler, telephone) are then connected by quick fastening devices and the modules are ready for occupation.
BENEFITS OF THE TECHNOLOGY
The technology lends itself to use in situations where there is a severe housing shortage.
Automated manufacture of the housing product has profound benefits:-
1 Time/Cost/Capacity constraints are met. The process is capable of being established relatively quickly to produce housing on the scale needed with completions for at least one million people to be housed each year per factory unit of production. This means not only that the problem is tackled very quickly but also that costs are kept down since available funds are turned over many times compared to conventional methods.
2 Through automation precision, quality as well as quantity is assured.
3 The need for an abundance of a highly skilled labour force is eliminated by the provision of internal services to the self-contained modules, capsulized 3 storey high service riser ducts and plant rooms.
4 Total flexibility of planning configuration accounts for efficiency, adaptability, cost effectiveness and a capacity for adjustable density and growth to meet any specific situation.
5 It is possible to have standard documentation for each class of building reducing design and documentation time for earlier commencement/completion/possession.
6 Pre-defined product costs are not exceeded and maximum prices can be guaranteed, likewise pre-determined timetables are met.
7 Lightweight thermal efficient construction reduces foundation costs and material content. Scarce building materials for conventional purposes are to a large extent preserved.
8 Fire would be contained to a single dwelling module. By means of the construction crane at roof top the damaged module could be replaced and recycled.
9 Emergency housing for disaster areas could be implemented by the installation of a steel rolling plant and assembly line on board a ship/s. During the voyage to the disaster zone modules could be run off/stacked on deck ready for immediate use on the ship's arrival.
10 Land utilisation is maximised with scarce arable land preserved for agricultural and non-urban pursuits.
11 The integrated loop clusters reduce costs of road construction and installation of service mains and ensure maximum vehicular free public open space and facilities in an environment with a sense of "place". Packaged capsulized self contained sewerage systems, electricity generating plants and water purification plants are independent of existing infrastructure other than water supply - important in places where services are already appallingly overloaded or non-existent.
CONCLUSION The "group form" loop cluster design relating to space between buildings permits easy orientation of all buildings to ensure each dwelling has a minimum of four hours of sunshine per day and provides natural cross ventilation in the summer months.
Aspect for all modules is over a garden landscape where visual and acoustic privacy is ensured by module design.
Need for growth and expansion can be met by easily staged development.
Single entrance design ensures dwelling security.
The bulk of the technology is a matter of co-ordination of existing technologies developed in other fields of industry and are thus well established, understood and proven.
Perhaps the greatest of these benefits is that they accrue at each stage of the housing development process - there is no one element of the technology which produces disadvantages over the conventional approach.

THESIS ©

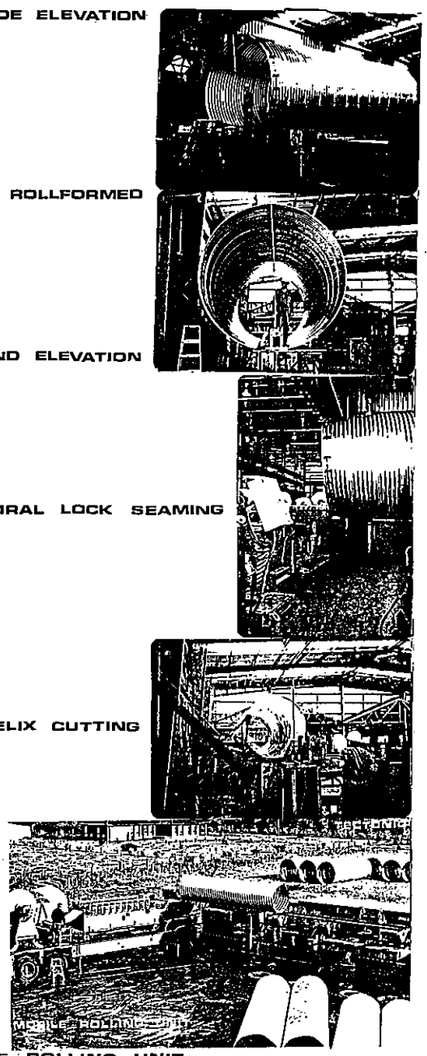
SIDE ELEVATION

SHELL ROLLFORMED

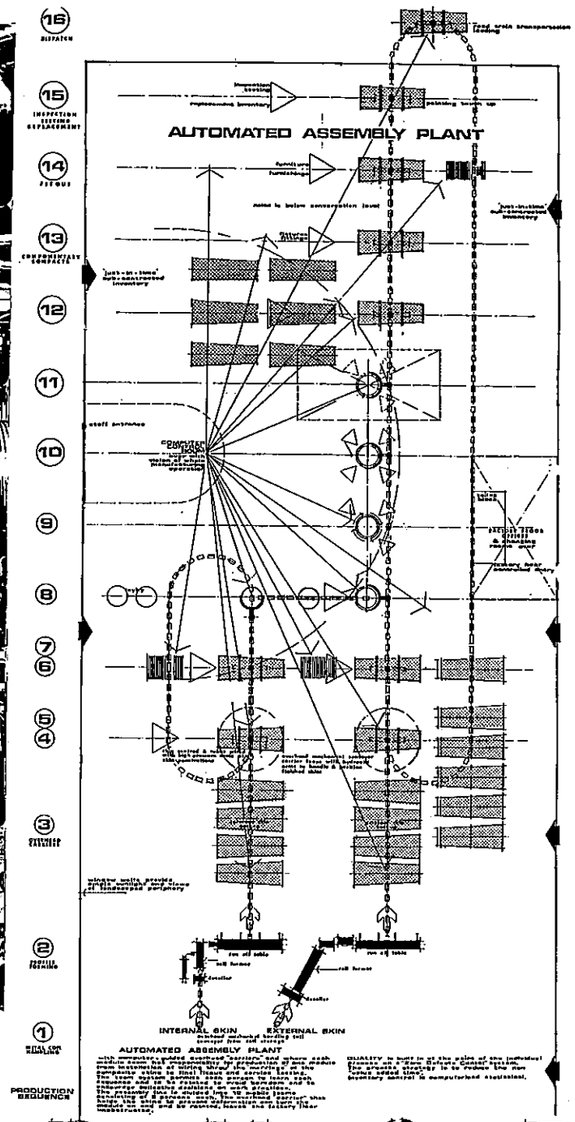
END ELEVATION

SPIRAL LOCK SEAMING

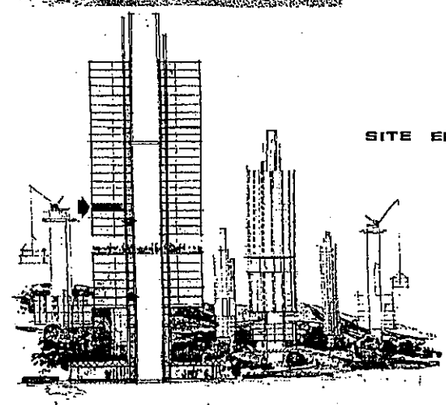
HELIX CUTTING



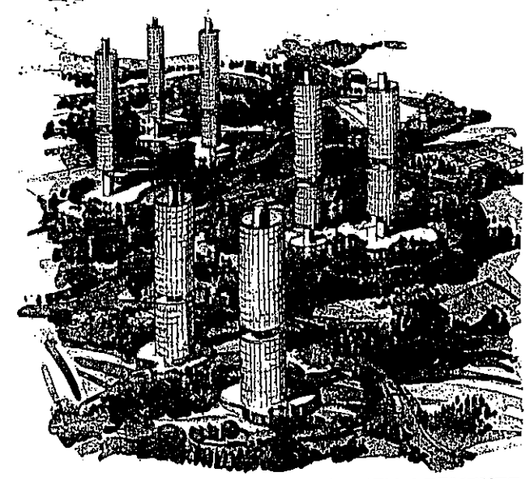
MOBILE ROLLING UNIT



CAPSULISED SERVICE DUCT SITE DELIVERY

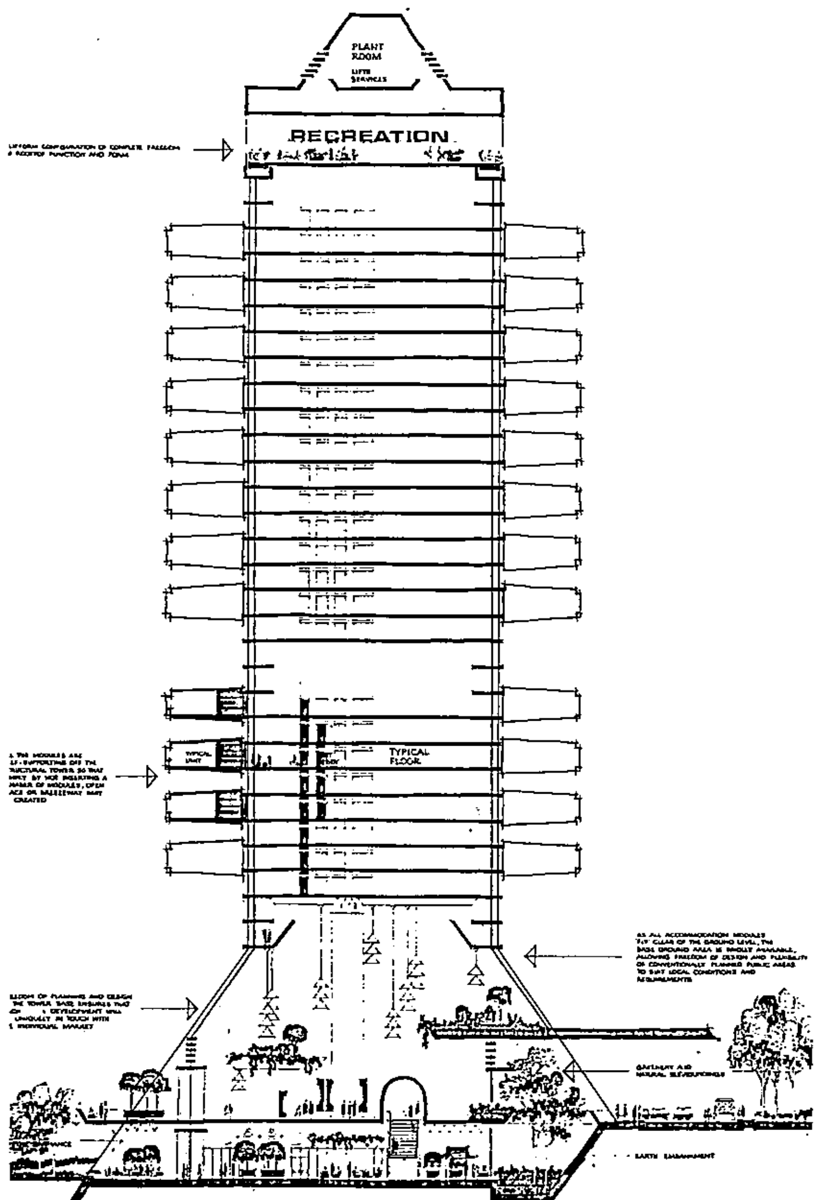


SITE ERECTION

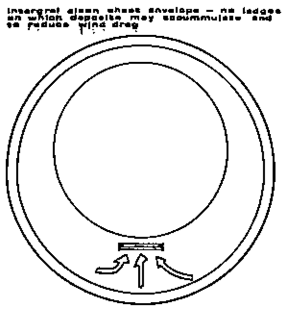


CLUSTER DEVELOPMENTS

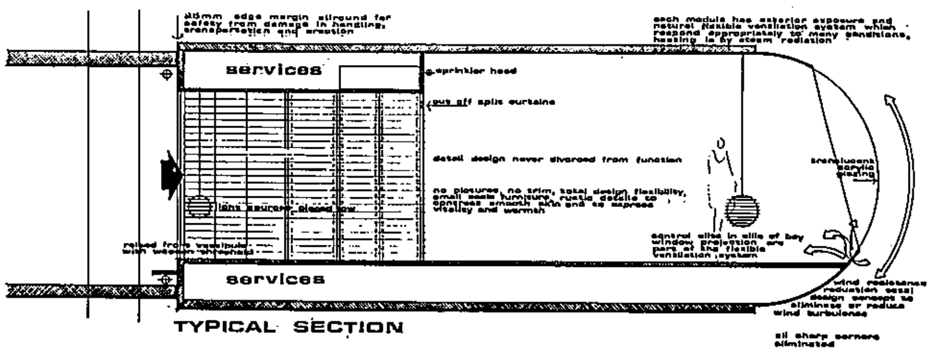
PRODUCTION ©



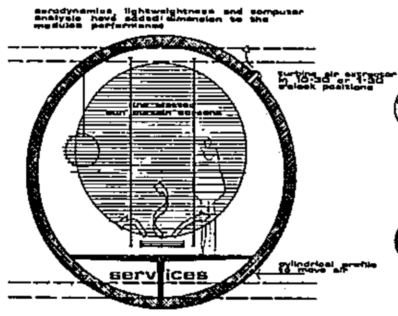
SOLID CORE BUILDING SECTION



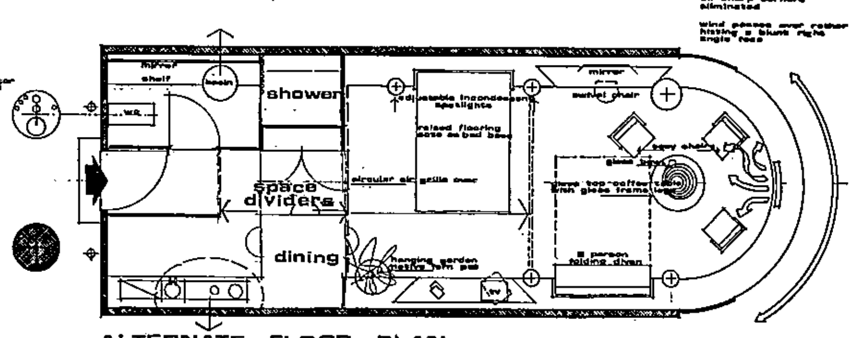
END ELEVATION



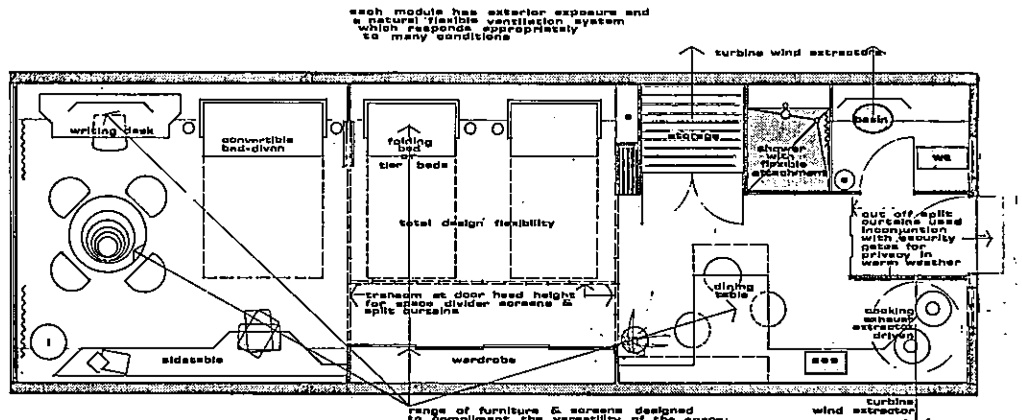
TYPICAL SECTION



TYPICAL CROSS SECTION



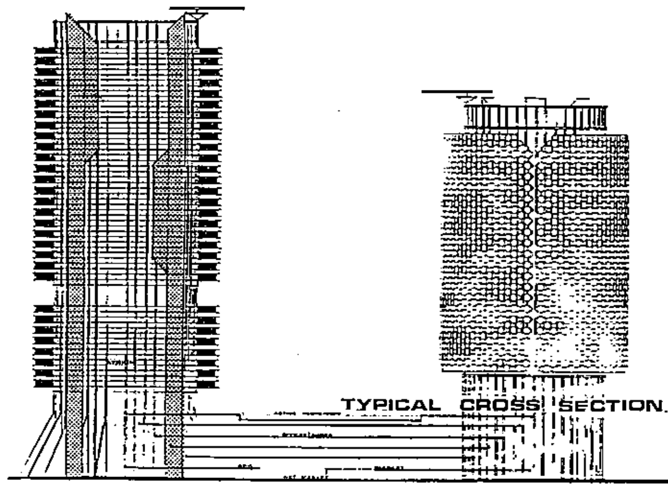
ALTERNATE FLOOR PLAN



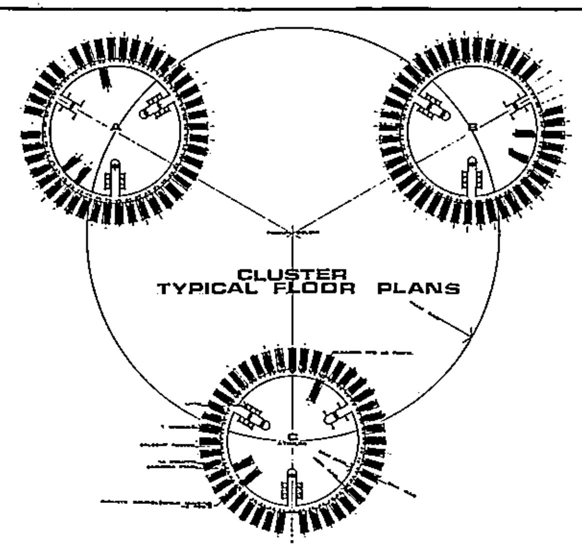
AREA : 40m² or 5 persons at 8m² each (378") (75·8")

BASIC FLOOR PLAN

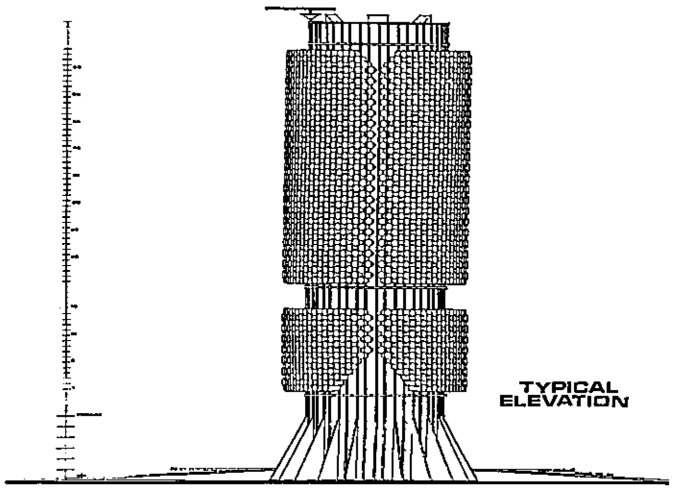
D E T A I L ©



TYPICAL CROSS SECTION

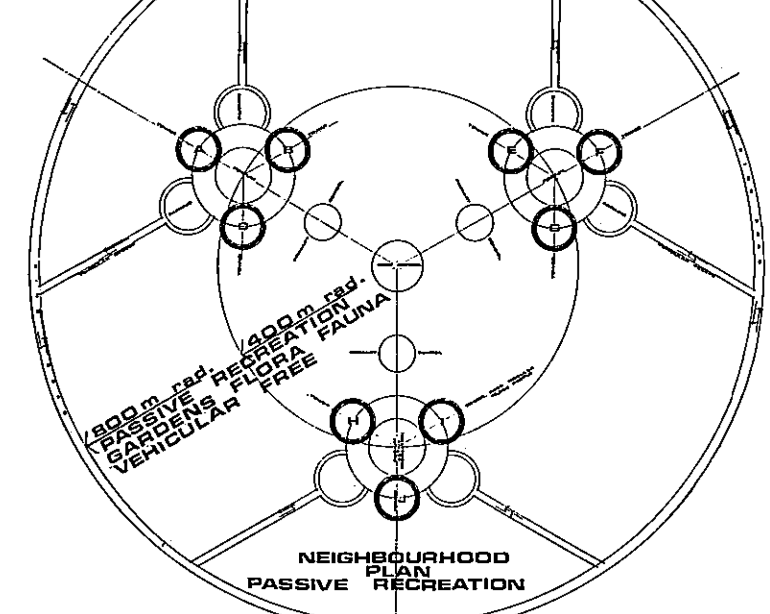


CLUSTER TYPICAL FLOOR PLANS

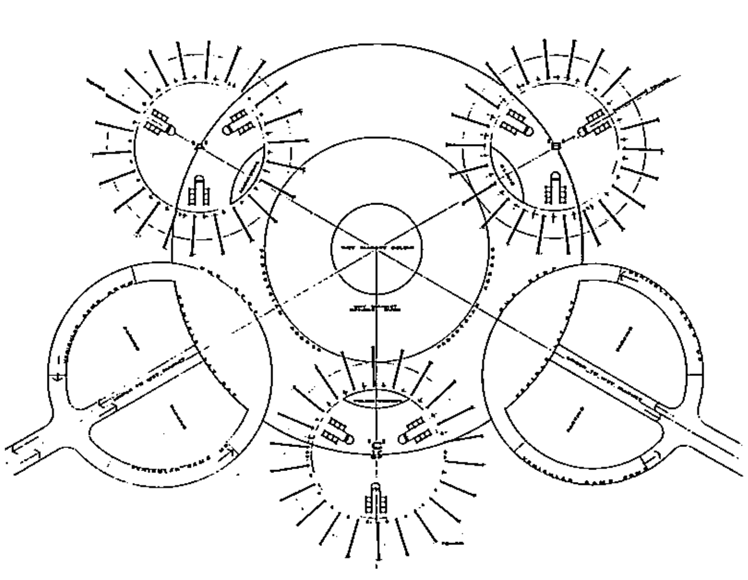


TYPICAL ELEVATION

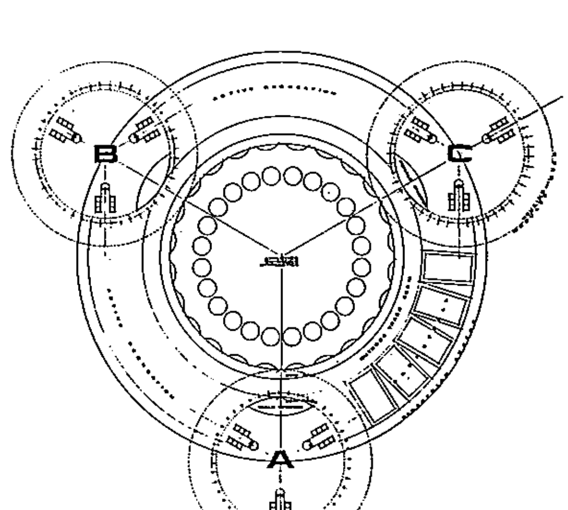
3 TOWER CLUSTER
6000 FAMILY MODULES
30000 PEOPLE
ACTIVE RECREATION 4Ha : 1·3m² P.P.
PASSIVE RECREATION : 20m² P.P.
LIVING SPACE : 8m² P.P.
NEIGHBOURHOOD POPULATION : 90000
CLUSTERS VEHICULAR FREE



NEIGHBOURHOOD PLAN
PASSIVE RECREATION



CLUSTER PLAN
GROUND, FIRST FLOOR



CLUSTER PLAN PODIUM FLOOR
ACTIVE RECREATION

S O L U T I O N ©

COMPONENTES DEL SISTEMA CONSTRUCTIVO

42401205

AÑO INTERNACIONAL DE LA VIVIENDA
PARA LAS PERSONAS SIN HOGAR
(IYSH)
CERTAMEN MUNDIAL DE SOLUCIONES
CINTUS
SECTOR III

LINEARES

PLANARES

ESTRUCTURAS ESPACIALES

LAS SCOCCHE ESCATULARES

PROCESO CONSTRUCTIVO - SUCESION DE LOS ESTADIOS

LA SCOCCA ESCATULAR

LA ASSIMILACION DEL ESPACIO

POLIEQUIPACION

COMINACIONES

LA RIGIDEZA CONTITUTIVA

ISZALLACIONS

SU REUTILIZO

EQUIPAJES LINGUISTICOS

LA EVOLUCION DE LAS TIPOLOGIAS EDILICIAS

ESTRATEJIAS

HABITAT MARGINALES

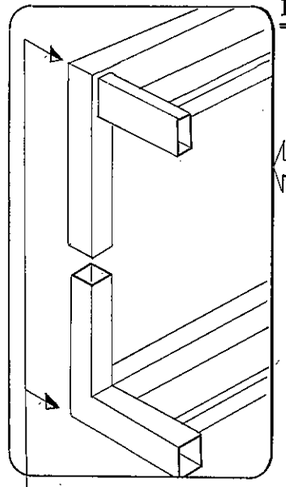
CALAMITADES NATURALES O ARTIFICIALES

PLANO

PLANO

19220321

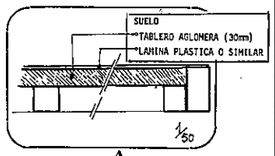
CONTENEDOR: UNIDAD PREFABRICADA (I)

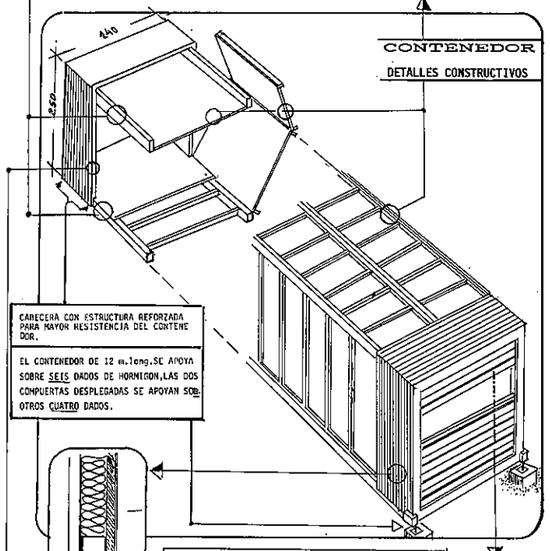


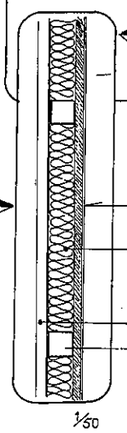
ESTRUCTURA DEL CONTENEDOR

SE FABRICA DE ACUERDO CON LAS NORMAS INTERNACIONALES RELATIVAS A LA CONSTRUCCION DE CONTENEDORES.

* PERFILES DE ACERO CONVENIENTEMENTE TRATADOS CONTRA LA OXIDACION
* SECCIONES DE LA PERFILERIA CON DIMENSIONES DE ACUERDO CON LAS DIMENSIONES DEL CONTENEDOR

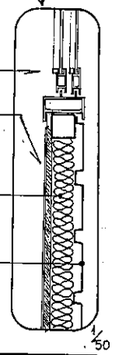


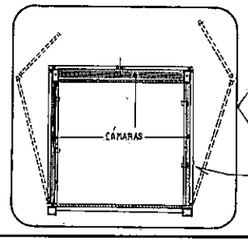




COMPONENTES DEL CONTENEDOR

- °CARPINTERIA DE VENTANAS(Modelos variados)
- TABLERO INTERIOR DE MADERA AGLOMERADA Y ACABADO INTERNO MELAMINICO.
- RELLENO DE MATERIAL AISLANTE CON COEFICIENTE DE AISLAMIENTO ADECUADO A CIRCUNSTANCIAS LOCALES (Al efecto se varía el ancho de la cámara)
- TABLERO EXTERIOR DE VARIADAS ALTERNATIVAS(Chapa de acero plegado,Fibrocemento,etc)
- BASTIDOR DEL "SANDWICH" FABRICADO CON PERFILERIA DE ACERO CON SECCION TIPO 40x40 mm

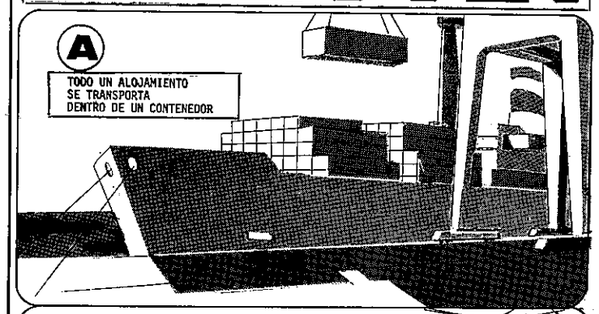




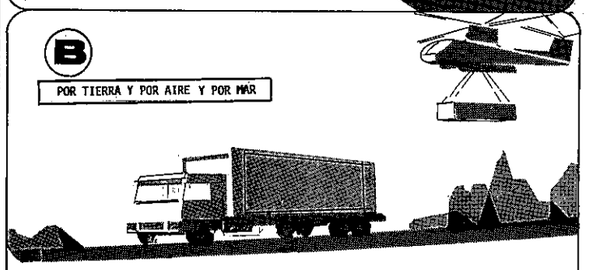
INSTALACIONES PREMONTADAS

* ABSOLUTAMENTE TODAS LAS INSTALCIONES DE FONTANERIA,ELECTRICIDAD,DESAGUES,etc.SALEN MONTADAS DESDE FACTORIA Y SON TAMBIEN PROBADAS.
* LOS DISTINTOS SISTEMAS DE DISTRIBUCION EN PLANTA (ver modelos)SE DISEÑAN DE MODO QUE IN SITU NO SE PRECISE TRABAJO ACCESORIO DE ESTE TIPO,SALVO CONEXIONES A REDES URBANAS.
* TODOS LOS EQUIPOS ELECTRICOS SE MONTAN SOBRE LOS TABIQUES ADJUNTOS A LAS CAMARAS DE CARGA,LATERALES Y SUPERIOR DEL CONTENEDOR.

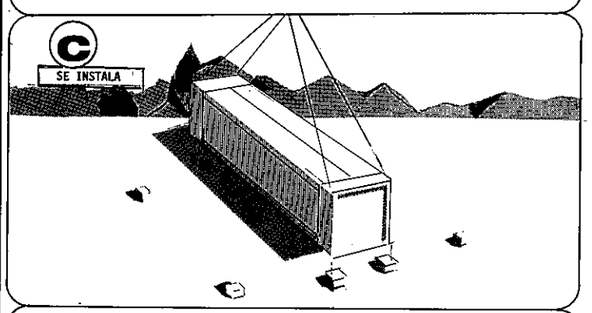
A TODO UN ALOJAMIENTO SE TRANSPORTA DENTRO DE UN CONTENEDOR



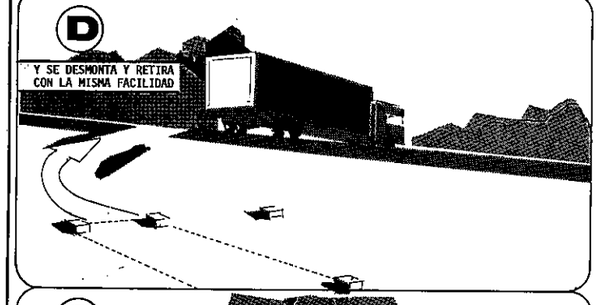
B POR TIERRA Y POR AIRE Y POR MAR



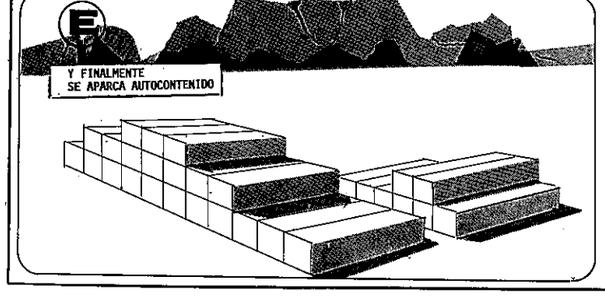
C SE INSTALA



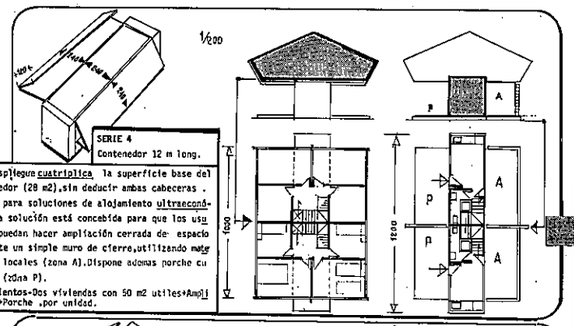
D Y SE DESMONTA Y RETIRA CON LA MISMA FACILIDAD



E Y FINALMENTE SE APARCA AUTOCONTENIDO

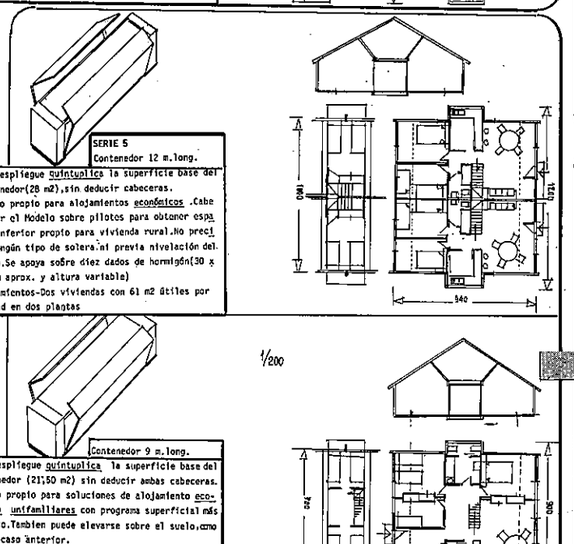


SERIES DISTINTAS PARA SOLUCIONES DIFERENTES



SERIE 4
Contenedor 12 m long.

Por despliegue cuatriplica la superficie base del Contenedor (28 m2),sin deducir ambas cabeceras .
Modelo para soluciones de alojamiento ultraeconómico.La solución está concebida para que los usuarios puedan hacer ampliación cerrada de espacio mediante un simple muro de cierre,utilizando materiales locales (zona A).Dispone ademas porche cubierto (zona P).
*Alojamientos-Dos viviendas con 50 m2 utiles+Ampliación +Porche ,por unidad.

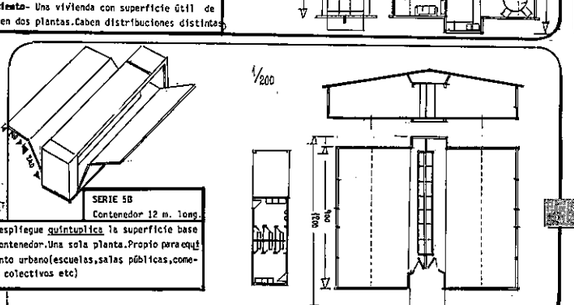


SERIE 5
Contenedor 12 m.long.

Por despliegue quintuplica la superficie base del Contenedor(28 m2),sin deducir cabeceras.
Modelo propio para alojamientos económicos .Cabe elevar el Modelo sobre pilotes para obtener espacio inferior propio para vivienda rural.No precise ningún tipo de solera,al previa nivelación del suelo.Se apoya sobre diez dados de hormigón(30 x 30 cm aprox. y altura variable)
Alojamientos-Dos viviendas con 61 m2 útiles por unidad en dos plantas

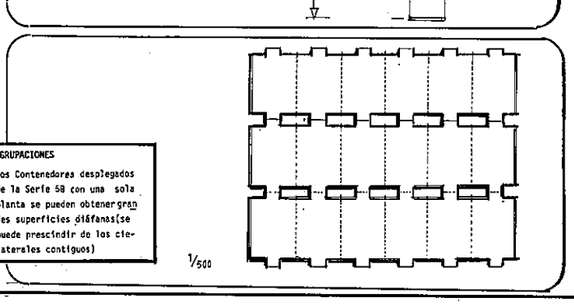
Contenedor 9 m.long.

Por despliegue quintuplica la superficie base del Contenedor (21,50 m2) sin deducir ambas cabeceras.
Modelo propio para soluciones de alojamiento económico unifamiliares con programa superficial más extenso.Tambien puede elevarse sobre el suelo,como en el caso anterior.
Alojamiento- Una vivienda con superficie útil de 65 m2 en dos plantas.Caben distribuciones distintas



SERIE 5B
Contenedor 12 m. long.

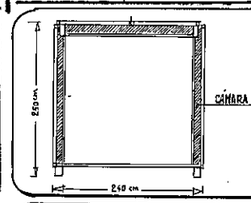
Por despliegue quintuplica la superficie base del Contenedor.Una sola planta.Propio para equipamiento urbano(escuelas,salas públicas,comedores colectivos etc)



AGRUPACIONES

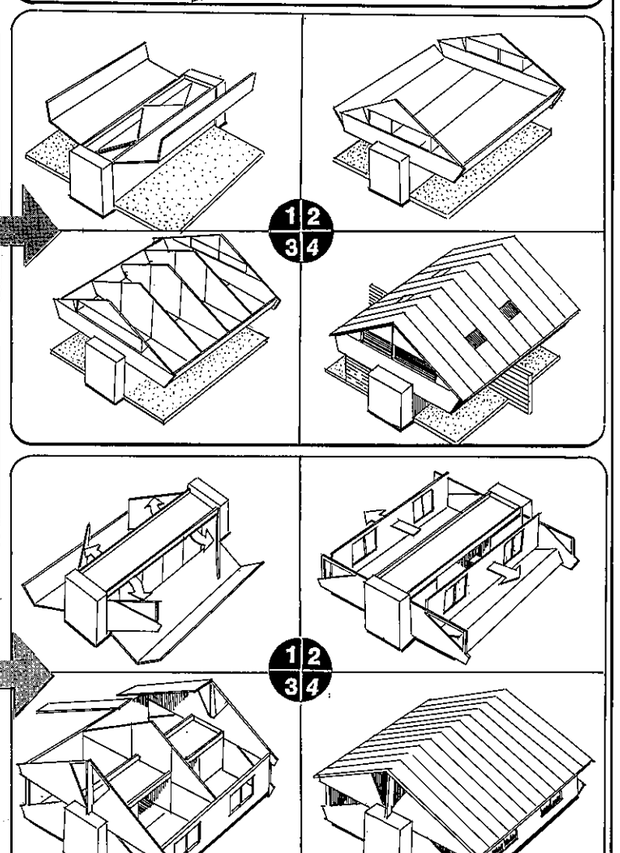
Los Contenedores desplegados de la Serie 5B con una sola planta se pueden obtener grandes superficies diáfanas(se puede prescindir de los cierres laterales contiguos)

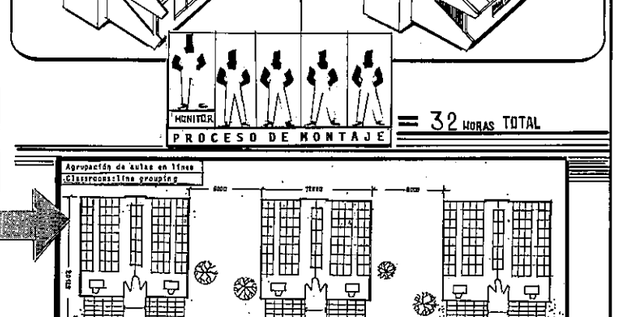
SISTEMA DE TRANSPORTE, DESPLIEGUE Y MONTAJE IN SITU (II)

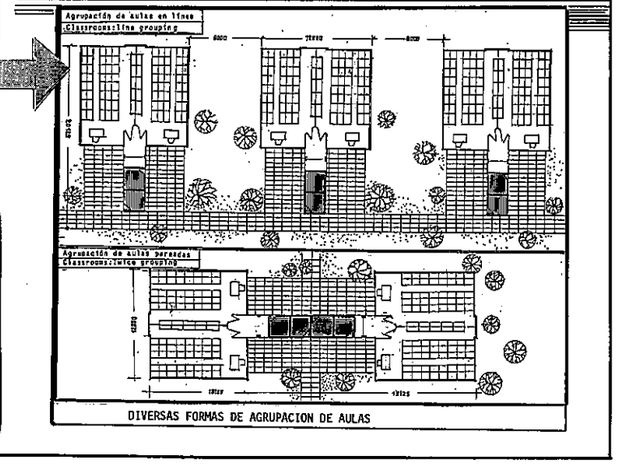


SISTEMA DE TRANSPORTE AUTOCONTENIDO

*Todos los componentes no-montados en factoría y transportados en el contenedor para montaje in situ,son planos de modo que pueden ser alojados en las cámaras de transporte disponibles en los laterales y techo del contenedor.
*Los paneles "Sandwich"utilizados para cubierta(ver detalle en sección de escuelas),se alojan en cámara de cubierta. Los paneles de fachada laterales y cabecera,se alojan en las cámaras laterales.Otras piezas menores,se transportan en los espacios vacíos dentro del contenedor.

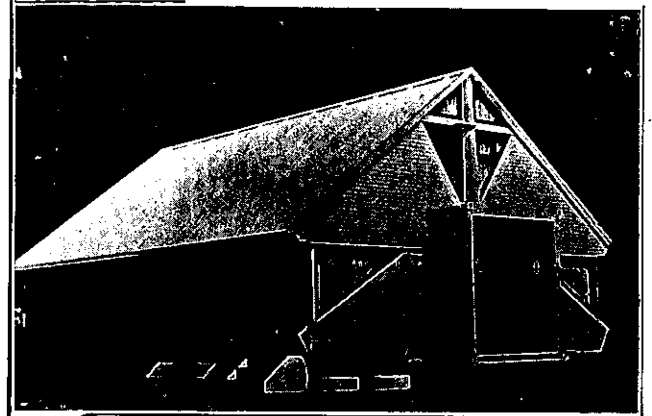






DIVERSAS FORMAS DE AGRUPACION DE AULAS

EJEMPLOS REALES DE DIVERSOS MODELOS



2. CERTAMEN DE SOLUCIONES, PRESENTACION DE PROYECTOS

2.1. PROPOSITO

Se pretende que los concursantes aporten sus ideas renovadoras tanto al concepto de la vivienda, los instrumentos jurídicos que enmarcan su gestión y su financiación, como a las más inmediatas posibilidades tecnológicas, tales como la utilización de nuevos materiales y componentes de la edificación. Quedará abierto el estudio a nuevos conceptos de la vivienda, de alguno de sus órganos, de los procesos de ejecución o de cualquier otro aspecto que haya despertado el interés del concursante. Y serán tenidos en consideración desde aspectos ecológicos, energéticos de durabilidad, transporte y reciclaje hasta los que conciernen el entorno, carácter local, variedad o belleza.

OBJETIVOS BASICOS OFERTADOS EN ESTA PROPUESTA

· Los siguientes propósitos del texto del Certámen, que incluimos al márgen, han sido objeto del presente Proyecto.

Aplicación de nuevas tecnologías-Ofrecemos una solución industrial de elemental simplicidad, asequible con escasos recursos técnicos. La Serie 4 de modo particular, permite ser complementada con materiales y mano de obra local. El montaje se realiza con estrictos peones y un monitor.

Ecologia- Adecuación climática: es un simple problema de nivél de aislamiento +Conservación energética: queda implicada en el punto anterior (ver leyenda en área de Componentes del Contenedor) +Adecuación al paisage: se facilita mediante materiales complementarios del lugar (punto anterior) asi como mediante coloración adecuada y recursos formales (nuestra estética resulta identificable con cualquier paisaje).

Durabilidad, Transporte y Reciclaje- Entendemos que estas tres palabras no pueden interpretarse, en este caso, como conceptos asépticos absolutos. Los dos segundos de algún modo se contraponen al primero.

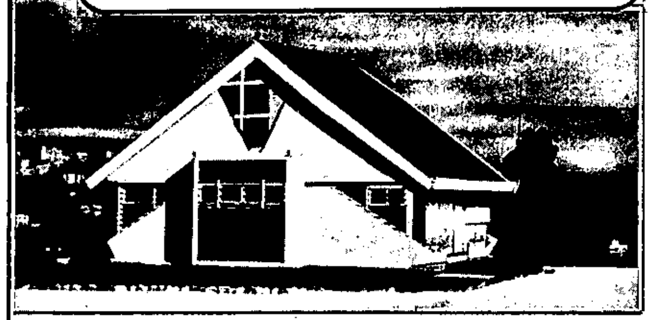
+Reciclaje: de principio excluye a un amplio sector de materiales susceptibles de empleo. Razones: manipulación, resistencia, tolerancias de fabricación etc. +Transportabilidad: exige ligereza, estrictez dimensional, etc.

+Durabilidad: para hacerla asequible a los postulados anteriores, se precisan materiales tratados convenientemente (nuestras experiencias en el uso de contenedores para transporte, así lo demuestra).

ENTENDEMOS QUE LA MUESTRA GRÁFICA QUE SE OFRECE, NO PRECISA DE MAYORES EXPLICACIONES AL CASO.

Variedad y Belleza-Hemos concebido un sistema constructivo originalmente, con tres objetivos esenciales: **MULTÍUSO** (variedad y flexibilidad) **+TRANSPORTABLE Y AUTOCONTENIDO** (ahorro de fletes, facilidad de almacenaje, reutilización) **+RECICLAJE MÁXIMO** (no dependiente del suelo, de elemental montaje, resistente a las sucesivas manipulaciones)

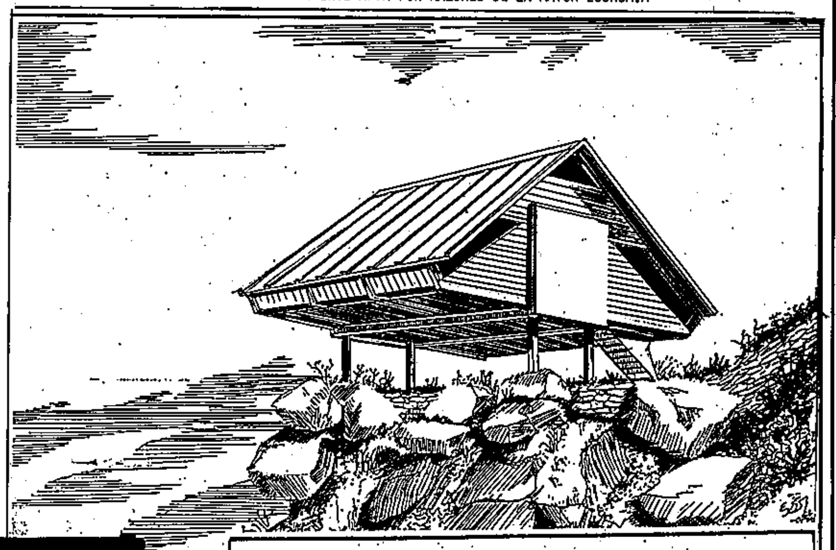
En cuanto a BELLEZA: el proyecto ha sido totalmente cocebido y desarrollado por un arquitecto.

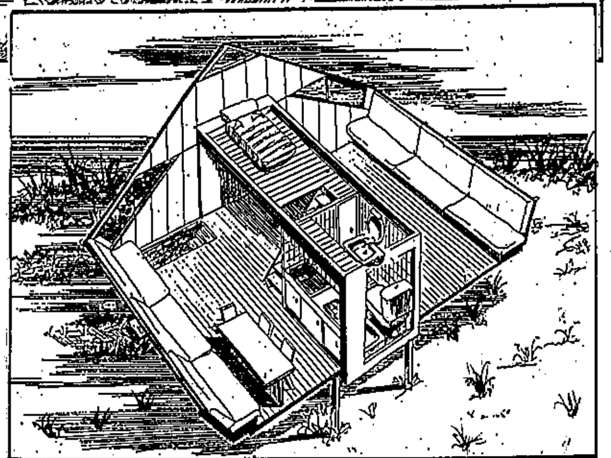


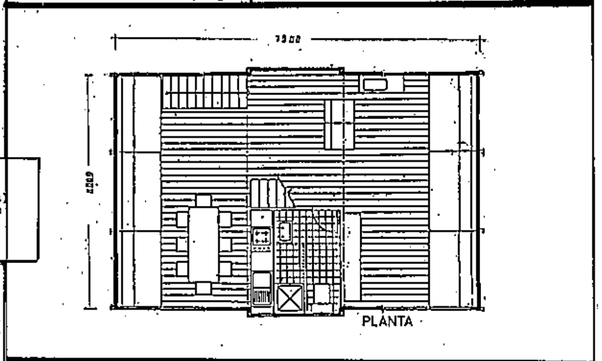
AGRUPACION DE UNIDADES SERIE- 5B

PERSPECTIVAS DE LA SERIE. 4 (IV)

SOLUCION ESPECIALMENTE APTA POR RAZONES DE LA MAYOR ECONOMIA







SOLUCION DE EMERGENCIA PARA ALTA MONTAÑA

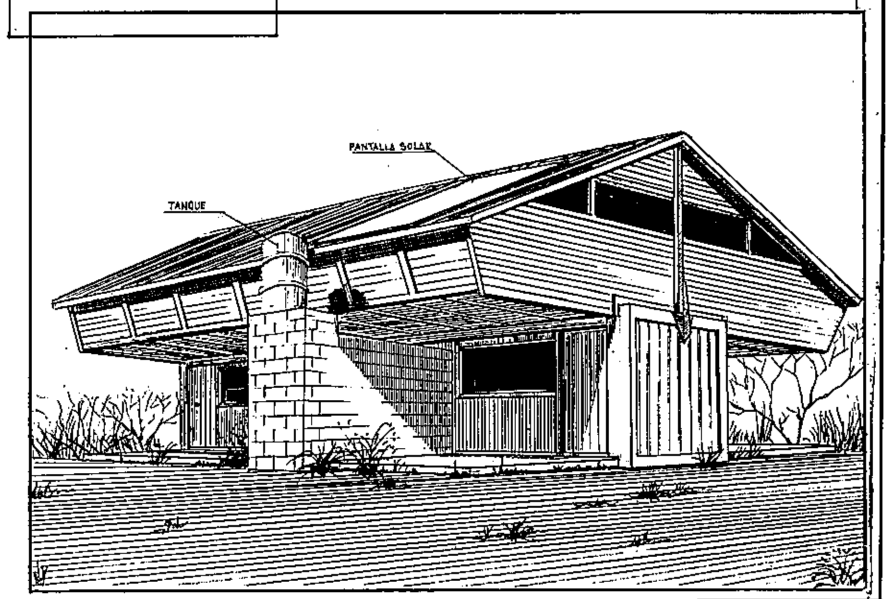
+Se utiliza contenedor de 30 pies (6metros)
+Patas telescópicas para adptación al suelo
+Tanques para recogida de agua pluvial.
+Pantalla captadora de luz solar.

SOLUCION PROPIA PARA POBLACION MARGINADA O DESPLAZADOS

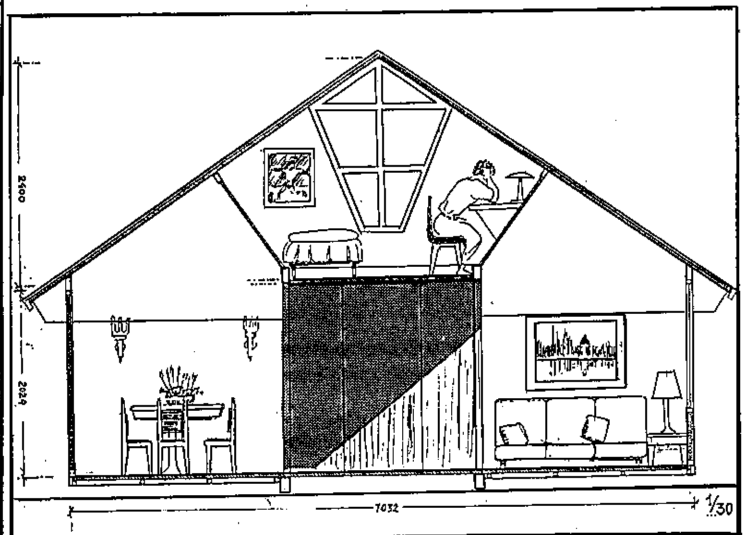
+Máximo contacto con el suelo en actividades domésticas realizables fuera y a cubierto. Solo arriba para dormir.

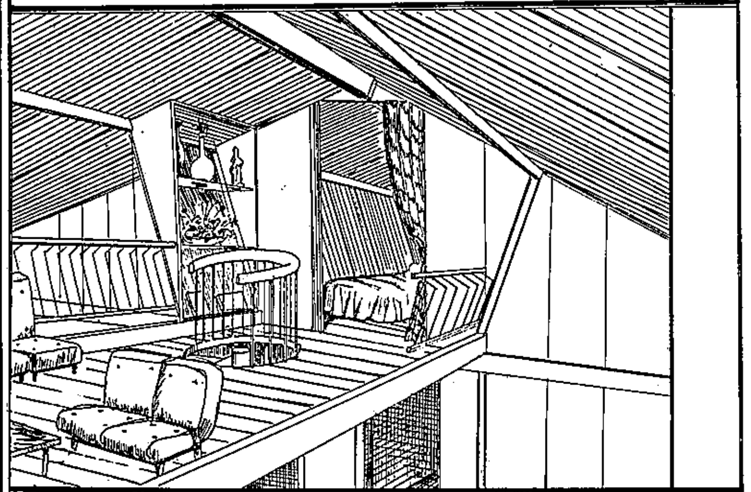
+Posible ampliación con materiales locales envolviendo la planta baja.

+Posible autonomía: captación de luz solar y agua pluvial



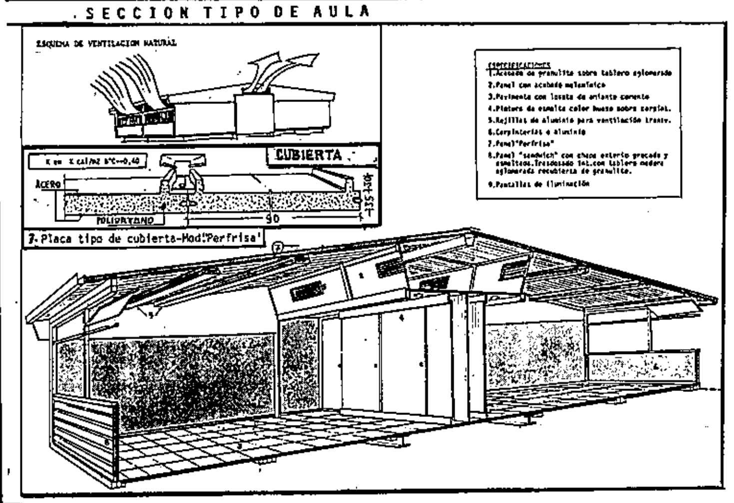
SECCIONES TIPO DE ALOJAMIENTOS



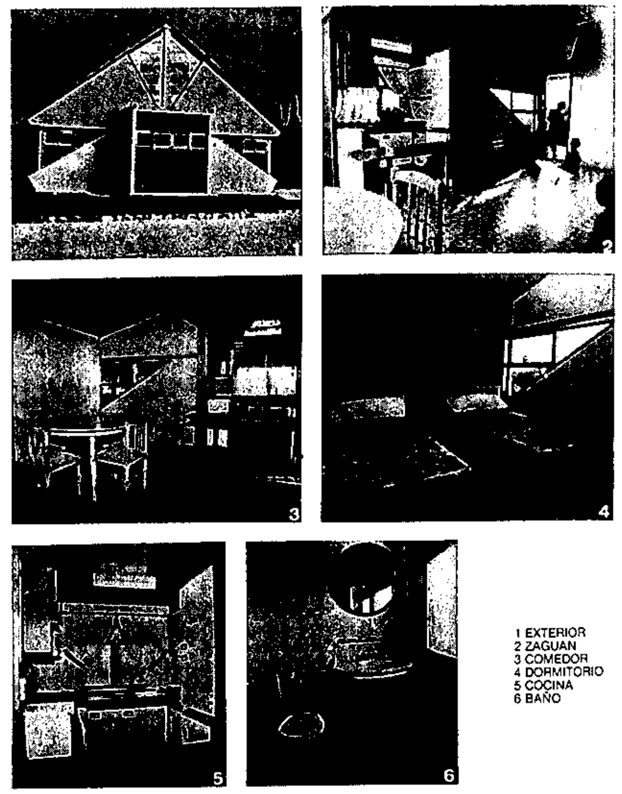


SERIE 5 • SECCION TIPO Y PERSPECTIVA DEL SEGUNDO NIVEL

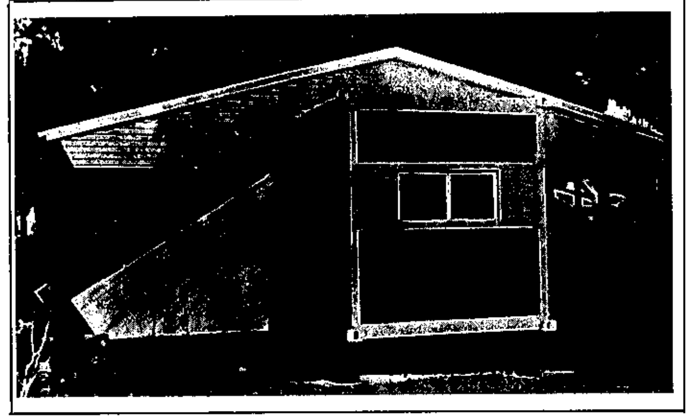
. SECCION TIPO DE AULA

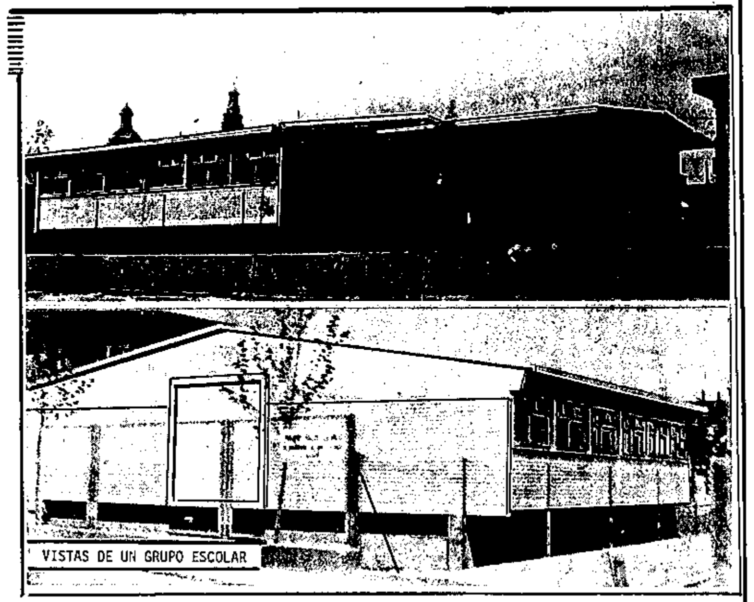


VISTAS DE DIVERSAS SOLUCIONES (III)



1 EXTERIOR
2 ZAGUAN
3 COMEDOR
4 DORMITORIO
5 COCINA
6 BAÑO





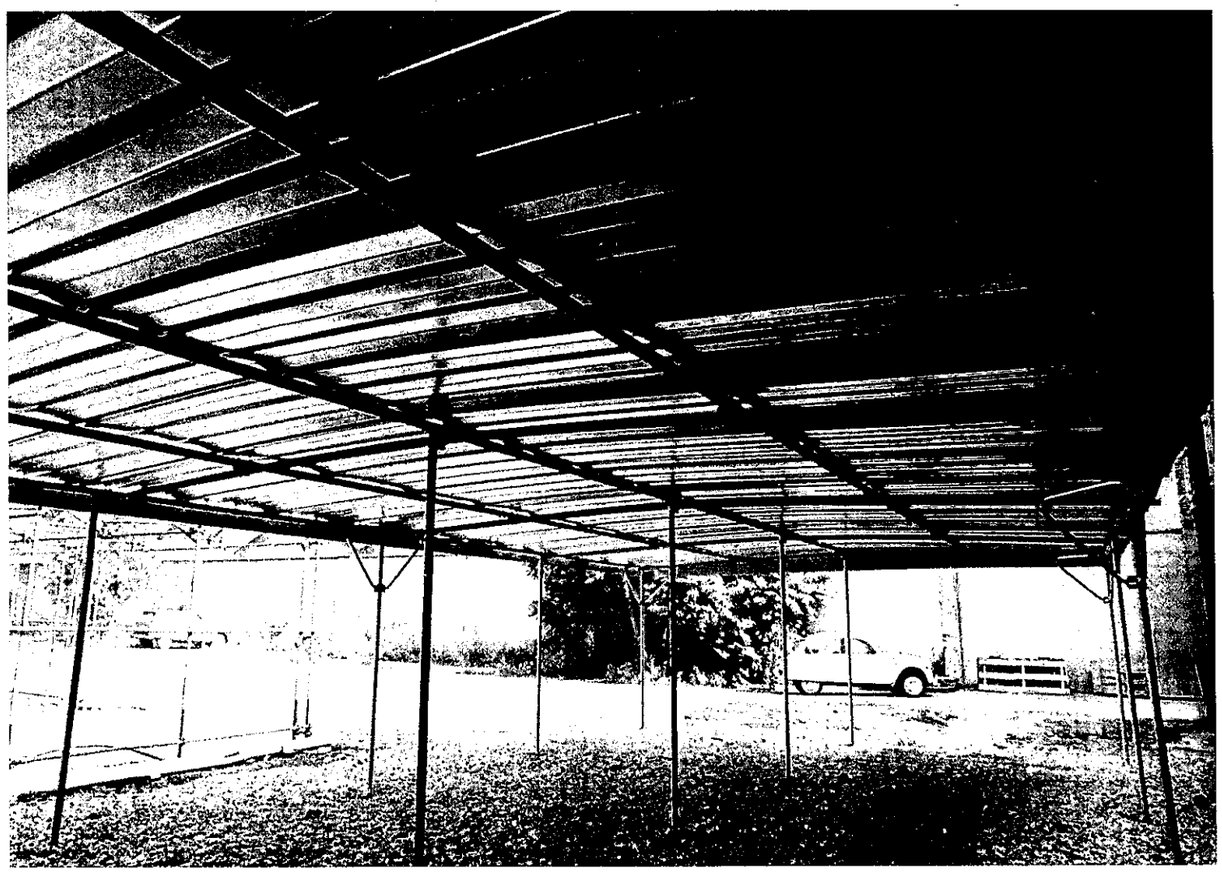
VISTAS DE UN GRUPO ESCOLAR

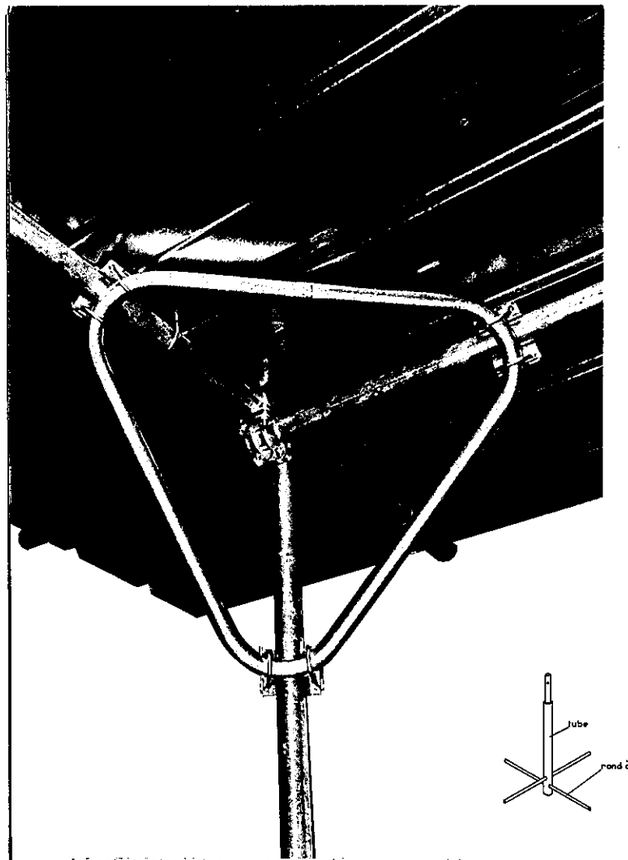
UN ABRI MINIMUM EVOLUTIF

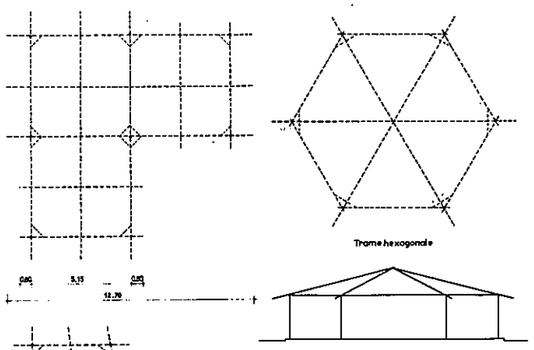
ADAPTE AU CLIMAT, OPTIMISANT LES RESSOURCES LOCALES

LA TOITURE AVANT LES MURS : D'ABORD **UN PARAPLUIE**

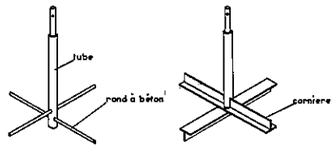
1. UNE STRUCTURE SIMPLE DE MONTAGE, A GEOMETRIE VARIABLE, PERMETTANT TOUTES LES IMPLANTATIONS ET GROUPEMENTS, POSSIBILITE DE PLUSIEURS NIVEAUX, ANCREE ET CONTREVENTEE, RESISTANT AUX TREMBLEMENTS DE TERRE ET AUX TYPHONS, TRANSPORT A VOLUME MINIMUM, TUBES STANDARD SANS PERTES.
   Bambou, Rondin, Bois débité, Tube acier ou aluminium.
2. UNE FONDATION ELEMENTAIRE AVEC ANCRAGE
   Une pierre, un rond à béton, de la terre.
3. UN CONTREVENTEMENT UNIVERSEL EN TUBE D'ACIER ADAPTE A TOUS MATERIAUX.
   ELEMENT TRIANGULAIRE PERMETTANT UNE GEOMETRIE VARIABLE DE LA STRUCTURE.
4. UN ASSEMBLAGE PAR ELEMENTS EN TOLE ET COLLIERS (Brevets).
   MONTAGE SIMPLE PAR SERRAGE INDEPENDANT POUR CHAQUE TUBE.
5. UNE COUVERTURE A PENTE VARIABLE AVEC EVACUATION DES EAUX PLUVIALES PAR FOSSES.
   Toile, Polyane, Chaume, Bambou, Bois, Carton bitumé,
   Plaques amiente ciment, Toles ...
   Isolation thermique possible au dessus du parapluie avec les même attaches.
6. UN SOL, TERRE PLEIN SURELEVE OU PLANCHER SURELEVE VENTILE.
7. UNE CLOTURE EXTERIEURE, DES CLOISONNEMENTS INTERIEURS ULTERIEUREMENT.
   Paille, Branchages, Natte, Caillebottis, Bambou, Bois,
   Carton bitumé, Polyane, Toile, Pisé, Banco, Adobe,
   Brique, Parpaing, Plaques amiante ciment, Toles ...



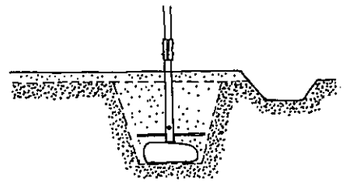




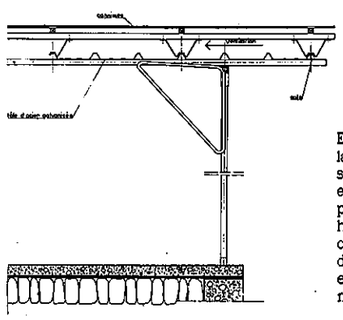
Système d'ossature à géométrie variable.
Liberté angulaire et dimentionnelle de la trame en plan et de la forme et de la pente du parapluie.



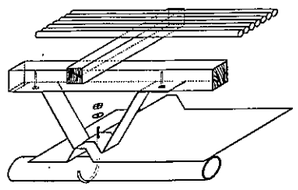
Le contreventement : un triangle en tube acier galvanisé de ø 33,7 2,9.
Le libre jeu de la position des attaches autorise un choix de géométrie complexes en plan et en élévation.

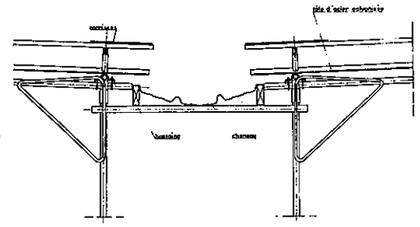


Fondations par appui simple de poteau sur pierre, dallé ou parpaing. Ancrage par ronds à béton, cornières soudées dans massif de terre ou béton maigre.

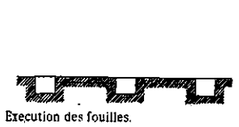


Elément de soutien de la structure supportant l'isolation en canisses, côtes de palme, branchage, herbe de savane, chaume ... établie au dessus du parapluie en se servant des même attaches.

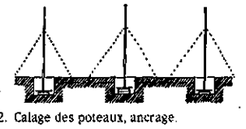




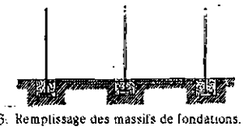
Liaison de deux parapluie par un élément en tôle formant chéneau.



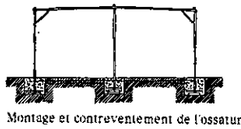
Exécution des fouilles.



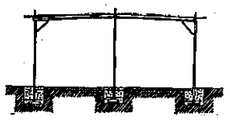
2. Calage des poteaux, ancrage.



3. Remplissage des massifs de fondations.

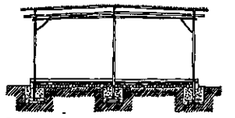


4. Montage et contreventement de l'ossature.

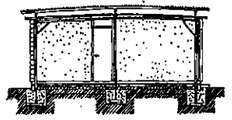


5. Pose des bacs en tôles galvanisée.

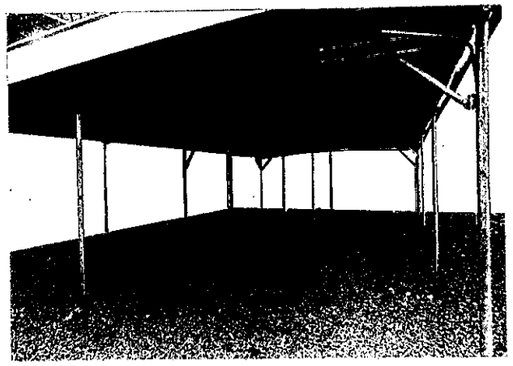
6. Exécution des fossés et du sol sûreleve en terre battue ou dalle.

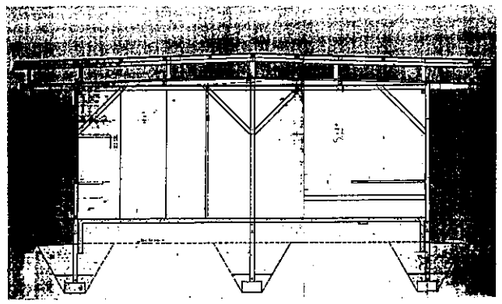


7. Pose de l'isolation thermique.

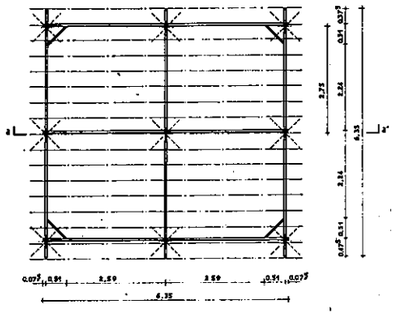


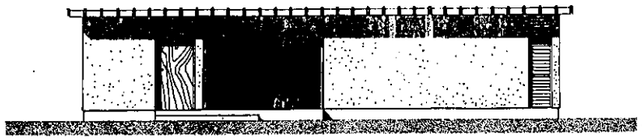
8. Montage des clotures extérieures et des cloisons ultérieurement.

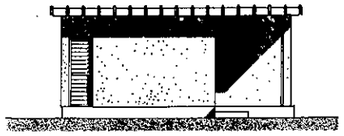




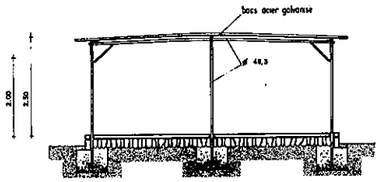
Prototype d'un parapluie de 100 m2 = 4 travées _ 15 poteaux.
Tubes acier galvanisé standart de 6m,40 pour poutres et pannes, coupés en deux pour poteaux de 3m,20.
Galbe des poutres et de la tôle acier galvanisé de50/100 par traction manuelle.



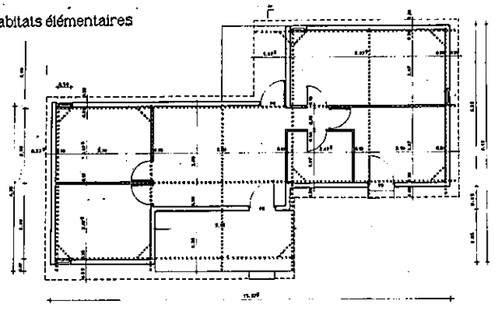


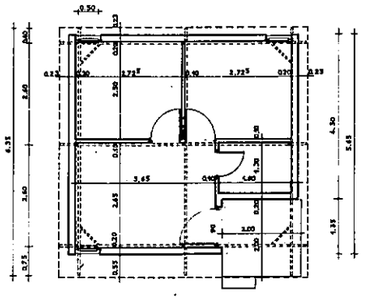


façade principale

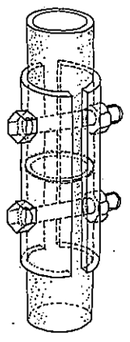


Etat final d'habitats élémentaires

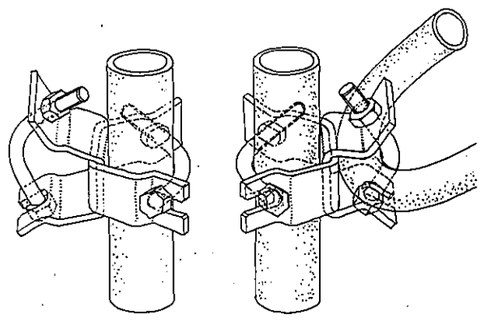




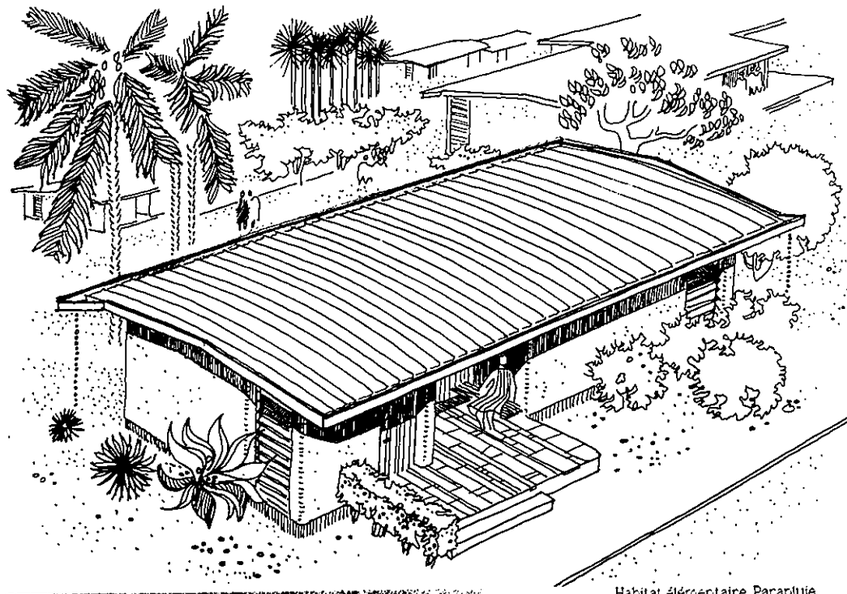
Raccord de tubes de structure

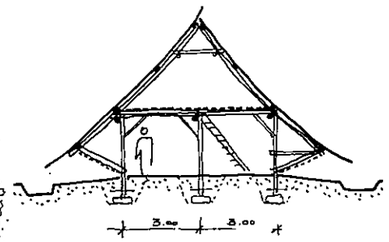


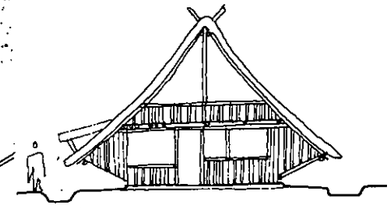
Noeud d'assemblage poteaux, poutres, pannes et triangles de contreventement : un collier tôle et un collier boulonné pour chacun des tubes de ø 48,3 et un collier boulonné pour chacun des tubes de ø 33,7 des triangles de contreventement.



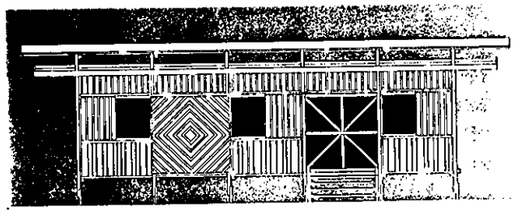
Essai d'un prototype à quatre poteaux.
Surcharge de couverture en eau de 150 kg/m2
Travée 4m,85 _ Tubes acier galvanisé ø 48,3×2,9 et triangles

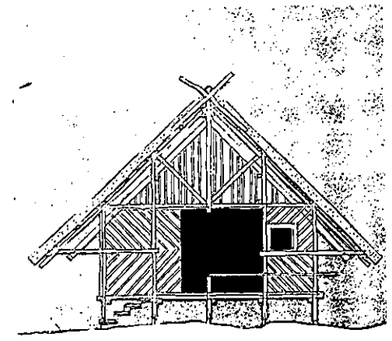


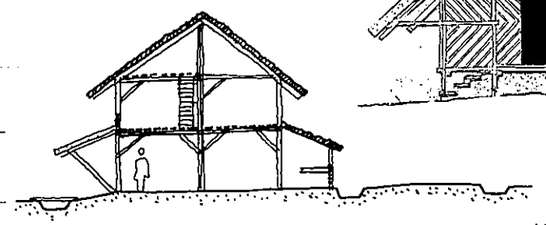




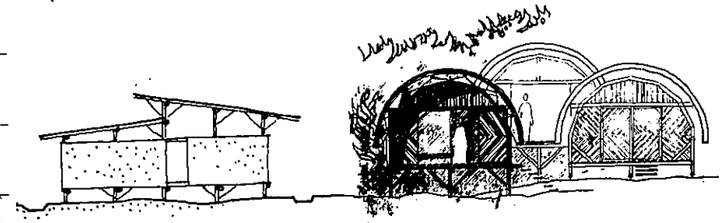
Habitat élémentaire. Parapluie tôle largement débordant protégeant la cloture en pisé, adobé, banco ...





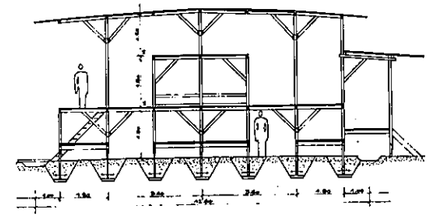


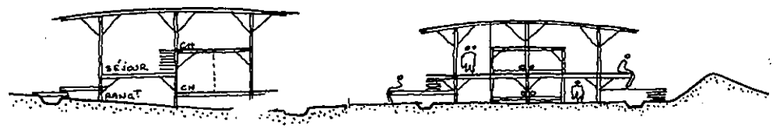
Schémasde formes complexes de structures acier, bois ou bambou.



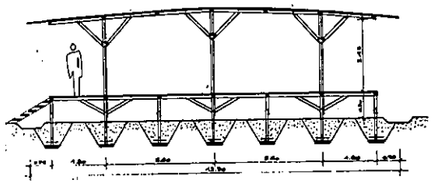
Etat final d'un parapluie avec plancher surélevé ventilé, isolation thermique de la couverture en tôle, cloture et cloisons en planches. Equipement sanitaire minimum.

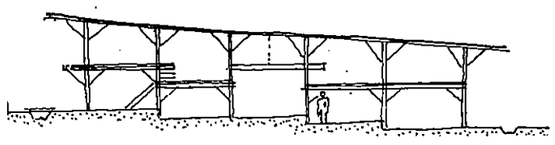
Un parapluie avec plusieurs niveaux





Un parapluie avec sol surélevé





Schémas d'implantation sur sols variés et jeux de niveaux.

INTERNATIONAL COMPETITION 86/87: SECTION III — NEW TECHNOLOGY IN CONSTRUCTION

1 — SOLUTION ANALYSIS

The solution to the world problem of social housing is in advanced building technology fulfilling the following conditions:

- It must be a sound business system, be viable and profitable under different circumstances in various countries and be implementable without massive foreign capital or government investment.
- It must be a dynamic and self generative system, small in scale, complete and easy to implement initially but allowing for efficient growth with increased capacity to solve problems of greater magnitude and complexity.
- It must use readily available cheap raw materials.
- It must be easy to learn and must use locally available professionals and labour, inexperienced in building system technology.
- It must produce permanent buildings with a life expectancy of over 50 years with minimum maintenance.
- It must produce houses with acceptable insulation standards without the use of costly applied material for all but the coldest countries.
- It must offer total freedom of design for the buildings to reflect local values and taste.
- It must allow economical one-off designs as well as small scale and large scale projects to be undertaken simultaneously so that existing cities can be revitalised and new towns developed in a wide variety of ways.
- It must be fully thought through and tested for trouble free implementation, yet be open ended and adaptive to local needs, such as earth quake resistant design, school building, etc.
- It must be future based and be adaptive to automation and the advanced application of computers in design, communication, management and production.

THE PROPOSAL is a single unified development which I shall, for this purpose, call Total System (TOS). It has been visualised from first principles top down, from the architect's view point, but developed bottom up from the hardware end over a period of 20 years. TOS is a single body science and no one development may be considered less important than the other.

WHAT IS TOS?

TOS is an integrated science of building that cuts across professional, contracting, business, hardware and communication boundaries. It may, with some difficulty, be divided into the following sub-systems: they are the **Modular System, Digital System, Design and Information System, Wall System, Floor System, Reinforcement System, Assembly System, Production System and Production Equipment.** It also includes staff and management training and business planning.

While based on a careful and extensive analysis of existing systems and materials, TOS rejects the concept that economies are only possible through standardisation of building. Instead it supports the view that real economies are only possible by a complete re-think at all levels of work, starting from the architect's office and going right down to the application of hardware and work routines at the production level. TOS is based on true modular co-ordination, not modular standardisation. It is the means that have been vigourously standardised and not the end product.

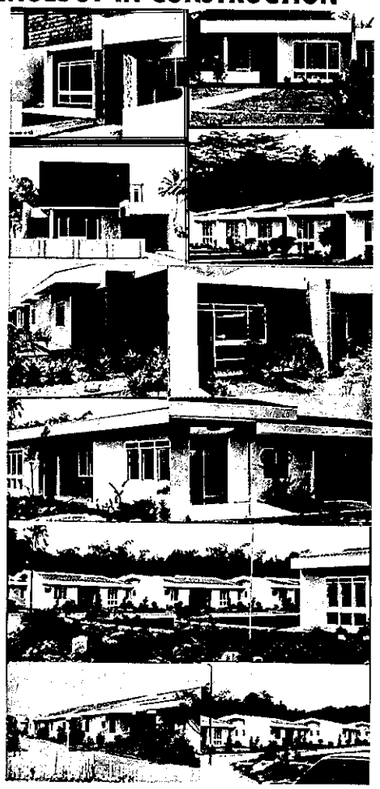
It is often thought that high technology is complex technology. This is not the case with TOS where the complexities are resolved at the thinking level and a noteworthy feature of TOS is its extreme simplicity at all levels of application. The highly complex relationships that exist between the various solutions are transparent to the designer and the manufacturer. Neither need concern themselves with the critical questions of tolerance, fit, modular relationships and the many jointing problems as these are automatically derived from the design system, the structural system and the production system. The communication system acts as a common language to bind the various professions and management together and provides the control codes for operation of the various hardware components.

The uniqueness of TOS is that there are no limitations in design whether in quantity or one-off. Single storey, high rise, split level, arches, staggered layouts, cantilevers and balconies can be freely designed with the finished product indistinguishable from normally constructed high quality housing. TOS homes, while being very strong and permanent, with a feel of mass and solidity, are nevertheless lighter than mass concrete housing and give greater weather resistance due to the hollow core structure and the fully reinforced structural concrete joints in both axes. The ability to build all types of commercial housing in addition to social housing has a strong bearing on the profitability of a housing industry. Although the market for commercial housing may not be very large, the profit margin is often significant.

Working from a plant with an output of 50,000 m2 inhabitant area the profit can be doubled if only 25% of the output were for commercial housing. The ability to profit from commercial housing and the chance to enter into a long term business venture, with great growth potential, would form the necessary incentive to attract investors into the building of low cost mass housing, an otherwise low profit sector of the housing market. The viability of the business would be established by the regularity of work from the low cost housing market. A fact to be noted is that there is very little cost difference in production of high cost, medium cost or low cost housing as finishes and fittings, obtained externally from the plant, account for the large difference in cost. The Profit margin nevertheless is based on gross value and hence the substantial difference in profit for the different classes of housing.

TOS is first implemented in a central plant with an output of 40 — 50,000 m2 inhabitant area per year, to serve a radius of about 150 km. The plant may then be doubled with a small additional investment. Following this, satellite plants may be set up for expanded production while maintaining a compact central planning and management unit.

High level management is slow and difficult to develop, but long term success is largely dependant on development of key management personnel. Hence careful recruitement and training of key managerial staff is a priority. Low level staff are easy to train, but their efficiency will depend on senior management attitude. Professional and technical staff adapt to the System with enthusiasm and their early commitment will see the venture through initial difficulties.



2 — ELEMENTS OF TOS BUILDINGS

All TOS houses, regardless of whether they are luxury condominium or low cost houses, are built according to the same stringent quality criteria as there is no saving in accepting sloppy workmanship or poor design in any kind of building.

The structural integrity of a TOS building is ensured by the use of high strength 200mm. thick hollow core wall and floor panels, joint by fully tensile joints and by internal vertical columns extending continuously between storeys. Due to the inherent integrity and strength of structures built according to the system the architect is left a large degree of freedom to find an aesthetically pleasing and functional design without being unduely limited by structural restraints.

The use of large diameter concrete joints that are continuously reinforced along their entire length, rather than mortar fill joints, ensures crackfree and leakproof joints of absolute integrity. A good finish of panels is ensured by work being carried out under factory conditions. A good building finish is ensured as joints are internal in the panels and as the small joint gaps between panels are easily concealed.

TOS Wall Panels have an average concrete thickness of 100 mm. after account has been taken of the hollow cores. The hollow cores have an approximate diameter of 150 mm., but are somewhat elliptical in shape. The centre distance between the hollow cores is 200 mm. It is thus desirable, though not necessary, that the measurements of TOS building be modules of 200 mm. The hollow cores are vertical when the elements are erected. They are used to run plumbing and electrical wires in.

Wall Reinforcement in the horizontal direction, consists of a double layer, one set in each face, of high tensile indented wires (usually 6 mm.) running horizontaly and obeying the following rules: two pairs of wires spaced vertically at 100 mm at top and bottom of panel with stirrups at 200 mm, provide edge stiffening. Maximum spacing of paired wires of same diameter inbetween, at 400 centres provide crack resistance. Wires passing through openings are cut back and cast into the opening surrounds. Vertical reinforcement is provided by standard cages of 6 mm. steel and obeying the following rules: a cage along each vertical edge and adjoining all openings. Cages at mid span at maximum 600 centres.

TOS Floor Panels have the same thickness and geometry as the wall panels. They are cast on the same bed, using the same techniques, as for the wall panels. Free spans of up to 7 meters are allowed for floors and when the floor panels are used as roof panels the span can be somewhat longer. Cantilevering with parapet load is allowed up to 40% of the span of the panel without extra reinforcement. Double cantilevering is possible through the provision of extra reinforcement crosswise to the span direction in the web or over the core.

Floor Reinforcement consists of 6 mm. indented prestressing wires running in the direction of the span, which is crosswise to the hollow cores, at 200 mm. or greater intervals. As with the wall panels, the reinforcement is symmetrical in the upper and the lower flange. Sheer reinforcement is provided at every web, with standardised ladders through which the wires pass.

Wall Joints — When panels are placed edge on edge a full or double sized hollow core is formed between the panels, within which the reinforcement loops overlap. By placing a locking bar through the loop overlap and filling up the cavity with concrete, a fully reinforced joint is formed. The joint in fact forms a column within the wall. These columns are normally made to continue through floors to give the building full integrity between storeys. Additional columns can be created wherever necessary through placing reinforcement and concrete in non-joint hollow cores. Horizontal wall joints are essentially gravity joints. The panels are held firmly in place by being locked into the vertical columns.

Floor Joints in the direction of the span are made in a way similar to the vertical wall panels with reinforced interlocked joints. The upper flange is left open to allow concrete to be poured from the top. Reinforcement wires are placed between adjoining floor panels, where a small gap is left. Concrete is poured into the joint in such a way that it will enter a short distance into the hollow cores of the floor panels. Thus the required sheer resistance is created along the length of the joint. The floors are anchored to the walls by the columns extending through it and where necessary with bent reinforcement anchored into the wall hollow cores.

Foundations are chosen according to ground conditions in the ordinary way. Two important considerations to take into account are that TOS buildings are comparatively light and that for low rise buildings no ground beams are required as the elements are designed as wall beams or arches in the structural design. If the ground conditions are suitable, the use of bored pile foundations is often the cheapest alternative.

Stairs and Landings are cast in special moulds in full or half flights.

Fascia Panels are cast in special moulds to required sizes in ribbed profile sections.

Surface Finishes — The panels are in themselves very smooth and are normally just painted. Different surface textures may however be made for aesthetical reasons. The surfaces may simply be roughened while the concrete is still wet and then painted, or large or small stones may be put into the wet concrete to give a stone work effect. It is also possible to glue tile brick material onto the smooth panel surfaces for a brickwork effect, or to glue various kinds of tiles to the panels.

Roofs — The cheapest kind of roof is a flat roof made from TOS floor panels. For leak integrity, it is sufficient that the joint be sealed with a suitable epoxy putty. The prestressed panels themselves may be considered proof against cracks or leaks. If a pitched roof is required, the roof is made according to a conventional timber truss design.

Internal-Services — All telephone, electrical, plumbing and sanitary services except for main sewer pipes are installed concealed within wall and floor panels. Knock out rubber inserts provide face openings on the panels and bridging openings across panels for passing the internal services.

STRUCTURAL DESIGNS for floor and wall panels have been optimised using the finite element programme Sap IV and based on British Code CP110. The floor design has been checked independently with another programme using isoparametric elements. The computer analysis was carried out by a research institute, in a series of assignments.

Floor Panel design is based on a stressed skin design concept with equal symmetrical prestressing at top and bottom. Cores run crosswise to the main span. The same reinforcement positions are used in the anchorage as for walls, except that prestressing wires are used. The economies of reinforcement allow a medium span design of about 4 m. and a long span design of 6 to 7 m. to be used for all intermediate spans. Camber and differential dilfection do not present a problem with this design as there is no camber and dilfection under load is very low. Floor cantilever without parapet wall load is 50% of span.
The serious problem of designing for irregular floor layouts has been solved by the concept of the "Complement Pair" wherein two slightly different widths of floor slabs are used in various combinations with a varying joint width (Fig. 6.1). The joint width will be less than 100 mm. in general cases. While a few other combinations may be used, a combination of 1.3 m. and 1.7 m. width meets most design requirements, while making maximum use of the casting bed.

Wall Panel analysis, with possibilities of large or several small openings, is based on two design concepts:
A wall beam concept is used for work up to 3 storeys where no ground beams are required and each floor layout may differ. The load bearing concept is used for designs up to 5 storeys.
Rules for design of floors and walls for work up to 5 storeys were checked against the above analysis. In practice, designs up to 10 storeys show no change in the rules. Taller buildings may require some voids in the walls of lower storeys to be filled as columns or stiffeners.

ASSEMBLY SYSTEM
LOWER PICTURE —
SIMPLE WALL REINFORCEMENT COMPONENTS & TOOL

3 — TOS EQUIPMENT AND THE PRODUCTION SYSTEM

To ensure efficient production and quality control, production of TOS buildings is carried out to the greatest degree possible, in a well organised factory. All main equipment in the plant have been specially developed for the System.

CASTING BEDS — The core of a TOS factory is a twin set of raised casting beds made of concrete according to a special technique. The size of one bed is about 100m x 3.2m. The two beds are used alternatively and share much of the same equipment. While one bed is curing, the other is being cast. Fixed anchorages at each end of the beds have numbered slots to locate reinforcement wires. These have the double purpose of stretching rubber sidings, which will form the side shuttering of the mould along the beds and also tensioning or prestressing the wires which will form the main reinforcement. Rail tracks are fitted on either side of the beds to carry the auto production equipment. The electrical conductor system and steam pipes are fitted below the beds on separate sides, while a wire basket on each side of the bed carries the side shuttering when not in use. The first operation is to clean and oil the bed. This is easily done with the auto-cleaner as the bed is free of obstructions.

FLEXIBLE MOULD SYSTEM — All shuttering and mould inserts are in rubber and are compact, light in weight and easy to handle. As they are made from industrial rubber, they are resistant to the corrosive and abrasive effects of concrete and will give a long trouble free life. They do not create vibration noise, form a tight seal with the bed and do not damage the bed or the casting machine, nor are they easily damaged. As concrete does not stick to rubber, these are easily cleaned off and need not be oiled. The core formers are rubber encased and also do not require oiling.

Side Shuttering — The next step in the casting operation is to place the prestress wire threaded rubber side shuttering on the bed and to anchor them in the appropriate slots in the anchorages. For the wall panel casting, the distance between the sidings is chosen so that it corresponds to the height of one storey. Floor panels are normally cast in parallel. Three sidings spaced at 1.2 — 1.8 m are then used. When the siding wires are stretched they will hold the sidings absolutely straight in the same way a taught string would.

Core-Formers — Continuously along the length of the side shuttering, runs a set of closely spaced holes through which the core-formers will be placed. The core-formers consist of rubber sheathed metal cores which can be expanded through a simple pneumatic mechanism. They have no moving parts and are totally rigid when expanded. Once a core-former has been placed across the bed and expanded, it forms an absolute tight fit against the side shuttering. The purpose of the core-former is not only to form hollow core voids in the panels but also to locate and lock into position all mould inserts, such as joint formers, opening formers and reinforcement cages. The core-former and the mould inserts interact in such a way that when the core-former is expanded, the mould inserts automatically become centered on the core-former within a tolerance of a few millimeters and both are then very firmly held in this position.

Joint Formers — The rubber joint-formers are used to form the division between two panels with suitable edge profiles and projecting tie loop reinforcement. The joint formers come in four different types which can be combined to form all the different types of joints.

Opening Formers — In places where there are to be doors, windows or other openings in the panels, appropriate rubber shuttering from the set of joint formers is placed and locked into position with the core-formers. Following the placing of the top reinforcement wires, these openings are covered by rubber covered sheets that are held to the core-formers with rubber studs.

BED CO-ORDINATES — Since the mould inserts are always exactly centered on the core-formers, the task of positioning an insert is reduced to determining which core-former the insert is to be placed on. The core-former and thus the position of the inset is easily referred to by numbering the holes along the sidings. The positions of the numbered core-formers along the length of the bed define an X co-ordinate with a 200mm module, while the reinforcement along the length of the bed, by reference to the numbered slots in the end anchorages, defines a Y co-ordinate. All work on the bed is carried out by reference to these co-ordinates and no measuring is necessary.

REINFORCEMENT — All the reinforcement used are of standard type irrespective of the loading or span, for it is only their spacing that changes. They are entirely made from a standard diameter (normally 6 mm.) indented wire. Tools to produce the standard "C", "E", "I", "U" and "O" loops to tolerance within 3 mm. are pneumatically or manually operated. Prestressing wire of the same diameter is used for floor slabs and the stressing jacks are the same for wall and floor casting. The reinforcement is drawn along the bed by the auto-wiredrawer.

CASTING TRAIN — Once all mould inserts have been placed in the bed and the reinforcement wires have been tensioned or stressed, the bed is ready for automatic casting. Concrete is supplied from a central batching plant via a main conveyor and chuts. The concrete is placed, vibrated, screeded and finished by casting machines travelling on tracks along the bed. The electro-hydraulically driven machines are robustly built from standard components with minimum moving parts for ease of handling and long trouble free life.

CURING — Following finishing, the bed is left for a few hours to pre-cure. This time may be used to apply special surface finishes to some of the panels, e.g. by pressing stones into the concrete. A canvas is then folded over the bed and the casting is steam cured. Before this, the side shutterings have been removed and the core-formers slid over to the other bed, which is now in the stage of being set up.

PANEL FINISHING — Window and door frames are normally installed with fast curing cement after the steam cycle, while the panels are still on the bed. Thereafter the panels are separated and lifted with straps threaded through the cores, with overhead cranes, to the side of the factory where they will be kept for three days to allow for post-curing. This gives ample time to paint and tile the wall panels, to prepare electrical and plumbing operations and to hang doors and windows.

ERECTION— Depending on the circumstances and in particular on the distance between the plant and the construction site, the panels may be transported on simple trailers, by standard trucks or by heavy trailers. The symetric reinforcement and the fairly large thickness make the panels highly resistant against warping or cracking during transport. At the site, the panels are lifted onto prepared foundations and jointed. The ground floor concrete may have been cast beforehand. It takes about one day to erect a fair size house, but if it has several storeys the erection will be spread over several days, as the joints should be allowed to cure for 24 hours between each storey.

FINISHING — Once the structure is erected, the finishing crew moves in. Joints are touched up, the painting improved and floor tiling and other floor finishes are put in. Electrical and plumbing installations are made in the hollow cores and in conduits in the floor joints. These installations are extensively prepared at the factory with all appropriate openings already made and wires and pipes already pre-cut. The finishing operation is normally carried out over 2 — 3 weeks.

COMMUNICATION & DESIGN IMPLEMENTATION — For each building, the set of drawings required by the authorities must of course be prepared in the normal way by the architects and consultants for the project. However, it is to be noted that no drawings are required for the work in the factory. All work is carried out according to work-sheets in a simple coded form.

PRODUCTION EQUIPMENT

4 — TOS MODULAR CONCEPT AND THE DESIGNER

The **TOS MODULAR SYSTEM** not only establishes the physical relationships between the various elements, but is also the central nerve of the Building System. It is used for carrying digital messages throughout the various disciplines in a universally understood code. In this respect, it may be considered akin to a radio frequency wave which carries an encoded message. After serving its function, the discipline of the module can be stripped off, leaving behind only its desirable features and the message it carries. The TOS module has a value of one when used for conveying digital information. It does not matter whether this value is 170 mm. or 200 mm. and it can be in imperial measurements if desired. It is however operated in three modes:

The Absolute Mode is used when the module coincides exactly, in all dimensions, with the physical location. This will happen when the module used is 200 mm. and the wall thickness as well as the centre to centre of the cores in the wall are also 200 mm. This would result in all room sizes being multiples of the module. The absolute mode is usually used in structural design.

The Relative Mode is used when the actual physical location does not coincide but is relative to the modular location. The physical relationship in this case may be absolute in one direction but relative in the other. This will happen when the module chosen is 200 mm. and the centre to centre of the cores are also 200 mm. but the wall thickness is only 150 mm. The digital information is not changed in this case. The relative module may also be used in two dimensions, in which case the location of the wall for instance may be off by a designated value. It would be easier to imagine the application of the relative mode as a deliberate use of absurdly large tolerances in location. Room sizes will not be multiples of the module in this case. The relative mode is normally used for partition layout.

The Apparent Mode is used when there is no real relationship to the modular grids other than at one point in two or three dimensions. It may be thought of as the fourth dimension of a new unrelated module. It is used for inserts within panels such as doors and windows. While a window may be referred to by the main modular dimension as 9x10 for instance (in this case using decimeters), only the centre line of a reference point in the insert would be real. The real dimensions may in fact be well off and may even be in non metric measurements. As the TOS modular concept may be difficult to understand and use accurately, it is made transparent to the user. For the purpose of this report all references are confined to the use of a structural module of 200x200 mm. with a modular value of one. Once this has been defined, the designer and all others involved in the process of building can forget the module and work in the real world of mm., dm., or m.

TOS COMMUNICATION has been solved in a two stage process. Stage one involves the use of the Digital System. This System is confined to communication using digital information manually taken off building plans. The second stage involves the use of a Design and Information System (Designer). This is a classification system, a knowledge system, a creating tool and a message transfer system. Digital information is created automatically by the Designer.

The Tos Digital System is used independent of the Designer. The digital information derived is in an intelligent form and can be interpreted manually or be used on microprocessor controlled machines. The digital information is first created by imputing building information in digital form together with simple codes, to word prompts, in a small computer programme. First the structural locations, then the window locations, types and so on. The Digital System has very little thinking capacity, but it can, for instance, locate reinforcement or work out quantities and costs automatically. The System uses positive, negative as well as implied information which leads to compactness of schedules.

The Digital System can best be illustrated by example. The schedule given in Fig. 5.2 contains all relevant information for manufacturing the wall elements complete with openings, reinforcement and joint details for building the wall layout shown in Fig. 5.1. Seven columns of information are shown. Column 8, 9, 10, etc., not shown, contain electrical, plumbing inserts, etc. The standard cage locations are derived from the above information on a separate sheet. The most important information for casting the walls is given under columns 3 and 4. Examining column 3 shows that "N" and "T" repeat frequently. These are the main joint formers. "N", "E", "S", "W" are attachments and refer to North, East, South and West. They refer physically to the aspects on the building plan as well as to the attachments named after them. "S" is in fact the reverse of the same attachment "N". "V" is a vertical joint. The lower case "c" indicates that the joint is within a wall and not at its edge. "NSe" indicates that there is a joint on both sides of the wall at the same core, required for "+" joint using only 3 walls.

Workers can be easily taught to understand the schedule or automatic machines can use the same information. Figures 6.1 & 6.2 show a layout and schedule for floor production. The schedule is much more compact as only one type of joint former and reinforcement is used and is therefore implied. The Digital System produces simple layout plans using spaced modular dots and giving measurements and reference names. This is not a graphic system but it is very useful for checking that the error prone digital information has been correctly input.

TOS DESIGNER is a "thinking" System. If the Modular System forms the nervous system and the Digital System the message carrier, then the Designer may be considered the brain of TOS where information is stored as well as created. It is described here in concept.

The Designer is not a graphics system but the data may be transformed to produce architectural drawings, perspectives, structural calculations, costing, etc. by linking with suitable programmes. Production schedules, similar to those produced by the Digital System, are however produced directly. In its design mode the Designer uses 3-dimensional models for visualisation, creation and editing of data.

The Data File — For simplicity of use and speed, TOS Designer uses a single data file for design creation. A multi-key index automatically keeps order in the file. The file is divided horizontally into two zones. A top yellow zone works in "global" mode while a lower green zone operates in "bit" mode. All data are manipulated in string form as the Designer is a language and symbol oriented system.

Data Structure — The file has the following data structure:
OBJECT [Block ( ), Level ( ), Element ( ), Attribute ( ), Aspect ( ), Position ( ), Object Class ( ), Object Parameter ( )].

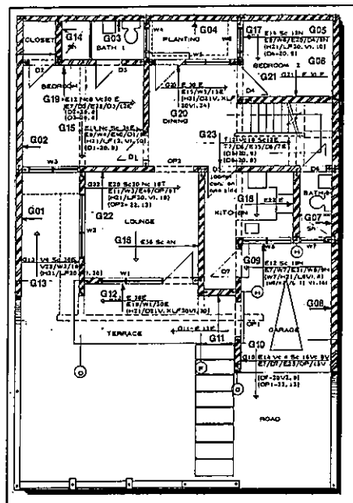
Object Class ( ) has a complex structure thus: ELEMENT [ATTRIBUTE, Class ( )]. BLOCK, LEVEL, ASPECT and POSITION answer the specific question where? ELEMENT and ATTRIBUTE answer the general question what? OBJECT CLASS refers to the particular and consists of simply a Word Identifier. Eg., "French Windows" which, in this context, is not a general term but refers to a specific class of windows described in "Object Definition". "Object Definition" determines object growth and gives rise to three types of Objects: Static, Geometric and Evolutionary. Static Objects are functionally similar to an object library in a graphics system, while Geometric Objects follow clear geometric growth patterns. We shall however be more concerned with Evolutionary Objects, for with these, it is possible to define a whole class or style of objects in a single class definition and then give them form and shape with OBJECT PARAMETER. A series of windows, for instance, referred to in Object Class as Louvre-Fixed (LF — referred to in schedule Fig. 5.2), consists of all possible designs amounting to about 1,800 possibilities, working within a lower limit of 0 and an upper limit of 3 m height and 6 m length, assuming that growth is in increments of 100 mm in both directions. There is no theoretical limit to object growth and the limit is only set for convenience.

Evolutionary Objects differ in an important respect from Static and Geometric Objects. They do not exist on their own but are always related to other compatible objects which influence their growth and it is this interactive relationship together with the inherited data (described below) that gives Designer the concept of intelligence. The Designer works in negative logic in the influence or inference level, for each new edited data limits further the object range of related objects rather than point specifically to what they are. The rules to establish physical growth and element relationship may be structural, as in spacing and location of mullions dictated by glass thickness, functional, as opening size, vent area and cill height dictated by room area and room use, aesthetic, as in proportion or articulation, or economic, as in low cost or medium cost housing. Rules are established by labouriously drawing out an entire range of a Class object to a reasonable extent, examining one's own thinking process at each critical change and defining the change with a word definition and a numeric variable. At its higher level, the Designer is very much a subjective system, as the rules are governed by personal choice. Object Class, defined as evolutionary objects, is a very powerful concept. It is possible, for instance, to define almost all windows, well beyond the normal range used by architects for housing, within twenty class definitions. TOS Designer is however a finite system and does not work outside the pre-defined objects. While the Designer can be used in a partially complete stage, it can be said to be reasonably complete only when structure and rules have been established on all the design elements.

The Designer is easy to use for it always presents a design with a fully entered record only requiring editing. It works in this mode from the beginning when the file is first open. Before a new type design can be created however, a "Training File" must be created and edited. All subsequent designs created under this sub-index inherit essential data on the design, such as window type with restrictions on Parameter and roof type and pitch. Subsequent editing of records in the file create further sets of proposals in a roll forward technique. When the architect is satisfied with his creation, the "bit" data is generated from the global level from which the final design is derived. "Bit" data are not subject to influence, like "Global Data", but they may also be edited for individual manipulation of single objects.

TOS Designer largely does the work for the quantity surveyor, makes life easier for the structural engineer and fun for the architect, but it is necessary for all users of TOS technology to work in a global production oriented environment, sharing the same information and goals and giving up sub-optimisation for total optimisation.

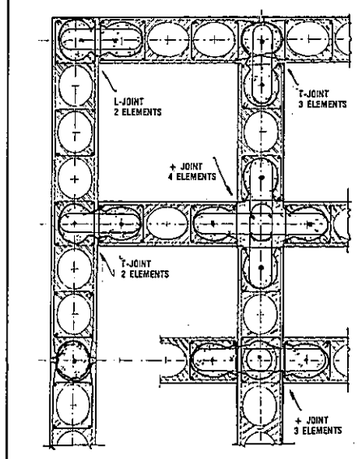
5 — WALL SYSTEM



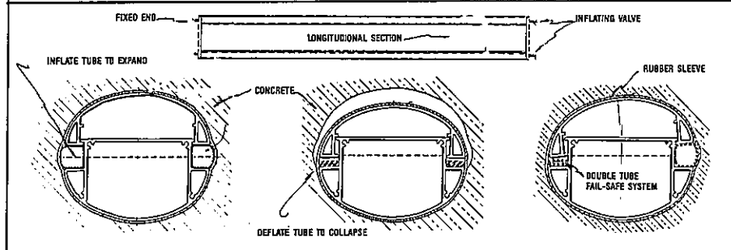
1 WALL LAYOUT

HEIGHT = 29.5		JOINT FORM.		OPENING		
(1) (WA#)	(2) SPAN (dm)	(3) JF	(4) LOCATION	(5) GOP #/PR #	(6) TYPE — H21	(7) LOCATION
		HV —	0			
G01	HV 40	T —	42			
G02	T 34	Sc —	76			
	Sc 14	SHE —	92			
G03	HE 12	Sc —	104			
	Sc 28	T —	132			
G04	T 30	T —	162			
G05	T 30	EHS —	192			
G06	HS 26	Sc —	220			
	Sc 22	T —	242			
G07	T 22	T —	264			
G08	T 42	WHE —	306	GOP16/PR 1	L5VL.8	315
G09	HE 12	Sc —	320	GOP17/PR 2	2L11V1.15	329
	Sc 18	NHE —	348	GOP 7/PR 3	D20V2.9	348
G10	HE 14	Vc —	354			
	Vc 4	Sc —	358	GOP 8/PR 4	OP22.12	365
	Sc 16	Vc —	374			
	Vc 8	VHE —	384			
G11	HE 12	EHE —	396	GOP10/PR 5	D21V1.10 LF20VL.30	414
G12	HE 18	EHV —	434			
G13	HV 4	Sc —	440	GOP11/PR 6	LF20V1.20	457
	Sc 36	EHE —	476			
G14	HE 14	EHE —	490	GOP13/PR 7	LF12V1.10	498
G15	HE 14	NSc —	504	GOP 1/PR 8	D20.9	530
	Nsc 34	EHE —	538			
G16	HS 28	Sc —	574			
	Sc 4	NHE —	580	GOP15/PR 9	LF20V1.10	588
G17	HE 14	Sc —	594	GOP 4/PR10	D20.9	600
	Sc 12	EHE —	606			
G18	HE 22	EHE —	630	GOP 2/PR11	D20.8	637
G19	HE 12	Nc —	642			
	Nc 8	Vc —	650	GOP 3/PR12	D20.8	659
	Vc 20	EHE —	670	GOP14/PR13	D21V1.9 LF20V1.24	685
G20	HE 30	EHE —	700			
G21	HE 30	EHE —	730	GOP12/PR14	LF20V1.18	740
G22	HE 20	Sc —	750			
	Sc 20	Nc —	770	GOP 9/PR15	OP22.12	779
	Nc 18	T —	788	GOP 5/PR16	D20.9	794
G23	T 12	Vc —	800			
	Vc 18	Sc —	818	GOP 6/PR17	D20.8	823
	Sc 12	EH —	830			

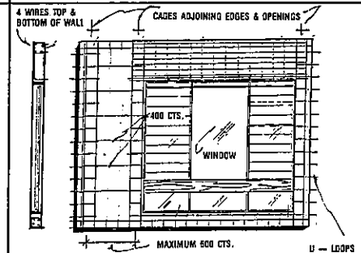
2 WALL PRODUCTION SCHEDULE



3 WALL JOINTING SYSTEM

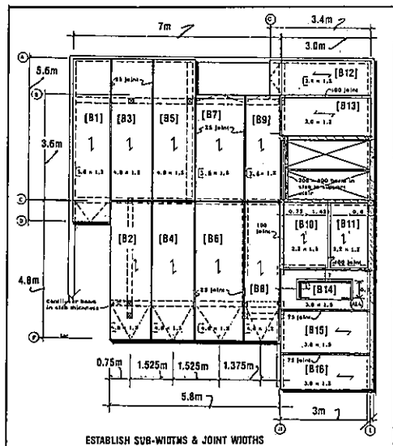


4 CORE FORMER SYSTEM



5 WALL REINFORCEMENT SYSTEM

6 — FLOOR SYSTEM

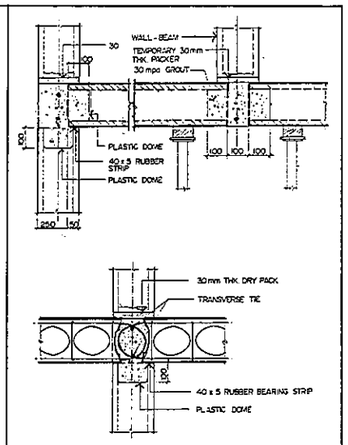


1 FLOOR LAYOUT/STAGE 3

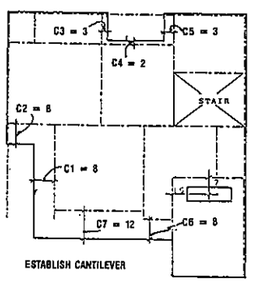
ELEMENT (FLOOR/ROOF) 1.5 M WIDTH				
(1) REF. #	(2) SPAN (dm)	(3) LENGTH	(4) JF LOCATION	(5) BEAM LOCATION
B02	−12(B)+36	48	48	12
B03	+34+14	48	96	
B04	−12+36	48	144	
B05	+34+14	48	192	
B07	+34−02	36	228	
B10	+22	22	250	
B14	+30	30	280	
B15	+30	30	310	
D06	−06+38+12−06	62	372	
D07	−06+38+12−06	62	434	
D08	−06+38+12−06	62	496	

SIDE SHUTTERING AT : 0—15
PRESTRESS WIRE ϕ5 AT : 0.5—2.5—6.5—8.5—12.5—14.5
HIGH TENSILE WIRE ϕ6 AT : 4.5—10.5

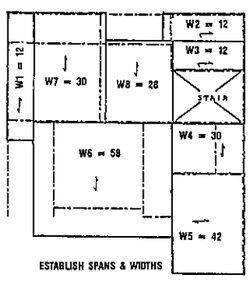
2 FLOOR PRODUCTION SCHEDULE



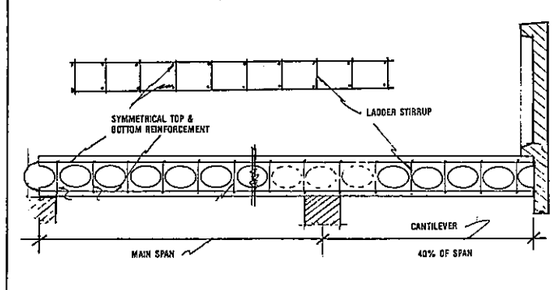
3 FLOOR JOINTING SYSTEM



4 FLOOR LAYOUT/STAGE 1

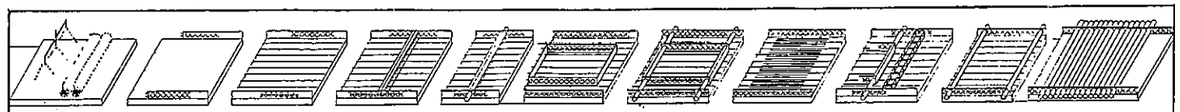


5 FLOOR LAYOUT/STAGE 2

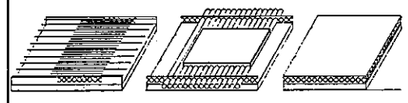


6 FLOOR REINFORCEMENT SYSTEM

7 — PRODUCTION SYSTEM

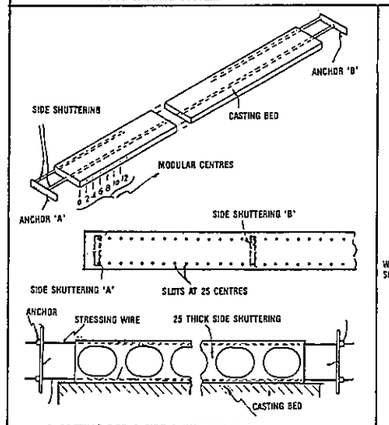


1— CLEAN BED AND SPRAY WITH RELEASING AGENT.
2— LAY SIDE SHUTTERING AND STRETCH.
3— LAY BOTTOM REINFORCEMENT AND STRETCH. THREAD STIRRUPS.
4— LOCATE JOINT FORMERS IN POSITION TOGETHER WITH TIE BARS AND CAGES.
5— LAY O-FORMERS AT JOINTS AND EXPAND.
6— LAY OPENING FORMERS IN POSITION.
7— LAY TWO SIDE O-FORMERS IN PLACE AT EACH OPENING FORMER AND EXPAND.
8— LAY ADDITIONAL SPECIAL BOTTOM REINFORCEMENT WHERE REQUIRED.
9— LAY REINFORCEMENT CAGES IN MODULAR POSITION.
10— LAY O-FORMERS TO TAKE ELECTRICS OR OTHER INSERTS, ATTACH INSERTS AND EXPAND.
11— INSERT OTHER O-FORMERS AND EXPAND.

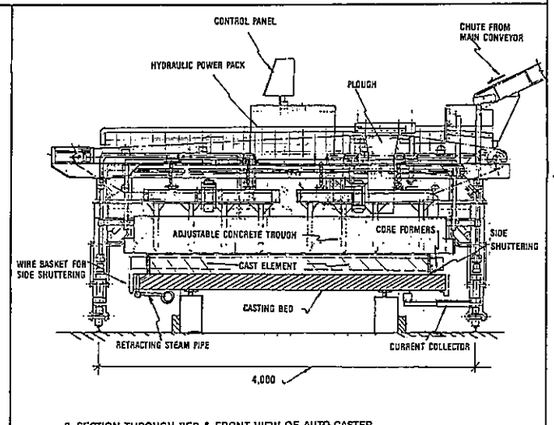


12— LAY TOP REINFORCEMENT.
13— COVER ALL OPENINGS. CHECK LOCATION AND ACCURACY OF: SIDE SHUTTERING/JOINT FORMERS/ OPENING FORMERS/INSERTS/ REINFORCEMENT.
14 COMMENCE CASTING.
15— CARRY OUT CASTING, SCREEDING AND FINISHING OPERATIONS.
16— LAY TILE, STONE OR OTHER APPLIED FINISH WHILE CONCRETE IS STILL WET.
17— WHEN CONCRETE IS SUFFICIENTLY HARD REMOVE OPENING FORMERS AND THE O-FORMERS HOLDING THEM.
18— SET AND CAST IN PRE-ASSEMBLED DOOR WINDOW AND OTHER FRAMES. (EXCLUDE TIMBER FRAMES AT THIS STAGE IF STEAM CURE CYCLE IS TO BE USED.)
19— REMOVE ALL OTHER O-FORMERS IN ALTERNATIVE ORDER.
20— COVER AND ADOPT COMPLETE STEAM CURE CYCLE OR ALLOW HARDENING.
21— SET AND CAST IN TIMBER FRAMES IN RAPID HARD CEMENT (FOLLOWING STEAM CURE CYCLE).
22— INSTALL ADDITIONAL INSERTS WHERE APPLICABLE AND SET IN RAPID HARDENING CEMENT.
23— APPLY ADDITIONAL FINISHES WHERE APPLICABLE.
24— WRITE IDENTIFICATION AND ASSEMBLY SEQUENCE CODE, LIFT AND STACK.

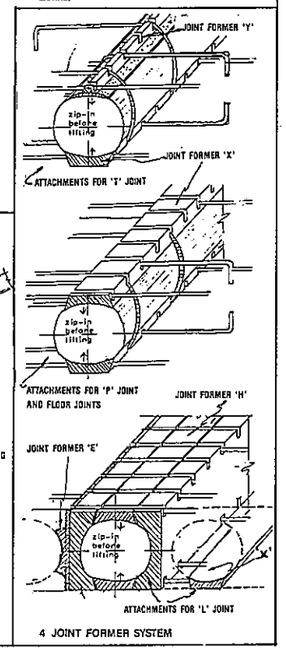
1 CONTINUOUS CASTING SYSTEM



2 CASTING BED & SIDE SHUTTERING

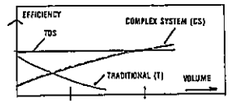


3 SECTION THROUGH BED & FRONT VIEW OF AUTO-CASTER

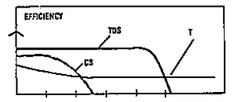


4 JOINT FORMER SYSTEM

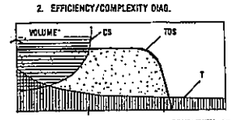
8 — COST EFFICIENCY



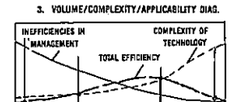
1. EFFICIENCY/VOLUME DIAG.



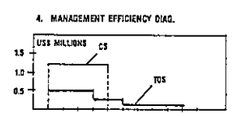
2. EFFICIENCY/COMPLEXITY DIAG.



3. VOLUME/COMPLEXITY/APPLICABILITY DIAG.



4. MANAGEMENT EFFICIENCY DIAG.



5. TOTAL YEARLY WRITE OFF

There is no one simple way to realise savings in something as complicated as house construction. It is useless to cut cost in one area if that will only result in an equal increase of cost in some other area.

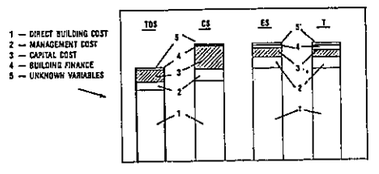
TOS realises economies from a combination of the following factors:

— A systematic approach to management and production results in close control and co-ordination. Management resources are used efficiently and overheads are held down.
— An efficient design of the building elements and the way they are produced result in materials and labour being used efficiently. Many small savings add up to a significant total.
— The production equipment is uncomplicated but efficient. Investment and capital costs are kept down as are operation and maintenance costs.
— A TOS plant is normally established on a permanent basis using local talent and resources. Capital costs are better spread and overheads are held down.
— A TOS plant is developed in stages. Capital costs are held down.
— The TOS concept is designed to suit local conditions and uncertainties are reduced.

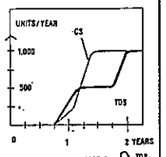
Building systems may be broadly classified as elementary and complex systems. While elementary systems rely on simplicity of concept and the cheapest possible equipment, the complex systems in contrast rely on sophisticated hardware solutions implemented in well managed plants. The problem with the former is that it represents a very small improvement in efficiency over traditional building while the low cost hardware rapidly break down and become unusable. Complex systems on the other hand require very large capital, large contracts of standard housing and high technical and management skills. Experience with complex systems shows that the life span of such a plant is short when transplanted into a new country, where continuity of work of a standard type cannot be expected. Thus there is no long term gain for capital investment or manpower training.

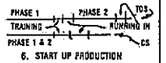
TOS belongs to neither of these categories. While based on the most advanced concepts, it is implemented in easy to operate permanent plants. TOS is designed to be applicable with equal efficiency to all classes of work in all volumes. Fig. 1, 2 & 3 illustrate this. Fig. 4 illustrates the dilemma of complex technology where management cost cancels out other gains. Building systems involve greater capital cost. Capital cost for TOS is smaller and can be written off over a longer period of time since all classes of work can be undertaken and the plant is set up on a permanent basis. Fig. 5 & 6 illustrate this.

When direct cost of building is reduced significantly, capital cost becomes a major factor. Interest and repayment, particularly during the initial construction, training and running in period, must therefore be kept down. A TOS plant is constructed in two phases with each phase involving a fully functioning unit. A small team of management and labour is trained in the first phase at a slower rate but by the time the second phase is completed a fully functioning management and workforce is available to bring it into full production quickly. The slow start gives time to attend to early problems and to adjust to the co-ordination problems that will arise between the various functioning units at the plant and site. A TOS plant may be worked profitably at stage one till conditions are right for expansion. The cost difference is illustrated in Fig. 7, 8, 9 & 10.

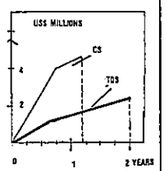


10. TOTAL BUILDING COST DIAG.

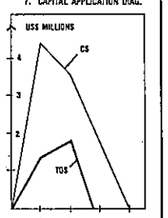




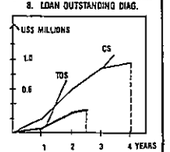
6. START UP PRODUCTION SCHEDULE



7. CAPITAL APPLICATION DIAG.



8. LOAN OUTSTANDING DIAG.



9. CUMULATIVE INTEREST DIAG.

9 — TOS ORGANISATION

No previous experience in system building technology is required in a TOS organisation for workers, supervisors and managers. For this reason great emphasis is placed on training at all levels. TOS training goes well beyond the simple teaching of technical skills to the establishment of a total work environment, as hardware and work routines cannot be separated from the people who will operate them.

A TOS organisation is viewed as a dynamic system and training is a continuing process. The aim of training is to quickly familiarise the staff with the practical application of the technology while guiding them to gain a deeper understanding of the philosophies and concepts of the system. TOS is very easy to understand and operate and contains such safeguards that errors can never be disastrous. To operate it at maximum efficiency however requires a will to constantly learn and adapt.

A TOS plant will require, from the start, two trainee managers to act as general manager and technical manager. At least one of the managers should have a few years experience in concrete technology. Outside expertise for set up of the laboratory and training of lab technicians may be required if one of the managers does not have deep knowledge in this field. Suitable candidates for managers would be those with general and wide experience, rather than specialists.

Key staff at foreman level would be for the following sections: plant maintenance, electrical, plumbing, carpentry, boiler and batch plant. A few concrete finishing workers would be useful additions to the staff. Foremen may be trained if none are available. All other workers need not have any experience but would be given on the job training. It would take two to three months for the staff to begin working as a team with some degree of efficiency.

Professional training and guidance for architects and engineers are provided on the job. It is intended that a large part of the training for professionals and supervisors would be taken over by TOS Designer when this programme is ready.

A TOS plant is simple in layout and most of the work involved in setting up a plant can be carried out by locally appointed professionals with supplied details. It would normally take four to five months to construct a plant and another two months for completion of all installations.

TOS TRAINING PROGRAMME

1 — Seven Training Programmes
01 Managers Training
02 Supervisors Training
03 Office Assistant Training
04 Office Staff Training
05 Foremen Training
06 Workers Training
07 Consultants Training

2 — Six Training Methods
01 Learning by doing
02 Demonstration
03 Demo Practice
04 Interactive lectures
05 Seminars
06 Group Work

3 — Two Training Objectives
01 Work Proficiency
02 Commitment

4 — Twelve Fields of Training
01 Company Training
02 System Training
03 Data Training
04 Task Training
05 Equipment Training
06 Quality & Safety Training
07 Administration Training
08 Management Training
09 Production Training
10 Assembly Training
11 Maintenance Training
12 Design Training

5 — Three Training Levels
01 General Orientation
02 Subject Understanding
03 Subject Proficiency

23412601
CINTVS

NUESTRA PROPUESTA DE VIVIENDAS SE BASA EN LAS CONDICIONES DE CUALQUIER PAÍS CENTROAMERICANO PARA PERSONAS CON UN BAJO PODER ADQUISITIVO - CON TRADICIÓN EN EL USO DE ELEMENTOS CERÁMICOS O ADOBE Y USO DE CUBIERTAS LIGERAS PREVIENDO - LA POSIBILIDAD DE DERRUMBE POR TEMBLORES DEL SUELO QUE CARACTERIZAN LA REGIÓN. NO SE ANALIZAN LAS CONDICIONES CUBANAS POR SUS CARACTERISTICAS DE DESARROLLO PARTICULAR.

LAS SOLUCIONES PROPUESTAS PARA SER CONSTRUIDAS POR MEDIOS PROPIOS ESTAN DISEÑADAS - CON MATERIALES DE FÁCIL PRODUCCIÓN, TALES COMO: MADERA, ASBESTO-CEMENTO, CERÁMICA Y UN ÍNFIMO USO DE HORMIGÓN Y ACERO. LOS ELEMENTOS - COMPONENTES DE LA SOLUCIÓN PRINCIPAL SON: PILAR Y PANELES CERÁMICOS, LOSAS DE CUBIERTA Y GANCHOS METÁLICOS DE SUJECIÓN. EN LA SEGUNDA - SOLUCIÓN LOS CIERRES Y DIVISIONES SON CON PANELES SANDWICH DE ASBESTO - CEMENTO.

TANTO LA FABRICACIÓN DE LOS ELEMENTOS - COMO SU COLOCACIÓN SON REALIZADAS POR LOS USUARIOS Y LA COMUNIDAD. SU MONTAJE ES SIMPLE Y SIN EQUIPOS DE IZAJE.

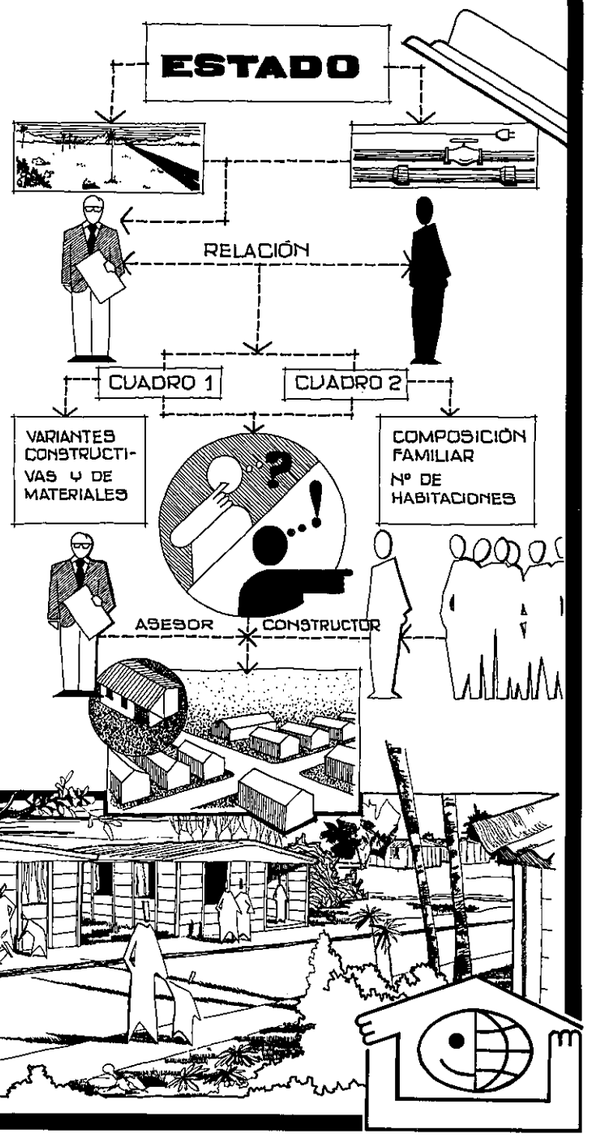
LAS VIVIENDAS PUEDEN SER UBICADAS EN UN CONTEXTO TANTO RURAL COMO SUB-URBANO Y PUEDEN SER INDIVIDUALES, PAREADAS Y AGRUPADAS EN-CUATRO PARA FORMAR NÚCLEOS Y CONFORMAR COMUNIDADES A LAS CUALES EL ESTADO ASIGNARÁ - LAS REDES TÉCNICAS Y LOS SERVICIOS SOCIALES NECESARIOS.

LOS NÚCLEOS DE VIVIENDAS PUEDEN PROVEERSE DE SISTEMAS DE CALENTADORES SOLARES - PARA AGUA SANITARIA DE USO DOMÉSTICO LOCUAL CONTRIBUYE A DISMINUIR EL CONSUMO DE ELECTRICIDAD APROVECHANDO UNA FUENTE DE ENERGÍA GRATUITA Y EL COSTO INICIAL DE LA INSTALACIÓN NO ES TAN ALTO AMORTIZANDOSE EN UN TIEMPO RELATIVAMENTE CORTO.

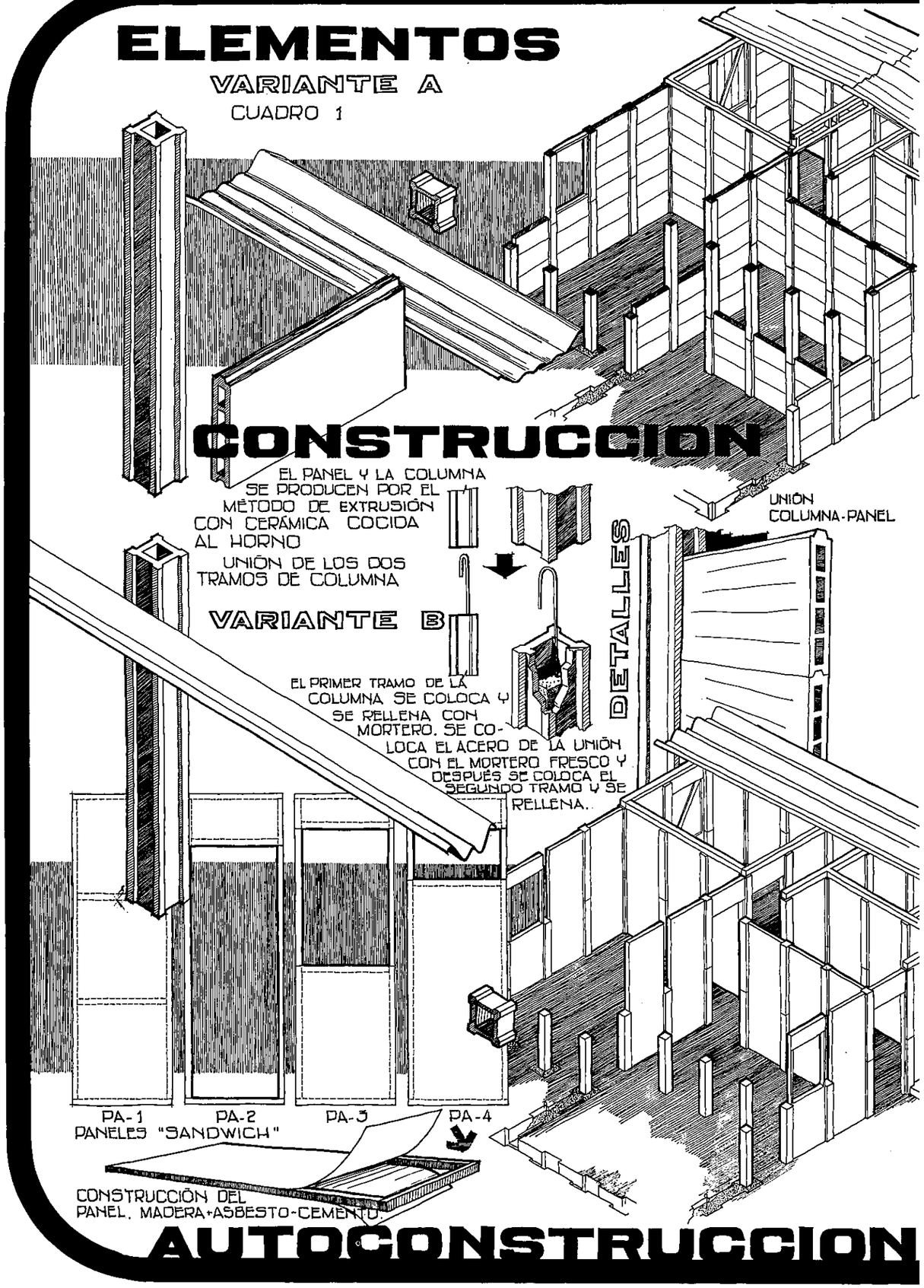
ESTA SOLUCIÓN CONTRIBUIRÁ AL LOGRO DEL - CONFORT BIOCLIMÁTICO EN LAS VIVIENDAS.

EL ARQUITECTO ACTÚA DE PUENTE ENTRE EL - ESTADO Y LOS USUARIOS Y CONTROLA ALGUNAS ETAPAS DE LA FASE CONSTRUCTIVA Y EL PLANEAMIENTO DE LA COMUNIDAD.

NUESTRA PROPUESTA SE CLASIFICA EN EL - SECTOR III DEL CERTÁMEN



ELEMENTOS
VARIANTE A
CUADRO 1



CONSTRUCCION

EL PANEL Y LA COLUMNA SE PRODUCEN POR EL MÉTODO DE EXTRUSIÓN CON CERÁMICA COCIDA AL HORNO

UNIÓN DE LOS DOS TRAMOS DE COLUMNA

UNIÓN COLUMNA-PANEL

VARIANTE B

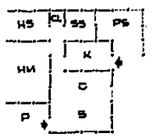
EL PRIMER TRAMO DE LA COLUMNA SE COLOCA Y SE RELLENA CON MORTERO. SE COLOCA EL ACERO DE LA UNIÓN CON EL MORTERO FRESCO Y DESPUÉS SE COLOCA EL SEGUNDO TRAMO Y SE RELLENA.

DETALLES

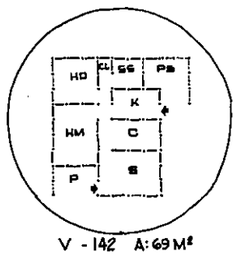
PA-1 PA-2 PA-3 PA-4
PANELES "SANDWICH"

CONSTRUCCIÓN DEL PANEL. MADERA+ASBESTO-CEMENTO

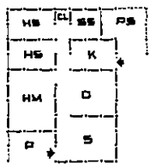
AUTOCONSTRUCCION



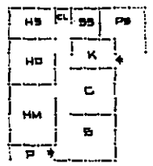
V -132 A:62 M²



V -142 A:69 M²



V -143 A:76 M²



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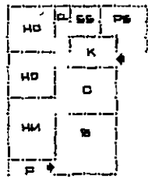

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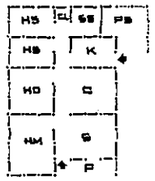

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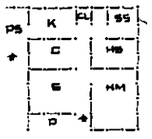

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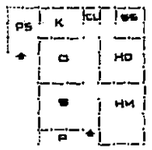
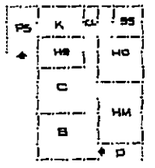


V -242 A:69 M²

V -243 A:76 M²



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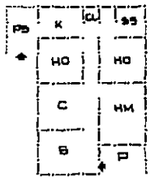

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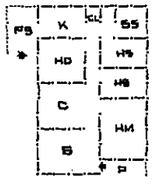
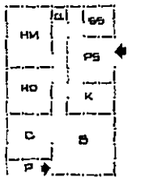


V -264 A:85 M²

V -352 A:70 M²



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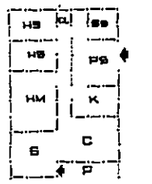

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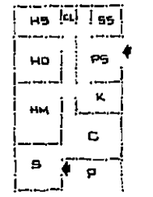

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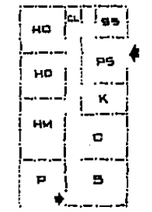

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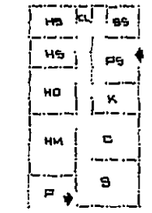

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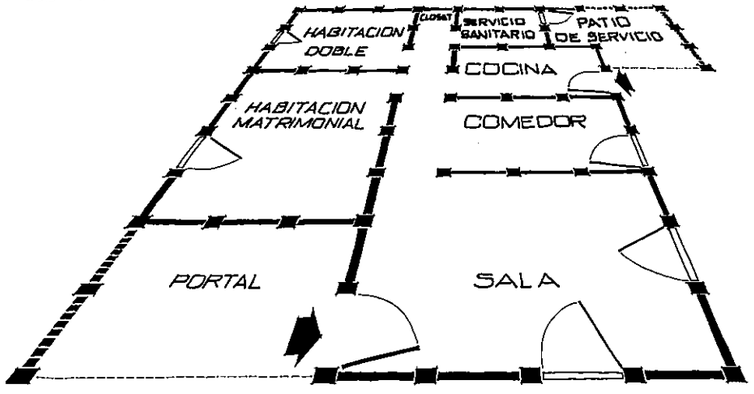


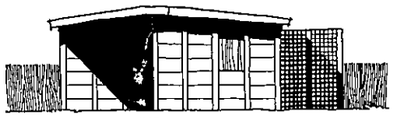
LA CASA

VARIANTES DE PLANTAS

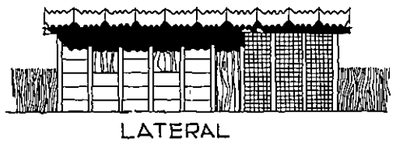
CUADRO 2

V - XYZ
- → VIVIENDA
- 1 → Nº DE HABITACIONES (DORMITORIOS)
- 2 → Nº DE PERSONAS
- 3 → Nº DE LA VARIANTE

ELEVACIONES

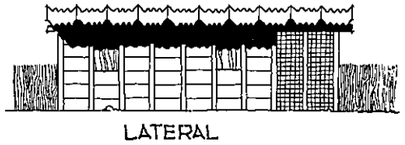


FRONTAL

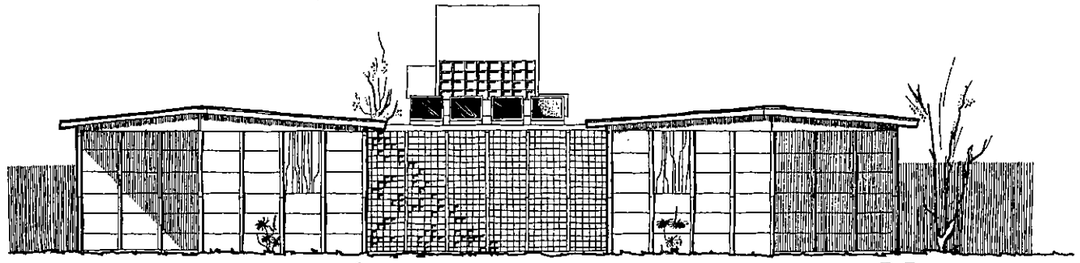


LATERAL

POSTERIOR

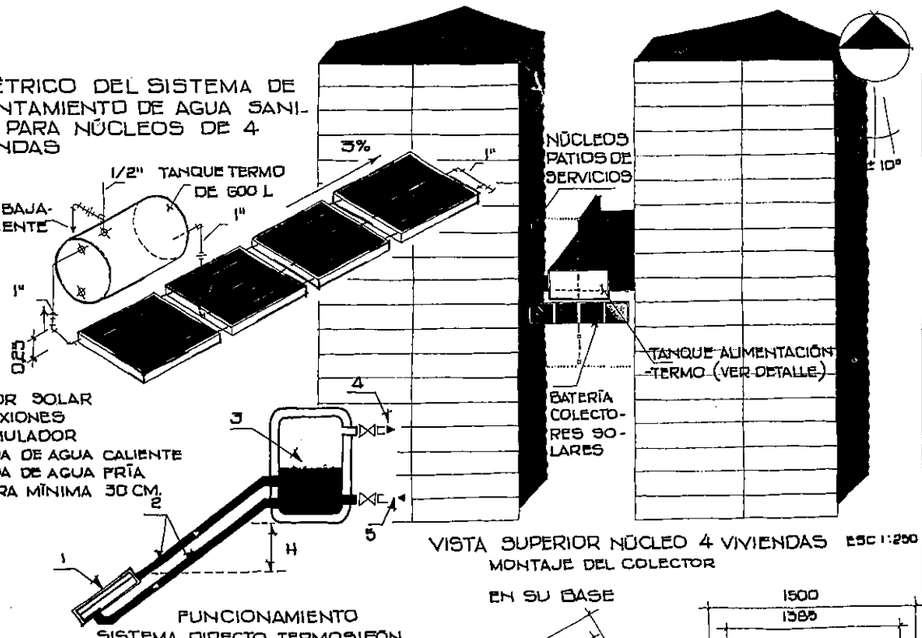


LATERAL



ELEVACIÓN FRONTAL ESC 1 : 75

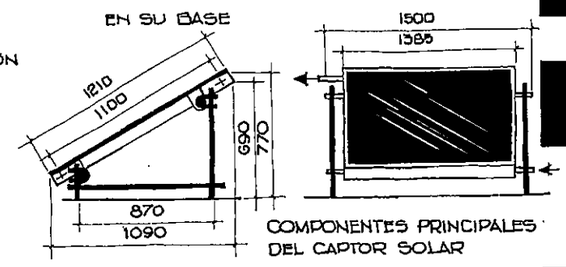
ISOMÉTRICO DEL SISTEMA DE CALENTAMIENTO DE AGUA SANITARIA PARA NÚCLEOS DE 4 VIVIENDAS



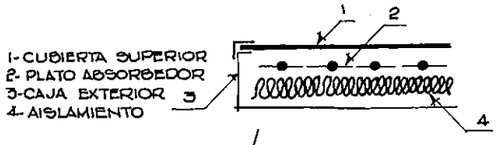
FUNCIONAMIENTO SISTEMA DIRECTO TERMOSIFÓN

VISTA SUPERIOR NÚCLEO 4 VIVIENDAS ESC 1:250

MONTAJE DEL COLECTOR EN SU BASE

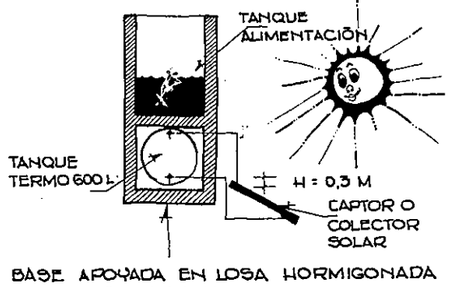


COMPONENTES PRINCIPALES DEL CAPTOR SOLAR

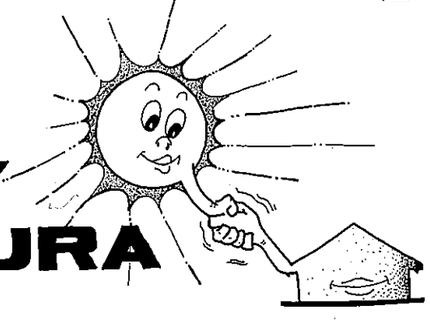


1- CUBIERTA SUPERIOR
2- PLATO ABSORBEDOR
3- CAJA EXTERIOR
4- AISLAMIENTO

DETALLE DE UNA POSIBLE SOLUCIÓN DEL SISTEMA ESC 1:50



BASE APOYADA EN LOSA HORMIGONADA SOBRE COLUMNAS



SOL Y ARQUITECTURA

CIUDADES PROVISIONALES DE PAPEL

«LO QUE ES GRATIS O NO SE APRECIA O SE DESPRECIA»
(DICHO POPULAR)

A. LA PROVISIONALIDAD

UNO DE LOS PROBLEMAS QUE MENOS ATENCION HA MERECIDO, POR PARTE TANTO DE LOS ARQUITECTOS COMO DE LOS GOBIERNOS, ES EL DEL ALOJAMIENTO PROVISIONAL DE SECTORES NECESITADOS DE LA POBLACIÓN. Y ELLO POR DOS RAZONES DE PESO: UNA LA DE LA DIFICULTAD Y EL POCO LUCIMIENTO DEL PROBLEMA REAL, Y OTRA MÁS IMPORTANTE, LA PROPIA NATURALEZA DEL MISMO, QUE ES PRECISAMENTE SER PROVISIONAL, O SEA PASAJERO, Y UNA VEZ CONCLUIDO, OLVIDADO. SIN EMBARGO EL PROBLEMA DE LA PROVISIONALIDAD ES PERMANENTE. ES DECIR, CONTINUAMENTE SE PRODUCEN EN TODAS PARTES DEL MUNDO, Y CON FRECUENCIA EN UN MISMO PAÍS SITUACIONES DE ALOJAMIENTO QUE RECLAMAN LA PROVISIONALIDAD, BIEN SEA POR CATÁSTROFES, O ACONTECIMIENTOS CLIMATOLÓGICOS EXTRAORDINARIOS COMO INUNDACIONES, O MIGRACIONES INTERIORES CON MOTIVO DE TRASVASE DE MANO DE OBRA DE UN SECTOR A OTRO, O A CAUSA DE UNA RECONVERSIÓN, O DESPLAZAMIENTOS DE UNA REGIÓN A OTRA EN ÉPOCAS DE COSECHA; O GRANDES ACONTECIMIENTOS DEPORTIVOS O FESTIVOS QUE ATRAEN MASAS INUSUALES DE VISITANTES; O ALOJAMIENTO DE POBLACIONES MARGINALES EN ESPERA DE VIVIENDAS «DEFINITIVAS»; HASTA LLEGAR A LOS, POR DESGRACIA CADA DÍA MÁS FRECUENTES, CAMPOS DE REFUGIADOS DE TODO TIPO, DE CARÁCTER PROVISIONAL PERO INDEFINIDO.

HEMOS INTENTADO ENCONTRAR UNA SOLUCIÓN LO MÁS GENÉRICA POSIBLE, TRATANDO OBTENER DE ELLA UN *INSTRUMENTO* TAN FLEXIBLE, QUE MEDIANTE LA ADICIÓN O SUPRESIÓN DE DETERMINADOS ELEMENTOS O ETAPAS DE DESARROLLO, PUEDA UTILIZARSE PARA PALIAR TANTO EMERGENCIAS INMEDIATAS, COMO ASENTAMIENTOS «PROVISIONALES CONSOLIDADOS» COMO LOS CAMPOS DE REFUGIADOS, CUYO STATUS PUEDE PROLONGARSE DECENAS DE AÑOS. SE TRATA POR TANTO DE ESTUDIAR NO SÓLO LOS PROBLEMAS TÉCNICOS INMEDIATOS, SINO TAMBIÉN LA VARIACIÓN CUALITATIVA QUE PUEDE TENER EL ASENTAMIENTO A LO LARGO DEL TIEMPO, PROYECTANDO PREVISIONES TANTO TÉCNICAS COMO DE ORGANIZACIÓN A LARGO PLAZO, QUE PREPAREN A LA POBLACIÓN PARA RESOLVER Y ATACAR LOS PROBLEMAS, DERIVADOS DE UNA PERMANENCIA NO PREVISTA INICIALMENTE, ANTES DE QUE ÉSTOS SE PRESENTEN.

LA EXPERIENCIA ACUMULADA A LO LARGO DE AÑOS DE INVESTIGACIÓN Y EL PROFUNDO ESTUDIO DEL PROBLEMA NOS HAN LLEVADO A ELABORAR LA PRESENTE PROPUESTA.

B. LA TÉCNICA

B1. *EL MATERIAL.*—UN ANÁLISIS GLOBAL NOS CONDUCE A DIVERSAS CONSIDERACIONES CON RESPECTO AL MATERIAL BÁSICO A UTILIZAR: DEBE PROCEDER DE LOS RECURSOS RENOVABLES DEL PLANETA, CONSUMIR POCA ENERGÍA EN SU ELABORACIÓN, SER FÁCILMENTE MANIPULABLE, TENER UN ALTO RENDIMIENTO PESO-M2 EFICAZ, Y SER LO MÁS LIGERO POSIBLE.

CON TODAS ESTAS CONDICIONES EL MATERIAL QUE APARECE COMO IDÓNEO ES EL CARTÓN ONDULADO UTILIZADO EN EMBALAJES, CON ALGUNAS MODIFICACIONES SUPERFICIALES PARA IMPERMEABILIZARLO Y DISMINUIR EL RIESGO DE INCENDIO (AMBOS PROCESOS EN FASE DE ESTUDIO).

ESTE MATERIAL ES ADEMÁS UN SUBPRODUCTO INDUSTRIAL DE LA MADERA, LO QUE LE HACE MÁS APROPIADO QUE ESTA. SE ELABORA CON PASTA DE PAPEL DE BAJA CALIDAD Y EL PRODUCTO FINAL PUEDE SER RECICLADO. EL CARTÓN ONDULADO TRIPLE CAPA PRESENTA ADEMÁS UN BUEN AISLAMIENTO TÉRMICO Y UNA ACEPTABLE RIGIDEZ INICIAL, ASÍ COMO SU MANIPULACIÓN POSTERIOR PUEDE SER HECHA POR MEDIOS ARTESANALES, SEMIINDUSTRIALES, O CON MAQUINARIA DE ALTO RENDIMIENTO CAPAZ DE PRODUCIR 3.000 PANELES/HORA.

B2. *LA MODULACIÓN.*—SE HA ELEGIDO PARA LOS PANELES UNA MODULACIÓN A CARAS EXTERIORES DE 96 CM. DE ANCHURA Y 265 CM. DE ALTO LO QUE PERMITE UNA GRAN FLEXIBILIDAD TANTO DE ORGANIZACIÓN DE HABITACIONES COMO DE DISTRIBUCIÓN INTERIOR DE MOBILIARIO.

PARA LA VIVIENDA, LA MODULACIÓN DEL «SOLAR» QUE LA CONTIENE (12,6 × 12,6 M.) ES MAYOR QUE EL ESTRICTAMENTE NECESARIO (10,56 × 10,56 M.), PERMITIENDO UN REAJUSTE DE LOS REPLANTEOS Y PROPORCIONANDO A SU ALREDEDOR UNA CIERTA ÁREA SEMIPÚBLICA DE USO RESTRINGIDO Y DE MANTENIMIENTO PRIVADO.

B3. *LOS PANELES.*—ESTÁN CONSTITUIDOS POR UNA LÁMINA DE CARTÓN ONDULADO, CON SUS BORDES PLEGADOS PARA FORMAR UNOS PEQUEÑOS PILARES VERTICALES Y UNA VIGA O ZUNCHO PERIMETRAL TANTO EN LA PARTE SUPERIOR COMO INFERIOR. EN SU CARA EXTERIOR SE AÑADE OTRA LÁMINA DE ONDULADO ENCOLADA SOBRE RASTRELES DEL MISMO MATERIAL, LO QUE PROPORCIONA UN AISLAMIENTO TÉRMICO [TRES CAPAS DE ONDULADO + CÁMARA DE AIRE (2 CM.) + TRES CAPAS DE ONDULADO] REALMENTE EFICIENTE.

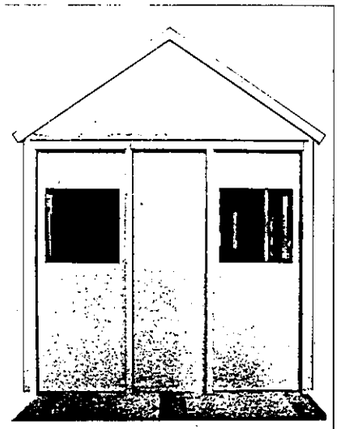
LOS CORTES Y HENDIDURAS DE DOBLADO SE PUEDEN HACER MANUAL O INDUSTRIALMENTE.

B4. *LA ESTRUCTURA.*—A PESAR DE SU APARENTE FRAGILIDAD LA CONEXIÓN DE UNOS PANELES CON OTROS CONFIERE AL CONJUNTO UNA RIGIDEZ REALMENTE ASOMBROSA YA QUE LOS NERVIOS DE BORDE DE LOS PANELES FORMAN UNA RETÍCULA, TANTO HORIZONTAL COMO VERTICAL, QUE ES REMATADA POR LOS PANELES DE CUBIERTA Y TECHO, QUE FUNCIONAN COMO UNA ESTRUCTURA DE PAR Y TIRANTE FORMADA POR LÁMINAS Y NERVIOS.

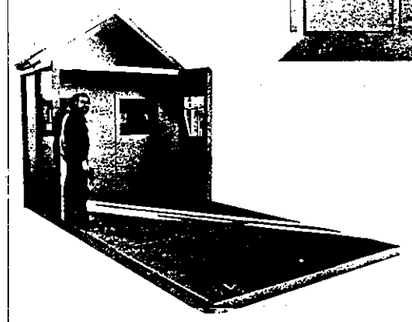
CADA UNIDAD CAPSULAR ES AUTORRESISTENTE Y ESTÁ CAPACITADA PARA RESISTIR NIEVE (80 KG./M2), VIENTO (120 KM/H) Y ESPECIALMENTE ACCIONES SÍSMICAS DE GRAN ENVERGADURA.

B5 *LA VIVIENDA.*—SE COMPONE DE UNIDADES INDEPENDIENTES O «CAPSULAS DE HABITACION QUE SE ENCHUFAN O CONECTAN» BIEN MEDIANTE PASOS PROTEGIDOS, BIEN MEDIANTE CONECTORES CERRADOS A MODO DE PASILLOS.

PROTOTIPO

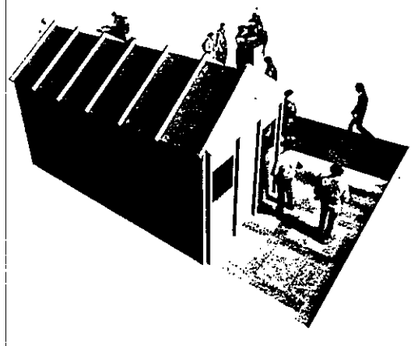


COMIENZO DE MONTAJE

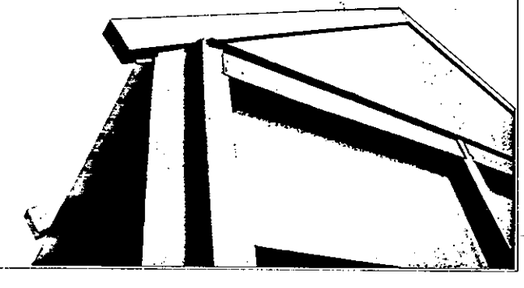


MONTAJE DE CUBIERTA

VISTA GENERAL



DETALLE DE ESQUINA



EL SISTEMA PROPUESTO PERMITE LAS MÁS VARIADAS COMBINACIONES TANTO COMPACTAS COMO ABIERTAS. AQUÍ LO HEMOS EJEMPLIFICADO CON UNA SOLUCIÓN DE VIVIENDA-PATIO EN EXTENSIÓN, PARA VER SU CAPACIDAD DE ADAPTACIÓN A SITUACIONES TRADICIONALES DEL TERCER MUNDO EN CLIMA SEMIÁRIDO.

EL DISEÑO DE ESTE SISTEMA ESTÁ PLANTEADO PARA PERMITIR LA CONSTRUCCIÓN EN ETAPAS QUE VAYAN CUBRIENDO LAS SUCESIVAS NECESIDADES, COMENZANDO EN LOS NIVELES DE URGENCIA Y ACABANDO EN LOS DE CONFORT.

LOS PROBLEMAS DE REPLANTEO Y CIMENTACIÓN SE HAN RESUELTO SIMULTÁNEAMENTE MEDIANTE CUATRO TABLAS DE MADERA, QUE ATIRANTADAS EN SUS DIAGONALES FORMAN EL PERÍMETRO DE LAS DISTINTAS UNIDADES, A LAS QUE SE ANCLARÁN LOS PANELES DE FACHADA. ESTAS TABLAS DE ANCLAJE SON ESTABILIZADAS PRIMERO MEDIANTE PICAS CLAVADAS EN EL TERRENO EN NÚMERO PROPORCIONAL A LA INTENSIDAD DE LOS VIENTOS EN LA ZONA, E INVERSAMENTE PROPORCIONAL A LA DUREZA Y LA CONSISTENCIA DE ÉSTE. POSTERIORMENTE ESTE ANCLAJE SE VA A INCREMENTAR CON EL RELLENO DEL SUELO HASTA EL NIVEL SUPERIOR DE LA TABLA CON TIERRA APISONADA, YESO CON PAJA, U HORMIGÓN.

EXISTE POR ÚLTIMO UNA ETAPA POSTERIOR DE CONSOLIDACIÓN, EN LA CUAL CADA CÁPSULA SERVIRÍA, O BIEN DE MOLDE PARA REVESTIRLA DE DOS ROSCAS DE LADRILLO HUECO A PANDERETE ENFOSCADO EXTERIORMENTE, O BIEN DE ENCOFRADO PERDIDO PARA UN GUNITADO DE HORMIGÓN CON FIBRA DE VIDRIO, ETC.; CON LO QUE SE TRANSFORMARÍA FINALMENTE CADA MÓDULO EN UNA VIVIENDA CONVENCIONAL INDISTINGUIBLE DE LAS DEMÁS.

B6. *REDES INTERIORES DE SERVICIO.*—SÓLO APARECEN EN LAS ÚLTIMAS ETAPAS DE ASENTAMIENTO Y SU DISTRIBUCIÓN (ELECTRICIDAD Y AGUA) SE REALIZA A LO LARGO DE LA CÁMARA QUE QUEDA ENTRE EL TECHO Y LA CUBIERTA. LA DISTRIBUCIÓN PARA TODO EL ASENTAMIENTO ES AÉREA, LO QUE PERMITE EL FÁCIL Y BARATO MANTENIMIENTO, ASÍ COMO LA RÁPIDA CONSTRUCCIÓN Y POSTERIOR REUTILIZACIÓN UNA VEZ DESAPARECIDA LA PROVISIONALIDAD.

LA RED DE ALCANTARILLADO SÓLO SE REALIZARÍA CUANDO FUESE PERTINENTE UNA ETAPA DE CONSOLIDACIÓN.

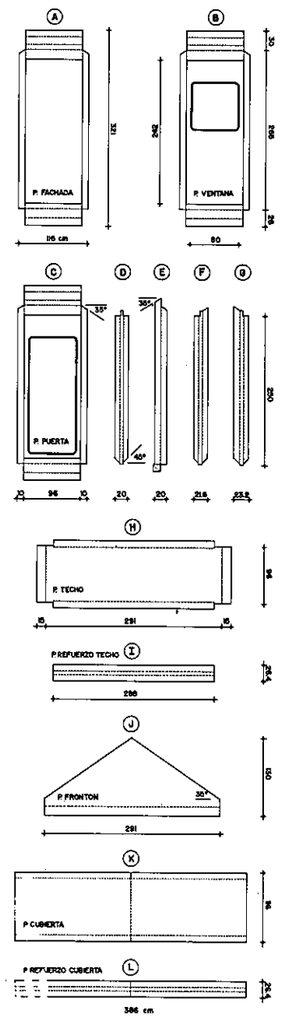
C. EL ASPECTO ECONÓMICO

A LAS VENTAJAS APUNTADAS EN EL PÁRRAFO B1 (MATERIAL) HEMOS DE AÑADIR:

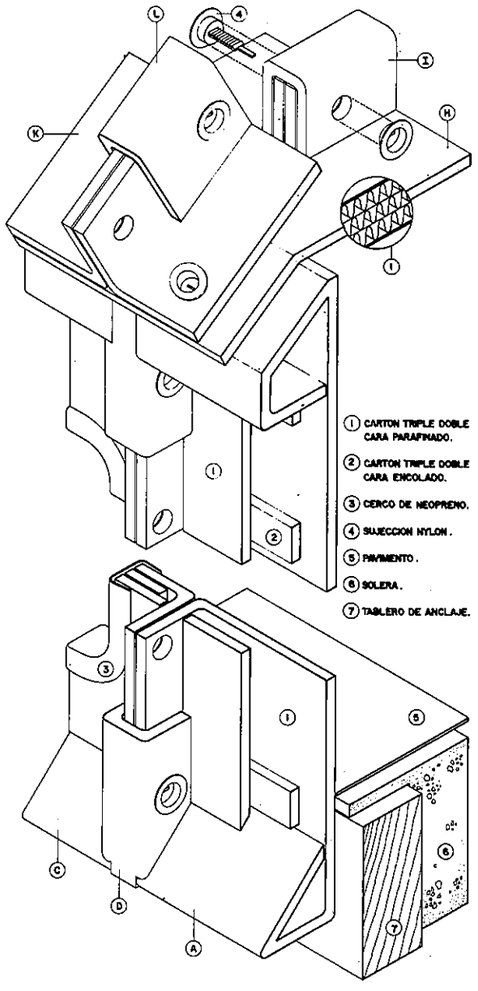
C1. *PRODUCCIÓN.*—UNA MÁQUINA DE CORTADO Y MARCADO DE PLIEGUES DE PANELES AUTOMÁTICA, Y SUPO-

DETALLES TECNICOS

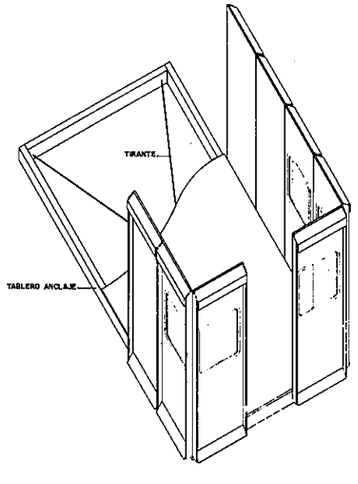
PANELES

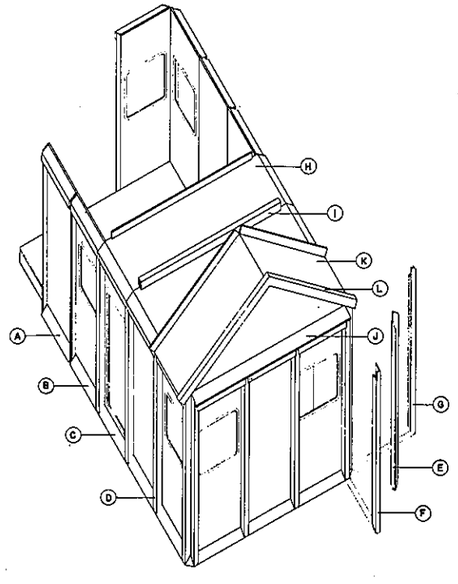


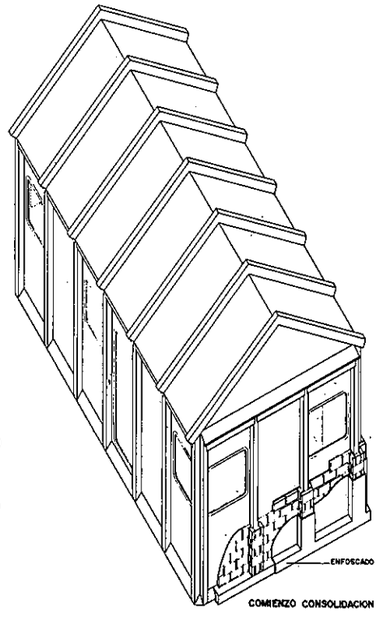
SECCION CONSTRUCTIVA



PROCESO DE MONTAJE







NIENDO UNA MEDIA DE 100 PANELES/VIVIENDA TERMINADA, DEBERÍA PRODUCIR ALREDEDOR DE 30 VIVIENDAS/HORA. ESTO SUPONDRÍA UNAS 240 VIVIENDAS/DÍA Y UNA MEDIA DE ¡5.000 VIVIENDAS/MES!, PARTIENDO DE LA LÁMINA DE CORRUGADO YA ELABORADA.

C2. *TRANSPORTE.*—EL PESO TOTAL DE UNA VIVIENDA EN EXTENSIÓN, DE 60 M2 ÚTILES, ES DE 1.000 KG. Y SU VOLUMEN DE 6 M3. UN CAMIÓN DE TIPO MEDIO PODRÍA TRANSPORTAR EN CADA VIAJE ALREDEDOR DE 15 VIVIENDAS DE 60 M2 (FASE FINAL DE CONSOLIDACIÓN DEFINITIVA).

LOS PANELES SE TRANSPORTAN DESARROLLADOS, Y EN OBRA SE PLIEGAN LAS SOLAPAS Y SE SUJETAN CON LOS CONECTORES.

C3. *CALIDAD.*—LA RELACIÓN COSTO-CALIDAD ES MUY ALTA, DEBIDO POR UNA PARTE A LA PREFABRICACIÓN DE COMPONENTES, LO QUE ASEGURA CALIDAD DE ESTRUCTURA, CERRAMIENTOS Y ACOPLAMIENTO. Y POR OTRA A LA POSIBILIDAD DE ADICIONAR ACABADOS INTERIORES TRADICIONALES COMO RECUBRIMIENTOS DE YESO, PINTURA, O BIEN PANELES VINÍLICOS DIVERSOS QUE FACILITARÁN POR POCO DINERO UNA PERSONALIZACIÓN DE LOS AMBIENTES INTERIORES Y EXTERIORES DE LA VIVIENDA.

C4. *IMPACTO EN EL ENTORNO.*—EL COSTO DE RESTITUCIÓN DEL ENTORNO A SU SITUACIÓN PRIMITIVA, EN EL CASO DE LA DESAPARICIÓN DEL ASENTAMIENTO, SERÁ SIEMPRE PROPORCIONAL A LA DURACIÓN DE AQUÉL, FAVORECIDA POR LA CIRCUNSTANCIA DE NO EXISTIR OBRAS DE INFRAESTRUCTURA GRAVOSAS DE DEMOLER, LA BIODEGRABILIDAD DE LAS PROPIAS VIVIENDAS, LA RECICLABILIDAD DE TODOS LOS COMPONENTES, INCLUYENDO DEPÓSITOS DE LONA E INSTALACIONES AÉREAS.

C5. *MONTAJE.*—UNA «CÁPSULA» DE 20 M2 SEMEJANTE A LA DE LAS FOTOGRAFÍAS PUEDE SER MONTADA EN MENOS DE TRES HORAS POR TRES PERSONAS NO ADIESTRADAS.

D. EL ASPECTO HUMANO

PREFABRICACIÓN + AUTO CONSTRUCCIÓN = RAPIDEZ + CALIDAD + PERSONALIZACIÓN.

EL PRINCIPIO DE QUE: «NO BASTA QUE UNA SOLUCIÓN SEA BUENA SI LOS AFECTADOS NO LA SIENTEN COMO TAL», NOS HA LLEVADO A CONSIDERAR:

D1. *LA IMAGEN.*—EL FRACASO DE ALGUNAS SOLUCIONES INNOVADORAS A CAUSA DE QUE SU ASPECTO HA SIDO ASUMIDO COMO CULTURALMENTE AJENO (IGLOOS DE POLIURETANO MONTADOS POR BAYER Y LA CRUZ ROJA ALEMANA EN NICARAGUA, PERÚ Y TURQUÍA, HEXAGONALES DE OXFAM, POLIEDROS DE EMMERICH EN MARRUECOS, ETC.), NOS HA LLEVADO A LA CONSIDERACIÓN COMO FORMA, DEL ARQUETIPO DE LA «CABAÑA PRIMITIVA», YA QUE ES LA MÁS EXTENDIDA, PUDIENDO SER ACEPTADA POR LA MAYOR PARTE DE LAS CULTURAS, TANTO ORIENTALES COMO OCCIDENTALES.

D2. *PARTICIPACIÓN.*

D2.1. EN LA CONSTRUCCIÓN Y LA ORGANIZACIÓN DE LA VIVIENDA LA MEJOR MANERA DE QUE LOS POBLADORES SE IDENTIFIQUEN CON SU HÁBITAT ES QUE LO CONSTRUYAN ELLOS MISMOS, RESPONSABILIZÁNDOSE, EN GRAN MEDIDA, DEL RESULTADO FINAL. PARA ELLO LA EJECUCIÓN DE CADA UNIDAD CORRERÁ A CARGO DEL USUARIO, CABEZA DE FAMILIA, AYUDADO POR OTROS DOS FUTUROS AUTOCONSTRUCTORES, DE LAS MISMAS CONDICIONES, QUE UTILIZARÁN ESTA AYUDA COMO MEDIO DE APRENDIZAJE, TRANSMITIENDO A SU VEZ CADA UNO DE ELLOS SU CONOCIMIENTO A OTROS DOS APRENDICES. LA EXTENSIÓN DEL ADIESTRAMIENTO, AL SER EL PROCESO UNA PROGRESIÓN GEOMÉTRICA, ALCANZARÍA A LAS 500 FAMILIAS DEL ASENTAMIENTO UNIDAD A LAS 27 HORAS HÁBILES DE HABERSE COMENZADO. LA TRANSMISIÓN PARA LOGRAR UN EFICAZ RENDIMIENTO HA DE TENER LUGAR MEDIANTE: COOPERACIÓN, APOYO VISUAL, ORAL Y ESCRITO, DEBIENDO EXISTIR TAMBIÉN FOTOS Y DIBUJOS QUE ILUSTREN Y RECUERDEN EL MONTAJE PASO A PASO.

DEBERÁ TAMBIÉN EXISTIR EN EL CENTRO DE ESTUDIOS Y COORDINACIÓN UN GABINETE DE APOYO TÉCNICO PARA AYUDAR A RESOLVER IMPREVISTOS Y DUDAS, ASÍ COMO RESPONSABLES ROTACIONALES DE CADA UNIDAD DE SERVICIOS, DE SECTOR, Y DE DISTRITO.

E. EL ASPECTO URBANÍSTICO

E1. *LA MODULACIÓN.*—ESTÁ ORGANIZADA PARA QUE CADA MÓDULO SUPERIOR TENGA UNA DIMENSIÓN MAYOR QUE LA SUMA DE LOS QUE CONTIENE. ELLO PERMITE UNA JERARQUIZACIÓN DE CALLES Y SECTORES DIFERENCIANDO CLARAMENTE ÁREAS DE RESPONSABILIDAD.

LOS MÓDULOS URBANÍSTICOS NO SON FIJOS Y VARIARÁN CON ARREGLO A LA CLIMATOLOGÍA, CULTURA Y NECESIDADES DE CADA CASO. EN EL EJEMPLO PRESENTE, PENSADO PARA UN CLIMA SUBTROPICAL, LA DIMENSIÓN REFLEJADA ES UNA DIMENSIÓN MÁXIMA, INDICANDO CON ELLO QUE SE TRATA DE HACER MÍNIMA LA OFERTA DE ESPACIO PÚBLICO, YA QUE ÉSTE EN GRUPOS DE ESCASO PODER ECONÓMICO RESULTA DIFÍCIL DE MANTENER ORGANIZATIVA Y MONETARIAMENTE.

E2. *REDES Y SERVICIOS*: LA SOLUCIÓN ES TAMBIÉN PROVISIONAL.

ELECTRICIDAD: SE DESARROLLA EN DOS ETAPAS SIEMPRE CON TENDIDO AÉREO. EN LA PRIMERA UN GRUPO ELECTRÓGENO PROPORCIONA SÓLO ILUMINACIÓN URBANA. EN LA SEGUNDA PUEDE EXISTIR ENGANCHE A LA RED REGIONAL, SE AUMENTAN LOS PUNTOS DE ILUMINACIÓN Y SE INTRODUCE LA ELECTRICIDAD EN LAS VIVIENDAS.

AGUA: DOS ETAPAS. EN LA PRIMERA CADA UNIDAD DE 8 VIVIENDA ESTÁ ABASTECIDA POR UN DEPÓSITO DE 3 M3. DE LONA IMPERMEABLE QUE SE RELLENA SEMANALMENTE CON CUBAS. EN LA SEGUNDA, DE DOS FASES, APARECE UNA RED AÉREA DE TUBERÍA DE POLIETILENO. EN LA PRIMERA FASE CONECTA LOS DEPÓSITOS ENTRE SÍ, Y EN LA SEGUNDA DISTRIBUYE A LAS VIVIENDAS, DESAPARECIENDO LOS DEPÓSITOS SI HAY CONSOLIDACIÓN DEL ASENTAMIENTO.

ALCANTARILLADO: NO EXISTE. APARECERÍA EN LA ETAPA DE CONSOLIDACIÓN. INODOROS EN LAS VIVIENDAS CONSISTENTES EN UN SIMPLE ARO DE MADERA EN EL QUE SE COLOCAN BOLSAS DE POLIETILENO DE CIERRE HERMÉTICO PROPORCIONADAS SEMANALMENTE A CADA FAMILIA POR LA COMUNIDAD, RESUELVEN EL PROBLEMA DE FECALES. CON EL APROVECHAMIENTO DE LOS DESECHOS SE FINANCIAN LOS RECIPIENTES.

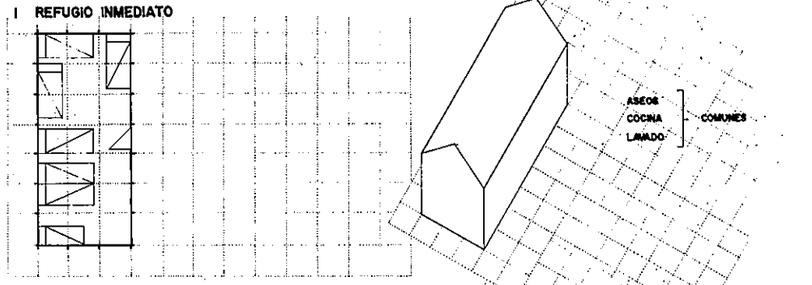
PEQUEÑAS ZANJAS EN CADA UNIDAD, DIMENSIONADAS SEGÚN LA POROSIDAD DE TERRENO, ABSORBEN EL AGUA DE LAVADOS, ELIMINANDO PREVIAMENTE LOS RESTOS ORGÁNICOS MEDIANTE REJILLAS ADECUADAS EN LOS DESAGÜES DE LOS FREGADEROS.

LAS BASURAS SE SELECCIONARÍAN CON BOLSAS DISTINTAS PARA RESTOS ORGÁNICOS, VIDRIOS Y METALES. CADA FAMILIA TENDRÍA BOLSAS NUMERADAS PARA COMPROBACIÓN ASIGNADAS SEMANALMENTE. EL RECICLADO DE BASURAS FINANCIARÍA LAS BOLSAS.

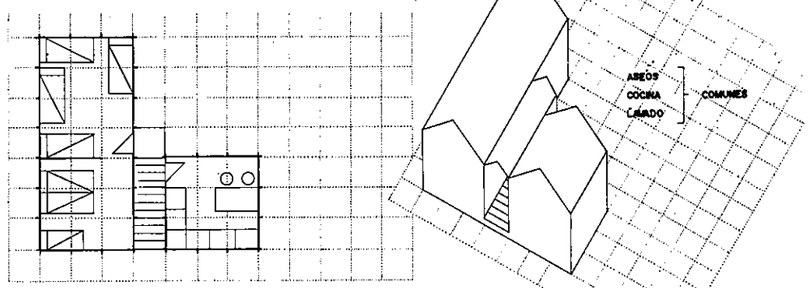
E3. *EQUIPAMIENTO.*—LOS EDIFICIOS DE LA PLAZA, INICIALMENTE OCUPADOS POR LOS SERVICIOS ORGANIZATIVOS Y DE DISTRIBUCIÓN DE AYUDAS, PAULATINAMENTE SON CONVERTIDOS EN ALCALDÍA, ESCUELA Y SUPERMERCADO. SE COMPLEMENTARÍA CON UNA NORMATIVA POR LA QUE SE PUDIERAN ASIGNAR ALGUNOS MÓDULOS DE VIVIENDA A PUNTOS DE VENTA.

ETAPAS DEL ASENTAMIENTO

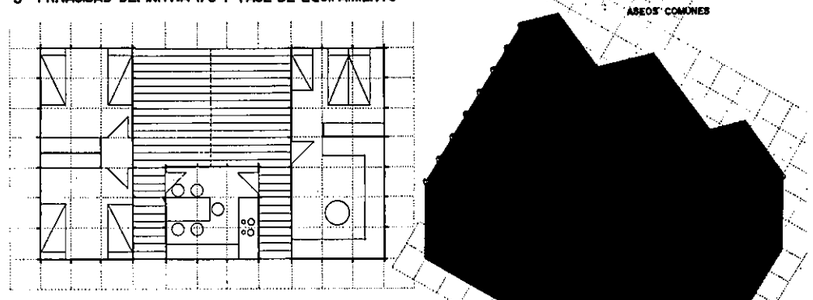
1 REFUGIO INMEDIATO



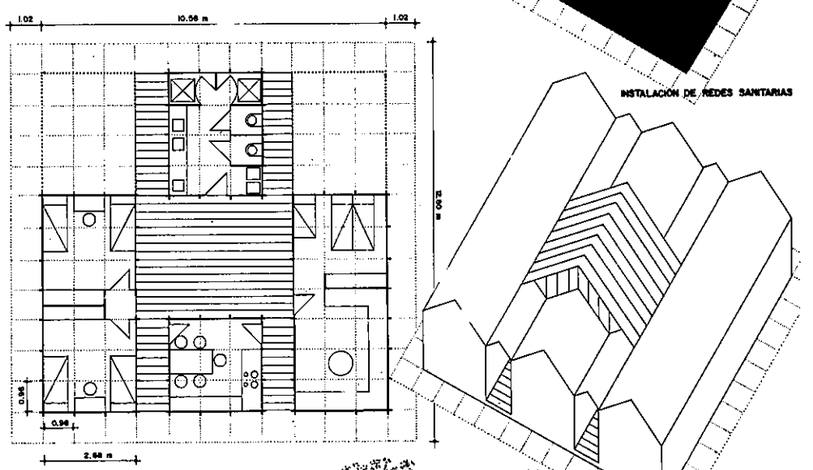
2 PRIMERA FASE DE PRIVACIDAD

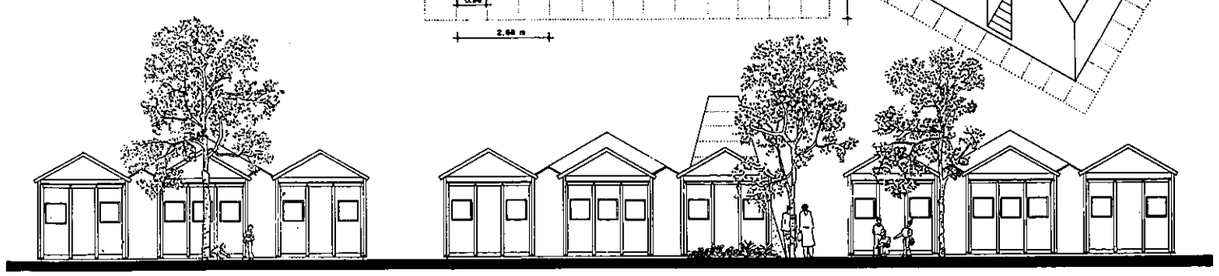


3 PRIVACIDAD DEFINITIVA Y/O 1ª FASE DE EQUIPAMIENTO



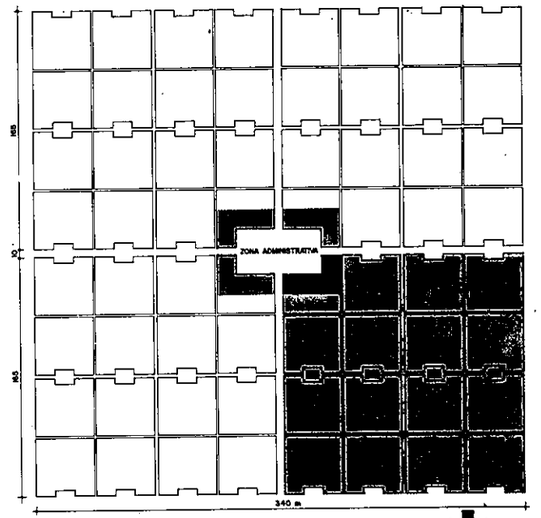
4 DESMANTELAMIENTO O COMIENZO DE CONSOLIDACION DEFINITIVA



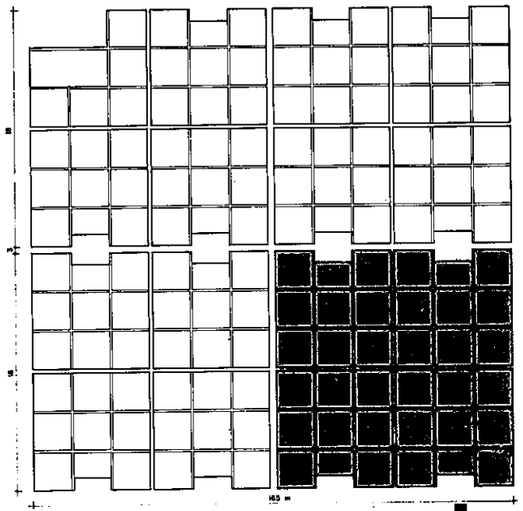


UNIDAD DE 500 VIVIENDAS

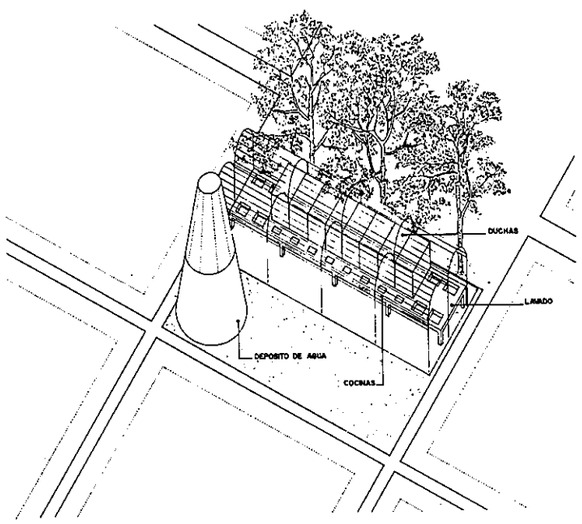
ORDENACION GENERAL (500 FAMILIAS).



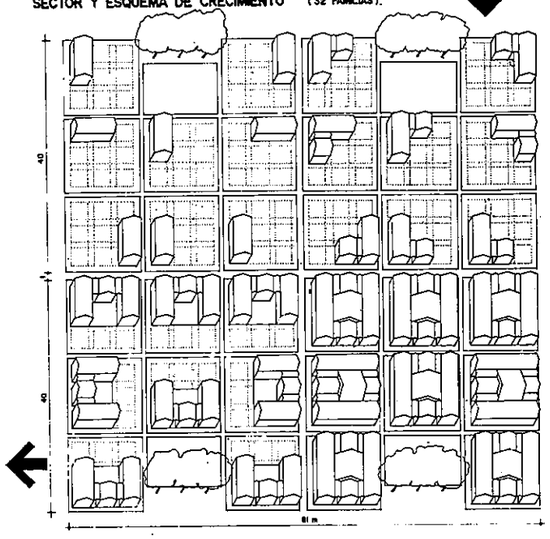
DISTRITO (125 FAMILIAS).



MODULO SERVICIO SECTOR (8 FAMILIAS).



SECTOR Y ESQUEMA DE CRECIMIENTO (32 FAMILIAS).



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CINTUS SECTION III

UNE SOLUTION QUI DEMONTRE UNE ATTITUDE ORIGINALE QUANT AU CHOIX, A L'UTILISATION ET A LA CONFIGURATION DES ELEMENTS CONSTRUCTIFS, ET QUI FAIT PREUVE D'INNOVATIONS TECHNIQUES AU NIVEAU DES MATERIAUX, DES SYSTEMES DE STRUCTURE ET DES METHODES DE CONSTRUCTION.

UN PROCEDE DE CONSTRUCTION EN BOIS CONCILIANT INDUSTRIE ET ARTISANAT

PRES DE 10.000 LOGEMENTS ONT DEJA ETE CONSTRUITS AVEC CE PROCEDE EN UN LIEU GEOGRAPHIQUE RESTREINT, CE QUI PEUT ETRE CONSIDERE AU REGARD DU PROBLEME DES MILLIONS DE SANS ABRIS COMME LE PROTOTYPE D'UNE SOLUTION OBJECTIVEMENT PROUVEE ET RENOUVELABLE.

DESCRIPTION SOMMAIRE DU PROCEDE

La structure est réalisée à partir d'une série limitée d'éléments industrialisés en bois, combinables entre eux. Les sections utilisées sont toutes des sous-multiples de bois avivés.

OSSATURE - CHARPENTE

Les éléments verticaux, portiques préfabriqués, à la fois ossature et charpente, sont composés d'éléments assemblés par connecteurs, ils s'assemblent entre-eux sur une trame carrée par boulonnage de leurs montants latéraux formant des poteaux cruciformes de très grande résistance et sont scellés aux fondations par des tubes en acier galvanisé et des goujons.

Les portiques offrent le choix de 3 hauteurs d'étages ou de façades et de 2 types de pentes de toiture (18% et 87%). Leur combinaison permet des constructions jusqu'à 2,5 niveaux (comble R+2 aménageable) et des volumes de couverture en croupe, noue ou décrochés, adaptables à différents types de plans.

Les cloisons sont des éléments identiques aux portiques s'assemblant à l'intérieur de ceux-ci sur une sous-trame et sont fixées sur les colombages par boulons et tirefonds.

Les colombages recevant les revêtements et les menuiseries sont cloués dans les portiques et les cloisons.

Les éléments de toiture - pannes, sablière, faîtage - se boulonnent directement sur les portiques, ainsi que les éléments de planchers bas ou intermédiaires.

La résistance des constructions sans le secours des remplissages est garantie par la solidarisation de l'ensemble des éléments entre eux, qui depuis les fondations jusqu'au faîtage, forme une structure indéformable de type poteaux/poutres (poteaux cruciformes aux assemblages et poutres à treillis en tympan des portiques, au-dessus des traverses linteaux continues).

REVETEMENTS

- Murs extérieurs : Libres : Clins bois; tôle nervurée; panneaux dérivés; blocs de béton ou terre compactée...
- Murs intérieurs et sous-rives : Contre-plaqué 6 mm cloué; ou autre...
- Couverture : Bac acier galvanisé ondulé tirefonné sur pannes; ou autre...
- Menuiseries extérieures : Volet barre-écharpe; Chassis à lames orientables bois ou verre; ou autre...
- Menuiseries intérieures : Porte isoplanes ou à barre-écharpe.
- Maçonnerie ou terre : remplissages en fonction de la destination.

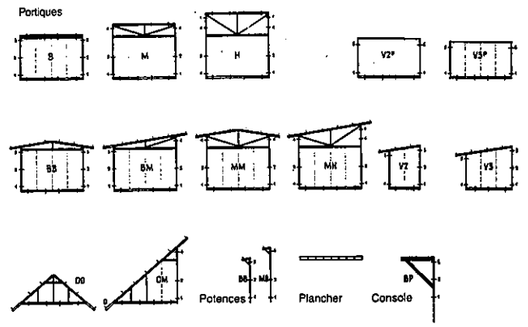
La liberté de choix des remplissages et des revêtements permet l'utilisation aussi bien des éléments complémentaires du procédé que d'autres composants industriels ou artisanaux et la possibilité d'un habillage progressif pour l'étalement des coûts. L'éventail des possibilités du second oeuvre est largement ouvert.

ELEMENTS HORS PROCEDE

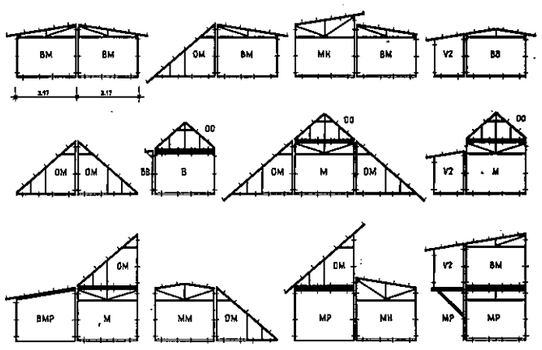
Pouvant éventuellement être fournis.

- Fondations : Longrines périphériques en béton armé (section : 0,30 x 0,40 m) Plots carrés en béton armé de 0,40 x 0,40 x 0,30 m sous poteau isolé.
- Dalle : Dalle béton armé d'un treillis soudé sur tout venant compacté, ép = 0,10 m, sur polyane 120µ.
- Electricité; Plomberie; Peinture: Fonction de la destination.

ELEMENTS TYPES



EXEMPLES D'ASSEMBLAGES



HYPOTHESES D'ETUDE DU PROCEDE

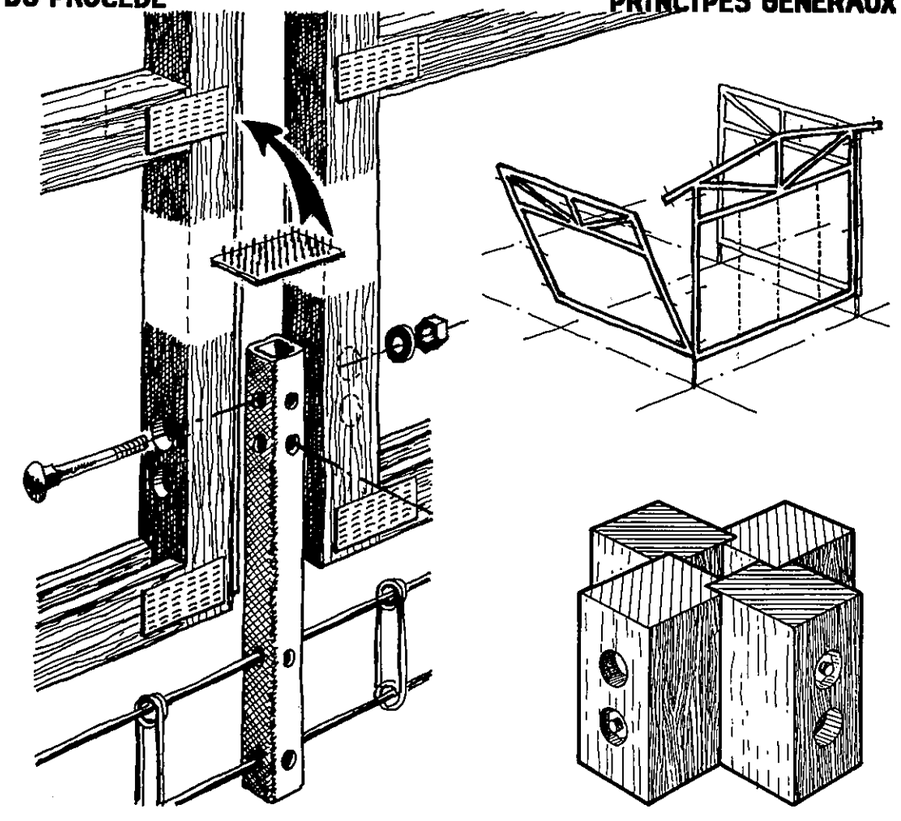
Pallier la rareté des capitaux, économiser l'énergie et les devises. Pour un faible prix de revient proposer une réponse à la pénurie de logement social et à des contraintes climatiques particulières en incorporant la plus grande diversité possible de matériaux locaux, laisser ouverte la possibilité d'améliorer constamment son logement à partir d'une structure fiable donc mettre en œuvre un concept d'habillage progressif au contraire du déshabillage propre à certaines recherches de performances économiques.
D'où le choix d'un procédé d'ossature bois à remplissages libres.

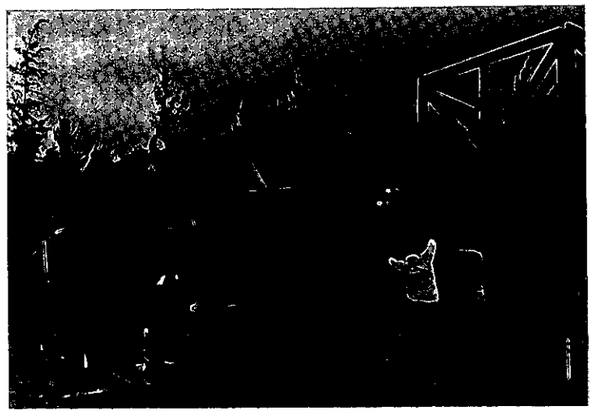
Répondre par une architecture attrayante, à une demande d'habitat et pas seulement de logement, en offrant la possibilité de réaliser des équipements très divers, tout en permettant d'élargir le marché de l'usine pour sa nécessaire rentabilité.
D'où un procédé par composants à destinations banalisées.

La seule possibilité de vaincre les pénuries primaires réside dans le développement industriel, la croissance s'opérant grâce au dégagement d'un surplus social qui est fonction de la productivité du travail. La production de logements pour le grand nombre est donc liée au développement industriel par la mise en oeuvre de technologies appropriées.
D'où un procédé industriel et simple à mettre en œuvre.

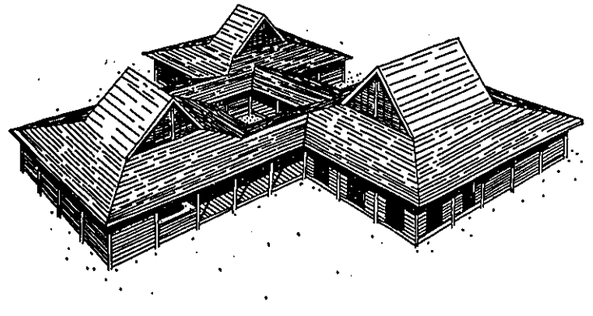
La capacité à créer des richesses résulte directement de l'articulation positive entre les différentes chaînes de production . Le procédé doit donc permettre l'ouverture sur ces chaînes en insistant sur le maintien des économies communautaires de subsistance, et pouvoir répondre aussi bien au secteur institutionnalisé qu'au secteur informel.
D'où un procédé liant l'industrie à l'artisanat.

PRINCIPES GENERAUX

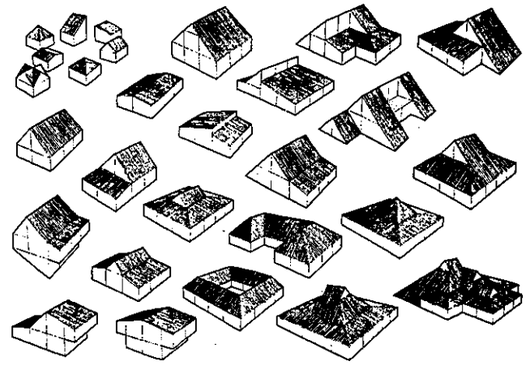




VARIETE DE PROGRAMMES



EXEMPLES DE VOLUMETRIE



DEVELOPPEMENT DU PROCEDE

La possibilité de diversification, outre la variété d'aspects qui en résulte, facilite l'adaptation du système à différents types de programme (habitation, hébergement touristique, petit équipement...)

Le procédé permet de conserver les solutions apportées par l'architecture traditionnelle aux difficiles problèmes climatiques des zones tropicales (auvent protecteur des pluies et du soleil, ventilation naturelle par plan traversant, vérandas rafraîchissantes,...) ou d'adopter les techniques actuelles d'isolation (laine de verre, polystyrène...)

La standardisation poussée et la répétitivité des composants des éléments, créent un effet de série dans la série qui permet de bénéficier des avantages de l'industrialisation à partir de quantités relativement réduites, sans monotonie des réalisations.

Le montage ne nécessite pas d'engin de levage, tous les éléments manuportables (100 kg maximum) se prêtent à des opérations isolées, sans plus-value importante.

A partir de l'unité de production locale de nombreux concepteurs peuvent utiliser le procédé.

La facilité de mise en œuvre des ossatures rend possible l'utilisation de réseaux d'artisans existants.

La vente en kit peut être interessante.

Produit et Production bénéficient de la compatibilité Industrie-Artisanat, à la fois par l'acquisition de la fiabilité industrielle (précision, régularité technique, volume des stocks...) et par la conservation de l'économie d'échelle et de la souplesse artisanales.

LA CONSTRUCTION

EXEMPLE DE MODE OPERATOIRE POUR UNE MAISON TRES ECONOMIQUE ET UNE MAIN D'ŒUVRE PEU QUALIFIEE

1 Décaper le terrain de niveau, tracer la maison au sol, creuser une rigole périphérique et couler des petits plots en béton aux axes de structure.

2 Monter les portiques en les boulonnant entre-eux, (ainsi que les tubes d'ancrages en pieds de poteaux). Chaque élément est manœuvrable par deux personnes.

5 S'assurer à l'œil de la rectitude de la construction, faire venir les ossatures à la main et peaufiner le calage si nécessaire, serrer les boulons à l'avancement. Ce processus de montage permet de construire "droit" quelle que soit la qualification de la main d'œuvre.

6 Passer les ferraillages des longrines périphériques dans les trous des tubes d'ancrages et sur les crosses de fixation des traverses basses. Quand la dalle sera coulée le tout formera une structure résistante et indéformable.

7 Boulonner les pannes de la charpente et poser la couverture. Tous les matériaux de couverture sont utilisables, le plus économique et fiable étant la tôle ondulée; elle peut être laissée brute recouverte de chaume ou de liteaux contre le soleil et le bruit de la pluie.

8 Poser sur le sol et remonter sur les murs à leur positon définitive les tuyauteries et câbles divers. Ces éléments étant complètement mis en place avant le coulage de la dalle, on est certain de leur bonne position.

9 Mettre des coffrages en planches à la périphérie, contre les traverses basses. Les traverses basses formant gabarit, la dalle sera parfaitement adaptée à la construction.

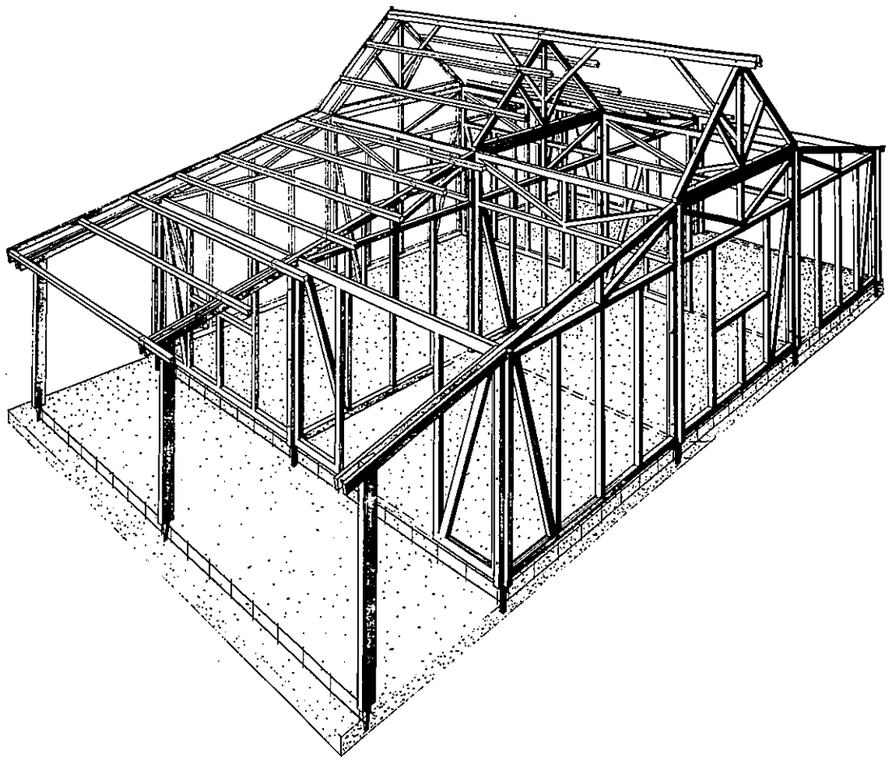
10 Remblayer éventuellement et couler la dalle en béton armé. Les dallages et fondations sont ainsi exécutés à l'abri du soleil et de la pluie, ils seront parfaitement plans et adaptés à la structure. les traverses basses des portiques formant gabarit.

11 Poser les menuiseries. Du simple volet à la double fenêtre avec moustiquaire. Elles seront fonction du niveau de prestation souhaité.

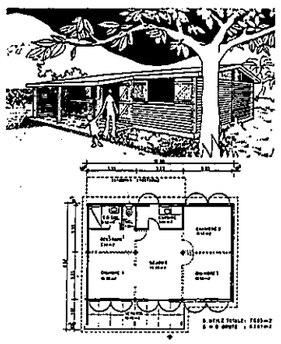
12 Exécuter les remplissages ; ceux-ci peuvent être très variés : clins bois, panneaux dérivés, toile, tôle, blocs de béton, blocs d'adobe, torchis... en général tous les matériaux d'usage local.

13 Exécuter les finitions second-œuvre. Peinture revêtements de sol...

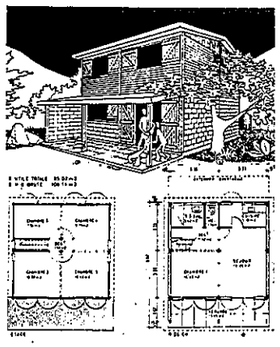
ECORCHE D'UNE OSSATURE



LOGEMENT R. de Ch.



LOGEMENT ETAGE



PRODUIT ET PRODUCTION

Commencée dans un pays tropical pour répondre à une demande d'habitat économique, l'étude conceptuelle du procédé a été en permanence confrontée au savoir-faire industriel et artisanal local, jusqu'à la mise au point de prototypes considérés comme satisfaisants par les acteurs de la recherche (concepteur et industriel).

Ce premier aboutissement de la conception et du savoir-faire a été mis à l'épreuve de l'usager par la réalisation d'une pré-série de modèles économiques, en réponse à des programmes de logements sociaux et de modèles améliorés mis à la disposition de la clientèle privée à moyen et haut revenus.

Cette première expérience dans le domaine de l'habitat groupé et diffus ayant satisfait les usagers relevant d'une large gamme de revenus, la fabrication en série a pu commencer. En effet, l'objectif fondamental de la recherche qui était d'apporter une solution au problème du logement économique était atteint.

Il est nécessaire de souligner que ce succès est le résultat d'une rencontre (beaucoup plus rare qu'on ne le pense habituellement) entre une volonté politique (souci de l'habitat social et de la préservation de l'environnement), une Administration (capable de traduire la volonté politique dans les faits), une capacité financière (Financements spécifiques dédiés au logement des plus défavorisés), un entrepreneur (vraiment entreprenant) et un concepteur (expérimenté donc réaliste).

La possibilité de transfert de technologie étant vérifiée, le procédé peut entrer dans sa phase de développement.

PROJET D'UNITE DE PRODUCTION

TRANSFERT DE L'INGENIERIE DE PROCEDE ET DE SA MAITRISE INDUSTRIELLE

Conclusion logique de l'importance et du succès de l'expérimentation, le transfert du procédé dans l'ensemble des zones tropicales et sub-tropicales, comme une solution prouvée aux problèmes d'habitat économique et d'équipement de ces régions, peut maintenant être envisagé sous la forme d'unités de production.

CAPACITE NOMINALE DE PRODUCTION

L'hypothèse raisonnable, si on s'en réfère aux pré-études, est la possibilité d'implanter, en association avec des partenaires locaux, des unités d'une capacité nominale de production de 1000 logements types par an décrite succintement ci-après.

Le choix de cette capacité nominale tient à quatre facteurs objectifs :

1 Capacité d'écoulement de la production
Les pays auxquels s'adresse ce procédé, compte tenu du nombre d'habitants et de leur besoin en logements économiques, sont potentiellement capable d'absorber sans problème une telle production.

2 Calibrage des machines
La production maximum de certaines des machines (à commande manuelle) indispensables à la production se situe à ce niveau, leur amortissement se trouverait de ce fait grandement facilité.

3 Connaissance du niveau de production
Le partenaire industriel principal a dans son usine une capacité de production similaire et en a par conséquent la parfaite maitrise industrielle.

4 Amortissement du transfert technique
Les frais de transfert de technologie comprennent un minimum incompressible et ne croissent pas proportionnellement à la capacité de production, le calibrage de l'unité à 1000 logements en permet à priori un amortissement satisfaisant.

PRODUCTION TYPE

Le modèle "LTS TICASE 82 4/5 P TB " de 78 m2 qui a permis le calibrage de l'usine est actuellement le plus demandé et représente environ 7% de la production. A titre indicatif la production actuelle est de :

70% Modèles économiques
20% Equipements divers; scolaire; loisirs; armée; agriculture...
10% Maisons particulières de standing.

TEMPS DE PRODUCTION
1 880 heures par an. Avec , hors l'encadrement expatrié nécessaire le temps du transfert, une main d'oeuvre entièrement locale..

UNITE DE BASE

Usine de capacité maximum théorique annuelle de production d'éléments en bois, avec fourniture des pièces d'assemblage et tous accessoires, destinés à la construction des ossatures et charpentes complètes de 1000 logements.

APPROVISIONNEMENTS
Pour l'unité de base les bois approvisionnés sont supposés livrés secs et traités, à section d'usinage et en longueurs tombantes.

CARACTERISTIQUES DE PRODUCTION pour 1.000 logements types

Cube de bois déligné	
7 sections différentes	5 917 m3
Cube bois pièces finies	
-30% de perte à l'usinage	4 142 m3
Linéaire toutes sections confondues	
16 profils	920 000 ml
Nombre de pièces finies	
54 types de pièces	467 000 u

UNITES COMPLEMENTAIRES

Tous les produits et prestations ci-après peuvent être fournis par d'autres entreprises ou artisans locaux et sont calibrés comme l'unité de base. Leur projet dépend essentiellement du contexte.

MISE A DIMENSION D'USINAGE, TRAITEMENT ET SECHAGE DES BOIS
Fonction de la qualité des bois et du contexte de la filière bois.

REVETEMENTS
Pour le remplissage des ossatures : Production des menuiseries, façonnage des panneaux et éléments de couvertures, fourniture des accessoires.

CARACTERISTIQUES DE PRODUCTION pour 1000 logements type

habillages revêtements ext.	57 744 m2
menuiseries extérieures	10 800 m2
lambris intérieurs	168 353 m2
plafonds et faux-plafonds	15 808 m2
portes int. (recalibrage seul)	6 000 u
couverture bac-acier	96 473 m2

PRESTATIONS ANNEXES
Pour des productions répétitives, l'électricité, la plomberie, la peinture des panneaux, les armatures de fondations et dallages peuvent être fournis par l'usine. La pose devant être réalisée par des partenaires entrepreneurs.
Eventuellement production de blocs de béton aggloméré ou de terre compactée.

MISE EN OEUVRE
Pour l'assistance au montage des ossatures sur chantier et la coordination des corps d'états secondaires, un service travaux peut être créé au sein de l'usine. En tout état de cause, le transfert du savoir-faire en matière de construction à partir du procédé fait intégralement partie du projet.

IMPACT DU PROJET

INSERTION DE LA PRODUCTION DANS LE CONTEXTE ECONOMIQUE
Le procédé permet l'insertion d'un processus industriel dans les chaînes de production de l'habitat et favorise leur articulation à différents niveaux :

1 COMMUNAUTAIRE
Les économies d'échelles permettront de fournir en KIT des ossatures fiables et faciles à mettre en oeuvre à un prix sensiblement égal à celui du bois en avivé acheté chez le détaillant. La construction et la finition étant assurées par le processus dit "coup de main".

2 ARTISANAL
Des artisans (voir formation ci-après) peuvent s'approvisionner en composants auprès de l'usine et réaliser l'ensemble des travaux de construction.

3 NATIONAL
La production de l'usine peut participer aux grands projets d'aménagements en permettant de les concrétiser rapidement par la production en masse d'un habitat parfaitement adapté.

4 INTERNATIONAL
A terme, à partir d'une telle unité , il est possible d'envisager une exportation partielle de la production.

L'association, par l'intermédiare de l'unité de production, de ces différentes chaines permet la participation à la création de la synergie positive nécessaire au développement industriel.

VALEUR AJOUTEE ET COUTS
La valeur ajoutée est estimée à ± 60% du chiffre d'affaire. La charge de l'investissement par mètre carré construit pour 500 logements / an est ± 50 FF pour l'unité de base et ± 30 FF pour les compléments.

VALORISATION DES RESSOURCES LOCALES
Bois, utilisation possible des essences secondaires
3 000 à 6 000 m3/an
Bacs acier ondulé ou autres couvertures
50 000 à 100 000 m2/an
Panneaux ou remplissages terre tradi.
130 000 à 260 000 m2/an
Association possible d'une technologie de blocs de terre vibro-compactée.
La nécessaire mise en place de circuits d'approvisionnement fiables permet la participation à une filière bois dynamique.

CREATION D'EMPLOIS 275

Pour 1 unité Avec hors le personnel nécessaire le temps du transfert une main d'œuvre entièrement locale.
Pour une production de 500 logements / an.

EMPLOIS A LA PRODUCTION	149
Production des ossatures	93
Personnel cadre	6
Ouvriers qualifiés	27
Autres	60
Unités complémentaires	56
Personnel cadre	1
Ouvriers qualifiés	15
Autres	40
EMPLOIS INDUITS	126
Pour des opérations de 50 logements moyens	
Approvisionnements non quantifié	--
Montage des bâtiments	63
Personnel cadre	3
Ouvriers qualifiés	15
Autres	45
Corps d'états secondaires	63

FORMATION
Par le transfert de technologie formation de cadres et de main d'oeuvre qualifiée. Sensibilisation à un processus de production véritablement industriel au niveau de la gestion, manufacture, construction, organisation et technique.
Il a été constaté par ailleurs que certains personnels de l'usine, une fois formés, s'établissent à leur compte et deviennent les principaux clients-artisans pour la construction en secteur diffus.

ACCESSION A LA PROPRIETE INDIVIDUELLE
L'éventail de production, de la vente en kit au clé en main, permet de répondre aux possibilités de plans de financements individuels variés.
Un accédant pourra, à partir d'une ossature et d'un toit monté, modifier et améliorer les finitions de son logement au fur et à mesure de ses possibilités financières.

PARTICIPATION AUX GRANDS PROJETS
Par la fixation d'emplois en un lieu déterminé en fonction d'une politique d'aménagement du territoire, et par la participation à la réalisation des objectifs en logements et en équipements, l'unité de production participera à deux titres aux grands projets d'aménagement.

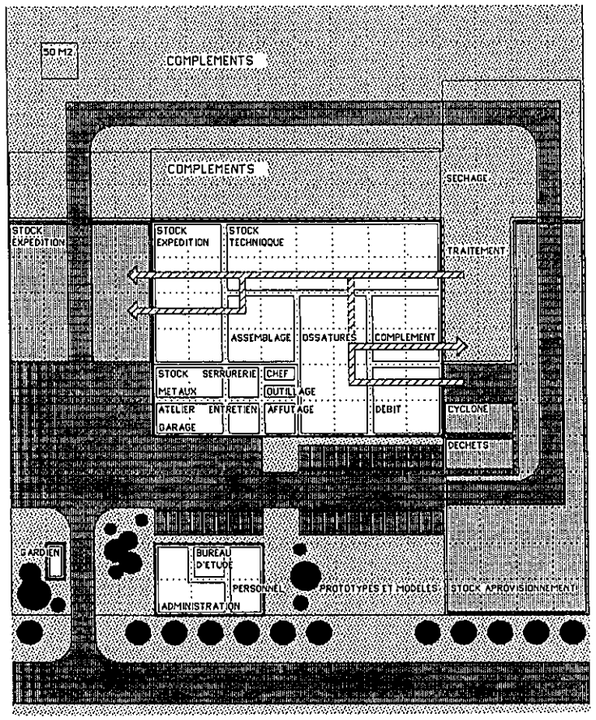
RETOMBEES SUR L'ENVIRONNEMENT
Même dans le cas de finitions modestes l'aspect des maisons et équipements donnera toujours une impression d'ordre et de solidité. Pour les lotissements l'unité d'aspect sera prépondérante.

ECONOMIES D'ENERGIE ET DE DEVISES
L'utilisation du bois et des ressources locales permet d'importantes économies d'énergies et de devises.

ADAPTATION AU CLIMAT
Le procédé à été conçu dans et pour des climats tropicaux, les bâtiments réalisés bénéficient efficacement de la ventilation naturelle, de la protection solaire et d'une faible inertie thermique.

FIABILITE DES CONSTRUCTIONS
Quel que soit le niveau de prestation, les bâtiments offrent une garantie de sécurité et de salubrité remarquable.
Ils sont de plus anti-sismiques et anti-cycloniques.

USINE TYPE



GREEN RESIDENTIAL HILLS FOR STATIONARY AND MOBIL LIVING

REF. SECTION

THIS STUDY INCLUDES PARTS OF THE SECTIONS I, II, III AND IV WITH A MAIN EMPHASIS OF DETAILS ON SECTION III.

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1. TASK

SOLVING THE WORLD-WIDE PROBLEMS OF THE HOMELESS

2. PROBLEM DIAGNOSIS

HOMELESS PERSONS, OFTEN FROM THE LOWEST SOCIAL STRATA SUCH AS COLOUREDS, FOREIGN WORKERS, RECENT IMMIGRANTS, POOR AND SOCIALLY DISADVANTAGED PERSONS.
HOMELESS PERSONS LIVING IN SLUMS ON THE EDGES OF LARGE CITIES AND ON MANY PSEUDO CAMPS IN MAKESHIFT SHELTERS, RIPE FOR DEMOLITION, WITH INADEQUATE SANITARY INSTALLATIONS AND IN HYGENIC CONDITIONS HAZARDOUS TO ONE'S HEALTH.
THE LIFE OF THE HOMELESS ON THE EDGE OF THE CULTURAL AND PHYSICAL SUBSISTENCE LEVEL WITH AN INSUFFICIENT EDUCATIONAL STANDARD AND RESTRICTED EDUCATIONAL POSSIBILITIES.
HOMELESS PERSONS WITHOUT WORK OR WITH SOCIALLY DISREPUTED JOBS, INDIFFERENCE TOWARD THE CURRENT MORAL CAUSED BY THE SOCIAL ENVIRONMENT.
HOMELESS PERSONS WITH AN ATTITUDE OF PASSIVE RESIGNATION TOWARD THE POSSIBILITIES OF CHANGING THEIR LIVING CONDITIONS IN COMBINATIONS WITH SOCIAL DISCRIMINATION AND THE LACK OF POSSIBILITIES AS WELL AS AN ABOVE-AVERAGE HIGH CRIME-RATE AND DRUG-ADDICTION RESULTING FROM THESE CONDITIONS.

3. THERAPY METHOD

SLUMS AND HOMELESS PERSONS ARE THE VISIBLE MANIFESTATION OF THE INTELLECTUAL AND MORAL CONDITION OF A SUFFERING SOCIAL STRATUM. THEREFORE A DRASTIC THERAPY TOWARD THE SOLUTION OF THE PROBLEM CANNOT CONSIST ONLY IN SIMPLY CHANGING THE OUTWARD PICTURE, I. E. IN MERELY REMOVING THE SYMPTOMS.
A PERMANENT SOLUTION MUST PUT AN END TO THE CAUSES OF THE SYMPTOMS. IT THEREFORE LIES ONLY IN THE CHANGING OF THE INTELLECTUAL AND SOCIAL CIRCUMSTANCES OF THESE UNDERPRIVILEGED SOCIAL GROUPS AND OF THOSE OTHER PRIVILEGED SOCIAL STRATA, WHICH MUST BE CONVINCED OF THE NEED TO HELP.
AN EFFECTIVE THERAPY, WHICH LEADS TO THE PROBLEM'S SOLUTION, IS THEREFORE POSSIBLE NOT THROUGH ONE UNIQUE RELIEF ACTION, SUCH AS THE MERE PROCUREMENT OF ADDITIONAL HOUSING SPACE, BUT ONLY ON A MEDIUM-TERM BASIS THROUGH A PLANNED PROCESS OF DEVELOPMENT.
STEP-BY-STEP AND CONTROLLED, THIS PROCESS MUST INCLUDE THE NECESSARY SOCIAL CHANGES IN A FLEXIBLE WAY. MOREOVER THE ENGAGEMENT OF THE GROUPS CONCERNED MUST BE ACTIVATED IN SUCH A WAY THAT THEY THEMSELVES DIRECT THE PROCESS TO AN INCREASING DEGREE DURING ITS COURSE OF DEVELOPMENT.

4. THERAPY PROGRAM

THE CHARACTERISTIC DETAILS OF THE PROBLEM DIAGNOSIS AND THE INVESTIGATION OF THE THERAPY METHOD EXPLAIN AND DETERMINE THE SPECIFICALLY NOVEL PROGRAM FOR THE SOLUTION OF THE PROBLEM - ESPECIALLY THE NATURE AND THE CONSTRUCTION METHOD OF ACCOMMODATIONS FOR THE HOMELESS:

A) DURABLE, SUBSTANCE-PRESERVING USE-VARIABILITY OF AN URBAN SYSTEM, WHICH IN A SIMPLE WAY SECURES THE POSSIBILITY OF PERMANENT, TO-BE-AUTO-CONSTRUCTED ADAPTATION TO THE OCCUPANTS' WHISHES, WHICH ARE FAST-CHANGING DURING THIS PROCESS;

B) EARLY AND LONG-TERM ACCOMPANYING PROFESSIONAL ADVERTISING TO DEVELOP IN THE PERSONS CONCERNED THE MOTIVATION TO ATTAIN SOCIAL ASSIMILATION AND OCCUPATIONAL TRAINING,

IN DETAIL:

4.1 CONSTRUCTION OF A TECHNICALLY SIMPLE, COST-EFFICIENT, HIGH-DENSITY URBAN STRUCTURAL SYSTEM FOR LIVING SPACE (FOR EXAMPLE 3- TO 4-STOREYED), USEVARIABLE WITH ALL THE NECESSARY INSTALLATION FITTINGS;
LIVING SPACE, WHICH CAN BE COMPLETED AS ACCOMODATIONS WITH QUALITATIVELY DIFFERING MEANS OF CONSTRUCTION, ALSO BY WAY OF AUTO-CONSTRUCTION, AND ADAPTED TO THE DIFFERENT ABILITIES AND WISHES OF THE USERS.

4.2 EARLY AND ACCOMPANYING EXTENSIVE ADVERTISING FOR A SWEEPING DEVELOPMENT OF MOTIVATION TO REACH THE PLANNED SOCIAL PROGRESS OF THE UNDERPRIVILEGED PARTS OF THE POPULATION TO BE ASSIMILATED.

4.3 ADVERTISING FOR VOCATIONAL TRAINING AND OFFERS OF VOCATIONAL TRAINING, BEGINNING WITH TRAINING OFFERS WITHIN THE FIELD OF THE HERE NECESSARY BUILDING CONSTRUCTION, - IN MORE THAN 20 DIFFERENT KINDS OF HANDICRAFTS.

4.4 TRAINING AND JOB OFFERS DURING THE CONSTRUCTION OF THE URBAN STRUCTURAL SYSTEM AND THE ACCOMODATIONS' PARTS.

4.5 ACCOMPANYING FINANCIAL AID DURING THE CONSTRUCTION OF THE NEW LIVING ACCOMMODATIONS, PREPARATION OF A PROMOTION PROGRAM FOR POOR FAMILIES WILLING TO RECEIVE TRAINING, WITH THE AIM OF FOUNDING SMALL ENTERPRISES IN THE SERVICE-, TRADE-, AND BUSINESS-SECTOR WITHIN THIS NEW URBAN STRUCTURE.

5. RECOMMENDATION OFFER IN THE CONSTRUCTION FIELD

GREEN RESIDENTIAL HILLS

REALIZATION OF ORDERLY AND EASILY SURVEYABLE GREEN HIGH-DENSITY NEIGHBOURHOOD AREAS, ECONOMIC AS FOR INFRASTRUCTURE,
ADJUSTED TO THE FAST-CHANGING NEEDS OF THIS SOCIAL STRATUM, THEREFORE HIGHLY USEVARIABLE FOR CONTINUOUSLY CHANGEABLE STATIONARY AND MOBIL RESIDENCE AND WORK, FOR RELAXATION AND TRAFFIC,
INCLUDING REGENERATIVE BUILDING TRAFFIC AS WELL ADMITTING LATER CONSTRUCTION AND USE CHANGES OF THE INTERIOR SECTOR.

EXPLANATION:

5.1 AUTO-CONSTRUCTION THROUGH SYSTEM-IMMANENT, CONSTRUCTIVE SEPARATION

A) SUPPORTING FRAMEWORK WITH PLATFORMS AND STAIRCASES OF PRECAST ASSEMBLY UNITS MADE OF REINFORCED CONCRETE, APPROX. 40 % COST SHARE,
WITH EMPLOYMENT OF THE FUTURE RESIDENTS PROPORTIONAL TO PERFORMANCE AND FOR THEIR MANUAL TRAINING,

B) INSTALLATION CONDUITS AND SANITARY SPATIAL ELEMENTS, READY FOR CONNECTION, AS FIXED POINTS OF THE LIVING SPACE, APPROX. 15 % COST SHARE,
IF POSSIBLE WITH EMPLOYMENT OF THE FUTURE RESIDENTS PROPORTIONAL TO PERFORMANCE AND FOR THEIR MANUAL TRAINING,

C) COMPLETION OF THE LIVING SPACES IN AUTO-CONSTRUCTION OR IN THE LOCALLY CUSTOMARY, CONVENTIONAL WAY OF CONSTRUCTION, BUT ALSO THROUGH SYSTEM-BUILDING WITH PLANE OR SPATIAL ELEMENTS DEPENDING ON THE LOCAL FACILITIES
INTO FINISHED ACCOMMODATIONS CORRESPONDING TO THE WISHES OF THE RESIDENTS AND IN ACCORDANCE WITH GIVEN PLANNING ALTERNATIVES OR WITH SIMILAR IDEAS OF THE RESIDENTS, APPROX. 45 % COST SHARE.

5.2 HIGH ECONOMY AND LONG-TERM PRESERVATION OF SUBSTANCE THROUGH PLANNED CONSTRUCTIVE SEPARATION

OF THE LONG-LIVED, MULTIFUNCTIONAL SUPPORTING FRAMEWORK AND THE SHORT-LIVED, NON-SUPPORTING INTERIOR WORKS, WHICH ARE DEPENDENT ON REQUIREMENT CHANGES.

A) LONG-LIVED SUPPORTING PRIMARY STRUCTURE

FIREPROOF SUPPORTING FRAMEWORK FOR VARIABLE USE WITH PLATFORMS AND STAIR-CASES MADE OF SIMPLE PRECAST ASSEMBLY UNITS OF REINFORCED CONCRETE, DURABLE BEYOND SEVERAL GENERATIONS AND MODERN IN ITS USE TO THE MATERIAL AND POLYFUNCTIONALITY, CONSEQUENCE: HIGH ECONOMY OVER A LONG PERIOD.

B) NON-SUPPORTING STRUCTURE, SHORT-LIVED DUE TO FAST-CHANGING NEEDS

IN CASE OF ACCOMMODATION ALTERATIONS DUE TO SHORT-TERM CHANGES IN THE NEEDS OF THE OCCUPANTS, LAYOUT ALTERATIONS ARE EASILY POSSIBLE AND COMPLETELY PRESERVE THE PRIMARY STRUCTURE, EVEN GIVEN AUTO-CONSTRUCTION. FOR EXAMPLE THROUGH RECONSTRUCTION, MODERNIZATION, STRIPPING-DOWN AND RENEWAL OF THE BUILDING'S NON-SUPPORTING STRUCTURE.

5.3 PUBLIC-UTILITY AND WASTE-DISPOSAL CONDUITS AS TERTIARY STRUCTURE

INSTALLATION CONDUIT-TRAINS IN THE SUPPORTING STRUCTURE SUPPLY ALL CONNECTIONS FOR WATER, SEWAGE, GAS, CURRENT, TELEPHONE, PERHAPS WARM-WATER, AND IN THE STAIR-CASE AREA FOR THE REFUSE REMOVAL.

5.4 PERMANENT RENEWABILITY

A TRANSPORT AND LIFT SYSTEM, WHICH IS CONSTANTLY AVAILABLE FOR MOVABLE AND STATIONARY SPATIAL ELEMENTS, PLANE ELEMENTS, AND OTHER ASSEMBLY PARTS, SUPPORTS THE CONTINUAL STRUCTURAL ADAPTATION TO THE CONSTANTLY CHANGING NEEDS AND SITUATIONS OF THE OCCUPANTS BEYOND GENERATIONS TO COME.

5.5 SANITARY CELL AS POINT OF CONNECTION AND FIXED POINT FOR THE ACCOMMODATIONS FOR 1-STOREY AS WELL AS MULTISTOREY BUILT-UP AREAS

BECAUSE OF ITS INSTALLATION INTENSITY AND THE TECHNICALLY COMPLICATED EQUIPMENT, THE SANITARY AREA SHOULD NOT BE PRODUCED IN AUTO-CONSTRUCTION. THIS AREA IS CONCENTRATED AS THE SANITARY AND ENERGY CENTRE UPON A SPATIAL ELEMENT IN SUCH A WAY THAT - WITH THE SAME MEASUREMENTS (2.5 M / 1.8 M / 2.7 M) - IT FITS ALL ACCOMMODATIONS AND CAN BE PRODUCED VERY ECONOMICALLY IN A MANUFACTURING PLANT IN THE FORM OF A SPATIAL CELL IN ASSEMBLY-LINE PRODUCTION. SUCH INSTALLATION-UNITS, WHOSE FLOOR-SPACE IS SMALLER THAN THAT OF A PASSENGER CAR, CAN STILL BE EMPLOYED VERY ECONOMICALLY EVEN IF TRANSPORTED OVER LONG DISTANCES. IN CASE OF A LACK OF INFRASTRUCTURE, THEY NEED NOT BE MANUFACTURED LOCALLY.
THE PLANNED SPATIAL ELEMENTS FOR SANITARY AND ENERGY PURPOSES CONTAIN: SHOWER, W.C., WASH-BASIN, WASHING-MACHINE, SMALL CABINET, CONNECTION FOR WATER AND SEWAGE FOR THE KITCHEN, - IF NECESSARY - WATER HEATING INCLUDING THE CONNECTIONS FOR HEATING PURPOSES OF A STOREY HEATING-SYSTEM TO BE CONNECTED - PROVIDED THAT NO CENTRAL HEATING FOR THE COMPLETE CONSTRUCTION IS DESIRED, THE GENERATION OF WARM INDUSTRIAL WATER FOR WASHING AND SHOWERING PURPOSES.

5.6 APPLICATION PURPOSES

HIGH-DENSITY, USE-VARIABLE, STATIONARY AND MOBIL LIVING WITH STOREY-GARDENS, MULTISTOREY CAR PARK FOR CARAVANS AND PASSENGER CARS, HOTELS, HOMES AND HOSTELS, SCHOOLS, OFFICE- AND ADMINISTRATIVE-, SMALL-INDUSTRY- AND BUSINESS-ACCOMMODATIONS, AND MANY OTHER THINGS.

GREEN RESIDENTIAL HILLS FOR STATIONARY AND MOBIL LIVING

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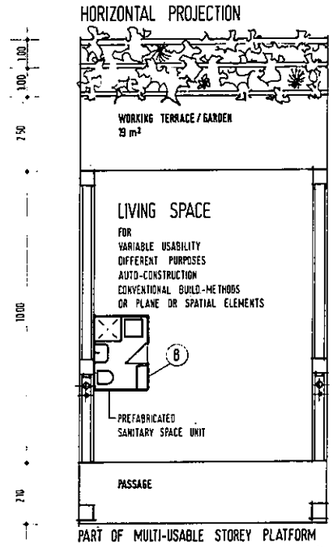
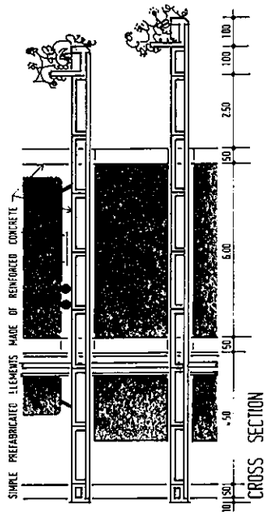
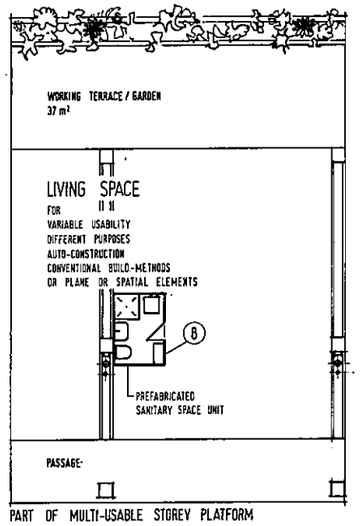
HORIZONTAL PROJECTION



PART OF MULTI-USABLE STOREY PLATFORM



HORIZONTAL PROJECTION



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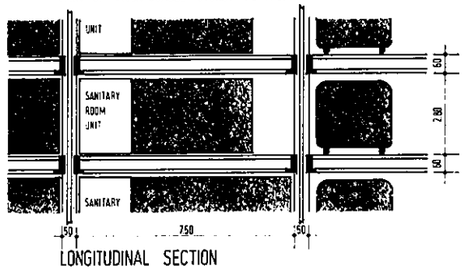
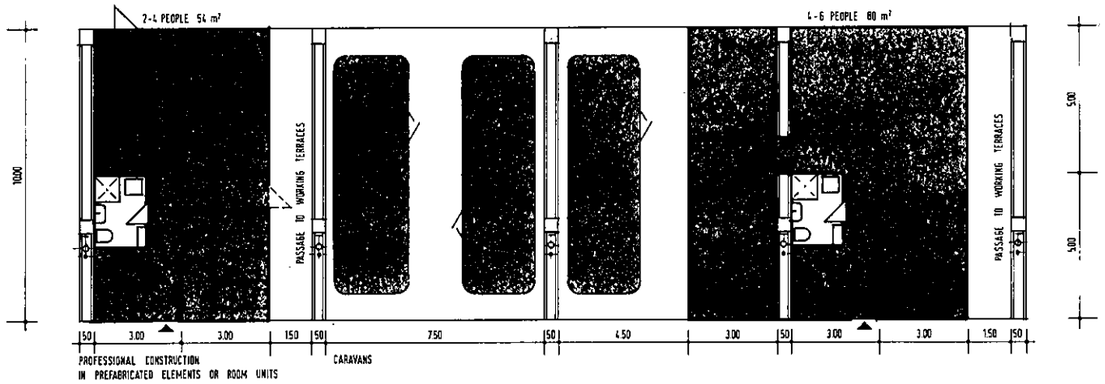


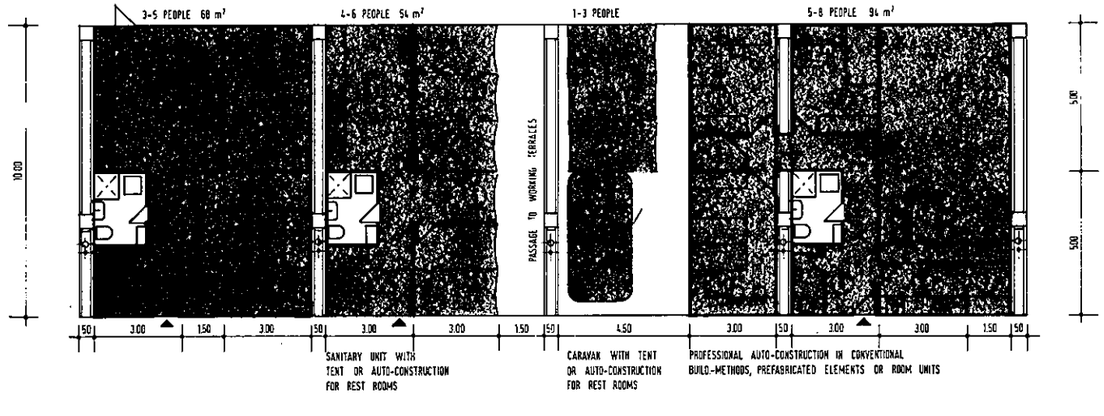
LONGITUDINAL SECTION

LEGEND

1 KITCHEN-CUM-LIVING-ROOM
2 KITCHEN
3 BED-SITTING-ROOM
4 BEDROOM
5 STORE-ROOM
6 WC
7 PANTRY
8 SANITARY ROOM UNIT (WC, WASH-BASIN, WASHING MACHINE, SHOWER CUBICLE, SHELVES, INCL. INSTALLATION FOR CENTRAL HEATING AND POSSIBLE AIR-CONDITION FACILITIES)

GROUND PLANS, EXAMPLES FOR VARIABLE USABILITY





GREEN RESIDENTIAL HILLS FOR STATIONARY AND MOBIL LIVING

34391208

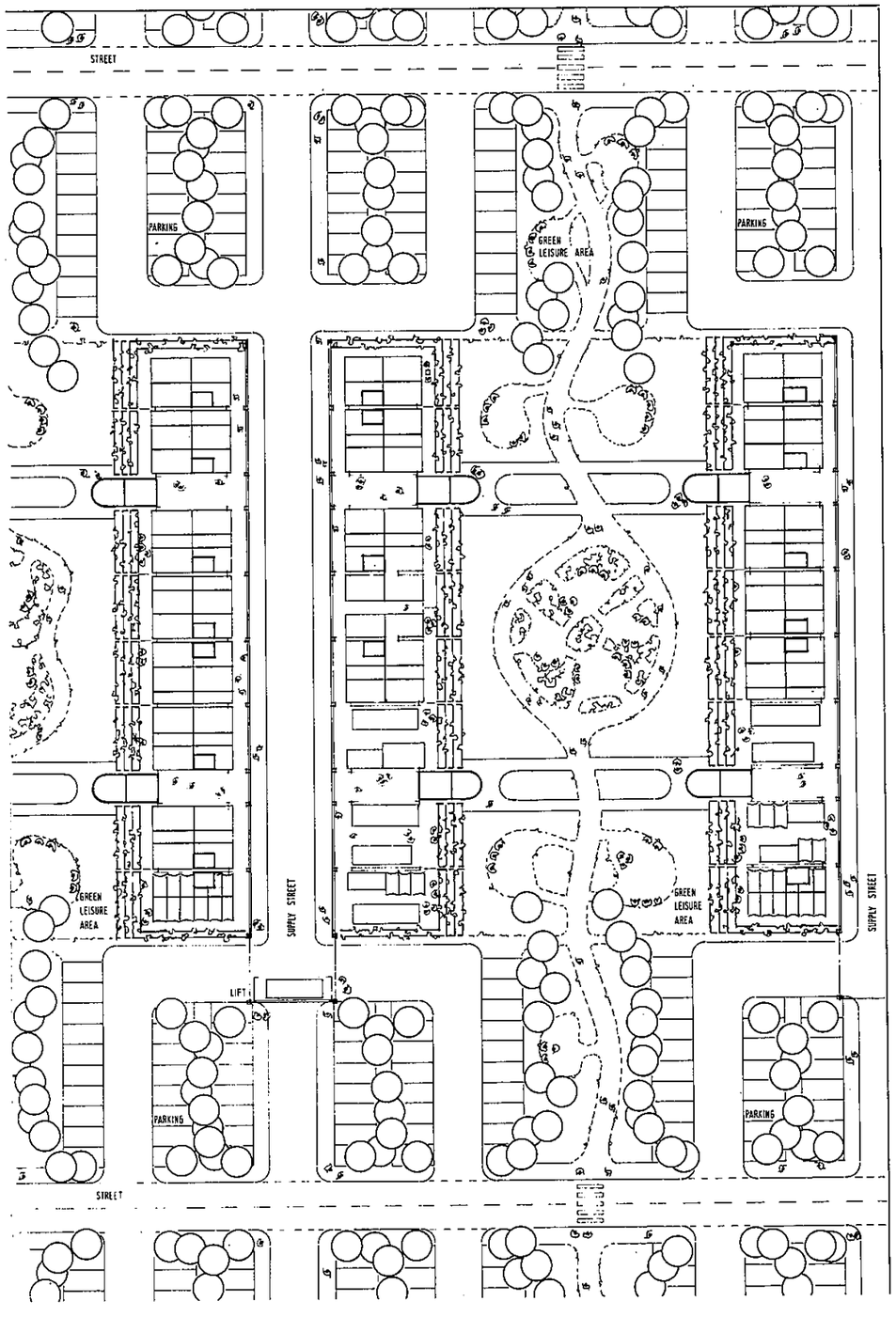
CROSS SECTION
PLATFORMS FOR CHANGING RESIDENTIAL PURPOSES

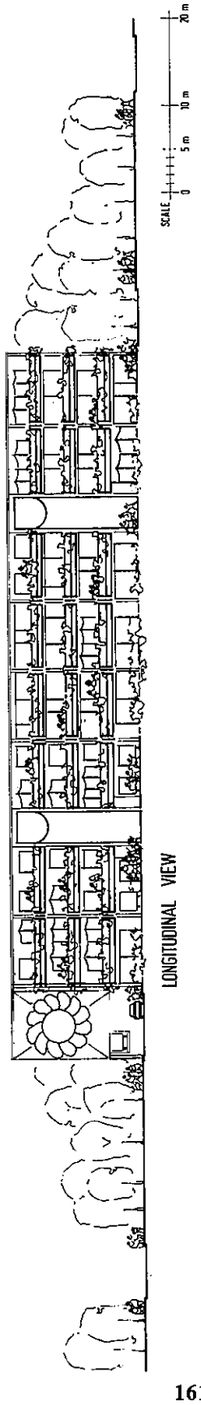
SIDE VIEW

SUPPLY STREET

GROUND FLOOR
SMALL WORKSHOPS AND BUSINESSES
KINDERGARTEN, COMMUNICATION / SPORTS ROOMS AND LIVING SPACES
OTHER FLOORS:
DIFFERENT LIVING SPACES

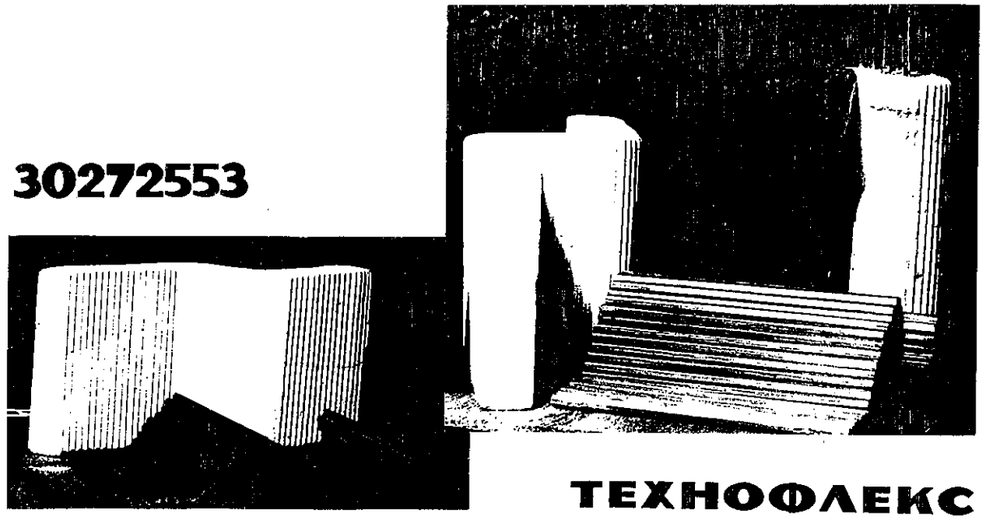
TOP VIEW



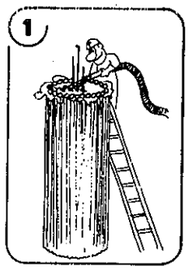


LONGITUDINAL VIEW

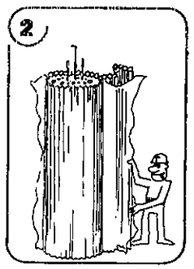
TECHNOFLEX



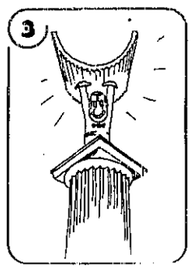
ТЕХНОФЛЕКС



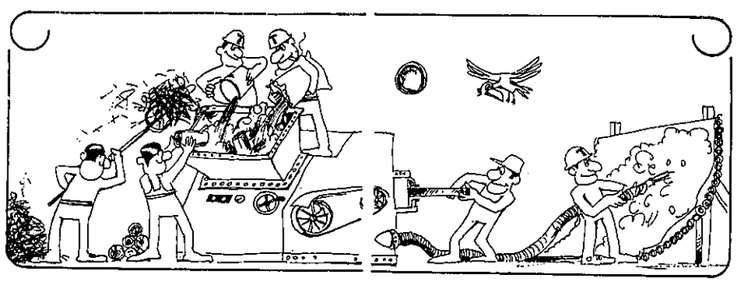
1 - CASTING THE CONCRETE



2 - DETACHING THE FORMWORK AND PLASTIC SEPARATOR



3 - THE FINAL PRODUCT HAS AN ELEGANT LINEAR RELIEF



FIBRE REINFORCED COMPOSITES MAY BE PRODUCED USING A VARIETY OF LOCALLY AVAILABLE RAW MATERIALS

DEPENDING ON THE COMPOSITION AND MIXING TECHNOLOGY THE END PRODUCT CAN BE EITHER A SPRAYING/CASTING MIXTURE, OR A PREFAB PANEL OR BOARD

TECHNOFLEX - A FLEXIBLE APPROACH TO HOUSING CONSTRUCTION

(SECTION III)

Building has always been related to something rigid, flexibility has never sounded in place when speaking about construction. Now that the lack of decent dwelling has become a problem for a significant part of mankind, innovative thinking can do a lot to improve the situation.

This project is dedicated to the collective efforts of builders around the world to provide shelter for the homeless. We think we can present some ideas that could help those "homeless": not all of them, of course, but those who most desperately need shelter. The project is aimed at specific geografic regions, mainly remote areas with poorly developed infrastructure and communicaitons, with unfavourable climatic conditions. Unfortunately, these regions are often economically backward, too. That is why many developing countries face severe housing problems.

THE NATURE OF THE PROBLEMS

It is commonly known that a solution for speedy construction of vast numbers of houses would require a highly industrialised construction, implementing modern building principles and labour-saving technology. However, this technology is not present just in the countries and regions that most need it; the powerful equipment simply cannot appear at the would-be sites, where no roads and bridges exist. Hence, to overcome the existing problems, one has to apply the following principles:

- maximum prefabrication in highly-developed regions, the prefab product being designed for easy transportation and erection.

- minimum use of heavy equipment and qualified labour, relying mainly on small light-weight machines and tools and on local labour force (the "DO-IT-YOURSELF" principle)

- maximum use of locally available building materials and raw materials for new building products, applying advanced "hi-tech" materials only in the cases of complete prefabrication (DIY-kit form).

- implementation of new methods in accordance with existing traditions, energy requirements, national habits and laws.

WHY FLEXIBILITY ?

Rigid structures can never be efficiently transported over a long distance, neither could they be erected promptly without the use of heavy equipment. The authors of this project have applied a new approach that renders some creative ideas concerning not only the building structures, but also the technology used, the equipment and the whole concept of habitation. The proposed flexible structures and flexible technologies have caused an interesting feedback from the field of new materials where innovation can very well fit into the flexibility approach.

TECHNOLOGY

Dozens of todays technological methods of building are based on one of the most common contemporary building materials - concrete. Naturally, concrete is as rigid as could be, but looked from a different angle it is flexibility itself: prior to hardening it can take any shape (or form) you can imagine - you only have to provide the FORMWORK. Why look this splendid flexibility in such a stiff technological drawback - the formwork? Can't we make it flexible? This is how TECHNOFLEX was born - the flex-ible tech-nology of producing concrete structures by means of a new type of formwork - flexible. The idea is very simple: just make a carpet of stiff(!) rods or tubes, connected by flexible (!) strings through perpendicular holes in the rods. You can roll it and carry it easily anywhere. It can easily take any shape: just fix it to a rigid(!) template - a simple bare beam for a flat shape or a complex curved pattern cutout in plywood or sheet metal. An added polythene sheet takes the same shape, making the form waterproof and allowing easy separation. NEXT TIME YOU CAN USE THE SAME PIECE OF FORMWORK FOR A TOTALLY DIFFERENT SHAPE, MANY TIMES OVER. In a more sophisticated version, which was experimented by the authors the rods have an octangular cross-section and the holes for the steel cords widen towards their openings. This one becomes rigid(!) and preserves its shape even without supporting templates: just by straining the strings with simple excentric lockers. When the tension is released, the whole piece is FLEXIBLE again. Illustrated you can see numerous applications of this technology. (Attention: PATENT pending!)

Another example of flexibility are the FOLDING-FRAME prefabricated houses, self-explanatory from illustrations. This folding flexibility not only saves a lot of space dramatically reducing transport costs; it also allows for the DO-IT-YOURSELF erection on site, without cranes or heavy equipment, just with a lever system or blockwork polyspast. ENERGY-EFFICIENCY is self-inviting when you see those houses' triangular silouettes. And the often criticised "unused" spaces at the angles(corners) are suitable for the specialised equipment and heat-storage devices.

MATERIALS

New construction technology can benefit a lot from recent developments in materials sciences. Only in the last few years the heavy steel reinforcement of concrete could be replaced by the light and flexible(!)fibres like the popular among hi-tech builders CEM-FIL(TM) glass fibre. But man has used FIBROCOMPOSITES a long time back in history: he has reinforced mud structures and bricks with straw and various plant fibres. These composites have unique properties: they can withstand much greater loads than their unreinforced counterparts, being remarkably light at the same time and allowing for the application of various technological mehtods. One of these methods is the recently developed SPRAY-TECHNIQUE, where fibre-reinforced concrete is not cast, but sprayed onto the formwork by specialised equipment. IDEAL FOR THE TECHNOFLEX! And who says that the raw materials should necessarily be hi-tech? Different

local materials may be applied, especially where extreme strengths are not needed: wood-wool, coccoanut and sisal fibres, straw and any vegetable fibres. All these have been tested by construction scientists in many countries and the results are encouraging.

A NEW HABITATION CONCEPT

And last, but not least, why not be more flexible in our way of thinking? For centuries on end mankind is struggling to dig out rocks from the earth, pile them up to the sky, fix them rigidly(!) and try to live there exposed to winds, heat, rain or snow. Why not dig in? You won't have to erect walls, save huge amounts of building materials and preserve valuable landscapes; and think of the energy saving with practically no losses to the atmosphere! This is a BACK-TO-THE-CAVERNS appeal, but not to those caverns where man started in pre-historic times; to the modern hi-tech caves examples of which are already seen in some Scandinavian countries, and the economical and ecological efficiency of which is one of our great hopes for the future... But this is the theme of another project and another Competition.

Thank You for paying attention to our ideas!

The Authors

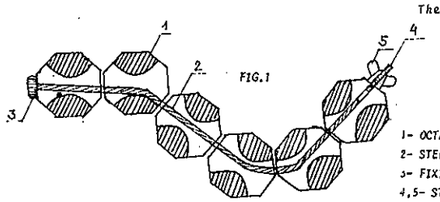
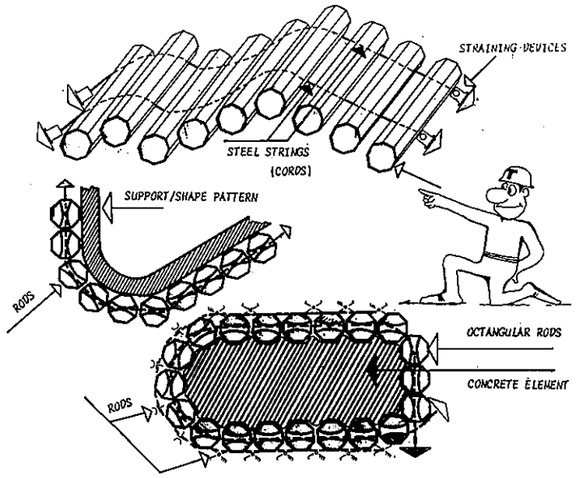


FIG.1

1- OCTANGULAR RODS
2- STEEL STRINGS
3- FIXING ONE END OF THE STRING
4,5- STRAINIG DEVICE AT THE FREE END



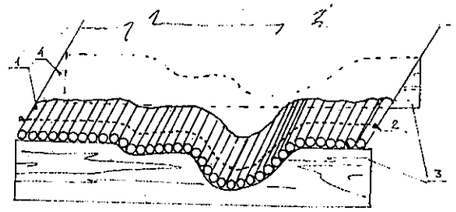
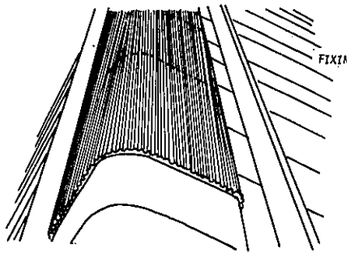
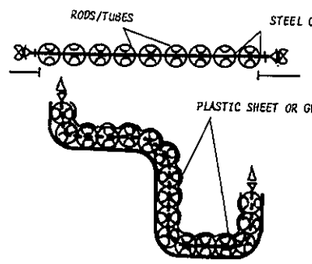


FIG.2

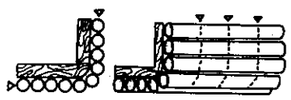
1- RODS
2- STRINGS
3- SHAPE PATTERN CUT OUT OF WOODEN BOARD OR METAL SHEET
4- PLASTIC FILM FOR EASY SEPARATION



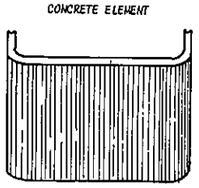


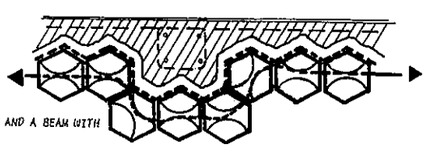
LAYER OF SPRAYED CONCRETE

FLEXIBLE FORMWORK PRINCIPLE



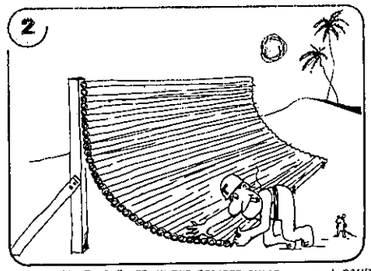
CONCRETE ELEMENT



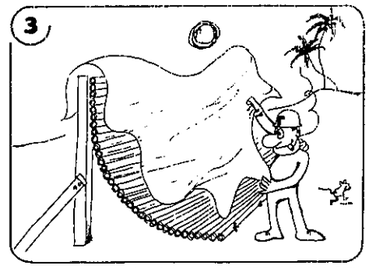


TECHNOFLEX MAKES IT POSSIBLE TO FORM A SLAB AND A BEAM WITH THE SAME PIECE OF FORMWORK

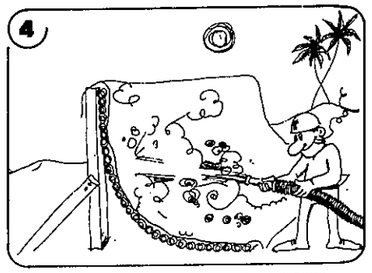
1- THE FLEXIBLE FORWORK CAN BE FOLDED LIKE A CARPET



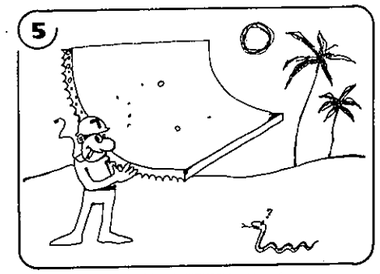
2- ON-SITE IT IS FIXED IN THE DESIRED SHAPE



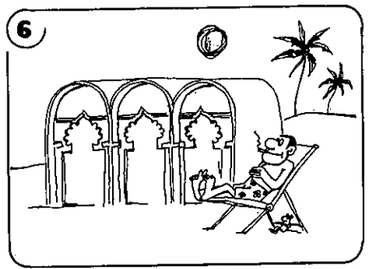
3- A POLYTHENE SHEET IS APPLIED TO AVOID STICKING OF CEMENT TO THE FORM



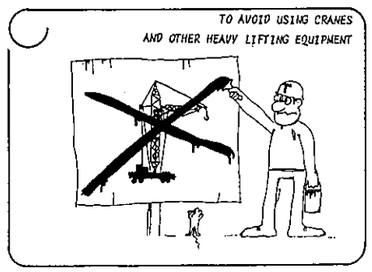
4- PRE-MIXED FIBRE REINFORCED CONCRETE IS SPRAYED

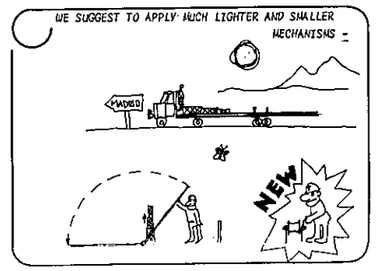


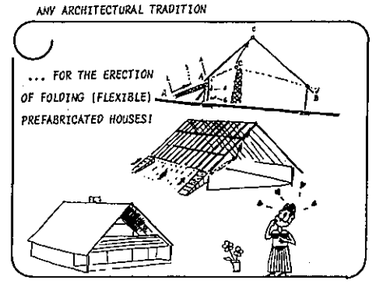
5- EASY TO OBTAIN THIN LIGHTWEIGHT SHELLS



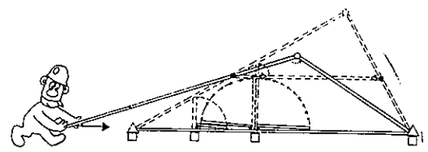
6- ...WITH AN UNSURPASSED VARIETY OF SHAPES THAT EASILY SUIT ANY ARCHITECTURAL TRADITION



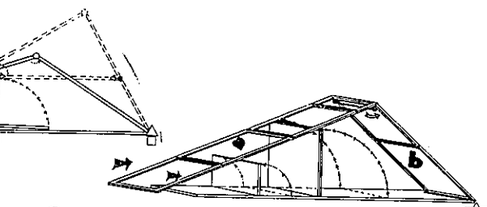


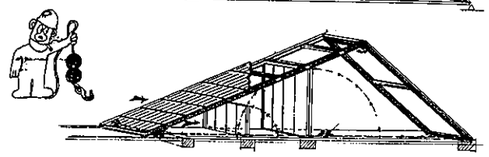


ENERGY-EFFICIENCY is self-inviting when you see those houses' triangular silouettes. And the often criticised "unused" spaces at the angles(corners) are suitable for the specialised equipment and heat-storage devices.

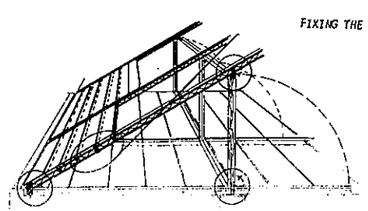


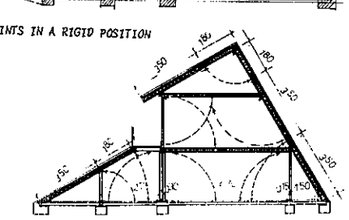
ERECTING THE FOLDED STRUCTURE

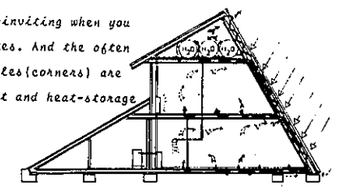


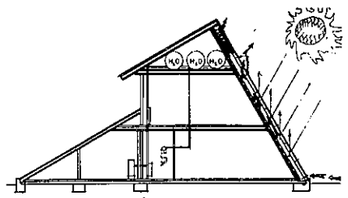


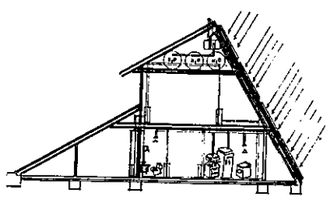
FIXING THE JOINTS IN A RIGID POSITION











INTERNATIONAL COMPETITION FOR SOLUTIONS ON NEW TECHNOLOGIES FOR SOCIAL HOUSING

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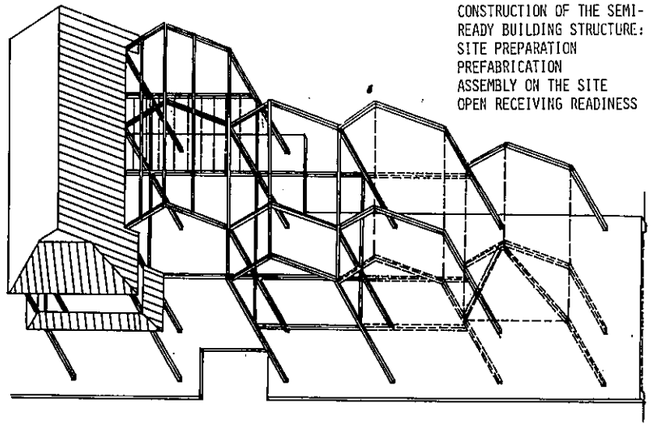
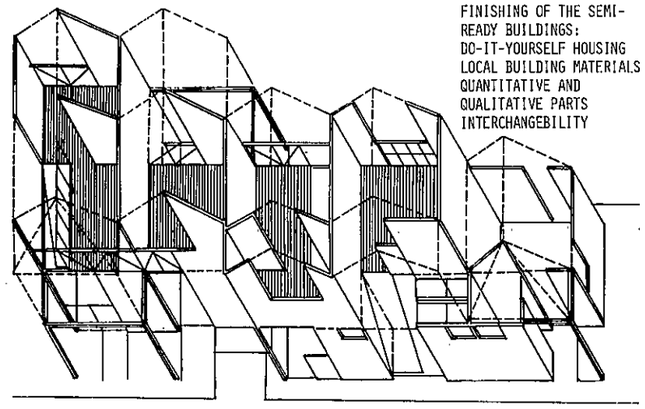
SECTION III

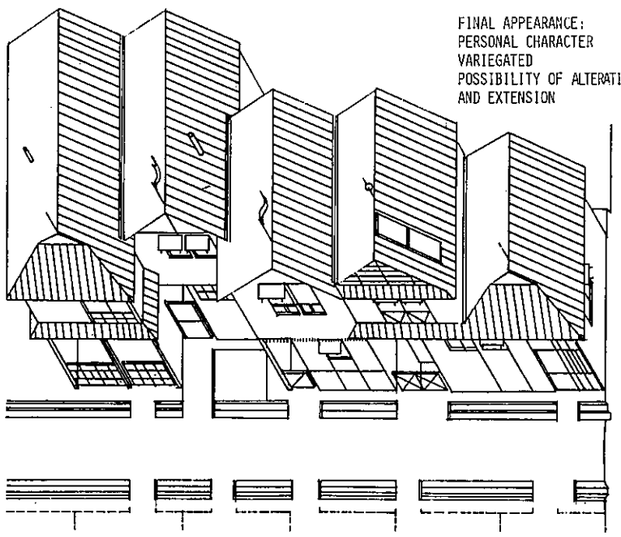
SEMI-READY LOW COST BUILDING METHOD FOR HOT AND HUMID TROPICAL CLIMATE



CONSTRUCTION OF THE SEMI-READY BUILDING STRUCTURE:
SITE PREPARATION
PREFABRICATION
ASSEMBLY ON THE SITE
OPEN RECEIVING READINESS



FINISHING OF THE SEMI-READY BUILDINGS:
DO-IT-YOURSELF HOUSING
LOCAL BUILDING MATERIALS
QUANTITATIVE AND
QUALITATIVE PARTS
INTERCHANGEBILITY



FINAL APPEARANCE:
PERSONAL CHARACTER
VARIEGATED
POSSIBILITY OF ALTERATION
AND EXTENSION

THE RESOURCES THAT CAN BE SPENT TO CONSTRUCTION OF SHELTERS IN DEVELOPING COUNTRIES - OUT OF THE GNPs - ARE FAR MORE LESS THAN THE NEED IN THIS RESPECT, THE MASS PRODUCTION OF SHELTERS CAN ONLY BE SATISFACTORY IF UNIFORM SOCIAL DISTRIBUTION IS APPLIED BECAUSE IN THE OTHER CASE THOSE WHO ARE EXCLUDED FROM THE SOCIAL SUPPORT SHOULD SOLVE THEIR OWN HOUSING PROBLEMS IN SPONTANEOUS WAY. THIS PROCESS LEADS TO ADDITIONAL ILLEGAL SETTLEMENTS THAT WILL CONSIDERABLY HINDER THE CHANCES OF ECONOMIC DEVELOPMENT BOTH OF THE INDIVIDUALS' AND OF THE NATIONAL ECONOMY, AS WELL /DUE TO THE INCREASED DENSITY OF POPULATION THE DANGERS AND SHORT-FALLS OF THE INFRASTRUCTURES WILL INCREASE, THE DECREASE OF THE SPECIFIC NUMBER OF WORK-PLACES AND THE LONGER DISTANCES FROM THE SETTLEMENTS, ETC./, THE DECREASE OF THE GNP PER CAPITA DUE TO THE POPULATION GROWTH WILL PREVENT THE RECONSTRUCTION OF THE UNECONOMICAL INFRASTRUCTURES OF THESE SLUMS.THIS PROBLEM CAN ONLY BE SOLVED BY NEW, PLANNED DEVELOPMENTS WHICH ARE PRIMARILY INTERRELATED WITH THE ESTABLISHMENT OF WORK OPPORTUNITIES.

THE LIMITED FUNDS AVAILABLE /AS OUTSIDE FACTORS/ SHOULD BE UTILIZED IN THE MOST EFFECTIVE WAY BY TAKEN INTO ACCOUNT THE COMMUNITY INTERESTS, THE INTEREST OF THE COMMUNITY SHOULD BE REALIZED IN THE FIRST PLACE THROUGH THE APPROPRIATENESS OF THE INFRASTRUCTURE /A POSSIBLE PLANNED GRADUAL DEVELOPMENT/, ON THE OTHER HAND ON THE QUALITY OF THE SHELTERS TAKEN AS NATIONAL WELTH /ECONOMICAL CONSTRUCTION, QUALITY,ETC./. THE FINANCING OF LARGE SCALE CONSTRUCTION OF SHELTERS FROM EXTERNAL SOURCES IS ONLY ECONOMICAL BY EXPENDITURE SAVING TECHNOLOGIES. A POSSIBLE FORM OF EXTERNAL INTERVENTION CAN BE THE ESTABLISHMENT OF A PREFABRICATING INDUSTRY WHICH ALSO CREATES WORK-OPPORTUNITIES /INCREASE IN PRODUCTIVITY,COST SAVING MASS PRODUCTION/ BOTH IN THE FIELDS OF PRODUCTION OF BUILDING MATERIALS AND OF PREFABRICATED ELEMENTS.

THE OWN EFFORTS OF THE PEOPLE IN NEED FOR SHELTER ARE THE INTERNAL SOURCES OF MASS PRODUCTION OF HOUSING. THE OWN EFFORT, BESIDE THE WORK EXECUTED CAN ENSURE SKILL DEVELOPMENT BY APPLYING CHEAP LOCAL BUILDING MATERIALS AND RELATED CONSTRUCTION TECHNOLOGIES. THIS KIND OF OWN EFFORTS, BECAUSE OF LACK OF SOPHISTICATED SKILLS ARE ONLY SUFFICIENT FOR CERTAIN CONSTRUCTION ACTIVITY, BECAUSE IT IS INSUFFICIENT FOR ECONOMICAL AND EFFECTIVE CONSTRUCTION ACTIVITY WHICH IS RELATED TO INCREASED VALUE AND QUALITY, OR IT WILL ONLY DELAY THE FINAL SOLUTION.

THE UTILIZATION OF THE EXTERNAL AND INTERNAL RESOURCES IN THE PROPER PLACES IS ENSURED BY THIS SEMI-READY BUILDING STRUCTURE AND THE RELATED CONSTRUCTION TECHNOLOGY. THIS METHOD MEANS THE DIVISION OF THE CONSTRUCTION PROCESS TO AN EFFECTIVE, INDUSTRIALIZED ONE AND BY THIS TO A BASIC STRUCTURE WHICH WILL ENSURE THE QUALITY AND THE LONGER LIFE-TIME AND TO THE OTHER ONE THAT CAN BE GRADUALLY REALIZED, THE FLEXIBLE ONE WHERE THE STRUCTURES AND THE FINISHING CAN BE DONE ACCORDING TO THE OWNER'S TASTE IN ANY TIME. THE EXTERNAL FUNDS AVAILABLE WILL MAKE ONLY POSSIBLE THE CONSTRUCTION OF A MINIMUM BASIC STRUCTURE WHICH CAN BE PREFABRICATED AND ASSEMBLED ON THE SITE AND BY THIS THE SITE ALLOCATION WILL BE GIVEN /ACCORDING TO THE FUTURE INFRASTRUCTURE REQUIREMENTS/ AND A GOOD QUALITY AND SAFE BUILDING WILL BE ENSURED WITH THE POSSIBILITY OF A FUTURE EXTENSION.

THE DEFINITION OF THE BASIC STRUCTURAL ELEMENTS CAN BE ESTABLISHED FROM THE ASSEMBLY HIERARCHY CHAIN MODEL /SEE:NEXT PAGE/ FOR THIS CONSTRUCTION METHOD OF FRAMED STRUCTURE TO BE BUILT IN HOT AND HUMID TROPICAL CLIMATE.
ACCORDING TO THE VIEW POINTS OF THIS INVESTIGATION THE BASIS OF THE STUCTURE OF THE SEMI-READY BUILDING ARE ① FOUNDATION, ② LOAD BEARING STRUCTURE /FRAME/, ③ ROOFING.THE FOUNDATION SHOULD BE SUITABLE FOR DIFFERENT UPPER STRUCTURES BY ITS FLEXIBLE RECEIVING CHARACTER /GRAF-MODEL OF JOINTS/.
THE FINISHING STRUCTURES CAN BE INCIDENTALS AND BUILT IN DIFFERENT TIMES. THEIR QUALITY AND DURABILITY MUST NOT BE OF THE BASIC STRUCTURES' BECAUSE THEY CAN BE RECONSTRUCTED SEVERAL TIMES, THEY CAN BE CHANGED WITHIN THE LIFE-TIME OF THE BASIC STRUCTURE.

THE FINISHING OF THE SEMI-READY BUILDING STRUCTURE IS INDIVIDUAL THEREFORE ITS APPEARANCE AS A DEVELOPMENT IS MANYFOLD AND CHANGING IN TIME LIKE THE NATURALLY GROWING CITIES. THIS SEMI-READY BUILDING STRUCTURE, BEYOND PROVIDING SHELTER, IS SUITABLE FOR CONSTRUCTING COMMUNAL BUILDINGS /SCHOOLS,COMMUNITY BUILDINGS, PUBLIC ADMINISTRATION BUILDINGS,DISPENSARIES,COMMERCIAL BUILDINGS/ ALSO BY USING LOCAL MANPOWER DURING THE CONSTRUCTION,BUT IN CASE OF BETTER EXTERNAL SPONSORES THESE BUILDINGS CAN BE FINISHED BY HIGHER QUALITY FINISHING STRUCTURES.

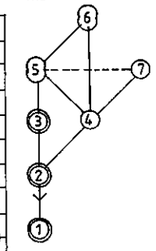
THE BASIC STRUCTURES OF THE SEMI-READY BUILDINGS AND THEIR PRODUCTION TECHNOLOGY, AS WELL AS, THEIR ADOPTATION TO THE SITE AND RELATED KNOW-HOWS CAN BE IMPORTED FROM OTHER COUNTRIES,THIS STRUCTURE AND THE KNOW-HOW IS SUITABLE TO ECONOMICAL IMPORTATION AND TO THE CONDITIONS OF THE TRADE AND TRANSPORT. THE REQUIRED PRODUCTION UNIT IS SIMILAR TO THE FACTORY MAKING LIGHT-WEIGHT SRTUCTURAL ELEMENTS.

DESIGN OUTCOMES DERIVED FROM SPECIFIC BUILDING CONSTRUCTIONS
USEFULNESS TYPICAL TO HOT AND HUMID TROPICAL CLIMATE:

PROTECTION AGAINST SOLAR HEAT	:	-SHADING,OVERSIZED CORNICES
PROTECTION AGAINST WARMING UP OF THE STRUCTURES	:	-CROSS VENTILLATION,PITCH ROOF
REDUCTION OF HEAT ACCUMULATION WITHIN THE STRUCTURES	:	-SMALL STRUCTURAL WEIGHT
NATURAL VENTILLATION OF THE BUILDING TO INCREASE COMFORT	:	-PERFORATED WALLS
RAINWATER DRAINING OF INTENSIVE RAINFALLS	:	-PITCHED ROOF DRAIN SYSTEM
PROTECTION AGAINST FLOOD AND SOIL EROSION	:	-MULTI STOREY BUILDING, ELEVATED GROUND FLOOR
GREAT DEPTH OF LOAD BEARING SOIL LEVEL	:	-DEEP FOUNDATION OR UNSENSITIVITY TO SEDIMENTATION
PROTECTION AGAINST WINDSTORMS IF ANY	:	-RIGIDITY,ANCHORING
PROTECTION AGAINST TERMITES	:	-TERMITE BLOCKING TERMITE PROOF
CORROSION ESPECIALLY AT SEE COASTS	:	-CORROSIONPROOF

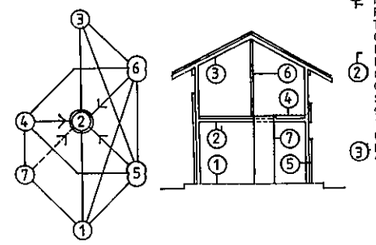
THE LISTED STRUCTURES OF FACADES AND ROOFS WITH SIGNIFICANT CHARACTERISTICS CAN ONLY BE CONSTRUCTED BY THE APPLICATION OF LOAD BEARING FRAMED STRUCTURES. ②

ASSEMBLY SEQUENCE OF THE STRUCTURE:



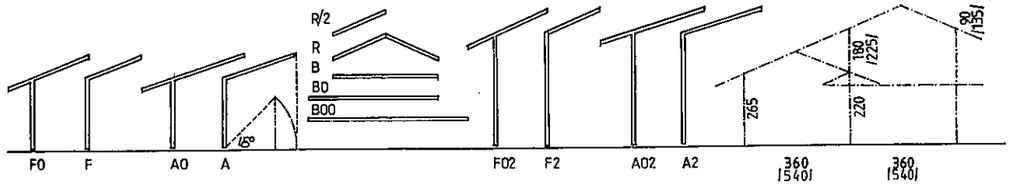
IN CASE OF FOUNDATION OF COMPACT,CLOSE-SET FRAMED STRUCTURE SLAB IS REQUIRED.

GRAF-MODELL OF STRUCTURAL JOINTS:

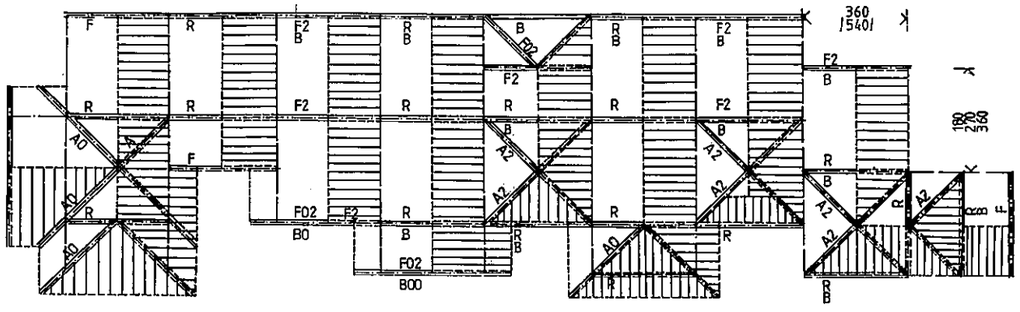


A COMPACT,CLOSE-SET FRAMED STRUCTURE IS REQUIRED TO THE FLEXIBLE ASSEMBLY OF DIFFERENT FITTING.

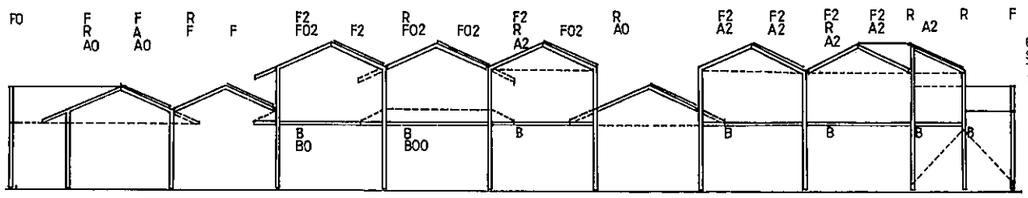
① SEMI-READY BUILDING STRUCTURE:
FOUNDATION: IN-SITU SLAB FOUNDATION MADE WITH TECHNOLOGY SIMILAR TO CONCRETE ROAD CONSTRUCTION.
② LOAD-BEARING STRUCTURE: LIGHT-WEIGHT COMPACT, CLOSE-SET, IN-SITU MADE OR PREFABRICATED FRAMED STRUCTURE ELEMENTS, QUICKLY ASSEMBLED IN-SITU, IF POSSIBLE BY APPLICATION OF LOCAL MANPOWER.
③ ROOF STRUCTURE: CORRUGATED SHEETS FIXED TO PURLINS.



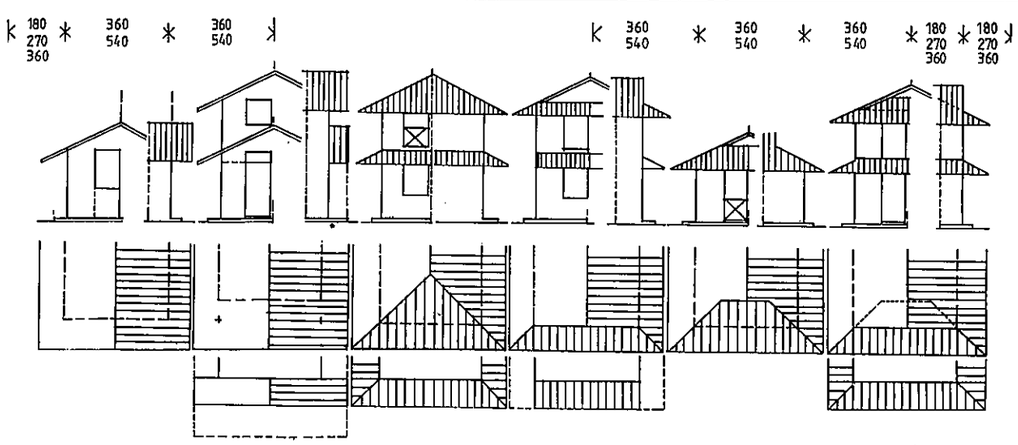
ELEMENTS SET AND GEOMETRY OF THE FRAMED STRUCTURE: THE MINIMUM FRAME DISTANCE AT RESIDENTAL HAUSING CONSTRUCTION: 3.60 M. BIGGER DISTANCE CAN BE APPLIED MAINLY AT COMMUNAL BUILDINGS. THE FRAMES IN CASE OF ROW-HAUSES ARE CONSISTING OF TWO COLUMN AND ROOF ELEMENTS AT EVERY SECOND MODULE AR AISLE WITH ROOF AND PERHAPS CEILING BEEMS BETWEEN THEM.



BUILDING THAT CAN BE CONSTRUCTED BY THE APPLICATION OF STRUCTURAL FRAME ELEMENTS, RESIDENTAL BILDING LAYOUT VARIATIONS AND THEIR INTERRELATED VARIANTS,EXAMPLES: THE ROOF COVERINGS FOR THE SAKE OF DEMONSTRATING THE SLOPES ARE SHOWN ONLY IN THE DIRECTIONS. THE DISTANCE BETWEEN THE FRAMES AS WELL AS THE MASTER BEAMS IS PENDING FROM THE STRUCTURES OF THE FLOOR AND FACADE THAT IS 180 AND 360 M.



EXAMPLES SHOWING CROSS-SECTION ARRANGEMENTS: THE FRAMES ARE STIFFENED IN TRANSVERSAL DIRECTION.



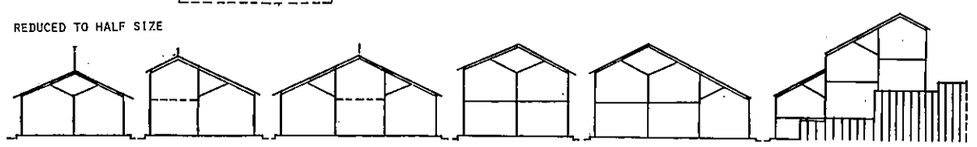
STYLES OF ROOFS: DIFFERENT ROOF SHAPES. GABLES,EAVES AND SHEDING CORNICES.

DETAILS OF GABLES AND SIDE VIEWS.

ROOF SHAPE DETAILS.

SHADING CORNICES.

REDUCED TO HALF SIZE



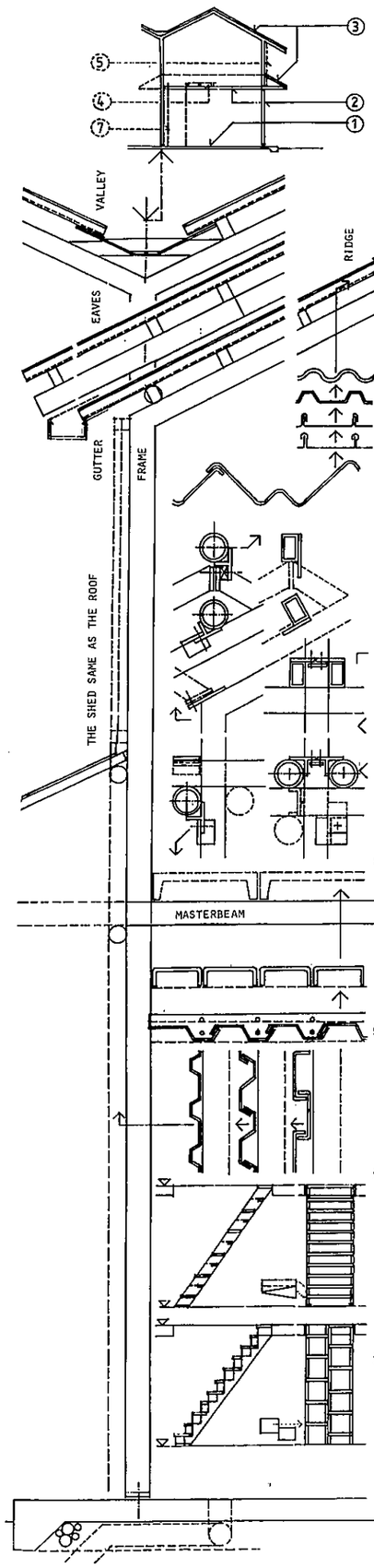
APPLICATION ON FRAMED ELEMENTS AT BIGGER, MAINLY AT COMMUNAL BUILDINGS.

ON PLAIN AND ON SLOPE.

IN-SITU PREFABRICATING OF SEMI-READY BUILDING STRUCTURE ELEMENTS:
TREMINATE-PROOF OR SEASONED TROPICAL TIMBER STRUCTURE WITH TRADITIONAL OR UP-TO-DATE BOLTED JOINTS.
THE ASSEMBLY OF THE BUILDINGS CAN BE EXECUTED BY LOCAL CONTRACTORS USING LOCAL MANPOWER.
EXTERNAL MANUFACTURE OF EXPORTED STRUCTURES: ONES WITH THE BEST PARAMETERS ARE MARKED WITH *

③ CONSTRUCTION OF LOCALLY MADE FINISHING STRUCTURES: THE LOCAL BUILDING MATERIALS CAN BE APPLIED BY USING TRADITIONAL OR SIMPLIFIED TECHNOLOGIES. THE INTERMEDIATE TECHNOLOGIES/I.E. CONCRETE REINFORCED WITH BAMBOO/, AS WELL AS THE SIDE PRODUCTS /I.E. CONCRETE REINFORCED WITH COCONUT FIBRE/ CAN BE APPLIED IN PRODUCTION LIGHT WEIGHT ELEMENTS.
THE ASSEMBLY TECHNOLOGY APPLIED IS SIMILAR TO THE SIMPLIFIED TRADITIONAL WORKS AND METHODS.

THE RECEPTIVITY OF THE SEMI-READY BUILDING IS OPEN TO FINISHING ELEMENTS DUE TO THE CLOSE SET FRAMED STRUCTURE.
THE JOINTS CAN BE MADE BY TRADITIONAL METHODS /I.E. SIZAL ROPE FIXING/, OR BY SOLTS AND COTTERS BETWEEN THE PLACED FRAME ELEMENTS UNDER THEM.
THE FIXINGS THAT CAN BE LODSENED WILL MAKE EASIER THE REPLACEMENT AND CHANGE OF FINISHING STRUCTURES IF NEED ARISES.



③ ROOFINGS:
DIFFERENT, IN THE FIRST PLACE THOSE LOCALLY AVAILABLE

ALUMINIUM*
ASBESTOS-CONCRETE
STEEL SHEETMETAL (GALVANIZED)
GLASS/SYNTHETIC MATERIAL / SIZAL FIBRE CONCRETE

CORRUGATED/ TRAPEZOIDAL*
FOLDED
MACHINE FOLDED
IN-SITU
PROFILE SHEETMETAL

② ALTERNATIVES OF FRAMED STRUCTURE JOINTS IN CASE OF DIFFERENT ROD ELEMENTS MADE OF GALVANIZED STEEL* OR ALUMINIUM.

RIDGE - ONLY AT STIFFENERS
MID-JOINTS/GUTTER-PURLIN JOINTS

FRAME-ROOF ELEMENT

FRAME COLUMN-MASTER BEAM

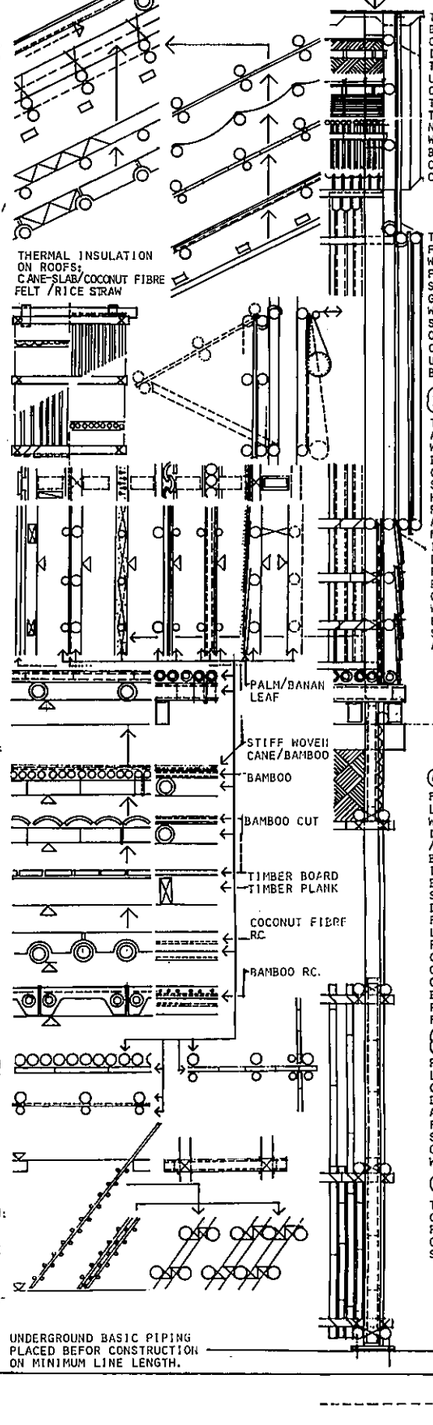
④ CONCRETE SLAB

THE POSSIBLE PREFABRICATION OF FLOOR STRUCTURES: STEEL/GLASS/SYNTHETIC FIBRE REINFORCED LIGHT-WEIGHT FLOOR ELEMENT SAME AS BEFORE BUT BUILT IN FORM-WORK AND ON-THE SITE CONCRETING.

⑤ THE POSSIBLE PREFABRICATION OF EXTERNAL FACADE WALL ELEMENTS: STEEL/GLASS/SYNTHETIC MATERIAL/SIZAL FIBRE REINFORCED ASBESTOS CONCRETE LIGHT WEIGHT SLABS IN HORIZONTAL OR VERTICAL ARRANGEMENT.

⑦ THE POSSIBLE PREFABRICATION OF STAIRCASE STRUCTURES: SUPPORTS MADE OF TIMBER OR METAL, SINGLE-FLIGHT STAIRS WITH HIGH INCLANATION THE SIMMETRIACAL OR OVERLAPPING STAIRS ARE MADE OF TIMBER.
AT COMMUNAL BUILDINGS THE STAIRCASES CAN BE MULTI-FLIGHT OR SINGLE-FLIGHT WITH TIMBER OR METAL SUPPORT WITH NORMAL SIZE STEPS.

② THE STRUCTURE OF FOUNDATION: CONCRETE SLAB MADE OF LOCALLY AVAILABLE COURSE OR GRINDED COURSE AGGREGATE BEDDING OR WITHOUT IT UNDER THE FRAME COLUMN WITH MINIMUM STEEL REINFORCEMENT, IN CASE OF POSSIBILITY OF STORMY WEATHER CONDITIONS WITH ENFORCED ANCHORING AND FINISHED FLOORING.
TERMITE INSULATING



THE ROOFING STRUCTURE CAN BE FITTED WITH INTERNAL COVER CARRYING THE THERMAL INSULATION WITH VENTILLATION. THE SUPPORTING FRAME UNDER THE COVER IS BAMBOO OR WOODEN LATH FIXED TO THE FRAME STRUCTURE. THE MATERIAL OF THE INTERNAL COVER: COMPRESSED OR WOVEN CANE, GRASS, MAT, BAMBOO TEXTILE, BOARD OR CUT BAMBOO BOARD, OR WOOD COVERING.

THE STRUCTURES BUILT IN FRONT OF THE DOORS AND WINDOWS HAVE A PRIMARY FUNCTION TO CLOSE AND SHED THE ROOMS BEHIND. GLAZING OF DOORS AND WINDOWS IS NOT MADE. THE SHUTTERS ARE MADE OF WOOD OR BAMBOO. THE OPENINGS CAN BE FITTED WITH ROLL-UP SHUTTERS MADE OF BAMBOO ELEMENTS.

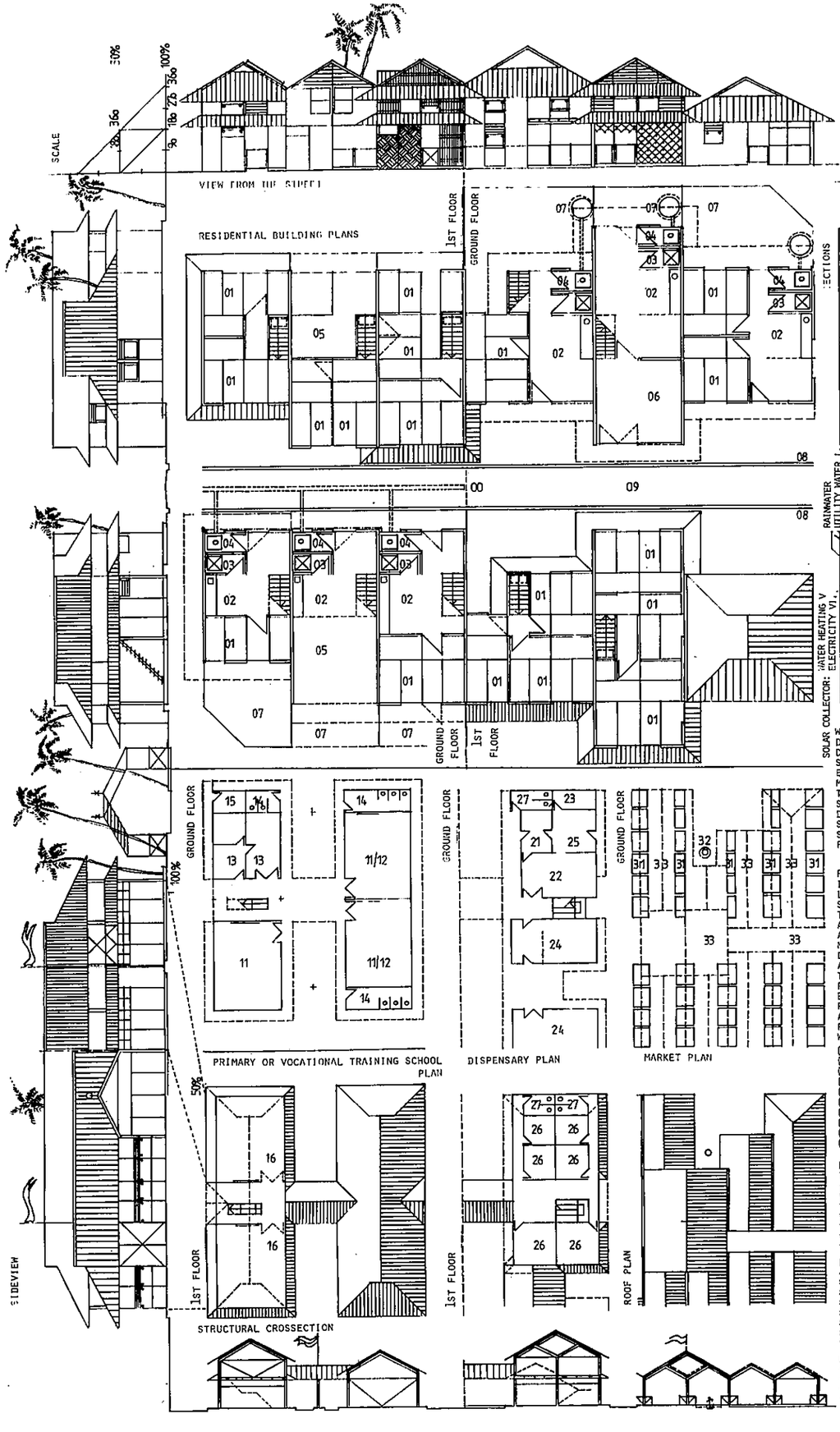
⑤ THE EXTERNAL COVERINGS ARE MADE OF LOCAL MATERIALS WITH TRADITIONAL TECHNOLOGY. DIFFERENT BAMBOO, WOOD COVERINGS FIXED TO THE SECONDARY FRAME IN HORIZONTAL AND VERTICAL POSITION ARE TO BE FIXED ALSO TO THE FRAME/PURLIN/ MASTER BEAMS.
IN CASE OF INCREASED DEGREE OF FIRE PROTECTION REQUIREMENT WITH SOIL PLASTERING. THE STRUCTURE OF THE RESIDENTIAL BUILDING WALLS IS SIMILAR TO THE EXTERNAL WALLS BUILT ON SIDES OF THE FRAME COLUMNS AS THE NEED MIGHT BE.

④ FLOOR STRUCTURE FROM LOCAL MATERIALS FITTED WITH TRADITIONAL TECHNOLOGY: IN CASE OF SHORT SPAN /SHORT FRAME DISTANCES/ BAMBOO FLOORING.
IN CASE OF BIGGER SPAN; BAMBOO/TIMBER PLACED ON SECONDARY BEAMS WITH DIFFERENT FLOORINGS.
FLOOR STRUCTURES MADE OF LOCAL MATERIALS BY PREFABRICATION ON THE SITE: COCONUT FIBRE REINFORCED CONCRETE FLOOR ELEMENTS ON BAMBOO BEAMS AND BAMBOO BEAMS AND BAMBOO REINFORCED CONCRETE FLOOR ELEMENTS.

⑥ PARTITION WALLS MADE OF LOCAL MATERIALS, TRELLIED COVERINGS FIXED TO VERTICAL BAMBOO/ TIMBER FRAME SUPPORTS AND FIXED TO THE MAIN FRAMES/PURLINS/FLOOR STRUCTURES.
OPENING WITH CURTAINS OR WITH DOORS AT THE FACADES.

⑦ THE CHARACTER OF STAIRCASES IS OF LADDER, SINGLE-FLIGHT STAIRS WITH SINGLE OR DOUBLE BAMBOO BEAM SUPPORTS WITH BAMBOO STEPS.

UNDERGROUND BASIC PIPING PLACED BEFOR CONSTRUCTION ON MINIMUM LINE LENGTH.



WATER SUPPLY GRADUALLY DEVELOPED /DIFFERENT DEMANDS/: UTILITY WATER SUPPLY. RAINWATER PIPING. EAVES GUTTER AND STORAGE: METAL OR SYNTHETIC MATERIAL TANK, OVERHEAD TANK, WATER SUPPLY SYSTEM.
DRINKING WATER=PUBLIC SUPPLY BUILDING.
SUPPLY AND SEWAGE SYSTEM FITTED TO FACADES.

REFERENCE BUILDINGS, PLACED IN DEFINITE GEOGRAPHICAL LOCATIONS, THE RESULT OF SEMI-READY BUILDING ADOPTATIONS TO SOUTH-EAST ASIA OR CENTRAL AMERICA AND SOUTH AMERICA BETWEEN NORTH AND SOUTH 15 LATTITUDES FINISHED BY LOCALLY AVAILABLE MATERIALS AND TECHNOLOGIES.
RESIDENTIAL BUILDINGS BUILT ON PLOTS WITH PUBLIC UTILITY AVAILABLE AND ON PLOTS PREPARED FOR PUBLIC UTILITY CONTRUCTION WITH MINIMUM FLOOR AREAS:

01 BEDROOM
02 KITCHEN-DINING
03 BATH/SHOWER
04 WC
05 UNSPECIFIED AREA
06 WORKSHOP/SHOP
07 GARDEN
08 RAINWATER CANAL
09 ROAD
00 SEWAGE CANAL /PUBLIC/

PRIMARY OR VOCATIONAL TRAINING SCHOOL PLAN

PRIMARY OR VOCATIONAL TRAINING SCHOOL:
11 CLASSROOM
12 SCHOOLWORKSHOP
13 OFFICES
14 WC
15 BURSAR
16 CLASSROOM /SIDE OPEN/

DISPENSARY PLAN

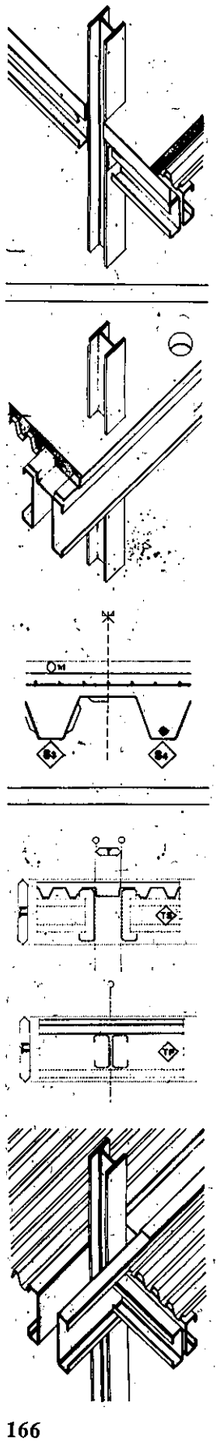
DISPENSARY:
21 WAITING ROOM
22 EXAMINATION ROOM
23 MEDICIN STORE
24 DOCTOR
25 NURSE/CLERK
26 WARD
27 WC

MARKET PLAN

MARKET:
31 STALLS
32 WATER OUTLET
33 CONSUMER TRAFFIC

1933 10 18 sector 3

INTEGRATED STEEL SYSTEM FOR INDUSTRIALIZED RESIDENTIAL BUILDING



THE METASYSTEM EMPLOYMENT AREA

It is, as we have just said, residential building up to a height of eight storeys.
At all events, the wind brace systems remain unaltered for the entire height; the longitudinal ones can be entrusted to the staircases in reinforced concrete. The choices of maximum height which do not exclude the intermediate heights, are determined by their obvious and reconfirmed constructive economy.
Generalized conformity to most of the building programs can be added to this as well as the verification that structure and its complementary components can be easily coordinated both in production and in transport and assembly.
The inhabitative cell types in current use are constantly changing imposing an adaption of the norms for all components to the qualitative and quantitative standards of public building.

For this reason, we first tried to satisfy these specific necessities, but, at the same time, we never excluded the possibility of taking on more challenging situations or even "research studies".
In practice, we thought about giving an immediate answer to the building of one-family dwellings with one or two isolated storeys, row houses up to two storeys high and a gallery, where a greater number of storeys is needed; row blocks and tower blocks.
It is evident, however, and widely verified that these types of building are still not considered as "building" (or architecture) but only instruments waiting to be organized into complex structures which, on the other hand, need to fit in with urban situations or to more uneven ground. We are, then, in an area of continual evolution to which neither the use of well-know building types nor the adoption of open construction systems can works as inhibiting factors.
In many ot the territorial sectors at any latitude, the poor situation in due to the scarse abilities to move the building types and to the use of constructive systems where availability has not been sufficiently estimated.

The setting out of a dimensioned building type falling within the standard values requested by the local normative, wa can use this type as an urban or reduced dimensioned module according to the program that we need to develop.
We can add to it, repeat it in three dimensions and integrate it according to the pre-existing routes or bordering volumetres, etc.
Speaking more specifically about civil dwellings, we can say these are already overshadowed if we follow the conformation of the space-type structure or "tunnel" building systems.
They appear flanked along their longer side - variable within resonable limits of maximum and minimum however respecting the standards they need to satisfy - according to storey distributive systems (row houses or blocks, gallery-type constructions, etc.).
As of late the tunnel system has become one of the most experimented building processes. Being built with walls in reinforced concrete, the tunnel does not allow for enough freedom. In the metasystem, this binding element is overcome while maintaining its image, its fundamental idea, the fact thas it is assembled and not built in a traditional way. It, however, guarantees a greater freedom of movement inside due to its carrying structure being in columns, that is to say, as it appears on the plans, in puntiform. Above all, we can start thinking about acting on frontal modules of changeable structures that could be supported in different ways, even in the putting together of a single building.
It might be appropriate at the time that the ida of tunnel cells is so essential in the metasystem that any distributive, spatial, architectural reasoning as well as the details of technical architecture can not help but be based on it.

THE CHOICE OF STEEL

We know that, among the building materials at hand today, steel is, without a doubt, the most available and relevant. It creates the best conditions to develop an almost integral industrialization process of the metasystem.
In the structural part, the use of steel is somehow taken for granted (this is what gives the metasystem a special connotation compared to others). For the complementary parts, it remains preferential because it grants, more than any other material, a so-called "catalogue architecture" which is based on a large range of steel materials found on the market.
It is necessary to write a detailed description of the structure, a list of "specifics" that each structural component (or other) must adhere to in every situation:

Use of well-know components

The column, unified in section s from HEB 140 to HEB 240, is used,
The horizontal parts (main and secondary girders) and the complementary parts (wind braces) are made of steel plate up to a thickness of 8 mm. according to the normal techniques of transformation for shearing, bending, profiling, etc.
That is to say, the "obligatory" sections of the system components do not have to be so different from those normally shown in a catalogue (L, C, omega, etc.). As these sections are not always easily available in a warehouse and it is difficult to justify a large and sophisticated production, we generally adapt the average thickness of 6 mm. to make it compatible with the normal drawing features and with the processing machines which are normally found int the production centres.
For a component, the fact of being well-know means being found on the market or being produced by transformation from unfinished elements according to the processes or by the sections normally feasible.

Use of joints and normal assembly

Paradoxically, with this metasystem, we are not inventing anything new. It has, however, the capability of coagulating a series of heterogeneous experiences in the building industrialization field using both traditional and recent construction materials. It proposes a series of components and connections that achieves the completeness of a constructive process.

Above all, we like to produce a structure of normal assembly, and easy to produce in its entirety so as to avoid the inconveniences sometimes revealed in metal structure construction.
From the numerous examples in traditional carpentry, the joints or constructive details have been chosen that, while satisfying the retail problem, are at the same time coordinable with constant features such as: using as few welded components as possible, excluding welding operations, using one kind of bolt for each joint.

Ease of assembly

One of the main features of the system in addition to those previously mentioned is the absence of welding. Components are assembled using bolts following normal procedures which might even means the use of the dinamometric key. The use of a single format of nut and bold might not seem economical but when you consider the use os excessive dimensions and the over-ordering of certain sizes of nuts and bolts, it isn't. The simple fact of having to make only one order, of using only one piece of equipment to fix them in place and of avoiding error (a small bolt in a large hole) seems to be a convincing one. The assembly phases have been studied in such a way as to allow for the maximum accesability to the structure for every type of operation.

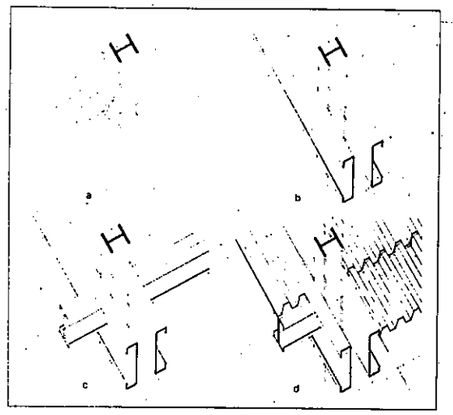
Given the description of the basic components of the metasystem, at this point, the hypothesis of an operative filing system which provides for the production and before this, the ordering of all the components through automatic means, seems obvious, This process is wide-spread nowadays and should be thought of not only as a saving of consignement time but a managerial instrument of the metasystem. The "data bank" would therefore have great flexibility in responding to the diverse nature of the demand.
It follows that, owing to the situation of mass production and stocking of large commissions and the programming of precise timing, a sort of retail selling could be the result. The metasystem is an ideal solution - above all for the Structural part - to spontaneity in the construction of small structures which are a considerable part of urban development.
Speaking of "spontaneity", the metasystem offers an ideal opportunity to people who are building for themselves; whether it be an urban or sub-urban dwelling or a cooperative venture. It speaks a common language, comprehensible to everyone. It is, therefore, evident that the adoption of the metasystem by more than one professional designer working on the same project becomes the common denominator in exercising individual freedom assuring, at the same time, unison in practice.
Through the experience gained in countries throughout the world and considering all that has been demonstrated thus far, steel seems to be most suitable if not the only giving positive results from all points of view.

THE STRUCTURE

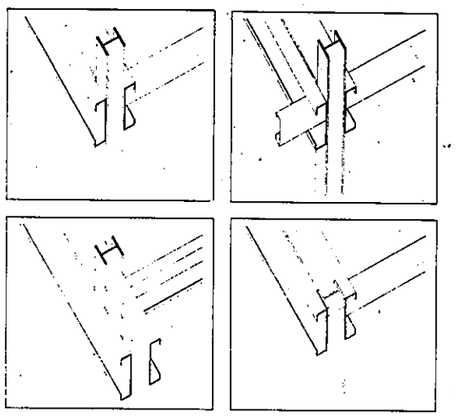
The fundamental feature of the structure is having the columns lined up and forming their exclusive module called the "tartan band" which alternates, according to the plans of the designer, to modular distances of 60 cm. across the front. Transversally, however, the basic module of 60 cm. appears without any anomalous space or interval. If we denote the "tartan band" with letter T and the base module with an M, it is possible to read any longitudinal development of the plan or any frontal view as:

T + nM + T + nM +.....

where n in a variable which oscillates between a minimum of 4 (that is to say 4x60 cm. = 240 cm.) up to a maximum, which has been fixed at 8 (that is to say an open frontal space of a maximum of 480 cm.). The limit is due to the joists passing through, as will be demonstrated in figure 9 - part 2.
In the transversal direction "n" has no limits other than in the internal of the maximum depth of a structure according to the choices, the necessities and the different types of building Regulations one must work within. In this direction the open space allowed for between 2 columns is a maximum of 9 (that is to say 540 cm.).
On the vertical side the base module of 60 cm. is used but is formalized and defined in a 30 cm. sub-module (which can be divided once again into 15 cm. + 15 cm.) having more versatility when considering the standard height of window sills, heating systems, and other complementary accessories. The finished thickness of the floor has a value of 35 cm. which corresponds, you could say, to a sort of "tartan band" on a vertical plane.
After this brief description and the formulation of its dimension limits, we can say that this modular mesh is amply suitable to all types of dwellings and its variations (description in Part 3 - Dwelling Typology). In this mesh a solution to all the fittings which seemed foreign to the system have been found as, for example, stair cases in reinforced concrete (their fitting "from outside the system" is logical for both prefab structures and those cast on the site).
The components of the structure can be analyzed in 2 sections - the fundamental components and the accessories.
The column, as has already been mentioned, is the same for all structures up to a height of 4 stories and ra is ed for the lower stories when there are 5, 6, 7 or 8 stories, this being the maximum height required nowdays and respecting the average volumetres being built.
The channel girders in cold formed steel plate which coupled on the two levels of the column wings HE and having the same weight and length (a maximum of 30 Kg./m. for a maximum thickness of 8 mm. is added to 360 Kg. over 12 m. of development) makes up the main girder; its wing with a maximum value of 90 mm. is perpendicular to the "tartan" band for the entire depth of the building body.
By perforating the wings of the column and the internal part of the girder - making use of their flat vertical side - easy assembly and locking by using simple nuts and bolts is guaranteed.
Because of this flat side one could "deduce" the possibility of moving the column along the girder and viceversa owing to the absence of joint plates or other accessories which would project out of the structure.
The girder can take any position on the column so long as it is lined up on the modular weave, which includes any frontal movements as well as from storey (the same can be said of the movements of the joists).
With the columns lined up to the width of the "tartan band" and next to them the 2 channel girders the third structural component of the trasversal joinsts can be defined (that is to say those perpendicular to the "tartan band" and parallel to the front). They are also cold formed in steel plate with a channel - which is the distinguishing feature of the girders - and are erected two at a time so as to make a double T and set apart to a value equaling the thickness of the joint plate linking them to the main girder.
Their maximum length as will have been deduced from a previous description of the modular weave, is 4.80 m. This figure in addition to guaranteeing the average dimensions of standard dwellings, falls within the general features of the components.
Even though the metasystem has been illustrated in this way, it can be altered and improved (and not only in its structural parts). For this, some elements (the above mentioned joints and anchorages) can on occasion be conveniently redesigned according to the necessities of the contract, the production quantities or the availability of materials.
As for the erection of the structure, it has been said that the greatest attention has been focused on simplicity joining the most number of components and rendering them easy to handle. This would avoid the need for sophisticated and costly site equipment.
This means that the same component groups could de reduced to minimum numbers (only one shipment of nuts and bolts, for example) thus taking up less space on the site. The assembly process, using an extendable ladder can and must take place in absolutely stable conditions in every plase so as to eliminate any type of ground scaffolding. It would then be ideal to have the perimetric components installed by a skilled worker from the ground floor up.



Standard node
The sequence of assembly starting from the column (a), to the principle girders (b) and then to secondary (c), and to the ⌐⌐ shaped steel plate of the floor.
The standard node is represented here as a single column one, as is the case of all the figures in this part.

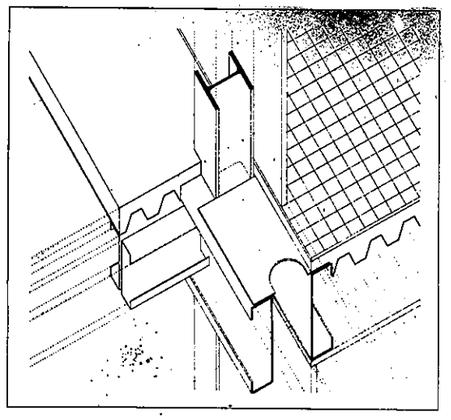


Corner node
Close view of a structural corner node. This node and those of the following figures are resolved by cuting or interrupting the components in a suitable way so as to show them in this standard node.

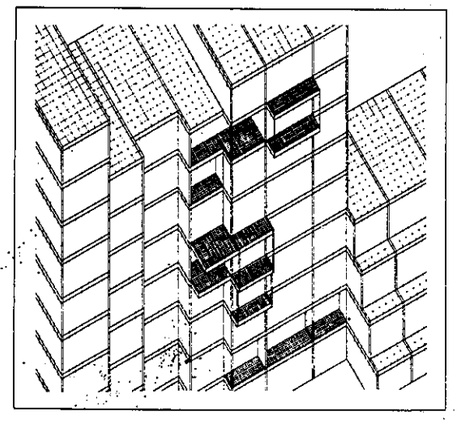
Frontal node
Close view of a structural frontal node.

Lateral node
Close view of a structural lateral node

Covering node
Close view of a structural corner node in the covering



Complete standard node
The standard node in figure 7 is completed in cls casting for the floor, with the flooring finishings and with the lined plaster slabs for the walls and false-ceilings.



External frontiers
On the same level of the external frontiers at the right angles to the "tartan" band it is possible to plan the prospectus taking into consideration any articulation of surfaces or of volume, in a line, overhanging, or in recess.

THE COMPLEMENTARY AND FINISHING COMPONENT

The simplicity used in the structure is carried over into the choices for the complementary or finishing components. We know that in present-day industrialized building employing steel structures, the most delicate task is that of "dressing" the structure.
The "wet" operations on the site are specifically for the foundations, for the floor casting over the ⌐⌐-shaped steel plate, for the staircase and sometimes for the roof. All other operations are carried out "dry" since they are all purely mechanical. The finished product is reached in a much shorter time compared to traditional methods. (The internal parts, that is to say, the walls, the ceiling and the other finishing touches are the only restraining area of the completed building).
Naturally, not being able to enter into all the details and taking for granted all the obvious choices which are already in wide use in this field, we propose now to take a close look at the features which characterize this metasystem.

Modular coordination

All the components of the surface and of the three dimensional structures are coordinated in a basic module of 60 cm. and its submultiples of 30, 15, 10 and 5 cm. The market today offers many examples of modular elements having the same dimensions and a wide number of unfinished products which have still to take on specific features. The formulation of a wide range of materials available through a catalogue has been considered, over and above the components which on the basis of numbers can be specifically designed for the metasystem.

Easy joining

The metasystem offers a wider range of possible methods of joining even the most variable structures using joints, attachments and so on. This has been made possible through the use of cold formed steel plate structural components which have appendices with many different profiles. One example is the ease with which ceilings, lightweight systems, false ceilings, etc, are hung from the secondary girder channels.

The permeability of the structure to reach the systems

Considering what has already been mentioned concerning the possible development of the structure's vertical wind braces, it can be appreciated the way in which the "tartan band" area between the columns can be completely and safely crossed by the various systems in an ample space (140 mm.). In addition, with a view to developing the systems in the structure, the floor thickness remains hollow for at least 2/3 of the finished value. Thus the structure is completely practicable with the installation of normal systems.

The external frontiers

Here we have a very delicate problem. If on one hand there are a number of well-know, technically architectural cases in the solving of joinings, installations, thermal-acustic insulating and functionality (the locking together with the darkening of a room, the activity for which it will be used and its relative finishing touches, the choice of material, etc.) on the other hand, we should point out the alternative to the "tartan" band module which is the span of the tunnel. It also has a whole and finite number of modules and creates conditions which are resolvable in 2 directions.
In the first instance, a panel or a series of panels are kept aside for every front opening of every tunnel. This marks the presence of the "tartan" band in its true dimension of 140 mm. Added to this there is a special panel which makes it necessary for the front opening panel to be even and completely equipped as well as being light-weight. This fits in with the general principles of the metasystem.
Or we can fall back traditional panels but placed back to back with the finished side turned out so as to cover the "tartan" band.
The wide range directions to take which are offered in part 2 on this subject is proof of how delicate this aspect is. It is in the hands of the designer to resolve. The directions are all or almost all illustrated as being on the corner between the front and the side. This case is the most difficult to solve and the solutions to the rest are included in the same case.
The overall choices to adhere to which are generally left up to the designer to make, are tied to cost, the availability of material (not the least important being the installation of the traditional manufactured goods, such as brick walls. This too, is illustrated in the part concerning corners), the construction site equipment, environmental conditions, which also include cultural conditions. The integration between external frontiers and coordinating systems of solar energy or environmental exploitation both in an active and a passive sense have always been a topic of great interest, even though passively.

THE IDEA OF THE METASYSTEM

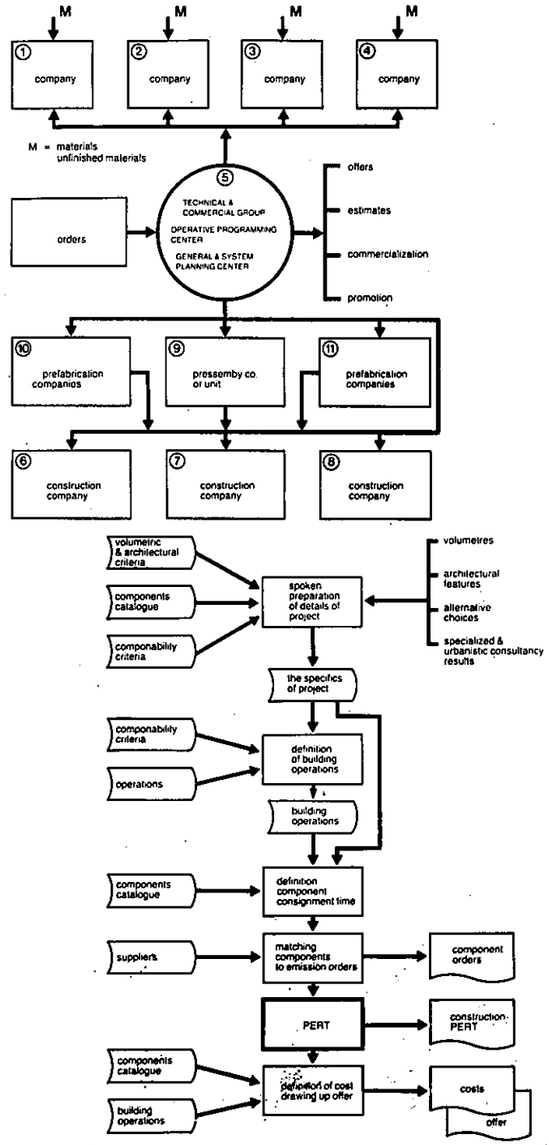
The fundamental feature of a metasystem is the absence of conditioning the final result of the designing - production - building process.
There is, however, an image made up of a number of "marks" which characterize a metasystem and allow it to be recognized as such.
In the metasystem described in this publication, the "marks" which are not yet a part of any kind of building philosophy are:
- the use of steel which makes for slimmer column sections
- the maximum height which can be reached
- the designing connotations of the tunnel with the diversified frontal realization compared to the sides and not needing the presence of the "tartan" band
- the "dry" or "mechanical" assembly which implies a completely new approach on the subject of maintenance.
- substitution instead of repairing, in keeping with the industrial origin of the process
- the possibility of substituting some of the components rendering the building alterable in time both on the inside and on the outside (this in theoretically known as "open works").

There are still other "marks" to be picked out in the components which, however, remain the most readable on the "skin" of the building. These same components should not carry marks which might identify the designer who could have chosen them for a particular context but should make a mark in how they are composed with other components. This means that total freedom at all levels must be given to the designer. This is the objective of the metasystem.

THE PRODUCTION CYCLE

The previous section described the logic behind the metasystem in the planning stage. It must not be detached from successive stages - from that of the building to that of the construction site but must be integrated avoiding the spitting of responsibilities.
An activities "industrial" dimension is characterized by the level of rationality it is possible to reach in the main segments of its make-up. The rationalization of a segment of a productive (or building) activity consists in picking out the easiest and least costly working cycle.
The transition between, the traditional building system of a "hand-crafted" structure and an industrial system structure calls for an integral plan which takes into account all the segments which will make up the activity of constructing buildings.
The buildings should be considered the final product of an industrial cycle which is finalized and rationally conceived and not as the result of the "work" of a builder or of a team that supplies the plans and necessary materials for the realization of a "hand-crafted" structure.
Example of the inevitable logic come from the evolution of widely-know, industrial activities and for this easily recognizable as legitimately "industrialized". In the building world today, it is still difficult to accept the term "industrial" and where it has been used, it has been at the level of a few marginal segments of specialized or even patented component production.
Nowadays, industrialized building utilizes mechanized, on-site methods or makes use of components manufactured in limited quantities by mechanized and/or automized processes or organizative systems adopted to improve the efficiency of the construction site.
As was mentioned previously, the industrialization of an activity requires the singling-out of stable, optimized and rational prodution cycles.
This has happened in the electronics industry, the automotive industry, in the production of systems and in the so-called integrals of steel-making and metallurgy in general.
The push towards an industrialization process in the field of construction in the sense of the planning of an industrial system for the production of buildings for civilian use has come out of great industrial complexes, well-know world-wide which possess a suitable culture and the experience necessary in the field of systems planning and informatics.
The transition from the traditional way of building to a new system based on industrial methods, must take the problems involved in the transformation of the production cycle and the levels of qualification and professionality of the people involved at every stage of the cycle into account.
Starting from the present-day situation, an industrialized building system is, from the outset, a plan of coordination of changing possibility in the attempt to reach the desired characteristics of an effective and economically effective operation.

Diagram of operative and informative flow of BASIS



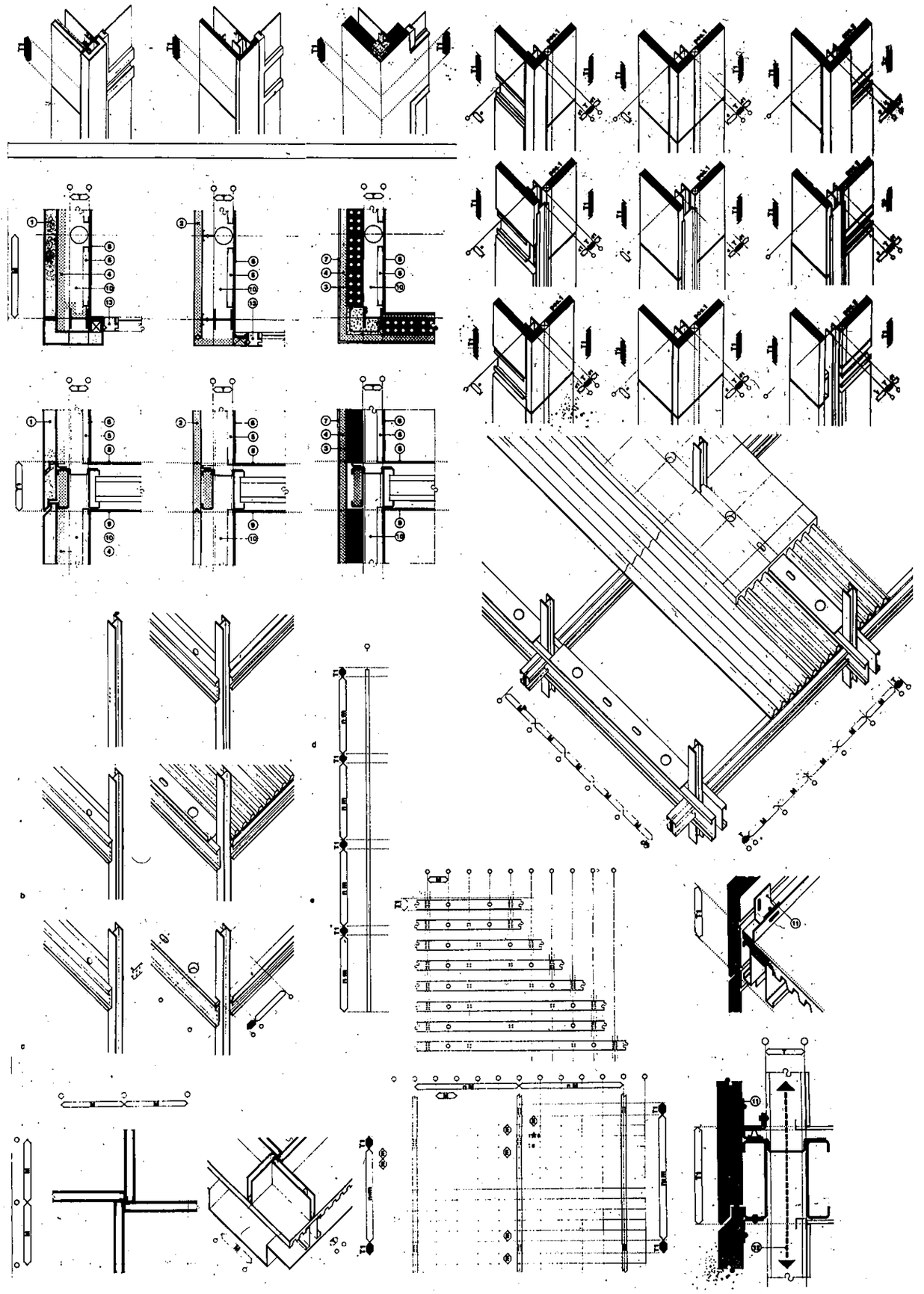
METHODOLOGY AND THE INSTRUMENTS NECESSARY TO CARRY OUT OPERATIONS

The success of a productive cycle can be guaranteed through the making of suitable decisions on types of systems, through correct planning and researching methods in order to allow for the efficient management of a production cycle, taking into account every aspect of the cycle.
One condition necessary for the smooth running of an industrial plant is the compatibility between all the workings of the various areas of the activity.
The main methodological principles of a smooth-running operation are those concerned with:
- the planning methods
- the productive methods
- system informatics

Consequently, a complete production system and therefore the construction of buildings is made up of a practical and operative part and a designing part (metasystem). These two parts must be connected through a system of logic which integrates all the activities of the cycle, from the production of the materials to putting the finishing touches on a building, at an industrial level.
We are speaking of a "so-called copernican solution in so far as it proposes a multipolar productive structure which orbits around a central pole in a heliocentric way, made up of the directing Company", (see "L'impresa di Costruzioni: nuovi modelli organizzativi e informatica" by Prof. G. Dioguardi - translation - "The Building Company: new organizative pattern and informatics").
The following diagram (figure 1) represents the traditional organizative concept in which the roles of the suppliers and subcontractors and the building companies differentiate and vary according to the individual commissions which are never systematic or programmable.
The second diagram (figure 2) represents a step forward in carrying out a more integrated methodology even if it is still not on an industrial level: the idea of marketing and promotion coming before the idea of systematic activity towards building systems, the adoption of prefabbricated structures, the integration of more sectors on an operative level.
The distinctive features of the metasystem can successfully compete in the field of civilian constructions with a high incidence of steel components in the planning stage integrated on an industrial level with all parts of the cycle, from materials production to the finishing touches.
With an integrated system such as this, production can follow through uninterrupted, allowing for greater freedom in the planning stage. Every case can be settled in complete accordance with the situation when referring to tabour and the finishing materials.
Due to its intrinsic nature, the system is able to develop its organic unity when the large, medium-sized, and small companies involved (each one in its own field) are able to view an integral logic through the activities and the intersectorial coordinating structures.
Basis, the system elaborated by Nuova Italsider and its associates and the subject of this publication, belongs to such an integrated system of production and realization, utilizing the metasystem in its designing process. The special feature of Basis consists in the coordinating structure which operatively integrates the different components of the system.
Referring to the diagram in figure 3 (the operative and informative flow) one can note a non-conventional structure in "Group 5" which can be thought of as a true and proper company having a highly professional make-up which elaborates projects using an integrated system of production in conformity with industrial cycles.
Following is a description of some of the possible phases of the Basis system as an example (figure 3):
- an "Entity" decides to commission the erection of one or more steel structure buildings.
- "group 5" dictates the general plan and the estimates making use of the maximum number of materials available from Companies 1, 2, 3 and 4. At the same time it seeks out other specialized firms which could, when needed, be approached to supply the materials necessary
- if the proposal as it appears above, is approved, "Group 5" takes every detail of the necessary operations in hand until the supply contract has been drawn up
- "Group 5" then sends the integrated working plans to the Companies and factories involved. The plans cover all aspects from production of the basic materials (girders, cold formed sections, etc. marked with the letter "M" in the diagram in figure 3) inclusive of the working cycles, deadlines, method of transportation, the explanation of the operative methodology
- Companies 1, 2, 3 and 4 then draw up their plans for technological modification and start the production of components, readying and finishing them according to the requirements of the integrated plan. The companies dealing with the prefabrication and pre-assembly 9,10, and 11 follow likewise within the time limits established. The construction site operation of Companies 6, 7, and 8 can then start up in an integrated system (where the products of various segments of the production cycle converge).

It is clear that in an industrial system of this type, the different companies operate in a way that is not typically of their field. In other words they are not tied exclusively to the line of products which they formally manufacture but they become "links" in an articulate industrial system. It does not mean either that the relative costs in every phase of the system are interdependent but that economic success in the manufacturing of these products is linked to respect for the logic in the system.
The process described must have as a rule, the development of the management ability in informatics. The "directing" company must promote the use of systems (hardware and software) which it then lends to the companies that are collaborating. This process called "top-down" sows the seed of informatics integration among the minor firms.
The diagram in figure 4 is an example of view of the way in which an automatic support system for the production and realization of single dwellings and complex residential developments can be set up.
The "Leading" company or the "Group" company must therefore look ahead at the outside world and in time, improving with time through a continuous process of feedback concerning the "product" and through the operative sectors connected to it. It will be the job of informatics to carry out this process and in time realize the following economic benefits:
- an excellent opportunity for the standardization of the primary components with regards quality, size, morphological and geometric features
- facility in production, transport and assembly of the basic and more complex elements
- a good opportunity to by-pass traditional working and transporting stages thereby drastically cutting the costs of transport, moving and storage of materials and building elements
- a good opportunity to program production campaigns created by the situation of multiple building contracts
- sharp reductions in completion times on the site along with reductions in the space necessary (especially critical in cities)
- an excellent probability of being able to keep to temporal and contractual commitments
- the possibility to reduce circulating capital during the productive cycle and to carry out many different production and working activities contemporarily with the precision of a workshop or a plant.
- the widest direct and indirect utilization of more products and manufactured goods coming from the "Group"

Through the wide use of computerized systems and the highly efficient structurization of the productive activity, the functionality of the technical-commercial activities, of the technological and productive developement as well as that of assembly, pre-erection, erection and finishing. As can be seen in the "flow-chart" in figure 4, an automatic system of design and building, a number of "data files" are necessary; those which refer to the components and those referring to the criteria of componability.



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MEMORIA :

LA PRESENTE MEMORIA SE REFIERE ESPECIFICAMENTE A UNA PROPOSICION QUE PATENTA UNA ACTITUD ORIGINAL EN RELACION AL USO O DISPOSICION DE LOS ELEMENTOS CONSTRUCTIVOS Y QUE SUGIERE UNA NOVEDAD ESENCIAL EN CUANTO A MATERIALES SISTEMAS ESTRUCTURALES Y METODOS DE EDIFICACION, DEFINIDOS EN EL CONTENIDO TEMATICO DENOMINADO SECTOR III.

A.- MARCO DE REFERENCIA

1.- EN CONCORDANCIA CON LOS PROPOSITOS ESTABLECIDOS SE PLANTEA EL DESARROLLO DE UN ELEMENTO OBTENIDO CIENTIFICAMENTE QUE MEJORA LA CAPACIDAD EFECTIVA DE LOS RECURSOS EXISTENTES AL ALCANCE DEL ARQUITECTO.

2.- ESTE NUEVO ELEMENTO TECNOLOGICO ES SUSCEPTIBLE DE APLICARSE A CUALQUIER ESCALA RELATIVA A LA MAGNITUD DEL PROBLEMA A SOLUCIONAR Y COMPATIBLE CON LOS CONCEPTOS TRADICIONALES DE EDIFICACION MUNDIAL. Y ORIENTADO PREFERENTEMENTE A PROGRAMAS DE AUTOCONSTRUCCION PLANIFICADA.

B.- DEFINICION DEL ELEMENTO TECNOLOGICO Y DESCRIPCION.

1.- ES DEFINIDO COMO UNA BRIQUETA TRIDENTE, TRIQUETA, QUE CONFORMA UN ELEMENTO CONSTRUCTIVO MODULAR.

2.- LA TRIQUETA ES OBTENIDA MEDIANTE LA AGLOMERACION DE VIRUTA DE MADERA MINERALIZADA MOLDEADA MECANICAMENTE.

3.- SU CONFORMACION ESPACIAL PERMITE EL PERFECTO ENCAJE Y UNION ENTRE ELLAS EN TODOS LOS SENTIDOS DEL ESPACIO, CONFORMANDO MUROS ESTRUCTURADOS INTERNAMENTE DE MANERA NO DEFORMABLE.

C.- CAMPO DE APLICACION.

1.- LA TRIQUETA PERMITE LA CONSTRUCCION DE PARAMENTOS VERTICALES PERFECTAMENTE AUTOESTRUCTURADOS.

2.- AL PODER ELABORARSE ALTERNATIVAMENTE CON DISTINTOS MATERIALES SUSCEPTIBLES DE SER AGLOMERADOS Y MOLDEADOS, TALES COMO: PASTA DE PAPEL YESO Y SOLUCION DE ADHESIVO ACUOSO; MORTERO Y PIEDRA POMEZ; ARCILLA; MORTERO Y FILAMENTOS DE POLIETILENO; YESO Y FIBRA TEXTIL; VIRUTA DE MADERA AGLOMERADA MINERALIZADA Y OTROS, PUEDE DETERMINARSE LAS CARACTERISTICAS MECANICAS Y AISLANTES DEL PARAMENTO VERTICAL RESULTANTE.

D.- CARACTERISTICAS Y VENTAJAS ALTERNATIVAS

1.- FACILIDAD DE EJECUCION.

LA TRIQUETA SOLO REQUIERE IR SUPERPONIENDOSE EN FORMA ALTERNADA, PREVIA INMERSION EN UNA SOLUCION ADHESIVA ACUOSA, A FIN DE CONFORMAR UN TODO HOMOGENEO Y PERFECTAMENTE TERMINADO, SIMPLIFICANDO EL PROCESO CONSTRUCTIVO A UN NIVEL ELEMENTAL, "SACAR-MOJAR-PONER", A TODA PRUEBA.

2.- USO DEL MATERIAL.

LA TRIQUETA SOLO NECESITA SER SUMERGIDA EN UNA SOLUCION ACUOSA ADHESIVA, DEL TIPO FENOL FORMALDEHIDO C/S RETARDADOR, A FIN DE PERMITIR LA CORRECTA UNION DE TODAS LAS SUPERFICIES DE CONTACTO, NO SIENDO NECESARIO EJERCER MAYOR PRESION PARA LOGRAR UNA ADHERENCIA PERFECTA, LOGRANDOSE EN TODAS LAS TRIQUETAS UNA ADHERENCIA DE DOBLE CONTACTO.

3.- RAPIDEZ DE EJECUCION

SU FACILIDAD Y SIMPLICIDAD LE CONFIEREN UNA GRAN RAPIDEZ DE EJECUCION.

4.- EXACTITUD.

LA DISPOSICION Y DISEÑO DE LA TRIQUETA, PERMITE ASEGURAR UNA TOTAL EXACTITUD EN LA OBRA TERMINADA, SIN ALTERNATIVA DE ERROR, OBTENIENDOSE UNA CORRESPONDENCIA TOTAL ENTRE PROYECTO DE ARQUITECTURA Y OBRA; EN FORMA MILIMETRICA.

5.- ECONOMIA.

- EL RACIONAL DISEÑO DE LA TRIQUETA ASEGURA EL 100% DE APROVECHAMIENTO, SIN PERDIDA.
- EL MATERIAL PROPUESTO, VIRUTA DE MADERA, ES BASICAMENTE EN MUCHOS PAISES, UN MATERIAL DE DESECHO INDUSTRIAL, SIN MAYOR VALOR COMERCIAL.
- SU USO NO REQUIERE EMPLEO DE MANO DE OBRA CALIFICADA, ESTANDO ORIENTADO SU USO EN PROGRAMAS DE AUTOCONSTRUCCION. PREFERENTEMENTE.
- NO REQUIERE ELEMENTOS ADICIONALES AL DESCRITO, EN SUS UNIONES.
- SU SISTEMA DE ENCAJE Y BAJO PESO ESPECIFICO RACIONALIZA EL TRANPORTE, EL BODEGAJE Y MANIPULACION.
- NO REQUIERE ADICION DE ELEMENTOS AISLANTES EN ATENCION A SU MATERIAL CONSTITUTIVO BASICO,

6.- OTRAS.

- DE ACUERDO A PRUEBAS DE LABORATORIO, ES POSIBLE OBTENER TRIQUETAS DE UN ANCHO NO SUPERIOR A 75 MM. QUE CUMPLEN CON LAS CONDICIONES DE: RESISTENCIA MECANICA, INCOMBUSTIBILIDAD, AISLANTE, IMPUTRECIBLE. NO AFECTADO POR XILOFAGOS, INSECTOS O ROEDORES Y OTRAS. CABE DESTACAR ASIMISMO SU IMPERMEABILIDAD.
- LAS SUSTANCIAS CONQUE SE IMPREGNA LA MADERA, SALES DE CALCIO Y MAGNESIO, SON A SU VEZ DESECHOS DE INDUSTRIAS QUIMICAS.
- EL AGLOMERANTE, CEMENTO MODIFICADO CON SILICATO DE BARIO, LE CONFIERE CARACTERISTICAS DE AISLANTE RADIACTIVO.
- FINALMENTE DEBE INDICARSE QUE 1M3 DE MATERIA PRIMA, "BASURA FORESTAL", PRODUCE 3 M3 DE MATERIAL APROVECHABLE.

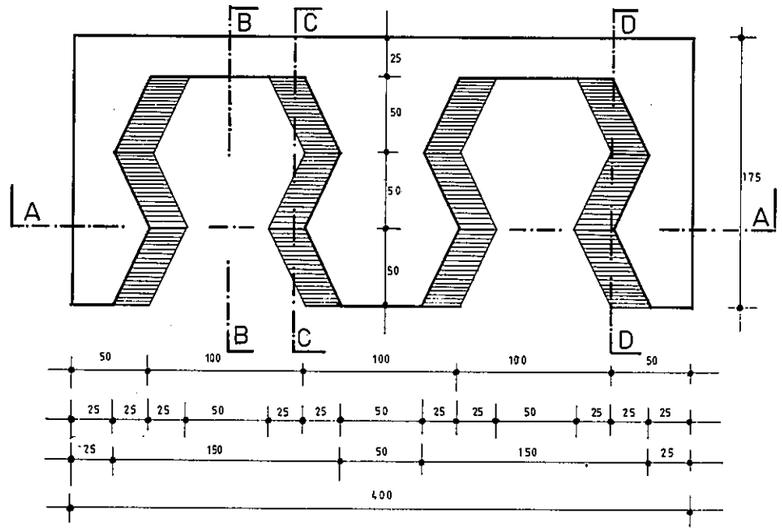


FIGURA 1 PLANTA DE TRIQUETA

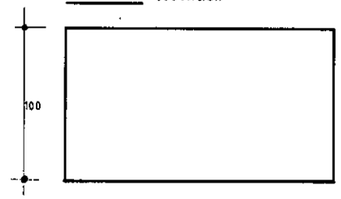


FIGURA 2 ELEVACION

NOTA:
MEDIDAS EN MILIMETROS

FIGURA 3 ELEVACION

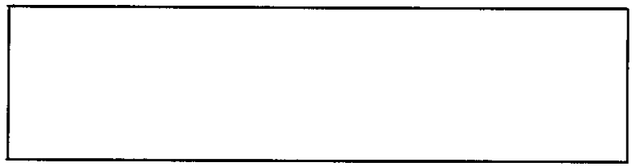


FIGURA 4 CORTE B B

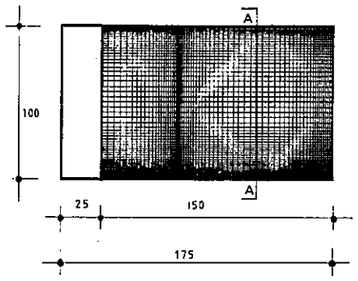


FIGURA 5 ELEVACION

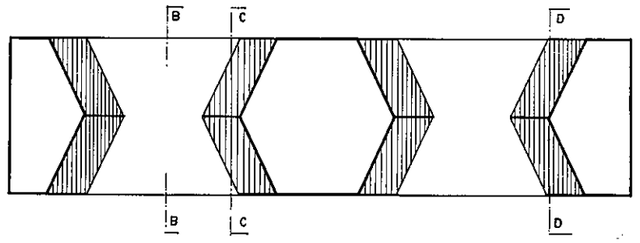


FIGURA 6 CORTE C C

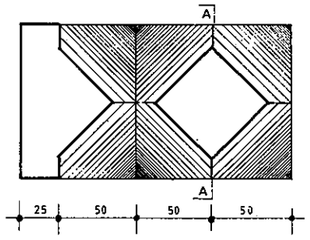


FIGURA 7 CORTE A A

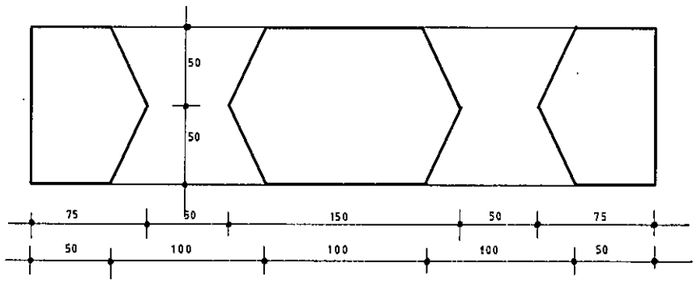
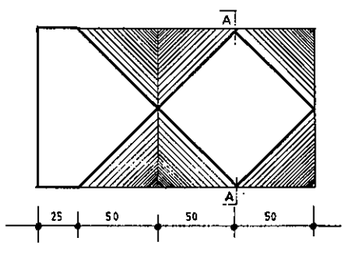


FIGURA 8 CORTE D D



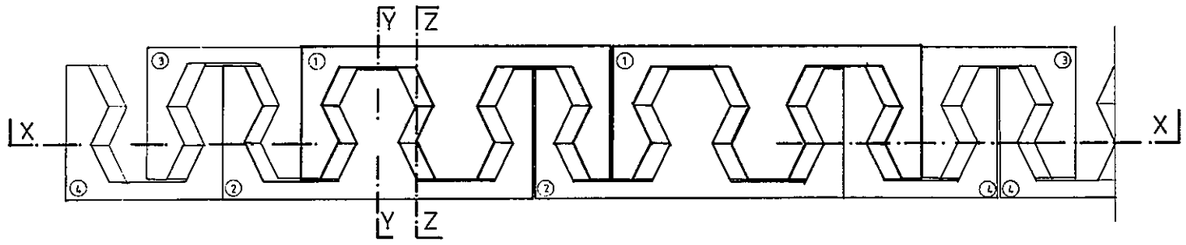


FIGURA 9 PLANTA DE MURO Y DISPOSICION DE HILADAS

FIGURA 10 ELEVACION DE MURO

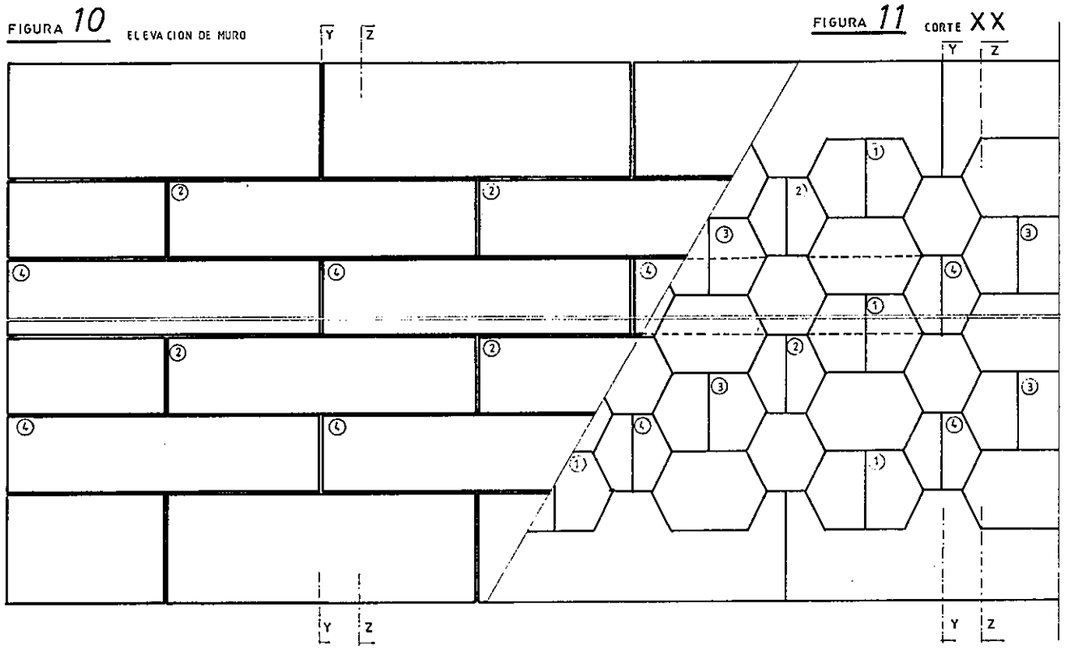


FIGURA 11 CORTE XX

FIGURA 12 ELEVACION

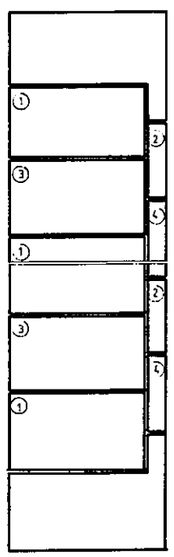


FIGURA 13 CORTE YY

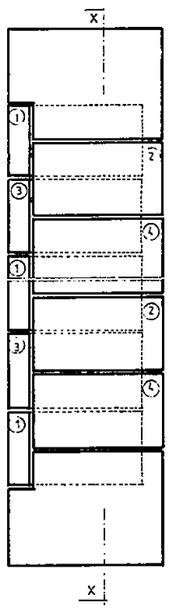
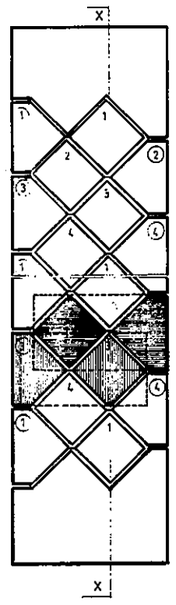


FIGURA 14 CORTE ZZ



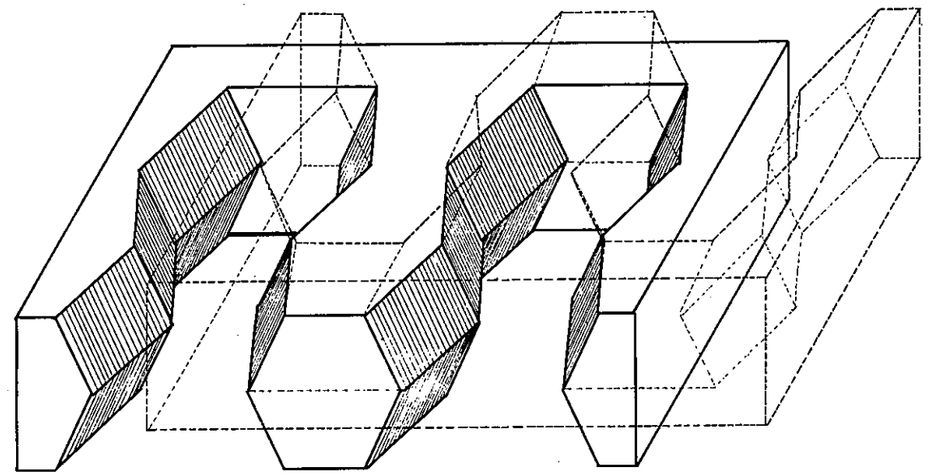


FIGURA 15 VISTA DE TRIQUETA

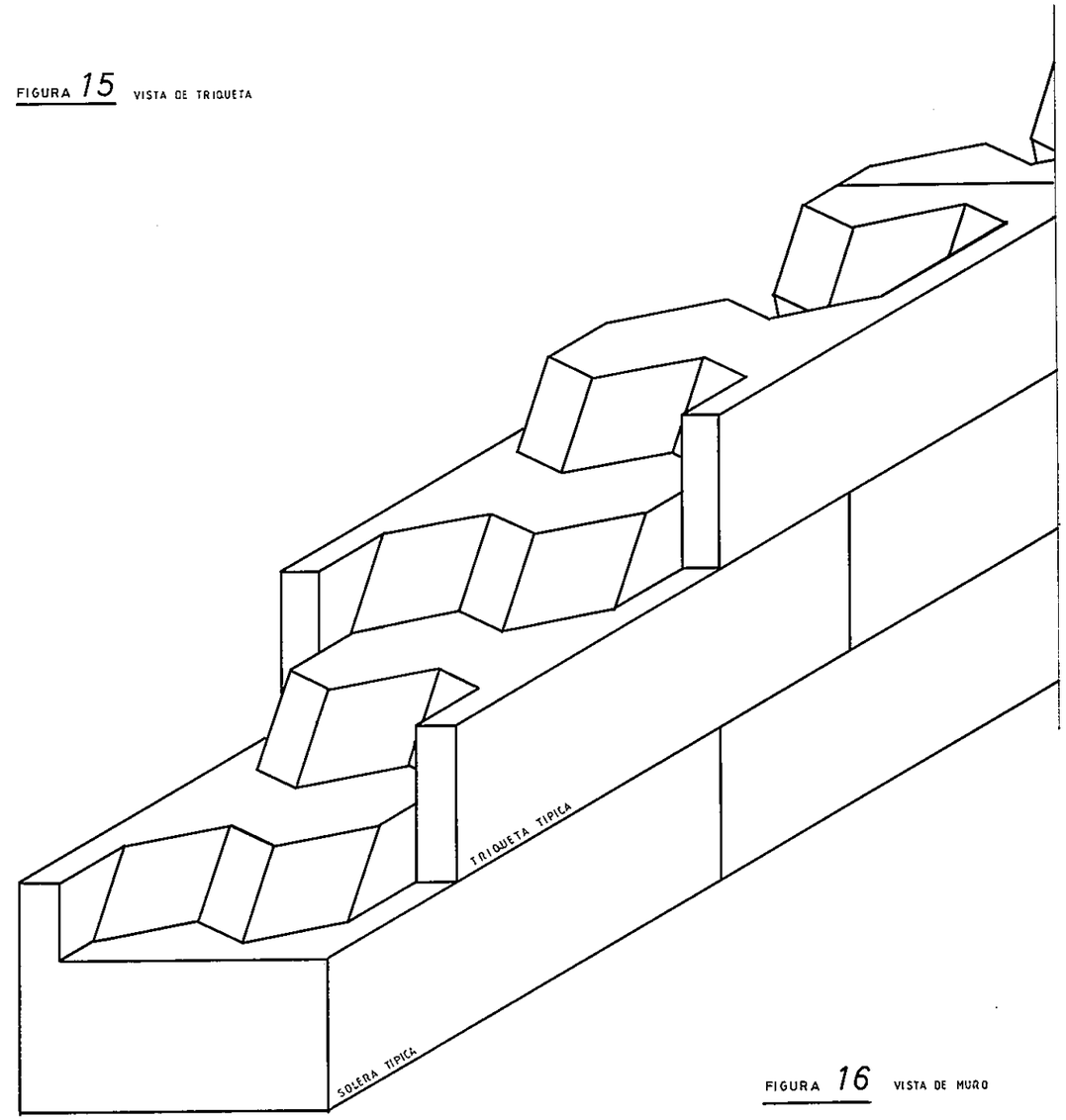


FIGURA 16 VISTA DE MURO

4771264 5

MEMORIA :

LA PRESENTE MEMORIA SE REFIERE ESPECIFICAMENTE A UNA PROPOSICION QUE PATENTA UNA ACTITUD ORIGINAL EN RELACION AL USO O DISPOSICION DE LOS ELEMENTOS CONSTRUCTIVOS, Y QUE SUGIERE UNA NOVEDAD ESENCIAL EN CUANTO A MATERIALES, SISTEMAS ESTRUCTURALES Y METODOS DE EDIFICACION, DEFINIDOS EN EL CONTENIDO TEMATICO DENOMINADO SECTOR III.

A.— MARCO DE REFERENCIA

1.— EN CONCORDANCIA CON LOS PROPOSITOS ESTABLECIDOS, SE PLANTEA EL DESARROLLO DE UN ELEMENTO OBTENIDO CIENTIFICAMENTE, QUE MEJORA LA CAPACIDAD EFECTIVA DE LOS RECURSOS EXISTENTES AL ALCANCE DEL ARQUITECTO.

2.— ESTE NUEVO ELEMENTO TECNOLOGICO ES SUSCEPTIBLE DE APLICARSE A CUALQUIER ESCALA RELATIVA A LA MAGNITUD DEL ALOJAMIENTO A SOLUCIONAR Y COMPATIBLE CON LOS CONCEPTOS TRADICIONALES DE EDIFICACION MUNDIAL. LO QUE PERMITE TANTO LA ELABORACION DE PROGRAMAS Y LA ASIGNACION DE RECURSOS EN SU JUSTA MEDIDA, COMO ASIMISMO ADAPTARLOS, OPTIMIZANDOLOS, DE ACUERDO AL GRADO DE DESARROLLO DE LAS COMUNIDADES, SIN MENOSCABO DE LA IDENTIFICACION DEL USUARIO CON SU ENTORNO CULTURAL EXISTENTE.

3.— EL NUEVO ELEMENTO, DE TECNOLOGIA SENCILLA, PERMITE NUEVAS FORMAS DE EXPRESION ARQUITECTONICA DE LA VIVIENDA MASIVA LLEVANDO IMPLICITA LA RELACION DURABILIDAD, SEGURIDAD, SALUBRIDAD Y ECONOMIA.

B.— DEFINICION DEL ELEMENTO TECNOLOGICO Y DESCRIPCION

1.— ES DEFINIDO COMO UNA PLACA MALLA ESTRUCTURAL ALVEOLAR, PLACA MAESTRA, QUE CONFORMA UN ELEMENTO CONSTRUCTIVO DE CARAS PARALELAS, DOTADO DE ESPACIOS INTERIORES LLENOS Y VACIOS, CARACTERIZADA POR ESTAR FABRICADA DE UNA SOLA PLANCHA DE MATERIAL LAMINADO EN LA QUE SE PRACTICAN CORTES, PLEGADOS Y UNIONES, QUE CONFORMAN UN ENTRAMADO DE FORMAS GEOMETRICAS QUE CONECTAN Y SEPARAN LAS CARAS PARALELAS.

2.— LA PLACA MAESTRA ES OBTENIDA MANUAL O MECANICAMENTE A PARTIR DE UN SOLO ELEMENTO, MEDIANTE UNA SUCESION DE PARES DE CORTES SIMETRICOS OPUESTOS Y/O ALTERNADOS ENTRE SI, Y PLEGADO PARCIAL DEL MISMO Y POSTERIOR UNION DE ALGUNOS PUNTOS DE CORTE NO PLEGADOS, CON APROVECHAMIENTO TOTAL DEL ELEMENTO ORIGINAL.

2.1. LA RELACION ENTRE PLACA MAESTRA Y LA MINA ORIGINAL, COMO APROVECHAMIENTO DE LA MISMA, ES DE 75:100 EN EL SENTIDO DEL PLEGADO Y 100:100 EN SU OTRO SENTIDO.

2.2. LA PLACA MAESTRA PRESENTA DOS CARAS PARALELAS OPUESTAS CUYAS SUPERFICIES ESTAN CONSTITUIDAS POR FIGURAS GEOMETRICAS LLENAS Y VACIAS PROPORCIONAL Y PERIODICAMENTE EN UNA RELACION MAYOR DE SUPERFICIES LLENAS QUE VACIAS.

2.3. AMBAS CARAS PRESENTAN UNA DISPOSICION TAL, QUE ENFRENTANDO A CADA FIGURA GEOMETRICA LLENA, SE OPONGA UNA FIGURA VACIA, NO PERMITIENDO LA VISION DIRECTA A TRAVES DE ELLA.

2.4. LOS ELEMENTOS CONECTORES SEPARADORES DE AMBAS CARAS PARALELAS, SON PARTE CONSTITUTIVA E INTEGRAL DEL MISMO MATERIAL ORIGINAL SIN CORTES NI UNIONES Y DISPUESTOS EN TAL FORMA QUE CONTITUYEN UN ENTRAMADO ESTEREOMETRICO REGULAR EN AMBOS SENTIDOS DEL ESPACIO INTERIOR, EN FORMA TRAPEZOIDAL EN RELACION A LAS CARAS PARALELAS.

2.5 EL ENTRAMADO ESTEREOMETRICO INTERIOR CONFORMA VOLUMENES GEOMETRICOS IGUALES, PERIODICAMENTE ALTERNADOS Y CONTRARIOS, PERFECTAMENTE ENCAJABLES ENTRE SI, Y CUYA TOTAL SUCESION CONSTITUYE, VOLUME TRICAMENTE, MODULOS ALVEOLARES TOTALMENTE INTERCONECTADOS.

2.6. LAS UNIONES, DEL MISMO MATERIAL, SIEMPRE SE ENCUENTRAN EN LAS CARAS PARALELAS, Y EN FORMA ALTERNADA, UNA RESPECTO DE LA OTRA, DE TAL MODO QUE ENFRENTANDO INTERIORMENTE LAS CARAS PARALELAS, SIEMPRE QUE EN UN SECTOR DE LA PLACA, SE PRESENTA UNION, EN LA CARA OPUESTA EXISTE UNA SUPERFICIE CONTINUA, SIN UNIONES.

C.— CAMPO DE APLICACION

EL CAMPO DE APLICACION DE LA PLACA MAESTRA DE ACUERDO AL EMPLEO DE DIVERSOS MATERIALES PARA SU CONFECCION: ACERO, FIBRA DE VIDRIO, ABESTOCEMENTO, CELULOSA, FIBRAS CON AGLOMERANTES Y OTROS, TODOS ELLOS RELLENOS HOMOGENEOS DISTINTAMENTE CON HORMIGON, HORMIGON LIVIANO, POLIURETANO, POLIESTIRENO, YESO, VIRUTA O ALEACION DE LOS MISMOS U OTROS, PERMITEN CONFORMAR A MODO DE SIMPLE EJEMPLO NO LIMITANTE: MUROS, TABIQUES, CIELOS, TECHUMBRES, CIELOS TECHOS, PISOS FALSOS, SILOS, PISCINAS, DUCTOS, ESTANQUES, FUSELAJES, EMBARCACIONES, CHASSIS, DIFUSORES, FILTROS, ETC.

CABE ACOTAR AL RESPECTO QUE LA PLACA MAESTRA PUEDE OBTENERSE TAMBIEN, POR MOLDEO.

LA PLACA EN SI CONFORMA UN ELEMENTO QUIEBRAVISTA, QUIEBRASOL, CORTAVIENTOS, MALLA DE TIERRA, REVESTIMIENTO ACUSTICO Y BASE FUNDAMENTAL DE COLECTORES SOLARES.

DEL MISMO MODO ACEPTA LA CONFECCION DE ELEMENTOS DE CONSTRUCCION, SIMPLEMENTE REVISTIENDOLA, SIN RELLENO.

DENTRO DE ESTA VASTA GAMA DE POSIBILIDADES, SE PLANTEA PARA EFECTOS DE APLICACION TECNOLOGICA A LA VIVIENDA SOCIAL, EL USO DE LA PLACA MAESTRA ORIGINADA DE UNA SOLA LAMINA DE ACERO, DE SUPERFICIE RUGOSA Y ESPESOR MINIMO, RELLENA CON HORMIGON LIVIANO.

D. CARACTERISTICAS Y VENTAJAS ALTERNATIVAS

LA PLACA MAESTRA CONFORMA UN ELEMENTO ESTRUCTURAL PARA SER UTILIZADO EN TODOS AQUELLOS ENVOLVENTES QUE CONFORMAN UNA EDIFICACION, APORTANDO VERSATILIDAD, RAPIDEZ, ECONOMIA Y OTROS BENEFICIOS A LA SOLUCION DE LA VIVIENDA SOCIAL.

1. FACILIDAD DE EJECUCION.
LA PLACA MAESTRA PUEDE OBTENERSE MEDIANTE UN PROCESO INDUSTRIAL A GRAN ESCALA, O BIEN MANUALMENTE DE ACUERDO A LA MAGNITUD Y ESCALA DEL PROBLEMA A SOLUCIONAR.
2. CONCEPTO ESTRUCTURAL.
ES UNA ESTRUCTURA ESTEREOMETRICA SOLIDARIA EN QUE LOS ESFUERZOS MAYORES A QUE ESTAN SUJETOS LAS CARAS EXTERIORES ESTA RESUELTO, PROPORCIONANDO LA MAXIMA SUPERFICIE LLENA, PARA ELLO.
LA CONCEPCION DE LOS CONECTORES-SEPARADORES COMO UN TODO INTEGRANTE DE AMBAS CARAS, SIN CORTES NI UNIONES, Y A SU ESPECIAL DISPOSICION ESTEREOMETRICA, CONFIEREN A LA PLACA, UN TRABAJO SOLIDARIO DEL CONJUNTO, OPTIMIZANDO Y RACIONALIZANDO EL USO Y EMPLEO DE MATERIAL.
3. VERSATILIDAD.
EL USO DE LA PLACA MAESTRA, COMO UN SOLO ELEMENTO DE MURO CONTINUO PERMITE LA EJECUCION DE GRANDES SUPERFICIES CONTINUAS ENVOLVENTES, SIN ADICION DE ELEMENTOS DE UNION. PUDIENDO LEVANTARSE INTEGRAMENTE LA VIVIENDA Y DESPUES HORMIGONARLA.
PERMITE LA EJECUCION DE ELEMENTOS MODULARES, FACTIBLES DE SER PREFABRICADOS Y MONTADOS DIRECTAMENTE EN OBRA, DEBIDO A SU BAJO PESO RELATIVO Y FACILIDAD DE TRANSPORTE Y ALMACENAMIENTO.
PERMITE LA OBTENCION DE FORMAS Y SUPERFICIES PLANAS Y CURVAS (POLIGONALES)
4. COMPATIBILIDAD.
SU EMPLEO ES COMPATIBLE CON ELEMENTOS TRADICIONALES DE HORMIGON ARMADO, ALBAÑILERIAS O ESTRUCTURAS METALICAS, SIENDO PERFECTA LA EVENTUAL UNION CON ELLOS.
5. ECONOMIA.
COMPARATIVAMENTE ES MAS ECONOMICA QUE LOS TABIQUES PREFABRICADOS CONVENCIONALES AL OPTIMIZARSE EL APROVECHAMIENTO DEL MATERIAL Y AL NO REQUERIR DE ELEMENTOS ESTRUCTURANTES INTERIORES ADICIONALES.
REFERENTE A MALLAS CONVENCIONALES, LA PLACA MAESTRA NO REQUIERE DEL USO DE MOLDAJES, PUDIENDO HORMIGONEARSE POR CUALQUIERA DE SUS SEIS CARAS YA SEA MANUALMENTE O EN FORMA MECANICA MEDIANTE EL SISTEMA DE HORMIGON PROYECTADO, PERMITIENDO ADEMAS SU INMEDIATA TERMINACION, SIN ADICION DE ESTUCO.
SU PROCESO DE LLENADO, JUNTO A TODAS SUS CARACTERISTICAS, FACILITA SU EVENTUAL EMPLEO COMO ELEMENTO DE PREFABRICACION MODULAR COMO ALTERNATIVA AL SISTEMA CONTINUO.
6. RAPIDEZ Y FACILIDAD DE EJECUCION.
EL HECHO DE SER UN ELEMENTO AUTOSOPORTANTE PERMITE SU MONTAJE INMEDIATO IN SITU Y SU POSTERIOR LLENADO CON HORMIGON PROYECTADO, PUDIENDO DEJARSE INCORPORADO PREVIAMENTE TODAS LAS INSTALACIONES QUE SE REQUIERAN, OBTENIENDO ADEMAS EN FORMA INMEDIATA LA SUPERFICIE DE ACABADO.
SU EVENTUAL PREFABRICACION MODULAR PERMITE SU INMEDIATO MONTAJE,
SU RAPIDEZ INCIDE DIRECTAMENTE EN LA RELACION COSTO-BENEFICIO, REDUCIENDO EL COSTO FINANCIERO Y LOS PLAZOS DE ENTREGA DE VIVIENDAS EN BENEFICIO DE LA INVERSION Y DEL USUARIO.
7. ADICION DE ELEMENTOS
LA ESPECIAL CONFORMACION INTERIOR DE LA PLACA, PERMITE INCORPORAR A ELLA TENSORES Y/O BARRAS DE ACERO PARA LOGRAR MAYORES SOLICITACIONES MECANICAS SI FUERAN REQUERIDAS POR CALCULO, SIN LIMITACION DE SU SENTIDO DIRECCIONAL, AUN EN FORMA SIMULTANEA.
LA CONFORMACION ESPACIAL DE SUS ALVEOLOS PERMITE DEJAR INCORPORADOS TODOS AQUELLOS ELEMENTOS DE ANCLAJE NECESARIOS PARA FUTUROS USOS: PERNOS, GANCHOS, TACOS DE MADERA, ETC.
8. LA PLACA PUEDE USARSE SIN RELLENO REVISTIENDO SOLAMENTE SUS CARAS, COMO TAMBIEN PERMITE REVESTIRLA Y LUEGO SI SE DESEA, RELLENARLA.
DEL MISMO MODO PERMITE EL EMPLEO DEL RELLENO, HORMIGON, COMO REVESTIMIENTO EXTERIOR, ESTUCO, MEDIANTE EL SIMPLE REBALSE E INMEDIATO AFINADO.
9. EL EMPLEO DE LA PLACA MAESTRA SATISFACE TODAS LAS NORMAS DE SALUBRIDAD Y SEGURIDAD, Y OTRAS COMUNES DEL HORMIGON ARMADO CONVENCIONAL, DEBIDAMENTE OPTIMIZADO.
10. LA PLACA MAESTRA PERMITE LA CONFECCION DE SUPERFICIES DE CUBIERTAS QUE SUPERAN EL CONCEPTO DE LOSA CONVENCIONAL O LOSA PREFABRICADA, POR SU FACULTAD DE ABSORBER Y TRANSMITIR LOS MOMENTOS NEGATIVOS EN ATENCION A SU DISEÑO, Y SIN PERJUICIO DE EVENTUALES REFUERZOS MULTIDIRECCIONALES Y DEL HECHO DE PODER PROYECTARSE EL HORMIGON POR CUALQUIERA DE SUS CARAS.
11. EL EMPLEO DE PLACA MAESTRA EN EL ELEMENTO PREFABRICADO CIELO-TECHO PERMITE LA SOLUCION TOTAL DE: LA ESTRUCTURA DE TECHUMBRE SOMETIDA A CARGAS, LA CUBIERTA, LA REFLECCION SOLAR, LA BARRERA DE VAPOR, EL AISLANTE, EL CIELO INTERIOR PERFECTAMENTE TERMINADO, Y LA INSTALACION ELECTRICA NECESARIA, CUBRIENDO TODOS LOS RECINTOS QUE CONFORMAN UNA VIVIENDA.
12. FINALMENTE EL USO DE LA PLACA PERMITE LA SOLUCION DEL EQUIPAMIENTO COMUNITARIO EN FORMA OPTIMA, COMO ASIMISMO LA SOLUCION DE PROBLEMAS DE INFRAESTRUTURA DE URBANIZACION EN VIVIENDAS SOCIALES SIENDO PERFECTAMENTE FACTIBLE SU USO EN VIALIDAD URBANA, ADUCCIONES DE AGUAS, ESTANQUES Y OTROS QUE EL PROYECTISTA CONSIDERE, MEJORANDO LA CAPACIDAD EFECTIVA DE LOS RECURSOS EXISTENTES, INCLUYENDO LOS ENERGETICOS, COMO BASE CONSTITUTIVA FUNDAMENTAL DE COLECTORES SOLARES, OPTIMIZADOS, DE DOBLE CIRCUITO.

• "PLACA MALLA ESTRUCTURAL ESTEREOMETRICA ALVEOLAR" PATENTE DE INVENCION EN TRAMITE
• PRIMER PREMIO CONCURSO NACIONAL DE INVENTOS 66'

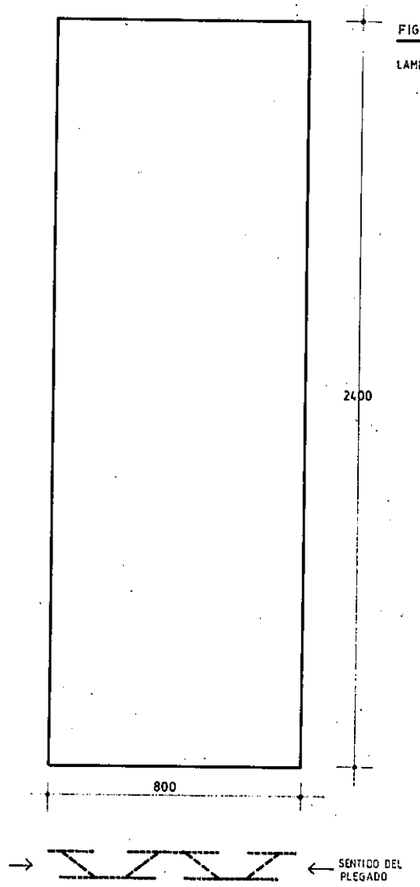


FIGURA 1
LAMINA ORIGINAL

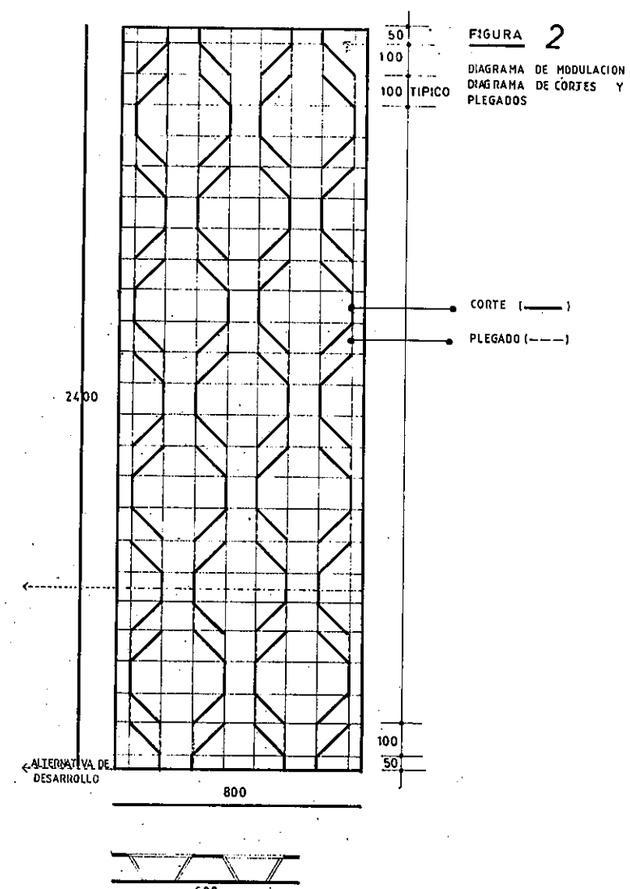
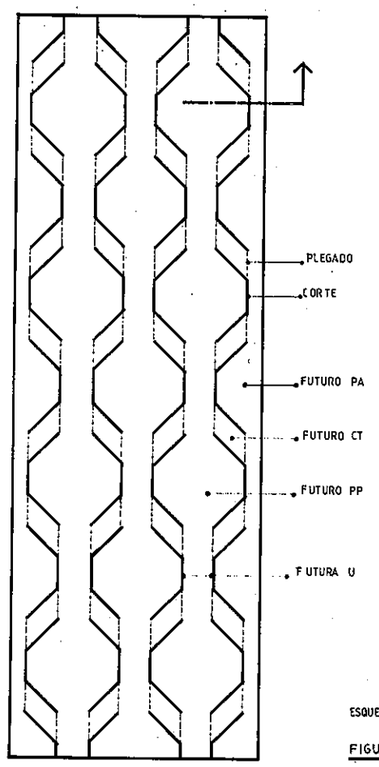
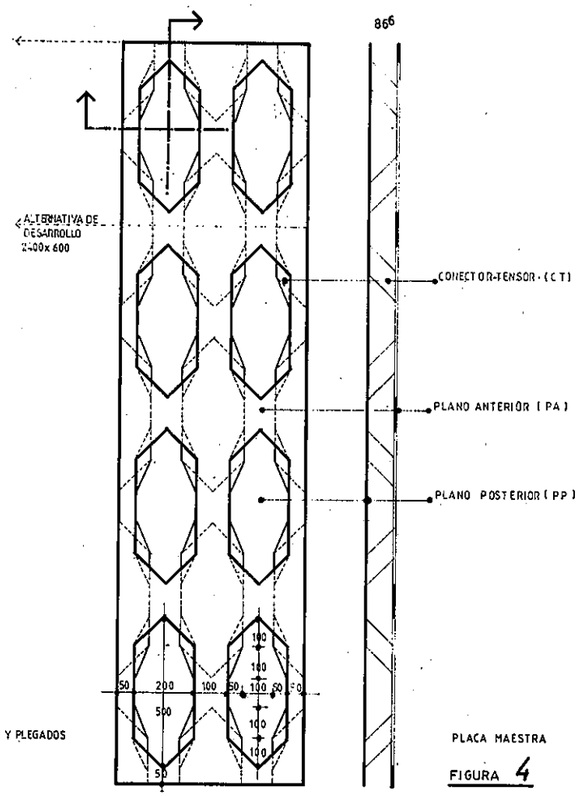


FIGURA 2
DIAGRAMA DE MODULACION
DIAGRAMA DE CORTES Y PLEGADOS



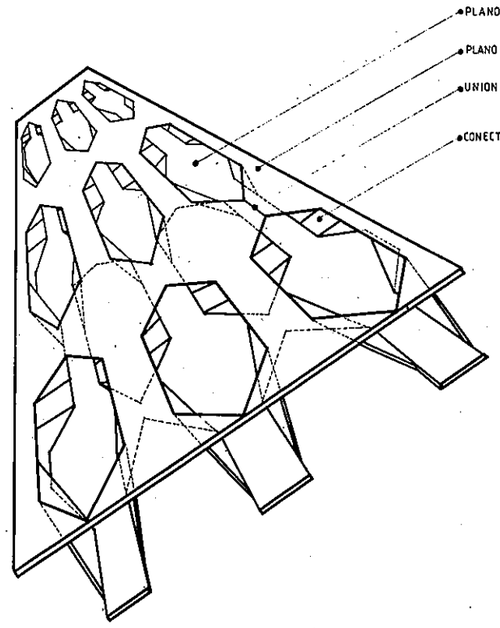
ESQUEMA DE CORTES Y PLEGADOS
FIGURA 3



PLACA MAESTRA
FIGURA 4

FIGURA 5

VISTA EXTERIOR GENERICA
DE UNA SECCION DE PLACAS
UNIDAS



SUPERFICIE PA= SUPERFICIE PP= 45% VACIOS, 55% LLENOS.

FIGURA 6

VISTA INTERIOR PARCIAL

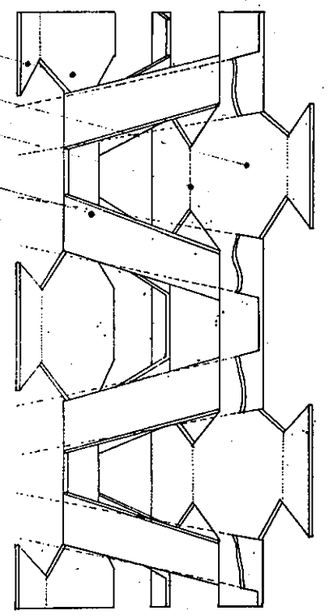


FIGURA 9

PLACA CIELOTECHO
VISTA DE CIELO
(PLEGADO: ALTERNATIVA DE
DESARROLLO).

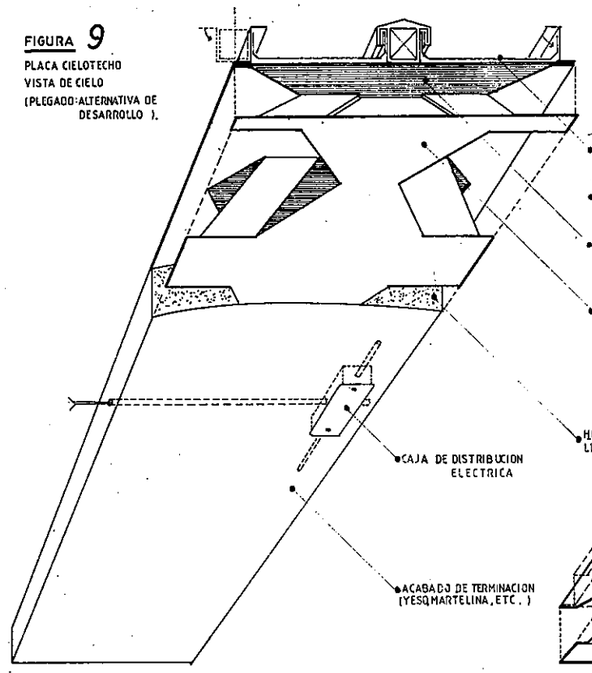
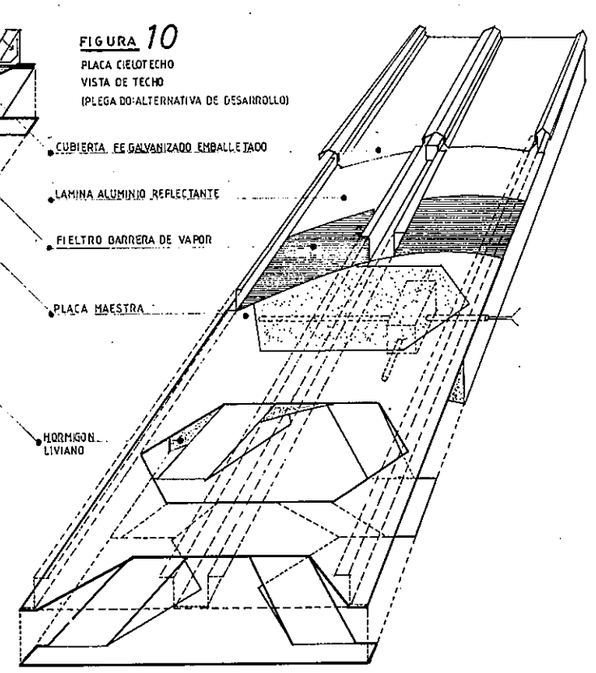
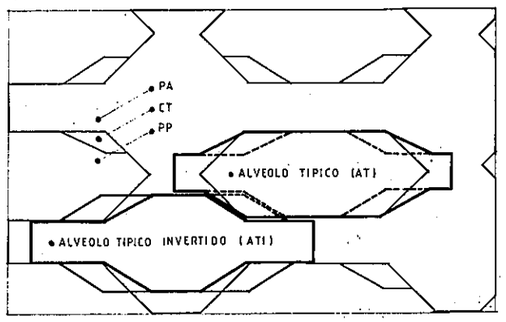
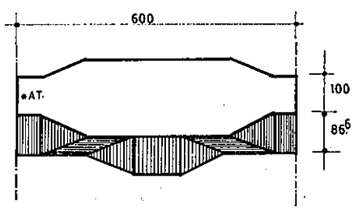


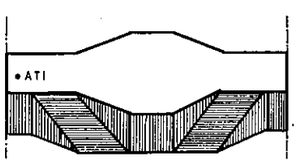
FIGURA 10

PLACA CIELOTECHO
VISTA DE TECHO
(PLEGADO: ALTERNATIVA DE DESARROLLO)



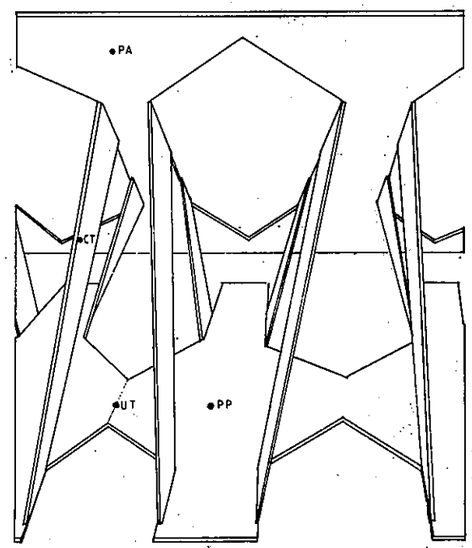






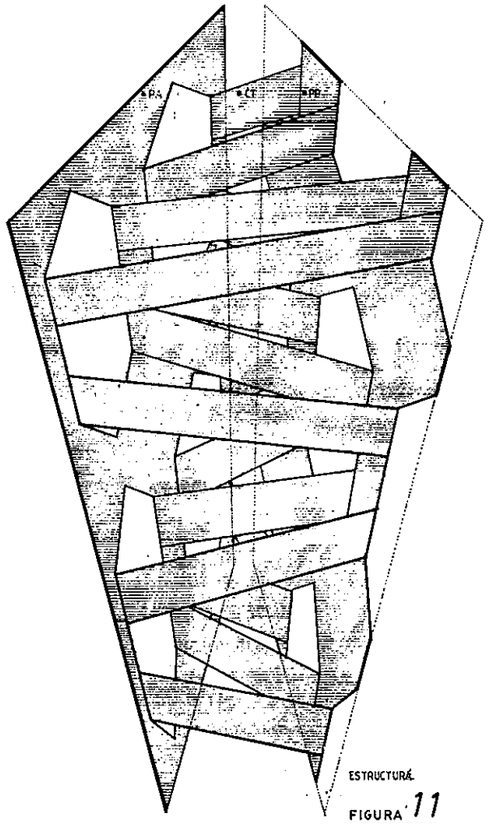
DISPOSICION DE ALVEOLOS

FIGURA 7



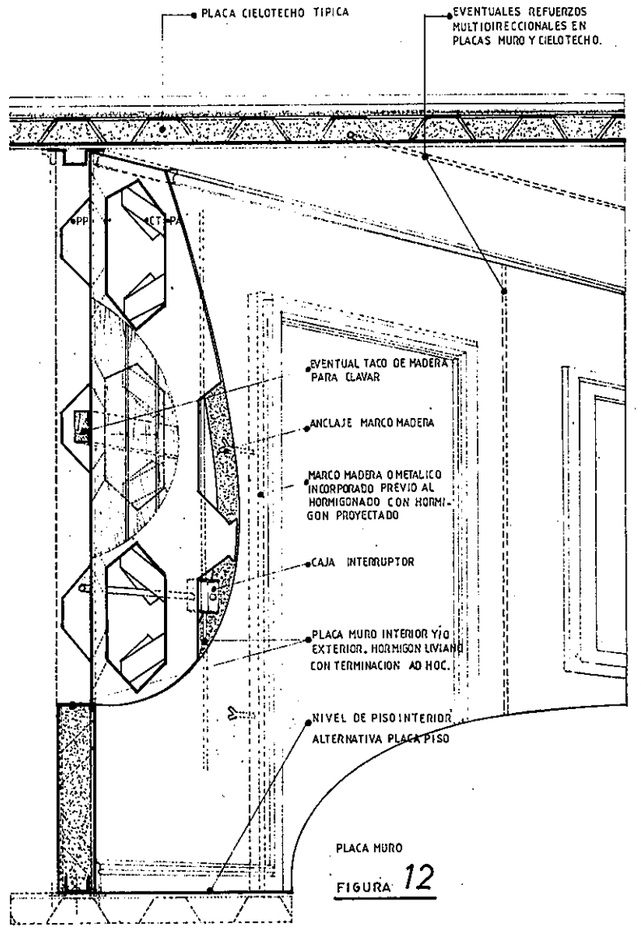
VISTA INTERIOR PARCIAL

FIGURA 8



ESTRUCTURA

FIGURA 11



PLACA MURO

FIGURA 12

30426365 SECTOR III

UNA NUEVA TECNOLOGIA

El invento tiene por título: estructura de edificio de armazón fijo y elementos habitables móviles.

El método de construcción que aquí se propone se enmarca dentro de la utilización de elementos prefabricados tridimensionales ligeros en la construcción.

Dicho método tiene como fin el proporcionar una solución original al problema de una vivienda moderna, reduciendo al mínimo las estructuras fijas de los edificios y completando estas esctructuras fijas con estructuras móviles, fáciles de instalar y de quitar; de este modo la vivienda del hombre moderno cubre las exigencias más variadas: el hogar ya es transladable, sustituible de manera fácil y rápida con sistemas de tipo industrial o artesanal. Al mismo tiempo se evitan los desperdicios, se reducen los costes, y, debido a una gran flexibilidad en la construcción y en el uso, se facilitan los asentamientos.

*

Más exactamente la estructura del edificio está compuesta por: un armazón fijo llamado SETA (estructura tridimensional de ensamblaje) que incluye también la techumbre, los paneles para paredes exteriores, accesos a los diferentes niveles, instalaciones de servicio y una pluralidad de elementos habitables móviles llamados "PARDAS" (abreviatura de paralelepipedo) con servicios y complementos; tales elementos se suman al armazón fijo, cada uno de modo intercambiable.

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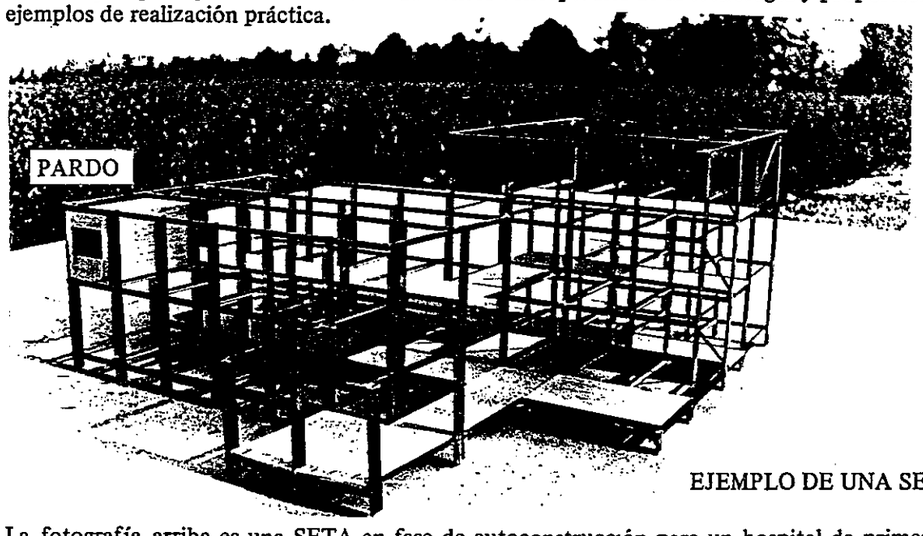
Los dibujos que siguen aclaran los fundamentos conceptuales de la tecnología y proporcionan algunos ejemplos de realización práctica.

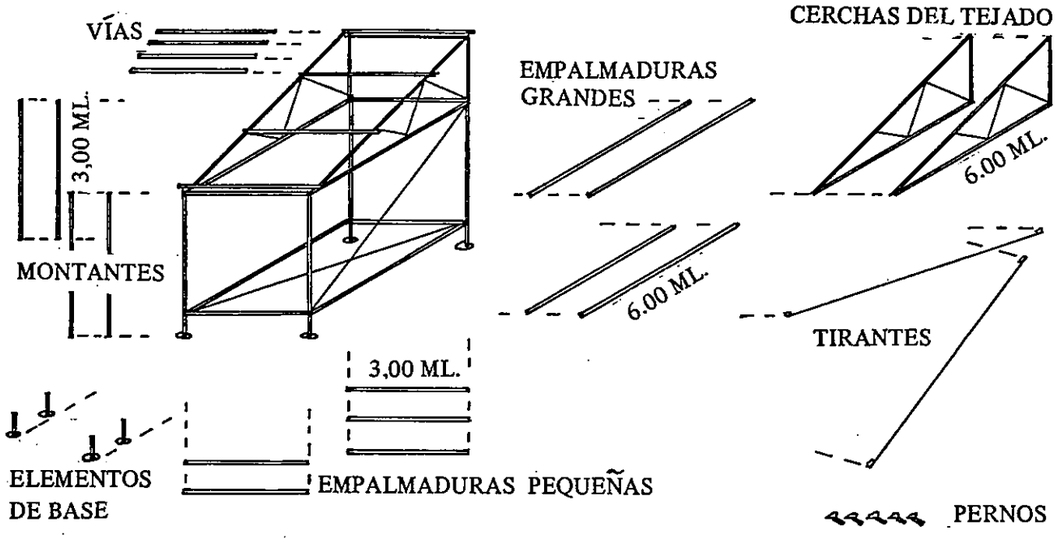


EJEMPLO DE UNA SETA

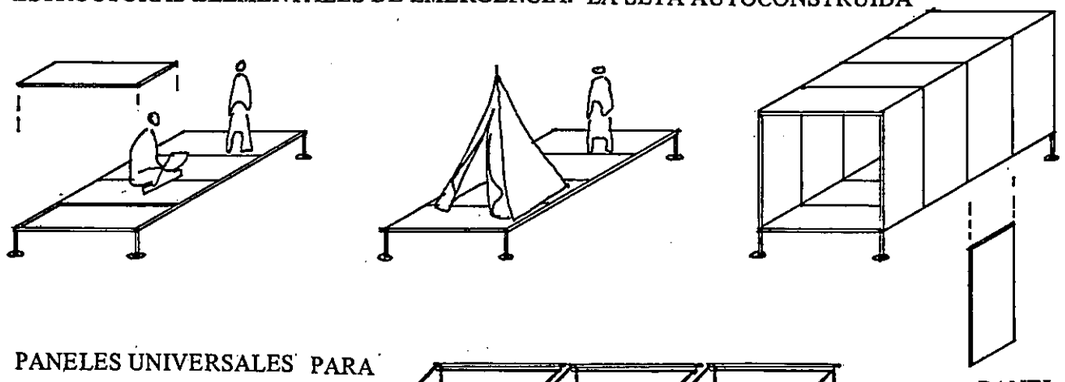
La fotografía arriba es una SETA en fase de autoconstrucción para un hospital de primeros auxilios en zona sísmica: el peso ligero del edificio "pardico" (correspondiente a la mitad de un edificio tradicional) y su estructura constituída por partes no fuertemente conectadas, permite la mejor adaptación a los movimientos sísmicos.

¡ HAZLO TU MISMO!

LOS ELEMENTOS CONSTRUCTIVOS DE LA SETA AUTOCONSTRUIDA Y DESPUÉS UNIDAS CON PERNOS FIJOS

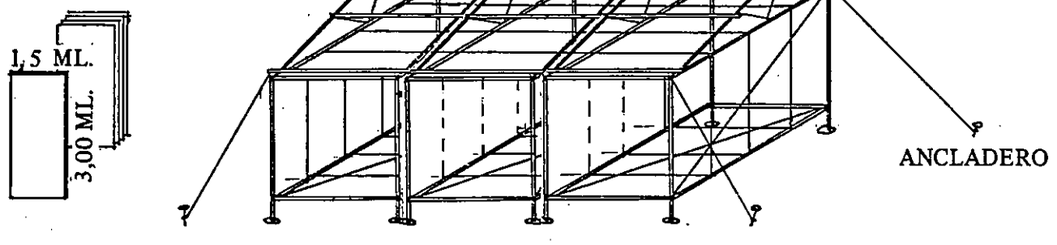


ESTRUCTURAS ELEMENTALES DE EMERGENCIA: LA SETA AUTOCONSTRUIDA

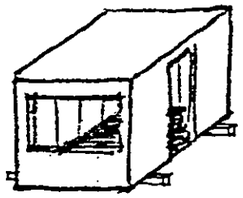


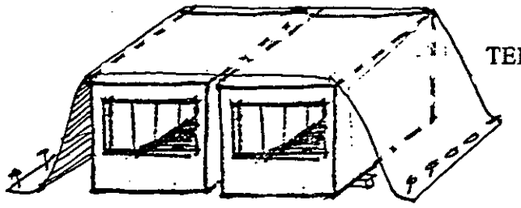
PANELES UNIVERSALES PARA SUELOS, TECHOS Y PAREDES.

PANEL



ESTRUCTURAS ELEMENTALES DE EMERGENCIA: LAS PARDAS





TELÓN

LA SETA EN COMPAÑÍA DE LAS PARDAS

1°- SETA

2°- PARDO EN FASE DE MONTAJE....

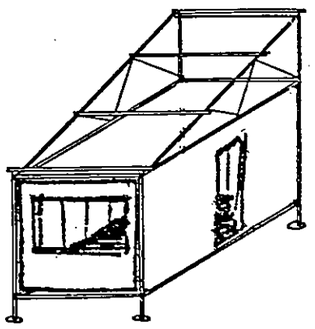
3°- CON LAS PARDAS MONTADAS...

4°- ENCIERRO

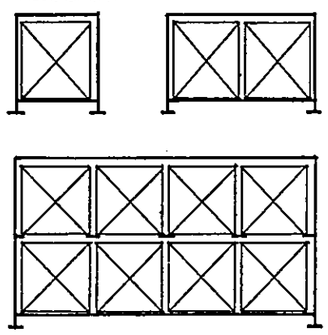
5°- VENTANA

6°- PANELES UNIVERSALES PARA SUELOS, TECHOS Y PAREDES.

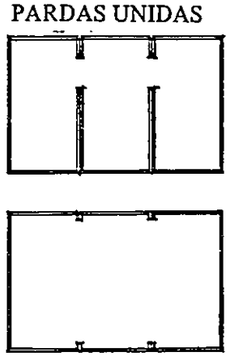
ESQUEMA CONSTRUCTIVO



SECCIÓN

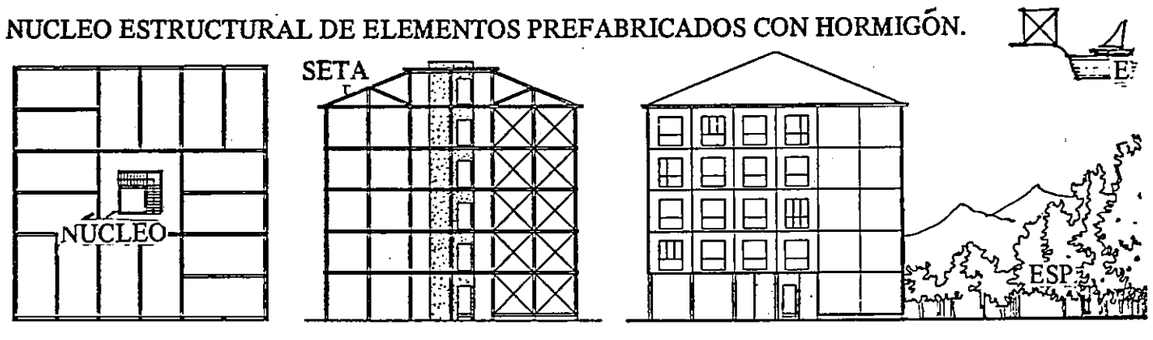


PARDAS UNIDAS

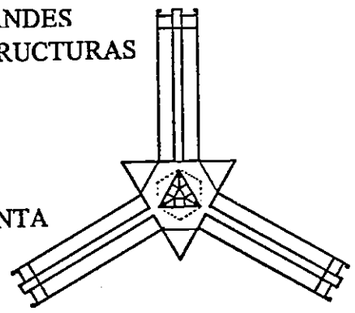


PUERTO DE LAS PARDAS PARA UNA, DOS, TRES FAMILIAS: LA SETA SE PUEDE MODIFICAR CON EL TIEMPO.

NUCLEO ESTRUCTURAL DE ELEMENTOS PREFABRICADOS CON HORMIGÓN.

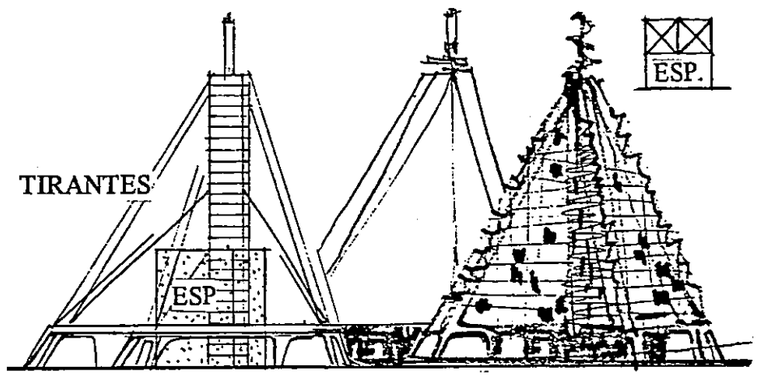


GRANDES ESTRUCTURAS

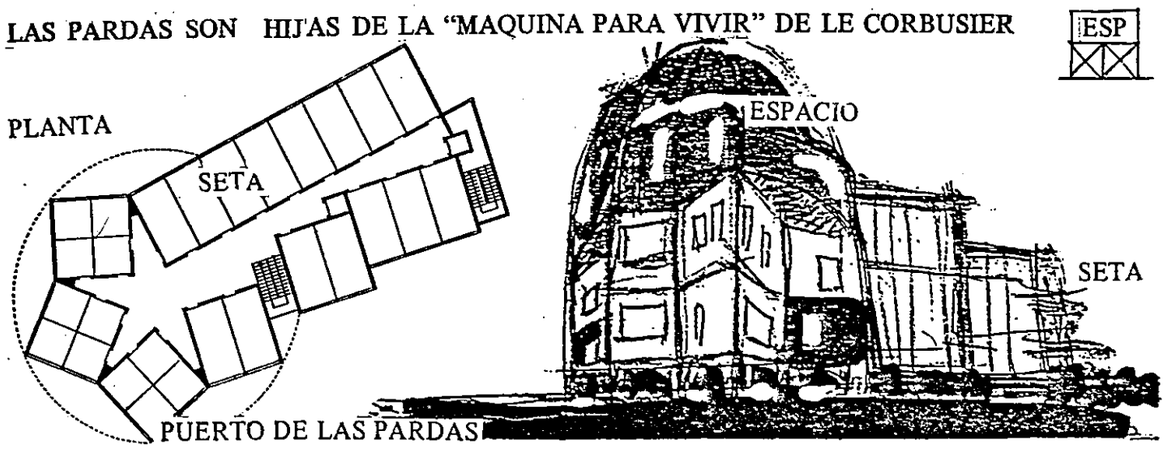


PLANTA

TIRANTES



LAS PARDAS SON HIJAS DE LA "MAQUINA PARA VIVIR" DE LE CORBUSIER



CINTUS
SECTION III

INTERLOCKED BLOCK WALLING WITH INTERLOCKED WALL BLOCK LINTOLS. KEY CONSTRUCTION FOR STRAIGHT LINTOLS.

CHARACTERISTICS:SUITABLE FOR APPROPRIATE,EARTHQUAKE RESISTANT BUILDING. DRY WALLING WITH WALL BLOCKS AND INTERMEDIATE INLAID DISCS.LINTOLS COMPOSED OF MODIFIED WALL BLOCKS.

THE POOR BUILDERS PROBLEM - THE CHALLENGE TO THE ARCHITECTS.

MILLIONS OF POOR PEOPLE LIVE TODAY IN REGIONS PRONE TO EARTH QUAKES. BUT THEY CANNOT AFFORD TO HAVE SAFE SHELTER.THEREFORE THEY DESPERATELY NEED AFFORDABLE,EARTH QUAKE RESISTANT SHELTER.

CRITERIA FOR SOLUTIONS TO THE PROBLEM

-AVAILABILITY OF THE NECESSARY MATERIAL
-LOW COST
-ADAPTABILITY TO SELF-HELP CONSTRUCTION
-ACCEPTABLE STRUCTURAL STABILITY AND STRENGTH
-ALLOWING NORMAL SIZE OPENINGS FOR DOORS AND WINDOWS.

THE PROPOSED SOLUTION:INTERLOCKED WALL BLOCKS DRY WALLING

THE PROPOSED SOLUTION SATISFIES THE ABOVE LISTED CRITERIA:

SPECIFIC CHARACTERISTICS OF THE PROPOSED SOLUTION

HORIZONTAL INTERLOCKING OF WALL BLOCKS BY USING INTERMEDIATE DISCS.
INTERLOCKING WITH A SMALL LOOSE ALLOWS FOR SLIGHT,LIMITED,HORIZONTAL FLEXIBILITY.
INTERLOCKING OF WALLS,WALL CORNERS AND CROSSING WALLS.
INTERLOCKED LINTOL CONSTRUCTION :
ADAPTABLE TO VARIOUS WALL BLOCK MODULES.

CONSTRUCTION AND PRODUCTION OF THE WALL BLOCKS AND INTERMEDIATE DISCS

THE CONSTRUCTION BUILDS UPON THE FACT THAT SEISMIC FORCES ARE MAINLY LATERAL SCHOCK WAVES,THE FIRST OF WHICH IS THE STRONGEST,FOLLOWED BY WEAKER ONES.
THE EFFECT OF SUCH A SCHOCK CAN BE DECREASED OR ELIMINATED IN A WALL IF THE WALL IS OF AN APPROPRIATE CONSTRUCTION,ALLOWING LIMITED FLEXIBILITY.THE PROPOSED CONSTRUCTION SATISFIES THIS CRITERIA.AND CAN THEREFORE BE CONSIDERED EARTHQUAKE RESISTANT.
THE LIMITED FLEXIBILITY IS ACHIEVED BY USING INTERLOCKING INTERMEDIATE DISCS BETWEEN THE WALL BLOCKS IN DRY WALLING.

INTERLOCKED WALL BLOCK LINTOL PRODUCTION

THE KEY BLOCK DIFFERS FROM AN ABOVE DESCRIBED WALL BLOCK IN THAT I HAS NO RECESSES AT ITS UNDER SIDE AND IT HAS SLIGHTLY OBLIQUE ENDS.THIS LATTER IS ACHIEVED BY INSERTING WEDGE-FORMED BLOCKINGS INTO THE MOULD BEFORE RAMMING THE MIX POURED INTO THE MOULD.
THE TWO BLOCKS ADJACENT TO THE KEY BLOCK ARE SIMILAR BUT HAVE ONLY ONE OBLIQUE END AND THEY HAVE ONLY ONE,DISPLACED,UPPER SIDE RECESS.

ORDINARY MORTAR JOINED WALL BLOCK LINTOL PRODUCTION

THE ORDINARY MORTAR JOINED LINTOL WALL BLOCKS DIFFER FROM THE INTERLOCKED ONES ONLY IN THAT THEY HAVE NO RECESSES OR HOLLOWS.

BUILDING THE INTERLOCKED BLOCK WALL AND ITS DITTO LINTOLS

BUILDING THE INTERLOCKED BLOCK WALL IS DRY WALLING WITH A DISPLACEMENT OF ONE HALF BLOCK MODULE FROM ONE WALL BLOCK LAYER TO THE NEXT ONE.
AT WALL CORNERS AND AT CROSSING WALLS THE WALLING CONSEQUENTLY RESULTS IN A CRISS-CROSS BOND.
AT WALL OPENINGS FOR DOORS AND WINDOWS INTERLOCKED WALL BLOCK LINTOLS ARE BUILT USING A TEMPORARY SUPPORT UNTIL THE WALL BLOCK LAYERS ON TOP OF THEM ARE BUILT.
WHEN THE BLOCK WALLING HAS REACHED THE TOP LEVEL OF THE OPENING TO BE BRIDGED BY THE KEY LINTOL,THE LINTOL BLOCKS ARE LAID INTO THEIR PROPER PLACE USING A TEMPORARY SUPPORT.THEN THE WALLING CONTINUES.DUE TO THE REDUCED LENGTH OF THE KEY BLOCK SOME FILLING IN IS REQUIRED AT THE ENDS OF THE LINTOL.THE WALLING IS CONTINUED AND FINALIZED.THE LINTOL IS NOW PRESSED BETWEEN BLOCK LAYERS BELOW AND ABOVE IT,THUS KEEPING IT FIRMLY IN PLACE AND MAKING IT FUNCTION AS A BEAM,TRANSFERRING ITS LOAD TO THE WALL BENEATH IT .

SEALING THE HAIR THIN OPEN WALL JOINTS

IN ORDER TO STOP DRAFT AND TO KEEP INSECTS OUTSIDE,THE OPEN WALL JOINTS CAN BE SEALED BY FILLING IN WITH A LEAN MATERIAL MIX,DURING OR AFTER THE WALLING.

FUNCTIONING OF THE WALL DURING AN EARTH QUAKE

WHEN A BUILDING WITH WALLS OF THE INTERLOCKED TYPE IS EXPOSED TO AN EARTH QUAKE,THE INITIAL SCHOCK CAUSES THE WALL BLOCK LAYERS TO SLIDE IN RELATION TO EACHOTHER AT THE OPEN JOINTS.THE SLIDING IS TRANSMITTED FROM THE LOWER JOINTS THROUGHOUT THE WALL TO ITS TOP.BUT THE INTERLOCKING CONSTRUCTION LIMITS THE SLIDING WHICH SIMILARLY FOLLOWS THE SLIDING ALL THE WAY UP TO THE TOP OF THE WALL.THEN FOLLOWS THE REACTION WHEN THE SCHOCK ABATES AND THIS CAUSES A RETURN SLIDING,AGAIN LIMITED BY THE INTERLOCKING CONSTRUCTION.REPEATED SCHOCKS CAUSE REPEATED WAVES OF LIMITED SLIDING OF THE WALL BLOCKS.IMPORTANT STABILIZING WALL ZONES ARE THE WALL CORNERS AND CROSS POINTS.

THE WALL BLOCK CONSTRUCTION

THE WALL BLOCK,OF NORMAL SIZE AND OUTER FORM,IS PROVIDED WITH FOUR RECESSES,TWO AT ITS UNDER SIDE AND TWO AT ITS UPPER SIDE.THE RECESSES ARE SYMMETRICALLY LOCATED,SQUARE,AND HAVE BEVELLED SIDES.
THE SYMMETRICAL LOCATION ALLOWS INTERLOCKED WALLING WITH NORMAL HALF BLOCK MODULE HORIZONTAL DISPLACEMENT OF BLOCK LAYERS AND NORMAL CORNER WALLING.THE SQUARE FORM ALLOWS INTERLOCKING IN ALL HORIZONTAL DIRECTIONS.THE SLIGHT BEVELLED SIDES MAKES PRODUCTION AND WALLING EASY.
THE UPPER RECESSES ARE PROVIDED WITH A BOTTOM BUT THE LOWER ONES ARE JUST MOUTHS OF HOLLOWS.

THE DISC CONSTRUCTION

THE DISC HAS A FORM THAT MAKES IT FIT ALMOST EXACTLY INTO THE RECESS OF THE WALL BLOCK;THERE IS BETWEEN THE TWO A LOOSE OF ONLY ABOUT 1 MM.

THE WALL BLOCK PRODUCTION

THE WALL BLOCKS ARE PRODUCED IN MOULDS OF COMMON TYPE OF TIMBER OR METAL PROVIDED WITH A RAM.SUCH SIMPLE MOULDS ARE FOUND IN MOST COMMUNITIES WITH BUILDING ACTIVITY.A SELF-HELP BUILDER CAN EVEN MAKE HIS OWN ONE. BUT THE BLOCKINGS IN THE MOULD HAVE TO BE OF REQUIRED SIZE AND FORM IN ORDER TO GIVE THE REQUIRED TYPE OF BLOCK.
THE APPROPRIATE MIX OF SOIL OR AGGREGATE,CEMENT AND WATER IS POURED INTO THE MOULD AND RAMMED.THE NEW WALL BLOCK IS REMOVED FROM THE MOULD AND CURED BEFORE WALLING.

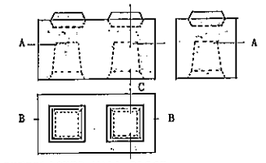
THE DISC PRODUCTION

THE DISCS ARE PRODUCED,SINGLE OR IN SETS,IN SIMPLE MOULDS OF TIMBER,SOIL CEMENT OR METAL.A SELF-HELP BUILDER CAN MAKE HIS OWN MOULDS.THE MOULD CAN COMPRISE OF TWO HALVES WITH ONE OR MORE RECESSES SIMILAR TO THOSE OF THE WALL BLOCKS.
THE APPROPRIATE MIX OF SOIL OR AGGREGATE,CEMENT AND WATER IS POURED INTO THE MOULD HALVES WHICH THEREAFTER ARE RAMMED TOGETHER.THE NEW DISC,OR DISCS,ARE REMOVED FROM THE MOULD AND CURED BEFORE WALLING.

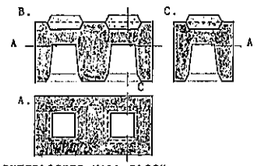
THE LINTOL CONSTRUCTION

THE LINTOL CONSTRUCTION BUILDS UPON THE AGE OLD KEY CONSTRUCTION,USED IN ARCHES OVER WALL OPENINGS;A WEDGE-FORMED KEY STONE AT THE TOP OF THE ARCH.THE ACTUAL PROPOSAL ADAPTS THE CONSTRUCTION TO A STRAIGHT LINTOL. THREE,SLIGHTLY MODIFIED,WALL BLOCKS ARE COMBINED AND FORM A BEAMLIKE LINTOL OVER THE WALL OPENING.COMPRESSED BETWEEN WALL BLOCK LAYERS THEY CONVEY THE WEIGHT AND LOAD CARRIED BY THEM TO THE WALL PART BELOW.

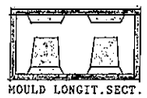
INTERLOCKED WALLING



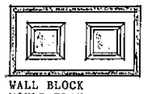
INTERLOCKED WALL BLOCK PLAN AND ELEVATIONS.



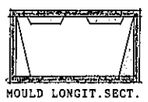
INTERLOCKED WALL BLOCK SECTIONS.


MOULD LONGIT.SECT.


CROSS SECT.


WALL BLOCK MOULD PLAN.

INTERLOCKED WALL BLOCK AND LINTOL BLOCK MOULDS WITH BLOCKINGS OUT AND RAM.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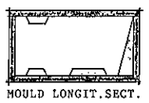
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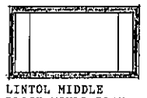
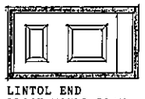
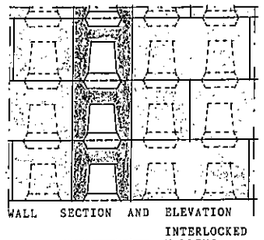
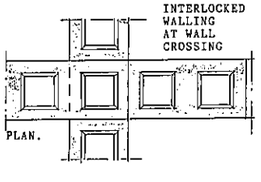
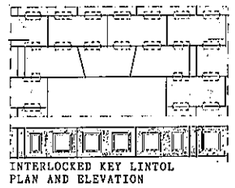
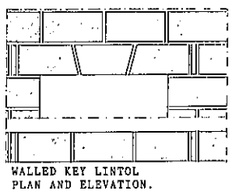

LINTOL MIDDLE BLOCK MOULD PLAN.


LINTOL END BLOCK MOULD PLAN.


WALL SECTION AND ELEVATION


INTERLOCKED WALLING AT WALL CROSSING
PLAN.


INTERLOCKED KEY LINTOL PLAN AND ELEVATION


WALLED KEY LINTOL PLAN AND ELEVATION.

ROOF COVERING ELEMENTS FOR SUN HEAT AND RAIN NOISE CUSHIONING

CHARACTERISTICS:SIMPLE,THIN AND LIGHT ELEMENTS OF SOFT NATURAL MATERIALS FORM A COVERING,CUSHIONING SHIELD ON TOP OF THE ROOF.

CINTUS SECTION III.

THE POOR BUILDERS PROBLEM - THE CHALLENGE TO THE ARCHITECTS.

TODAY MILLIONS OF PEOPLE,MOSTLY POOR PEOPLE,LIVE AND WORK UNDER ROOFS WHICH LACK SUN HEAT AND RAIN NOISE CUSHIONING FACULTIES AND THEREFORE, IN REGIONS WITH HOT AND/OR RAINY CLIMATE,ARE SUFFERING FROM HEAT AND/OR NOISE.LIVING,WORKING,RESTING OR SLEEPING IS ALMOST IMPOSSIBLE IN A TOO HOT ROOM AND THE DRUMMING OF RAIN ON A THIN SHEET ROOF DROWNS ANY TALKING.OBVIOUSLY POOR INDOOR CLIMATE IS UNHEALTHY TOO.
THESE ROOFS ARE MOSTLY MADE OF CORRUGATED OR PLAIN SHEETS OF THIN METAL OR FIBER CEMENT.IN MANY REGIONS CORRUGATED IRON SHEETS ARE THE ONLY ROOFING MATERIAL EVEN POOR PEOPLE CAN GET FOR THEIR SHELTER.
IN ORDER TO PROTECT THEMSELVES FROM THE ABOVE INCONVENIENCES SOME PEOPLE HAVE MANAGED TO BUILD A CEILING UNDER THE ROOF.THIS IS RELATIVELY EXPENSIVE AND NOT VERY EFFICIENT EITHER.FURTHERMORE,THE THUS CREATED SPACE BETWEEN ROOF AND CEILING,BEING MOSTLY ALMOST UNACCESSIBLE,COLLECTS DIRT AND PESTS AND BECOMES A SOURCE OF HEALTH HAZARDS FOR THE INHABITANTS.
THE SEVERE AND BIG PROBLEM TODAY FOR MILLIONS OF MOSTLY POOR PEOPLE IS: HOW TO GET A BEARABLE MICRO CLIMATE IN THE SHELTER?
THE THATCHED ROOF GIVES A COMFORTABLE MICRO CLIMATE BUT FIRE RISKS AND LIMITED MATERIAL AVAILABILITY MAKES IT NOT A SOLUTION FOR DENSELY BUILT AREAS.

CRITERIA FOR SOLUTIONS TO THE PROBLEM.

-AVAILABILITY OF NECESSARY MATERIAL
-LOW COST
-ADAPTABILITY TO SELF-HELP CONSTRUCTION
-FUNCTIONALITY
-ADAPTABILITY TO VARIOUS ROOFING MATERIALS AND ROOF TYPES
-SIMPLE CONSTRUCTION,PRODUCTION,BUILDING AND MAINTENANCE

THE PROPOSED SOLUTIONS:
SUN HEAT AND RAIN NOISE CUSHIONING,ROOF COVERING,ELEMENTS.

THE PROPOSED SOLUTIONS SATISFY ALL THE ABOVE CRITERIA.

BUILDING WITH THE PROPOSED TWO TYPES OF ROOF COVERING ELEMENTS.

BUILDING WITH THE MAT TYPE ELEMENT.

THE MAT TYPE ELEMENTS ARE LAID SIDE BY SIDE ON TOP OF THE ROOF,RUNNING FROM EAVE TO EAVE,ACROSS THE ROOF RIDGE,THUS COVERING THE ENTIRE ROOF. THE ELEMENTS ARE FIXED TO THE ROOF AT THE SAME POINTS AS THE ROOF SHEETS ARE FIXED TO THE UNDERLYING PURLINS.FIXING WITH FIBER STRING. AT THE EAVES THE ENDS OF THE ELEMENTS CAN BE FIXED TO THE ROOF TRUSSES ALSO.
FOR THE FIXING OF THE ELEMENTS TO THE ROOF,STICKS OR POLES CAN BE USED. THE STICKS OR POLES ARE LAID ON TOP OF THE ELEMENTS.AT THE JOINT BETWEEN TWO ELEMENTS.THE STICKS OR POLES RUN FROM ONE END OF THE ELEMENTS TO THE OTHER.AT A RIDGE OR HIP TWO STICKS OR POLES MEET AND ARE JOINED. THE ELEMENTS ARE TIED WITH FIBER STRING TO THE STICKS OR POLES,WHICH IN TURN ARE TIED TO THE ROOF AT THE POINTS WHERE THE ROOF SHEETS ARE FIXED TO THE PURLINS.THE LOWER ENDS OF THE STICKS OR POLES CAN BE FIXED TO THE ROOF TRUSSES ALSO.

BUILDING WITH THE FRAMED TYPE ELEMENT.

THE FRAMED TYPE ELEMENTS ARE LAID IN ROWS ALONG OR ACROSS THE ROOF, STARTING FROM THE EAVE.WITH THEIR HORIZONTAL JOINTS RUNNING ABOVE THE ROOF PURLINS.THE ELEMENTS ARE LAID SIDE BY SIDE UNTIL THE ENTIRE ROOF IS COVERED.THE ELEMENTS ARE FIXED TO THE ROOF AND TO EACHOTHER AT THE SAME POINTS WHERE THE ROOF SHEETS ARE FIXED TO THE PURLINS.FIXING WITH FIBER STRING.
THE ELEMENTS CAN ALSO BE FIXED TO THE ROOF WITH STICKS OR POLES.THE METHOD IS SIMILAR TO THAT FOR THE FIXING OF THE MAT TYPE ELEMENT.

THE FRAMED TYPE ELEMENT

THE STICKS FOR THE FRAME ARE CUT TO PROPER LENGTHS,PROVIDED WITH CUTS AT THEIR ENDS FOR PROPER JOINING AND TYING.THE FRAME IS ASSEMBLED AND BRACED USING FIBER STRING.SHORTNESS OR WEAKNESS OF COVERING BUNDLES MIGHT REQUIRE SOME ADDITIONAL FRAME SUBDIVIDING MEMBERS.

STICKS OR POLES FOR FIXING THE ELEMENTS TO THE ROOF

FOR THE FIXING OF THE ELEMENTS TO THE ROOF STICKS OR POLES OF TIMBER OR BAMBOO CAN BE USED.THEY SHOULD REACH FROM ROOF EAVE TO ROOF RIDGE.TO ACHIEVE THIS IT MIGHT BE NECESSARY TO ADD STICKS OR POLES BY SPLICING. SPLICES ARE DONE WITH CUTTINGS,TENONS AND/OR FIBER STRING TYING.AT THE ROOF RIDGE PAIRS OF POLES ARE JOINED AT THEIR CROSSING POINT AS DESCRIBED ABOVE.

CHARACTERISTICS OF THE PROPOSED SOLUTIONS.

-THE ROOF COVERING ELEMENTS FORM A CONNECTED,SEMI-DENSE,AIR PENETRABLE, THIN LAYER ON TOP OF THE ROOF MAKING THE ROOF STAY COOL IN A CONSTANT, WELL VENTILATED SHADE.
-THE LAYER OF THE ELEMENTS ALSO FORMS A SOFT SHIELD FOR THE ROOF,PREVENTING RAIN FROM DIRECTLY HIT THE ROOF AND THUS ALSO THE LOUD NOISE,CAUSED BY THE VIBRATION OF THE ROOF SHEETS,THE DRUMMING EFFECT.

CONSTRUCTION OF THE PROPOSED TWO TYPES OF ROOF COVERING ELEMENTS.

THE MAT TYPE ELEMENT

THE MAT TYPE ELEMENT IS COMPOSED OF RELATIVELY SHORT STICKS OF TIMBER OR BAMBOO,OR OF THIN BUNDLES OF REED OR THATCH,TIED PRALLELLY TOGETHER WITH FIBER STRING,FORMING MATS OF REQUIRED LENGTH.
THE WIDTH OF THE MAT,WHICH IS THE LENGTH OF THE STICKS,CAN BE FREELY DETERMINED,IN ACCORDANCE WITH THE MATERIAL AVAILABILITY.A PRACTICAL WIDTH COULD BE ONE AROUND ONE METRE,AND ONE WHICH REPEATED,EQUALS THE LENGTH OF THE ROOF IT WILL COVER.
THE LENGTH OF THE MAT SHOULD EQUAL THE TOTAL ROOF WIDTH,OR THE DISTANCE FROM ROOF EAVE TO ROOF RIDGE OR HIP.

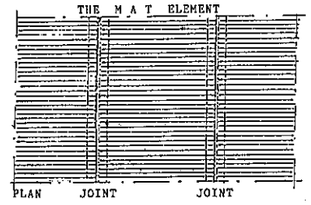
THE FRAMED TYPE ELEMENT

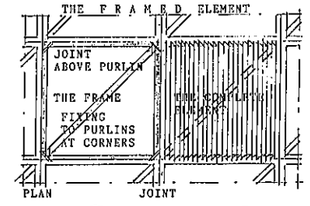
THE FRAMED TYPE ELEMENT IS COMPOSED OF A BRACED FRAME OF RELATIVELY SHORT STICKS OF TIMBER OR BAMBOO,ON ONE SIDE COVERED WITH A LAYER OF PARALLEL STICKS OF TIMBER OR BAMBOO,OR THIN BUNDLES OF REED OR THATCH, OR OF FIBER STRINGS,ALL TIED TOGETHER WITH FIBER STRING.
IN ORDER TO MAKE THE CONSTRUCTION RIGID ENOUGH,THE FRAME MEMBERS HAVE CUTS FOR PROPER JOINING AND FOR KEEPING THE TYING STRING FROM SLIPPING. THE COVERING STICKS HAVE SIMILAR CUTS FOR THE TYING STRING.
THE SIZE AND FORM OF THE FRAMED TYPE ELEMENT SHOULD BE CHOSEN WITH REGARD TO THE SIZE AND FORM OF THE ROOF TO BE COVERED.THE HEIGTH OF THE ELEMENT SHOULD,FOR PROPER FIXING OF THE ELEMENTS TO THE ROOF,BE EQUAL TO THE DISTANCE BETWEEN THE ROOF SUPPORTING PURLINS.THE WIDTH OF THE ELEMENT SHOULD,WHEN MULTIPLIED,EQUAL THE LENGTH OF THE ROOF.A PRACTICAL WIDTH COULD BE ONE CLOSE TO THE HEIGHT OF THE ELEMENT.IN MOST CASES SQUARE OR RECTANGULAR ELEMENTS ARE REQUIRED ONLY BUT HIP ROOFS REQUIRE ADDITIONALLY TRIANGULAR ELEMENTS.

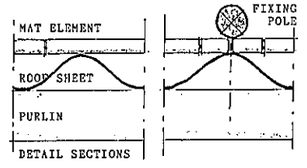
PRODUCTION OF THE PROPOSED TWO TYPES OF ROOF COVERING ELEMENTS.

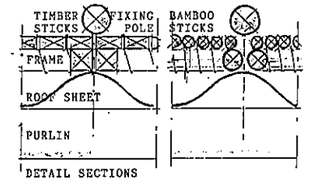
THE MAT TYPE ELEMENT

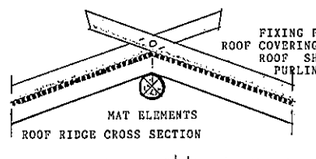
THE STICKS OR BUNDLES ARE CUT INTO THE DETERMINED LENGTH AND THE STICKS PROVIDED WITH SHALLOW CUTS NEAR THEIR ENDS IN ORDER TO KEEP THE TYING STRING IN PLACE.THE STICKS OR BUNDLES ARE THEREAFTER TIED PARALLELLY TOGETHER WITH FIBER STRING,FORMING A MAT OF REQUIRED LENGTH.IN SIMILAR WAY ADDITIONAL MATS ARE PRODUCED AS REQUIRED.

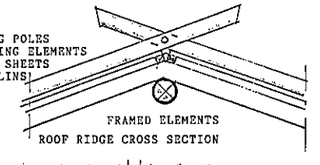


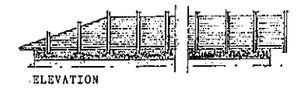


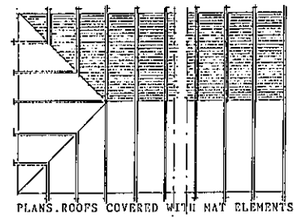


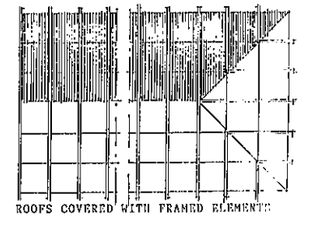









PLANS.ROOFS COVERED WITH MAT ELEMENTS


ROOFS COVERED WITH FRAMED ELEMENTS

D O O R S A N D S H U T T E R S

CHARACTERISTICS:ONE SOLE MATERIAL;TIMBER.NO NAILS,SCREWS,HINGES OR OTHER IRON MONGERY OR FRAMES NEEDED.SIMPLE AND FUNCTIONAL.

CINTUS SECTION III.

THE POOR BUILDERS PROBLEM - THE CHALLENGE TO THE ARCHITECTS.

TODAY MILLIONS OF POOR PEOPLE NEED SHELTER.BUT THE LACK OR NON-AVAILABILITY OF BUILDING MATERIALS AND OTHER NECESSARY RESOURCES OFTEN FORM INSURMOUNTABLE OBSTACLES FOR POOR BUILDERS.AND EVEN IF THEY MIGHT GET A ROOF AND WALLS,THEY CANNOT AFFORD DOORS AND WINDOWS.THIS BECAUSE DOORS AND WINDOWS MOSTLY ARE TOO EXPENSIVE TO BUY OR TOO COMPLICATED TO PRODUCE BY UNSKILLED AND UNEQUIPPED PEOPLE.THE SITUATION IS DESPERATE BECAUSE A SHELTER WITHOUT DOORS AND WINDOWS IS NEITHER SECURE,HEALTHY NOR PRIVATE.

CRITERIA FOR SOLUTIONS TO THE PROBLEM.

-AVAILABILITY OF THE NECESSARY MATERIALS
-LOW COST
-ADAPTABILITY TO SELF-HELP PRODUCTION AND CONSTRUCTION
-SIMPLE CONSTRUCTION AND BUILDING
-ADAPTABILITY TO VARIOUS WALL TYPES
-ACCEPTABLE SECURITY AND PRIVACY PROVISION.

THE PROPOSED SOLUTIONS:DOORS AND SHUTTERS OF TIMBER.

THE PROPOSED TYPES OF DOORS AND SHUTTERS SATISFY ALL THE ABOVE CRITERIA:
-THEY CAN BE MADE OUT OF SCRAP TIMBER COMPLETELY
-THE MATERIAL IS CHEAP AND THE PRODUCTION REQUIRES HAND TOOLS ONLY.
-THE SIMPLE CONSTRUCTION LENDS ITSELF TO SELF-HELP CONSTRUCTION
-THE PROPOSED DOORS AND SHUTTERS ARE SIMPLE TO BUILD INTO WALLS,REGARDLESS THE TYPE OF WALL MATERIAL OR THICKNESS.
-WITH REGARD TO SECURITY AND PRIVACY THE PROPOSED DOORS AND SHUTTERS ARE FULLY EQUAL TO THOSE ON THE COMMON MARKET.

CHARACTERISTICS OF THE PROPOSED SOLUTIONS.

-SIMPLICITY:ONLY ONE SINGLE MATERIAL IS REQUIRED
-SWINGING ON A TENON AND HELD BY ANOTHER TENON MAKES HINGES SUPERFLUOUS
-ONLY RELATIVELY SMALL MATERIAL DIMENSIONS ARE REQUIRED
-JOINTS ARE MADE USING TENONS AND/OR FIBER STRING,MAKING NAILS,SCREWS AND BOLTS SUPERFLUOUS
-THE SWINGING OF A DOOR OR SHUTTER CAN EASILY BE ALTERED TO PENDULATING, JUST BY MOVING THE UPPER ROTATION TENON
-BY WALLING PIECES OF TIMBER BOARDS INTO THE VARIOUS SIDES OF THE DOOR OR SHUTTER OPENING,AS COUNTERPARTS TO TENONS,LOCKING BOLTS OR AS STOPPERS,MAKES FRAMES SUPERFLUOUS
-FLEXIBILITY:THE DOORS OR SHUTTERS CAN BE USED AS SINGLE OR IN PAIRS AND THE DOOR OR SHUTTER LEAF CAN BE SINGLE OR HORIZONTALLY SPLIT,ALL TYPES SWINGING OR PENDULATING.

CONSTRUCTION OF THE PROPOSED TYPE DOOR AND SHUTTER.

THE DOOR AND SHUTTER IS MADE UP OF A SIMPLE BRACED FRAME WHICH IS PANELLED ON ONE OR BOTH SIDES.THE DIAGONALLY BRACED FRAME MEMBER ENDS ARE PROVIDED WITH CUTS FOR PROPER JOINING.JOINTS ARE PROVIDED WITH TENONS OR LASHED TOGETHER WITH FIBER STRING.
FOR SWINGING,THE DOOR AND SHUTTER IS PROVIDED WITH ONE LOWER AND ONE UPPER TENON,PROTRUDING FROM THE FRAME AT ONE SIDE OF THE DOOR AND SHUTTER LEAF.THE TENONS LAY IN A VERTICAL LINE.FOR THE UPPER TENON A SECOND RECESS IS PROVIDED,AT THE SAME UPPER SIDE OF THE FRAME,SOME 60-80 MM TOWARDS THE CENTER OF THAT SIDE,ENABLING TO GET THE TENONS IN AN OBLIQUE LINE,OR SWINGING AXIS.THIS RESULTS IN A PENDULATING MOVEMENT OF THE DOOR AND SHUTTER,WHEN PUSHED.
AT THE SIDE,OPPOSITE THE ONE OF THE SWINGING AXIS,CLOSE TO ITS CENTRE, THE DOOR AND SHUTTER IS PROVIDED WITH A LOCK,WHICH CAN BE A TIMBER LOCK. THE RIGHT LEVEL OF THE LOCK SHOULD DETERMINE THE LEVEL OF THE CROSS BRACE OF THE FRAME.THE LOCK BOLT SHOULD SLIDE ON TOP OF THE BRACE.IF REQUIRED,ADDITIONAL LOCKS CAN BE PROVIDED ATTACHED TO THE FRAME.
THE DOOR AND SHUTTER LEAF FRAME CAN BE PANELLED USING TIMBER STRIPS, WHICH ARE FIXED TO THE FRAME WITH TENONS OR FIBER STRING.
AS COUNTERPARTS,WITH RECESSES FOR THE SWING TENONS,ARE TWO PIECES OF TIMBER BOARD INSERTD;ONE FLUSH WITH THE FLOOR AND ONE JUST UNDER THE TOP OF THE WALL OPENING.THE UPPER ONE STRECHING ACROSS THE WALL OPENING CAN BE PROVIDED WITH A PROTRUDING STOPPER PIN AT THE LOCK SIDE OF THE OPENING. AT FLOOR LEVEL,OR SHUTTER OPENING BOTTOM LEVEL,A PIECE OF TIMBER WITH A PROTRUDING PIN IS INSERTED AS A STOPPER.SIMILARLY A STOPPER IS PROVIDED AT THE MIDDLE HEIGTH OF THE OPENING.AS COUNTERPART TO THE LOCK AT THIS LEVEL A PIECE OF TIMBER WITH A RECESS FOR THE LOCK BOLT IS INSERTED.

PRODUCTION AND BUILDING THE PROPOSED TYPE DOOR AND SHUTTER.

AT FIRST THE COUNTERPART PARTS FOR THE DOOR AND SHUTTER LEAF ARE PRODUCED AND INSERTED PROPERLY IN THE WALL OPENING.BEFORE INSERTING THEY SHOULD BE TREATED WITH PRESERVATIVE.THE PIECE OF TIMBER BOARD COMING ABOVE THE DOOR AND SHUTTER LEAF SHOULD BE SOME 200 MM LONGER THAN THE OPENING WIDTH,FOR PROPER FIXING REASONS.IF AT AN OUTER WALL,THE BOARD IS PROVIDED WITH A DRIP NOSE.THE HOLES FOR THE SWING TENON HAVE TO BE CAREFULLY LOCATED.THE WIDTH OF THE PIECE OF TIMBER BOARD IS 100+50 MM IF THE LEAF SWINGS OUTWARDS,100 MM IF IT SWINGS INWARDS.THIS BECAUSE OF THE LOCATION OF THE UPPER STOPPER.THE THICKNESS OF THE INSERTED COUNTERPART PIECES SHOULD EQUAL THE ACTUAL WALLING JOINT THICKNESS.
THEN,AND IN ACCORDANCE WITH THE ACTUAL WALL OPENING MEASUREMENTS AND WITH THE ACTUAL POSITIONS OF THE VARIOUS COUNTERPART PARTS,THE DOOR AND SHUTTER FRAME IS PRODUCED,ITS SWING TENONS INSERTED AND LOCK(S) ATTACHED,AND FINALLY ITS PANELLING FIXED WITH TENONS TO THE FRAME.
THE DOOR AND SHUTTER IS THEREAFTER FITTED INTO PLACE BY FIRST INSTALLING THE CORNER WITH THE UPPER SWING TENON,THEREAFTER CORRESPONDING LOWER CORNER AND TENON.NOW THE DOOR AND SHUTTER IS OPERABLE.

PRODUCTION AND BUILDING THE VARIOUS VARIANTS OF THE PROPOSED DOOR AND SHUTTER TYPE.

THE PENDULATING VARIANTS

THE PENDULATING SWING OF THE DOOR AND SHUTTER IS BROUGHT ABOUT JUST BY INSERTING THE UPPER SWING TENON INTO THE MORE CENTRAL RECESSES.

THE SPLIT VARIANT

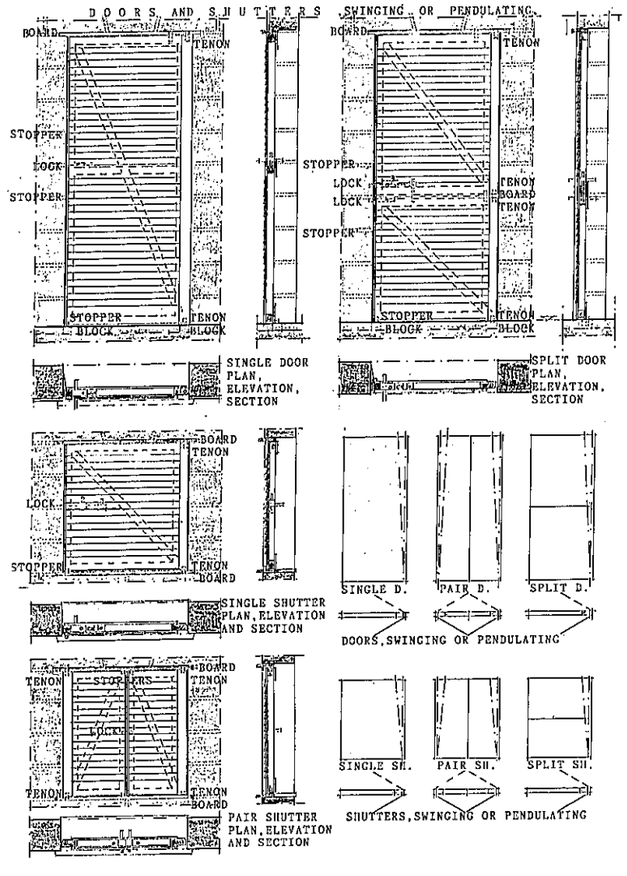
THE SPLIT VARIANT HAS A LOWER AND AN UPPER DOOR AND SHUTTER HALF.AT THEIR MEETING LEVEL IS A PIECE OF TIMBER BOARD INSERTED INTO THE WALL OPENING SIDE AND IN A HOLE THROUGH IT,THE LOWER TENON OF THE UPPER FRAME RESTS UPON THE UPPER TENON OF THE LOWER FRAME.OTHERWISE PRODUCTION AND BUILDING GOES AS DESCRIBED ABOVE.

THE PAIR VARIANT

THE PAIR DOOR AND SHUTTER HAS A LEFT AND A RIGHT HALF.PRODUCTION AND BUILDING FOLLOWS THE ABOVE DESCRIBED LINES.

PRESERVATION AND MAINTENANCE

THE MATERIAL SHOULD BE TREATED WITH PRESERVATIVE AGAINST ATTACKS OF INSECTS AND FUNGI AND AGAINST ROT.
THE SWING TENONS HAVE TO BE REPLACED FROM TIME TO TIME.IF THEIR ENDS ARE COVERED WITH BOTTLE CAPS THEY LAST INTACT FOR A LONGER TIME.



W I N D O W S A N D D A Y L I G H T / V E N T S H U T T E R S .

CHARACTERISTICS:ONLY SMALL SIZE PIECES OF TIMBER,OR FIBER CEMENT,OF GLASS PANE OR TRANSLUCENT FOIL NEEDED.NO NAILS,SCREWS, HINGES OR OTHER IRON MONGERY,NO FRAMES OR SASHES NEEDED.SIMPLE,FUNCTIONAL AND FLEXIBLE.

CINTUS SECTION III.

THE POOR BUILDERS PROBLEM - THE ARCHITECTS CHALLENGE.

MILLIONS OF POOR PEOPLE NEED SHELTER TODAY BUT CANNOT GET THE NECESSARY MATERIALS BECAUSE THEY ARE TOO EXPENSIVE OR NOT AVAILABLE.MILLIONS OF POOR PEOPLE LIVE IN SHELTERS WITH NO,OR INSUFFICIENT DAYLIGHT AND VENTILATION BECAUSE WINDOWS AND VENTS ARE TOO EXPENSIVE OR NOT AVAILABLE.
BUT A SHELTER LIKE THIS IS NEITHER HEALTHY NOR PRACTICAL OR PLEASANT.
WINDOWS ON THE MARKET ARE MOSTLY TOO SOPHISTICATED FOR THE POOR BUILDER; FRAMES,SASHES,HINGES,LOCKS,HOOKS ET C. AND TOO LARGE.
VENTS OF METAL ARE TOO EXPENSIVE AND THE CHEAP ONES ARE NOT FUNCTIONAL; THE S.C.'AIR BRICK'CANNOT BE CLEANED AND VENTILATION CANNOT BE REGULATED.
TO GET PROPER DAYLIGHT AND VENTILATION IS A MAJOR PROBLEM FOR POOR BUILDERS AND DWELLERS.

CRITERIA FOR SOLUTIONS TO THE PROBLEM.

-AVAILABILITY OF NECESSARY MATERIAL
-LOW COST
-ADAPTABILITY TO SELF-HELP CONSTRUCTION
-FUNCTIONALITY
-ADAPTABILITY TO VARIOUS WALL MATERIALS,TYPES AND FORMS
-SIMPLICITY IN CONSTRUCTION,PRODUCTION,BUILDING AND MAINTENANCE
-BURGLAR PROFNESS

THE PROPOSED SOLUTIONS.

-THE SMALL SIZE,MODULAR,FIXED TYPE WINDOW WITH GLASS PANE
-THE SMALL SIZE,MODULAR,FIXED TYPE WINDOW WITH PLASTIC FOIL
-THE SMALL SIZE,MODULAR VENT SHUTTER
THE PROPOSED SOLUTIONS SATISFY ALL THE ABOVE CRITERIA. THE WINDOWS HAVE ALWAYS TO BE USED TOGETHER WITH VENT SHUTTERS,FOR PROPER VENTILATION. VENTSHUTTERS CAN,WHEN SUFFICIENTLY REPEATED,ALSO PROVIDE ADEQUATE DAYLIGHT CONDITIONS IN A ROOM.

THE SHUTTER BOARD,IF NOT A MONOLITH,CAN BE COMPOSED OF PARTS JOINED TOGETHER WITH TENONS.FOR SWINGING IT IS PROVIDED,AT ITS ONE SIDE,WITH ONE LOWER AND ONE UPPER PROTRUDING TENON.FOR OPERATING IT IS PROVIDED WITH A HANDLE TENON AT THE OPPOSITE SIDE.
THE TWO COUNTERPART BOARDS ARE IN SIZE AND FORM IDENTICAL TO THOSE OF THE WINDOW WITH GLASS PANE.THE LOWER ONE,ON ITS UPPER SIDE,IS PROVIDED WITH RECESSES FOR THE LOWER SWING TENON,FOR THE STOPPER PIN AND TWO FOR THE MOVABLE LOCKING PIN.THE UPPER COUNTERPART BOARD IS PROVIDED WITH A RECESS FOR THE UPPER SWING TENON.
ALL TENONS ARE OF TIMBER;HARD TIMBER IF POSSIBLE.THE LOWER SWING TENON IS PRONE TO WEAR AND TEAR AND CAN BE PROTECTED SIMPLY BY PROVIDING ITS LOWER END AND THE RECESS WITH ONE BOTTLE CAP EACH.
BUILDING THE VENT SHUTTER STARTS WITH INSERTING THE COUNTERPART BOARDS WITH THE DRIP NOSE INTO PLACE IN THE WALL OPENING BY WALLING THEM INTO WALL JOINTS AT THE SIDES OF THE OPENING.THEN THE SHUTTER BOARD IS FITTED. FIRST ITS UPPER END WITH ITS SWING TENON THEREAFETR THE LOWER ONE.THE SHUTTER IS NOW COMPLETE AND OPERABLE.

REPETITION OF THE PROPOSED WINDOW AND VENT SHUTTER TYPES FOR PROPER DAYLIGHT AND VENTILATION.

THE MODULAR WALL OPENINGS CAN EASILY BE REPEATED BOTH HORIZONTALLY AND VERTICALLY IN ORDER TO GET PROPER DAYLIGHT AND VENTILATION INTAKES INTO A ROOM;HORIZONTALLY BY LEAVING ONE MODULE OF WALL BETWEEN THE OPENINGS, VERTICALLY BY DIRECT REPETITION.IN THIS WAY THE OPENINGS TOTAL AREA AND THEIR LOCATION CAN EASILY MEET ANY REQUIREMENT,FUNCTIONAL OR ARCHITECTURAL.

OPERATING THE VENT SHUTTER.

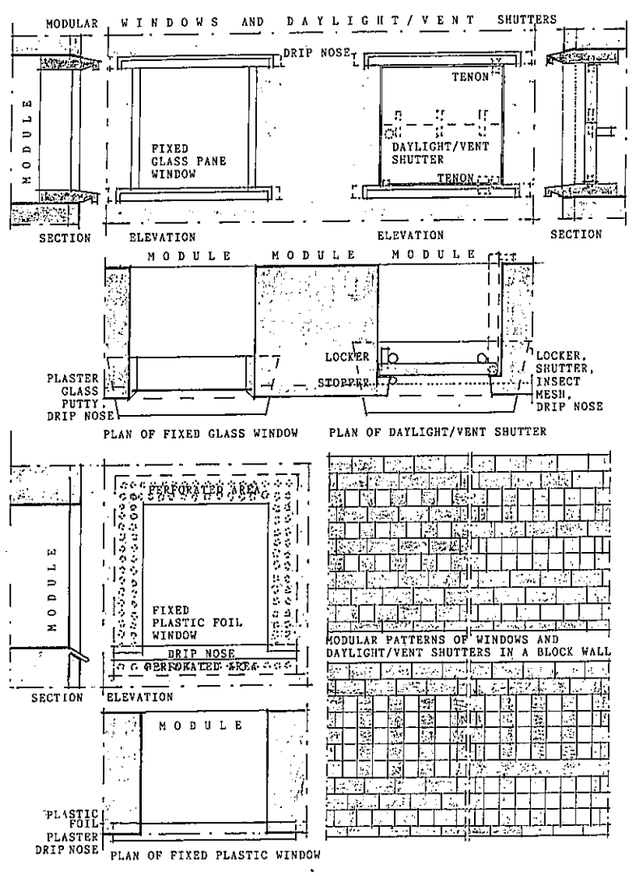
THE SHUTTER IS OPERATED BY HOLDING THE HANDLE PIN.IT CAN BE LOCKED IN BOTH ITS OPENED AND ITS CLOSED POSITIONS WITH THE MOVABLE LOCKING PIN. THE OUTSIDE STOPPER LIMITS THE SWING AND ACTS AS LOCKING COUNTERPART.

PRESERVATION OF TIMBER PARTS.

TIMBER PARTS SHOULD BE TREATED WITH PRESERVATIVE AGAINST ATTACKS OF INSECTS AND FUNGI AND AGAINST ROT.

INSECT MESH FOR VENT OPENINGS.

IF INSECT MESH IS NEEDED,BUT THOSE COMMON TYPES OF METAL NOT AVAILABLE, A SUBSTITUTE MADE OF ANIMAL HAIR CAN BE PRODUCED BY A SELF-HELP BUILDER. DIMENSIONING AND FIXING INTO PLACE SIMILAR TO THAT OF THE PLASTIC FOIL WINDOW.



THE WINDOW OR VENT SHUTTER MODULE

THE PRACTICAL MODULE IN THIS CASE IS THAT OF THE WALL INTO WHICH THE WINDOWS AND VENT SHUTTERS ARE GOING TO BE BUILT.
IF THE WALL IS OF WALL BLOCKS,A PRACTICAL MODULE IS THAT OF HALF A WALL BLOCK,OR SOME 210x220 MM.IF OF BRICKS,THE MODULE COULD BE ONE BRICK MODULE WIDE AND THREE LAYERS HIGH OR SOME 240x 220 MM.
THE PRACTICALITY OF THE PROPOSED MODULES LIES IN THE POSSIBILITIES TO EASILY REPEAT THE OPENING VERTICALLY,AND,HORIZONTALLY AT EVERY SECOND MODULE REGARDLESS IF THE WALL IS STAIGHT OR CURVED.

CONSTRUCTION OF THE WINDOW AND VENT SHUTTER TYPES PROPOSED.

WINDOW WITH GLASS PANE

THE WINDOW CONSISTS ONLY OF THREE PARTS:THE GLASS PANE AND TWO PIECES OF BOARD ACTING AS DRIP NOSES AT THE WALL OPENING OUTER SIDE.THEY CAN BE OF TIMBER OR FIBER CEMENT OR ANY OTHER AVAILABLE SUITABLE MATERIAL. IN BLOCK OR BRICK WALLS THE DRIP NOSES ARE WALLED INTO THE UPPER AND LOWER JOINTS AT THE WINDOW OPENING.THEIR THICKNESS SHOULD THEREFORE NOT EXCEED THAT OF THE WALL JOINT,THEIR WIDTH BE SOME 100 MM AND THEIR LENGTH SOME 80 MM LARGER THAN THE WIDTH OF THE OPENING.OBLIQUE CUT ENDS WILL KEEP THEM FIRMLY IN PLACE.DRIP NOSES ARE OF COMMON SHAPE.
THE GLASS PANE SHOULD FIT INTO THE OPENING WITH ITS DRIP NOSES,WITH A LOOSE OF 1-2 MM.SOME 15 MM FROM THE OUTER SURFACE OF THE WALL,A SOME 50 MM WIDE AND 15 MM THICK VERTICAL REBATE OF PLASTER IS PROVIDED AT EACH SIDE OF THE OPENING.
THE BUILDING STARTS WITH THE WALLING OF THE DRIP NOSES,WHICH PROTRUDE SOME 40 MM FROM THE WALL SURFACE.THEN THE REBATES ARE PLASTERED AND FINALLY THE GLASS PANE INSTALLED AND FIXED WITH PUTTY OR PLASTER.

WINDOW WITH TRANSPARENT OR TRANSLUCENT FOIL OF PLASTIC.

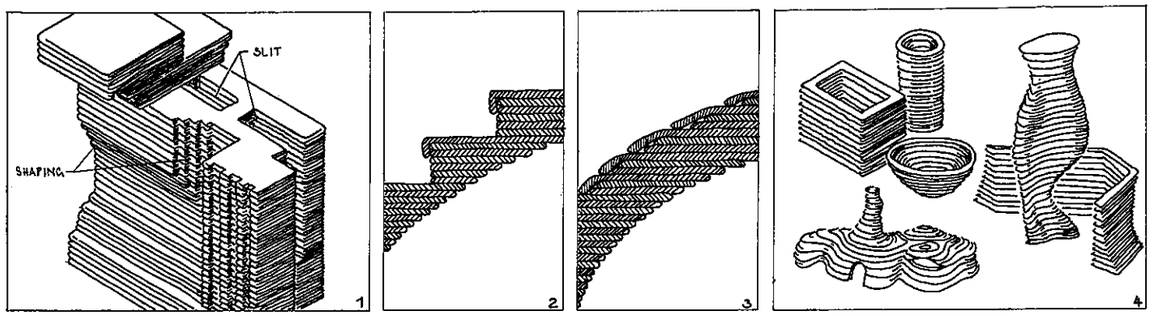
THE WINDOW CONSISTS ONLY OF APLASTIC FOIL OF A SIZE THAT OVERLAPS THE OPENING WITH SOME 50 MM AT EACH SIDE.THE OVERLAPPINGS ARE DENSELY PERFORATED.THE FOIL IS PUT IN PLACE AND FIXED TO THE WALL WITH PLASTER.THE PERFORATION ALLOWS FOR FIRM ADHESION OF THE PLASTER TO THE WALL.
IF NECESSARY,THE POSSIBLE VIBRATING OF THE FOIL CAN BE CUSHIONED BY COMBINING IT WITH A GRID OR NET OF THIN STICKS OR SIMILAR.

VENT SHUTTER

THE VENT SHUTTER IS COMPOSED OF ONLY THREE PARTS:THE SHUTTER BOARD AND TWO COUNTERPART BOARDS,ACTING SIMULTANEOUSLY AS DRIP NOSES.
THE PARTS CAN BE MADE OF SCRAP TIMBER OR FIBER CEMENT,OR OF OTHER SUITABLE AVAILABLE MATERIAL.

UNITED

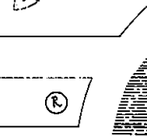
▷ INTERNATIONAL COMPETITION FOR SOLUTIONS ON NEW TECHNOLOGIES IN SOCIAL HOUSING IN THE INTERNATIONAL YEAR SHELTER FOR THE HOMELESS.



SECTION III

SOLUTIONS REFLECTING AN ORIGINAL ATTITUDE TO THE CHOICE, USE OR ARRANGEMENT OF CONSTRUCTIONAL ELEMENTS AND OFFERING SOME ESSENTIAL TECHNICAL INNOVATION IN MATERIALS, STRUCTURAL SYSTEMS AND BUILDING METHODS.

1 DETAIL OF DIFFERENTLY SHAPED BUILDING.
2 THIN LAYERS CONSTRUCTION OF A STAIRS.
3 THIN LAYERS CONSTRUCTION OF A VAULT.
4 VARIABLE SHAPING WITHOUT FORMWORK.



IDEA INTRODUCING A NEW BUILDING METHOD WITH IMPROVEMENT OF THE NEW MONOLITHIC THIN LAYERS METHOD : ®

MOSCHVER

I D E A

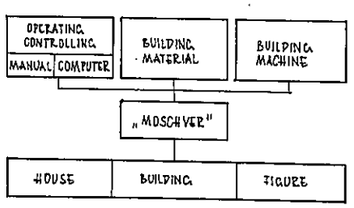
THE IDEA PROPOSED IT A CONDITION TO REDUCE THE BUILDING PROCESS WITH SPECIAL BUILDING MATERIALS ON SIMPLEST ELEMENTARY PROCESSES OF FORMING OBJEKTS. WITHOUT FORMWORK OR ASSEMBLING WORK THERE WILL BE PRODUCED SUPPOSITION TO THE APPLICATION OF THE MOST MODERN ROBOT AND COMPUTER AIDS DESIGN.
THE IDEA WILL BE REALIZED WITH IN THIN LAYERS ONE UPON THE OTHER PASTE OF STIFF PLASTIC MATERIALS WITHOUT FORMWORK. AFTER ARRANGING THE LAYERS THEY WILL GET STATIC STABILITY, VARIABLE THICKNESS AND BREADTH OF THE LAYERS CAN BE FORMED IN DEPENDENCE FROM THE CONSISTENCY OF THE STIFF PLASTIC MATERIAL AND OF THE DESIGN.
IT IS POSSIBLE TO WORK WITHOUT FORMWORK BY CARRYING OUT THIN LAYERS.
THE USE OF BUILDING MATERIALS WITH VERY HIGH STIFF PLASTIC CONSISTENCY ALLOWS TO PRODUCE SUCCESIVE LAYERS WITH HANG OVER OF THE LAYERS AND TO FORM VAULTS. CARRYING OUT THESE LAYERS CAN BE REALIZED BY USING LIGHT EXTRUDERS, THESE EXTRUDERS CAN OPERATE BY HAND OR CAN BE INTEGRATED IN A FULLY AUTOMATIC SYSTEM. IN USING THIS TECHNOLOGY BUILDINGS OR PLASTIC CREATIONS WITH COMPLICATED LAY - OUT AND SECTION WITH CONVEXITYS, WITH PROJECTIONS, OPENINGS, SLITS AND CAMBERINGS AT ANY SHAPE CAN BE ERECTED.

M A N U A L P R O C E S S

WITH THE SUPPORT OF A MANUAL OPERATED EXTRUDER THIN LAYERS FROM LOCAL AVAILABLE BUILDING MATERIALS CAN BE PUT DOWN, FOR INSTANCE A MIX - TURE FROM CLAY AND VEGETABLE FIBRE OR A MIX - TURE FROM PLASTER AND RICE - HUSK.
A CHARACTERISTIC THIN LAYERS BUILDING ORIGINATES BY THIS PROCESS.

A U T O M A T I C P R O C E S S

IN THE CASE OF FULLY AUTOMATIC PRODUCTION THIN LAYERS CAN BE CARRIED OUT WITH COMPUTER AIDED SYSTEMS CONTROLED BY FEELERS.
THE EXTRUDER HAS MANY NOZZLE ARRANGED PARALLEL AND WITH AN ADJUSTABLE CROSSECTION. THEY PRODUCE CONTINUOUS LAYERS UNDER VIBRATION WITH STIFF PLASTIC MATERIAL WHICH CAN BE SELECTIVELY INTERRUPTED TO FORM OPENINGS.
THE LAYERS CAN BE VARIABLE IN THICKNESS AND BREATH WITH A HIGH STABILITY OF THE SIDES OF LAYERS AND SET UP TO WALLS WITHOUT FORMWORK AFTERWARDS THE FACES OF WALLS ARE FINISHED BY ROLLING, SHAPING OR SMOOTHING.
THE BOND OF THE LAYERS CAN BE REACHED BY THE MATERIAL CONSOLIDATING ITSELF OR BY ADDITIONAL ADHESIVE LAYERS.
A GAP IN THE MIDDLE OF THE LAYERS FORMS A LARGE CAVITY WHICH CAN BE FILLED WITH GRANULES OR HARDENED FOAM FOR DAMMING UP.
BASED ON AUTOMATIC CONTROL IT IS POSSIBLE TO FORM WALLS LIKE A CANTILEVER.
HIGHLY ADAPTABLE MONOLITHIC STRUCTURES CAN BE PRODUCED BY THE MONOLITHIC THIN LAYERS METHOD.



L I T E R A T U R E

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J. PETHER	LEHMARCHITEKTUR - DIE ZUKUNFT EINER VERGESSENEN BAUTRADITION	PRESTEL - VERLAG MÜNCHEN	1982
K. MATHÉY	UMWELTBEWUSSTES BAUEN IN VERSCHIEDENEN GEOGRAFISCHEN REGIONEN	TECHNISCHE HOCHSCHULE DARMSTADT (VOLUME I)	1982
B. SHAMS YAZDANI	GRÜNDUNG DER LEBENSDAUER VON LEHMBAUTEN IN ERDBEBENGEFÄHRDETEN GEBIETEN AFGHANISTANS	GESAMTHOCHSCHULE KASSEL DISSERTATION „A"	1985
G. MUNKE	LOW - COST - BAUEN, ANWENDUNGSMÖGLICHKEITEN EINFACHER TECHNOLOGISCHER VERFAHREN Z. HERSTELLUNG V. NIEDRIGKOSTEN - BAUTEN AUS ÜBERFLUSS - ABFALL - UND BILLIGBAUSTOFFEN.	GESAMTHOCHSCHULE KASSEL SCIENTIFIC REPORT	1980
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CH. TRIEMERT	DER TERMITENSTAAT	FRANCKH'SCHE VERLAGSHANDLUNG STUTTGART	1931
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J. WEBER			

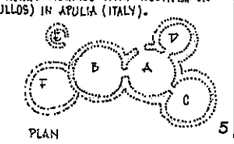
ANALYSIS

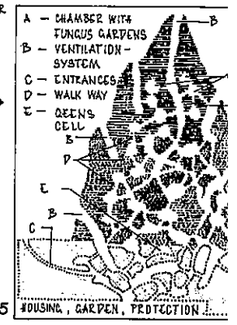
DEMAND

SOCIAL

⊙ IN THE ANIMAL KINGDOM THE CONSTRUCTION OF HOUSINGS, NESTS, OR HOLES IS CONTROLED BY NATURAL PROCESSES, THAT MEANS THE INSTINCTIVE SELF-MADE CONSTRUCTION.
„THERE IS NO SHORTAGE OF HOUSING!"
⊙ WITH REGARD TO THE FLEXIBLE BUILDING WHICH CORRESPONS WITH CLIMATE AND NEEDS THERE IS A PROMINENT EXAMPLE IN THE ANIMAL KINGDOM WITH THE HILL OF THE TERMITES' CULTIVATING FUNGUS. ▶
⊙ INNUMERABLE BUILDINGS FROM THE PAST DEMONSTRATE STILL THE OUTSTANDING TRANSFORMATION OF GROWING AND SOCIAL STRUCTURAL DEMANDS OF THE FAMILIES OR TRIBES INTO A BUILDING. THE MANUAL KNOWLEDGE AND THE HIGH CULTURE OF THE PEOPLES ARE EXPRESSED BY THE PUEBLO OF THE INDIANS, THE LOAM FARMS IN CENTRAL AFRICAN MUSCUM - AREA, THE TYPICAL KONDO-VILLAGES WITH ROUNDISH OR OVAL COTTAGES AND THE CONICAL HOUSES (TRULLOS) IN APULIA (ITALY).

LEGEND :
A — COMMON ROOM
B — KITCHEN
C — SLEEPING ROOM
D — STORE
E — LAVATORY
F — SITE FOR A FURTHER ROOM



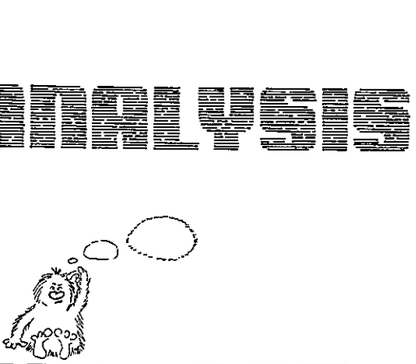


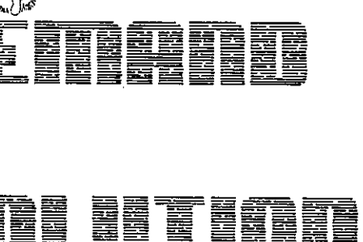
⊙ TO FULFIL THE ELEMENTARY HUMAN RIGHT OF HOUSING.
⊙ TO PAY ATTENTION TO THE SOCIAL AND ETHNOLOGICAL IDENTITY.
⊙ TO GUARANTEE THE RIGHT OF PLANNING THE INDIVIDUAL MILIEU.
⊙ TO TAKE IN CONSIDERATION THE DYNAMIC OF WAY OF LIVE AND THE PERMANENT CHANGES WITHIN THE FAMILY.
⊙ TO NOTE THE REGIONAL CULTURAL TRADITIONS WHICH ARE CROWN FOR INSTANCE ETHICAL AND ARCHITECTURAL QUESTION
⊙ TO GUARANTEE HYGIENIC CONDITIONS (PROTECTION AGAINST HEAT, COLDNESS, NOISE, FIRE, SHOCK AND MOISTURE AS WELL AS CREATION, OF SUPPLY WITH WATER AND ELECTRICITY AND DISPOSAL OF SEWAGE AND REFUSE).
⊙ TO NOTE SAFETY AND PROTECTION.

SOLUTION

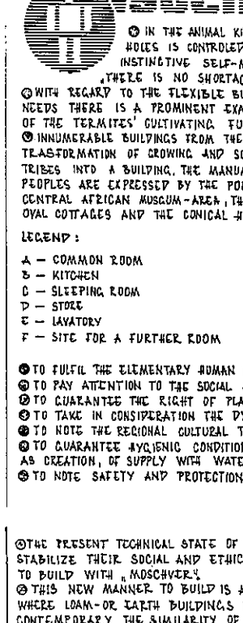
⊙ THE PRESENT TECHNICAL STATE OF DEVELOPMENT IN MICROELECTRONIC OFFERS THE CHANCE FOR THE MANKIND TO STABILIZE THEIR SOCIAL AND ETHICAL IDENTITY. THIS HAPPENS IN COMPREHENSIVE SENSE BY USING A HUMAN WAY TO BUILD WITH „MOSCHVER".
⊙ THIS NEW MANNER TO BUILD IS APPLIABLE IN ALL PARTS OF THE WORLD. THE NEW MANNER TO BUILD IS PRACTICABLE WHERE LOAM- OR EARTH BUILDINGS BUT ALSO VARIOUS STONE BUILDINGS ARE TRACEABLE IN BUILDING HISTORY. CONTEMPORARY THE SIMILARITY OF „MOSCHVER" TO TRADITIONAL METHODS PROVIDES THE SECURETY TO MEET ALL NATURAL HYGIENIC DEMANDS THAT IS PROTECTION AGAINST HEAT AND COLDNESS, NOISE, MOISTURE, FIRE AND SHOCK.
⊙ NECESSARYLY SANITARY CONDITIONS OF CLIMATE IN THE BUILDING ARE REACHED BY COMPACT STRUCTURES AND ABILITY OF DIFFUSION OF THE USED BUILDING MATERIALS.

EXAMPLE 1
PRINCIPLE OF ROUND SHAPE
MULTI FAMILIES HOUSE

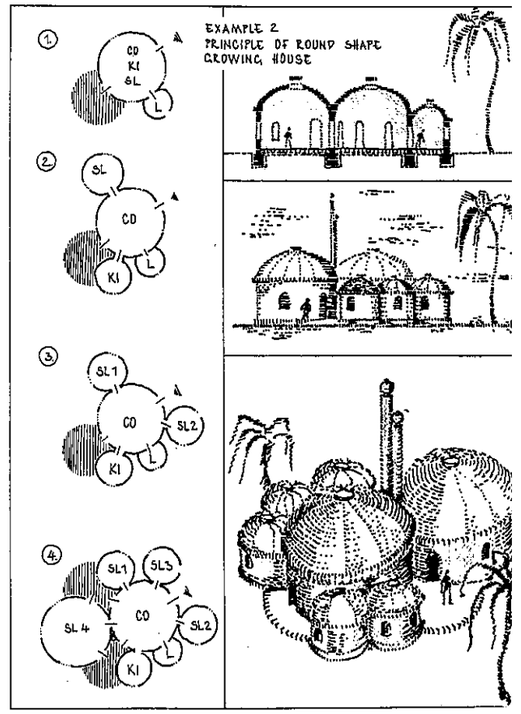




PROPOSAL MADE TO DEVELOP AND TO COORDINATE THE BUILDING PROCESS IN THE DIALOGUE BETWEEN USER AND ARCHITECT IN NATIONAL AND INTERNATIONAL FRAME :



EXAMPLE 2
PRINCIPLE OF ROUND SHAPE
GROWING HOUSE



SHELTER

ECOLOGICAL

● TROPIC AREAS IN AFRICA, AUSTRALIA, ASIA, AMERICA AND EVEN SOUTH-EUROPE ARE THE LIVING ROOM OF THE TERMITES. LOCAL RESOURCES IN CONNECTION WITH METABOLISM PRODUCTS LIKE EARTH AND WOODEN MATERIALS, MUD OR GLANDULAR SECRETIONS, ARE USED ONLY BY TERMITES, THEIR CONSTRUCTIONAL ADAPTABILITY IS MULTILATERAL. TERMITES BUILD CAVERNS, NESTS ON AND IN TREES BUT ALSO HILLS OR TOWER BUILDINGS IN THE PLAIN. OFTEN A RANK VEGETATION IS GROWN ON THE SOLID AND OCCUPIED BUILDINGS. ▼

● ESPECIALLY SUCH BUILDINGS, ERECTED WITH NATURAL RAW MATERIALS LIKE WOOD, GRAS, STROW, LOAM AND STONE ARE VALUABLE IN ECOLOGICAL SENSE BECAUSE THEY CAN BE RETURNED INTO THE NATURAL CYCLE (ROTTING OR RECYCELING).

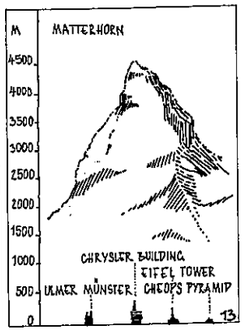
● USE OF REGIONAL NATURAL RESOURCES AN RECYCLED MATERIALS WITH REGARD TO A NEW RELATION BETWEEN MAN AND NATURE.
● MOST ECONOMICAL HANDLING OF AREA, MATERIAL AND NATURAL POTENTIALITY SPECIALLY WITH WATER AND VEGETATION.
● MOST EXTENSIVE USEING OF ALL REGIONAL ENERGY RESOURCES LIKE SUN, THERMAL EFFICIENCY OF EARTH, WIND AMP WATER POWER.
● HIGH ADAPTABILITY TO NATURAL AND ARCHITECTURAL SURROUNDINGS SUCH AS INTEGRATION OF VEGETATION ON WALLS AND ROOFS.

ARCHITECTURAL

● TERMES' NEST LIKE STALACTITE COLUMNE. ▶
● TERMITES' NEST LIKE MUSHROOM WITHOUT REINFORCEMENT MATERIAL. ▼

● BUILDINGS FROM THE EARLY BUILDING HISTORY SHOW REALLY THE UNITY OF FUNCTION, BUILDING MATERIAL AND ARCHITECTURE AND KEEP THEIR VARIETY MOSTLY FAMILY CHANGES ARE TAKEN IN CONSIDERATION. LOAM FARMS IN THE CENTRAL AFRICAN MUSEUM-AREA ARE EQUIPED WITH DECORATIONS SERVING SIMULTANEOUSLY AS CONNECTING LINK FOR FURTHER EXTENSION. ▶

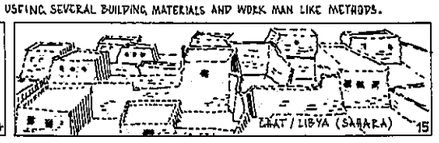
● ALL BUILDINGS IN THE ANIMAL KINGDOM ARE APAPTED TO LOCAL AND NATURAL CONDITIONS. THE SIZES OF THEIR BUILDINGS IS PARTLY AMAZING. CERTAIN TERMITES' BUILD UP TOWERS WITH A HEIGHT OF 12 METERS. IN RELATION TO THE SIZE OF A TERMITE (4 TO 5 MM) THE MAN MAY ERECT A TOWER AS HIGH AS THE „MATTERHORN." ▶



● IN ORDER TO ACHIEVE EQUAL RIGHT OF INDIVIDUALITY AND IDENTITY IN OCCUPYING AND USEING PUBLIC SPACE AS WELL IN MULTIVARIOUS COMMON LIFE NEW STRUCTIONAL SOLUTIONS IN THE DEVELOPMENT OF ARCHITECTURE ARE REQUIRED.
● TO RESPECT THE EXISTING LOCAL SCOPE OF STRUCTURE, OF HISTORY AND OF AESTHETIC FEELING.
● TO ACHIEVE SUCH A NEW QUALITY IN ARCHITECTURE MEANS THAT THE USER TAKES PART IN PLANNING AND DESIGNING AS WELL AS IN MAINTAINING AND CHANGEING THE CONDITIONS OF THE BUILDING DURING THE LIFETIME.

TECHNOLOGICAL

● THE ENORMOUS VARIETY IN SHAPE OF THE TERMITES' HILL IS BASED ON THE USE OF SMALLEST ELEMENTS. THE BUILDINGS CONSIST OF INNUMERABLE SMALL GLOBES OF EARTH. THESE GLOBES OF EARTH ARE MIXED WITH GLANDULAR SECRETIONS AND MORE OR LESS QUANTITIES OF SWALLOWED WOOD AMP EARTH SUBSTANCES KNEADED AND BUILD IN. TERMITES' BUILD WITH THESE GLOBES OF EARTH IN LAYERS THEIR BUILDING. IF IN A TERMITES' NEST A OPENING AS LARGE AS A PALM IS KNOCKED IN IT WILL BE CLOSED WITHIN AN HOUR. IN HUMAN SCALE THIS WOULD MEAN TO BUILD A 35 M^2 MONOLITHIC MASSIV WALL WITHIN AN HOUR. NORMALLY THIS PROCESS OF CLOSING TAKES PLACE DURING OR IN A SHORT TIME AFTER RAINING OR RAINING PERIOD. THE PROCESS IS FOLLOWED BY PLASTERING AND SMOOTHING.
● SELF MADE CONSTRUCTION AND THE USE OF LOCAL RESOURCES WITH SHORT WAYS OF TRANSPORT WAS SELF-EVIDENT IN BUILDING OF HOUSING-ACCOMENTATION IN THE EARLY BUILDING HISTORY. THIS WAS DONE FOR MILLENNIUMS BY USEING SEVERAL BUILDING MATERIALS AND WORK MAN LIKE METHODS.



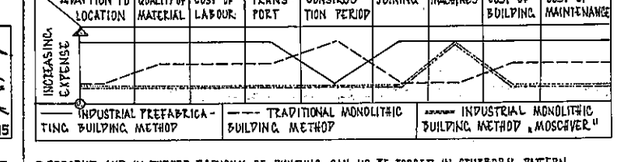
● RATIONAL AND ECONOMIC MANUFACTURING METHODS FOR BUILDING MATERIALS AND BUILDINGS ARE OBTAINED BY DEVELOPING MANUAL, INDUSTRIAL AND AUTOMATICAL PROCESSES AND ALTERNATIVE TECHNOLOGIES.
● THE AIM IS TO RECEIVE A SIMPLE, OPEN BUILDING SYSTEM WHICH CAN BE FREELY COMBINED AND WHICH ANABLES A NEW CREATIVE QUALITY AND OPENS NEW ALLOWANCES.
● THERE IS THE DEMAND OF HUMAN MACHINERY WHICH IS OVERLOOKED AGAIN BY MAN AND WHICH IS LESS DESTROYING THE ENVIRONMENT. IN ADDITION TO GREATLY TECHNOLOGICAL PROCESSES SMALLER PRODUCTION UNITS SHOULD BE DEVELOPED ESPECIALLY SUITABLE FOR SELF-MAKING UNDER SUPERVISION.
● TECHNICAL SCIENCE AND ART SHOULD BE LED TO A NEW ARCHITECTURAL UNITY.

ECONOMIC

● BOTH IN THE ANIMAL KINGDOM AND IN THE EARLY ARCHITECTURAL HISTORY EXTRAORDINARY EFFECTS CAN BE RECOGNIZED WITH REGARD OF ECONOMIC CONSTRUCTION OF HOUSING.

MOST OF THE EXAMPLES FULFIL NEARLY ALL SOCIAL, ECOLOGICAL, TECHNOLOGICAL AND ARCHITECTURAL DEMANDS. AN ESSENTIAL ROLL IS PLAYED WITH SUCH CONDITIONS AS SELF-MAKING, USE OF LOCAL RESOURCES, SIMPLICITY AND USEFULNESS IN THE BUILDING DRAFT.

ANALYSIS OF BUILDING EXPENSE



● PRESENT AND IN FUTURE ECONOMY OF BUILDING CAN NO BE FORCED IN STUBBORN PATTERN. ECONOMY MUST BE INTEGRATED IN THE WHOLE PROCESS OF REPRODUCTION OF GOODS FOR THE DEVELOPING PUBLIC LIFE AND IT MUST PROMOTE THE PROGRESS.
● BUILDING COSTS SHOULD BE KEPT DOWN BY THE FOLLOWING MEASURE:

- TO BUILD SIMPLER
- TO DISTRIBUTE INVESTMENTS
- DO YOURSELF BUILDING
- TO BUILD IN COMMUNITY
- TO BUILD SMALLER
- TO BUILD STEP BY STEP
- TO BUILD RATIONAL

● ON THE SHORTEST WAY „MOSCHVER" OFFERS THE SUPPOSITION TO MANUFACTURE ALL REGIONAL NATURAL RESOURCES AND EITHER TO UNUSED RECYCLING MATERIALS TO FINEGRAINED MATERIALS AT THE SAME TIME „MOSCHVER" ENABLES TO APPLY OF HUMAN AND FRIENDLY FOR ENVIROMENT METHODS.
● THIS MANNER TO BUILD GIVES UNRESTRICTED CAPABILITY TO ADAPT THE BUILDING TO NATURAL SURROUNDING UP TO THE SETTLEMENT OF VEGETATION AT THE BUILDING.
● BECAUSE THE STRUCTURE CONSISTS OF A HOMOGENEOUS MATERIAL ONLY ALL THE MATERIAL CAN BE RECYCLED BY CHANGING THE USE OF THE BUILDING.

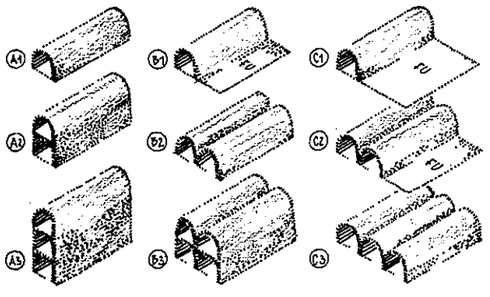
● THE NEW MANNER TO BUILD IS VERRY VARIABLE AND ADAPTABLE IT MEETS ALMOST ALL THE NEEDS ARISING FROM TOPOGRAPHY, LOCATION AND ARCHITECTURE. THE SMALLEST SITE WITH COMPLICATED SHAPE CAN BE ALSO USED. IN THAT WAY ECONOMICAL USE OF LAND IS PROVIDED.
● EVEN HISTORICALLY TRADITIONAL FORMS OF ARCHITECTURE OF THE EARLIEST HISTORY BUILT IN LOAM AND STONE CAN BE COPIED DIRECTLY BY USING PHOTOGRAMMETRY.
● „MOSCHVER" OFFERS THE POSSIBILITY TO CREATE A NEW ARCHITECTURAL QUALITY.
● THE USER RECEIVES A FREELY COMBINABLE SIMPLE SYSTEM OF STRUCTURE OFFERING TOP CREATIVE QUALITY AND NEW ALLOWANCES.

● „MOSCHVER" PRODUCES THE SUPPOSITION FOR DEVELOPING NEW HUMAN, FRIENDLY FOR ENVIROMENT AND ALTERNATIVELY HIGH TECHNOLOGICS FOR PRODUCTING BUILDING MATERIALS AND FOR CONSTRUCTING BUILDINGS.
● „MOSCHVER" OFFERS MAXIMUM EMPLOYMENT OF CAPAZITY OF MODERNEST DATASTORE AND ROBOTSYSTEMS BY USING SIMPLE FORMINGPROCESSES TO A LAY-OUT ARRANGEMENT IN THIN LAYERS. IN SOFT WARE IT WILL BE ANALYZED THE GEOMETRY OF STRUCTURES IN THIN LAYERS. IN THIS WAY ALL THE DATA WILL BE STORED IN THE COMPUTER. AT THE SAMETIME ARE POSSIBLE THE FASTER DATA RETRIEVEMENT FOR USER OF THE PLANING- AND REALISATION PHASES.
● WITH „MOSCHVER" LARGE TECHNOLOGICAL BUILDING PROCESSES CAN BE DEVELOPED. BESIDES IN FUTURE SMALLER SELF-MADE CONSTRUCTIONS CAN BE DEVELOPED, WHICH ARE FRIENDLY FOR USERS AND WITH DECENTRAL PRODUCTION UNITS ESPECIALLY FOR SELF-MADE BUILDINGS UNDER SUPERVISION.
● „MOSCHVER" RESULTS IN A SIMPLIFICATION OF BUILDING DETAILS.
● ART AND ENGINEERING ARE COMBINED TO A NEW QUALITY.

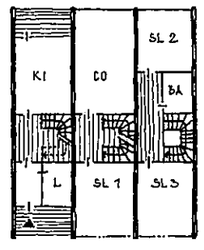
● „MOSCHVER" PERFORMS NEARLY ALL SOCIAL, ECOLOGICAL, ARCHITECTURAL AS WELL AS TECHNOLOGICAL AND INDIVIDUELL REQUIREMENTS OF THE STRUCTURE. THEREFORE, IT WILL BE ECONOMIC.
● THIS NEW MANNER TO BUILD COMBINES ECONOMIC ADVANTAGES OF INDUSTRIAL PREFABRICATION WITH MONOLITHIC BUILDING METHODS.
● THE CONNECTION OF A SIMPLE WAY TO WORK BUILDING MATERIALS WITH HIGH TECHNOLOGY PROMOTES THE PROGRESS IN THE SOCIETY AND WILL RESULT IN A NEW ECONOMIC QUALITY.
● FURTHER ECONOMIC FACTORS ARE:

- USE OF LOCAL RESOURCES RECYCLING MATERIALS INCLUDED
- TO INSERT INDUSTRIALLY MATERIAL IN THE STRUCTURE ON SITE
- THE TYPES OF BUILDING MACHINES WILL BE REDUCED
- BUILDING MATERIALS WILL BE RECYCLED
- NO FORMWORK WILL BE NECESSARY
- NO USE OF STEEL
- PLASTIC REDUCTION IN TRANSPORT

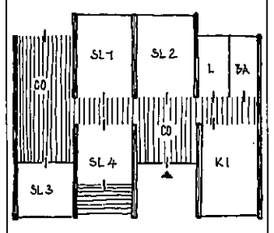
EXAMPLE 3 PRINCIPLE OF ANGULAR SHAPE GROWING HOUSE



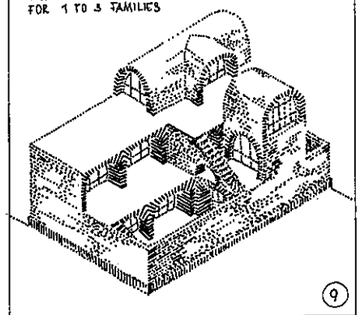
PLAN FIRST FLOOR / GROUND FLOOR / SECOND FLOOR



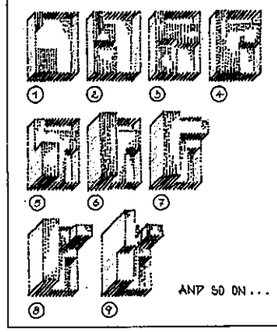
PLAN GROUND FLOOR

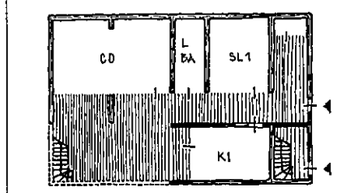


EXAMPLE 4 PRINCIPLE OF ANGULAR SHAPE GROWING HOUSE FOR 1 TO 3 FAMILIES

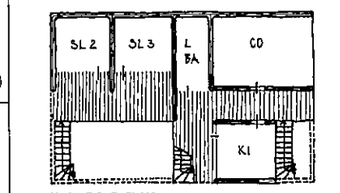


GROWTH OF HOUSE

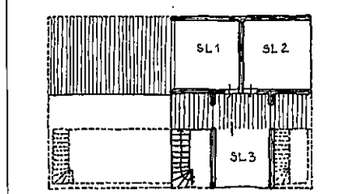




PLAN GROUND FLOOR



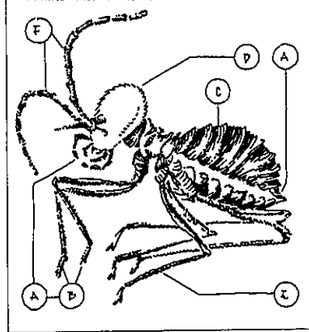
PLAN FIRST FLOOR



PLAN SECOND FLOOR

9

ANIMAL PRODUCTION:

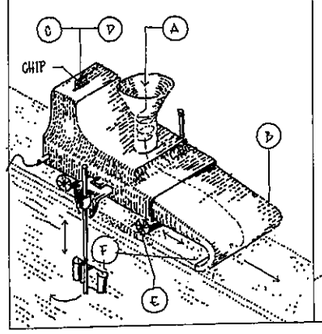


16

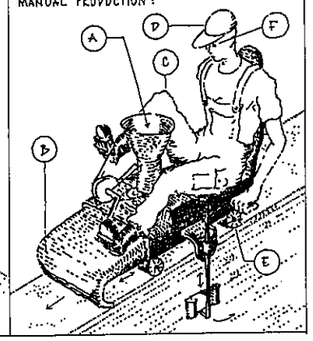
LEGEND:

- CO COMMON ROOM
- KI KITCHEN
- SL SLEEPING ROOM
- ST STORE
- L LAVATORY
- BA BATH
- FU SITE FOR A FURTHER ROOM
- (A) -EXCREMENTS; CELLULOSE; GLANDULAR-EXCRETION / MATERIAL PREPARATION
- (B) -MOUTH; LEGS - INSTRUMENT / EXTRUDER
- (C) -ANIMAL POWER / MANPOWER / ENGINE
- (D) -INSTINCT / CONSCIOUS / SOFT WARE
- (E) -MOVEMENT APPARATUS / TRANSPORT MECHANISM
- (F) -FEELER / CONTROL / SENSOR

ROBOT PRODUCTION:



MANUAL PRODUCTION:



EXAMPLES FOR BUILDING MATERIALS

BINDING AGENTS	BADING- AND WALL MATERIAL	FIBRE REINFORCEMENT
CEMENT, HYDRAT LIME, CLAY, LOAM, SISALCEMENT, RICE HUSKASH, FLIGHT ASH, BRICK BREAKAGE, SULPHUR, EXCREMENTS.	SAND, CHIPPINGSAND, CRUSHED ROCK TO SAND	REED, SEDGE, BAMBOO, GRAS, HAY, RUSH, PALM CUIR, LINEN, COTTON, WOOD - BANANA WOOD-FIBRE, RICE-HUSK, COCONUT-HUSK, SUGAR-CANE, JUTE - FIBRE, SISAL-HEMP-FIBRE - HEMP, KENAF.

CONCLUSION

QUOTATION: „NEARLY A QUARTER OF THE WORLD'S POPULATION LIVE IN THE UTMOST POWERTY AND MISERY, A HUNDRED MILLION HAVE NO SHELTER OF ANY KIND.
THIS SITUATION IS STEADILY WORSENING AND THERE ARE NO SIGNS OF IMPROVEMENT."

SUM RESULT:

1. THE GOVERNMENTS OF ALL CONTRIES OUGHT TO COME TO A SOCIAL DECISION TO TERMINATE A SUITABLE FINANCING MODEL.
2. A INTERNATIONAL RESEARCH CENTER SHOULD BE CREATED IN ORDER TO DEVELOP SUITABLE BUILDING MATERIAL RECIPES FOR „MOSCHVER" AS WELL AS THE APEQUATE COMPUTERS (HARD WARE AND SOFT WARE) TO CARRY OUT PILOT-PROJEKTS.
3. INDUSTRY SHOULD BE ERECTED OR CHANGED IN THE FIELD OF BUILDING MATERIALS AND COMPUTERS.
4. THE USER SHOULD BE INVOLVED IN THE WHOLE BUILDING PROCESS AS IN INFORMATION, PRODUCTION OF BUILDING MATERIALS PLANNING AND DESIGN AND CONSTRUCTION.

FOR THE HOMELESS

7411147

CONSTRUCCION CON PIEDRA TOBA

El presente trabajo informa sobre un material poseedor de las características que en el sector II del certámen se definen.

La piedra toba es un material de orígen volcánico. Si bien es una roca blanda, se endurece y deviene inalterable bajo la acción de los agentes atmosféricos. Es de fácil aserrado y tallado, lo que determina su utilización en la construcción y ornamentación.

Los yacimientos de toba se localizan en regiones donde ha existido actividad volcánica. En nuestro pais, las provincias cordilleranas son las de mayor potencial tobáceo.
Las reservas de esta roca son abundantes, su extracción es relativamente simple, y su explotación económica podría lograrse a costos reducidos.

Sumado esto a sus características físico químicas, hacen de esta roca un material idóneo para la construcción de viviendas económicas.

Si bien es un recurso natural excelente, hasta ahora en nuestro país, salvo dos casos aislados en Mendoza y Neuquén, sólo ha sido explotado artesanalmente según técnicas autóctonas de cada región.

Es dable suponer que el uso poco intensivo de este recurso se debe, en parte, al desconocimiento de métodos para su extracción mecanizada.

Por otra parte, es un recurso que no tiene la difusión que sería deseable, sobre todo en las esferas oficiales competentes, que planifican y toman decisiones en el área de vivienda.

Es intención de esta propuesta hacer un aporte en la difusión de este recurso, que aplicado a la construcción, puede representar un adelanto en la solución del déficit habitacional de vastas zonas que poseen reservas de piedra toba.

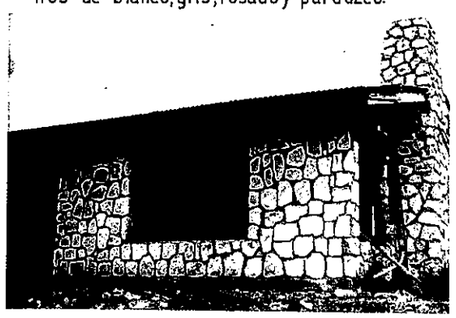
Bloques de piedra toba extraídos en forma mecanizada.

Historia y antecedentes

El empleo de la piedra toba en la construcción podemos rastrearlo a través de la historia desde épocas milenarias. En zonas volcánicas de diversas regiones del mundo existen antiquísimas construciones levantadas con piedra toba.
Como ejemplo pueden citarse las ruinas de Pompeya, las iglesias monolíticas de Lalibela, Etiopía, y la mayoría de las iglesias construidas por lo los españoles en México en el siglo XVII.

En Arequipa, Perú, la piedra toba ha sido y sigue siendo utilizada como mampuesto y revestimiento con excelente resultado.
En Argentina contamos con numerosos ejemplos, como S.C. de Bariloche, cuyos yacimientos de toba han servido como fuente de aprovisionamiento para construir muchos de sus edificios Existen construcciones con toba en ciudades de la pcia. del Neuquén, como Chos Malal, Huinganco, Las Lajas, Loncopué, que siendo muy antiguas permanecen en perfecto estado.

La piedra toba, dada su trabajabilidad se ha empleado también para la confección de elementos decorativos (escalones, frisos, alfeizares, maceteros, molduras etc.)



Construcción hecha con trozos de toba extraídos en forma manual

Características y clasificación

La piedra toba es una roca piroclástica ("piros"=fuego, "clastos"=roto) cuya formación es consecuencia de procesos volcánicos y sedimentarios.

Está constituída esencialmente por partículas de materiales volcánicos, fundamentalmente cenizas mezcladas con pequeñas proporciones de otros productos sedimentarios (arenas, limos, etc.)

Debido a la acción eruptiva de los volcanes se produce una lluvia de cenizas, de dispersión aérea, o flujo de ceniza de dispersión subaérea.
Las cenizas volcánicas, de granulometría similar a las arenas, son transportadas a distancia, por los agentes de la erosión que las remueven y transportan a diversas cuencas en donde forman depósitos, permanentes o temporarios.

Cuando las cenizas se consolidan para constituir las tobas, desaparece la incoherencia, sin embargo el grado de compactación de las tobas es muy variado. Se la puede encontrar como roca fácilmente desmenuzable con los dedos hasta las de compactación más acentuada: tobas litificadas.

Entre estos extremos, se encuentran las tobas aptas para la construcción, son blandas y porosas, pero su homogeneidad, permite la penetración de martillos o picos en su masa, sin que ésta se fracture.
Esta propiedad es la que posibilita su aserrado y labra en forma sencilla.
La coloración que presentan las tobas es casi siempre clara, varía entre tonos de blanco, gris, rosado y parduzco.

Caracteres geológicos de los yacimientos

La denominada lluvia de ceniza es transportada en forma aérea y depositada por perdida gravitatoria.
La forma de estos depositos depende del volumen del vulcanismo que le dio orígen y del relieve de el suelo donde se produce la sedimentación. En general la mayoría de los depósitos tobáceos son mantiformes, aunque se encuentran en cordones y otras formas irregulares.

Generalizando, las tobas no poseen estratificación nítida. Es muy probable que su desaparición se deba a la alteración o descomposición postdeposicional, que sería favorecida por la alta porosidad, la finura del grano y la alterabilidad de las cenizas primitivas.
Es posible en algunos casos que la ausencia de estratificación en un depósito sea aparente y limitada a las superficies expuestas, donde la meteorización elimina sus evidencias
Los depósitos tobáceos son en general homogéneos. Algunos de ellos pueden presentar diaclasamientos verticales producidos por el rápido enfriamiento de las cenizas volcánicas.

Prospección de los depósitos

La búsqueda de los depósitos debera orientarse hacia aquellos lugares donde ha existido actividad volcánica manifiesta, situación en la cual se ven favorecidos la gran mayoría de los países latinoamericanos.

Los materiales de construcción no suelen inventariarse, salvo las arenas, cantos rodados y puzzolanas, por lo que para localizar yacimientos de toba se debe recurrir a la lectura de las "hojas geológicas" en donde aparecen las regiones o localidades donde es probable su existencia.
Estas hojas son confeccionadas por el Servicio Geológico Nacional dependiente de la Subsecretaria de Estado de Minería de la República Argentina.

Estas hojas abarcan una superficie de 3600 km² y hacen una descripción que incluye un estudio geológico donde indican estratigrafia, estructura, tectónica, geomorfología e historia geológica.
Con esta información se puede determinar la presencia y localización de los depósitos de toba.

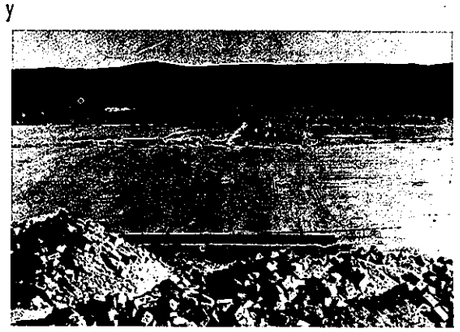
Extractamos un párrafo de la "hoja geológica Bardas Blancas" pcia. de Mendoza que se refiere a las tobas de esa región:

"La consistencia de esta roca la hace apta para la construcción, al mismo tiempo que permite labrarla con golpes de cortafrio o hacha con suma facilidad. La elevada porosidad que en general presenta, le da a esta roca propiedades antitérmicas y antisonoras. El campamento de la mina La Valenciana ha sido realizado en su totalidad con bloques de toba rosada. En este edificio puede observarse el excelente resultado obtenido, tanto en las características fisicomecánicas como desde el punto de vista estético.
Yacimientos de esta roca geográfica y topográficamente bien ubicados como para una explotación económica, existen en gran cantidad, destacandose los de ambas márgenes del río Malargüe por su proximidad a la ruta 40 y a la vía férrea."

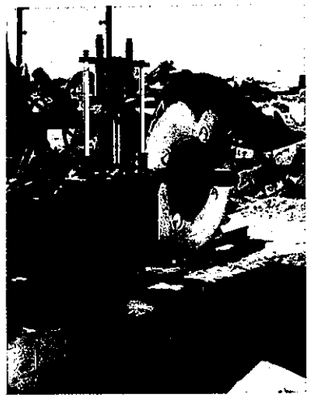
Métodos de explotación

Para la extracción de piedra toba se han utilizado métodos que varían de lo puramente artesanal hasta sistemas mecanizados como los utilizados en Italia desde hace quince o veinte años.
El método de explotación manual consiste en extraer los bloques de toba del frente de cantera por medio de barretas, los que luego, son troceados con hachas y cuñas para aplicarlos inmediatamente a la construcción.
A esta modalidad se le puede agregar el uso de motosierras o máquinas cortadoras para agilizar y regularizar el dimensionamiento de las piezas extraídas.
Además de lo rudo y difícil de este tipo de trabajo, también implica una muy baja producción primaria.

Los sistemas mecanizados se emplean en varios países, y en Argentina existen antecedentes de explotación comercial en Mendoza y Neuquén.
Para este tipo de extracción se utiliza una máquina originaria de Italia denominada "tagliatuffo", cuyo funcionamiento es simple y permite una producción en gran escala.
Esta máquina posee dos discos, uno vertical de 1,20 m de diámetro y otro horizontal de 60cm de diámetro con dientes de widia.
Se desplaza sobre rieles propulsadà por un motor de 6 cilindros y 50 hp de potencia.
La máquina actúa directamente sobre el terreno, cortándolo con el disco vertical en bandas de un ancho predeterminado, y en un paso posterior, ejecuta un corte transversal a las mismas, utilizando simultáneamente los dos discos. De esta forma obtiene los bloques de piedra, cuyas dimensiones se definen regulando la penetración del disco vertical y la medida de las bandas resultantes del primer corte.
Los bloques así extraídos presentan las caras perfectamente regulares. Si es necesario puede efectuarse luego algún corte secundario con herramientas símilares a las utilizadas para cortar cerámicos en obra.
Este tipo de máquina puede extraer entre 3000 y 10000 bloques por turno, de acuerdo a las características de las canteras.



Vista panorámica de una cantera. Se puede apreciar la extensa superficie de extracción, y la poca profundidad a la que se encuentra la roca.



Máquina tipo "Tagliatuffo". Se observan los dos discos que producen el corte del manto rocoso para extraer los bloques de toba.

Características fisicoquímicas

Transcribimos en forma resumida los datos proporcionados por el Instituto nacional de Tecnología Industrial que a pedido de la Subsecretaria de Estado de Obras y Servicios Públicos de la Provincia del Neuquén, realizó, el estudio tecnológico de la toba de Piedra del Aguila, (pcia. de Neuquén.) Fue realizado en 1986 y corresponde al Proyecto de Investigación de materiales de importancia regional.

RESISTENCIA A LA COMPRESION:	65 kg/cm^2
" " " FLEXION:	18 kg/cm^2
CONDUCTIBILIDAD TERMICA:	0,43 kcal/m h°C
ABSORCION	17%
DENSIDAD RELATIVA SECA:	1543 kg/m^3
ADHERENCIA AL REVOQUE:	4,2 kg/cm^2

De acuerdo a estos valores la toba reúne muy buenas condiciones para la construcción de viviendas Posee una gran capacidad como aislante térmico, apropiada para las zonas de clima riguroso, coincidente con aquellas donde el material se encuentra.
La resistencia a la compresión es comparable a la de un buen ladrillo, por lo que es posible construir hasta dos niveles. Tiene baja resistencia al desgaste y a la flexión, por lo que no es recomendable para pisos.
Si bien posee un alto índice de absorción, no presenta disgregación por la acción de las heladas, resistiendo perfectamente a este fenómeno, debido a su estructura constitutiva.
Es de destacar que el agua de la humedad ambiente absorbida por la piedra cementa las cuarcitas con los sedimentos volcánicos que la componen consolidándola a medida que pasa el tiempo.
Posee además capacidad refractaria soportando sin inconvenientes temperaturas de 700 a 1000 °C.

Mamposteria en piedra toba

Los bloques resultantes de la extracción mecanizada poseen dimensiones standard que pueden variar entre 40 o 50 cm x 25 o 30 cm x 20 o 25 cm
Estas dimensiones le otorgan al mampuesto de piedra las mismas ventajas que posee el bloque de cemento en cuanto a reducción de trabajo y de mezcla con respecto al ladrillo, pero con un resultado muy superior en la aislación térmica debido al bajo índice de conductibilidad de la piedra.
Cabe la posibilidad de levantar paredes de piedra toba con una o dos caras vistas, eliminando el revoque. Esta modalidad implica una notable baja en el costo por metro cuadrado de pared.

Para aprovechar mejor el material es importante que al proyectar se module la construcción en base a las dimensiones del bloque, manejando 1/2 bloques para los vanos, encuentros, etc.

El tipo de mortero a emplear es similar al que se utiliza para paredes de ladrillo o bloques.

La trabajabilidad de la toba facilita la realización de canaletas para las instalaciones de la vivienda.

Surcos practicados por la máquina sobre el manto rocoso. Se puede ver al fondo la máquina y el riel.

Material de cantera de extracción mecanizada.

Esta propiedad permitiría también la confección de piezas especiales que sirvan de encofrado integrado para vigas y columnas.

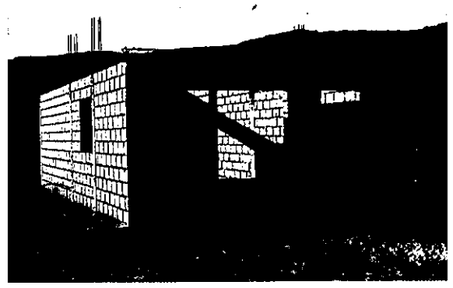
Las condiciones refractarias de la piedra, sugieren la posibilidad de proyectar hogares de leña y cocinas económicas integradas a la construcción, en respuesta a los usos, costumbres y condiciones bioclimáticas, de las zonas donde la piedra toba se encuentra.

Dado que la existencia y rendimiento económico de la piedra toba, está estrechamente relacionada con áreas de características sísmicas, es necesario en todos los casos construir respetando las disposiciones antisísmicas existentes.

Construcción en la que se combinó el ladrillo común con la piedra toba.

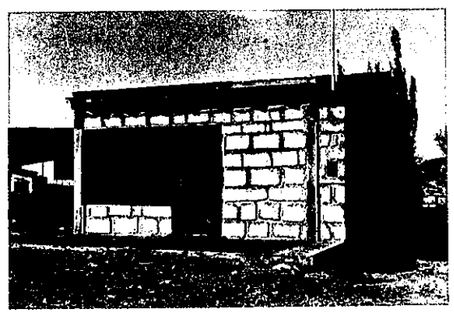
Aspecto económico

El geólogo Daniel Meilán* realizó en el año 1984, un análisis económico comparativo entre dos proyectos de inversión alternativos: producción del tradicional bloque de cemento, y explotación mecanizada de una cantera de toba para la extracción de bloques de piedra con iguales dimensiones a las del de cemento.
Ambos proyectos son situados en la localidad de Las Lajas, pcia. de Neuquén.
Los factores contemplados en este estudio para determinar la ubicación de estos proyectos fueron: las relaciones con la infraestructura regional, el mercado posible y los sustitutos competitivos.



Ejemplo de la aplicación de bloques de piedra, resultantes de la extracción mecanizada.

De este complejo y riguroso análisis surge la conclusión más ventajosa para la explotación de la piedra toba. Si bien requiere una inversión superior al 10% con respecto a la necesaria para la producción de bloques de cemento, demanda un menor capital de trabajo por que no exige integraciones de capitales adicionales durante la vida estimada del proyecto.
La producción de bloques de cemento exige la necesaria utilización de insumos y sus correspondientes traslados (fletes).
En el caso de la piedra toba, los bloques se obtienen directamente de su fuente natural, sin complejos métodos de elaboración.



Construcción realizada con bloques irregulares sobrantes de producción de la cantera.

Al aspecto estrictamente económico hay que sumar las superiores cualidades constructivas resultantes del uso de la piedra toba, con respecto a lo obtenido con materiales tradicionales: ladrillo y bloque de cemento.

La reducción del costo de construcción implica que con igual cantidad de recursos destinados a la construcción de viviendas, por parte de los organismos oficiales, las unidades construidas se incrementarán, facilitando el acceso a la vivienda digna.

Finalmente conviene considerar la posibilidad de generar una actividad semiartesanal derivada de la actividad extractiva. La producción de piezas especiales para mamposteria y elementos accesorios a la construcción implicaría nuevas fuentes de trabajo y la comercialización de productos con algún valor agregado.

LAS FOTOS PRESENTADAS CORRESPONDEN A UNA CANTERA DE PIEDRA DEL AGUILA (pcia. de Neuquén, Argentina) LAS CONSTRUCCIONES MOSTRADAS PERTENECEN A LA MISMA LOCALIDAD

FUENTES CONSULTADAS

MEILAN, DANIEL "Conveniencia de la utilización de las tobas volcánicas en la construcción de viviendas económicas" BANADE (Buenos Aires, Argentina 1984)

KNAIBL, OLGA "Recursos Regionales-La Piedra Toba" III Congreso Nacional de la Vivienda Rural (Neuquén, Argentina 1986)

GINGINS, MARIO "Posibilidades de explotación de la cantera de toba de Huinganco" (Neuquén, Argentina 1977)

* MEILAN DANIEL licenciado en geología, investigador del empleo de la piedra toba. Realizó el trabajo arriba citado, como geólogo del Banco Nacional de Desarrollo.

SECTION IV

1900 1909

4th sector

URBAN ANTECEDENT

2000 a.c

1521

OPEN ORDER, WHERE COMMUNITY ACTIVITY HAS A MAIN IMPORTANCE.

THERE IS EQUILIBRIUM BETWEEN BUILDINGS AN OPEN SPACES.

SPACE ENVIRONMENTS WITH VISUAL VARIETY AN EXPRESIVE POSSIBILITIES.

1522

1810

STRUCTURED ORDER, BROUGHT FROM EUROPE.

THERE ARE STILL MANY SPACES FOR COMMUNITY ACTIVITIES.

THE COMMERCIAL ACTIVITY WORKS IN LEVELS. HERE SUBSIST THE CONCEPT OF "TIANGUIS" WHERE THE INTERCHANGUE OF EXPERIENCE A HIGH LEVEL MAINTEIN.

1910

198?

INTERNATIONAL MODERN CONCEPTS. ARCHITECTURE IS AN ISOLATED DESIGN.

THE INDIVIDUALITY IS LOST AND PARADOXICAL, POPULATION HAS EVERY TIME LESS POSSIBILITIES FOR COMMON MANIFESTATIONS.

habitat

unique piece

mass production

we must change!

SOCIETIES PATTERNS COULD BE SEE LIKE AN IMAGE OF DIFFERENT VALORIES SYSTEMS

yesterday

today

INTRODUCTION

urban CULTURE

VERNACULAR CONCLUTION

1. AIRE AIR

adecuado

- NO DUST
- APT TEMPERATURE
- CORRECT HUMIDITY
- NO TOXIC SUBSTANCES

2. ALIMENTO FOOD

balanceado

CARBOHIDRATES + PROTEINS + MINERALS + GREASES + VITAMINES = SALUD HEALTH

3. VESTIDO CLOTHES

apropiado

FIRST PROTECTION SURFACE AGAINST THE ENVIRONMET.

4. HABITACION

integrada

HABITATION 198?

DESIGN REQUESTS

1. REQUERIMIENTOS REQUESTS

THE INNER SPACE WILL BE DESIGN IN 3 ZONES:
A) LIVING
B) INTIMATE
C) SERVICE

COFORT PRIORITIES:
1 ST. INTIMATE
2 ND. LIVING
3 RD. SERVICES

INTIMA.2 INTIMATE

- ORIENTATION TO SW.
- ILLUMINATION TO SE., S OR E.
- AIR INJECTION TO NW.
- EXTRACTION TO SE.

3. SERVICIOS SERVICES

- ORIENTATION TO SE.
- ILLUMINATION TO E, SE OR S.
- AIR INJECTION TO NW.
- EXTRACTION TO E, SE.

ESTAR.4 LIVING

- ORIENTATION TO NE
- ILLUMINATION TO ANY ORIENTATION.
- AIR INJECTION TO NW.
- EXTRACTION TO SE.

5. PROTECCION vs VIENTOS WIND PROTECTION

THE THERMIC MASSES WILL BE DISTRIBUTED IN THEIR CORRESPONDENT ZONE.
WALL THICKNESS VARIES FROM 60 TO 40 CMS. FOR MORE DETAIL SEE ECOTECHNICS.
MASSES WILL WORK WITH:
- DIRECT SOLAR RADIATION
- AIR INJECTION (HOT OR COLD AIR FROM OLLIN CENTER)

MASAS.6 TERMICAS THERMICS MASS

PROTECTION OF DIRECT WIND.
WINDS BLOW FROM NE, NW AND SW.
WINDS FROM NW ARE THE MOST DANGEROUS, SPECIALLY IN WINTER.

BIOCLIMATIC solution

OLLIN CENTER IS IMPORTANT BECAUSE IT CREATES THE CLIMATIC CONDITION INSIDE THE BUILDING AND PRODUCES, HOT WATER, CONTINUITY IN THE WATER PRESSURE, EXACT TIME, SUFFICIENT WATER IN THE SYSTEM, ETC.
OLLIN CENTER WORKS LIKE THE RADIAL AXIS OF THE HOUSE.

CENTRO.7 OLLIN CENTER

ORIENTATION WITH COMPUTER PROGRAM OLLIN CENTER AZIMUT O' SOUTH.

CALLES: STREETS

GOOD WINDS 3M/SEG.

VERY COLD WIND 3 M/SEG.

a.-verano summer

PRINCIPAL STREETS ARE ORIENTED TO "NORTH-SOUTH.
- IN SUMMER IS NECESARY TO USE ALL SYSTEMS AVAIBLE TO GET COOL. THE STR
- IN WINTER IT NEEDS TO BE PROTECTED AGAINST THE COLD WIND.

b.-invierno winter

PLANTA unidad habitacional

PLAN habitation unity

METODOLOGIA SOLAR

1. DESIGN ELEMENTS

CLIMATE ·
ANALYSIS OF THE REGIONAL CLIMATE IN A CONTINENTAL LEVEL.

MICROCLIMATE ·
LOCAL LEVEL. IT'S ORIGINATING BY THE TERRAIN TOPOGRAPHY.

COMFORT ·
ITS A STUDY OF PHYSICAL, PSYCHOLOGICAL AND BIOLOGY NEEDS OF THE LOCAL PEOPLE FOR BEEN RESOLUTE BY THE PROJECT.
OLYGAY GIVONI

YEARLY NEEDS ·
IN THIS POINT, ITS DEVELOPING THE SHADE CHART, UNILATERAL & BILATERAL ORIENTATION, PROTECTION AGAINST THE WIND, AND THE WIND USES WHEN IT IS REQUIRED.

MATERIALS ·
WE STUDY HERE THE BIO-CLIMATIC ADEQUATE VERNACULAR MATERIALS IN THE REGION. THEY ARE IN MOST OF THE CASES LESS EXPENSIVE THAN THE INDUSTRIALICED ONE.

2. MEASURE & MOTION

IMPORTANCE LEVEL ·
THE IMPORTANCE LEVEL IS THE RESULT OF DESIGN ELEMENTS, COMFORT, WIND (PROTECTION AND USE), SHADE, RADIATION AND REFRIGERATION.

ZONE ADVICE ·
FOR EACH CLIMATIC ZONE, THE METHODOLOGY GIVES DESIGN ADVICES, HABITAT AND LANDSCAPE.

VERNACULAR RESPONSE ·
A STUDY CONSIDERED BY TWO REASONS:
- APROPRIATE USES OF RESOURCES TO SPEND LESS ENERGY.
- CONSERVES THE VERNACULAR CHARACTER VALUED AGAIN.

APT SOLAR SYSTEMS ·
SELECTION OF THE APT SOLAR SYSTEMS (ACTIVE AND PASSIVE (HEAT, COLD)) MORE ADEQUATE TO THE PROJECT.

NEEDS PROJECT ·
HERE, THERE'S A LIST OF ARCHITECTURE NEEDS OF THE PROJECT, BY AFFINITY FUNCTIONS.

PRIORITY COMFORT ·
THE PRIORITY COMFORT IS SELECTED BY ZONE, THEN IT'S ANALYZED THE BIOCLIMATIC PROPERTIES BY ROOM.
1a 2a 3a

GRAPHIC FUNCTIONS ·
WE THINK SHAPE BUILDING CORRESPONDING:
- PLAN ORGANITATION.
- VERNACULAR SHAPE OUTSIDE.

SYST. LOCALITATIONS ·
LOCALITATION OF THE SOLAR SYSTEMS IN EACH SPACES AS IT'S REQUESTS:.

APT MATERIALS ·
SELECTION OF APT MATERIALS FOR BEEN USE IN PROJECT. WE OBTAIN THE TRANSMITION COEFFICIENT IS AND TEST IT IN A SIMULATE ENVIRONMENT.

PROYECT ·
THE PROJECT IS REALIZED IN PLAN AND ELEVATION. CONSIDERED THE 14 STEPS BEFORE DONE.

3th DIMENSION ·
THE PERFORMANCE OF BUILDING IS STUDIED IN THREE DIMENSIONS WORKING ALL TOGETHER IN THE YEAR (SPRING, SUMMER, AUTOMN, WINTER).

THERMIC EFFICIENCY ·
THE PROJECT IS SUBMITED IN TOTAL LOSS AND GAIN
STUDY OF ENERGY IN CRITICAL PERIODS.

REFRIGERATION ·
THE BUILDING IS STUDY IN CRITICAL PERIODS OF OVER HEAT. DYNAMIC WIND STUDY IS NEEDED INSIDE AND OUTSIDE (HELP AND PROTECT).

BALANCE ·
IF IN WINTER, THE LOSS OF ENERGY IS LESS THAN 3.25 KCAL/M2HR AND IN SUMMER, ITS DISSIPATED ADEQUATEMENT THE PROJECT IS IN 'BALANCE'.

WATCH OVER ·
ALL RESULTS ARE VERY VALUABLE DATAS FOR OTHER DESIGNERS. THIS INTERCHANGE WILL CREATE AN UNIVERSAL ARCHITECTURE. WORLD FRATERNITY.

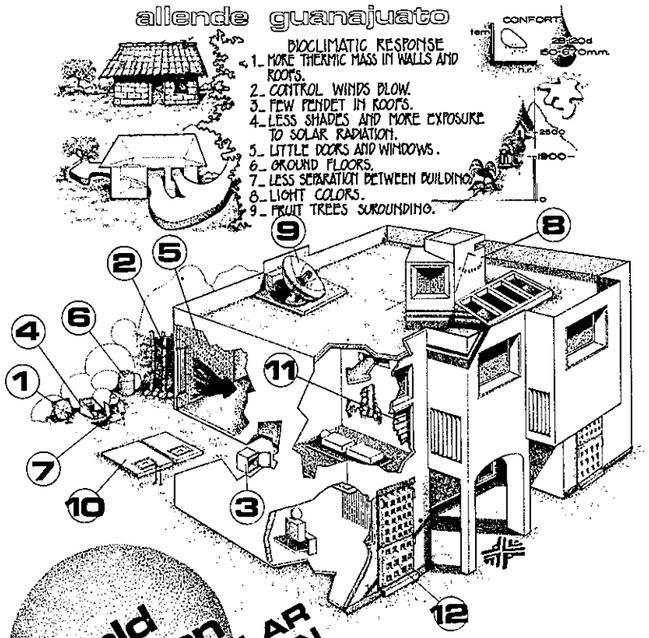
20 STEPS

RESPUESTA VERNACULA

HABITAT VERNACULO

allende guanajuato

BIOCLIMATIC RESPONSE
1_ MORE THERMIC MASS IN WALLS AND ROOFS.
2_ CONTROL WINDS BLOW.
3_ FEW PENDET IN ROOFS.
4_ LESS SHADES AND MORE EXPOSURE TO SOLAR RADIATION.
5_ LITTLE DOORS AND WINDOWS.
6_ GROUND FLOORS.
7_ LESS SEPARATION BETWEEN BUILDING.
8_ LIGHT COLORS.
9_ FRUIT TREES SURROUNDING.



world solution
- advance SOLAR method DESIGN
- plus
- vernacular response author

SOLAR methodology

③ NIGHT
free ice! with night
ICE BOX

② VEGETAL TOWER

super-market at home
save energy and money
FOOD ④ DRY BOX

safe
clean
free
REFLECTOR COOKER ①

» just turn «
loss 90% 10%
gain 20% 80%
gain 100 %
loss 27 %
control your temperature
DIO-THERMIC ⑪

CLIMO-PANEL ⑫

world ARCHITECTURE
—originals creations by author

REFRIGER WALL ⑤
evaporation effect
great!
wind direction
40°c 25°c
water movement
temp + −
conditions: h.r. + −

up up up
to home service
supply
SOLAR PUMP
9

- WIND TOWER
- SOLAR AIR HEATER
- SOLAR WATER HEATER
- SOLAR CLOCK
- DESTILLATION DEVICE
- HIGH HUMIDITY DEVICE
- DUST FILTER
- NATURAL FRAGANCE
- ELEVATED WATER TANK.

to OLLIN center
to solar pump
LOCAL WATER SUPPLY
ollin
⑧ CENTER

TRASH BASKET ⑥ use it again

FERTILIZER PRODUCER
bigger plants with organic material

WATER STORAGE ⑩ ...water, always!

SOLAR OVEN ⑦
roast a chicken in... two hours!

don't waste water!
SOAPY WATER FILTER

16666661

A FIFTH APPROACH

BACKGROUND.

SHELTER FOR THE HOMELESS.

The United Nations have designed 1987 "The International Year of Shelter for the Homeless", with attention to be focussed on the homeless in developing countries. The aim is to get to grips with the uncontrolled worsening of housing problems by relating them to such contexts as growth, planning, social conditions, water, land distribution, and building practices. Four approaches to housing problems have so far been defined:

1. Tolerating and neglecting them
2. Compulsory removal, with or without alternative homes
3. Low-cost mass-produced urban housing
4. Slum rehabilitation or site and service projects'

The present document aims at presenting a "fifth approach" to the crying need for shelter. In wiew of the vast urbanization to be expected in the near future, this "fifth approach" emphasises the importance and necessity of concentrating on new alternative building materials and technologies.

The problems are enormous. People in Asia, Africa, Latin America and the Middle East are up against over-population, deteriorating environments, and migration which increases the pressure on urban centres, not to mention such difficulties as squatting and the absence of public services and utilities. Will open drains, untreated waste, miserable sanitation, flies, and poor lighting, combined with the permanent threats of eviction and unemployment, finally drive families to despair, alcoholism and prostitution? Will undernourished children, if they reach school age, be forced to help to feed their families instead? The myriads of problems vary from one continent, country or local comunity to another, and there is no single universal solution which can alleviate the global need for shelter.

SOCIAL CONDITIONS.

Indications have reached the United Nations of a growing will to focus on this problem so as to improve unworthy conditions. A distinction should be made between two different interrelated tasks: one is to develop programs to improve housing conditions, the quality of life, the environment in which children grow up, in existing slum areas, the other, equally important, is to analyse the reasons for rapidly swelling flood of people to urban areas and plan concrete and in particular realistic measures to slow down or preferably to reverse the trend.

Attention to rural housing and living conditions may prove just as important as concentration on urban slums. What drives such large population groups to abandon their rural way of life to seek a better living in the cities? What woult it take to get village people to stay in the country? Is this chiefly a question of jobs and educational opportunities, or are other factors more important?

Programs aimed at urban slum clearance or slum rehabilitation must be matched by plans for improving rural living conditions. To halt the migration from country to city, it may be necessary to devote even more resources to the former than to the latter. In isolation, slum rehabilitation can create as many problems as it solves: improved living and housing conditions in urban areas attract even larger numbers of people from outside.

ECOLOGICAL FACTORS.

Uncontrolled and accelerating urban expansion, aggravated by immigration from rural areas, will increase the shortage of food, fuel, and cultivated land. Even today, commercial timber felling, land clearance and fuel gathering are reducing Africa' s forest and woodland areas by 3.6 million hectares a year.

Such figures lend urgency to the question of how long we can afford such vast and unnecessary exploitation of resources. How long will there be enough timber for roof construction or fuel for brick-making? How long will the topsoil last? Urban growth based on continuing use of traditional materials will upset the world' s ecological balance even further.

FINANCIAL BASIS FOR ALLEVIATING THE NEED FOR THE SHELTER.

A common denominator for slum populations is their low income, which permits little or no contribution to joint projects. Attempts to provide housing depend on outside funding, either in the form of cheap loans provided by local authoroties, or as contributions and gifts from voluntary organizations in developed countries.

UNUSED RESOURCES.

As cities expand, greater financial resources are called for. Funds have to be carefully allocated to sectors where the best results can be achieved. There is a need to develop economic models embodying new financial mechanisms which will increase poor people' s incomes and thus enable them to participate in the development of the community. One way of bringing this about is by providing meaningful work. If poor people produce attractive products, they may open the door to an unused resource: the purchasing power of the better off among the local population.

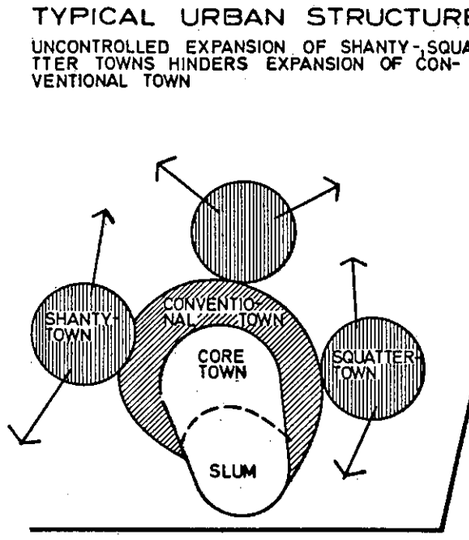
TOWN PLANNING.

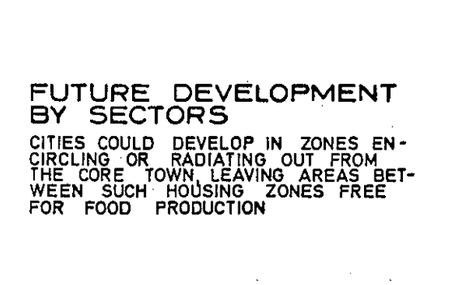
Today' s big city generally comprises the original and familiar urban centre, which develops according to the prosperity of its established population, and housing areas for the less prosperous or poor population groups. It is in the latter we find over-population, environmental pollution, inadequate infrastructures, squatting, and all the pressures resulting from the influx from the outside. It used to be thought that slums, squatters, and shanty towns were transitiry features. But by the year 2000 about 83% of the world' s population will be living in cities. Under what conditions?

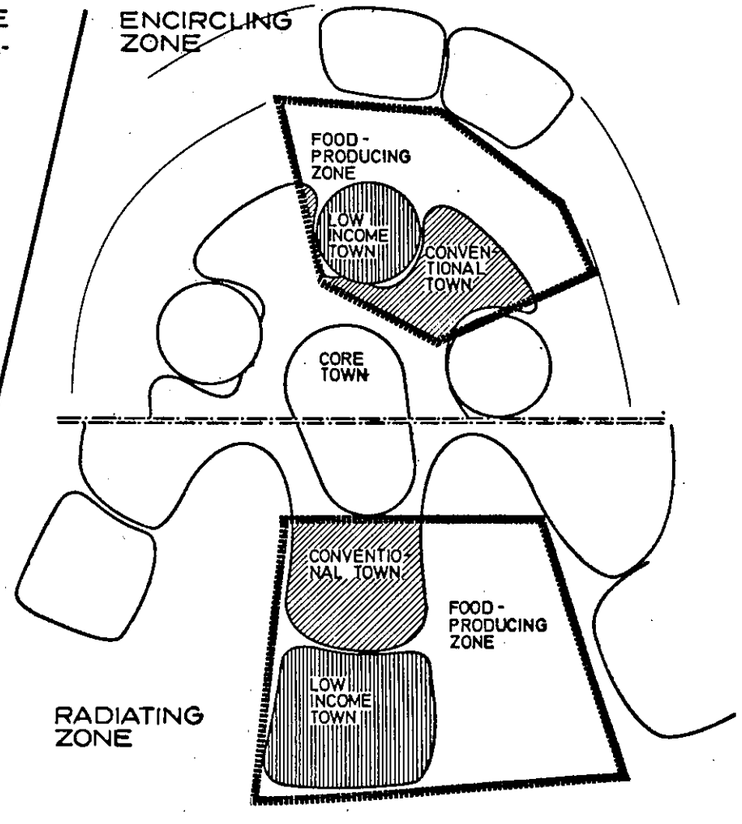
It is none too soon to start thinking about future urban development. Expansion will encroach on steadily shrinking areas we need-- to grow food, among other things. We therefore need to find urban structures which permit cities to expand while safeguarding agricultural areas, such areas must be within reasonable distances of consumer centres, because of the growing communication and transport problems which also lie ahead.

We can never hope for equal standards of housing for all. The differences between conventional town and the poorer areas will remain. Our aim must nevertheless be to provide reasonably decent accommodation for all population groups-- including the poor. We associate slums, squatters and shanty towns with need and misery. We need to launch a new concept which will symbolise the creation of decent housing conditions: "Low income towns". Future urban development must aim at integreating the conventional and low income town.

Cities could develop in zones encircling or radiating out from the original core town, leaving areas between such housing zones free for food production. Future expansion could be planned as development by sectors, with each sector integrating conventional with low income elements by means of its infrastructure, and linked to a neighbouring food-producing zone. Such a sector principle can be adopted under present and probably also under future systems in which public or private agencies assume responsibility for implementing integrated housing programs.







PROPOSAL.

A NEW THRUST.

The enormous exploitation of traditional building materials that follows from increased urbanisation will, in addition to its harmful impact on the ecology, in the long run lead to deterioration of poor people' s living and housing conditions. We are convinced that the development and use of new alternative materials and technologies is one answer to this. Another essential is cooperation at all levels and on a global scale. Public opinion needs to be made to focus on the housing problem. Work on innovative ideas needs to be made attractive. With the support of international agencies, national governments and local authorities, the results of such innovative workmust be channelled to "low income towns". And the populations of "low income towns" must be enabled to receive and make the most of the new opportunities.

THIS COMPETITION ENTRY ENVISAGES A PROGRAM BASED ON THE USE OF A NEW BUILDING MATERIAL AND A NEW TECHNOLOGY WITHIN AN ALTERNATIVE ECONOMIC MECHANISM.

NECESSARY CONDITIONS.

The program assumes cooperation between a conventional town and a low income town, and that the problem of migration is tackled in special village development programs. An umbrella organization should provide an inter- disciplinary team of anthropologists, psychologists, social workers, economists, architects, engineers and ergonomics and energy conservation specialists, with responsibility for implementing integrated programs adapted to local cultural, social and economic structures.

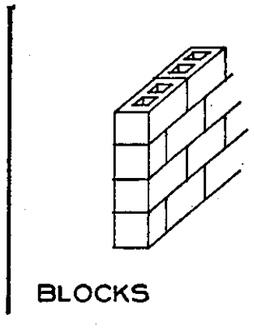
ULTRA-LIGHTWEIGHT CONCRETE.

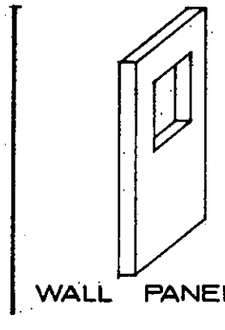
There is no need for any further analysis of the physical characteristics and anatomy of slums and shanty towns, which are all too well known. Slum upgrading and site and service projects in their present form are not always the best long-terms solutions. In many cases they mean even greater population and housing density. In the long run, haphazard choices of often unsuitable materials, not to mention ecologically harmful exploitation of resources, can hardly lead to any improvement in the housing situation. The need for innovation and creativity in the use of materials and technology has already been mentioned. The present competition entry will present a "case" involving the use of ultra-lightweight concrete in a "low income town" context.

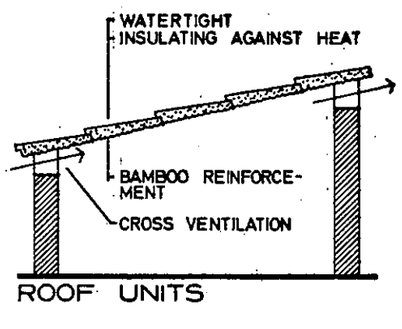
DESCRIPTION OF THE MATERIAL.

Ultra-lightweight concrete has the following properties:
- Ease of manufacture and handling
- Can be shaped into blocks, wall units and roof units as required
- Insulates against heat and cold
- Is watertight
- Can be reinforced in the traditional way with steel or plastics, but also with easily renewable materials (bamboo)
- Low specific gravity (600 kg/m3)
- Economical with cement

The concrete is a blend of expanded polystyrene beads and cement. A low income town community can manufacture it at 1/5 of the cost of commercial production. It should attract general interest.


BLOCKS


WALL PANELS



ROOF UNITS

ADVANTAGES.

The properties listed above give ultra-lightweight concrete enormous potential in the struggle against the housing shortage. It can replace a number of traditional materials which ought to be preserved and can, in combinations with easily renewable local materials, be a basis for developing new technologies. Studies and tests that have been carried out in West Africa, Pakistan and the Philippines give reason to believe that the concrete lendsitself very readily to conventional building.

PRODUCTION COOPERATIVES/ PRODUCTION UNITS.

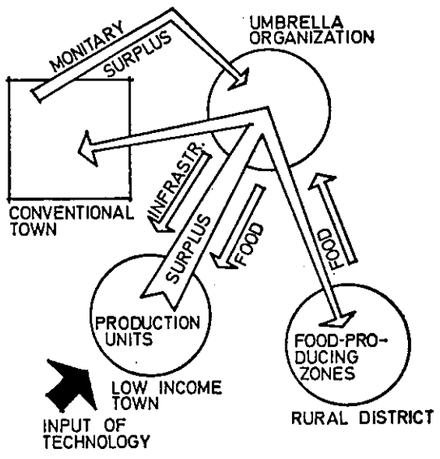
Among inhabitants of a low income town, a cooperative is set up to manufacture the material. The product satisfies the need for housing in the low income town. The surplus is distributed to building material shops in a conventional town and outlets in rural districts. Production units are set up as required so as to keep transport distances short.

CONTROL MECHANISMS.

The new material/ product is distributed through an umbrella organization which is responsible for the overall integrated development of low income areas and for the propper functioning of the necessary social, cultural and economic mechanisms. The organization will provide links between the low income production cooperative, food-producing areas and conventional urban structures.

ECONOMIC MECHANISMS.

Present-day slum populations consists of people with varying levels of income, but below those in a conventional town. This makes it important to establish income- generating activities, so that also people with purchasing power are directly or indirectly drawn into the consumption of goods produsedin low income areas. The connection with the food-producing sections of the population is also important. To live in the country and produce food must again be regarded as a fulfilling way of life. The relation between a low income town and a conventional town, and between the low income town and rural districts, can be illustrated by an example:



Ultra-lightweight concrete is manufactured in a low income area to meet the area' s need for better housing. An umbrella organization (a private or governmental agency) administers the production, the distribution of materials, and the work done by inhabitants (inexpensive labour). The same organization channels the surplus produsedto building material shops in the conventional town and to the rural district. Profits from sales in the conventional town are invested in the low income town' s infrastructure. The surplus distributed to the rural district is exchanged for food.

AN EFFECT MODEL.

As mentioned, one of the most important objectives in the fight agains the housing shortage is to create new meaningful jobs and income-generating activities. This would be the effect of placing lightweight concrete, a result of innovation, at the disposal of low income town development through a controlling organization. Large numbers can be employed in the production of the building blocks and in building. The expandable polystyrene beads, which have to be produced centrally, can in addition to their use in concrete products also be used in other industries, for instance the production of fish boxes (food storage). The product is attractive enough to be used also by those with means. Local money is in other words being drawn into slum projects where it has previously played no part, to the benefit of the low income town. This in turn means less pressure on traditional sponsors.

CLOSING REMARK.

This project promotes innovation, new materials and new technologies which open the way for for new forms of aid. Those receiving the aid themselves become active mediators of new ideas instead of passive receivers of donations.

THE PRESENT COMPETITION ENTRY ILLUSTRATES ONE OF MANY METHODS FOR COMBATING THE HOUSING SHORTAGE, AND SEEKS TO:
- CONTRIBUTE TO MAINTAINING THE GLOBAL ECOLOGICAL BALANCE
- MOBILISE MAN' S MOST VALUABLE RESOURCE, HIS BRAIN, IN THE FIGHT FOR BETTER HOUSING AND LIVING CONDITIONS FOR THE POOR PEOPLE OF THE WORLD.

section III, because our solution offers some essential technical innovation in materials "using the forces of nature as a binder". In this case: "atmospheric pressure". To have some dry stuff "vacuous packed in a plastic bag" to get a building-block, reflects an original attitude to the choice and use of constructional elements.

12101492

Foto: ZAFARI Sprovr/ Bakkar/I.S.

it may not cost a dime

To deliver a contribution in the struggle for shelter. What is meant by this? It may not cost a dime. Not because there is no government budget or a foreign debts crisis. For there are millions to be spent on weapons, which are no tools to solve our problems. Or .. may be on the long run after all?

In any case, what we have learned, is not to wait for others. We have to do it ourselves if we need a house.

A house:

some walls
enclosing intimicies?

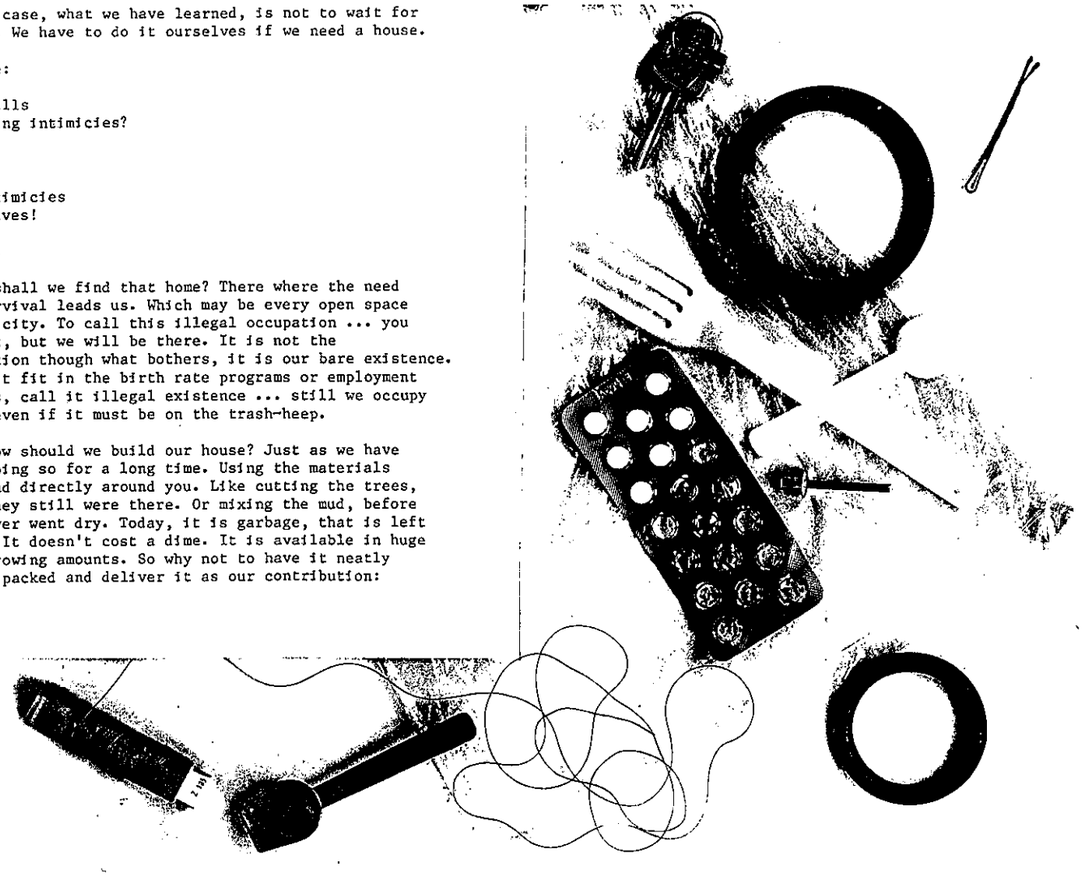
or

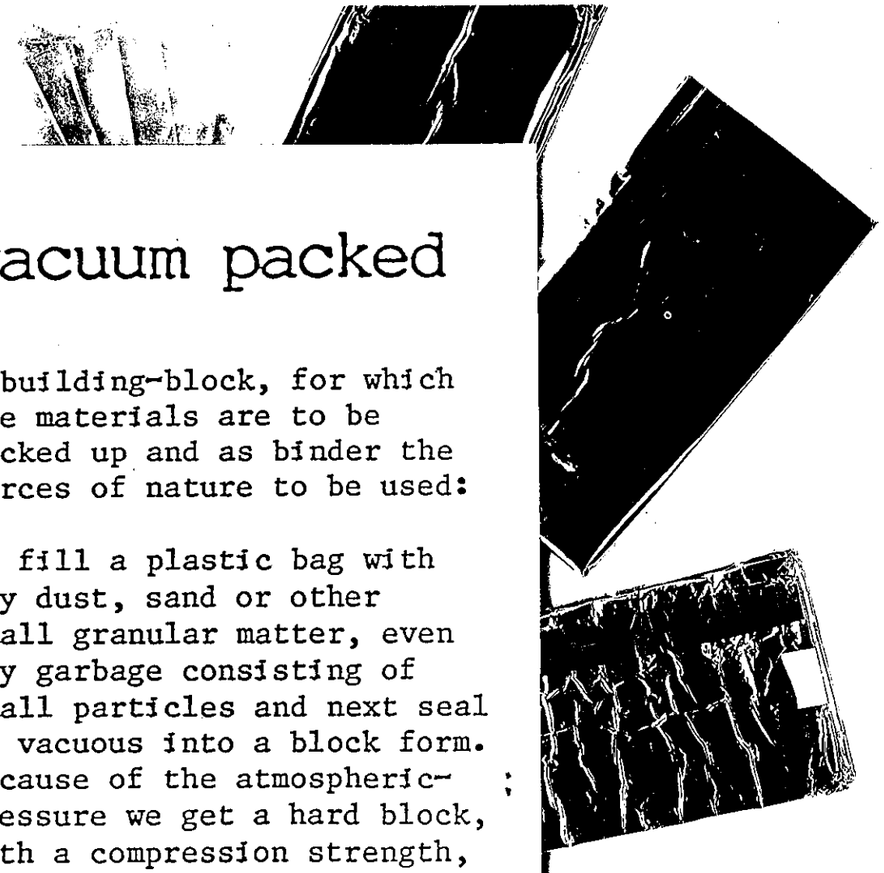
the intimicies
themselves!

a home.

Where shall we find that home? There where the need for survival leads us. Which may be every open space in the city. To call this illegal occupation ... you name it, but we will be there. It is not the occupation though what bothers, it is our bare existence. We don't fit in the birth rate programs or employment schemes, call it illegal existence ... still we occupy room, even if it must be on the trash-heep.

Then how should we build our house? Just as we have been doing so for a long time. Using the materials you find directly around you. Like cutting the trees, when they still were there. Or mixing the mud, before the river went dry. Today, it is garbage, that is left to us. It doesn't cost a dime. It is available in huge ever growing amounts. So why not to have it neatly vacuum packed and deliver it as our contribution:

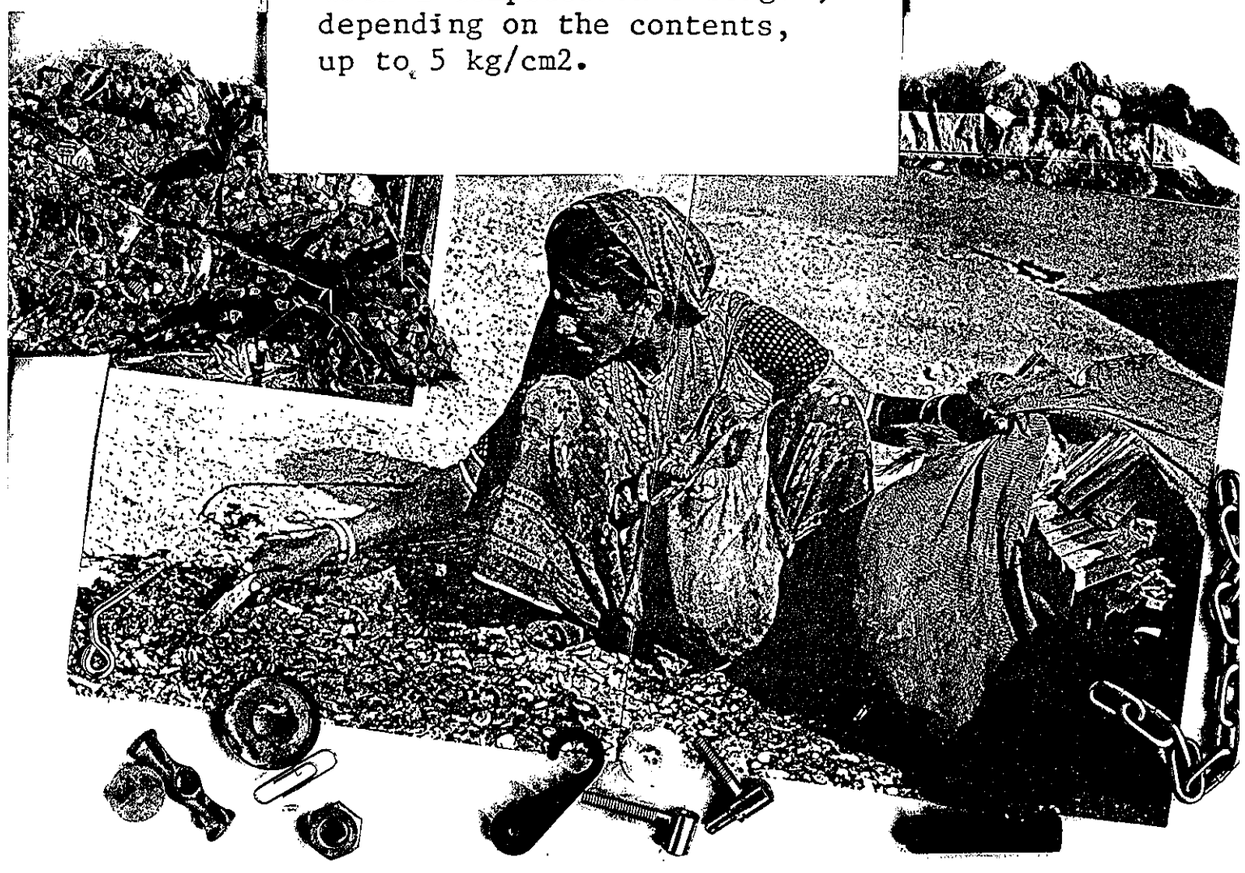




vacuum packed

A building-block, for which the materials are to be picked up and as binder the forces of nature to be used:

We fill a plastic bag with dry dust, sand or other small granular matter, even dry garbage consisting of small particles and next seal it vacuous into a block form. Because of the atmospheric-pressure we get a hard block, with a compression strength, depending on the contents, up to 5 kg/cm2.



no manuels needed

the **apparatus** to have the contents of the plastic bags vacuous packed is very simple to handle and doesn't need a manual. It is small and easy to carry around. We should rather compare it with a domestic vacuum cleaner.
Because of the low price, it earns itself back in a fast way, while it doesn't lean itself for economical exploitation.

the **format** of the blocks may vary and will in fact be restricted by the dimensions which the packingunit allows. A manageable minimum size is approximately 5x10x20 cm, corresponding with that of a brick or a 250 g. package of coffee.

the **packaging** may consist of ordinary plastic bags. However, plastic bags developed especially for this purpose, applied with a fasteningmedium, will simplify the welding together of the blocks.
The material of the bags may be simple plastic or aluminium impregnated plastics in different colours or tear- and gnaw-unfriendly plastics.

the **fastening** of the blocks to each other can be done in various ways:
- glueing with cheap lowgrade gum
- dry-pressing on each other when the plastic bags were provided with self closing or cold sticking strips on the sides
- wet-pressing on each other of the blocks of which the plastic bags were partly preteated with dry gum.

the **walls** can be left unfinished, in which case the nature of the material must been taken into consideration. So nails will not be allowed. A punctured block will lose its hardness and consistently its strength, although the strength of the wall will not serious be affected by some punctured blocks here and there.
Still there are simple and cheap finishes to protect the walls from puncturing:
- covering the wall with a plaster
- allowing the outside of the wall to be covered by climbing plants, which may be directly on the wall or along lines on some distance from the wall.

make a clean sweep

the **loads** from floors and roofs are to be received by a load-spreading layer. Scrapwood will already be satisfactory here. The blocks can be loaded on compression only. The compression-strength is sufficient for the modest measurements of our houses.

the **stability** will sufficiently be found in the innerwalls, made of the same material and interweaved with the outerwalls. Curves and corners strengthen the walls more.
And by forming niches in the wall a very stabile solution is achieved. An advantage of this sistem is, that by holding doors and windows back into the niches, they find better protection against sun and rain.
Furthermore the inwards looking niches may serve as cupboards.
The edges of the wall-openings can best be protected with U-profiles made of scrapwood. The profiles will serve also for the attachment of windows and doors.
It is also recommendable to apply a scrapwooden plinth as protection of the wall.

the **garbage**
For the foundations we can use the heavier stony objects, we find around while the smaller ones will serve as the fill for the floor, finished with a plaster.
The roofconstruction can be made of wreckings, like wood and sheetmaterials, covered with plastic foil or canvas-wastes. To protect these for disintegration by sun radiation or rupture by the wind, we finish the roof with sods of grass.
The grass is grown with the help of compost. Compost is produced out of the wet garbage consisting of foodrests etc. The advantages of this form of rooffinish is well-known: protection of the underlying roofmaterials, better warmth and soundisolation, maintenancefree.
A good many of the garbage, as we see, lent itself allready for recycling.

the **rubbish** we use for the blocks, however, the major part, was seen as the waste of the garbage, good for nothing.
In the far end, the fate of all the kinds of garbage. So by clearing this, we really make a clean sweep.

SECTION V

A111111A

1- UNE POLITIQUE RATIONNELLE DE DEVELOPPEMENT

Le problème de l'habitat, et en particulier celui du logement des sans-abris n'est qu'un aspect du problème du développement.

Au même titre que les problèmes d'éducation, de santé, d'alimentation etc.

Il importe donc d'en chercher d'abord les solutions au niveau d'une politique rationnelle de développement.

Seule une telle politique équilibrée prenant en compte tous les secteurs de développement et leurs contraintes et les potentialités d'un pays ou mieux d'un ensemble de pays offrira des chances de succès aux politiques sectorielles de développement de l'habitat et du logement des sans-abris.

2- RECHERCHE DE SOLUTIONS AU PROBLEME FONCIER DES SANS-ABRIS

Il ne peut y avoir de solutions efficaces au problème du logement des sans-abris sans solutions adéquates du problème foncier.

Les règlements d'urbanisme et les affectations foncières devraient inclure le problème des sans-abris.

UNE VISION GLOBALE DU PROBLEME

3- UNE POLITIQUE DYNAMIQUE DES MATERIAUX

Le problème du logement des sans-abris est aussi un très important problème de matériaux.

Des recherches continuelles devraient permettre de disposer de matériaux fiables, adaptés aux conditions locales, peu chers, faciles à mettre en oeuvre et durables.

La préhension des matériaux dans la nature ne devrait pas hypothéquer l'avenir écologique (Ex. l'emploi du bois en AFRIQUE)

4- L'AIDE INDISPENSABLE

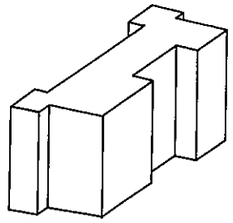
Souvent les sans-abris manquent de ressources. Sans une aide soutenue des Etats, Collectivités, Institutions et Particuliers, les solutions ne deviendront jamais réalités.

Cette aide, financière, technique jouera un rôle incitateur qui amènera les sans-abris à prendre en charge eux-mêmes leurs problèmes de logement.

5- QUELQUES SOLUTIONS TECHNIQUES

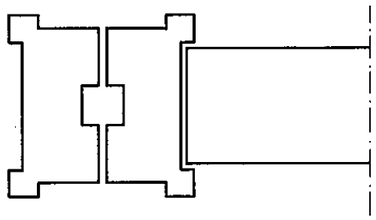
Les solutions suivantes nécessitent peu de moyens, font appel à peu de produits manufacturés et pourront être mises en oeuvre par les intéressés eux-mêmes

EMPLOI DE LA TERRE STABILISEE OU NON

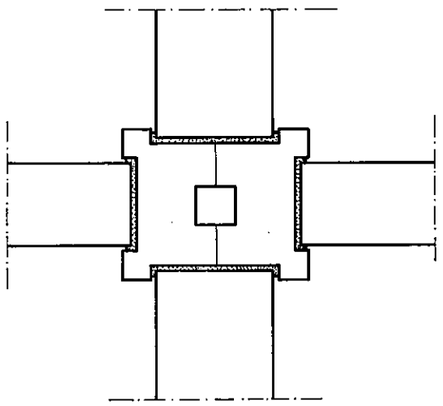


BLOC DE TERRE STABILISEE OU NON POUR POTEAUX
DIMENSIONS VARIABLES

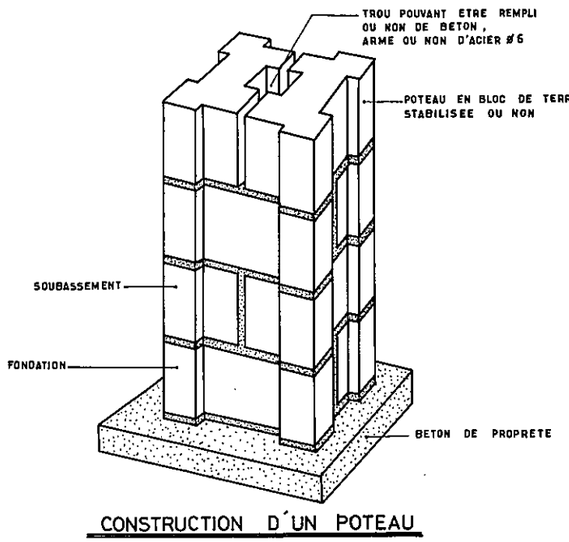
POTEAUX



SCHEMA D'UN POTEAU



POTEAU A L'ANGLE 4 MURS
DIMENSIONS VARIABLES



CONSTRUCTION D'UN POTEAU

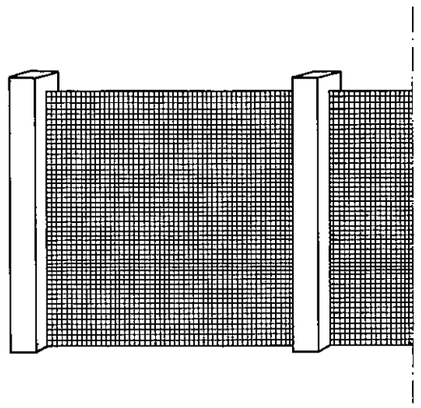
Réalisation de blocs de terre, stabilisée ou non au ciment (très faible dosage) emploi de moules en bois.

Elévation de poteaux par emploi des blocs jouant le rôle de coffrage.

Remplissage ou non de ciment.

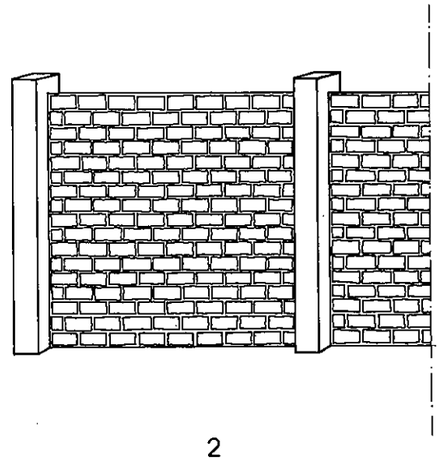
Quelques armatures (⌀6) verticaux eventuellement.

LES MURS



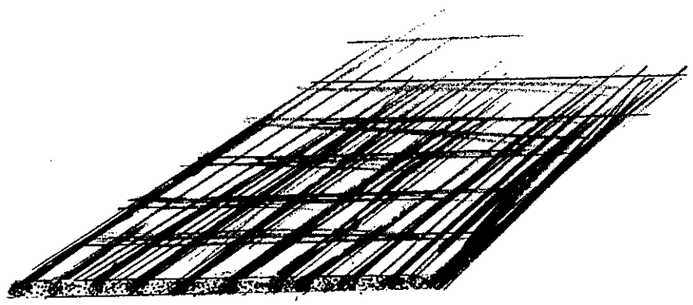
1
EMPLOI DE GRILLAGES OU DE BRANCHAGES SERVANT D'ARMATURE A DU PLATRE PROJETE

OU



2
D'AGGLOMERES DE TERRE FAIBLEMENT STABILISEE AU CIMENT OU NON

COUVERTURE A BASE DE FIBRES NATURELLES



PANNEAU CONFECTIONNE AVEC DE LA PAILLE ET TENDU AVEC DES RONDS A BETON

Charpente réalisée avec des ronds à béton (l'emploi du bois accentuera la désertification)

Couverture en paille (graminée sauvage) ligaturée et traitée par des produits courants contre les insectes et la moisissure.

Le tout peut être recouvert par une bâche étanche

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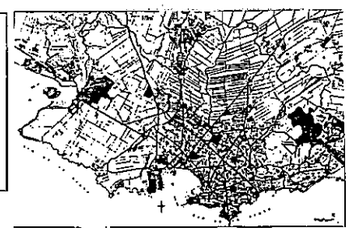


ESTRUCTURA DEL BARRIO

La calle Guazucuá es el eje estructurador del barrio, siendo además la única conexión vial con las calles de la trama urbana.

Las trazas peatonales evidencian la dependencia respecto a los servicios esenciales tales como abastecimiento de agua, comercios, transporte, escuelas, etc., que se localizan en el área urbanizada que se extiende al Norte y al Este del barrio.

IMAGEN DEL BARRIO

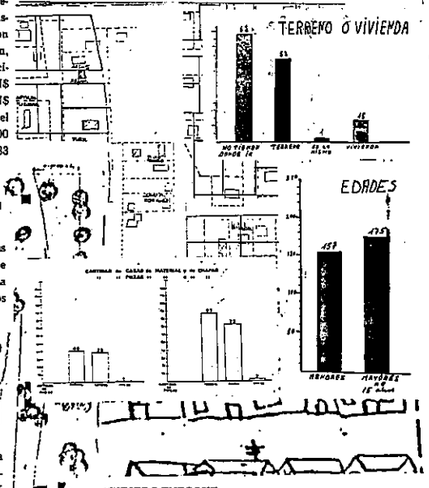
Algunas zonas están escasamente arboladas, otras en cambio presentan agrupamientos de varias especies que conforman un microclima beneficioso para el acondicionamiento de las viviendas.

para unos vivienda, para otros refugios.
para unos salud, para otros apenas la continuidad del ser.
para unos educación, para otros adaptación al medio.
para unos trabajo y alimentación, para otros simplemente subsistencia.

BARRIO 19 DE ABRIL

1er. Aniversario de la **CONQUISTA DE LOS TERRENOS** después de **3 LARGOS AÑOS DE LUCHA.**

Integramos **MOVIDE.** junto a los barrios: EMANCIPACION, 17 METROS, MAUSA, MARTINEZ REINA, SAN VICENTE, y la COOPERATIVA LA CALERA.



VIVIENDA
De un total de 114 viviendas existentes, se relevaron 100.
Del estudio realizado sobre éstas se constata:
52% viviendas consta de una sola habitación.
43% viviendas no tiene baño.
41% viviendas tienen baño exterior.
16% viviendas tienen baño interior.
Las áreas varían desde un mínimo de 4 m² hasta un máximo de 50 m².

POBLACION
El barrio está habitado por 523 personas, agrupados en 127 núcleos familiares.
Un alto porcentaje de trabajadores del barrio tiene experiencia en trabajos de construcción (42 personas son obreros de la construcción, el 20% de las familias perciben ingresos inferiores a N$ 2.000, el 65% entre N$ 2.000 y N$ 4.000, y el 15% restante entre N$ 4.000 y N$ 6.000. (Datos de 1983 US$ 1 = N$ 40).

USO DEL SUELO
Se destaca como espacios públicos de relación social algunos tramos de la calle Guazucuá, como ser el ensanchamiento del cruce con "pasaje B" donde se localizan el salón comunal y la policlínica y en la zona donde se localizan los comercios de abastecimiento cotidiano. ("Frente al almacén").
Los espacios de uso privado son los predios donde se ubican las viviendas, las huertas y los animales de corral.

SOLARES
Existen 119 predios cuyas áreas varían desde menos de 100 m² hasta 1.000 m². La ocupación promedio de los predios es de 10% a 15%.

EQUIPAMIENTO
El espacio destinado para plaza carece del equipamiento mínimo necesario y está mal ubicado.

PROBLEMAS

Tenencia de la tierra

Infraestructura
- No hay calles
- No hay agua
- No hay luz

Vivienda deficitaria

Ingresos escasos

PRIORIDADES DE LOS VECINOS
- Propiedad del suelo
- Luz
- Agua
- Calles
- Saneamiento
- Viviendas adecuadas

NUESTRO ENFOQUE

- El profesional debe estar al servicio de los sectores más carenciados de la población, ayudándolos a elevar su nivel de vida integralmente y específicamente el arquitecto a mejorar las condiciones en materia habitacional.
- Contribuir al fortalecimiento de las organizaciones autogestionarias, representativas, democráticas y participativas.
- Propiciar la apropiación de la tierra por parte de las organizaciones de pobladores para así generalizar la viabilidad de la propuesta.
- Respetar las pautas del grupo comunitario asistido sin interferir en su dinámica interna.

"Se dice que somos 'ocupantes precarios': hace 30 años que habitamos el barrio!"

MARCO TEORICO

Las condiciones más críticas de vivienda, salud, educación y trabajo, afectan simultáneamente a un mismo sector de la población que aumenta proporcionalmente día a día.

Esta situación tiene su raíz en un sistema que tanto a nivel económico, ideológico, como político se basa en la desigualdad, la competencia y el individualismo, generando la injusticia social.

Los sectores populares han creado nuevas organizaciones sociales que luchan por satisfacer sus necesidades comunes.

Estas organizaciones populares, procurando incidir sobre su realidad, desarrollan una práctica social que se relaciona dialécticamente con su conciencia social colectiva.

Entendiendo que este proceso dialéctico (acción-reflexión-acción) genera una toma de conciencia, resulta fundamental el papel de las organizaciones populares como condensadoras del accionar social, para superar la acción y conciencia individual por la acción y conciencia colectiva.

Nuestra opción de trabajo se integra en una concepción global que, partiendo de las necesidades y prácticas de las organizaciones populares, se orienta a la concientización de sus intereses y a la construcción de su proyecto social alternativo.

El problema se centra entonces, en cómo estas organizaciones relacionan sus prácticas con sus intereses, construyendo sobre ello su propio proyecto.

HIPOTESIS DE TRABAJO

- Conocimiento global de la realidad, partiendo de las situaciones particulares, analizando sus causas y evaluándolas para definir estrategias de superación.
- Sistematización del conocimiento, mediante el planteo ordenado de los elementos surgidos en el proceso, posibilitando avances cualitativos.
- Proceso participativo desarrollado conjuntamente por el equipo técnico y la comunidad.
- Equipo técnico interdisciplinario, para la atención integral de la problemática de los grupos asistidos.

CONTEXTO

A principios de la década del 60 se conforma el asentamiento precario que da origen al actual Barrio 19 de Abril.

En 1973 se instaura en el país un régimen dictatorial.

En setiembre de 1980 las 120 familias que componen el asentamiento reciben notificación de desalojo con 15 días de plazo para abandonar el terreno.

En 1982 junto a otros barrios de características similares participan en la creación del MOVIDE (Movimiento proVida Decorosa). Organización social que defiende los intereses del sector.

En junio de 1983 el Poder Ejecutivo decreta la expropiación del terreno. Ante este hecho la comisión barrial solicita asesoramiento técnico urbanístico-arquitectónico.

El barrio se plantea conformarse como cooperativa para resolver en forma conjunta la problemática habitacional.

A nivel público no existen líneas de crédito que atiendan las necesidades del sector.

No se reconocen legalmente Personerías Jurídicas a las organizaciones sociales.

Los vecinos ven defraudadas sus expectativas de mejoramiento global del barrio. Como alternativa se plantean realizar un ahorro familiar mensual de US$ 8 para mejoramientos parciales.

Un 20% de las familias tenían que ser trasladadas debido a las afectaciones que existen sobre el terreno (ensanches y vía férrea), generando un margen de incertidumbre sobre el área utilizable.

La Intendencia Municipal de Montevideo plantea a dos barrios de MOVIDE (Movimiento proVida Decorosa) el interés de realizar la construcción de sus viviendas.

La indefinición respecto a las posibilidades reales de viabilizar alguna de las alternativas programáticas que se presentaron planteó la necesidad de que toda acción de mejoramiento pudiera ser integrada a cualquiera de ellas, en una etapa posterior.

Alternativas planteadas:

- Dotación de una infraestructura mínima.
  Necesidad de ahorro previo o préstamo solidario.
  Escasa o nula intervención del Estado.
  Mantenimiento de la situación de marginación.
- Consolidación y mejoramiento de la situación existente.
  Necesidad de préstamo solidario importante.
  Posible intervención parcial del Estado.
  Mejoramiento de la situación, pero puede estancarla en tanto no haya continuidad en el programa.
- Dotación de núcleo básico de servicios e infraestructura mínima.
  ídem anterior.
- Solución integral al problema del hábitat.
  Necesidad de programas estatales estables o líneas crediticias para la acción privada que atienda las necesidades del sector.

La evaluación de la conveniencia de priorizar una u otra alternativa se dio en el marco de cambios políticos (1984 proceso de apertura democrática y período electoral; 1985 restauración de gobierno democrático).

METODOLOGIA

Entendemos por metodología la articulación entre los objetivos planteados, los métodos y las técnicas a aplicar, relacionados coherentemente con el marco teórico que les da origen.

Nuestra propuesta metodológica se desarrolla retomando la relación dialéctica, acción-reflexión-acción, existente en las prácticas sociales organizadas, siendo en función de ellas que adquiere su real sentido.

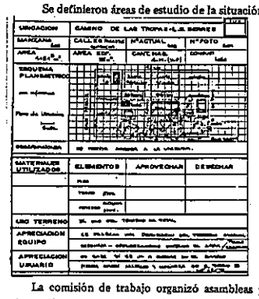
EXPERIENCIA BARRIO 19 DE ABRIL

A partir de los primeros contactos entre el equipo técnico y la comisión barrial se definieron las distintas instancias de trabajo:

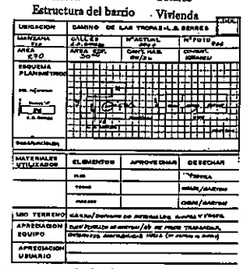
- comisiones de trabajo específicas, con integrantes de la comisión barrial y del equipo técnico
- asambleas por zonas
- asambleas generales

La comisión de trabajo se planteó como primer paso la realización de un relevamiento físico y social del barrio.

Se definieron áreas de estudio de la situación:



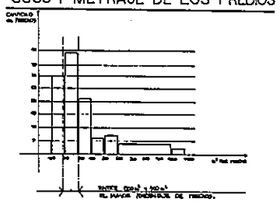
Población
Estructura del barrio

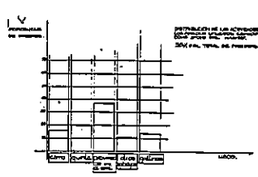


Solares
Vivienda

La comisión de trabajo organizó asambleas por zonas para la devolución a los vecinos de la sistematización de los datos obtenidos y algunos problemas a considerar: cantidad y composición de núcleos familiares, niveles de ingreso, ocupaciones (cantidad de personas que trabajan en la construcción), tipos y tamaños de los predios, uso de los predios (huertas comunes, pastoreo de caballos, etc.), tipos y dimensiones de las viviendas, necesidades según los núcleos familiares, espacios y locales comunes, afectaciones de ensanche y expropiaciones existentes sobre el terreno, etc.

USOS Y METRAJE DE LOS PREDIOS





En estas reuniones se profundizó sobre algunos aspectos pero no se tomaron resoluciones definitivas.

Se realizó una segunda serie de asambleas por zona para continuar el análisis de:
- forma y disposición de los predios
- agrupamiento de viviendas

Se llega a la definición de algunas pautas de diseño que responden al modo de vida de la comunidad:
- predios iguales, de 200 m² aprox.
- tener locales comunes y una plaza.
- mantener las contigüidades vecinales existentes (salvo necesidad de traslado).
- viviendas en un solo nivel y aisladas.

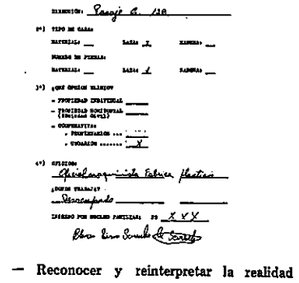
La comisión de trabajo plantea a los vecinos la posibilidad de proponer una nueva estructura para el barrio, solicitando la realización de propuestas que serían expresadas a través de dibujos.

Se trabaja cómo representar gráficamente, presentando una foto aérea e identificando en ella los elementos principales del barrio. Luego se relaciona la foto aérea con un plano de relevamiento, y éste con un croquis del esquema del barrio. En hojas que tenían previamente dibujado el perímetro del terreno, los vecinos debían ubicar los elementos fundamentales: calles, espacios libres, servicios, etc. Las propuestas, en su mayoría, fueron realizadas en las familias y no en forma individual.

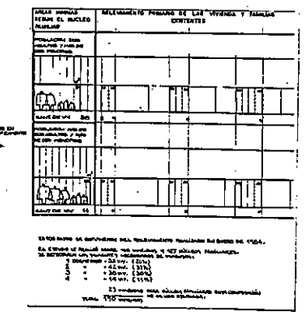
La colectivización de las propuestas se realizó en una asamblea general, donde se expusieron todos los dibujos. Se plantearon las características generales de las propuestas que habían sido previamente sistematizadas y se profundizó en el análisis de las relaciones espacio-funcionales de:
- vías de circulación (para vehículos pesados, carros, peatones, etc.)
- locales comerciales
- locales y servicios comunes
- espacios públicos

ACCION

- Recoger datos de la realidad para abordar su compresión global.



- Reconocer y reinterpretar la realidad vivida.



REFLEXION

- Reflexionar las relaciones entre los modos de vida colectiva y la estructura espacial pública.

ACCION

- Expresar una nueva imagen del barrio, a través de la reelaboración de las relaciones entre los modos de vida colectiva y la estructura espacial de lo público.

- Elaborar pautas de diseño que expresen los intereses colectivos en relación a los espacios públicos.

La organización se movió en un sentido pragmático entre la reivindicación de sus derechos y la satisfacción de sus necesidades básicas inmediatas. Esta práctica fue aportando conocimientos para reelaborar concepciones y objetivos de la organización.

De este modo se llega al planteo de que el derecho a una vivienda digna es derecho esencial del ser humano y que es responsabilidad del Estado dar solución al problema habitacional. Por ello el desarrollo de este trabajo se enmarcó en la reivindicación de una solución integral que contemplara la vivienda, los servicios y todos los aspectos que conforman el hábitat (físicos, culturales y económicos).

Este planteo reivindicativo debía apoyarse con una propuesta arquitectónica que sirviera simultáneamente al desarrollo de acciones de mejoramiento inmediatas (luz, agua).

Los vecinos definieron un sistema, de construcción del programa, mixto:

- ayuda mutua para obras de infraestructura y locales comunales.
- autoconstrucción para el mejoramiento de las viviendas.

Moviéndose en el plano reivindicativo la organización presenta al BHU (Banco Hipotecario del Uruguay) su propuesta de reestructuración urbanística, enmarcada dentro de la plataforma de MOVIDE (Movimiento pro-Vida Decorosa).

En junio de 1985 la IMM (Intendencia Municipal de Montevideo) en convenio con el BHU (Banco Hipotecario del Uruguay) plantean un Plan Habitacional de Emergencia, que en su primer etapa abarca 9 asentamientos precarios, entre ellos el Barrio 19 de Abril.

A raíz de esto se inicia un proceso de diálogo entre MOVIDE (Movimiento pro-Vida Decorosa) y la IMM (Intendencia Municipal de Montevideo) donde la organización plantea algunas dudas:

- ¿Cuál es el costo total de vivienda y terreno, cómo se pagaría? ¿existe subsidio?
- ¿Es respetada la organización de los barrios y sus técnicos?
- ¿Cuáles son los criterios de adjudicación de las viviendas?
- ¿Cuál es la modalidad de participación de los usuarios?

Ante las vacilaciones y contradicciones en las respuestas a estas interrogantes, MOVIDE (Movimiento, pro-Vida Decorosa) explicita sus puntos de vista sobre:

- Adjudicación de las viviendas a cargo de la organización.
- Tenencia de la vivienda en forma permanente (no en precariato)
- Participación de los usuarios en la elaboración de los proyectos.
- Definición del costo del programa, características de las viviendas (área, materiales).
- Subsidio en un 90%.
- La amortización de los préstamos afectará los ingresos familiares en un no más de un 10%.
- Contratación de la mano de obra capacitada de los barrios para la ejecución de los programas.
- Integración de los talleres de trabajo de MOVIDE (Movimiento pro-Vida Decorosa), herrería, carpintería, bloqueras, etc.

En el planteo de estos puntos trabajaron todos los asesores de los barrios que integran MOVIDE (Movimiento, pro-Vida Decorosa).

Agotadas las posibilidades de modificar las condiciones que planteaba el Plan Habitacional de Emergencia, el Barrio 19 de Abril, decide no integrarse a éste. Continua entonces movilizándose para obtener soluciones, prioritariamente la propiedad del terreno.

A su vez, dada las dificultades de realización del Plan, los organismos públicos responsables responden con nuevas iniciativas (construcción mediante licitación pública, planes pilotos, etc.).

Frente a ello el Barrio 19 de Abril toma nuevamente el proyecto como planteo reivindicativo prioritario.

Simultáneamente solicita un préstamos solidario a MOVIDE (Movimiento pro-Vida Decorosa) para la instalación de la infraestructura de agua y luz.

De este modo se fueron logrando acuerdos primarios pero sustanciales que se sintetizaron en un esquema realizado en la misma asamblea.

Pautas definidas:

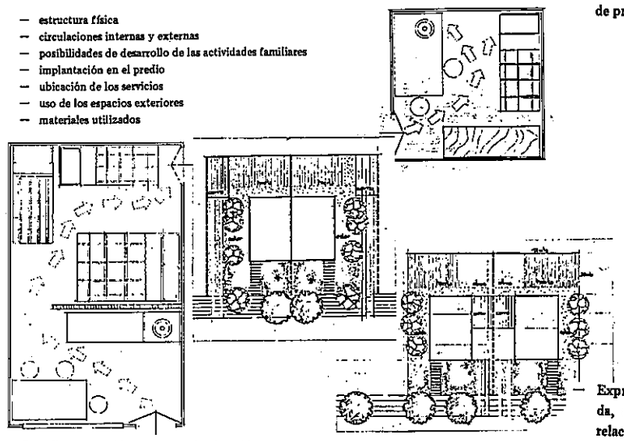
- mantener la calle principal del barrio.
- las vías de circulación, según su uso, de tránsito vehicular pesado, lento, peatonal, etc., se diferenciarán en el pavimento y en las dimensiones.
- los locales comerciales podrán estar en los predios de las viviendas.
- los locales comunes estarán vinculados con la plaza principal y en un lugar relativamente baricéntrico del barrio.

Con todas las pautas de diseño recogidas, gráficas y conceptuales, se comenzó el estudio del anteproyecto urbanístico, a partir del cual se desarrolló un proceso de intercambios sobre sucesivas aproximaciones al anteproyecto definitivo.

El trabajo que se inició sobre las características de las viviendas aportó elementos imprescindibles para avanzar en la propuesta.

En base al relevamiento de las viviendas se seleccionaron tres tipologías consideradas representativas de acuerdo a:

- estructura física
- circulaciones internas y externas
- posibilidades de desarrollo de las actividades familiares
- implantación en el predio
- ubicación de los servicios
- uso de los espacios exteriores
- materiales utilizados

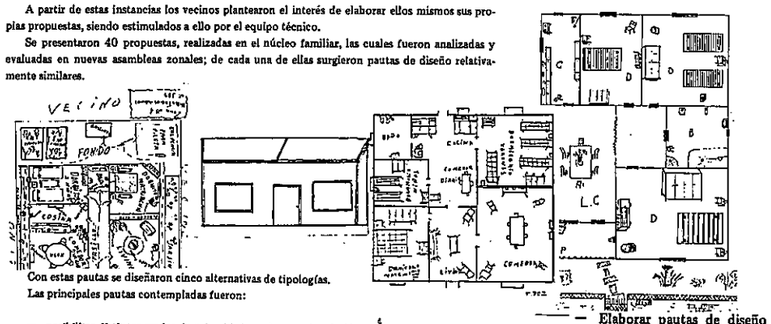


Se realizaron asambleas por zona donde se dibujaron las tipologías seleccionadas, analizándose las actuales condiciones de habitabilidad.

Además se analizaron las distintas posibilidades de agrupamiento e implantación de las viviendas en el predio.

A partir de estas instancias los vecinos plantearon el interés de elaborar ellos mismos sus propias propuestas, siendo estimulados a ello por el equipo técnico.

Se presentaron 40 propuestas, realizadas en el núcleo familiar, las cuales fueron analizadas y evaluadas en nuevas asambleas zonales; de cada una de ellas surgieron pautas de diseño relativamente similares.

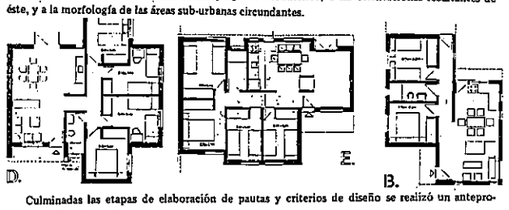


Con estas pautas se diseñaron cinco alternativas de tipologías.
Las principales pautas contempladas fueron:

- posibilitar distintos grados de privacidad con la zona de relación.
- posibilitar la modificación de usos de los espacios.
- permitir la fácil vinculación con los espacios exteriores.
- posibilitar el desarrollo de actividades económicas en el predio (talleres, depósito de materiales, huertas, cría de animales, etc.)

Las alternativas propuestas se analizaron y evaluaron en asambleas zonales y en asambleas generales con todos los vecinos.

En estas instancias se lograron acuerdos en optar por dos de las alternativas propuestas, respondiendo al loteo planteado en el anteproyecto urbanístico, a las orientaciones resultantes de éste, y a la morfología de las áreas sub-urbanas circundantes.



Culminadas las etapas de elaboración de pautas y criterios de diseño se realizó un anteproyecto que los sintetizó.

Los aspectos relacionados con la definición de un mínimo habitacional fueron resueltos de acuerdo a los lineamientos exigidos por MOVIDE (Movimiento pro-Vida Decorosa):

- las áreas se inscriben dentro de los límites admisibles para una vivienda de carácter permanente y con un alto costo social (subsidio)
  1 dormitorio 36m²; 2 dormitorios 55m²; 3 dormitorios 65m²; 4 dormitorios 76 m²
- los materiales utilizados son: muros exteriores - bloque de hormigón y aplacado de ladrillo (12 cms); tabiques - bloque de hormigón; cubiertas - livianas de fibrocemento o galvanizado con cielorrasos de losetas cerámicas
- el costo total de las viviendas es de 80 US$ el metro cuadrado excluyendo el costo del terreno.

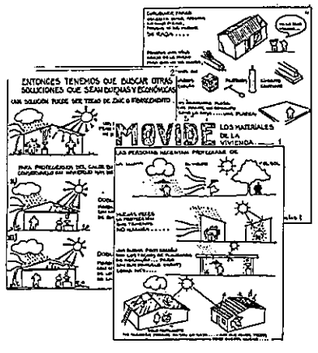
REFLEXION

— Reflexionar la relación entre los modos de vida familiar y la estructura espacial de privacidad.

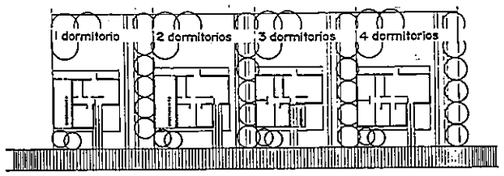
ACCION

— Expresar una nueva imagen de la vivienda, a través de la reelaboración de las relaciones entre los modos de vida familiar y la estructura espacial de privacidad.

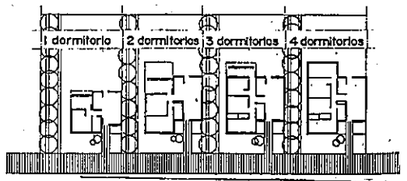
— Elaborar pautas de diseño que expresen los intereses colectivos en relación a los espacios de privacidad.



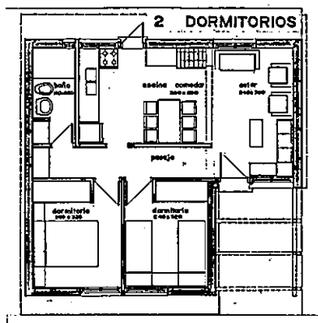
— Sintetizar las pautas de diseño en un proyecto totalizador.

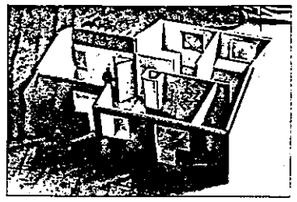


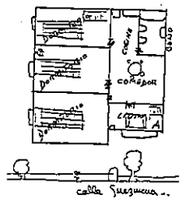
PLANTAS DE UBICACION
tipología tipo A

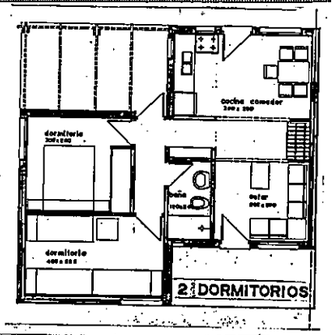


PLANTAS DE UBICACION
tipología tipo B

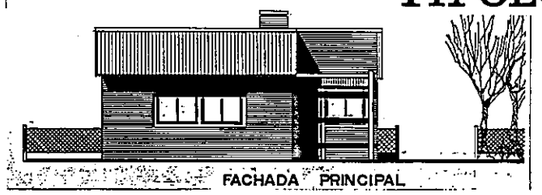


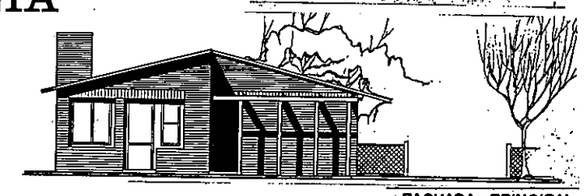


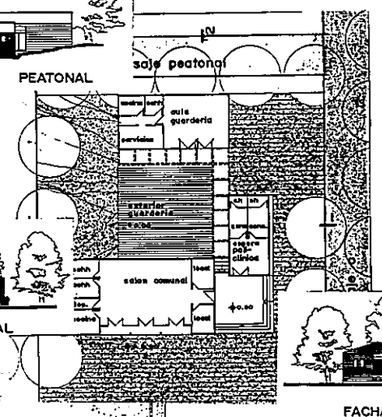


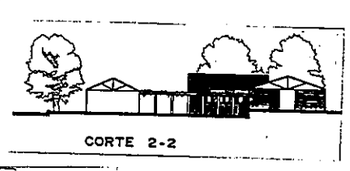


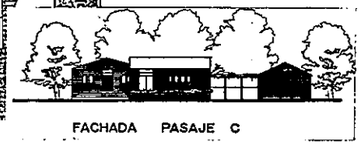
TIPOLOGIA

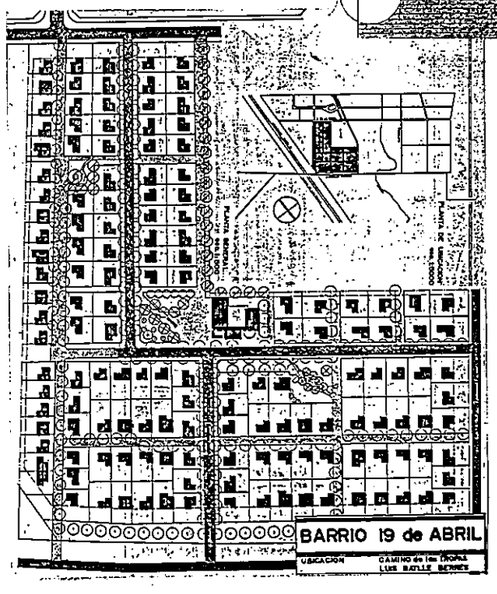












EVALUACION

Pensamos que en relación a las pautas y objetivos planteados, así como al proceso realizado, se ha obtenido un resultado positivo.

Nos interesa remarcar la identificación y apropiación de los vecinos del barrio en relación a la propuesta arquitectónica-urbanística, entendemos que esto es el resultado del proceso participativo que se desarrolló, posibilitando una revalorización a nivel personal y un fortalecimiento a nivel grupal y organizativo.

Entendemos que como organización popular se ven avances, tanto en las reivindicaciones propias del grupo, como en una mejor capacidad de autogestión. Es en este sentido que nos parece positiva la labor nuestra en la medida de ser utilizada como herramienta para dicha tarea reivindicativa.

Este proceso creemos que es educativo, tanto para la comunidad, como para los técnicos, en la medida que se toma contacto con la realidad social.

Este intercambio entre la comunidad y el grupo técnico es dialéctico, en tanto la comunidad es sujeto activo y participativo de la producción del conocimiento.

La sistematización, evaluación de los conocimientos adquiridos nos permitirá una aplicación cualitativamente superior en otras futuras experiencias.

En el proceso realizado, la participación tiene un papel fundamental, ya que sólo a través de ésta los individuos pueden visualizar sus intereses, expresarlos, colectivizarlos, ponerlos en juego en cada paso que da la organización y extraer de ellos nuevos conocimientos que se incorporen a su saber.

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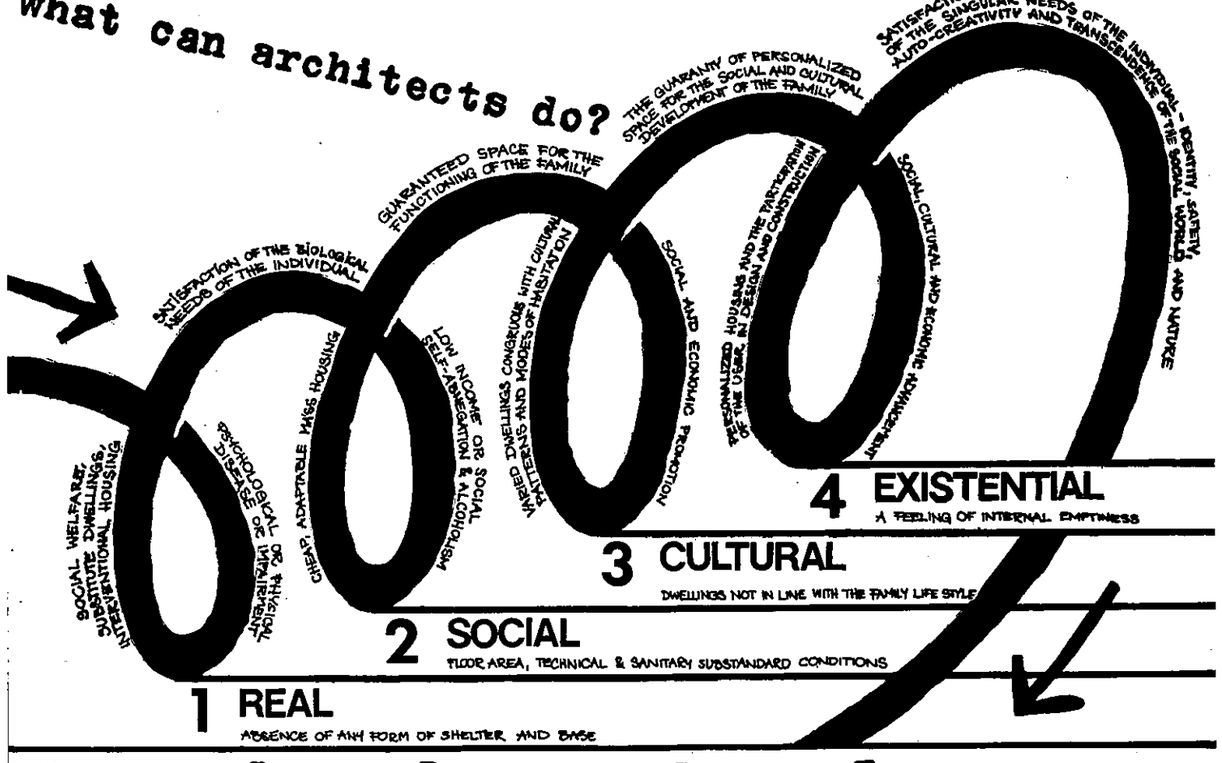
SECTION II: three original architectural projects.
SECTION V: the un-ended spiral of homelessness.

the unended spiral of homelessness...

what can architects do?



four levels of homelessness

problem:

The problem of real homelessness is a marginal one in Poland, although it must be stated that the fact that it remains largely unnoticed by society and its structures makes it all the more dangerous.
Out of the four levels of homelessness this, the lowest one, affects the physically or mental sick or impaired individuals who are incapable of doing any work or taking up responsibility for their own fates.
In this case the problem is in the creation of the biological requirements for survival: clothing, food and shelter.

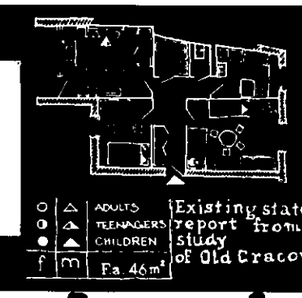
solution:

- social welfare, medical care, and interventional housing. In this field the architects can be more helpful as a citizen than as a professional. What is really needed is money and appropriate social policies, as well as a heart, rather than archirectural, original solutions.

level 1 real homelessness

problem:

Social homelessness may be portrayed as a lack of space for proper functioning of the family even though specific individual members are not homeless in the strict sense. This homelessness afflicts two social groups in Poland - people living in substandard floor area, technical or sanitary conditions (lack of social aspirations, the objective technical state of housing resources in Poland), and - several milions families who, due to economic possibilities do not have independent homes and live under conditions of substandard floor or in separation. This situation is also a result af too great a number of very small overcrowded apartments in Poland. (average apartment size ca 5o sq m) We have tried to solve more architectural problem of this second group by proposing a new type af cheap, flexible forms for multi-family and single-family housing.

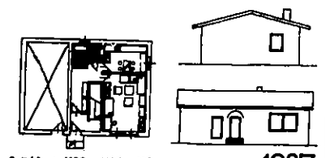


Existing state report from study of Old Cracov

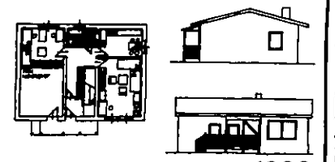
original solution:

adaptable, complex dwellings

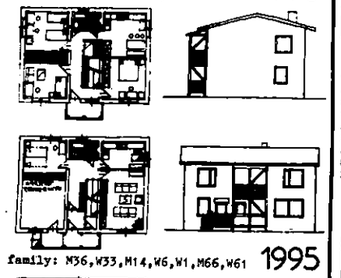
the house grows up together with the family



family: M28, W25, M6 (Man or Woman, age)
minimum space for proper functioning of the family: 1 room, kitchen, bath, wc — 1987



family: M31, W28, M9, W1 — 1990



family: M36, W33, M14, W6, W1, M66, W61 — 1995

family: M46, W43, M71, M24+W19, W11, M4 — 2005

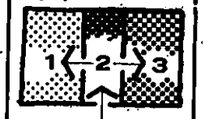
family: M51, W48, M29, W24, W1, W21 — 2010

RIGHT: solutions for multi-family housing

a complex dwelling for two families with possibility to arrange it for multigeneration family - such an investment policies would free up an enormous number of small apartments for lone people and young couples.

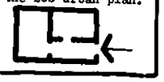
LEFT: solutions for single-family housing - -an introduction to project EOS.

The adaptable house in growing up together with its family. It starts from minimum space for proper functioning.
A traditional polish form of house was used as a constructional and functional scheme in project EOS:

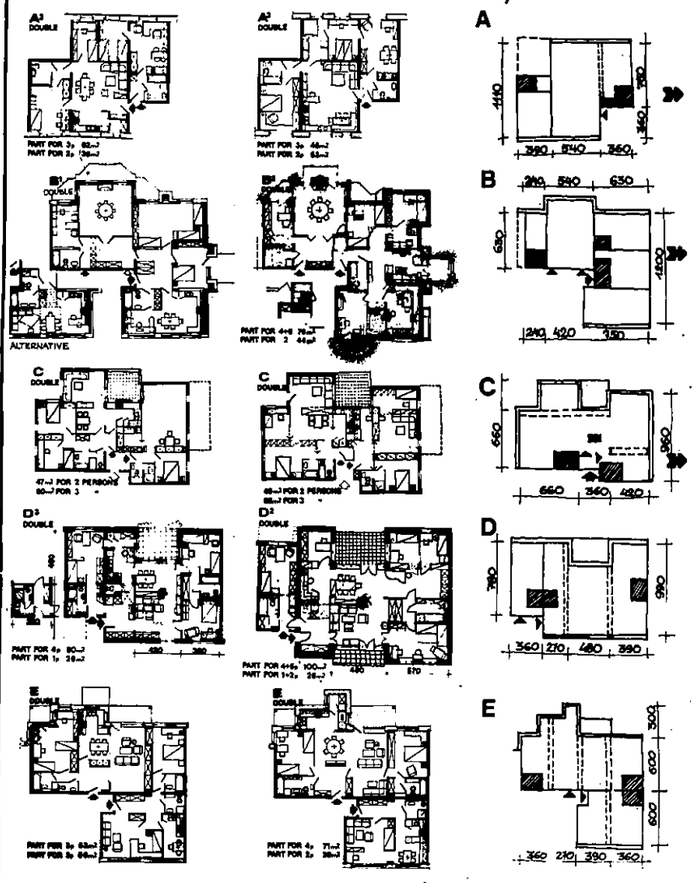


1 - white room
2 - hall
3 - black room

there is a modification of this basic scheme used in some situations in the EOS urban plan.

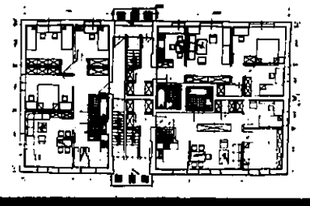


a transformable structure and utility scheme...



multi-family housing in project EOS

Six family, two storey house based on the traditional scheme of proletarian houses (see elevation on the bottom of "level 4" page).
Every dwelling has its own entrance (even staircase) to the garden.



level 2 social homelessness

problem:

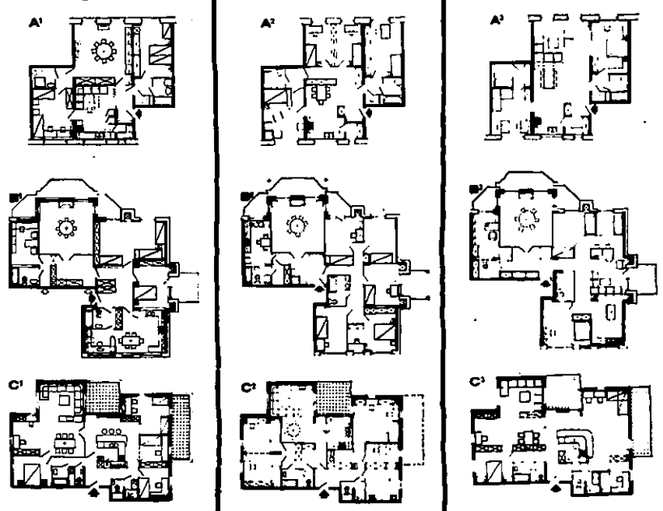
Cultural homelessness may be illustrated by frustrations of families who, though they posses independent dwellings, live in schematically designed environment, identical with all others. This makes family life concordant with custom and with hierarchy of values - impossible; it gives birth to deprivation of higher, social needs and degrades the family in its cultural and socialization functions. The house is no longer a home.

We propose an ecological approach to cultural individuality and instead of "functional dwelling" a qualitative analysis of life styles and way of habitation and the design of dwellings in agreement with cultural patterns of space use.

original solution:

cultural patterns' dwellings

1 integrational | 2 isolational | 3 balanced



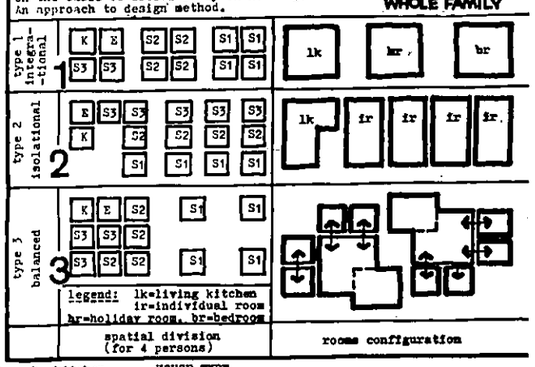
Each individual in the family has a right to one theoretical personal spatial module (S1), to one social module (S2), and one module of additional floor space (S3) to free interpretation. Each family also has the right to utility space for proper functioning of the home.
The way in which these modules are arranged into rooms bounded by walls is determined by the family life style model.

AN INDIVIDUAL: S1 personal space, S2 social space, S3 additional space

WHOLE FAMILY: K kitchen, E eating, W storage, U utility

three basic types of space use in Poland

on the basis of social study on housing.
An approach to design method.



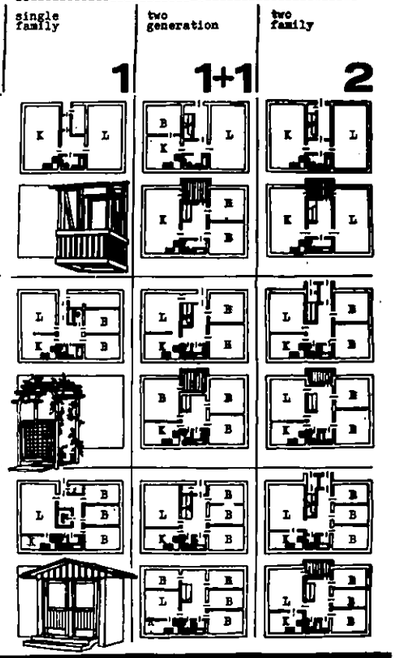
A QUALITATIVE ANALYSIS OF HOUSING MODELS

k- kitchen
l- living room
b- bedroom

HOUSE TYPE reflects the natural development of each family

typology of dwellings in project EOS

cultural pattern	single family	two generation	two family
integrational traditional housing model	1	1+1	2
isolational urban housing model	1	1+1	2
balanced partnership housing model	1	1+1	2



TRADITIONAL HOUSING MODEL (rural, worker)

Background: an external system of values
tradition - ritual- religion
the result:
unconscious involvement in cultural patterns-intoleranc

Family type: patriarchal
two or three children, woman often unemployed
family relations based on strict division of roles
mutual distance
paternal authority

Spatial division: holiday zone and day-to-day zone
strong need for spatial integration, week need for individual space
inability to use small rooms
two, three persons share bedroom (even bed)

Interior design capability - the copying of traditional patterns
naivite and amateurism in opposition to scholastic taste, space is understood as a set of rooms filled with free standing furniture

URBAN HOUSING MODEL (middle class)

- choice is determined by acceptance by other people
the result: imitation
choice steering by prestige value
vacillation

- intermediate
one or two children, woman most often employed
married couple relations evolving to partnership between generations ceratain distance, the needs of children are fetishized

-representational zone and private zone
needs of adults have preference
interior is a "calling card" for the outside world

- the copying of a variety of patterns which have often their sources in incongruous worlds of values
fashion and modernity are symbols of social promotion
disharmony - sterylity
non - stylishness

PARTNERSHIP HOUSING MODEL (young couple, intelligensia)

-an internal system of values
the result: conscious choice of aims and ability to evaluate and contemplate tolerance

- democratic
one or two children
woman employment dependent on the development phase of family
couple relations based on emotional ties
and common interests

-common zone and expanded personal zone, strong need for isolation caused by autonomization and informational overload of an individual, tendency toward self development
spatial rights for children

- conscious composition
spatio-functional whole
free choice of conventions
rationality -personalization
space is understood as a set of functional zones
organically surrounded by objects

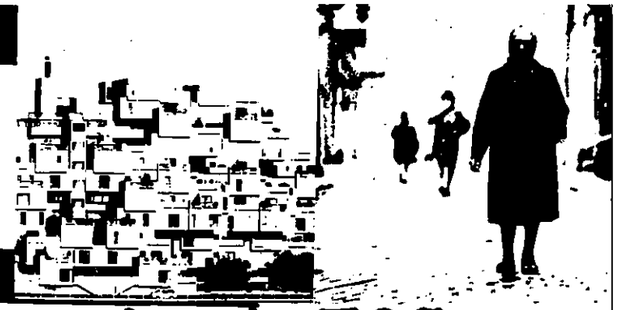
level 3 cultural homelessness

problem:

Why do countries with the most comfortable living conditions also have the greatest frequency of suicides and mental illness?

Why is it that wealthy people often like to live in houses erected with their own hands?

Existential homelessness is permeated by a feeling of internal emptiness alienation and neurosis of the individual. It is a reaction against the de-personalization of surroundings. The architect should help the individual regain a feeling of identity, safety and give him the ability to be creative and to transcend the social world and nature.
Architectural critics,in Poland, have named existing type of mass-housing as "the contemtuos oesthetic", or "cubicles for work force". These names best illustrate the state of deprivation of the need for a HOME on a level higher than mere shelter in the biological sense.

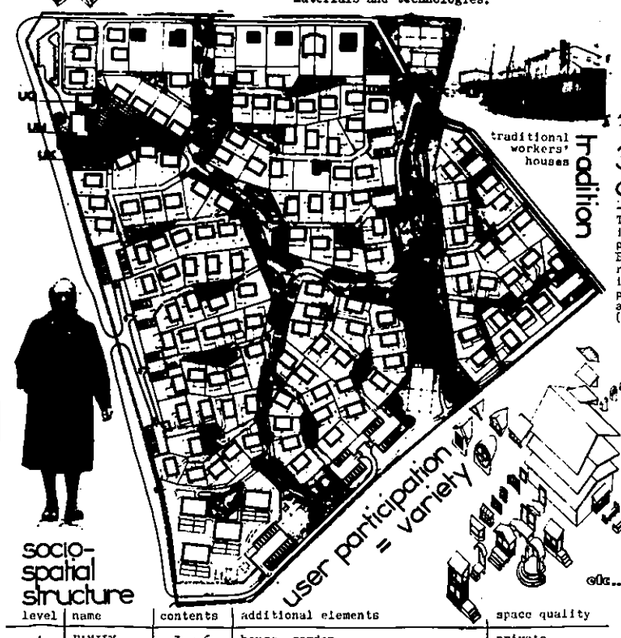


original solution:

main aims of project EOS ...

1. The satisfaction of the need for identity.

The process of the identification of Man with his place of residence takes place in four domains:
- social - through appropriate socio-spatial structures,
- aesthetic - through variety stemming from the participation of the users in design and construction,
- functional - through the ability to fit the dwelling into functional needs and cultural patterns (see diagram on "level 3" page)
- technical - through the participation of users in design and construction, use of simply materials and technologies.

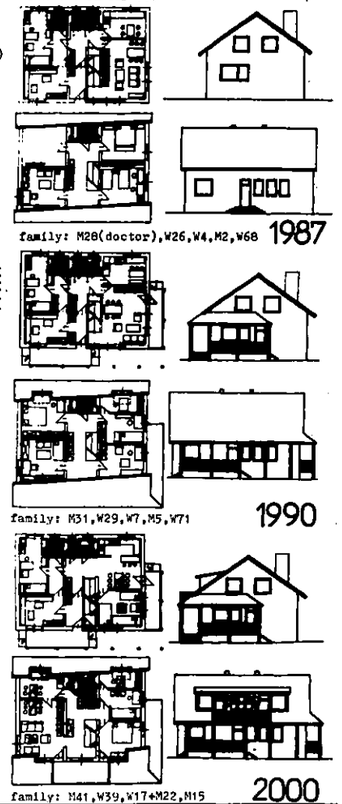


3. Settlement democracy.

- a home for everyone!
The acceptance, as equals, of investors having differing financial potential, capabilities, and needs. Everyone may choose a personalized road to a home thanks to independence, adaptation possibilities and great number of alternative shapes of EOS house. (see also drawings on "level 2"page)

4. Flexibility.

This makes possible the adaptation of the interior to suit changing needs which, in its turn, enables the quelling of the effects of homelessness levels three and four (see also on "level 2" page).
The adaptable house grows up together with the family ...



socio-spatial structure

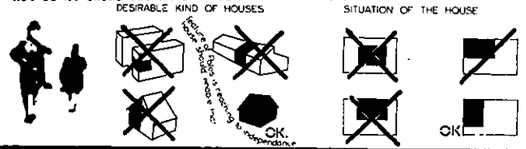
level	name	contents	additional elements	space quality
1	FAMILY	3 - 6 persons	house, garden	private
2	NEIGHBOUR UNIT	8 - 12 families	common entrance, yard, sand-pit, dust-bin	semi-private
3	NEIGHBOUR GROUP	3 - 5 neighbour units	recreation ground, meeting place, playing grounds for children, kindergarten	semi-public
4	SETTLEMENT	2 - 6 neighbour groups	market, shopping centre, cafe, club, pub, kiosk, playing ground, gymnasium, public transport station, doctor, teacher, architect!	public
5	NET-WORK WITH NODES OF: -EMPLOYMENT, -SERVICE, -RELAX			

5. Technological and economic simplicity.

It guarantees the reality of the solutions and makes possible the participation of users in design and construction.

2. The satisfaction of the need for independence

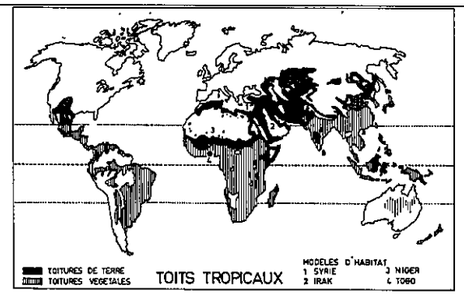
- this gives an opportunity for the complete personalisation of the house. Only spatial independence in the location of the house makes possible full personalization. This independence and the requirement of high density must not be at odds. The maximum size of building plot should be 250-350 m².



level 4 existential homelessness

ANNEE INTERNATIONALE DES SANS-ABRI

CONCOURS INTERNATIONAL POUR DES SOLUTIONS ARCHITECTURALES 1987



AVANT PROPOS

Cette participation concerne les SECTIONS I et II du programme CINTUS, en ce sens que le concept de l'habitation, envisagé sous l'angle spatial, introduit à 4 applications localisées dans 4 pays.

La zone d'extension des sans-abri, dont les conditions sont souvent liées à la fois à des conditions climatiques difficiles, à la mutation générale des technologies et à un exode vers les centres urbains, peut se visualiser, dans son contexte traditionnel, au moyen de la carte des toitures végétales et de terre crue dans le monde; les 4 modèles d'habitat proposés se situent dans les zones tropicale humide d'Afrique de l'Ouest et tropicale sèche du Moyen-Orient, avec dans chacune un climat typique (sud-Togo pour la première, Syrie pour la seconde), et un climat nuancé de la valeur opposée (climat tropical sec à nuance humide du sud-Irak et climat tropical humide à nuance sèche du sud-Niger).

Cet ensemble de propositions est doublement introduit par deux paragraphes généraux: une recherche des aspects circonstanciels du problème des sans-abri dans le monde et le formulation de principes généraux d'intervention par rapport au problème, au niveau de l'environnement.

Cette participation se présente donc de la manière suivante:

- introduction I : le problème des sans abri dans le monde.
- introduction II : principes generaux d'intervention.
- le concept d'habitation.

- 4 applications localisées.

LE PROBLEME DES SANS-ABRI DANS LE MONDE

Evoquer ce problème de manière générale peut être considéré comme une ambitieuse entreprise tant les causes, les conditions et les circonstances qui sont à son origine sont diverses et complexes de par le monde.
Cependant, en regard d'une situation générale critique, et dans l'esprit qui anime le Concours International pour des Solutions Architecturales, C I N T U S, un certain nombre de réponses, tant au niveau des conditions que des principes de mise en oeuvre, peuvent être circonscrits et avancés

OÙ ?

La question se pose au niveau des zones territoriales préférées par les populations dans le besoin et en déplacement, que ce soit sous l'effet de la sécheresse (Sahel), de la guerre (Liban, Irak, Iran, Nicaragua, Salvador,), sous l'effet d'un exode rural massif (général) ou par des conditions économiques difficiles, et d'autres encore; généralement peri-urbaines, les zones investies sont soit squattérisées, en cas de substitution de populations (Liban), soit construites de bidon-villes et favelas ou aménagés en cités de transit, provisoires et désincarnées, vers des destinations encore provisoires.
La question qui se pose au niveau des localisations n'est pas tant "où se mettre ?" que "quoi faire faire aux populations déshéritées ?", fatals parasites de populations urbaines de conditions généralement moyenne ou petite.
L'activité économique, les occupations et la réinsertion de ces populations serait-elle une des clefs du problème ? Il est de fait que, dans le cas de populations d'extraction rurale, le développement d'activités agricoles et maraichères, au sein de villages peri-urbains, serait utile et bénéfique aussi bien pour les sans-abri que pour les populations urbaines; de même, des activités liées à l'élevage pour des populations nomades fraichement sédentarisées pourraient avoir le même avantage.

QUOI ?

Quel genre d' habitat concevoir ? L'entreprise conceptuelle lancée à l' occasion du Concours, certes tournée vers la qualité, ne peut cependant dépasser un seuil au delà duquel l'opération n'est plus possible pour des raisons technologiques et financières.
Il est apparu que 3 caracteristiques devraient se retrouver dans les différentes solutions architecturales proposées: la décence, par un niveau de service suffisant, un niveau de confort correct, obtenu par des moyens simples et pratiques, et des dimensions relativement modestes afin de ne pas pénaliser les couts de construction.

COMMENT ?

Les moyens pour atteindre ces trois buts font appel, dans les 4 propositions qui suivent à des moyens simples: ils sont basés sur une utilisation, aussi grande que possible des materiaux locaux et des ressources locales en matière d'eau, d'énergie, de climatisation naturelle et de mise en oeuvre, par le biais de technologies simples et connues par les destinataires, ce qui leur permettrait d'intervenir directement dans la construction de leur futur habitat, avec les nuances d'interprétation que peuvent exiger des situations familiales différentes, par rapport à une règle généralement admise.

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COMBIEN ?

Le problème crucial, évoqué au niveau des moyens techniques, prend toute sa dimension dès que les aspects materiaux et main d'oeuvre deviennent plus précis; mais le caractère local très accentué des propositions architecturales ci-contre vise le même but d'un habitat devant théoriquement ne rien couter aux Pouvoirs Publics du Pays concerné, ainon un minimum.
Ce n' est guère concevable, mais ce principe a constitué une règle, un maitre-mot qui est resté présent à l'esprit tout au long de la conception des modèles proposés.

PRINCIPES GENERAUX D´INTERVENTION

Pour entrer plus avant au coeur des propositions, un certain nombre de principes directeurs de conception a été retenu de manière à circonscrir le champ des possibilités spatiales et technologiques; ils concernent essentielement les grandes categories d'équipements domestiques: les materiaux et leur mise en oeuvre, les réseaux et l'alimentation en eau, l' énergie.

LES MATERIAUX ET LEUR MISE EN OEUVRE.

Tous les materiaux utilisés sont locaux, de tradition technologique éprouvée, sans recourir dans leur approvisionnement comme dans leur mise en oeuvre à des choix sophistiqués ou couteux, ou les deux à la fois. Il en découle pour les modèles proposés une identification traditionnelle et culturelle qui irait plutot dans le sens d'une assimilation avec l'existant; généralement constitués de deux materiaux principaux (voir plus loin "le concept"), chaque modèle met en présence un habitacle opaque et lourd, généralement construit en terre, et un habitacle transparent et léger, la plupart du temps construit en materiaux végétaux, l'un comme l' autre étant extrait in situ dans la mesure du possible.

L'EAU, SON APPROVISIONNEMENT, SES REJETS ET LES DISPOSITIONS SANITAIRES

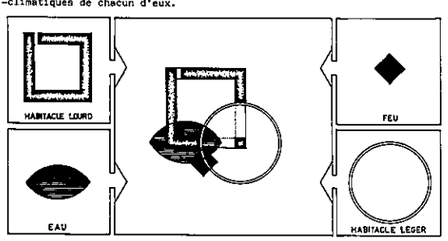
Le problème se pose de manière cruciale dans nombre d'agglomérations urbaines du monde en développement en particulier, et met gravement en cause la question de l'adduction d'eau pour la question qui nous occupe, particulièrement en raison des coûts d'aménagement.
Une concentration excessive des agglomérations ne fait qu'aggraver le problème en superposant au premier celui de l'assainissement de quartiers entiers.
Le recours à des moyens naturels et individuels comme la récupération des eaux pluviales, peut être économiquement viable, sanitairement et technologiquement possible, avec la mise en place de dispositifs simples tels que toit collecteur, descente EP, citerne cimentée ou préfabriquée et pompage à main, ou pompage direct de l'eau de nappe lorsqu'il est possible. Le matériel pour ces dispositifs, volontairement réduit, constituerait l'unique bien d'équipement à monayer pour l' ensemble des modèles.
En cas d'approvisionnement par eau pluviale, l'eau potable devrait être collectée par point d'eau public par exemple.
Les rejets d'eaux usées devraient être dirigés vers un puisard individuel. Des toilettes individuelles peuvent être creusées à part, lorsque le terrain le permet, ou regroupées en point sanitaire public; ce serait une seconde contribution gouvernementale à espérer.

L'ENERGIE

La cuisson des aliments est généralement assurée avec les moyens locaux, bois et charbon de bois, bouse séchée pour les éleveurs, mazout dans les pays producteurs.
L'éclairage par lampe à pétrole serait une solution économique, l'électrification restant,avec l'usage de cellule photo-voltaïques, des options toujours possibles mais relevant d'une contribution gouvernementale.
Lorsque les conditions extrêmes d'hiver le necessitent (cas des modèles Syrie et Irak ci-après), un chauffage d'appoint peut être obtenu par double orientation du foyer de la cuisine vers la zone de séjour d'hiver.

LE CONCEPT D´HABITATION

Chaque modèle proposé est composé de quatre éléments qui réduisent à l' essentiel les composantes d'un habitat minimaliste mais confortable: un habitacle solide et généralement minéral, assurant l'étanchéité et la sécurité; un habitacle léger et généralement végétal, assurant ombrage et ventilation; un dispositif "eau" réunissant citerne, cuisine et douche; un dispositif "feu" assurant la cuisson des aliments et éventuellement un chauffage d'appoint
La combinaison de ces quatre éléments selon les contraintes climatiques et les modes de vie locaux, vise à conjuguer dans chaque cas un ensemble de conditions d'habitabilité appropriées, avec un soucis d'économie d'espace par mutations saisonnières des fonctions, et ce à l'intérieur d'un espace habitable flexible; en effet l'espace intermédiaire, résultant de la "superposition" des habitacles minéral et végétal, en s'ouvrant soit sur l'un soit sur l'autre, permet de réduire ou d'augmenter les surfaces respectives en constituant par ailleurs un régulateur des ambiances micro-climatiques de chacun d'eux.

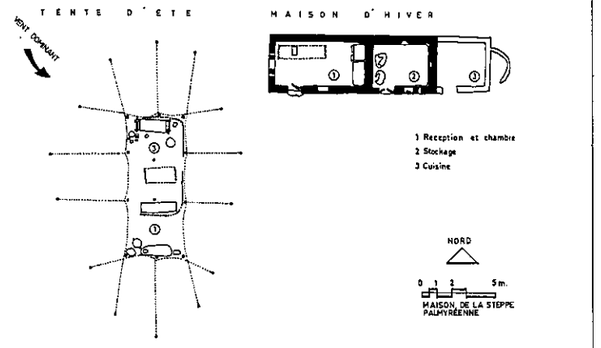


PRESENTATION DES MODELES

Chacune des 4 propositions ci-après se présente de la manière suivante:
Une partie analytique comprenant:
- une étude de l'habitat traditionnel local avec un plan typique, une analyse de son adaptation au climat et des zones domestiques principales.
- une étude bioclimatique comprenant un diagramme psychrometrique, un diagramme des conditions de confort et leur commentaire.

La proposition d'un modèle d'habitat et son commentaire.

SYRIE



SAISONNALITE DE L'HABITAT

Cette habitation du désert syrien associe deux habitacles majeurs et saisonniers, l'un construit en terre et spécifique de l'hiver, l'autre construit en toile et bois, léger et mobile, spécifique de l'été.
Si des fonctions spécifiques leur sont attachées, l'un comme l'autre peut abriter l'ensemble des activités propres à chaque saison, de telle sorte que chacun peut être directement assimilé à une saison extrême (plan ci-dessus).

DIFFERENCIATION DES ZONES DOMESTIQUES

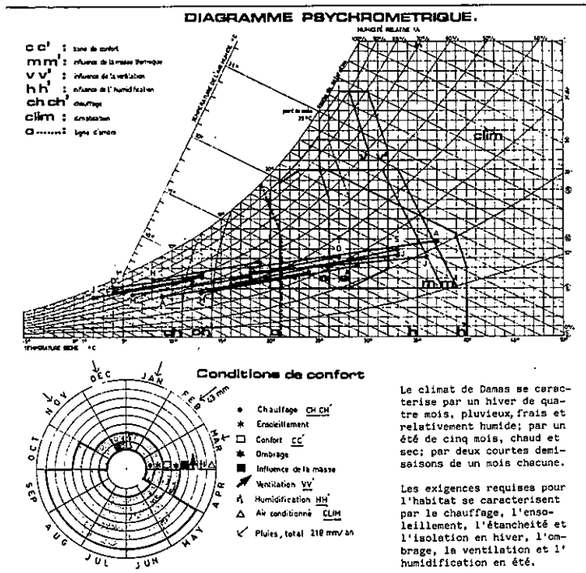
La partie accueil, ouverte aux visiteurs, est différentiée de la zone proprement familiale, été comme hiver: la première se regroupe avec les attributions de l'homme, tandis que la seconde regroupe plus volontiers les attributions de la femme, éducation des enfants, cuisine et entretien.

TERROIRS D'IMPLANTATION DES SANS-ABRIS

Venus de zones agricoles saturées, réfugiés des pays voisins en proie à la guerre, des sans-abris se regroupent aux abords des centres urbains importants.
Une politique générale à suivre pourrait être la création et le développement d'agglomérations peri-urbaines à vocation maraichère, et dont les produits pourraient directement intéresser la population urbaine proche, tout en rattachant les sans-abris à des savoirs-faire acquis, connus et économiquement recyclables.

PROPOSITION D'HABITAT

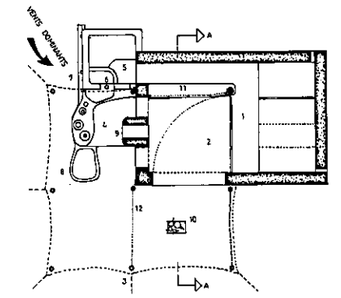
En référence au mode de vie régional, à la saisonnalité et aux materiaux disponibles localement, l'habitation unifamiliale pourrait être constituée des éléments suivants:
- un habitacle minéral construit en terre banchée ou en briques d'adobe, couvert d'un toit terrasse étanche et constituant l'espace hivernal.
- un habitacle léger et transparent, constitué d'une toile de tente tendue sur des perches de bois et constituant l'espace estival, ombragé ventilé et humidifié
- un bloc Eau regroupant la cuisine et la salle d'eau autour du point d' alimentation par pompage en citerne ou en nappe
- un point Feu à double orientation, associé à la cuisine pour la cuisson et au séjour d'hiver pour le chauffage d'appoint.



Le climat de Damas se caracterise par un hiver de quatre mois, pluvieux, frais et relativement humide; par un été de cinq mois, chaud et sec; par deux courtes demi-saisons de un mois chacune.

Les exigences requises pour l'habitat se caracterisent par le chauffage, l'ensoleillement, l'étancheité et l'isolation en hiver, l'ombrage, la ventilation et l' humidification en été.

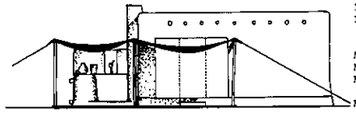
- l'espace mixte résultant de la combinaison de l'habitacle de terre avec l'habitacle de toile, pouvant être rattaché à l'un ou à l'autre par manipulation de volets mobiles, joue un role d'espace-tampon et de régulateur thermique pour l'ensemble; il peut être utilisé soit comme séjour d'hiver, soit comme chambre d'été.

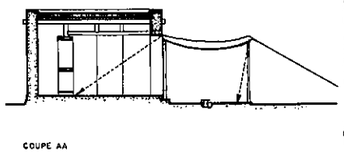


toile de tente sur poteaux

1 chambre d'hiver
2 chambre d'été et séjour d'hiver
3 séjour et chambre d'hote d'été
4 cuisine
5 salle d'eau
6 pompe à eau manuelle
7 citerne
8 vasque à humidification
9 feu
10 café
11 rangements
12 partition d'été entre accueil et famille

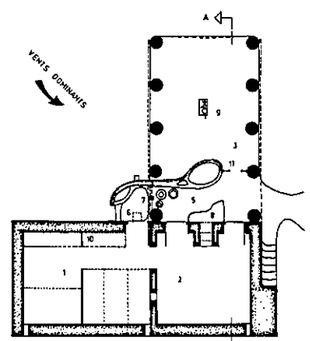
M2 étanche : 22
M2 sous toile : 27
M2 aménagé ext. : 4
M2 TOTAL : 53


ELEVATION SUD



COUPE AA

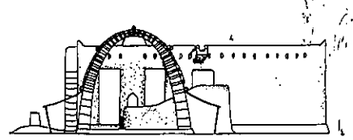
autre; le premier abrite les chambres et le séjour d'hiver, le second le séjour d'été servant aussi de chambre d'hote, et la cuisine à proximité du séjour d'hiver; la salle d'eau, contigüe à la cuisine partage avec elle l'alimentation en eau branchée soit sur un forage direct dans la nappe phréatique peu profonde, soit sur une citerne alimentée par les eaux pluviales d'hiver.

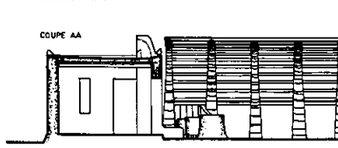


terre banchée
roseaux

1 chambres d'hiver
2 séjour d'hiver
3 séjour et chambre d'hote d'été
4 terrasse-chambre d'été
5 cuisine
6 salle d'eau
7 pompe à eau manuelle
8 feu
9 café
10 rangements
11 partitions d'été entre accueil et famille

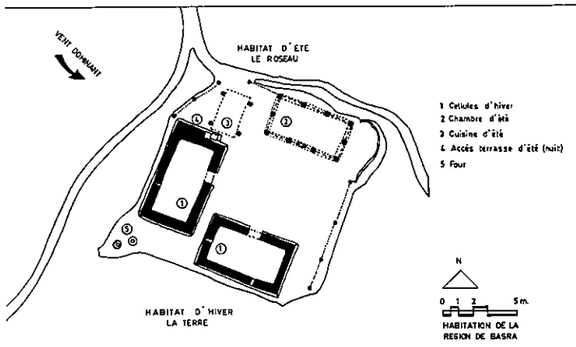
M2 étanche : 24
M2 sous roseau : 22
M2 aménagé ext. : 3
M2 TOTAL : 51


ELEVATION NORD



COUPE AA

IRAK



ADAPTATION DE L'HABITAT

Cette habitation, située à la lisière des marais du sud en Irak, associe deux types de constructions spécifiques des deux régions naturelles en présence: les constructions de roseaux (fragmites communis) propres aux marais et la construction de terre propre au delta du Tigre et de l'Euphrate.
L'originalité de ceé habitat réside en partie dans la saisonnalité des habitacles au sein d'un même enclos et dans l'organisation correspondante des fonctions; en effet les conditions climatiques extrêmes qui font passer de contraintes hivernales fraiches et humides à des contraintes estivales à nuances tropicales humides, surtout la nuit, trouve dans cette formule une adaptation judicieuse des matériaux locaux, avec des constructions de terre à bonne inertie thermique et occultation majeure en période hivernale, et des constructions de roseaux à très faible masse thermique et ventilation maximum.
Les terrasses des constructions en terre, accessibles et bien ventilées sont utilisées comme chambres d'été.

DIFFERENCIATION DES ZONES DOMESTIQUES

Disposées non loin de l'entrée, les constructions de roseaux permettent un accueil ombragé et bienvenu durant la saison chaude, tandis que la zone domestique d'hiver, réunissant plusieurs cellules unifamiliales, se referme autour de la cour intérieure.

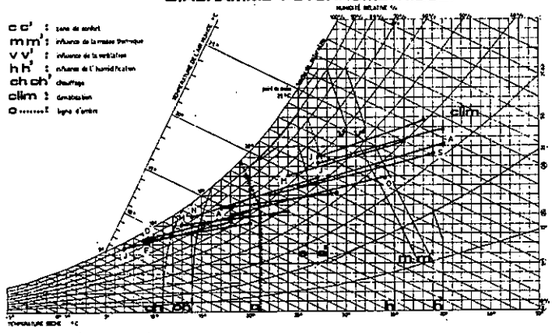
TERROIRS D'IMPLANTATION DES SANS-ABRIS

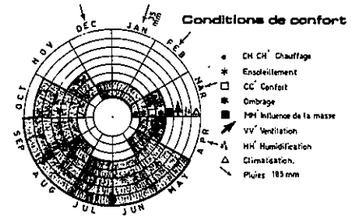
Les circonstances extrêmement troublées prévalant dans la région, et leurs effets sur les conditions de vie des populations locales ne permettent pas de projeter raisonnablement une politique des sans-abris dans la région; néanmoins , le modèle proposé ci-après, en se replaçant dans une tradition locale en matière d'habitat et d'utilisation des materiaux impliquerait une réactualisation des modèles d' habitat traditionnel, que ce soit en milieu rural ou péri-urbain,

PROPOSITION D'HABITAT

Le modèle proposé reprend les principes généraux évoqués plus haut et met en présence deux habitacles saisonniers, l'un en terre pour l'hiver, l' autre en roseau pour l'été, à la différence qu'ils sont accolés l'un à l'

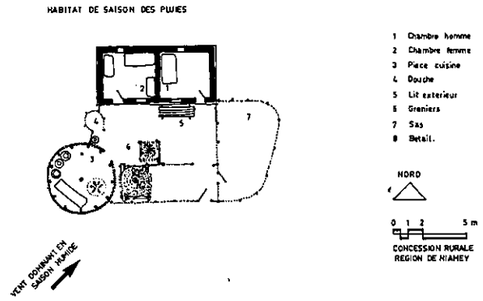
DIAGRAMME PSYCHROMETRIQUE.





Le climat de Basra se caractérise par deux saisons très progressives: un court hiver frais, pluvieux et humide, un long été chaud et sec et deux courtes demi-saisons à pluviometrie, humidité et chaleur atténuées.
Les besoins pour l'habitat se caractérisent par l'ensoleillement, le chauffage,l' étancheité et l'isolation en hiver, l'humidification, la ventilation et l'ombrage en été.

NIGER



ADAPTATION DE L'HABITAT

Cette habitation de la région de Niamey met en présence deux habitacles principaux, construits l'un en terre banchée et poutrelles de bois d'eucalyptus, l'autre en paille déroulée sur une charpente de bois de brousse ; le premier abrite les chambres toute l'année, tandis que la paillotte couvre la cuisine et sert parfois de chambre en saison humide. Le grenier , fermé en terre, repose sur des pilotis de bois et est coiffé d'une couverture de paille. (ci-dessus)

DIFFERENCIATION DES ZONES DOMESTIQUES.

La partie privative , strictement familiale, est bien différenciée de la partie accueil; la première regroupe les attributions féminines d'éducation des enfants, de cuisine et de conservation des récoltes, tandis que la seconde, propre à l'homme, commande l'accès principal et l'entrée de l'enclos du troupeau.

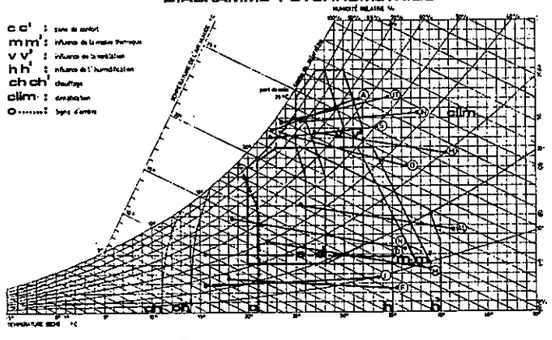
TERROIRS D'IMPLANTATION DES SANS-ABRIS

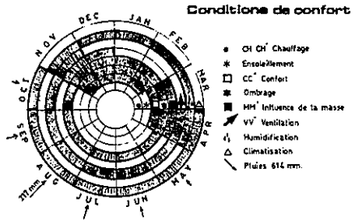
Generalement venus de la brousse environnante ou de la zone sahélienne sinistrée, la population peri-urbaine des sans-abris est, dans la plupart des cas, d'extraction rurale sédentaire ou nomade pastorale.
Les chances d'avenir de ces populations peuvent, entre autres, se situer dans une réactualisation de leurs savoirs-faire traditionnels, d'une part dans la mise en culture et l'irrigation des berges disponibles du fleuve Niger, d'autre part dans des activités liées à l'élevage (tanneries, tissage, etc.), intéressant directement la population urbaine de la capitale

PROPOSITION D'HABITAT

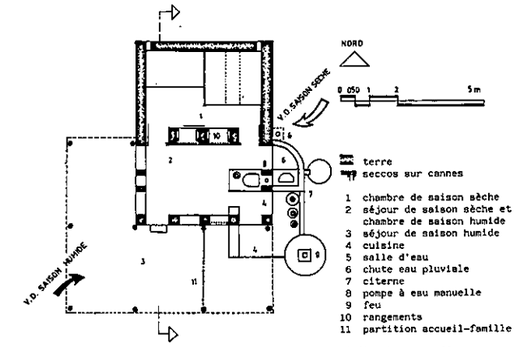
Le modèle d'habitat proposé met en complémentarité deux habitacles saisonniers de natures très différenciées: un habitacle en brique d'adobe couvert en terrasse, assurant une parfaite étancheité en saison humide et un bon abri de la fraicheur nocturne et matinale en saison sèche; un habitacle léger couvert de nattes de seccos, offrant un espace de séjour ombragé et bien ventilé en saison humide.
L'espace intermédiaire résultant de la combinaison des deux premiers, est traité en portique très ouvert dans la direction sud-ouest des vents dominants de saison humide, à masse thermique réduite, et fermé dans les directions nord et est des vents dominants de saison sèche; il est utilisé comme séjour durant cette dernière, tandis qu'il procure de bonnes conditions nocturnes en saison humide.
Le groupe Eau est disposé de manière à humidifier l'atmosphère du séjour durant la journée en saison sèche.

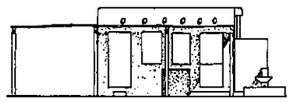
DIAGRAMME PSYCHROMETRIQUE.

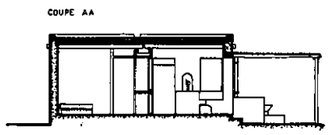


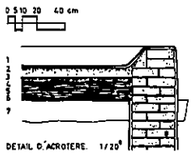


Le climat de Niamey se caractérise par deux saisons bien contrastées: une longue saison sèche, chaude et à fortes amplitudes diurnes; une longue saison des pluies aussi chaude mais avec de moindres amplitudes thermiques et une humidité plus élevée.
Les exigences requises pour l'habitat sont l'humidification, l'ensoleillement matinal et l'ombrage en saison sèche, la ventilation et l'ombrage en saison des pluies

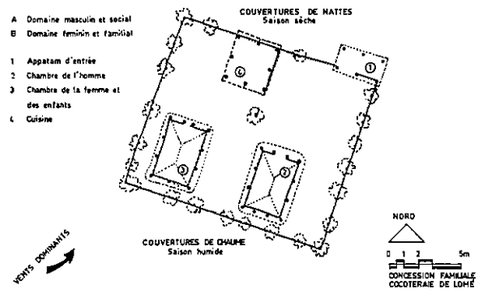








TOGO



ADAPTATION DE L'HABITAT

Cette habitation du sud togolais (ci-dessus), réunit deux types de constructions utilisant le bois et les feuilles du cocotier, mais couvertes de deux manières différentes: les unes, coiffées d'un toit de chaume à quatre versants, sont spécifiques de la saison des pluies; les autres, simplement couvertes de nattes de feuilles de cocotier tressées, sont propres à la saison sèche; l'emploi du végétal dans l'un et l'autre cas est, de par la faible conductivité de ce dernier, parfaitement judicieux sous un climat constamment chaud et humide comme celui de Lomé.
Le traitement très aéré des parois verticales permet une ventilation constante toute l'année.

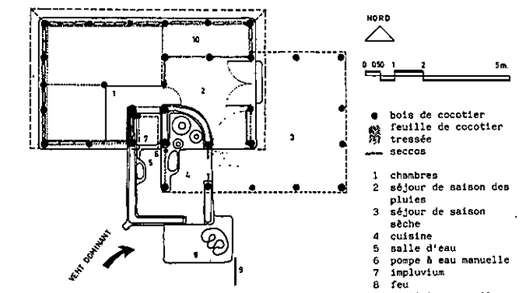
DIFFERENCIATION DES ZONES DOMESTIQUES

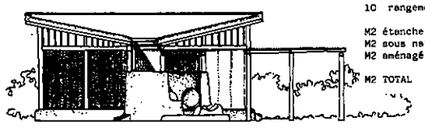
La concession s'organise suivant deux zones principales et successives: la zone spécifique de l'homme précédant celle de la femme; la première regroupe les attributions d'accueil et de garde de l'homme, avec son appatam d'entrée (pièce exterieure sous nattes), et sa chambre juste en face; la seconde réunit la chambre de la femme et des enfants avec la cuisine au fond de la concession.

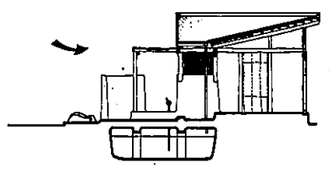
TERROIRS D'IMPLANTATION DES SANS-ABRIS

Chassés des régions du nord par la sécheresse, les populations sans-abris se fixent aux périphéries des agglomérations importantes, comme Sokode au nord et Lomé au sud.
Une répartition plus diffuse de ces populations dans les villes moyennes

L'espace intermédiaire résultant de la combinaison des deux habitacles très ouvert sur l'extérieur constitue une pièce de séjour par temps de pluie en saison humide; les fermetures mobiles permettent de l'utiliser aussi comme chambre supplémentaire de nuit.





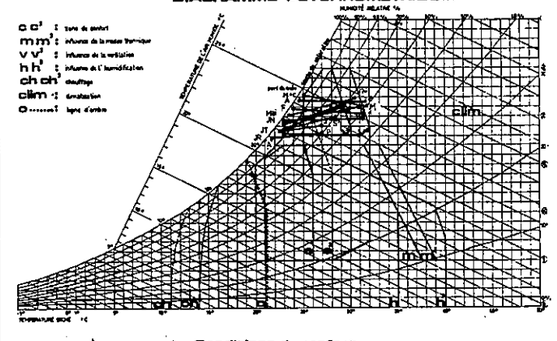


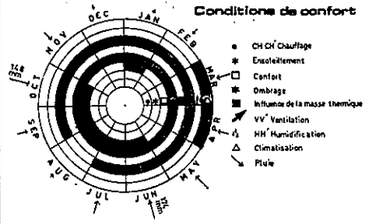
ou leurs périphéries contribuerait à tempérer la dimension du problème tout en permettant une meilleure assimilation par le biais d'activités bien adaptées: maraichage, artisanat, petit commerce individuel.

PROPOSITION D'HABITAT

Le modèle d'habitat proposé met en présence deux constructions végétales à base de bois et de feuilles de cocotier, de bois de brousse, de chaume et de terre, et se décompose de la manière suivante:
- un habitacle opaque mais bien aéré, coiffé d'une couverture de chaume enduit de terre passée à l'eau de néré (décoction de fèves de cet arbre) de manière à obtenir une surface lisse et imperméable, permettant de récupérer l'eau de pluie au moyen d'un impluvium.
- un habitacle transparent et couvert de nattes de cocotier tressées.

DIAGRAMME PSYCHROMETRIQUE.





Le climat de Lomé se caractérise par de faibles amplitudes thermiques et deux saisons peu différenciées si ce n'est par les pluies: une saison sèche chaude et humide, une saison des pluies plus humide et un peu moins chaude.
Les exigences requises pour l'habitat se caractérisent par un besoin constant d'ombrage et de ventilation, et par l'abri de la pluie une bonne partie de l'année.

PROBLEMA

. AMÉRICA LATINA ENFRENTA EN ESTE MOMENTO UNA GRAVE CRISIS DE ESTRUCTURA, RESULTANTE DE CINCO AÑOS DE DEPRESIÓN ECONÓMICA Y TRES DÉCADAS DE CRESCIMIENTO DESORDENADO.

. EN BRASIL, LA MISERIA CONTINUA A PLENO RITMO JUNTO A LOS MILLONES DE DESOCUPADOS, QUE NO POSSUEM TRABAJO O ACESSO A LA TIERRA Y ESTÁN REDUCIDOS A PRECARIAS CONDICIONES DE SUBSISTENCIA Y HABITACIÓN.

. EN EL ESTADO DEL PARANÁ, EL PRINCIPAL RESPONSABLE POR EL SURGIMIENTO DE NUCLEOS DE SUBHABITACIONES EN AREAS URBANAS ES LA EMIGRACIÓN RURAL, RESULTADO DIRECTO DEL DESEQUILIBRIO SOCIO-ECONOMICO, DEL CONTRASTE DEL GRAN PROPIETARIO Y EL PEQUEÑO PRODUCTOR SIN TIERRA. ESTE PROBLEMA SOLO PODRÁ SER SOLUCIONADO MEDIANTE LA REFORMA AGRARIA.

. PARANAGUÁ,CIUDAD HISTÓRICA DEL LITORAL PARANAENSE, ES UN CENTRO TURÍSTICO Y COMPORTA EL PRINCIPAL CORREDOR DE EXPORTACIÓN DEL ESTADO - EL PUERTO DE PARANAGUÁ - FUNDADO DURANTE LA COLONIZACIÓN PORTUGUESA DEL BRASIL. NO POSUE AREA PARA SU EXTENCIÓN Y 18% DE SU POBLACIÓN SE ENCUENTRA EN CONDICIONES DE SUBHABITACIÓN, ES CONSTITUÍDA PRINCIPALMENTE DE PEQUEÑOS E DE EX PESCADORES, SIN EQUIPOS , TRABAJADORES DE PUERTO E IMIGRANTES DE AREAS AGRÍCOLAS CERCANAS.

ANÁLISIS

. HABITAR SE CONSTITUYE EN UNA NECESIDAD BÁSICA AL HOMBRE.AL CONSTRUÍR SU HABITACIÓN, ÉL LE IMPRIME SU PROPIO PATRÓN ECONÓMICO Y SU CONDICIÓN SOCIO-CULTURAL, SE UTILIZA, GENERALMENTE, DEL MATERIAL FORNECIDO POR LA NATURALEZA QUE LO CERCA, DE ACUERDO CON LAS TÉCNICAS QUE EL DOMINA.

. DE ESTE MODO, NO EXISTE UNA SOLUCIÓN APENAS ARQUITECTÓNICA O URBANÍSTICA EFICAZ PARA EL PROBLEMA DE LA HABITACIÓN, YA QUE ELLA ES RESULTANTE DEL REFLEJO DE LA DESESTRUCTURACIÓN SOCIO-ECONÓMICA Y CULTURAL MUNDIAL.

. NO ADELANTA, POR LO TANTO, ENTREGAR UNA HABITACIÓN A QUIEN NI SIQUIERA LA SABE USAR, VALORAR, CONSTRUIR Y MANTERNERLA

. LOS COSTES SOCIALES SE TRANSFORMAM EN COSTES ECOLÓGICOS, CUANDO OBSERVAMOS QUE LA MISERIA SE CONSTITUYE EN UNA DE LAS FORMAS MÁS VIRULENTAS DE DENIGRACIÓN Y DE CONTAMINACIÓN DEL MEDIO AMBIENTE, AMPLIANDO AÚN MÁS LAS DESIGUALDADES SOCIALES AL REVERTIR A ESTA POBLACIÓN EL SUFRIMIENTO DE LOS DAÑOS CAUSADOS.

. ES NECESSARIO QUE LA HABITACIÓN SEA EL RESULTADO DE UNA ESTRUCTURA SÓLIDA Y SANA, QUE SEA, COMO SIEMPRE FUE, EL REFLEJO DEL HOMBRE Y DE SU MEDIO, SIN SER APENAS UNA MÁSCARA PARA UNA SOCIEDAD EN DESORDEN.

. SE IDENTIFICA AÚN QUE, AL MISMO TIEMPO EN QUE LAS CIUDADES DEL TERCER MUNDO NO POSUEN OTRA ALTERNATIVA QUE SI NO LA AUTO PRODUCCIÓN DE LOS SERVICIOS SOCIALES Y HABITACIONALES SE CONSTITUYEN EN ECOSISTEMAS CON UN POTENCIAL DE RECURSOS DESPERDICIADOS Y SUB UTILIZADOS.
UTILIZANDO-SE LA MANO DE OBRA OCIOSA ES POSIBLE RECICLAR ESTOS DESPERDÍCIOS, ECONOMISAR ENERGIA, MAXIMIZAR LA TRANSFORMACIÓN DE LOS RECURSOS LATENTES EN RECURSOS ECONÓMICOS, PROMOVIENDO SU AUTO-SUFICIENCIA, LA MEJORIA DE SUS CONDICIONES DE VIDA Y DE HABITACIÓN DE SU POBLACIÓN.

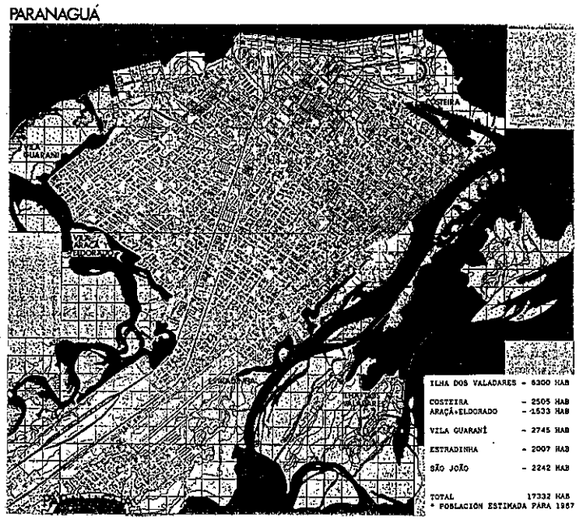
PROPOSTA

1. EL ENFOQUE DEL NUCLEO DE SUB HABITACIONES COMO DE UNA "AREA ENFERMA" EN LA CUAL LAS CARACTERÍSTICAS SOCIO-ECONÓMICAS Y CULTURALES ESTÁN EN DESARMONIA Y DEFICIENTES CON LAS DEL NUCLEO URBANO.

1.1. IDENTIFICACIÓN DE LAS AREAS CARENTES O DE LOS NUCLEOS DE SUB HABITACIÓN EN LA RED URBANA.

1.2. CLASIFICACIÓN DE LOS NUCLEOS DE ACUERDO CON LA SITUACIÓN EN : .AREAS URBANIZABLES
.AREAS DE RIESGO O INSALUBRES

PARANAGUÁ



1.3. PROPUESTA

.REURBANIZACIÓN Y CONSERVACIÓN DE LA "ILHA DOS VALADARES"

.REMOCIÓN INDUZIDA DE LA POBLACIÓN ASENTADA EN AREAS DE RIESGO PARA LAS AREAS DISPONIBLES EN LA "ILHA DOS VALADARES", ATRAVÉS DE LA LEGALIZACIÓN DE LA POSESIÓN DE LA TIERRA.

REURBANIZACION E CONSERVACION

2. HABITACION COMO PRODUCTO DE UNA ESTRUCTURA QUE LA VIABIZE (INFRA-ESTRUCTURA) Y LA INFLUENCIE (SUPRA-ESTRUCTURA O MEDIO AMBIENTE)

SE SABEN QUE ACTUAM COMO AGENTES EXTERNOS SOBRE LA PRODUCCIÓN DE LA HABITACIÓN EL MEDIO AMBIENTE O LOS ASPECTOS FÍSICOS, EL USUÁRIO, LA TRADICION CONSTRUCTIVA LOCAL Y LA POLÍTICA GOVERNAMENTAL, SIENDO QUE ESTOS AGENTES TIENEM COMO BASE TODA UNA ESTRUCTURA DE ASPECTOS SOCIALES, ECONÓMICOS Y CULTURALES DEL LOCAL O DE LA COMUNIDAD.

COMO AGENTES INTERNOS, QUE VIABILIZAN LA PRODUCCIÓN DE LA HABITACIÓN ESTAN LA POSESIÓN DE LA TIERRA, LA DISPONIBILIDAD DE MATERIALES EN EL LOCAL, MANO DE OBRA CAPACITADA Y EXISTENCIA DE UNFRA-ESTRUCTURA (ALCANTARILLADO, LUZ, ÁGUA Y TRANSPORTE). CUANDO QUALQUIER UNO DE ESTOS AGENTES FALLA, EL PROCESO DE PRODUCCIÓN DE LA HABITACIÓN BUSCA UN MEDIO ALTERNATIVO DE SUBSANARLO, SEA POR LA LEGALIZACIÓN DE LA POSESIÓN DE LA TIERRA Y/O LA RECUPERACIÓN DE SUELOS, POR LA PRODUCCIÓN DE MATERIAL ALTERNATIVO O DE RECUPERACIÓN DE MATERIALES (DE DEMOLICIÓN POR EJEMPLO), SEA POR LA CAPACITACIÓN DE LA MANO DE OBRA OCIOSA CON LA AYUDA DE LA ASISTENCIA TÉCNICA PERMANENTE A LA AUTO-CONSTRUCCIÓN POR MUTIRONES, SEA POR LA AUTO-PRODUCCIÓN DE INFRA-ESTRUCTURA CON REDUCCION DE COSTES.

SE FALLA CUALQUIER UNO DE ESTOS MEDIOS ALTERNATIVOS LA PRODUCCIÓN DE LA HABITACIÓN IMPLICARÁ EN LA APLICACIÓN DE RECURSOS FINANCIEROS POR PARTE DEL USUÁRIO, SEA PARA COMPRAR TERRENO O MATERIAL, SEA PARA PAGAR LA MANO DE OBRA O POR LA INFRA-ESTRUCTURA BÁSICA.

LA PRODUCCIÓN DE TALES RECURSOS FINANCIEROS POR EL USUARIO O POR LA COMUNIDAD DEBE SER ENTONCES ORIENTADA, EN EL CASO, POR EL ECONOMISTA Y CONSISTE EN LA TRANSFORMACIÓN DE RECURSOS LATENTES O POTENCIALES DE LA COMUNIDAD U DEL NUCLEO EN RECURSOS ECONÓMICOS, DE LA RECUPERACIÓN DE DESPERDÍCIOS Y DE LA ECONOMIA DE ENERGIA.

LA MOTIVACIÓN Y LA CAPACIDAD DE LA COMUNIDAD PARA ESTA MOBILIZACIÓN SERAN INFLUENCIADAS POR SUS ASPECTOS SOCIALES, ECONÓMICOS, Y CULTURALES, QUE DEBEM,ENTONCES, SER TRABAJADOS POR LA VISITADORA SOCIAL.

LA PRODUCCIÓN DE RECURSOS FINANCIEROS Y LA RECUPERACIÓN DE DESPERDÍCIOS SERAN, POR SU VEZ, FORMAS DE FORTALECIMIENTO DE LA COMUNIDAD, DANDO CONDICIONES DE ALIMENTACIÓN Y HABITACIÓN SALUDABLES, INFRA-ESTRUCTURA Y COMO CONSECUENCIA, EL DESAROLLO SOCIAL, ECONÓMICO Y CULTURAL DE LA COMUNIDAD, O NUCLEO CARENTE.

2.1. DIAGNÓSTICO DEL NUCLEO CARENTE EN EL CUAL SE VA ACTUAR, IDENTIFICANDO LOS POTENCIALES Y LAS DEFICIENCIAS DE LOS RECURSOS PARA LA PRODUCCIÓN DE LA HABITACIÓN.

DE LA ILHA DOS VALADARES

ASPECTOS FÍSICOS

ISLA FLUVIAL DE LA BAIA DE PARANAGUÁ
AREA TOTAL DE 2.8 km² (1,8 km² AREA UTIL + 1 km² CIENAGA)
DIMENSIONES 3,0km Y 0,5km
TOPOGRAFIA PLANA
SUELO ARENOSO CON PUNTOS DE EROSIÓN
VEGETACIÓN AUTÓCTONA Y CIENAGAS
PEQUENAS PLANTACIONES DE YUCA Y FRUTAS CÍTRICAS
CLIMA PLUVIAL TROPICAL
TEMPERATURA MEDIA ANUAL 21,1ºC (24,6-16,7ºC)

ASPECTOS SOCIALES

CRESCIMIENTO POBLACIONAL 5% AL AÑO
POBLACIÓN PREDOMINANTEMENTE JOVEN 63%
ORIGEN . 32,2% PARANAGUÁ (NUCLEO URBANO)
. 20,1% AUTÓCTONOS DE LA ISLA
MESTIZOS, ÍNDIOS, "CAIÇARAS"
. 25,2% GUARAQUEÇABA (CIUDAD CERCANA Y DECADENTE)
. 21,5% REGIONES AGRÍCOLAS CERCANAS
NIVEL EDUCACIONAL 07/14 AÑOS - 95% ALFABETIZADA
15/19 AÑOS - 50% PRIMARIO COMPLETO
MAIORIA ALFABETIZADA

TRADICIÓN CONSTRUCTIVA LOCAL

TRADICIONAL - "TAIPA DE PILÃO" - FORMA DE CONSTRUCCIÓN AUTÓCTONA DÓNDE SE HACE UN ENTRAME DE CAÑA O DE MADERAS EN LAS PAREDES DE VEDACIÓN Y DESPUÉS SE VEDA CON BARRO PREVIAMENTE MEZCLADO EN PILONES
ATUAL - ALBAÑILERIA
- CASAS DE MADERA DEL TIPO "STANDART"

- ISLA COSTERA CON AREA DISPONIBLE PARA LA REURBANIZACIÓN
- AREA DE EXPANSIÓN DEL PUERTO
- AREA INSALUBRE SOBRE LA CIÉNAGA
- AREA CONTAMINADA POR LA INDÚSTRIA DE ADUBOS
- AREA DE TERRAPLEN DESTINADA A UN PARQUE
- AREA DE TERRAPLEN DESTINADA A UN PARQUE
- 16% DE LA POBLACIÓN DE POUÁ

POSESIÓN DE LA TIERRA

LA ISLA DE LOS VALADARES SE CONSTITUYE EN UN PATRIMONIO DE LA UNIÓN O DEL ESTADO

LEGALIZACIÓN DE LA POSESIÓN DE LA TIERRA

LA REINVINDICACIÓN DEL MUNICIPIO DE PARANAGUÁ POR EL DOMÍNIO UTIL DE LA ISLA DE LOS VALADARES, ES DEJANDO A ESTA INSENTA DE TASAS, FORO O IMPUESTOS SOBRE EL REPASE DE SU DOMÍNIO UTIL A LOS HABITANTES DE LA ISLA (LAUDÊNIO)

MANO DE OBRA

NO CAPACITADA

CAPACITACIÓN DE LA MANO DE OBRA

ATRAVÉS DE LA ASSISTENCIA TÉCNICA A LOS GRUPOS AUTÓCTONOS Y MOBILIZADOS PARA LA CONSTRUCCIÓN O PARA LA MEJORIA DE LAS HABITACIONES.

ASPECTOS ECONÓMICOS

POBLACIÓN ECONOMICAMENTE ACTIVA - 35,5%
RENTA MENSUAL MEDIA FAMILIAR - 1 SUELDO MÍNIMO (U$60,00)
PROFISIONES PREDOMINANTES - TRABAJADORES DEL PUERTO (60%)
PESCADORES, SERVIENTAS,
COSTURERAS

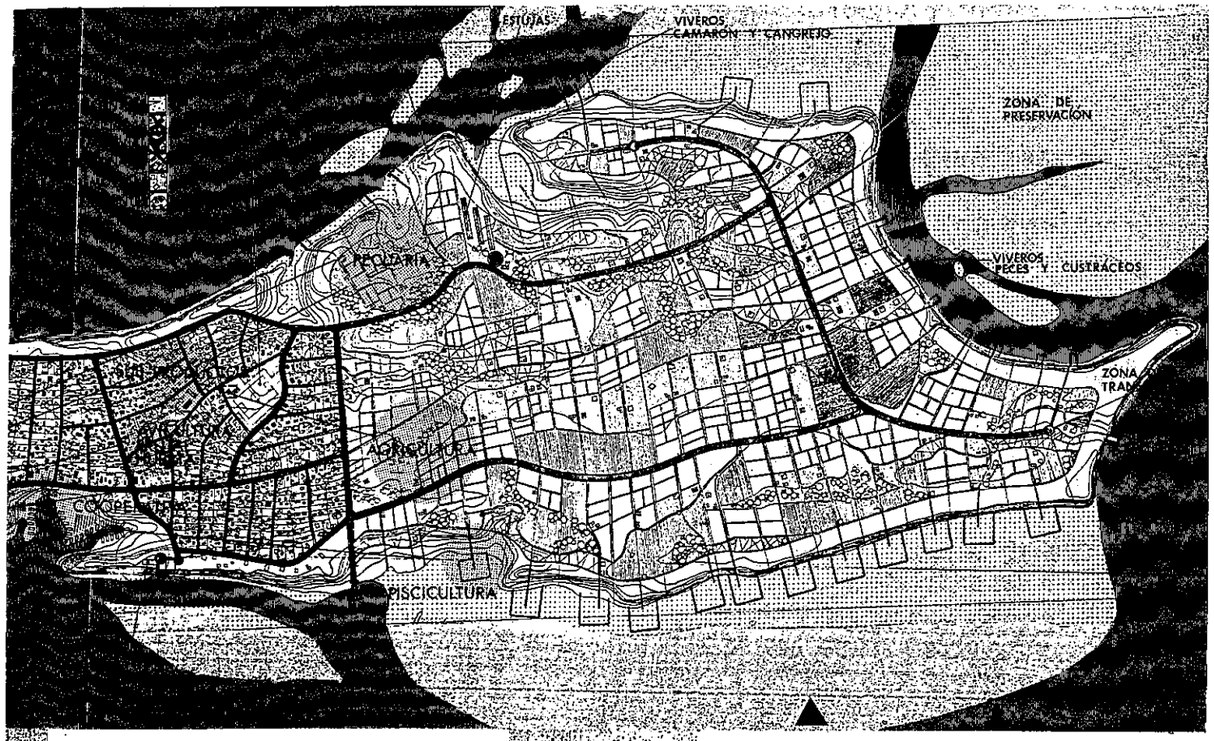
ASPECTOS CULTURALES

COMUNIDAD DIVIDIDA Y PARADA
LOS AUTOCTONOS DE LA ISLA AÚN MSNTIENEM LA TRADICIÓN DE LOS "CAIÇARAS" : DANZA TÍPICA - "FANDANGO"
COMIDA - "BARREADO"(A BASE DE CARNE DE BUEY) Y "PEIXADA" (PECES)
ABANDONARON RECIENTEMENTE LA PRODUCCIÓN DE LA ARTESANÍA Y DEL CULTIVO DE LAS FRUTAS CÍTRICAS.

USUARIO

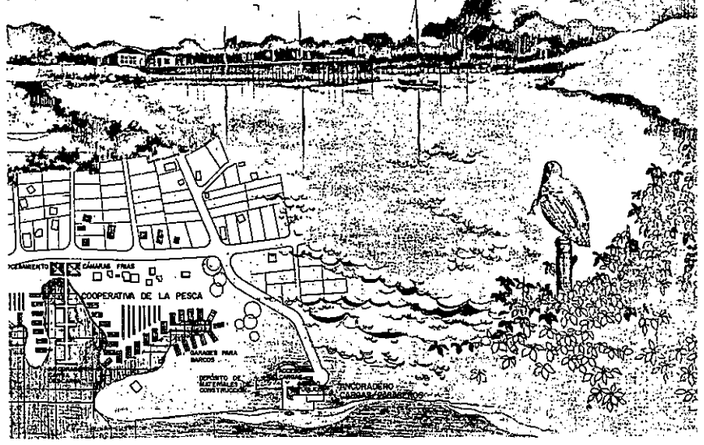
POLÍTICA GOVERNAMENTAL

LA SOLUCIÓN DEL PROBLEMA DE LA SUB HABITACIÓN A NIVEL MUNICIPAL ES INEXISTENTE



MATERIAL DISPONIBLE DEL LOCAL

MADERA DESHECHADA DEL PUERTO
NO HAY TIERRA EN LA ISLA PARA CASAS DE SUELO-CIMIENTO O DE LA "TAIPA DE PILÃO".



INFRAESTRUCTURA EXISTENTE

AGUA INSUFICIENTE PARA LA DEMANDA
SUMIDEROS A CIELO ABIERTO O DE FOSSA NEGRA
ENERGIA ELETRICA ATENDIENDO A 77% DE LA POBLACIÓN
TRANSPORTE PRECARIO PARA LA CIUDAD ATRAVÉS DE PEQUEÑAS EMBARCACIONES (BOTES ,BARCAROLAS) E INEXISTENTE DENTRO DE LA ISLA.
TELECOMUNICACIONES Y CORREOS - APENAS LO BÁSICO

EXECUCIÓN DE LA INFRAESTRUCTURA

COMPLETAR LA EXISTENTE CON EL USO DE LA PROPIA COMUNIDAD OBTENIENDOSE UNA REDUCCIÓN DE COSTES

3. VALORACIÓN DE LA COMUNIDAD

3.1. CONSCIENTIZACIÓN
ORGANIZACIÓN
MOBILIZACIÓN DE LA COMUNIDAD ACERCA DEL PROBLEMA

3.2. PARTICIPACIÓN DE LA COMUNIDAD EN EL ELABORACIÓN DEL DIAGNÓSTICO, DE LA PROPUESTA, DEL PROYETO Y EN LA EJECUCIÓN DEL MISMO.

3.3. VALORACIÓN DE LOS POTENCIALES Y DE LOS RECURSOS ESPECÍFICOS DE CADA COMUNIDAD, BIEN COMO DE LOS APORTES DE CADA CULTURA.

4. HARMONIZACIÓN Y DESAROLLO DE LOS OBJETIVOS SOCIALES, ECOLÓGICOS Y ECONÓMICOS ENTRE SÍ, ATRAVÉS DE LA ACTUACIÓN CONJUNTA DE LOS PROFESSIONALES RESPONSABLES POR LOS DIVERSOS ENFOQUES DEL PROBLEMA : ARQUITECTÓNICO, POLÍTICO, SOCIAL, BIOLÓGICO, ECONÓMICO, CIENTÍFICO, ANTROPOLÓGICO CULTURAL, ETC. ; REUNIDOS EN LA FORMA DE UN EQUIPO VERSÁTIL, MANTENIDOS POR UNA ENTIDAD PÚBLICA O PRIVADA DE ASSISTENCIA A LA PROBLEMÁTICA HABITACIONAL, O EN EL CASO DE LA ISLA, UNA COOPERATIVA DE CONSTRUCCIÓN MANTENIDA POR LA ASOCIACIÓN DE HABITANTES.

5. TRANSFORMACIÓN DE RECURSOS LATENTES EN RECURSOS ECONÓMICOS, POR EL ECONOMISTA, CONCIBIENDO SISTEMAS DE PRODUCION COMO CIRCUITOS CERRADOS, SIEMPRE QUE SEA POSIBLE, JUGANDO CON LAS COMPLEMENTACIONES ENTRE LAS DIVERSAS ACTIVIDADES.

5.1. IMPLEMENTACIÓN DE UN POLO AGROPECUÁRIO, CON PROPRIEDADES DE 1,5 A 2 ha, OCUPANDO LA MANO DE OBRA FAMILIAR CON ALGUNA TRADICIÓN EN EL SECTOR, PROMOVIENDO LA SUBSISTÉNCIA Y COMERCIALIZACIÓN DEL EXCEDENTE Y DE SUS SUB PRODUCTOS.

5.2. EXPLOTACIÓN RACIONAL DE LOS RECURSOS DE LA CIÉNAGA ATRAVÉS DE LA IMPLEMENTACIÓN DE AGUACULTURAS, PROMOVIENDO LA ENGORDA DE TAINAS (PECES), CANGUEJOS; CRIACIÓN DE RANAS CAMARONES PARA CARNADA, OSTRAS Y EL INCREMENTO DE LA PESCA ARTESANAL ATRAVÉS DE LA UTILIZACIÓN DE CERCADOS FIJOS QUE APROVECHEN EL EFECTO DE LAS MAREAS.

5.3. REVITALIZACIÓN DE LAS TRADICIONES "CAIÇARAS", PROMOVIENDO LAS ACTIVIDADES FOLKLORICAS COMO EL "FANDANGO" (DANZA TÍPICA) Y LA "PEIXADA" (TAMBIÉN COMIDA TÍPICA) E INCENTIVANDO LA PRODUCCIÓN DE LA ARTESANÍA TÍPICA (CESTARIA, MACRAMÉ Y CERÁMICA). AL MISMO TIEMPO QUE SE INTENSIFICA LA ESTRUCTURA COMUNITARIA, SE ACELERA UNA IMPORTANTE FUENTE DE RECURSOS : EL TURISMO.

5.4. IMPLANTACIÓN DE HUERTAS Y FRUTALES CASEROS Y PEQUEÑAS CRIACIONES DE ANIMALES PARA MEJORAR LA ALIMENTACIÓN DE LA POBLACIÓN Y COMERCIALIZACIÓN DEL EXCEDENTE Y DE SUS SUB-PRODUCTOS.

5.5. IMPLEMENTACIÓN DE UNA GRAN FERIA LIBRE EN EL NUCLEO DE LA ISLA, DÓNDE SERÁN COMERCIALIZADOS TODOS LOS PRODUCTOS DE LA ISLA, LA ARTESANIA, LAS COMIDAS TÍPICAS, Y DÓNDE SERÁ PRESENTADO EL "FANDANGO". SE AGILIZA ASÍ EL COMERCIO ENTRE LA ISLA Y LA CIUDAD, AL MISMO TIEMPO QUE SE DESAROLLA UN POLO DE ATRACCIÓN TURÍSTICA.

6. RECUPERACIÓN DE DESPERDÍCIOS

6.1. RECUPERACIÓN DE SUELOS, CON LA AYUDA DE UN AGRÓNOMO, ATRAVÉS DEL CULTIVO INTEGRADO, DEL CONTROL DE LA EROSIÓN DE LA DETERMINACIÓN DE ZONAS PARA PROTECCIÓN, TRANSICIÓN Y DE RECUPERACIÓN DE CIÉNAGAS.

6.2. RECUPERACIÓN DE MATERIALES DE CONSTRUCCIÓN POR UNA COOPERATIVA DE CONSTRUCCIÓN, ATRAVÉS DEL RECOGIMIENTO DE MATERIALES DEMOLIBLES Y DESHECHOS DEL PUERTO .

6.3. RECUPERACIÓN DE LA MANO DE OBRA OCIOSA ATRAVÉS DE LA APLICACIÓN DE SU OFERTA POTENCIAL DE TRABAJO EN LA PRODUCCIÓN DE ALIMENTOS, HABITACIONES Y ENERGIA IMPORTADA.

7. ECONOMIA DE ENERGIA

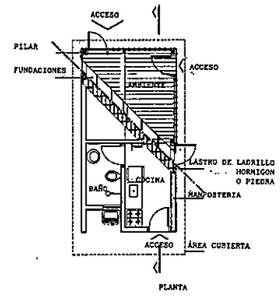
7.1. DISMINUCIÓN DE LA DEMANDA DE ALIMENTOS IMPORTADOS, DE HABITACIONES Y ENERGIA IMPORTADA.

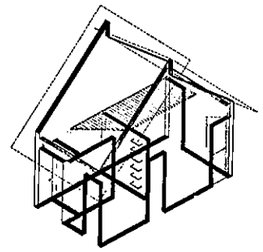
7.2. AUMENTO DE LA OFERTA POTENCIAL DE TRABAJO

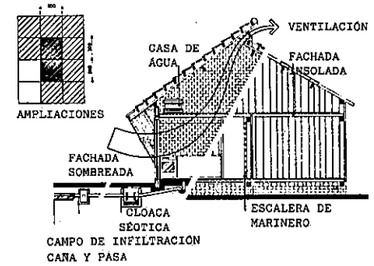
8. PRODUCCIÓN Y MEJORÍA DE LAS HABITACIONES POR LA PROPIA COMUNIDAD CON SU PROPIOS RECURSOS, ATRAVÉS :
. DE LA ACCIÓN DEL ARQUITECTO, ESTABLECIENDO CONDICIONES TERMO-ACÚSTICAS, HIDRO-SANITARIAS, FUNCIONALES Y ESTÉTICAS PARA CON LA HABITACIÓN.
. DE LA ACCIÓN INTEGRADORA DE UNA COOPERATIVA PARA LA CONSTRUCCIÓN.

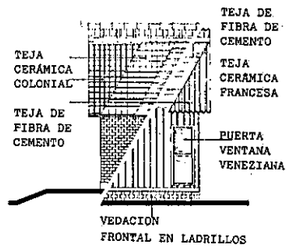
9. PRODUCCIÓN Y MEJORAMIENTO DE LA INFRA-ESTRUCTURA EN LA ISLA, ESTABLECIENDO :
. UN MEJOR SISTEMA DE TRANSPORTES POR INTERMEDIO DE BARCOS HASTA LA CIUDAD Y EL AUMENTO DEL NÚMERO DE ATRACADEROS.
. UN SISTEMA DE TRANSPORTES INTERNOS, EN LA ISLA, ATRAVÉS DE UN AUTOBUS CIRCULAR.
. IMPLEMENTACIÓN DE ESCUELAS, GUARDERÍAS PARA NIÑOS, PUESTOS DE SALUD, CORREO, TELÉFONO, POLICÍA.
. IMPLREMENTACIÓN DE UNA PLAZA EN EL NUCLEO DE LA ISLA PARA LA PROMOCIÓN DE LA FERIA E IMPLEMENTACIÓN DEL POLO TURÍSTICO/ECONÓMICO.
. IMPLEMENTACIÓN DE UN SISTEMA DE RECOGIMIENTO DE LOS RESÍDUOS DOMICILIARES EN UN SISTEMA DE SELECCIÓN Y REAPROVECHAMIENTO DE MATERIALES Y FABRICACIÓN DE ADUBO.

HABITACIÓN PROYECTADA

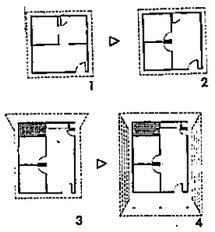


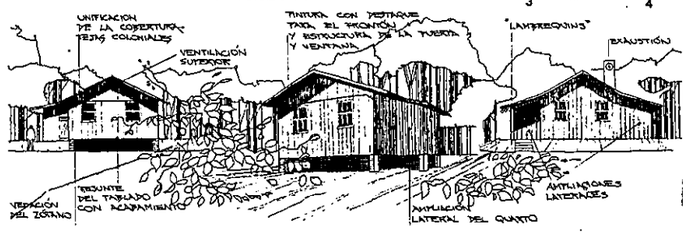






HABITACIÓN REDESENADA





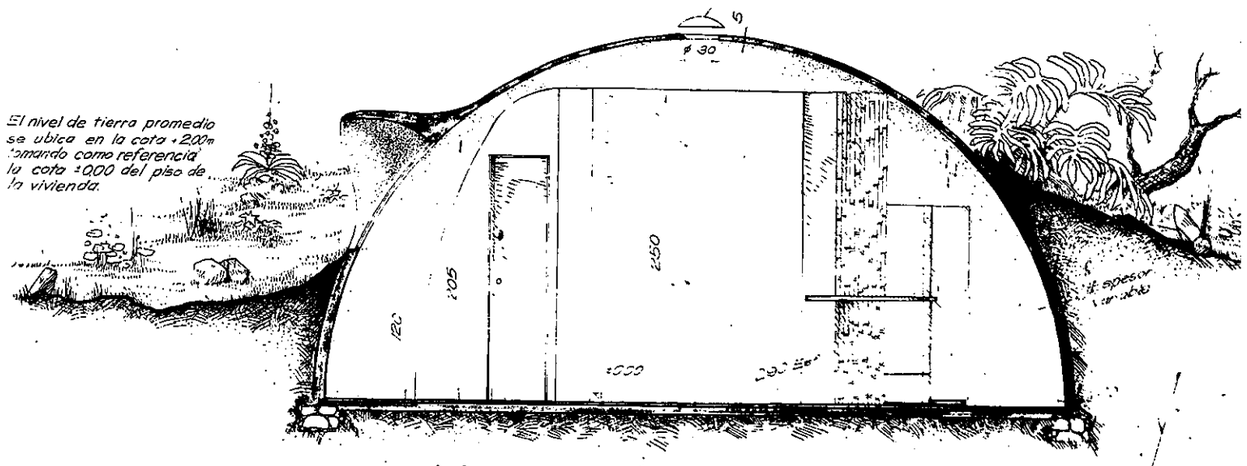
CONCLUSION

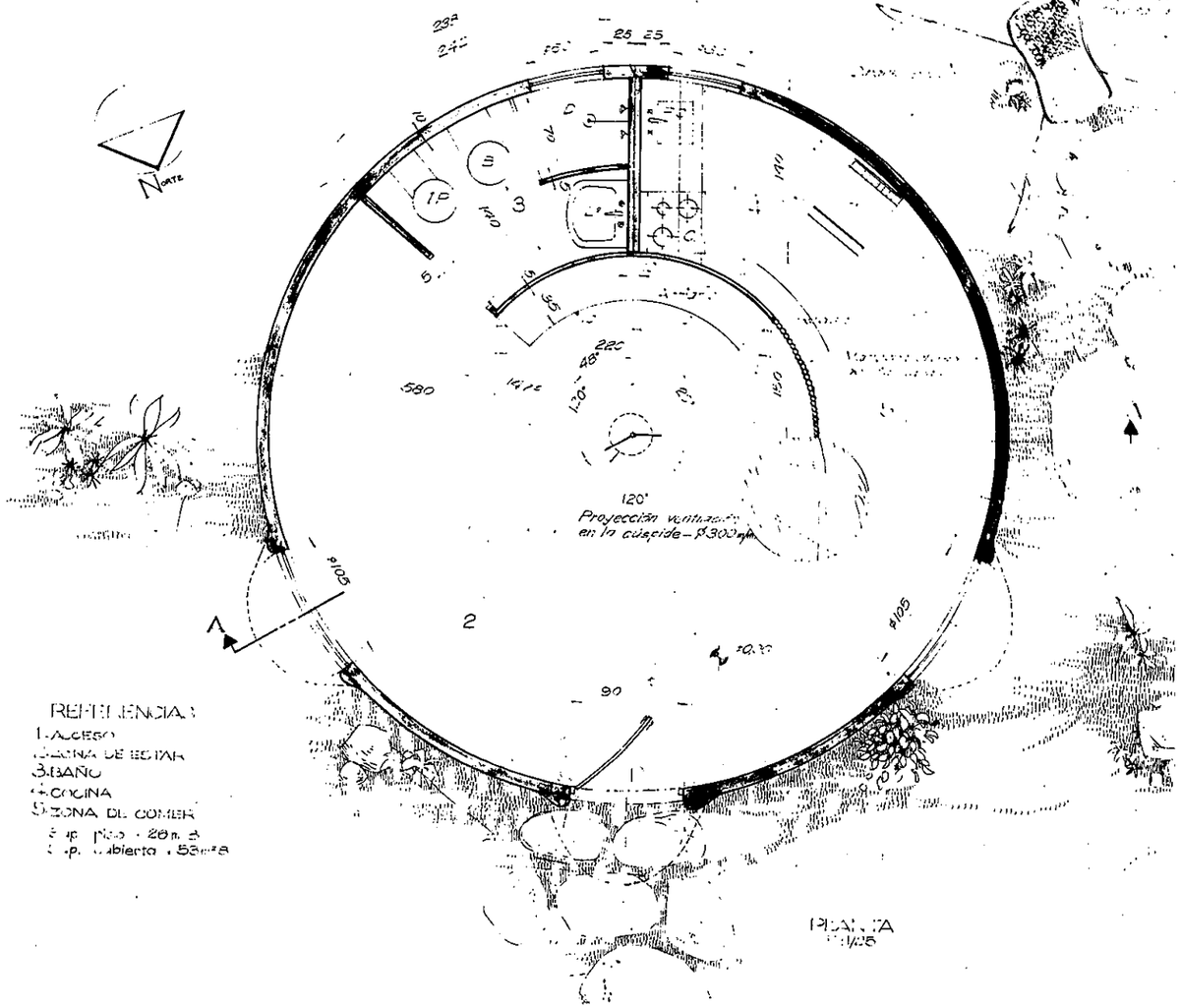
Harmonización de los aspectos socio-económicos, culturales e habitacionales del nucleo carente a los del contexto urbano, promoviendo su total integración ao mismo.

La auto construcción de las habitaciones como producto de una estruturación social, económica y cultural.

ARARUPI - Â

Escultura Habitable _ Vivienda Ecologica



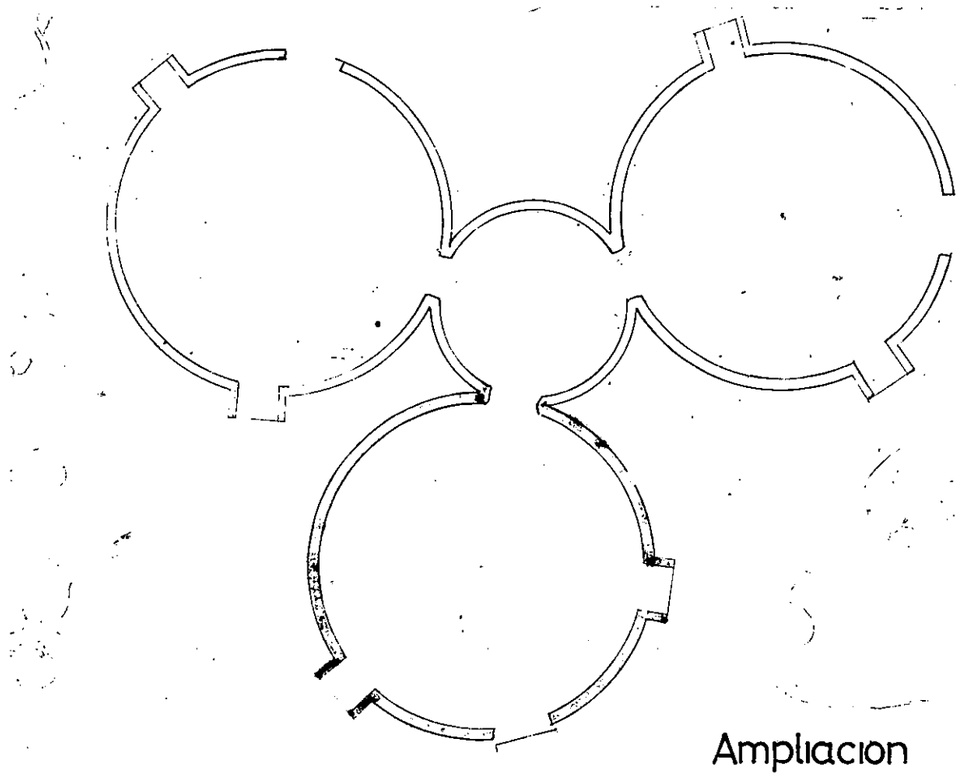


MEMORIA

ARA - RUPI - Â

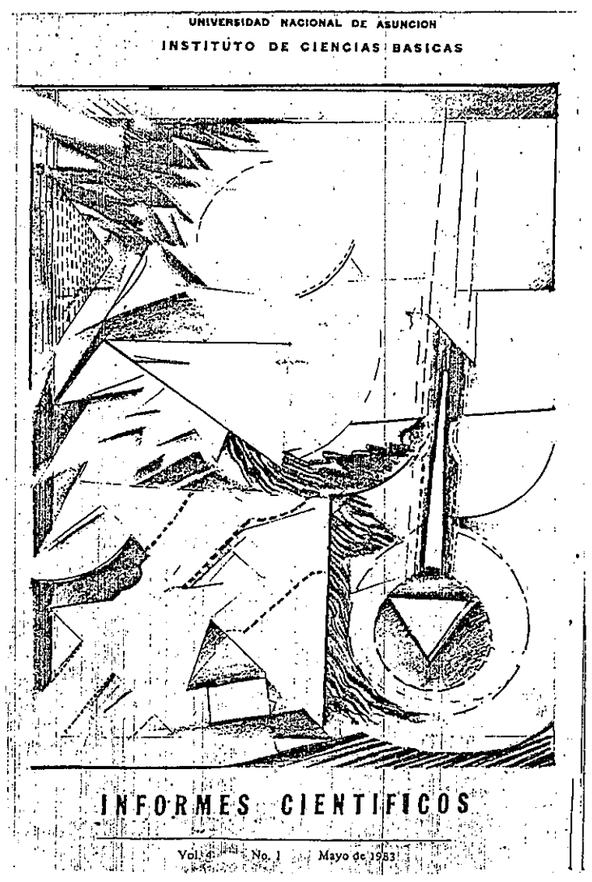
Escultura Habitable - Vivienda Ecológica - Económica - (Registro de Propiedad Intelectual - 44.248 Asunción - Paraguay)
COSTO ₲ 50.000.- (Cincuenta Mil Guaraníes) el Mt. Cuad. (US$ 48.-/Fecha 30/4/87).
Estructura Auto-Portante, Moldes en Hierro desmontable o de Goma inflable.
Materiales: Suelo cemento con fibras y bolsas de Polietileno y Alambre de Puas.
Piso: Cemento alisado
Revoques: Suelo cemento salpicado
Aislación Envolvente: Asfalto o Plástico
Pintura: A la Cal.
Aberturas de Hierro: De perfiles normales de Vidrio, Acrílico o Plástico.
Desagues: Los desperdicios serán conectados a cámaras Sépticas y pozos Ciegos, que permitiran el aprovechamiento como Bio-Gas.
La energía auxiliar se podrá aprovechar de la fuerza del Viento con un Dínamo Eólico.
Esta vivienda puede ser ampliada modularmente según las necesidades.
Debe ser construida en pendientes suaves. (Para el desague).
Cualidades Ecológicas: Por sus características físicas ambientales, en razón de estar semienterrada, la unidad permite disfrutar de una temperatura fresca en verano y cálida en invierno, aprovechando las cualidades térmicas de la tierra. A este respecto se puede citar el informe publicado por el Instituto de Ciencias Básicas de la UNA, de Mayo de 1983.

"Temperatura, Humedad Relative e Iluminación de una Vivienda Subterranea" que en el apartado de comentarios y conclusiones; pagina 53, menciona : "Los datos y resultados obtenidos en este estudio, revelan que la casa subterranea tratada aquí es más fresca en el verano que una casa convencional y además ofrece suficiente protección contra el frio invernal".
La perforación Genital, regula la circulación del aire interno. Por su forma geométrica (Semi-Esférica), la cáscara envolvente logra una adecuada resistencia estructural, con reducido gasto de material.
Ecologicamente ayuda a conservar la vegetación, puesto que no se usa madera y se construye bajo los árboles, que refuerzan el efecto de protección de la tierra y la jardinería le permite una buena oxigenación ambiental.



Ampliacion

Informe Cientifico



COMENTARIOS Y CONCLUSIONES

La casa subterránea, tal cual como se encuentra en Asunción, nunca registró un valor ΔT_{max} que haya sobrepasado +1,5°C en el verano (Tabla 5). En el invierno y en una oportunidad llegó a tener ΔT_{max} = -2,1 °C con las ventanas abiertas, mientras que con las mismas cerradas, el valor de ΔT_{max} fue de +4,5°C (Tabla 3). Resulta importante destacar la constancia de la temperatura en los puntos #3b, #4b y #5b, los cuales por su profundidad (1,5 metros bajo nivel) indican las perspectivas alentadoras de mantener una temperatura constante. Es más, aumentando la profundidad de la casa a 2,5 metros se incrementaría esta constancia. El clima de Asunción, sea en verano o invierno, muchas veces se halla fuera de la zona de confort (Figura 2), razón por la cual se llevaron a cabo las mediciones correspondientes en días fríos y calurosos.

Se han registrado datos adicionales de temperatura y humedad relativa en el período comprendido entre el 19 y el 26 de octubre de 1981, utilizándose en la oportunidad equipos de medición (R. Fuess, Berlin-Steglitz NR.F.8010) que fueron instalados dentro y fuera de la casa (ver Apéndice). Se puede observar que existe un desfase entre el máximo y mínimo de la humedad relativa y la temperatura. Así, el cambio de la temperatura del interior es menor (~ 8 C) que la de afuera (~ 15 C).

La cúpula de concreto del Instituto de Ciencias Básicas también fue objeto de las mediciones de temperatura y humedad relativa desde el 28 de setiembre al 5 de octubre de 1981. (ver Apéndice). El comportamiento de estos valores fue similar al de los registrados en la casa subterránea. Es decir, las variaciones de la temperatura dentro de la cúpula oscilaron alrededor de 5 °C, mientras afuera las variaciones eran cerca de los 15 °C. Este efecto es probablemente producido por la gran masa de material de la cúpula.

También se realizaron mediciones en un pozo de agua de la Facultad de Ingeniería Agronómica, en la Ciudad Universitaria de San Lorenzo. Los resultados indican que no es necesario cavar más de 5 metros para obtener una temperatura constante.

Los datos y resultados obtenidos en este estudio revelan que la casa subterránea tratada aquí es más fresca en el verano que una casa convencional y, además, ofrece suficiente protección contra el frío invernal.

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LA POBREZA SE PUEDE DEFINIR EN TERMINOS ECONOMICOS COMO LA SITUACION EN LA CUAL LOS INGRESOS FAMILIARES NO CUBREN LOS COSTOS DE LAS NECESIDADES BASICAS, TALES COMO: ALIMENTACION, VIVIENDA, VESTUARIO, SALUD Y EDUCACION.

LAS ORGANIZACIONES CIVICAS Y RELIGIOSAS Y LAS EMPRESAS QUE CONTRIBUYAN PARA LA INICIACION DE LA INFRAESTRUCTURA DE LOS CENTROS DE PRODUCCION, RECIBIRAN UN TRATAMIENTO PREFERENCIAL DE ACUERDO CON LAS LEYES VIGENTES DEL PAIS.

EN UN PAIS DE ECONOMIA MIXTA, POBLACION HETEROGENEA Y DISPERSA EN LAS AREAS RURALES, CON CRECIMIENTO EXPLOSIVO DE LA POBLACION MARGINADA Y UNA DESIGUAL DISTRIBUCION DE LA RIQUEZA EN LOS SECTORES RURALES Y URBANOS, SE PUEDE UTILIZAR LA INVESTIGACION APLICADA, COMO UN RECURSO PARA DETECTAR EL ORIGEN DEL PROBLEMA DE LOS SIN HOGAR Y COMO CONSECUENCIA DE LOS SIN TECHO.

EL SECTOR RURAL REQUIERE DE UNA ORGANIZACION SOCIAL QUE PERMITA INCORPORAR AL HOMBRE DEL CAMPO A LOS MEDIOS DE PRODUCCION Y AUTOCONSUMO. ELEVAR SU NIVEL DE VIDA PARA LOGRAR EL OBJETIVO, REQUIERE UNA POLITICA DE DESARROLLO AGROPECUARIO, QUE CONSIDERE AL HOMBRE DEL CAMPO COMO UNA PARTE INTEGRAL DE SU DESARROLLO. ESTO SE PODRA LOGRAR POR MEDIO DE LA FORMACION DE NUCLEOS QUE PERMITAN LA INSTALACION DE LA INFRAESTRUCTURA MINIMA Y LA ORGANIZACION DE LA PRODUCCION.

LA PROPUESTA DE ESTABLECER CENTROS DE PRODUCCION DE MATERIALES DE CONSTRUCCION EN PEQUEÑA ESCALA, ES UNA ESTRATEGIA A NIVEL NACIONAL PARA PROMOVER EL MEJORAMIENTO DE LOS MARGINADOS DEL CAMPO Y DE LA CIUDAD. ESTA PROPUESTA PRETENDE ELEVAR LAS CONDICIONES DE VIDA DE ESTOS GRUPOS A TRAVES DEL MEJORAMIENTO DE LA VIVIENDA Y DE LA INFRAESTRUCTURA EN LAS AREAS MARGINADAS.

EL PROBLEMA DE LOS SECTORES RURALES ESTA INTIMAMENTE LIGADO AL PROBLEMA URBANO YA QUE, EL CRECIMIENTO DESCONTROLADO DE LAS AREAS URBANAS ES PRODUCTO EN PARTE DE LA MIGRACION DE LA POBLACION CAMPESINA HACIA LOS CENTROS URBANOS EN LA BUSQUEDA DE UNA SOLUCION A SU PRECARIA SITUACION.

DOS TIPOS DE ACCION PUEDEN ESCOGERSE AL TRATAR UN SISTEMA MAS COMPLEJO COMO EL DE UN AREA RURAL. UNO ES DIRIGIDO A CORREGIR LAS DEFICIENCIAS, EL OTRO MODIFICAR EL SISTEMA INTERNO QUE HA CREADO TALES DIFERENCIAS.

LOS PALIATIVOS HASTA LA FECHA APLICADOS, NO HAN TENIDO LOS EFECTOS DESEADOS. SE REQUIERE UN CAMBIO DE ENFOQUE Y UN TRATAMIENTO MASIVO Y COORDINADO.

EN LAS AREAS RURALES DE LOS PAISES EN PROCESO DE DESARROLLO, SE ENCUENTRAN TRES (3) TIPOS DE POBLADORES:
I. EL SEDENTARIO - AISLADO
II. EL ARRAIGADO - PROPIETARIO
III. EL NOMADA - AGRICULTURA DE SUBSISTENCIA.

LA AGRICULTURA DE SUBSISTENCIA ALENTADA POR LOS GOBIERNOS, NO HA PERMITIDO EL DESPEGUE ECONOMICO Y SOCIAL QUE REQUIERE EL HOMBRE DEL CAMPO PARA MEJORAR SUS CONDICIONES SOCIO-ECONOMICAS.

EL PROBLEMA DE LA PROPIEDAD Y EL USO DE LA TIERRA, LA DISPERSION DE LA POBLACION SIN VIAS DE COMUNICACION, LAS ACTITUDES SOCIALES DEL CAMPESINO, ESPECIALMENTE SI VIVE AISLADO, SON RESULTADO DE TRADICIONES Y COSTUMBRES ARRAIGADAS A TRAVES DE SIGLOS DE EXISTENCIA Y NO ES FACIL ESCUDRIÑAR SU ORIGEN.

CENTROS DE PRODUCCION

UN RECURSO PARA MEJORAR EL HABITAT DE LOS MARGINADOS

SECTOR V

SE PROPONE IDENTIFICAR LAS CARACTERISTICAS SOCIO-ECONOMICAS, CULTURALES E INVENTARIO DE LOS RECURSOS DISPONIBLES EN EL AREA.

LA CONTRIBUCION DE ENTIDADES GUBERNAMENTALES, PRIVADAS Y CIVICAS, DEBERAN DIRIGIRSE HACIA LA ORGANIZACION SOCIAL Y TECNICA. EL CAPITAL SEMILLA O BIENES PARA IMPULSAR UN DESARROLLO ECONOMICO SOCIAL EFECTIVO TAMBIEN ES NECESARIO.

LOS MODULOS SE SELECCIONARON EN BASE A LOS SIGUIENTES REQUISITOS: DE 20 A 100 FAMILIAS EN AREAS RURALES; DE 150 A 200 FAMILIAS EN AREAS URBANAS; ACCESO AL SITIO DURANTE TODO EL AÑO, SERVICIOS PROGRAMADOS DE SALUD, EDUCACION Y EXTENSION AGRICOLA.

AL ESTABLECER MODULOS DE PRODUCCION, DENTRO DE LAS COMUNIDADES, SE FOMENTA EL DESARROLLO DE LAS INDUSTRIAS EN PEQUEÑA ESCALA. EL CENTRO DE PRODUCCION DE MATERIALES DE CONSTRUCCION SERVIRA DE PUNTO DE PARTIDA PARA LA INTEGRACION CON LA RED DE MODULOS ADYACENTES.

PARA IMPULSAR LOS CENTROS DE PRODUCCION, ES NECESARIO LA PROMULGACION DE UNA POLITICA NACIONAL QUE COORDINE LOS RECURSOS DE LAS AGENCIAS GUBERNAMENTALES.

NUCLEOS RURALES EN CONJUNTOS

POBLACION RURAL MARGINADA Y DISPERSA

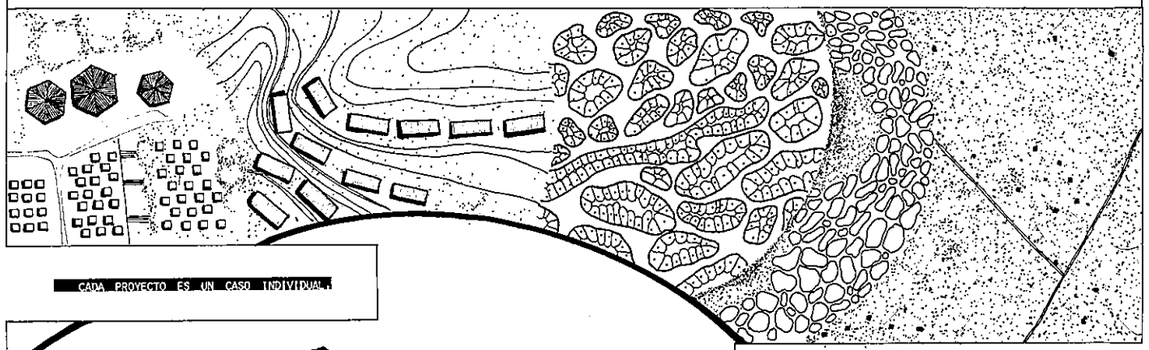
NUCLEOS RURALES AUTO-SUFICIENTE

SE PROPONE LA ORGANIZACION SOCIAL Y TECNICA PARA EL MEJORAMIENTO DE LAS POBLACIONES MARGINADAS RURALES Y URBANAS.

A TRAVES DE ESTA ORGANIZACION SE PROPONE DESARROLLAR LOS CENTROS DE PRODUCCION DE MATERIALES DE CONSTRUCCION PARA EL MEJORAMIENTO DE LA INFRAESTRUCTURA Y LA CALIDAD DE VIDA DE LA POBLACION MARGINADA EN LAS AREAS RURALES Y URBANAS.

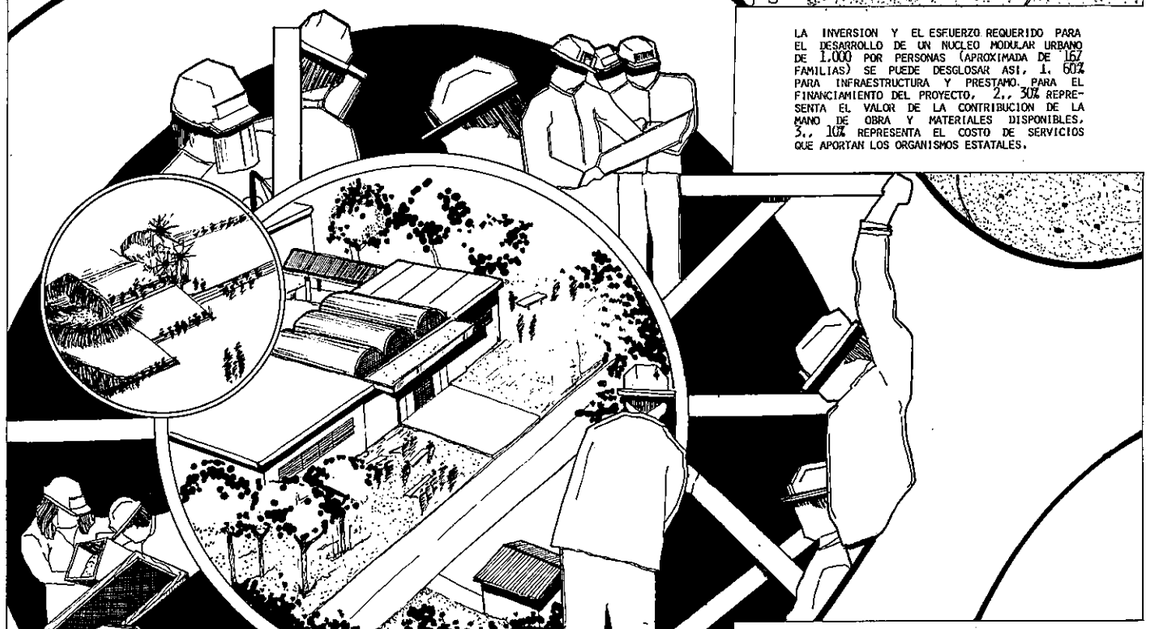
LOS CENTROS DE PRODUCCION SERAN TALLERES Y ESCUELAS PARA EL ADIESTRAMIENTO Y LA PARTICIPACION DE LOS SECTORES QUE INTEGRAN LA POBLACION ENTRE OTROS, LOS SECTORES PUBLICOS Y PRIVADOS Y LOS REPRESENTANTES DE LAS DISTINTAS ACTIVIDADES DE LA VIDA LOCAL.

LOS CENTROS DE PRODUCCION DE MATERIALES DE CONSTRUCCION, DEBERAN CONTRIBUIR A CREAR OPORTUNIDADES PARA QUE LOS MARGINADOS DESARROLLEN SU CAPACIDAD PRODUCTIVA Y CREATIVA POR MEDIO DEL ESFUERZO PROPIO, LA AYUDA MUTUA Y LAS COOPERATIVAS.



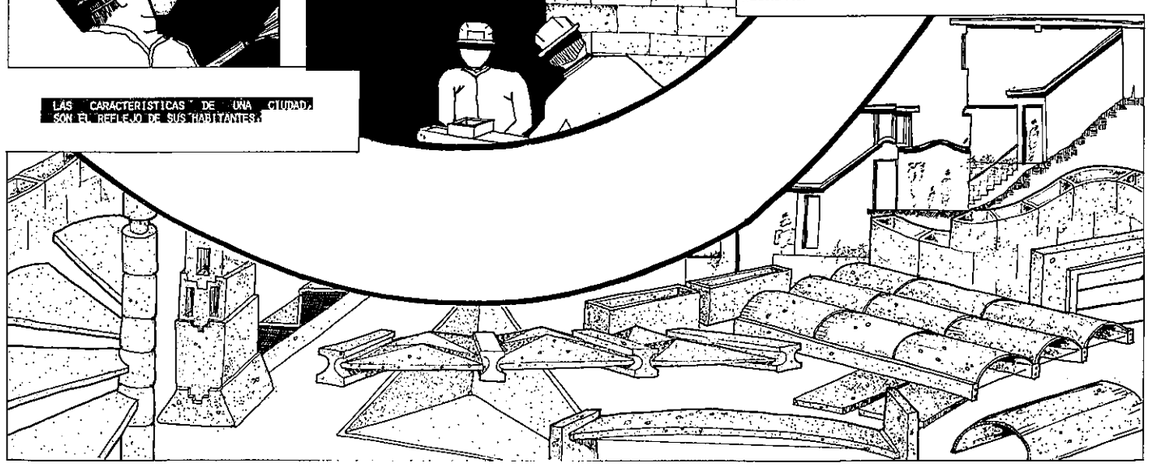
CADA PROYECTO ES UN CASO INDIVIDUAL.

LA INVERSION Y EL ESFUERZO REQUERIDO PARA EL DESARROLLO DE UN NUCLEO MODULAR URBANO DE 1,000 POR PERSONAS (APROXIMADA DE 167 FAMILIAS) SE PUEDE DESGLOSAR ASI, 1. 60% PARA INFRAESTRUCTURA Y PRESTAMO. PARA EL FINANCIAMIENTO DEL PROYECTO, 2,. 30% REPRESENTA EL VALOR DE LA CONTRIBUCION DE LA MANO DE OBRA Y MATERIALES DISPONIBLES. 3,. 10% REPRESENTA EL COSTO DE SERVICIOS QUE APORTAN LOS ORGANISMOS ESTATALES.



LAS TRANSACCIONES INVISIBLES QUE GENERAN LOS MARGINADOS NO SON REGISTRADAS EN LAS ESTADISTICAS OFICIALES.

LAS CARACTERISTICAS DE UNA CIUDAD, SON EL REFLEJO DE SUS HABITANTES.



LAS SOLUCIONES A SUS PROBLEMAS SE DARAN A CORTO, MEDIANO Y LARGO PLAZO, CON LA PARTICIPACION DE LOS AFECTADOS EN TODOS LOS NIVELES DE DECISION.

LA CONTRIBUCION DE ASISTENCIA SOCIAL Y TECNICA DE SUS DISTINTOS NIVELES, DEBERA SER COORDINADA PARA SU APLICACION , EN BASE A LAS NECESIDADES PRIORITARIAS DE LA POBLACION. LOS SUBSIDIOS DEBERAN SER ASIGNADOS EN BASE A LOS CRITERIOS DE EVALUACION Y CALIFICACION DE ACUERDO A LOS DERECHOS INALIENABLES Y HUMANOS DE LOS MARGINADOS.

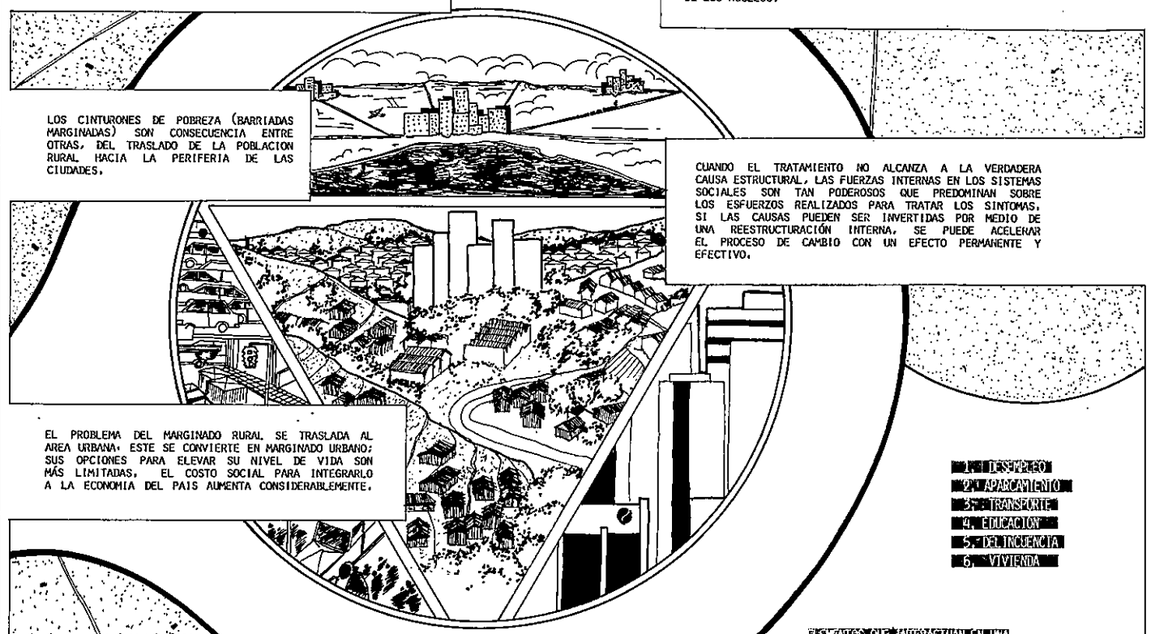
EL PRINCIPIO DEL SUBSIDIO, ES AYUDAR A LAS FAMILIAS, PARA QUE ESTAS MEJOREN SU CALIDAD DE VIDA. PARA EL EFECTO, SE ESTABLECERAN PARAMETROS QUE PERMITAN EVALUAR LOS NIVELES SOCIALES Y ECONOMICOS DE LAS FAMILIAS; UNA VEZ LOGRADO EL OBJETIVO, EL SUBSIDIO SERA TRASLADADO A OTRA FAMILIA MARGINADA. DE ESTA MANERA, SE ROTARA EL CAPITAL SEMILLA.

SE RECONOCE QUE A PESAR DE LOS BAJOS INGRESOS, EXISTE EN EL SECTOR MARGINADO UN POTENCIAL ECONOMICO Y UNA MANO DE OBRA SUB-UTILIZADA.

SE RECONOCE LA NECESIDAD DE COORDINAR LOS ESFUERZOS DE LOS SECTORES PUBLICOS Y PRIVADOS, PARA LOGRAR UNA EFECTIVA INTERACCION DURANTE EL PROCESO DE DESARROLLO DE LOS NUCLEOS.

LOS CINTURONES DE POBREZA (BARRIADAS MARGINADAS) SON CONSECUENCIA ENTRE OTRAS, DEL TRASLADO DE LA POBLACION RURAL HACIA LA PERIFERIA DE LAS CIUDADES.

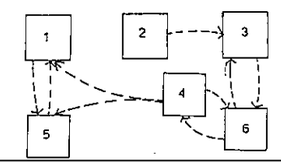
CUANDO EL TRATAMIENTO NO ALCANZA A LA VERDADERA CAUSA ESTRUCTURAL, LAS FUERZAS INTERNAS EN LOS SISTEMAS SOCIALES SON TAN PODEROSOS QUE PREDOMINAN SOBRE LOS ESFUERZOS REALIZADOS PARA TRATAR LOS SINTOMAS. SI LAS CAUSAS PUEDEN SER INVERTIDAS POR MEDIO DE UNA REESTRUCTURACIÓN INTERNA, SE PUEDE ACELERAR EL PROCESO DE CAMBIO CON UN EFECTO PERMANENTE Y EFECTIVO.



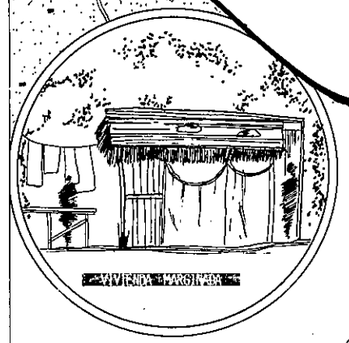
EL PROBLEMA DEL MARGINADO RURAL SE TRASLADA AL AREA URBANA. ESTE SE CONVIERTE EN MARGINADO URBANO; SUS OPCIONES PARA ELEVAR SU NIVEL DE VIDA SON MÁS LIMITADAS, EL COSTO SOCIAL PARA INTEGRARLO A LA ECONOMIA DEL PAIS AUMENTA CONSIDERABLEMENTE.

1. DESEMPLEO
2. ABASTECIMIENTO
3. TRANSPORTE
4. EDUCACION
5. DELINCUENCIA
6. VIVIENDA

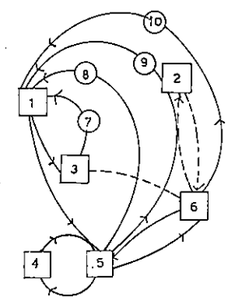
ELEMENTOS QUE INTERACTUAN EN UNA AREA URBANA.



EL PROCESO DE INVASION DE TIERRA PARA LA FORMACION DE BARRIADAS MARGINADAS URBANAS, SE INICIA EN LA PERIFERIA DE LAS CIUDADES. ESTO SE CONSOLIDA EN (ALGUNOS CASOS) EN 24 HORAS, LUEGO LOS INVASORES UTILIZAN EL PODER POLITICO, PRESIONANDO Y OBTENIENDO BENEPLACITO DE LAS AUTORIDADES GUBERNAMENTALES.



VIVIENDA MARGINAL



1. POBLACION
2. CONTAMINACION
3. ESPACIO CONSTRUIDO
4. RECURSOS NATURALES
5. CAPITAL INDUSTRIAL
6. AGRICULTURA
7. ALIMENTACION
8. PRODUCTIVIDAD
9. SANEAMIENTO
10. NACIMIENTOS

DIAGRAMA CAUSA SIMPLIFICADO DEL CRECIMIENTO

DIAGRAMAS: 1 Y 2, REF. J. ARACIL, "INTRODUCCION A LA DINAMICA DE SISTEMAS", MADRID, 1978.

LA INSTALACION DE LOS CENTROS DE PRODUCCION DE MATERIALES DE CONSTRUCCION COMO PUNTO DE PARTIDA PARA EL DESARROLLO DE LA POBLACION RURAL Y URBANA, PUEDE CONTRIBUIR A ALIVIAR EL PROBLEMA DEL DESEMPLEO EN ESOS SECTORES; ESTOS CENTROS INCREMENTARAN LA PARTICIPACION DE LA POBLACION EN LA SOLUCION DE SUS PROBLEMAS Y EDUCARAN A ESTE SECTOR PARA QUE PUEDAN TRABAJAR CON LA ORGANIZACION SOCIAL NECESARIA Y ASI CUMPLIR CON SU OBJETIVO.

EN LA PERIFERIA DEL AREA URBANA SE TRABAJA CON LOS NUCLEOS EN LA PROMOCION DE LA ORGANIZACION SOCIAL NECESARIA PARA ESTABLECER PROGRAMAS DE AYUDA MUTUA Y PROPIA PARA LA EJECUCION DE OBRAS QUE SERAN DE BENEFICIO PARA LA FAMILIA Y LA COMUNIDAD. EN ESTE CASO EL CENTRO DE PRODUCCION DE MATERIALES DE CONSTRUCCION, SERA LA SEMILLA PARA INICIAR EL TRABAJO EN GRUPO Y PARA UTILIZAR LA MANO DE OBRA DISPONIBLE.

EL ENFASIS SE DIRIGE HACIA LA ORGANIZACION SOCIAL DE NUCLEOS DE POBLACIONES AUTO-SUFICIENTES EN LAS AREAS RURALES Y LA ORGANIZACION DE MODULOS DE 1,000 PERSONAS (267 FAMILIAS) EN LAS AREAS URBANAS Y SUB-URBANAS DE LAS PRINCIPALES CIUDADES. EL PROPOSITO ES UTILIZAR LOS RECURSOS HUMANOS Y LOS MATERIALES PARA FOMENTAR LOS CENTROS DE PRODUCCION, DONDE SE PUEDE OCUPAR AL SECTOR DESOCUPADO DE LA POBLACION RURAL Y URBANA.

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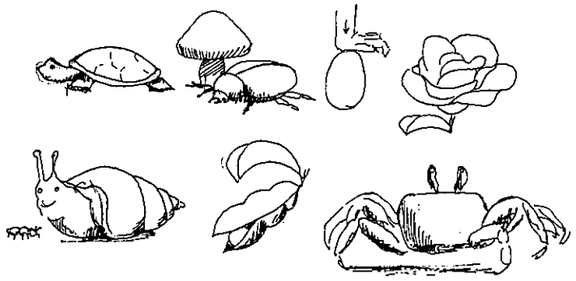
SECTOR V

ANTECEDENTES

Cuando se vive en un pais en el que la mayoria de la poblacion carece de los medios para adquirir la mas modesta de las viviendas, es facil comprender que el logro mas importante que puede obtenerse radica en el aspecto economico y de costos, quedando relegados a un segundo plano las conquistas en otros aspectos; por muchos meritos que pueda tener una vivienda, si no es barata no es para vivienda economica.

Otra posibilidad que desde fuera parece ser la "panacea", es el uso de las "Tecnologias" tradicionales como el adobe, el adobe mejorado, el tapial, el bajareque y las tecnologias en terrocemento. Pero resulta que en la practica, especialmente cuando se usan en construcciones urbanas, se han conseguido disminuciones sustanciales en los costos en comparacion con las construcciones de ladrillo o bloques de concreto que son las mas comunes, sino que mas bien, en la mayor parte de los casos resultan mas costosas, y en la actualidad estas tecnologias mas bien se estan usando para viviendas de lujo, para aquellos que pueden costearse el lujo de tenerlas. Es justo, eso si, reconocer las ventajas obtenidas en aspectos como los climaticos ambientales, ecologicos, en el rescate de valores culturales,etc. Pero cuando se trata de conseguir viviendas economicas, si una tecnologia produce viviendas costosas, no es la adecuada. Es importante aclarar que cuando se trata de viviendas rurales, tecnologias como el adobe tradicional, si producen viviendas mas baratas que las otras tecnologias usadas. Esto se debe principalmente al hecho de disponer de la materia prima, en el sitio mismo de la construccion,y no requerir un transporte costoso, como en el caso de las construcciones con este material a nivel urbano. A este factor se suma el de las "mingas", costumbre ancestral de nuestros pueblos en la que todos trabajan en la construccion de la vivienda de cada uno, costumbre que subsiste a nivel rural, mientras que a nivel urbano,los jacales, villas miseria, suburvios, callampas, o como se las llame, son el resultado de migraciones totalmente eterogeneas en las que se ha perdido esta practica.

Es facil desde esos paises, plantear alternativas como la prefabricacion de las viviendas con paneles y otros sistemas, que en muchos lugares con otro nivel de tecnologia es realmente una alternativa importante, pero en un pais "subdesarrollado" de aquellos en los que el problema se da con "real" intensidad, donde se carece de la experiencia, la tecnologia, la capacidad de inversion necesarios, etc, no se puede pensar en la prefabricacion ni en la industrializacion para un futuro inmediato.



PROPUESTA

Por estas consideraciones hemos creido que la busqueda de soluciones economicas para la vivienda, debe ampliar su campo de accion.
La alternativa que proponemos tiene su antecedente y su fuente en la vivienda de millares de seres vivos y de estructuras naturales, como las burbujas, las conchas , los caparazones de tortugas e insectos,las cabernas,el huevo,los petalos de las flores,los caracoles, las vainas de las gramineas, etc,etc. Muchas de las construcciones artesanales de nuestros antepasados,como ollas de barro y utensilios,se basan en los mismos principios, y en la historia de la humanidad existen muchos ejemplos de obras de arquitectura basados en los mismos principios, como las bobedas y cupulas persas y romanas, el Panteon romano, Sta. Sofia en Constantinopla, Jahrhunderthalle, San Pedro,etc, etc.

En base a alagunas experiencias hemos considerado conveniente ensayar con Cascarones de Hormigon Armado, aplicados a la vivienda economica. Este tipo de estructuras se ha utilizado con alguna frecuencia para otro tipo de edificaciones, como fabricas, estaciones de gasolina, iglesias, etc., y esporadicamente como viviendas, los resultados observados, nos han permitido detectar el hecho de que este tipo de estructuras es mas barato que las tradicionales, y que esos costos podrian reducirse aun mas si hacemos que el encofrado,que es un factor fuerte en los costos,sea reutilizable cientos de veses, construyendolo metalico por ejemplo, o neumatico, de esta manera su costo al prorratearse entre cientos de viviendas , seria practicamente nulo o muy bajo.

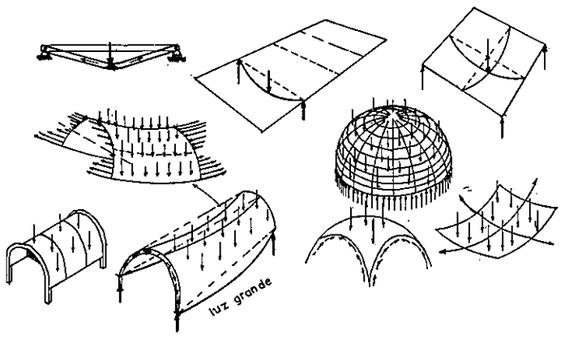
CASI SIEMPRE QUE LA NATURALEZA QUIERE CONSTRUIR UNA SUPERFICIE RESISTENTE ESCOGE UNA DE DOBLE CURVATURA MAS AUN SI SE TRATA DE ALVERGAR ALVERGAR ALGO VALIOSO COMO LA BELLEZA O LA VIDA.

Por otra parte, los cascarones son superficies curvadas, que por condicion inherente a su forma, son mucho mas resistentes que las superficies planas, mas aun cuando tienen doble curvatura, requiriendo en estos casos una cantidad muy reducida de material para su construccion, que determina espesores minimos en comparacion con las lozas planas por ejemplo, y refuerzos casi nulos cuando se trata de luces pequenas , como las que son frecuentes en vivienda. Todo esto hace que la lamina propiamente tenga un costo muy reducido, y sea una estructura muy resistente, ya hemos dicho que la naturaleza, la biologia tienen infinidad de ejemplos de este tipo de construccion , para superficies resistentes.

RESISTENCIA ADQUIRIDA POR LA FORMA

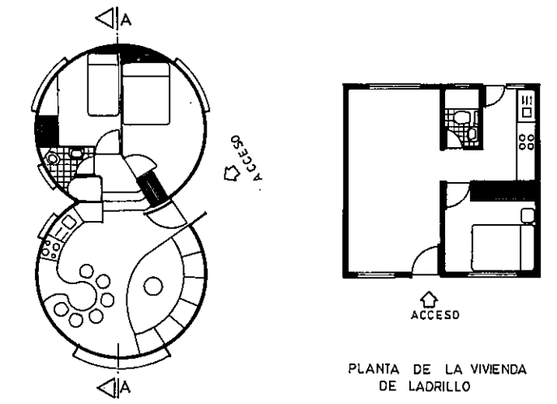
Con estos antecedentes, hemos iniciado una experiencia concreta, con el fin de establecer con mayor grado de certeza el nivel de economia que se puede obtener, asi como aproximarnos a detectar otros aspectos ventajosos o problematicos de esta propuesta, tanto en el proceso constructivo como en los resultados obtenidos.Para este fin, el diseno de la vivienda experimental,arquitectonica y funcionalmente tendria una superficie de construccion de 36m2, con el proposito de poder hacer mas factible la evaluacion de los costos y otros aspectos al compararla directamente con las viviendas producidas por las instituciones viviendistas de nuestro Pais, que con la tecnologia de ladrillo, realiza programas de vivienda con unidades de 36m2 en algunos casos.

El diseño estructural que esta determinado y determina el aspecto formal y funcional, esta constituido por dos secciones de esferas ensambladas, con un diametro de 5 m cada una, y en cada una de ellas se albergaran funciones de la vivienda, en la primera el area de sala, comedor y cocina, y en la segunda , dos dormitorios y un baño. Es importante dejar claro que no se trata de obtener el diseno ideal, que por esta ocacion fue descrito, se trata de determinar basicamente si una tecnologia da o no resultados economicos, siendo necesario dejar claro que el diseño funcional o formal de este ejemplo es secundario, y que en este aspecto se podria estudiar muchisimas otras posibilidades. Los calculos estructurales determinaron que no era necesario el refuerzo de hierro para efectos de las cargas que debia soportar la estructura, pero por razones constructivas tendientes a considerar las dialtaciones del hormigon, se la construyo con refuerzos de hierro de 6mm colocados cada 25 cm. medidos en el ecuador, distribuidos en la direccion los meridianos, y hierros de 6mm cada 25cm colocados en la direccion de los paralelos. Se fundio una loza de 4 cm de espesor. La fundicion de cada esfera se hizo por separado con el fin de utilizar dos veces el encofrado. Se utilizo una cimentacion de zapata corrida, ventajosa en tiempo de ejecucion y costo.



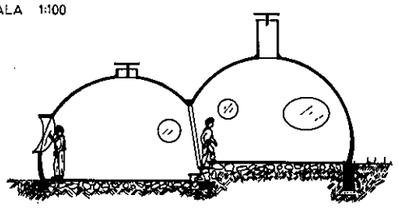
DISTRIBUCION DE ESFUERZOS

Pese a lo dicho deja claro que no estamos proponiendo esencialmente nada nuevo, sino el rescate de una posibilidad, el abanco sobre experiencias previas. Es esta caracteristicda de la humanidad la que le ha llevado a su estado actual de desarrollo, justamente el poder nutrirnos de las experiencias previas y abanzar cada vez un poco.

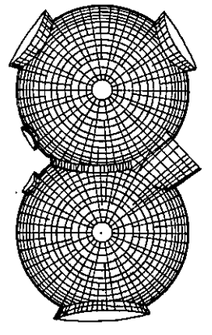


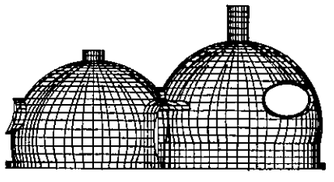
PLANTA DE LA VIVIENDA DE LADRILLO

PLANTA DE LA VIVIENDA CASCARA
ESCALA 1:100



CORTE A - A
ESCA 1:100

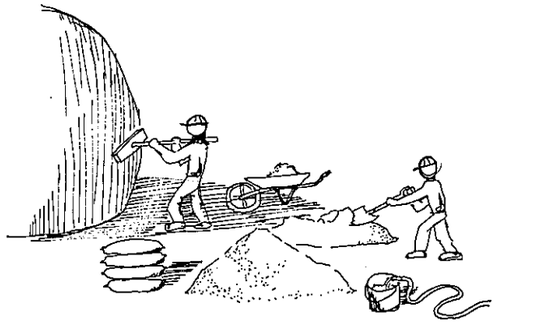




PLANTA y ELEVACION DE LA MALLA DE HIERRO DE 6mmø NECESARIO PARA EL COLADO DEL HORMIGON

No pretendemos que nuestro diseno sea mejor que el de las viviendas de los programas del gobierno, pensamos que si pero esto es secundario frente a la comparacion de los costos obtenidos, que nos permiten afirmar que las viviendas producidas, determinan disminuciones en los costos del orden del 40 %.

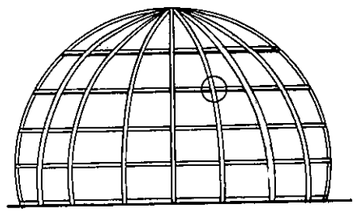
El encofrado que hemos utilizado fue construido con estructura de tubos rectangulares de hierro de 2' x 1' x 0.039' y recubrimiento de madera de 10 cm, es perfectamente desarmable y reutilizable, pensamos que al rededor de 20 veces, pero podria utilizarse casi indefinidamente si lo realizamos metalico por ejemplo.
Toda el proceso de construccion lo hemos hecho manualmente, la fundicion, el compactado y todos los procesos empleados, no han requerido de ninguna herramienta especial, incluso, por el gusto de hacerlo, la mezcla del hormigon la hemos hecho unicamente con palas. Asi mismo los obreros que hemos empleado, han sido ayudantes de albanil, con el objeto de detectar si se producia algun problema, lo que nos ha permitido determinar el hecho de que con una minima informacion inicial a los trabajadores, practicamente cualquier persona podria realizar esta fundicion. Este aspecto es a nuestro entender, muy impoortante , pues nos permite afirmar que este tipo de construccion es muy propicio para la AUTOCONSTRUCCION, que una vez que una institucion le preste o le arriende al interesado el encofrado, con una breve indicacion, y asi mismo con una direccion tecnica (indispensable en cualquier tipo de autoconstruccion), este podria emprender la construccion de su vivienda, lo que determinaria un abaratamiento mucho mayor todavia.



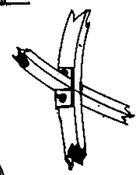
Si en una construccion se utiliza un acelerante, podria fundirse una vivienda cada dos dias, mientras que con el uso de ladrillo, adobe, etc., esta duraria dos o tres meses en el mejor de los casos.
Sus caracteristicas nos hacen pensar tambien en su facil industrializacion a futuro. por ser estructuras livianas y transportables.

COMPARACION DE COSTOS

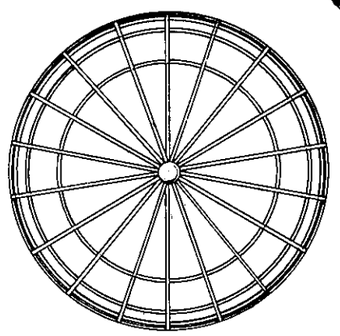
VIVIENDA DE LADRILLO		VIVIENDA CON CASCARONES DE H°A°	
RUBROS	$ USA	RUBROS	$ USA
cimientos de piedra	180,0	hierro y armado	183,8
cadenas de hormigon armado	154,5	fundicion cascara y zapata	412,1
estructura metalica	303,0	tabiqueria interior	90,
paredes de ladrillo	627,3		
cubierta de asbesto cemento	545,5		
SUBTOTAL	1810,3		686,9
razantes de pisos	327,3		327,3
puertas y ventanas	193,9		193,9
instalaciones electric y sanit	184,8		184,8
lavamanos retrete y ducha	133,9		133,9
SUBTOTAL	839,9		839,9
		10 % de costo de encofrado	46,5
TOTAL	2650,2	TOTAL	1585,3
COSTO POR m² CONSTRUCC	73,6		44
		COSTOS 41,2% MAS BAJO	



ELEVACION DE LA ESTRUTURA METALICA

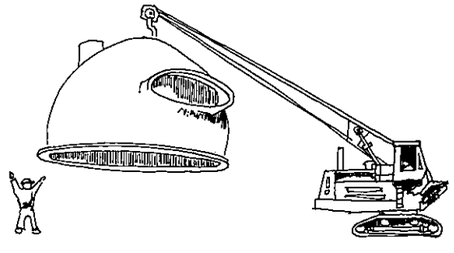


DETALLE



PLANTA DE LA ESTRUCTURA METALICA
DEL ENCOFRADO ESC. 1: 50

Los materiales empleados, cemento, hierro, arena, agua, se encuentran en nuestro medio, lo que evita la importacion y la dependencia del dolar americano, escaso, y en constante ascenso.
Pueden incorporarse en la fundicion tubos de PVC negro o cobre de 1/2' de diametro, para captacion del calor producido por la radiacion solar y su utilizacion en el calentamiento de agua para usos de la vivienda, o podria utilizarse tambien paneles solares para este fin. Podria pensarse en la instalacion de WC productores de abono, o generadores de metano, como complementos.
Pensamos que esta es una alternativa util, no solamente para las construcciones urbanas sino tambien, para construcciones individuales rurales, o nuevos centros poblados, por su total construccion en obra.

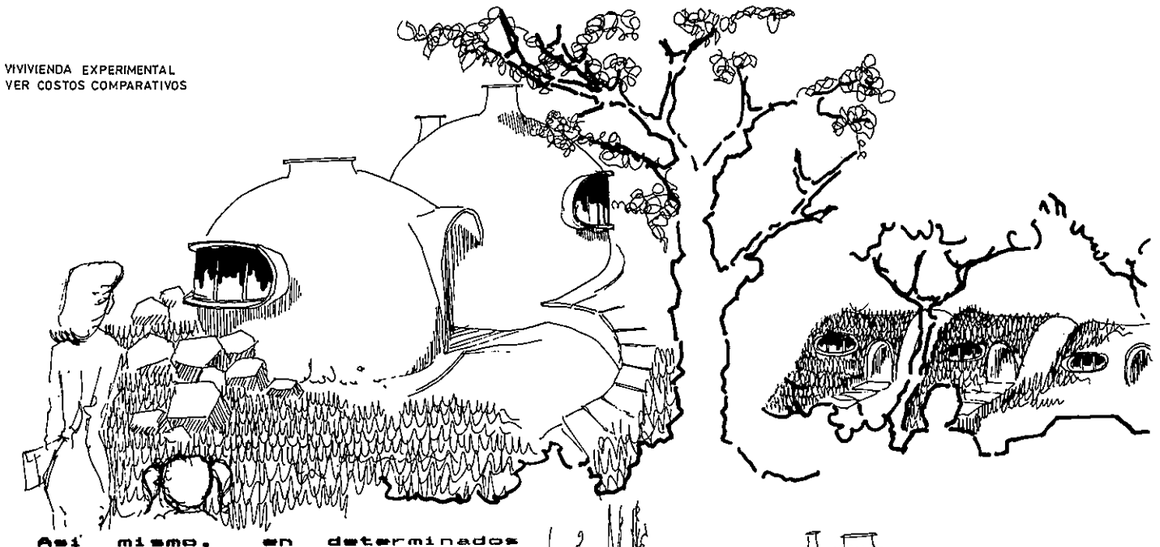


Es importante aclarar un hecho: y es el de que las cascaras de hormigon armado, pueden cubrir plantas de cualquier forma, no unicamente las circulares como nuestro trabajo.

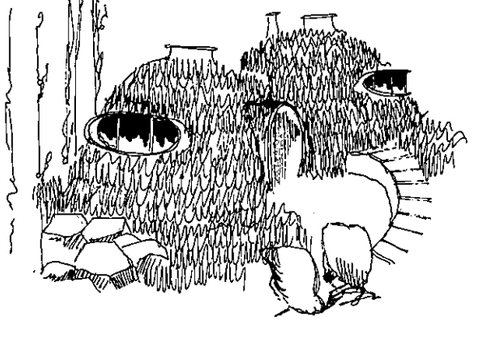
Aunque no haya sido el factor impulsor de esta busqueda, este tipo de estructuras hace posible una increible variedad y posibilidades formales y expresivas, que enriquecerian el aserv al servicio del arquitecto. Sabemos que esta misma circunstancia de la novedad formal de estas viviendas, para algunas personas, es mas bien un factor negativo debido a su caracter, en muchos casos a su edad, instruccion, etc,. Por todo lo expuesto no prentendemos que esta sea la solucion final y unica a la vivienda, pero si estamos convencidos de que es una importante alternativa que no pude dejar de considerarse para la vivienda de bajo costo.

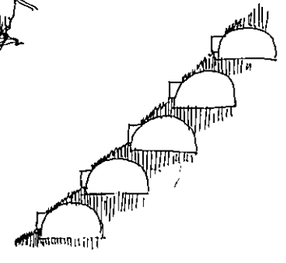
El moviliario interior de la vivienda, el mueble para la cocina, e incluso los mismos sanitarios, podrian ser moldeados a mano, con el consiguiente bajo costo, y enriquecimiento espiritual que esta labor produciria en el propietario, igual podria pensarse en elementos como la chimenea o divisiones de ambientes o libreros, etc.

VIVIVIENDA EXPERIMENTAL
VER COSTOS COMPARATIVOS



Asi mismo, en determinados climas, se hace necesaria la utilizacion de un aislante de las temperaturas exteriores, siendo el de uso mas frecuente el Poliuretano, cuya fabricacion es decididamente polucionante, y tiene el problema de que cuando se incinera despide gases venenosos de cianuro.
Nosotros planteamos el uso de vegetacion, cesped, muy abundante en nuestro medio o hiedra, por ejemplo,que no tendrian ninguno de los inconvenientes del poliuretano, y por el contrario determinan un respeto por el paisaje y un incremento de las areas verdes que redundan en un enriquecimiento de la calidad de vida.
Podria incluso, se nos ocurre plantear conjuntos habitacionales en sitios con pendiente, que con otro sistema serian peligrosos, cubiertos de tierra y vegetacion, etc.
La gama de posibilidades formales y organizativas es tan amplia que lo que presentamos es nada mas que una breve idea.





C.I.P. 250

CONSTRUCCION INDUSTRIALIZADA POPULAR

MEMORIA DESCRIPTIVA

1: OBJETIVOS

EL PROYECTO C.I.P. PERSIGUE OFRECER UNA SOLUCIÓN CONSTRUCTIVA QUE LLENE LOS SIGUIENTES OBJETIVOS:

1-1 QUE SEA DE FÁCIL CONSTRUCCIÓN, DE MANERA QUE SIN USAR ALTA TECNOLOGÍA SE PUEDA APLICAR AL COMÚN DE LA GENTE DE LOS PAÍSES SUBDESARROLLADOS (BANNANA REPUBLIC) CARENTE DE FORMACION TÉCNICA.

1-2 QUE USE MATERIALES O MATERIA PRIMA DE FÁCIL, ABUNDANTE, Y BARATA OFERTA EN LA ZONA.

1-3 QUE EL PRODUCTO SEA LIVIANO Y DE FÁCIL TRANSPORTE, PARA PODER LLEGAR POR CUALQUIER CAMINO A SU DESTINO SIN REQUERIR EQUIPOS O HERRAMIENTAS SOFISTICADOS PARA SU MONTAJE.

1-4 QUE SEA TAN ECONÓMICO COMO SEA POSIBLE PARA PODER QUEBRAR EL ESPIRAL ASCENDENTE QUE HA TOMADO EL COSTO DE LA CONSTRUCCIÓN.

1-5 QUE SEA DE GRAN RAPIDEZ PARA SU CONSTRUCCIÓN Y MONTAJE, TANTO PARA REDUCIR COSTOS FINANCIEROS COMO DE MANO DE OBRA.

1-6 QUE EL PROCESO SEA INDUSTRIALIZABLE A NIVEL DE MICROEMPRESAS PARA QUE GENERE EL MÁXIMO DE EMPLEO, QUALÁ CAMPESINO, PARA QUE ASÍ CADA MUNICIPIO O JUNTA DE ACCIÓN COMUNAL PUEDA DESARROLLAR SU PROPIA EMPRESA Y AUTOABASTECERSE DE VIVIENDA EN SU PROPIO SECTOR.

1-7 QUE OFREZCA CONDICIONES Y GARANTÍAS DE SER UN PRODUCTO AISLANTE DE LA TEMPERATURA, DE LA HUMEDAD, DEL RUIDO, DEL POLVO, ETC.

1-8 EL DISEÑO APROPIADO PARA LA VIVIENDA DEBERÁ SER UNA SOLUCIÓN MODULADA QUE FACILITE LA PRODUCCIÓN EN SERIE DE ELEMENTOS QUE AL ARMARLOS OFREZCA DIMENSIONES PERFECTAS Y FUNCIONALES SIN NINGÚN DESPERDICIO DE ESPACIO.

2: MATERIA PRIMA

2-1 EL PROYECTO C.I.P. PROPONE LA UTILIZACIÓN DEL VÁSTAGO DE LA MATA DE PLÁTANO, QUE SIENDO HOY POR HOY BASURA EN EL CULTIVO DEL BANANO, PUESTO QUE PARA COSECHAR CADA RACIMO ES NECESARIO TUMBAR EL VÁSTAGO Y DEJARLO TIRADO PARA QUE SE PUDRA, PROPONEMOS CONVERTIRLO EN UN INGRESO ADICIONAL, SIN NINGÚN COSTO PARA EL CAMPESINO, QUE PODRÍA SER MÁS IMPORTANTE QUE LA FRUTA MISMA, SI ÉSTE TOMA EL VÁSTAGO, LO EXPRIME EN UN PEQUEÑO MOLINO MANUAL Y EL BAGAZO LO PONE A SECAR AL SOL PARA LUÉGO, COMO ARTESANÍA FAMILIAR, FABRICAR CON ÉL LAS ESTERAS, QUE LA INDUSTRIA CONSTRUCTORA CONVERTIRÍA MÁS TARDE EN PÁNELES. EL JUGO QUE RESULTA AL EXPRIMIR EL VÁSTAGO SE TRATA SEPARADAMENTE AGREGÁNDOLE SAL Y JUGO DE ZÁBILA; QUE AL DESHIDRATARLO, HIRVIÉNDOLO SE CONVIERTE EN UNA SUSTANCIA MUCILAGINOSA, REPELENTE AL AGUA, QUE SE DEJA APLICAR FÁCILMENTE CON BROCHA SOBRE LA SUPERFICIE DE LAS ESTERAS, QUE AL SECARSE LAS VOLVERÁ IMPERMEABLES, LO QUE IMPEDIRÁ QUE SE PUDRAN Y QUE SE LES FIJE EL POLVO.

3: PROCESAMIENTO DE LA ESTERA

3-1 EL VÁSTAGO DE LA MATA DE PLÁTANO UNA VEZ EXPRIMIDO, SE PONE A SECAR AL SOL POR ESPACIO DE UN DÍA APROXIMADAMENTE POR CADA CARA; UNA VEZ SECO SE LE LLAMA CASCARÓN; RESULTA CONVENIENTE DARLE UN BAÑO POR INMERSIÓN EN UNA SOLUCIÓN DE SULFATO DE COBRE Y VOLVER A PONERLO UN DIA MAS AL SOL POR CADA CARA. CUANDO EL CASCARÓN ESTÉ COMPLETAMENTE SECO SE PROCEDE A CONFECCIONAR LAS ESTERAS COSIÉNDOLAS CON CABUYA DE PIQUE U OTRO MATERIAL. LAS ESTERAS UNA VEZ ELABORADAS SE TIENEN EN MANOS DE LA CONSTRUCCIÓN DONDE SE ARMARÁN LOS PÁNELES.

4: PROCESO DE ARMADA

4-1 PARA FORMAR CADA PÁNEL SE LE COLOCARÁ UN MARCO METÁLICO HECHO CON LÁMINA DE HIERRO GALVANIZADO CALIBRE 18, CON CORRUGAS PARA FACILITAR SU AMARRE, EN CUYO LOMO TROQUELAMOS SEIS (6) BOCAS QUE A SU VEZ LLEVAN UNA PERFORACIÓN DE 5 MILÍMETROS, POR LA QUE MÁS TARDE ENHEBRAMOS UN ALAMBRE.

4-2 LOS MARCOS AL JUNTARSE, COMPLEMENTÁNDOLOS ALGUNAS VECES CON ELEMENTOS ADICIONALES CONFORMAN UNOS PAQUEÑOS ESPACIOS A MANERA DE COLUMNETAS DE 4 POR 4 CENTIMETROS. LAS GRÁFICAS MUESTRAN CÓMO CON EL EMPLEO DE SÓLO TRES ELEMENTOS DIFERENTES SE PUEDE SOLUCIONAR TODO TIPO DE AMARRE ENTRE PÁNELES.

4-3 LAS GRÁFICAS MUESTRAN CÓMO ES DE FÁCIL ARMAR LOS PÁNELES PARA HACER MUROS; CÓMO SE ANCLAN AL CIMIENTO QUE ES SIMPLEMENTE UNA LOZA DE CONCRETO QUE SIRVE DE PISO; CÓMO SE PUEDE PRETENSIONAR EL CONCRETO CON EL QUE LLENAMOS VIGUETAS Y COLUMNETAS DE AMARRE; Y, EN FIN, CÓMO SE PUEDEN REFORZAR ALGUNOS NUDOS PARA CORREGIR EFECTOS DEL ESFUERZO CORTANTE QUE SE PUDIERA PRESENTAR.

4-4 LAS GRÁFICAS MUESTRAN CÓMO SE DEBE PRODUCIR LA LOZA DE PISO ARMADA COMO UNA LOZA RETICULAR, FIJANDO EXACTAMENTE LAS ZAPATAS METÁLICAS DE LAS COLUMNAS DE AMARRE Y CONFORMANDO LOS DEMÁS NUDOS CON UNA SIMPLE GRANDELLA PERFORADA; EN LA QUE ENHEBRAMOS EL REFUERZO EN ALAMBRÓN CON VARILLAS DE 1.33 METROS DE LARGO, ABSOLUTAMENTE STANDARD.

4-5 SI LA PLANTA DE LA CASA TIENE SUFICIENTES MUROS NORMALES UNOS A OTROS PARA CORREGIR EL VUELCO COMO UN MAZO DE NAIPES, PODRÍAMOS CONSTRUIR OTRA LOZA RETICULAR; ESTA VEZ CELULADA QUE SIRVIERA DE ENTREPISO PARA MONTAR UNA SEGUNDA PLANTA. EN ESTE CASO, EL ALIGERANTE CELULAR LO CONFORMA EL MISMO PÁNEL DE CASCARÓN Y LAS VIGUETAS DE CONCRETO SE FUNDIRÁN EN SITIO, SOBRE UNA FORMALETA RETICULAR RECUPERABLE, CONTENIDAS LATERALMENTE POR LAS CARAS PERIMETRALES DE CADA PANEL ALIGERANTE, PUDIÉNDOLOS PRETENSIONAR. SIN EMBARGO, NO RECOMENDAMOS LA CONSTRUCCIÓN EN DOS PISOS PARA LA VIVIENDA POPULAR, PUESTO QUE EL COSTO DEL TERRENO QUE SE EMPLEA PARA LA CONSTRUCCIÓN DE ESTE TIPO DE VIVIENDA TIENE GENERALMENTE UN COSTO INFERIOR AL QUE RESULTA TENER LA LOZA DE ENTREPISO.

4-6 SI SE TRATA DE CONSTRUIR UNA CUBIERTA, SE PUEDE PROCEDER COMO LO MUESTRAN LAS GRÁFICAS, MONTANDO UNAS CORREAS EN DOBLE T DE LAMINA PRENSADA CADA 840 MILÍMETROS ENTRE EJES: DENTRO DE SUS ALETAS SE INSTALAN LOS MISMOS PÁNELES CON MARCO METÁLICO A QUE NOS REFERIMOS EN 4-1; ESTA CUBIERTA OFRECERÁ FINALMENTE DOS SUPERFICIES PLANAS: UNA SUPERIOR, EN LA CUAL INSTALAMOS CUALQUIER SISTEMA DE IMPERMEABILIZACIÓN ADECUADO PARA EL CASO; Y, OTRA INFERIOR, QUE A MANERA DE CIELO RASO PUEDE PERMANECER TAL CUAL, O SER FRISADA, PINTADA, ENCHAPADA, ETC., SEGÚN LOS REQUERIMIENTOS DE CADA CASO. ES NOTORIO QUE OTROS SISTEMAS DE CUBIERTA ESPECIALMENTE LOS AUTOPORTANTES EN LÁMINAS DE ASBESTO-CEMENTO O METALES SUELEN RESULTAR MÁS BARATOS Y ESTABLES QUE EL SISTEMA QUE PROPONEMOS, ESPECIALMENTE POR EL COSTO QUE PRESENTAN LOS MANTOS O CAPAS IMPERMEABILIZANTES; A MENOS QUE SE ADOPTE UNA MAYOR PENDIENTE COMO LA QUE SE USA EN LAS CUBIERTAS VEGETALES, PERO CONSERVANDO EL RIESGO DE INCENDIO.

4-7 COMO PUEDE DEDUCIRSE DE LO DESCRITO ANTERIORMENTE, EL MONTAJE DE PÁNELES NO REQUIERE EQUIPO ALGUNO, NI TÉCNICA ESPECIAL. BASTA HACER UN TRAZADO PERFECTO, COLOCAR EL REFUERZO DE LA LOZA DE PISO CON SUS ZAPATAS METÁLICAS APROPIADAS Y FUNDIR UNA LOZA DE 10 CENTIMETROS DE ESPESOR SOBRE UN SUELO PREVIAMENTE APISONADO. EN LAS ALETAS DE LAS ZAPATAS SE MONTAN LOS PÁNELES, (CADA PÁNEL PESA SÓLO 10 KILOS). LOS PÁNELES SE FIJAN CON EL MARCO DE LA VIGA DE AMARRE SUPERIOR; LUÉGO SE INSTALAN LOS TENSORES, SE ENHEBRAN LOS HILOS TENSORES Y UNA VEZ TENSIONADOS SE FUNDE EL CONCRETO DE COLUMNETAS Y VIGUETAS. AL ARMAR LOS PÁNELES DEBE TENERSE EL CUIDADO DE DEJAR IGUALMENTE INSTALADOS LOS MARCOS DE PUERTAS Y VENTANAS.

4-8 DESPUÉS VENDRÍA LA INSTALACIÓN DEL ENTREPISO O DE LA CUBIERTA; SI SE TRATA DEL ENTREPISO BASTARÁ CON ASEGURAR UN PARAL DE MADERA, O DE TUBO, PARA CADA CRUZ DE LA FORMALETA, Y SOBRE LAS PESTAÑAS DE CADA CRUZ SE COLOCARA UN PEDAZO DE LÁMINA, LUEGO SE COLOCAN LOS PÁNELES DE VÁSTAGO DOBLES, A CONTINUACIÓN EL REFUERZO Y FINALMENTE SE TENSIONARÁ Y SE FUNDIRÁ EL CONCRETO.

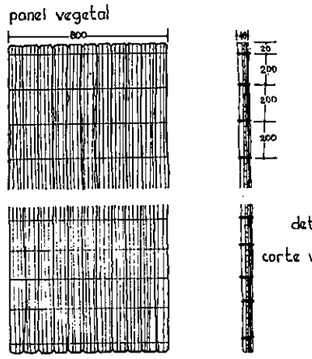
4-9 SI SE TRATA DE LA CUBIERTA: SE FIJAN LAS CORREAS EN DOBLE T A LAS VIGAS DE CORONACIÓN A DISTANCIAS EXACTAS DE 840 MILÍMETROS Y LUÉGO, POR ENTRE LAS ALETAS DE LAS CORREAS SE DESLIZAN LOS PÁNELES COMPLETOS Y POR ÚLTIMO, SE PROCEDE A IMPERMEABILIZAR.

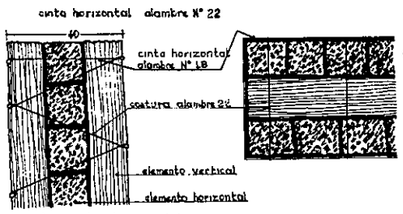
5: MANERA DE DAR ACABADOS

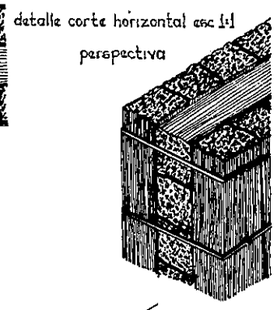
5-1 COMO YA SE HA DEMOSTRADO EL MEJOR USO DEL SISTEMA C.I.P. ES EL EMPLEO DE PÁNELES EN LA FABRICACIÓN DE MUROS, QUE EN VIVIENDA POPULAR REPRESENTA EL 50 o 60% DEL COSTO TOTAL DE LA VIVIENDA, REDUCIENDO SU COSTO NOTABLEMENTE Y DÁNDOLE PROPIEDADES AISLANTES QUE REPRESENTAN CONFORT Y QUE NO PUEDEN OFRECER OTRAS SOLUCIONES. PARA CONSERVAR ESTAS VIRTUDES E INCREMENTARLAS RECOMENDAMOS DAR ACABADOS ASÍ: PARA MUROS EXTERIORES O PARA AQUELLAS SUPERFICIES QUE SEAN SUSCEPTIBLES DE SER HÚMEDAS, PREFERIMOS FRISARLAS, YA SEA CON MORTERO DE CEMENTO, O DE TIERRA-CEMENTO, CON LO CUAL SE OBTIENE UN TABIQUE COMO CUALQUIER TABIQUE TRADICIONAL, QUE PUEDE SER PINTADO O ENCHAPADO COMO SE QUIERA. PARA MUROS INTERIORES RECOMENDAMOS APLICAR DIRECTAMENTE UNA CAPA DE ESTUCO QUE SE FIJA MUY BIEN DADA LA TEXTURA DE LA ESTERA; O, SIMPLEMENTE, APLICARLE UNA O DOS CAPAS A MANERA DE PINTURA CON EL JUGO PROCESADO QUE SE EXPRIME DEL VÁSTAGO DE LA MATA DE PLÁTANO, COMO SE INDICA EN 2-1 QUE ADEMÁS RECIBE PIGMENTOS CON LO CUAL SE LE PUEDE IMPRIMIR COLOR. SI EL SISTEMA SE UTILIZA COMO ENTREPISO, RECIBIRÁ POR LA CARA SUPERIOR EL CONCRETO DE REPARTICIÓN Y POR DEBAJO OFRECERÁ UNA SUPERFICIE TEXTURIZADA COMO CIELO RASO QUE SE ACABARÁ CON PINTURA. SI EL SISTEMA SE UTILIZA COMO CUBIERTA, SE ACABARÁ POR ENCIMA CON UN MANTO IMPERMEABILIZANTE QUE TERMINARÁ EN UNA CAPA DE PINTURA DE ALUMINIO BITUMINOSO, EN CASO DE QUE LA CUBIERTA SEA PLANA; O SE CUBRIRÁ CON SENDAS CAPAS DE PINTURA CON EL JUGO PROCESADO, COMO YA SE DIJO, PARA REPELER EL AGUA, PUDIENDO AGREGARLE EL COLOR QUE SE QUIERA.

5-2 CARPINTERIA: LOS MUROS QUE LLEVEN VACÍOS PARA PUERTAS RECIBIRÁN SIMPLEMENTE EL MARCO DE LA PUERTA DE 60 CENTIMETROS DE ANCHO ATORNILLÁNDOLOS A LOS MARCOS DE LOS PÁNELES VECINOS; LOS MUROS QUE LLEVEN VACÍOS PARA VENTANAS RECIBIRÁN UN PÁNEL CORRIENTE EN LA PARTE DE ABAJO A MANERA DE ANTEPECHO, Y EN LA PARTE DE ARRIBA SE INSTALARA UN MARCO CON LA CORRESPONDIENTE VENTANA.

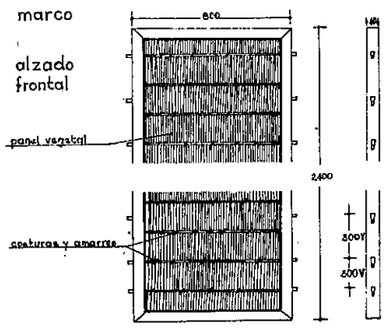
5-3 INSTALACIONES HIDRÁULICAS Y ELÉCTRICAS: EN MUROS DE SÓLO 40 MILÍMETROS DE ESPESOR ES IMPOSIBLE INCRUSTAR ALGO. EN CONSECUENCIA LOS DUCTOS DE ESTOS SERVICIOS DEBERÁN IR A LA VISTA APROVECHANDO LOS RINCONES. UN BUEN DISEÑO DE LA PLANTA PERMITIRÁ QUE ESTOS DUCTOS VAYAN INCRUSTADOS EN LA LOZA DEL PISO, O QUE POR LO MENOS CORRAN PROTEGIDOS POR LOS GUARDAESCOBAS. LAS REDES SANITARIAS, SI VAN POR EL PISO SE ENTERRARÁN EN ÉL, SI SIRVEN A UN SEGUNDO PISO, O A UNA CUBIERTA, SE TENDRÁN QUE COLOCAR SUSPENDIDAS DE LA LOZA DE ENTREPISO O POR LA CARA EXTERIOR QUE CONFORMA LAS FACHADAS.

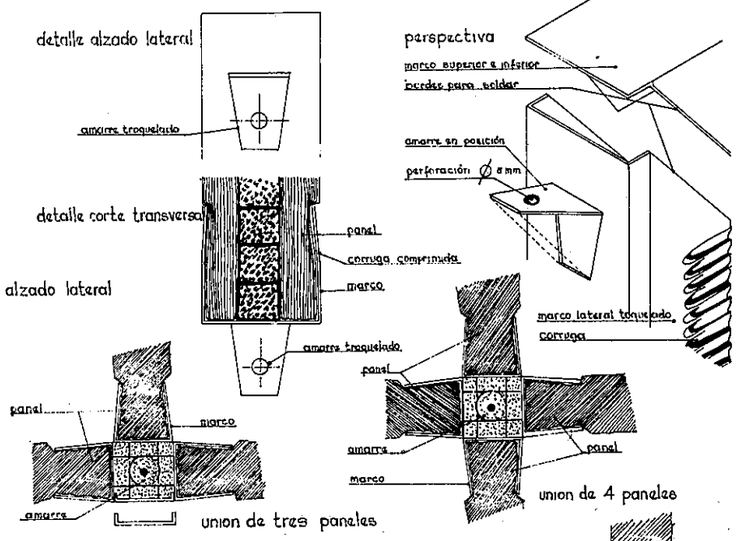


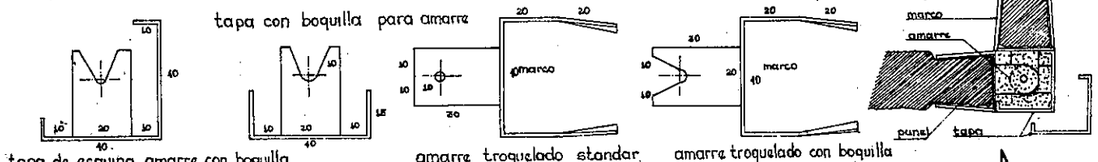


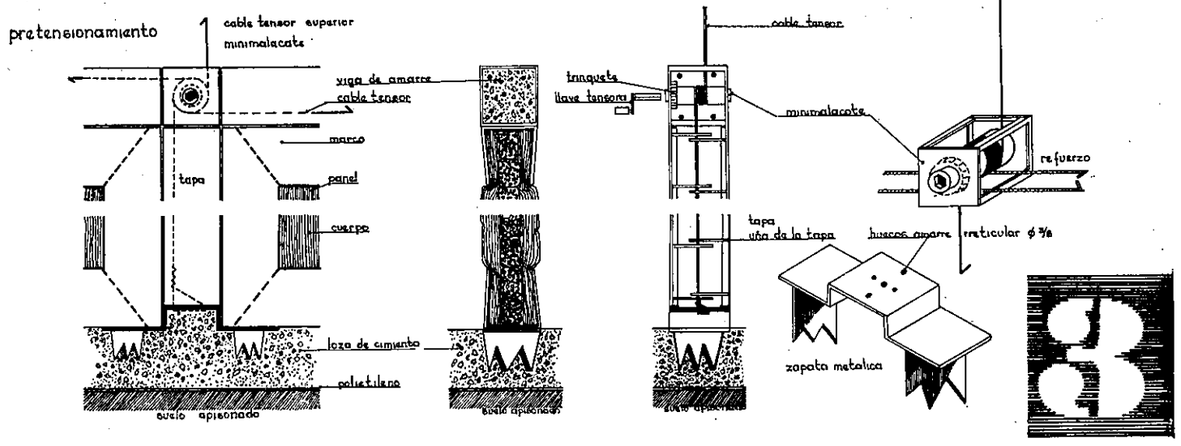


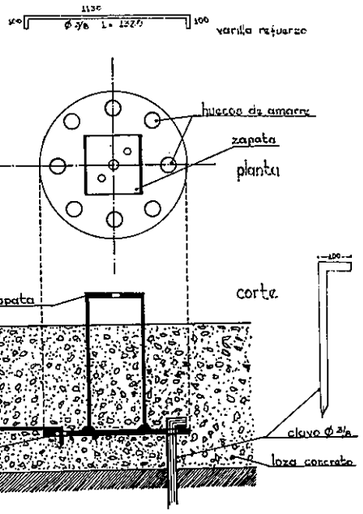
panel tipo triplex.
fibras vegetales comprimidas y pegadas.
costuras y amarre en alambre negro.
elementos verticales en curas exteriores.
elementos horizontales en el alma.

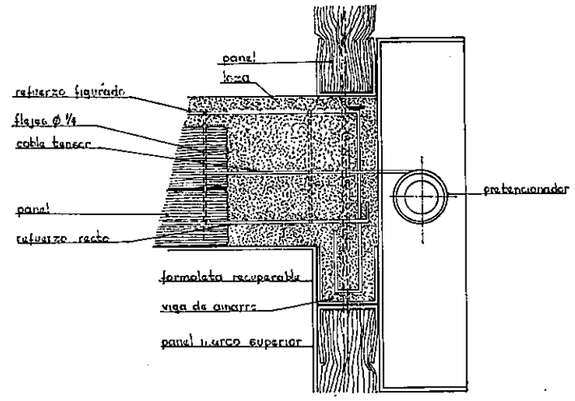


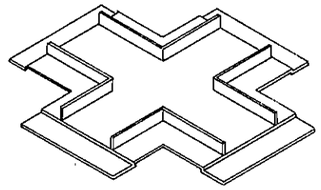


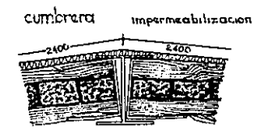


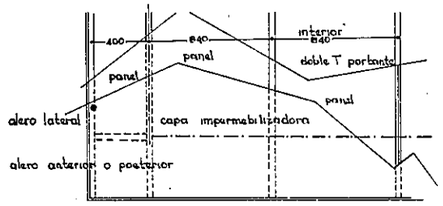


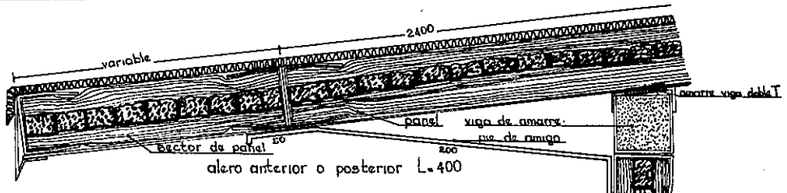


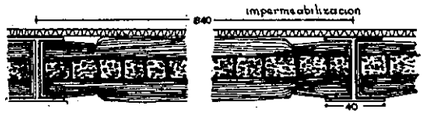












6: CONCLUSIONES

6-1 EL PROYECTO C.I.P EMPLEA UNA MATERIA PRIMA HOY TOTALMENTE DESECHADA, DANDOLE UN VALOR EN PRO DE LOS CAMPESINOS Y GENERANDO EMPLEO DE MANO DE OBRA RURAL, SEGURAMENTE DE NIÑOS Y MUJERES DESEMPLEADOS, PARA PROCESAR ALGO QUE INDUDABLEMENTE SE CONVERTIRA EN BIENESTAR ECONOMICO PARA LAS CLASES MAS DESFAVORECIDAS.

6-2 EL PROCESO DE CONVERSION DEL VASTAGO DE LA MATA DE PLATANO EN PANELES EMPLEABLES PARA MUROS NO EXIGE EQUIPOS NI GRANDES INSTALACIONES. SERIA IDEAL QUE CADA PEQUEÑA FABRICA TUVIESE UNA MAQUINA CORTADORA Y DOBLADORA DE LAMINA, PERO EN LA REALIDAD COMERCIAL LOS PERFILES YA CONFORMADOS SE PODRAN COMPRAR EN EL MERCADO TOTALMENTE LISTOS PARA SER USADOS. LA PEGADA Y COSIDA DE LAS ESTERAS PUEDE SER UNA LABOR PURAMENTE MANUAL QUE OCUPARA LOS BRAZOS EXACTAMENTE DE AQUELLA CLASE SOCIAL QUE HOY CONSTITUYE LOS CORDONES DE MISERIA DE NUESTRAS CIUDADES.

6-3 EL MONTAJE DE LAS VIVIENDAS SOLO EXIGE UN PLANO BIEN DETALLADO Y UN DESPIECE PERFECTO; LO DEMAS ES TAN SENCILLO QUE ESTIMAMOS NECESITAR SOLAMENTE UN DIA DE TRES HOMBRES PARA ARMAR UNA CASA DE MAS O MENOS 70 METROS CUADRADOS.

6-4 LOS ACABADOS QUE SE LE QUIERAN DAR A CADA CASA SON AL GUSTO Y EN LA OPORTUNIDAD QUE EL CONSUMIDOR ASI LO RESUELVA. INCLUSIVE LA CASA ASI CONSTRUIDA ES HABITABLE INMEDIATAMENTE, PUES NI MUROS NI CUBIERTAS TOLERAN O CONTIENEN HUMEDAD ALGUNA; ASI QUE, SI NO HAY DINERO PARA DARLE ACABADO, BIEN PUEDEN OCUPARLA RECIEN CONSTRUIDA, QUE SUS ACABADOS SE LE VAN DANDO A MEDIDA QUE LAS CIRCUNSTANCIAS LO PERMITAN.

6-5 BAJO ESTAS PREMISAS EL PROCESO INDUSTRIAL SE MINIMIZA Y SE DISTRIBUYE ENTRE TANTA GENTE QUE SE VUELVE MAS BIEN UNA ARTESANIA. EFECTIVAMENTE: LOS CAMPESINOS EN SUS PARCELAS APROVECHAN EL VASTAGO Y PROCESAN LAS ESTERAS; EN LOS PUEBLOS O EN LOS BARRIOS SE LES COMPRAN LAS ESTERAS A LOS CAMPESINOS Y EN CUALQUIER TALLER SE LES MONTAN LOS MARCOS DE LAMINA PREFABRICADOS CON LO CUAL QUEDAN LOS PANELES LISTOS; DESPUES, BASTA ARMAR LA LOZA DE PISO DE CADA CASA Y LUEGO PARAR LOS PANELES DE MUROS Y EXTENDER LOS DE CUBIERTA, OPERACION QUE SE HARIA EN UN SOLO DIA; PARA DAR LOS ACABADOS LES QUEDA TODA LA VIDA.

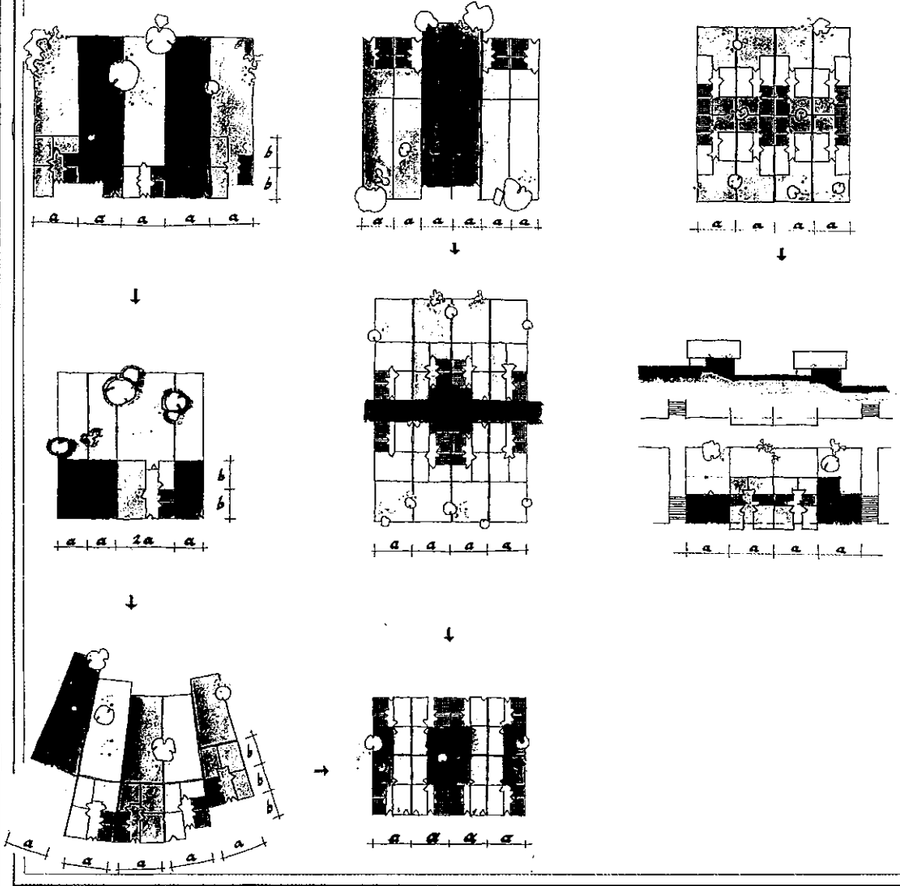
6-6 PERO SI SE PREFIERE MONTAR UNA INDUSTRIA PARA LA PREFABRICACION DE CASAS, UTILIZANDO EL SISTEMA C.I.P BASTARIA HALLAR LUGARES APROPIADOS SOBRE VIAS EXPEDITAS, CERCA A PLANTACIONES INTENSIVAS DE BANANO, ALLI, COMPRAR LOS TRONCOS DE VASTAGO, EXPRIMIRLOS, SECARLOS AL VAPOR, TORCERLOS, PEGARLOS Y COSERLOS PARA FABRICAR ESTERAS CONTINUAS QUE SERIAN CORTADAS DE ACUERDO A REQUERIMIENTOS ESPECIFICOS. POR OTRO LADO, SE COMPRARIA LA LAMINA EN ROLLOS O MEJOR, EN CINTAS, Y CON MAQUINAS AUTOMATICAS FABRICARIAN LOS PERFILES PARA LOS MARCOS Y TODAS LAS OTRAS PIEZAS QUE SE REQUIERAN; ENTONCES SE ARMARIAN LOS PANELES Y SE EMPACARIAN LAS CASAS DESARMADAS CON TODAS SUS PIEZAS Y UN PLANO E INSTRUCCIONES PARA ARMARLAS. SI EL CLIENTE MAYORITARIO ASI LO PREFIERE, LOS PANELES PODRIAN SALIR DE LA FABRICA CON SU CORRESPONDIENTE ACABADO DESDE RECUBRIMIENTO EN ESTUCO O MORTERO HASTA RECUBRIMIENTO EN PLASTICO O RESINAS, INCLUYENDO LOS QUE SE PUEDEN OBTENER CON EL MISMO JUGO PROCESADO DEL VASTAGO DE LA MATA DE PLATANO.

① U.I.A. COMPETION

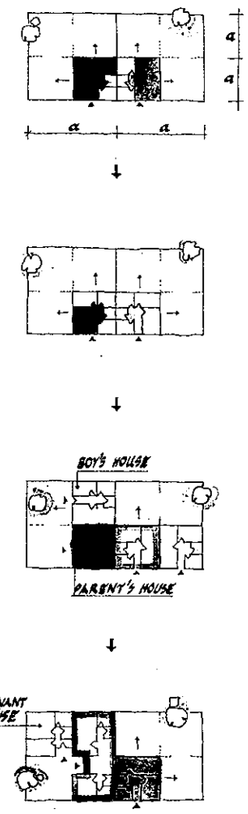
ALTERNATIVE INTERPRETATION OF SOCIAL HOUSING CONCEPT

URBAN AREAS

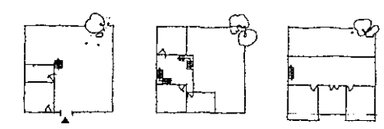
GOVERNMENTAL DECISION FOR THE DIVISION OF PLOTS AND AID FOR THE BUILDING OF SANITARY FACILITIES



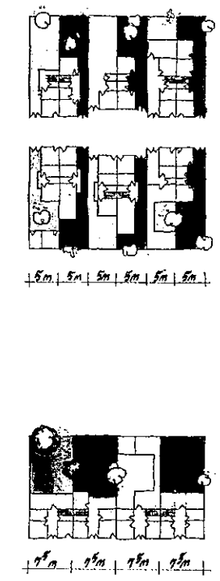
GOVERNMENTAL HELP FOR ONLY THE PLOTS



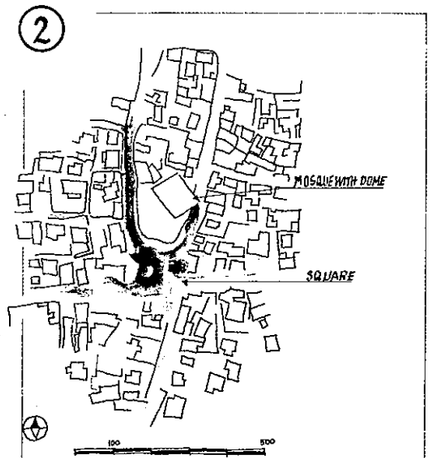
RURAL AREAS



A SAMPLE FROM HISTORICAL LUSSY ANATOLIAN HOUSES



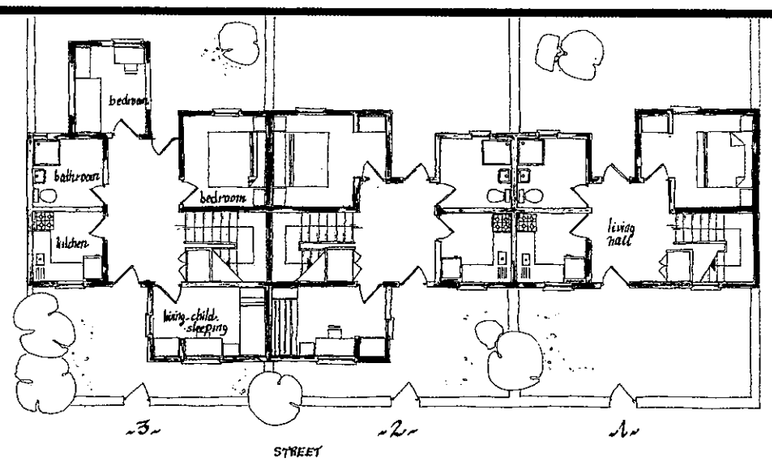
②

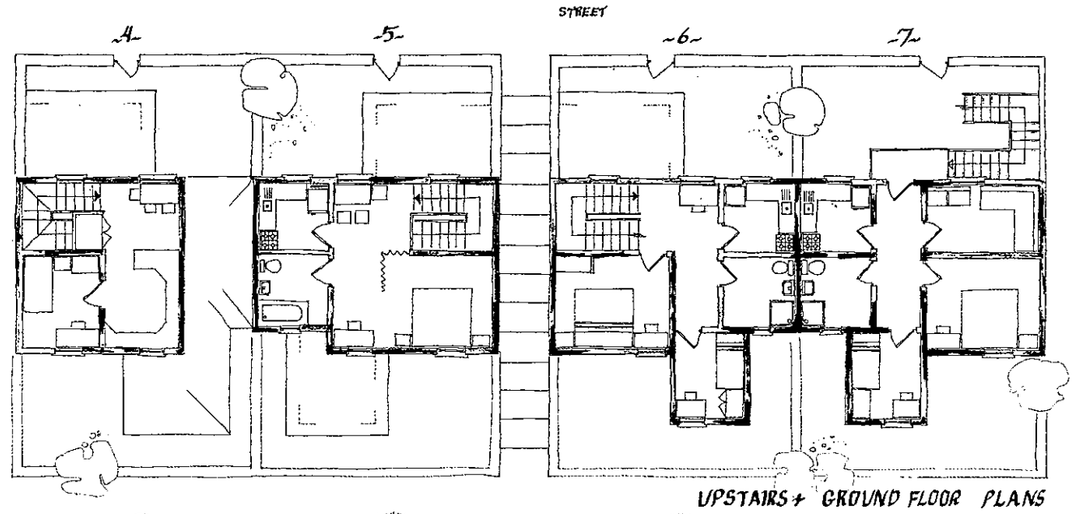


SITE PLAN:
PATTERN OF AN OLD
INFORMAL HOUSING SETTLEMENT

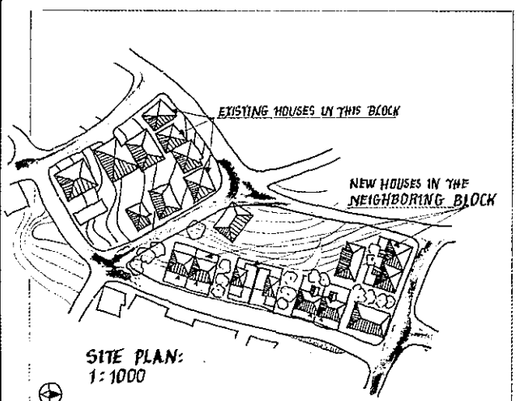
PHASES OF GROWTH

1. MIGRANT MOVES IN
2. MIGRANT HAS A CHILD
3. ANOTHER CHILD IS BORN
4. THE SON MOVES UPSTAIRS
5. SON BRINGS IN THE BRIDE
6. GRAND CHILD IS BORN
7. TENANT MOVES IN
   SON'S FAMILY MOVES OUT



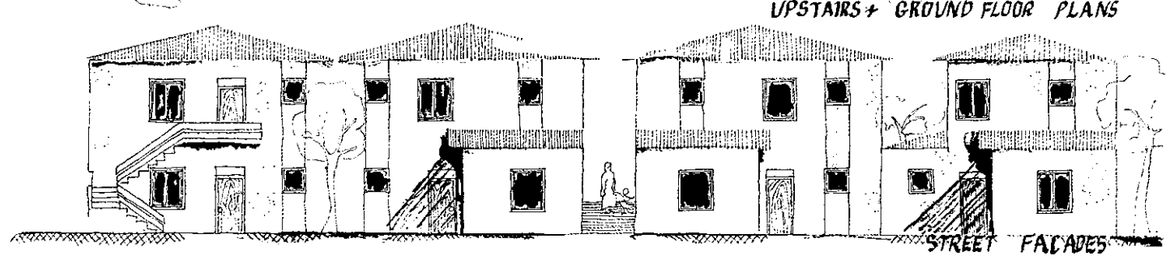


UPSTAIRS + GROUND FLOOR PLANS



SITE PLAN:
1:1000

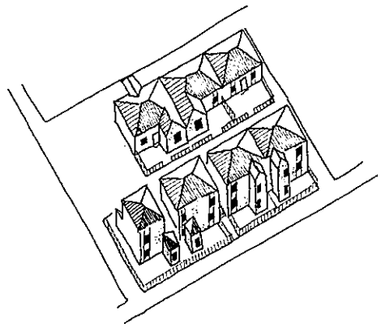
LOCATION OF NEW GROUP OF
HOUSES IN EXISTING TEXTURE

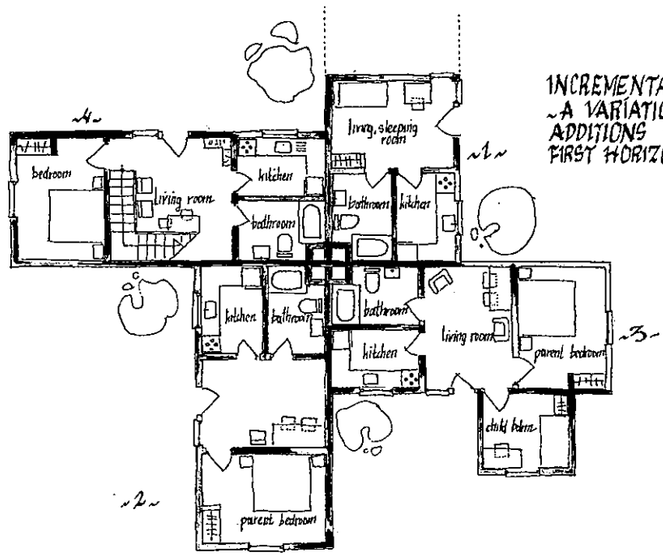


STREET FACADES

3

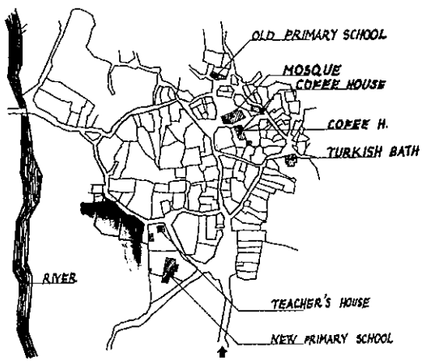
VIEW OF THE PROPOSED SOLUTION

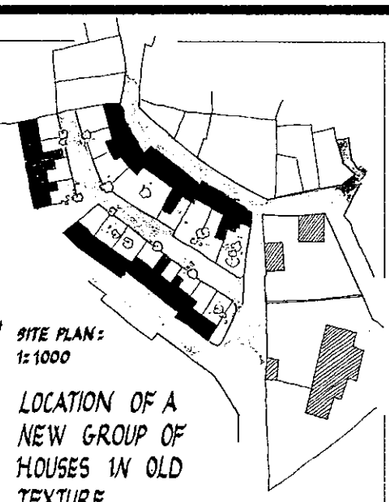




INCREMENTALLY- GROWING HOUSE
~A VARIATION~
ADDITIONS 1~4
FIRST HORIZONTAL, THEN VERTICAL

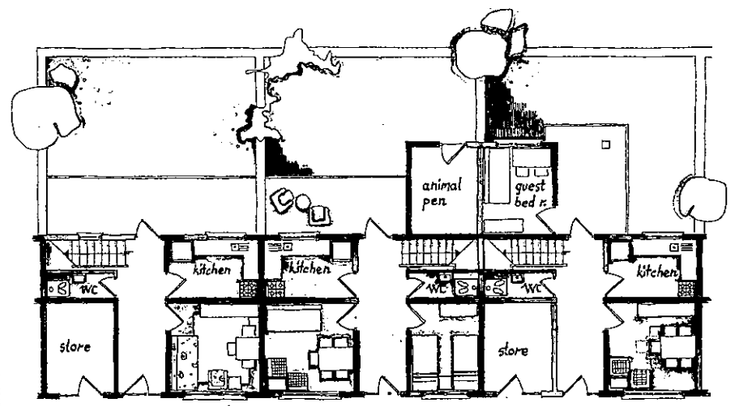
MEDIAVAL TEXTURE OF A
WESTERN ANOTOLIAN VILLAGE





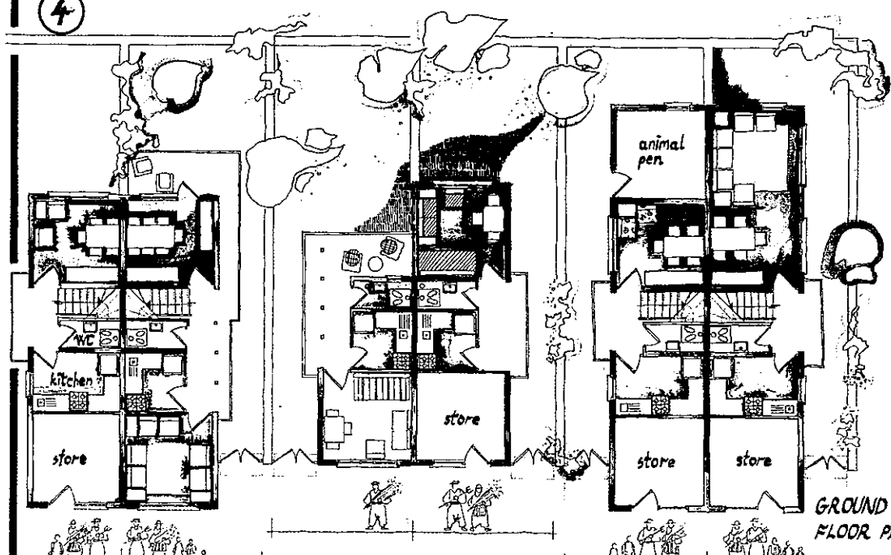
SITE PLAN:
1:1000

LOCATION OF A
NEW GROUP OF
HOUSES IN OLD
TEXTURE

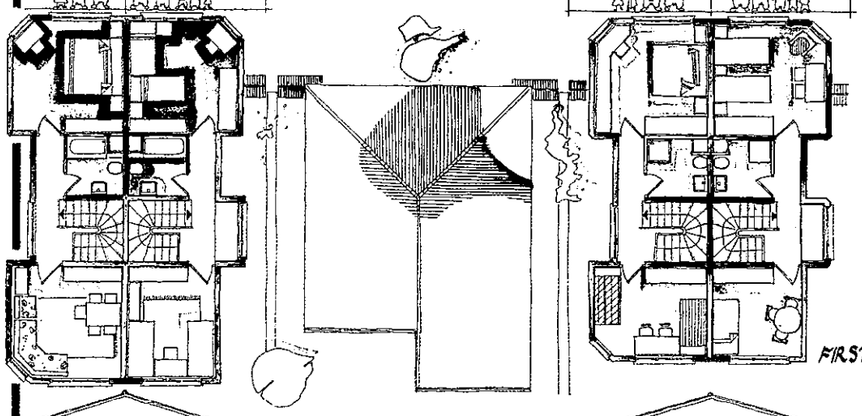


GROUND FLOOR PLANS

4

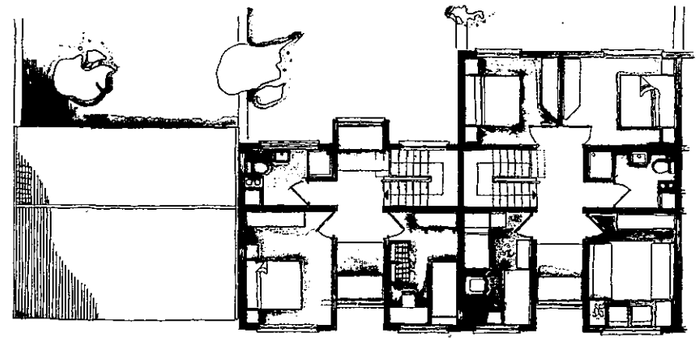


GROUND
FLOOR PLANS

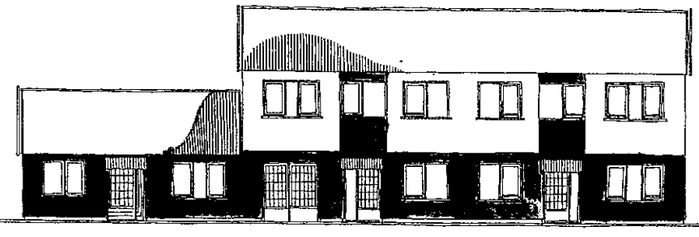


FIRST FLOOR PLANS

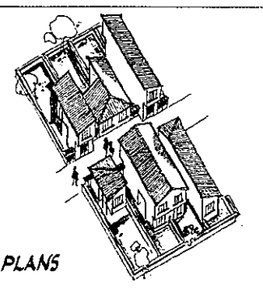
ELAVATIONS

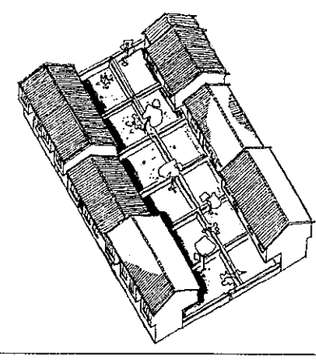


FIRST FLOOR PLANS



ELAVATIONS





EQUIPO DE APOYO A LOS AUTOCONSTRUCTORES "EL HORNERO"

SECTOR·V

CLUB DE AUTOCONSTRUCTORES "EL HORNERO"

PROGRAMA ARGENTINO DE APOYO A LA AUTOCONSTRUCCION INDEPENPENDIENTE

EN ARGENTINA, DE UN DEFICIT DE APROXIMADAMENTE 2.500.000 VIVIENDAS, CASI 1.000.000 (EL 40%) ES DEFICIT CUALITATIVO DE VIVIENDAS UBICADAS EN UN LOTE INDIVIDUAL. CUANDO NO SON IRRECUPERABLES, NECESITAN SER REPARADAS, TERMINADAS Y/O AMPLIADAS

LOS OBJETIVOS

ESTE PROGRAMA SE PROPONE DESARROLLAR E IMPULSAR UN SISTEMA MASIVO DE ASESORAMIENTO TECNICO Y DE ORGANIZACION SOCIAL.
ESTA DIRIGIDO A LAS PERSONAS DE ESCASOS RECURSOS QUE CON SU PROPIO TRABAJO CONSTRUYEN, AMPLIAN O TERMINAN SUS CASAS EN UN LOTE INDIVIDUAL EN EL PERIMETRO SUBURBANO.

POR LA AMPLITUD DE ESTE SECTOR INFORMAL DE LA PRODUCCION DE VIVIENDAS (ALLI SE UBICA CASI LA MITAD DEL DEFICIT DE VIVIENDAS EN NUESTRO PAIS) Y PORQUE SE FORMA CON ACCIONES INDEPENDIENTES AISLADAS Y DISPERSAS.
EL SISTEMA QUE ESTAMOS DESARROLLANDO Y PROBANDO SE PROPONE SER MASIVO Y CON GRAN CAPACIDAD DE AUTO-DIFUSION.

EL SISTEMA

LA RED DE TRANSMISION DEL CONOCIMIENTO Y DE ORGANIZACION COMUNITARIA SE ESTRUCTURA A TRAVES DE LAS RELACIONES DE VECINDAD Y DE LAS ORGANIZACIONES BARRIALES EXISTENTENTES.
A) LOS VECINOS AUTOCONSTRUCTORES QUE DESEAN RECIBIR ASESORAMIENTO TECNICO Y DESARROLLAR ACCIONES EN COMUN FORMAN EN LA ORGANIZACION DE BIEN PUBLICO DEL BARRIO EL GRUPO DEL CLUB "EL HORNERO".
B) EL EQUIPO TECNICO DEL CLUB ENTREGA EL "MANUAL DE AUTOCONSTRUCCION", QUE CONTIENE TODAS LAS INDICACIONES TECNICAS NECESARIAS PARA HACER UNO MISMO SU CASA SEGUN LAS TECNICAS CONSTRUCTIVAS Y LOS PROTOTIPOS DE VIVIENDAS USUALES EN LA ZONA.
C) ENTRE LOS VECINOS SE ELIGE COMO ASESORES BARRIALES A PERSONAS CON CONOCIMIENTOS DE CONSTRUCCION QUE RECIBEN LA CAPACITACION NECESARIA PARA BRINDAR ASESORAMIENTO TECNICO A PARTIR DEL "MANUAL".

D) EL CLUB "EL HORNERO" DE CADA BARRIO PUEDE DESARROLLAR DIVERSAS ACTIVIDADES COMPLEMENTARIAS: HACER COMPRAS Y TRAMITACIONES EN COMUN, PEDIR QUE SE HAGAN ESTUDIOS DE SUELOS, ORGANIZAR BANCOS DE HERRAMIENTAS Y/O MATERIALES.
E) LA RED ZONAL O NACIONAL DE LOS CLUB "EL HORNERO" PERMITIRA INTERCAMBIAR EXPERIENCIAS Y COLABORACION, REALIZAR ACCIONES EN COMUN EN APOYO A LA AUTOCONSTRUCCION (EN CUANTO AL FINANCIAMIENTO, REGLAMENTACIONES, ETC).
F) ESTA PREVISTO LA PREPARACION DE "PAQUETES METODOLOGICOS" QUE CONTENGAN CARTILLAS, GUIAS Y FICHAS QUE GUIEN LA ACCION BARRIAL DE "PROMOCION", ORGANIZACION", ETC.
G) SE ESTAN REALIZANDO EXPERIENCIAS EN CUMUN CON ORGANISMOS GURBERNAMENTALES (MUNICIPALES, BANCO HIPOTECARIO NACIONAL, ETC) CON VISTAS A IMPLEMENTAR NUEVAS POLITICAS DE VIVIENDAS.

LAS EXPERIENCIAS ACTUALES

LUEGO DE UN PRIMER AÑO DEDICADO AL DESARROLLO DEL MANUAL Y DE UN SEGUNDO AÑO DE ACCIONES PILOTO, SE HA COMENZADO A TRABAJAR EN LAS PRIMERAS ACCIONES PILOTO: SAN FRANSICO SOLANO Y ZARATE (VER PLANO ADJUNTO).

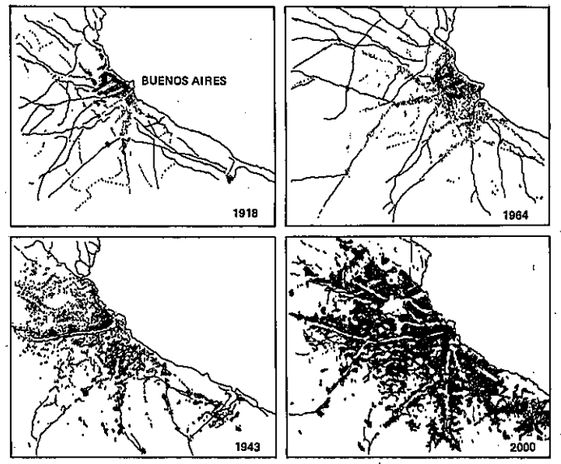
EN ESTAS EXPERIENCIAS SE AJUSTARAN LOS PROCEDIMIENTOS PARA PASAR EN EL AÑO PROXIMO A UN AREA DE MAYOR EXTENSION.

LOS PROYECTOS COMPLEMENTARIOS

PREPARACION DE ELEMENTOS A DISTANCIA.
- DESARROLLO TECNOLOGICO (A PARTIR DE LAS FORMAS CONSTRUCTIVAS ESPONTANEAS)
- CAPACITACION DE LOS ALBAÑILES–PROYECTISTAS.
- MANUAL DE MEJORAMIENTO DE LA VIVIENDA (ANALISIS, DIAGNOSTICO Y MEJORAMIENTO)
- AUTOCONSTRUCCION DE LA VIVIENDA RURAL.
- INVESTIGACION SOBRE LA AUTOCONSTRUCCION Y LA AUTOGESTION DE LA VIVIENDA POLAR.

LA AUTOCONSTRUCCION SUBURBANA

MUCHOS BARRIOS SUBURBANOS SON FRUTO DE LA AUTOCONSTRUCCION



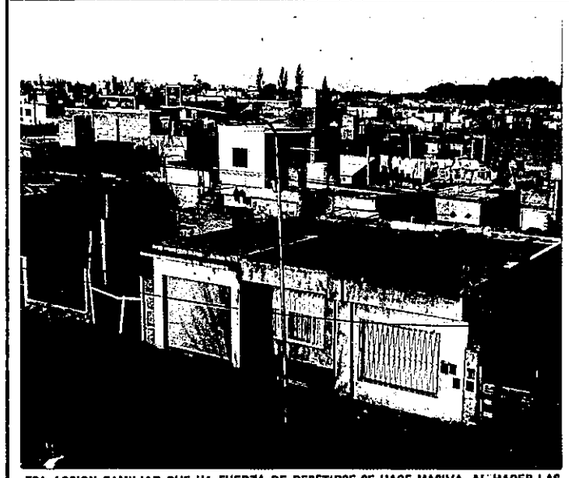
EN EL PERIMETRO DE LAS CIUDADES, EN SUS ZONAS SUBURBANAS DEFICIENTES Y CARENTES DE INFRAESTRUCTURA Y DE SERVICIOS, SE ASIENTA LA MAYORIA DE LA POBLACION POBRE URBANA.

ALLI LAS FAMILIAS DE MENORES RECURSOS VAN AUTOCONSTRUYENDO SUS VIVIENDAS CON GRAN ESFUERZO FISICO Y ECONOMICO.

ESAS VIVIENDAS, QUE HAN DE DURAR DECENAS DE AÑOS, CONSTITUIRAN EL COBIJO DE VARIAS GENERACIONES, SON LAS QUE VAN FORMANDO EL PAISAJE CONSTRUIDO QUE DENSIFICA LOS BORDES DE NUESTRAS CIUDADES.

PODEMOS VER COMO LAS CIUDADES VAN CRECIENDO A MANCHONES POR LA EXPLOSION LENTA DE ESA "CONSTRUCCION HORMIGA".

CONSTRUCCION MASIVA COMO SUMA DE ACCIONES AISLADAS



ESA ACCION FAMILIAR QUE HA FUERZA DE REPETIRSE SE HACE MASIVA. AL HACER LAS CASAS SE VAN EXPANDIENDO LENTAMENTE LAS CIUDADES. COMO LAS CASAS AUTOCONSTRUIDAS VAN BROTANDO DE A POCO Y AISLADAS, ES A VECES DIFICIL DARSE CUENTA COMO ESA ACCION FAMILIAR APARENTEMENTE INTRACENDENTE VA DIBUJANDO LA CIUDAD.

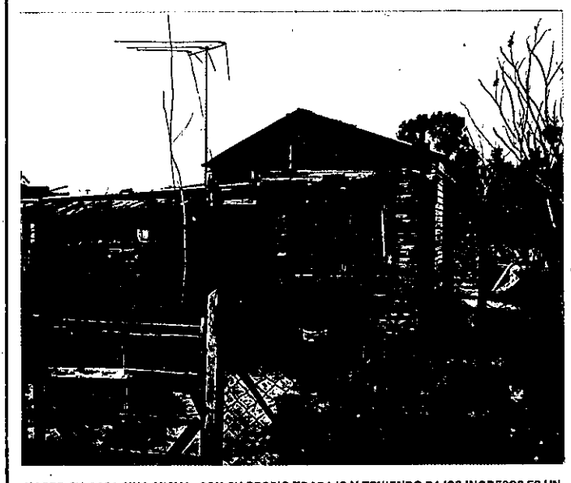
SI PUDIESEMOS SUMAR LOS TRABAJOS NECESARIOS PARA MEJORAR ESAS VIVIENDAS INDIVIDUALES DISPERSAS Y LAS QUE SE AUTOCONSTRUIRAN EN LOTES AUN DISPONIBLES Y EN FUTUROS LOTEOS, PODRIAMOS TENER UNA IDEA DE QUE PORCION INMENSA EN LA PRODUCCION DE LA VIVIENDA Y DEL ENTORNO ESTUVO Y ESTARA EN MANOS DE LA AUTOCONSTRUCCION INDEPENDIENTE Y DE LA AUTOGESTION.

CADA FAMILIA ENCARA SOLA EL ESFUERZO DE HACERSE LA CASA

ESA AUTOCONSTRUCCION ES INDIVIDUAL, AISLADA, ESPONTANEA E INDEPENDIENTE DE TODO SISTEMA ORGANIZADO Y DE TODO PLANO OFICIAL. LA FAMILIA ES GESTORA, PRODUCTORA Y RESPONSABLE DE LA CONSTRUCCION DE SU VIVIENDA: SUCEDE QUE LA AUTOCONSTRUCCION INDEPENDIENTE ES UN FENOMENO NEGADO O RECHAZADO POR QUIENES MARCAN LAS POLITICAS DE VIVIENDA.

LA FALTA DE APOYOS SOCIALES NECESARIOS, POTENCIA LAS DIFICULTADES, FRUSTRA POSIBILIDADES, HACE QUE EL PRODUCTO DE TANTO ESFUERZO Y DE TANTO SACRIFICIO SEAN ESOS BARRIOS FORMADOS POR CASAS SIEMPRE SIN TERMINAR. EN QUE LOS PROBLEMAS DE HACINAMIENTO, DE HIGIENE, TECNICOS Y DE DISEÑOS SON TANTOS QUE YA CASI PARECEN LOGICOS Y "NATURALES".

HACERSE LA CASA UNO MISMO ES UN PROCESO LARGO Y DIFICIL



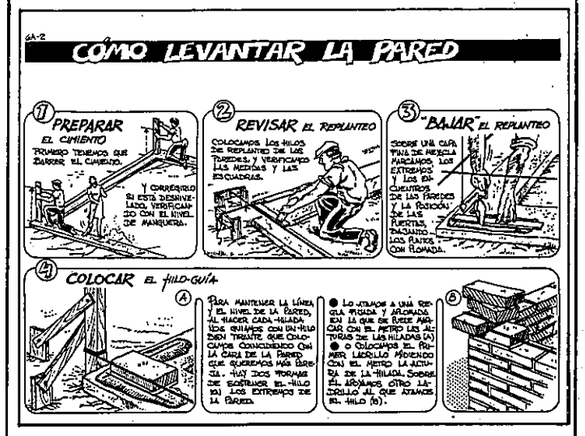
HACER SU CASA UNO MISMO, CON SU PROPIO TRABAJO Y TENIENDO BAJOS INGRESOS ES UN GRAN ESFUERZO. UNA VEZ QUE EL TERRENO ES OBTENIDO, COMUNMENTE SE EMPIEZA CON UNA VIVIENDA PREFABRICADA DE MADERA. DESPUES, LENTAMENTE, CON AHORROS PROPIOS, SIGUEN ADELANTE COMPRANDO MATERIALES QUE LES PERMITAN EMPEZAR EL LARGO PROCESO HACIA LA CONSOLIDACION DE LA VIVIENDA.

COMO EN GENERAL LA AUTOCONSTRUCCION SE REALIZA GRADUALMENTE, PROGRESANDO SOBRE UN PLANTEO ELASTICO, LA CASA SE VA CONSTRUYENDO POCO A POCO. SE AGREGAN CUARTOS A LO LARGO DE LOS AÑOS, DE ACUERDO A LAS NECESIDADES DE LA FAMILIA, A LOS RECURSOS QUE PUEDEN DESTINAR A LA CONSTRUCCION Y A LAS POSIBILIDADES QUE LA PARTE PREVIAMENTE CONSTRUIDA PERMITEN.

EL PROGRAMA DE APOYO

LA TECNICA Y LA TIPOLOGIA CONSTRUCTIVA HABITUALMENTE USADAS EN LA AUTOCONSTRUCCION ESTAN BASADAS EN LA PRACTICA TRADICIONAL Y SON SIMPLES Y APROPIADAS, PERO SUCEDE QUE EN LA MAYORIA DE LOS CASOS LOS AUTOCONSTRUCTORES APRENDEN LEVANTANDO SU PROPIA CASA. LOS ERRORES QUE SE COMETEN RETARDAN EL PROCESO E INCIDEN DIRECTAMENTE TANTO EN EL PRODUCTO COMO EN LA CALIDAD DE VIDA DE LOS USUARIOS.

PARA SOLUCIONAR ESTA SITUACION, SABIENDO QUE EL ASESORAMIENTO PERSONAL DIRECTO SERIA INSUFICIENTE, HEMOS DESARROLLADO UN "MANUAL" QUE EL AUTOCONSTRUCTOR PODRA TENER SIEMPRE A MANO PARA OBTENER LA INFORMACION Y LOS DATOS TECNICOS NECESARIOS.



EL MANUAL FUE DESARROLLADO A PARTIR DEL RELEVAMIENTO DE LOS TIPOS DE VIVIENDAS MAS USADAS Y DEL SISTEMA CONSTRUCTIVO POPULAR. A ELLOS SE REFIERE SU CONTENIDO QUE ES AMPLIO, PUES PRETENDE ABARCAR NO SOLO LAS TECNICAS DE CONSTRUCCION, SINO LOS HECHOS Y LA PROBLEMATICA QUE COMPONEN Y RODEAN AL ACONTECIMIENTO DE CONSTRUIR LA PROPIA CASA EN UN LOTE SUBURBANO.

PARA LOGRAR SU FACIL LECTURA E INTERPRETACION FUE HECHO COMO UNA PUBLICACION PARA SER CONSULTADA ANTE CUALQUIER TAREA O PROBLEMA. CON TECNICAS DE HISTORIETAS, CON TEXTOS Y DIBUJOS SIMPLES Y CLAROS, TAMBIEN INSTRUYE SOBRE REGLAMENTACIONES MUNICIPALES, CUIDADOS ESPECIALES A OBSERVAR, CALCULOS PARA LA COMPRA DE MATERIALES, ASI COMO LAS NOCIONES PARA PLANIFICAR LOS TRABAJOS.

LOS VECINOS–ASESORES RECIBEN CAPACITACION ESPECIAL

AUNQUE EL MANUAL SEA CLARO, EL AUTOCONSTRUCTOR QUE LO CONSULTA PUEDE NO ENTENDER ALGO O NO ENCONTRAR LA RESOLUCION A SU PROBLEMA. SE NECESITA ENTONCES ALGUIEN QUE PUEDA EXPLICAR O DETALLAR AL AUTOCONSTRUCTOR EL CONTENIDO DEL MANUAL.

ESA PERSONA ES UN "VECINO–ASESOR", CUYA CERCANIA FISICA SEÑALA, EN GENERAL, CERCANIA SOCIAL Y CULTURAL.

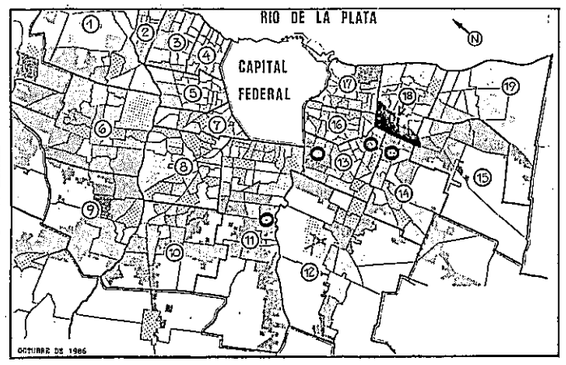
ESTE "VECINO–ASESOR", QUE DEBE TENER CONOCIMIENTOS PREVIOS DE CONSTRUCCION (PUEDE SER ALBAÑIL, JUBILADO DE LA CONSTRUCCION O ESTUDIANTE) RECIBE UNA CAPACITACION ESPECIAL SOBRE LOS CONTENIDOS DEL "MANUAL DE AUTOCONSTRUCCION" Y SOBRE COMO ASESORAR A SUS VECINOS AUTOCONSTRUCTORES.

EL CLUB "EL HORNERO" ES LA ORGANIZACION DE LOS AUTOCONSTRUCTORES

PROPONEMOS QUE LA ORGANIZACION DE LOS AUTOCONSTRUCTORES TENGA EL CARACTER DE CLUB, INSTITUCION PROPIA DEL FOLKLORE CIUDADANO QUE SUGIERE EL DERECHO A PARTICIPAR, A RECIBIR Y A HACER, UN SISTEMA DE INTERCAMBIO DE APOYO E INFORMACION QUE SE ENTRETEJA CON LOS VINCULOS VECINALES ESPONTANEOS Y CON LAS AGRUPACIONES POPULARES EXISTENTES.

SI EL "CLUB" HA DE AGRUPAR A QUIENES POR SI MISMOS Y DE A POCO CONSTRUYEN SU CASA, NADA MEJOR QUE TOMAR EL NOMBRE DE "HORNERO"; ESE PAJARO AUTOCONSTRUCTOR QUE TRASLADANDO Y ACOMODANDO BARRO Y PAJA CON SU PICO, HACE SU "CASITA". CREEMOS QUE UNA IMAGEN TAN CLARA Y POPULAR AYUDARIA A IDENTIFICAR EL CLUB Y A SUS MIEMBROS.

LAS EXPERIENCIAS ACTUALES



SAN FRANCISCO SOLANO (18)

La localidad de San Fancisco Solano, con una superficie de mil hectáreas y con una población de cien mil habitantes es una de las áreas más carenciadas del partido de Quilmes. Prueba de ello es que el cincuenta porciento de los hogares tienen sus necesidades básicas insatisfechas.

El programa de asesoramiento técnico masivo está siendo implementado en el área a través de las veinticinco organizaciones barriales y entidades de bien público ya existentes.

ZARATE

En el partido de Zárate, ubicado a noventa kilometros de la Capital Federal, hemos comenzado a implementar un programa de asistencia técnica en colaboración con el Municipio (gobierno local) y el Banco Hipotecario Nacional (ente financiador de Planes de Vivienda a nivel nacional).

El plan de mejoramiento con caracter de experiencia piloto beneficiará en esta primera etapa a cien familias carenciadas, localizadas en la periferia de la ciudad de Zárate y Lima.

Y ESTAMOS COMENZANDO A APLICAR EL PROGRAMA DE APOYO EN NUEVAS ZONAS

LOS SERVICIOS QUE BRINDA EL CLUB SON GRATUITOS

SABADO
8 DE NOVIEMBRE
A LAS 16 Hs.
EN LA SOCIEDAD DE FOMENTO "LA PAZ"
CALLE 892 Y 806 (NO SE SUSPENDE POR LLUVIA)

INVITAMOS A LOS VECINOS DE LA ZONA PARA FORMAR EL
CLUB DE AUTOCONSTRUCTORES EL HORNERO DE SAN Fco SOLANO

La edición por cuenta del Banco Hipotecario Nacional de este Manual de Autoconstrucción, incorpora dentro de la óptica oficial la realidad de más de un millón de familias argentinas que construyen sus viviendas con su esfuerzo y sin haber recibido ningún tipo de ayuda estatal hasta la fecha.

El gobierno democrático incorpora a estas familias, propietarias de las viviendas más dignas del país, como sujetos de su política habitacional.

La operatoria experimental HE. 420 que está desarrollando el BHN, aporta asistencia técnica y materiales de construcción para proveer a esas familias de los elementos que permiten mejorar su situación habitacional.

Este manual que se entrega gratuitamente a los participantes, es un elemento cuyo empleo será de invalorable importancia para lograr ese objetivo.

Arq. M. G. Malamud
Director del Programa TECHO

CURSO DE CAPACITACION

como Asesor Barrial

Organizado por la Municipalidad de Zárate y el equipo de Autoconstructores "El Hornero"

Por Cuanto _____

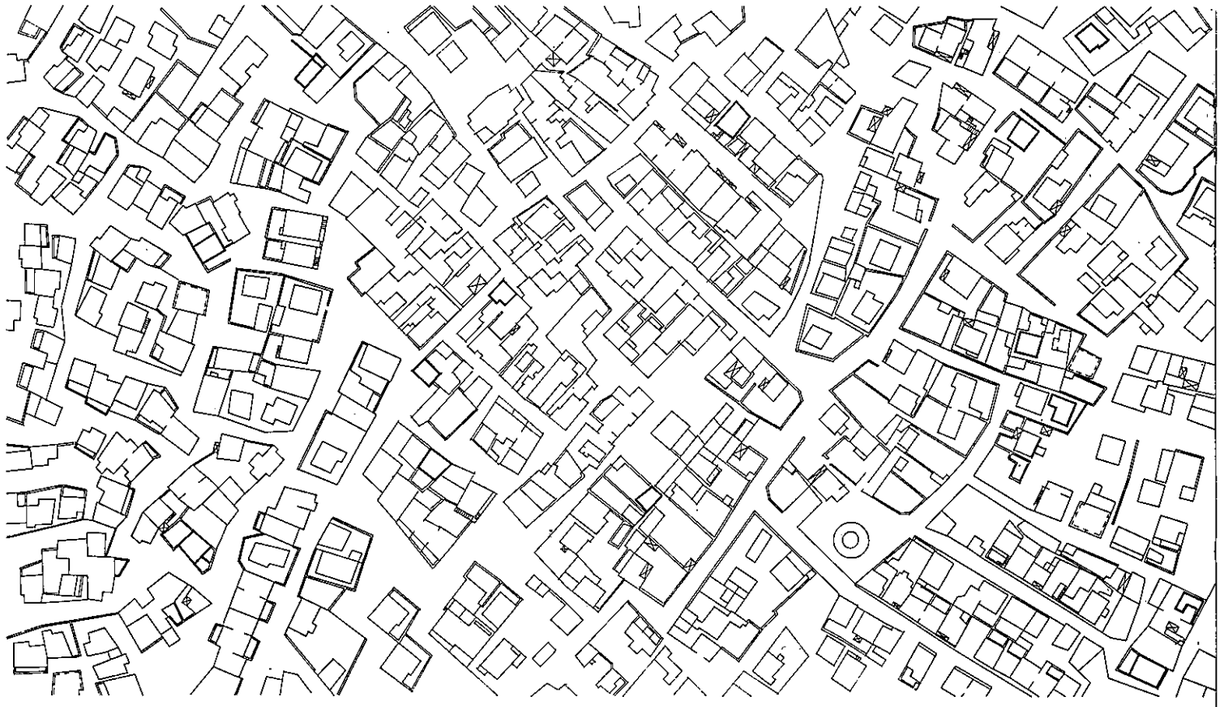
ha participado en el "Curso de Capacitación como Asesor" en los contenidos del Manual de Autoconstrucción del Club de Autoconstructores "El Hornero", se le extiende el presente Certificado.

Dr. ALDO LUIS ARRIGHI
INTENDENTE MUNICIPAL

DIRECTOR DE E. D. A.

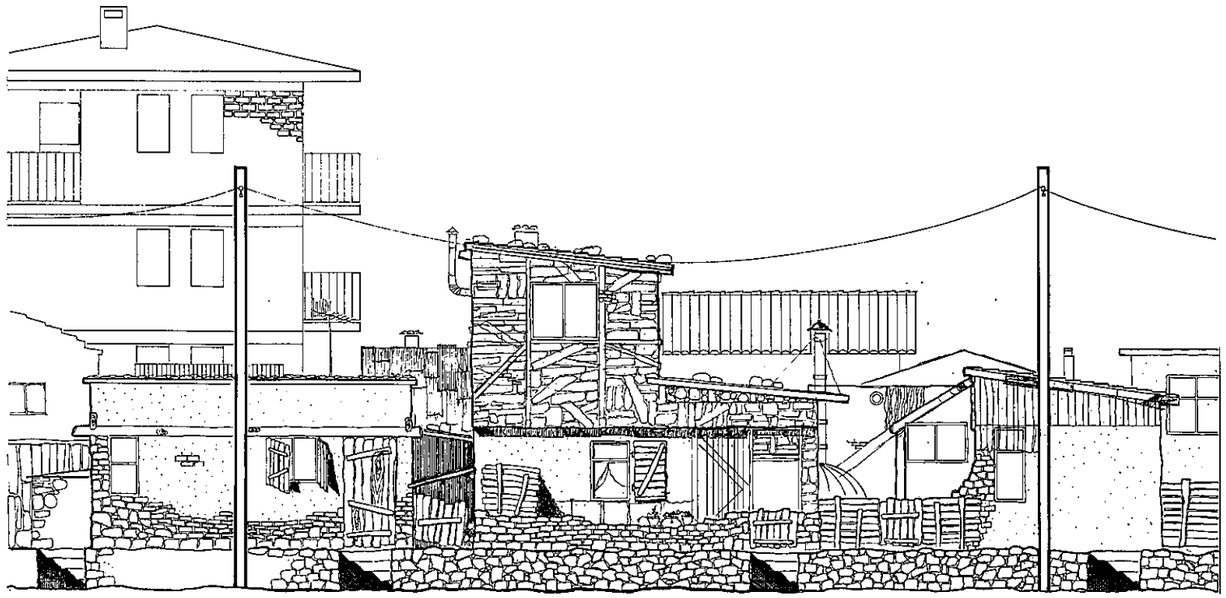
MUNICIPALIDAD DE ZARATE

EQUIPO DE APOYO A LOS AUTOCONSTRUCTORES "EL HORNERO"
CLUB DE AUTOCONSTRUCTORES "EL HORNERO"



TYPICAL PLAN OF SHANTY TOWNS IN DEVELOPING COUNTRIES

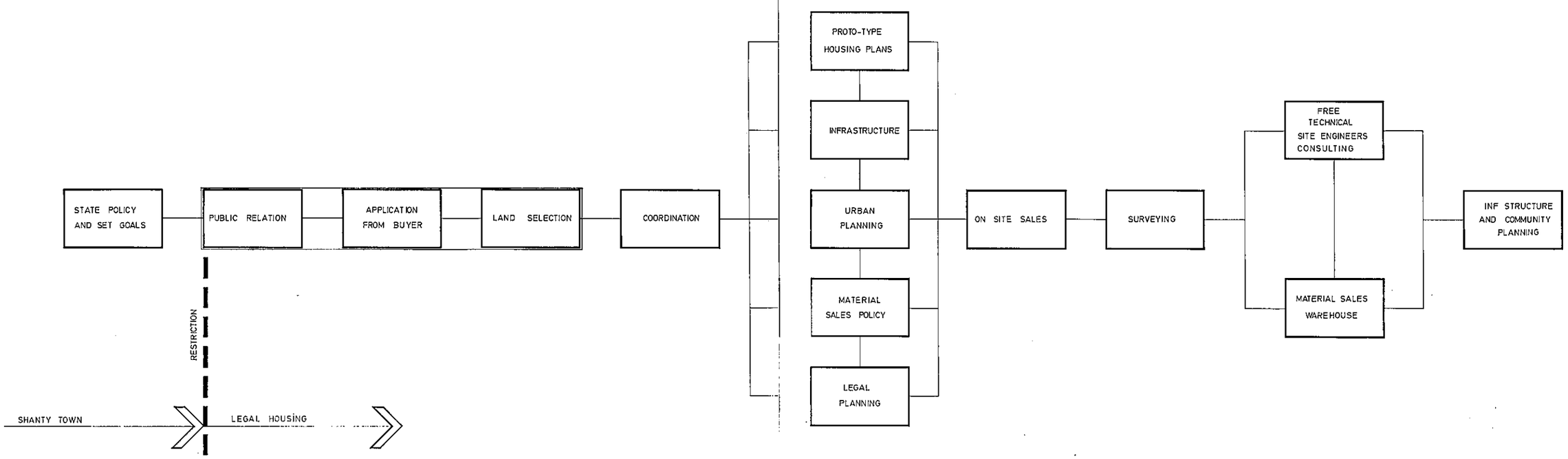
ILLEGAL SQUATTER HOUSING AND PLANNING PROBLEMS IN



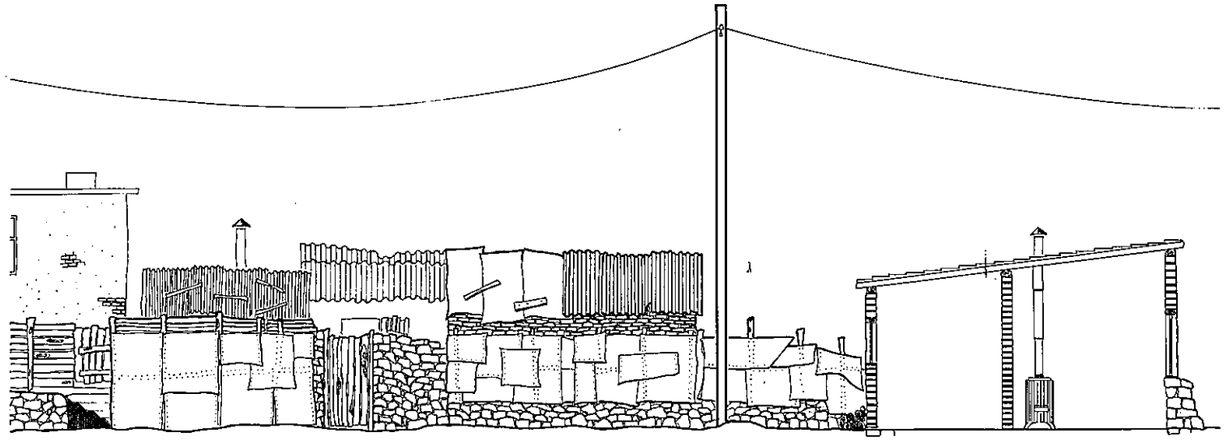
THIRD STAGE

SECOND STAGE

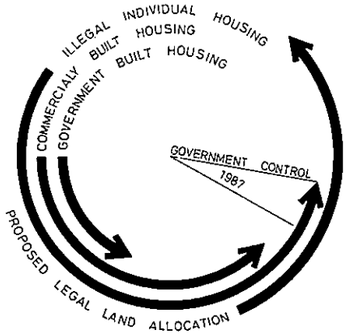
SOLUTION TO SHANTY HOUSING IN DEVELOPING COUNTRIES



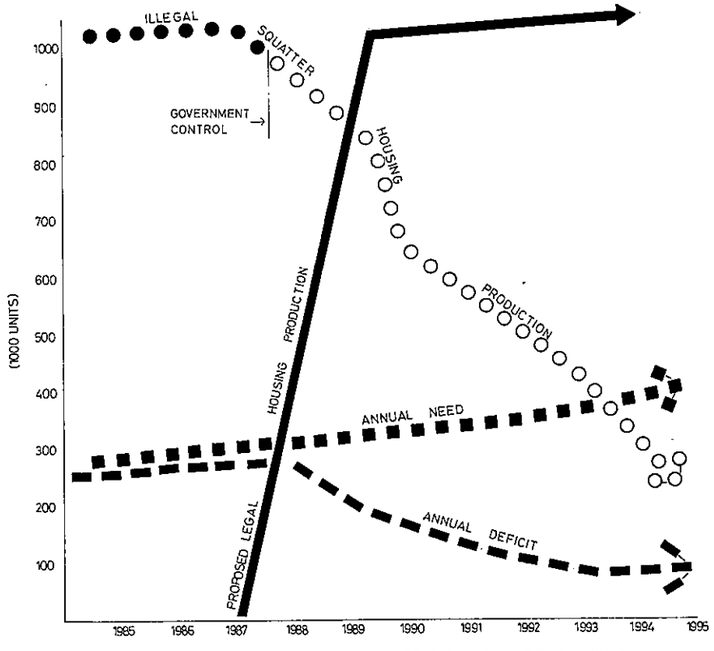
DEVELOPING COUNTRIES



FIRST STAGE TYP. FACADES SECTION



TOTAL HOUSING RATIO IN DEVELOPING COUNTRIES

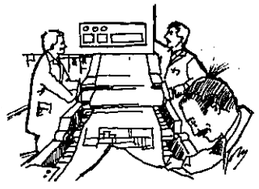


HOUSING PROVISION, NEED AND DEFICIT IN DEVELOPING COUNTRIES

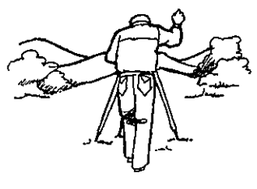
STATE POLICY AND SET GOALS

APPLICATION FROM BUYER

PROTO-TYPE HOUSING PLANS



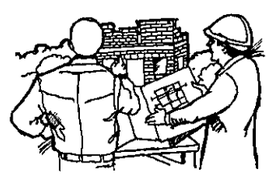
PRINTED PROTO-TYPE PLANS AND DETAILS.



SURVEYING

MATERIAL SALES

DO IT YOURSELF



TECHNICAL SITE ENGINEERS FREE SERVICE

SQUATTER HOUSING PROBLEMS AND SOLUTION

REASONS CAUSING THE DEVELOPMENT OF SHANTY TOWN (BUILT OVER NIGHT). IN DEVELOPING COUNTRIES, ENTERING OF THE MAJOR CITIES AND THEIR PERIPHERIES INTO A INDUSTRIALIZATION PROCESS, TRIGGERED A RAPID IMMIGRATION OF LARGE MASSES OF RUAL POPULACE INTO THOSE CITIES. SINCE THE STRUCTURES OF THESE CITIES AND ESPECIALLY THEIR MUNICIPALITIES WERE INADEQUATE TO MEET THE REQUIREMENTS OF THE NEWCOMERS FOR SETTLEMENT AND OTHER SERVICES THE INTERNAL MIGRATION, BECAME A VERY SERIOUS PROBLEM FOR THE COUNTRIES RESULTING IN DISORGANIZED URBANIZATION.

THIS FAILURE TO MEET THE HOUSING DEMAND THROUGH THE NORMAL ETHICAL WAYS, CAUSED THE UNETHETICAL BUILDING OF THE "SQUATTER HOUSES" BY LOW-INCOME PEOPLE WHO INFACT DO NOT LEGALLY OWN THE LAND HENCE THE INFORMAL HOUSING MARKET TOOK ON.

MEETING PARTIALLY THE HOUSING DEMAND BY ALLOWING THE CONSTRUCTION OF SLUMS WITHOUT ANY INFRASTRUCTURE HAS AGGRAVATED THE PROBLEM AND RENDERED IT'S SOLUTION EVEN MORE EXPENSIVE. AS A RESULT THE QUESTION OF INFRASTRUCTURE HAS BECAME THE TOP PRIORITY FOR LOCAL GOVERNMENTS BUT WHICH HAVE NEITHER THE ORGANIZED STRUCTURE NOR THE FINANCE TO SOLVE THIS.

OPERATION SCHEDULE

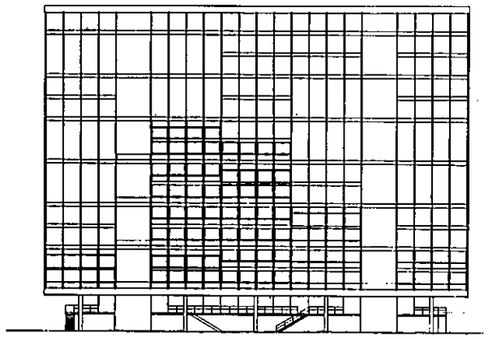
MONTHS	0	1	2	3	4	5	6	7	8	9	10	11	12
STATE POLICY AND SET GOALS	→												
APPLICATION FROM BUYER		→					→						
PROTO-TYPE HOUSING PLANS		→			→								
SURVEYING AND LAND SELECTION		→											→
SALES OF LOTS				→									→
INF. STRUCTURE									→				→

BENIFITS:

- BETTER URBAN PLANNING AND CITY PLANNING.
- FINANCIAL BENIFITS FOR LOCAL GOVERNMENTS.
- INFRASTRUCTURE PLANNING.
- BETTER SOCIAL STANDARD.
- SOLVING UNEMPLOYMENT.
- ON SITE JOB TRAINING.
- TO BRING ACTIVITIES TO PEOPLE.
- TECHNICALITY SOUND BUILDING.

9669699

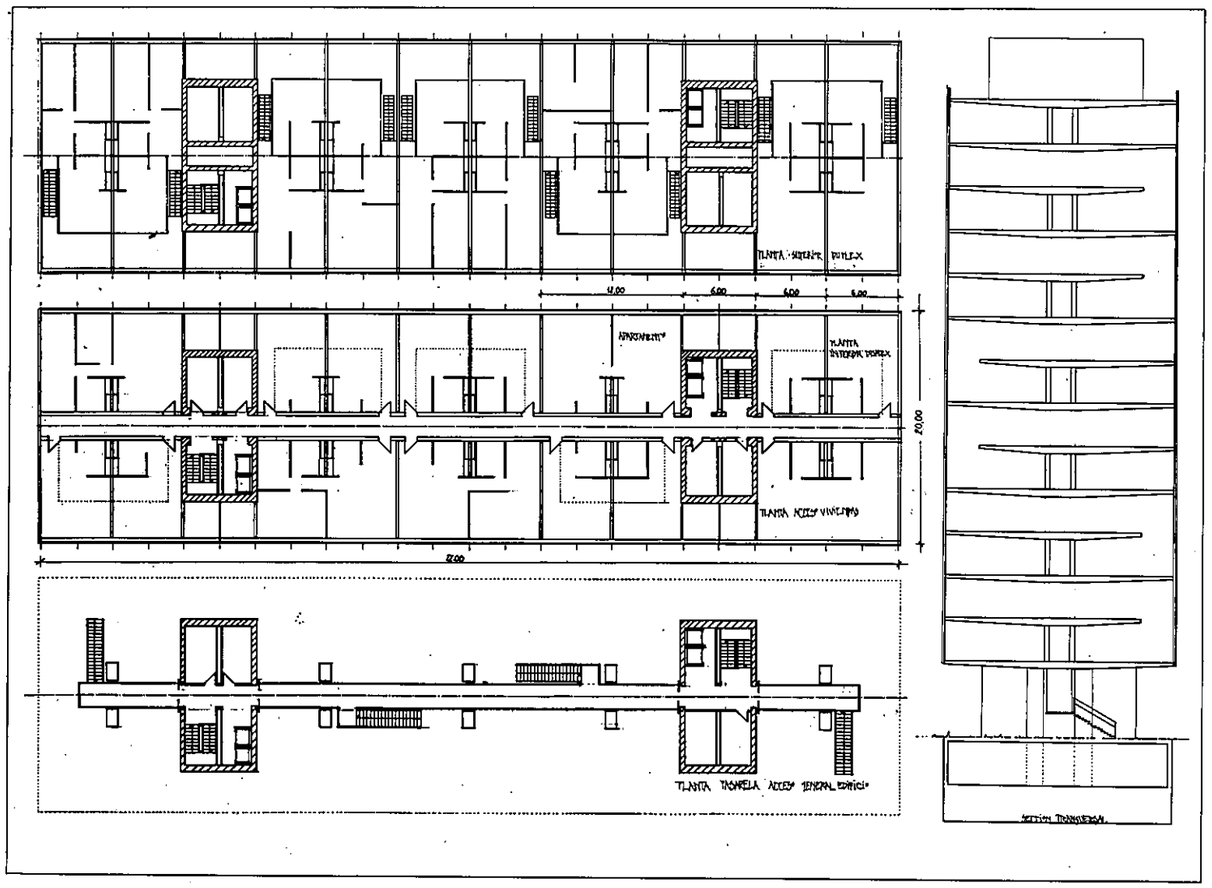
La propuesta inicial que da tema a este concurso,produjo en nosotros una vocación de controladores de la historia de la arquitectura.
Ante un planteamiento de vivienda moderna no se pudo optar mas que por la solucion de bloque lineal buscando en los grandes arquitectos del movimiento moderno la inspiracion y la propuesta,la idea y la innovacion.... De ahi que sea la tipologia de bloque lineal en altura el punto de partida.
Pero el bloque en altura y el lineal conllevan un mismo problema: las comunicaciones.Vertical y horizontalmente los habitantes han de tener un acceso facil y racional al edificio.De ahi surgen las primeras preguntas...¿por que no el Banco de Bilbao de Saenz de Oiza? ¿por que no la Unite d'habitation de Le Corbusier? ¿por que no ambas cosas?
Nuestra propuesta consiste en combinar estas dos tipologias para resolver problemas existentes en la Unite d'habitation.Duplex y apartamentos unidos en un esquema vertebrado.
Un gran pasillo a modo de puente entre dos grandes torres de hormigon...(Oiza)y viviendas a cada lado,extensible yrepetible en serie,como las utopias de la historia del urbanismo,"de Cadiz a Moscu,de Bruselas a Pekin..."(Arturo Soria).
La estructura de grandes vigas apoyadas como columna vertebral con otra familia de vigas voladas a modo de costillas que albergan las celulas de habitacion...y la fachada al Sol,a la Naturaleza,un gran prisma de vidrio,acero y madera, con alma de acero y cabeza de hormigon...con interiores de madera,madera que se puede tocar...materiales tradicionales y actuales utilizados con racionalidad.

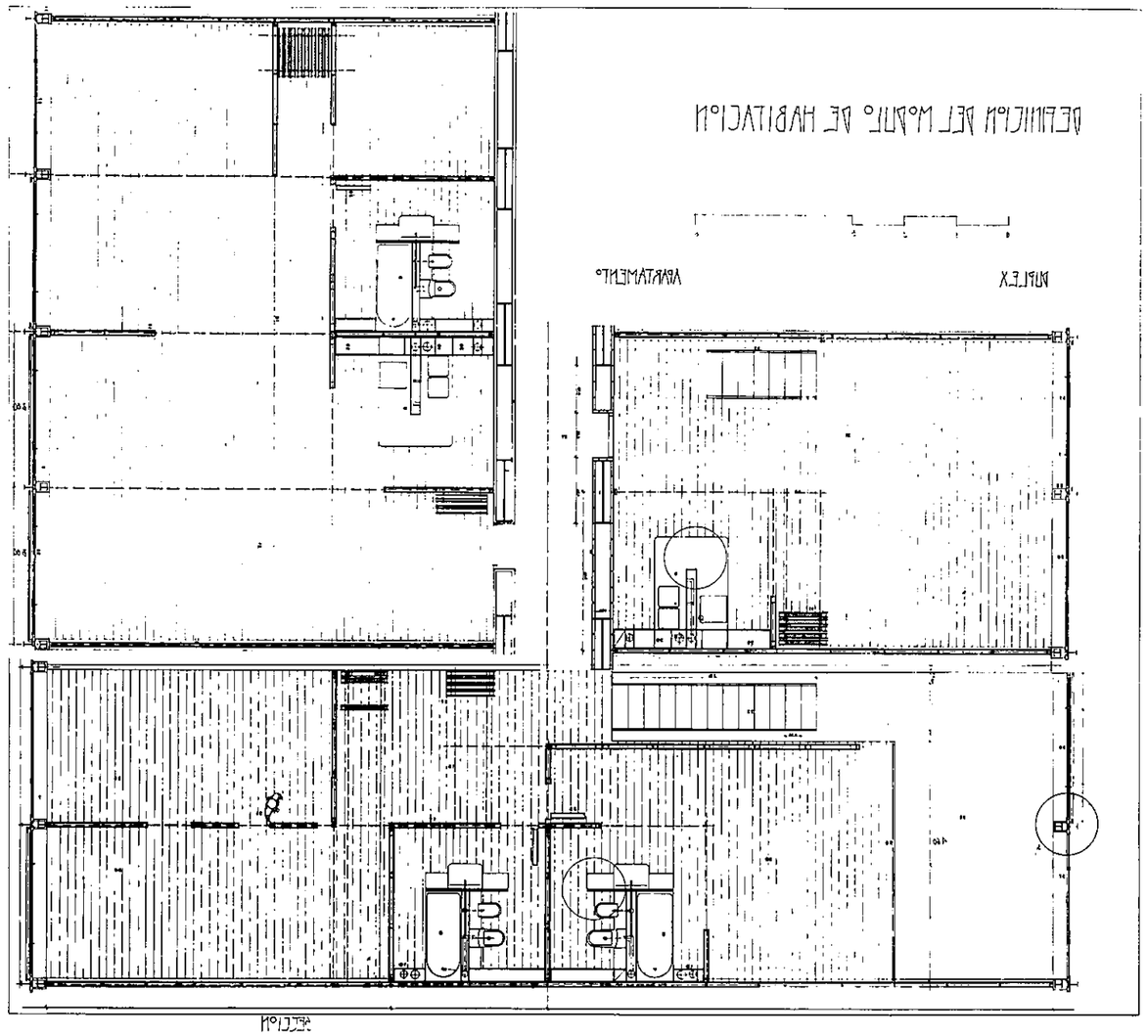


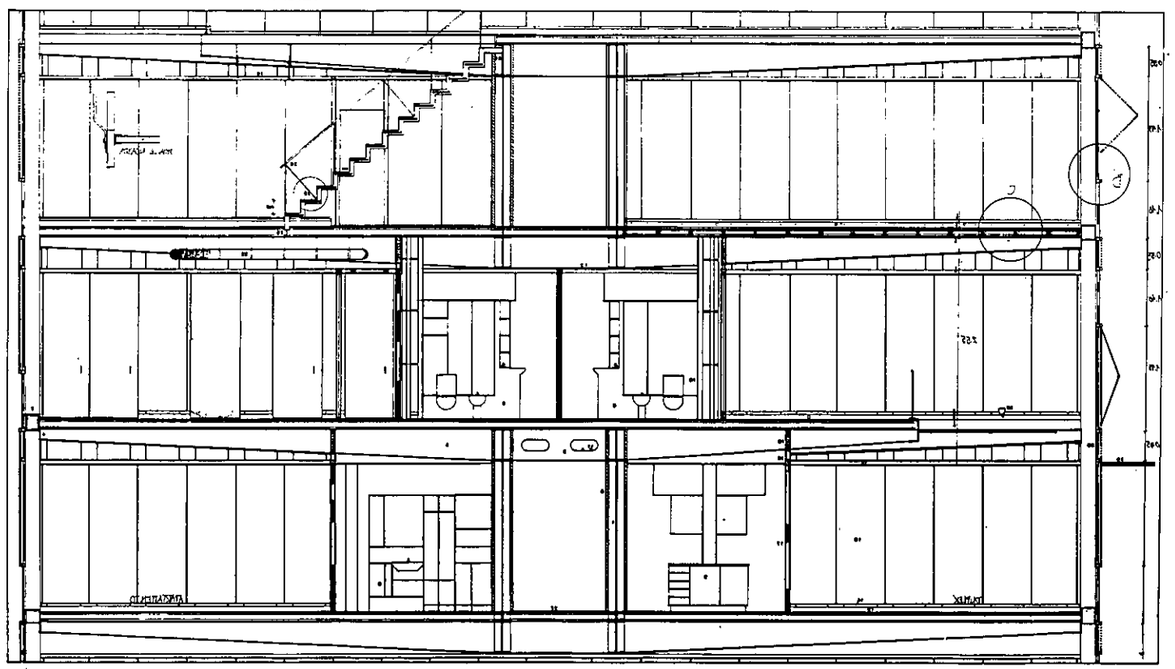
La modulacion,la seriacion,la industrializacion...grandes retos de la arquitectura actual.Un esquema repetible,posibilitado por modulos iguales conteniendo componentes industrializados y seriados;cocina y baño con materiales sofisticados a modo de maquinas dentro del proceso maquinal de la vida.. paneles de forjado prefabricados y montados en seco;divisorias interiores desplazables...
¿Y el espacio? La planta en voladizo libre de toda atadura estructural,libre de pilares,libre...Tabiques moviles que posibilitan modificar los espacios a voluntad,crear espacios nuevos, adaptarlos al proceso cambiante de la vida,a nuevas exigencias. El baño,la cocina dentro de la habitacion,la habitacion en el doble espacio,la habitacion en el espacio exterior...
Y el proceso constructivo racional,rapido,sin superposicion de oficios,montaje en seco,en serie...

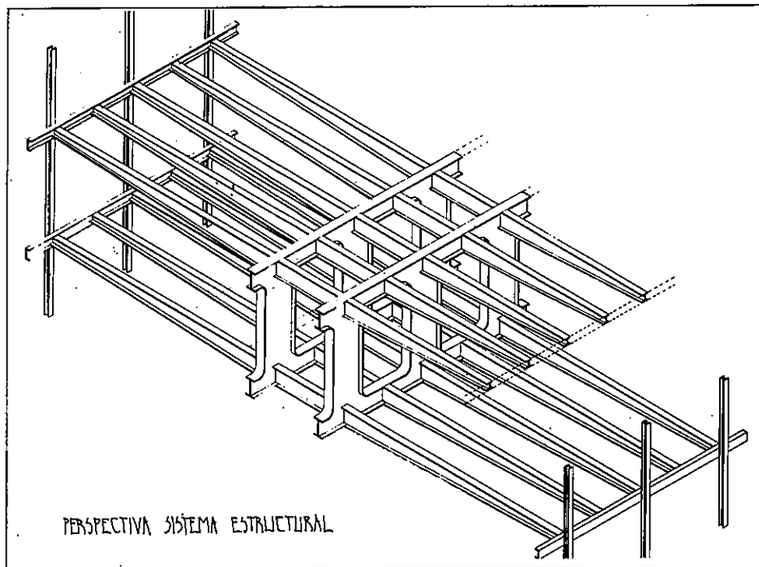
Este prisma posado en el territorio con dos patas,apenas tocando, en relacion con el medio,un volumen simple al sol...
¿Como se entra en un prisma sin romperlo?¿Por que no colgar una pasarela liviana de la estructura,de acero y madera como diseño sutil ,detalle llevado a su minima expresion,sin tocar el suelo mas que en el acceso y llevandonos a las torres,a esas patas del edificio,yde ahi hacia arriba,?

Acero,vidrio,madera,...industrializacin,seriacion... bloque al sol...posado en el territorio...
Sirva de modesto homenaje a nuestro inspirador,en memoria de Le Corbusier.

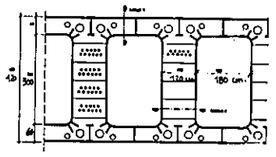




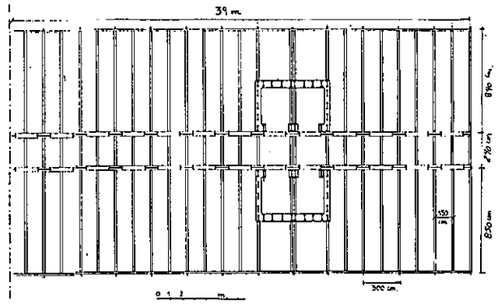




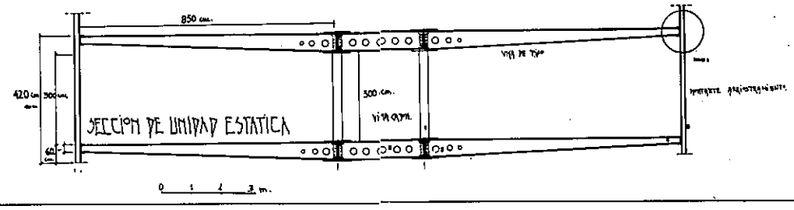
PERSPECTIVA SISTEMA ESTRUCTURAL



ALZADO VIGA PRETENSADA



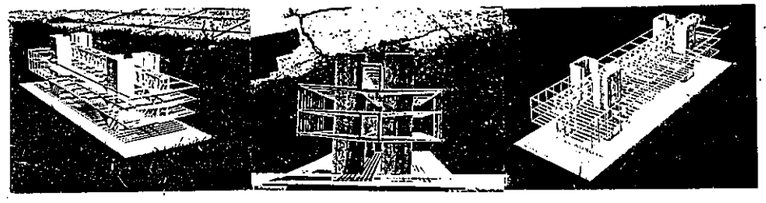
PLANTA ESTRUCTURA



SECCION DE UNIDAD ESTATICA

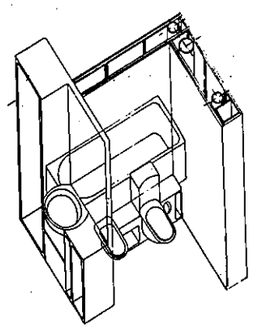
La estructura sustentante esta basada en el sistema NERVIKO.
Entre dos nucleos verticales de hormigon se apoyan cada dos plantas unas vigas cajon de una planta de altura,formada por dos vigas Vierendeel atadas por travesaños.En los cordones superior e inferior de dichas vigas se apoyan las vigas de piso completamente en voladizo.De esta forma las plantas quedan liberadas de pilares.
La viga cajon se comporta como el alma de una viga doble T y las vigas de piso voladas como las alas.
En este edificio las vigas cajon tienen una luz entre apoyos de 42m.y vuelan en cabeza 13 m..y las vigas de piso situadas cada 1.5 m. vuelan 8,5 m..
Los nucleos de hormigon sirven de comunicacion.vertical de personas e instalaciones,mientras las vigas cajon llevan la comunicacion horizontal..
Las vigas de piso van atadas en cabeza por perfiles U y para eliminar flechas diferenciales se arriostra en vertical con perfiles metalicos.

El sistema permite asimismo el montaje a pie de obra de la estructura de cada piso y su elevacion hasta la posicion final desde los nucleos previamente construidos.Asi se pueden ejecutar varias plantas a la vez.

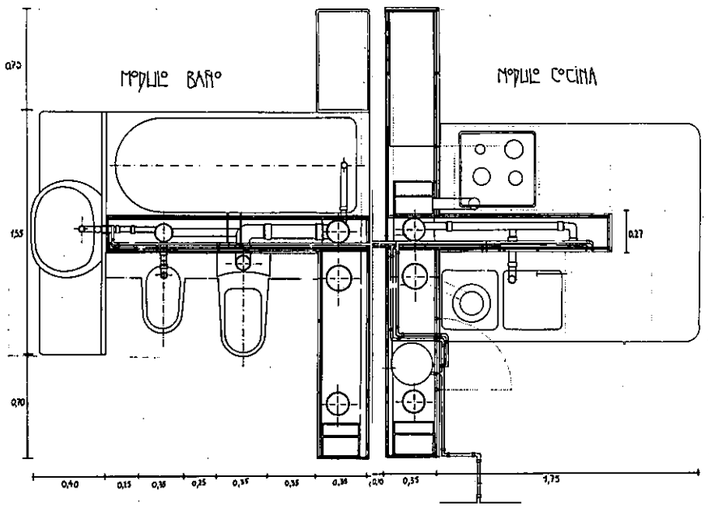


MODULO DE BAÑO

Construido en laminado de fibra de vidrio,refuerzos de fibras de carbono, resinas de epoxi con nucleo de espuma EPS de alta densidad,dicho laminado esta protegido al exterior con una pelicula de termoplastico que evita rayado desperfectos etc...El modulo es prefabricado,siendo los materiales habituales en la construccion de embarcacines y facilmente moldeables,con una rigidez grande a pesar de la ligereza.

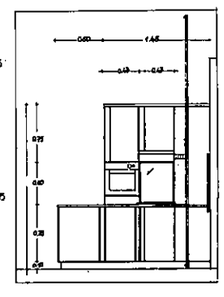


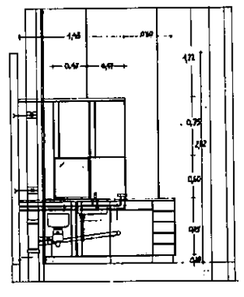
ALZADOS BAÑO



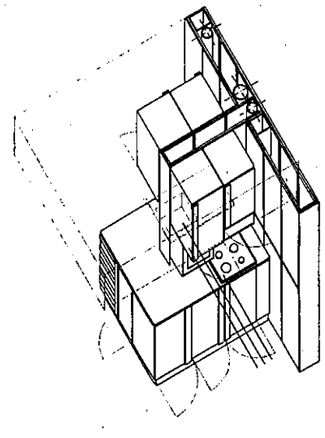
MODULO DE COCINA

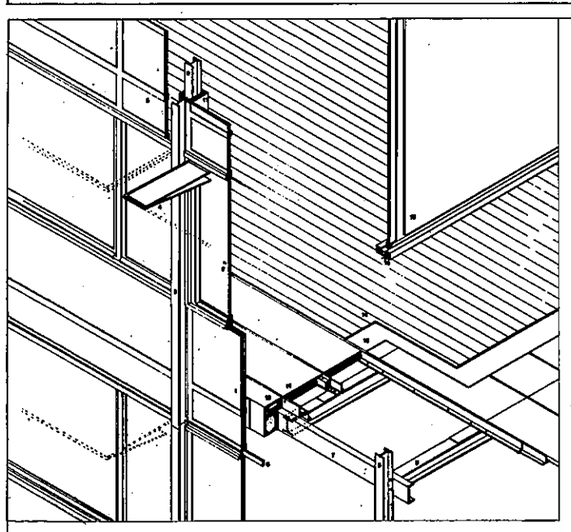
Construido con los mismos materiales que el cuarto de baño pero con el recubrimiento exterior en TEFLON para resistir temperaturas altas (cacharros de cocina calientes etc...)



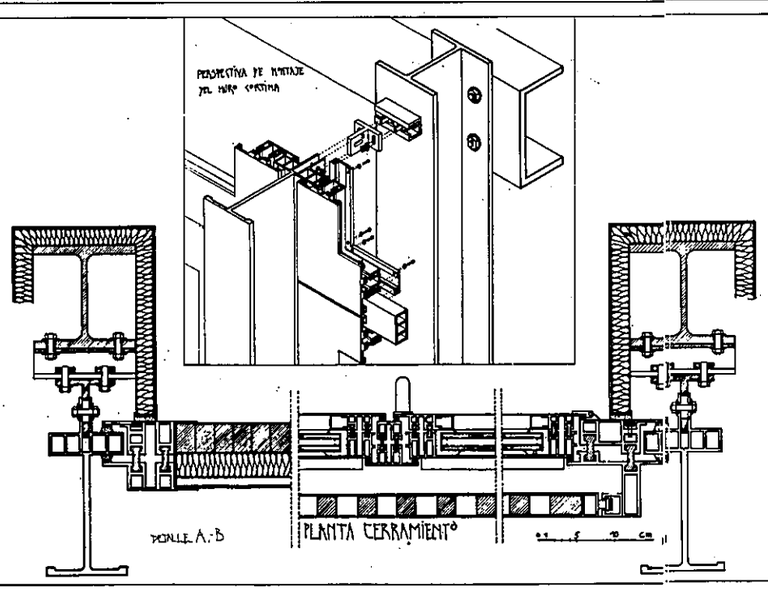


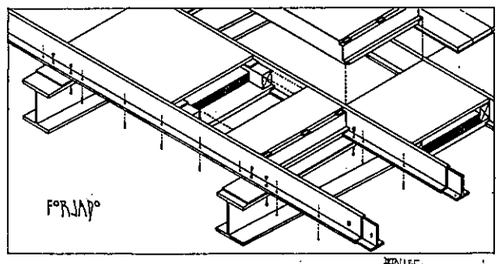
ALZADOS COCINA



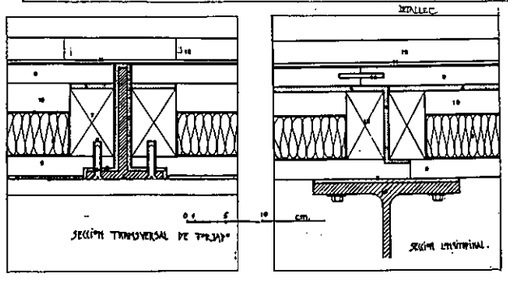


PERSPECTIVA CERRAMIENTO Y FORJADO





FORJADO



CERRAMIENTO

Muro cortina con zonas acristaladas y antepechos en panel sandwich de aluminio exterior,camara de aire, aislamiento y madera al interior.

El muro cortina viene en pannles montados y se colocan en fachada mediante un sistema flotante entre montantes de aluminio unidos a los montantes estructurales del edificio.

FORJADOS

Sobre las vigas de piso se colocan paneles prefabricados con tableros aglomerados conteniendo en su interior viguetas de madera como estructura secundaria.Dichos paneles de 60 cm. de ancho por 1,5 m. de longitud se unen a unas T invertidas apoyadas asimismo en las vigas de piso y gracias a juntas elasticas en materiales de caucho se consigue estanqueidad y evitandose vibraciones y taconeo molestos.Las maderas empleadas estan tratadas contra el agua y el fuego,tanto en el forjado como en cerramiento ydivisorias interiores.

WELCOMING THE BRIDGE-HEADERS

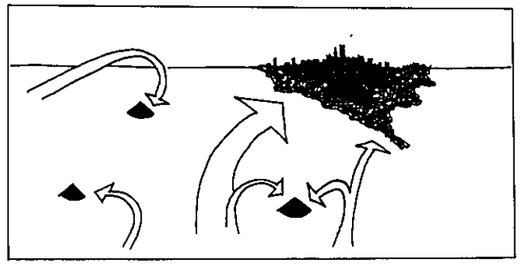
Shelter and work for single settlers in secondary cities

1. SOCIAL TASK

The construction of a shelter is a technical problem. Providing a home for the homeless is a social task. Homeless need a home. Shelter means cover and protection. Home means a congenial environment. Only the combination of shelter, means of subsistence and a sense of place lays the foundation of a successfull housing programme for the homeless.

SECONDARY CITIES

During the last decades the problems of overpopulation of the primate cities have become unsolvable. This is largely caused by migration to these cities. Policies are now directed towards rural development and the development of secondary cities. These cities should not be looked at as new places that will generate problems but as places that offer opportunities.



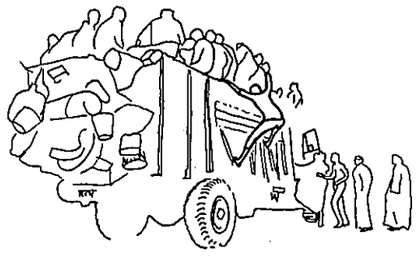
Divert the stream of migrants to secondairy cities.

SOCIAL STRUCTURE

In the smaller, secondary cities the social structure is still relatively strong and a supportive relation with the environment is still possible. Welcoming the bridge-headers to the secondary cities does not mean building houses for them, but linking the potentials and requirements of a town to the potentials and needs of the immigrants. Already long ago the shortcomings of the idea of building houses for the very poor became clear: people could not afford the rents and no opportunities to make a living were at hand. Self-help, sites and services, slum upgrading and other concepts were introduced and were succesful to a certain extend. Still, the main task remains: not only to give opportunities to build a shelter, but also to initiate social and physical structures that support viable neighbourhoods.

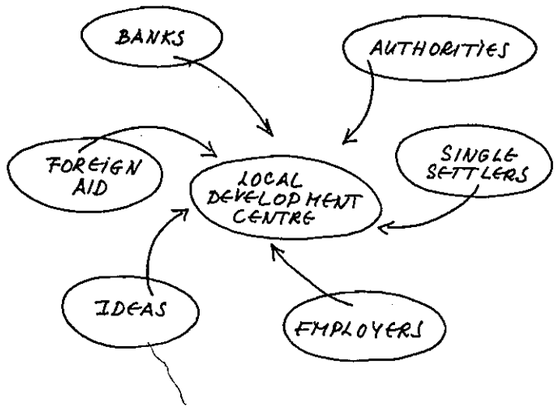
SINGLE SETTLERS

Most rural migrants who arrive at a town find temporary shelter with relatives. Such relatives usually live in the overpopulated primate cities. Authorities must divert the stream of migrants to the secondary cities by providing shelter and training as a mean to improve access to the labourmarket. Single settlers form the forward-line in this policy. This is a group of young men and women who have little family obligations, are fysically in their best years, and highly motivated to work at their future. These single settlers will get a foothold during their training, get accustomed to their new domain and develop abilities and skills to support the town in its development.

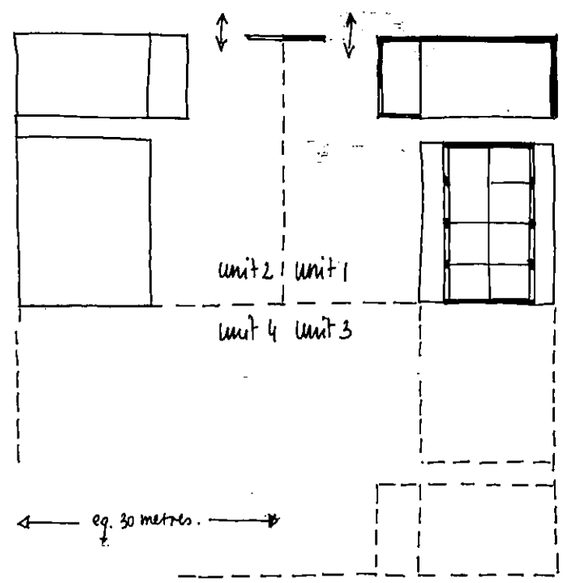


DOMAIN: A CONGENIAL ENVIRONMENT

Translated to "Shelter for the Homeless", we come to aspects like: availability of a plot, possibilities to make a living, education, structure of a neighbourhood and development of an appropriate lifestyle. People can and will only contriute to the improvement of their own situation if they can find the germs of a congenial environment. An environment which offers legal and social conditions for development In fact, the central theme of development is FAITH in ones new DOMAIN.



Participants of the proces.



The design of the training centre depends on the local circumstances. The centre is based on units (eg. 30 x 30 m.) consisting of a dormitory, workshops, a yard and a little office. The dimension will have to be based on a fixed number of settlers per unit (here 40 trainees) Extensions by adding units.
The dormitory must be simple to stress the idea that it provides temporary shelter only eg a place to put ones mat, a locker and some central sanitary facilities. During day-time this room can be used as class room or central meeting-place. The verandah and yard can be used as extension of the working-floor.

2. THE ORGANISATION OF THE PROCESS

"Welcoming the bridge-headers" must at first consist of offering a place to stay and some training and later of guidance and support of initiatives to become self-supporting. PARTICIPANTS in this process will be:

- new settlers, who are looking for an income;

- employers: industrialists, farmers, businessmen, who need skilled workers;

- banks, that are looking for investment possibilities;

- authorities, that support development options and responsible for quality,

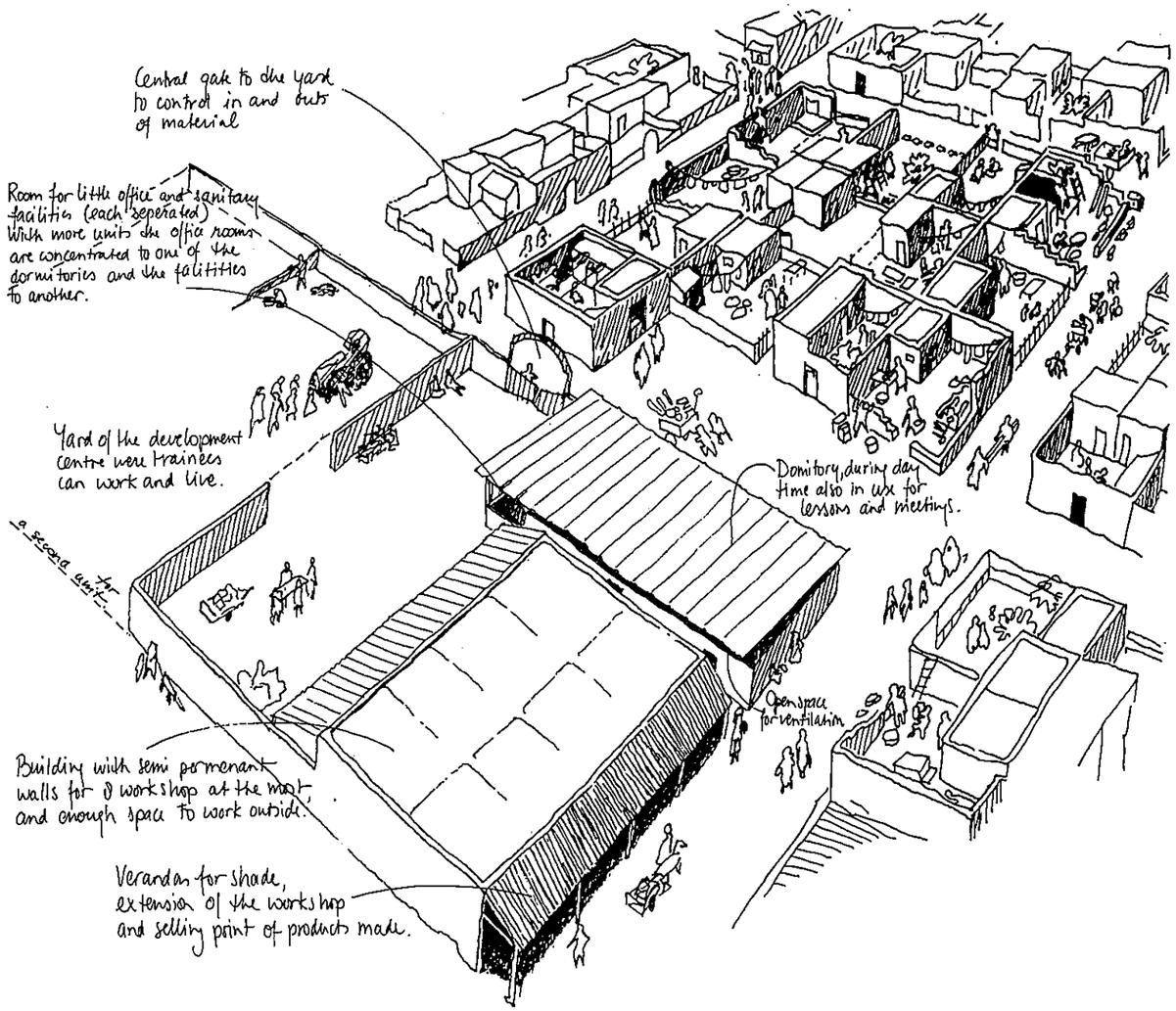
- foreign aid, that is interested in development.

All these participants have their own INTERESTS. Of vital importance is the endeavour to combine those interests, and find some form of co-operation whose activities contribute to the development of the town. The project will aim at exploiting the potential of participants and the town as a whole.

PHASING

For the whole process, the LOCAL SITUATION determines what participants will be involved: trade-unions, town council, churches, aid organisations etc..

In the FIRST PHASE the familiarisation of the participants with the project is of vital importance. General agreements must be made. If some groups actively oppose to this development on selfish or ideological grounds, the centre should be strongly supported by other actors. Ofcourse thei depends of the potential of the centre and the motivation of the trainees. In this phase the SUPPORT of influential bodies like local authorities and development aid organisations are important.



First unit of a training centre for settlers, as a starting point of local development.

In the SECOND PHASE simple shelter and a workshop are built for the reception, registration and training of single settlers. Here the FINANCING and TECHNICAL ASSISTANCE of local organisations and other donors are important. Here the construction can be used that the government obtains a part of the investment capital of national banks. or development-aid organisations it can be usefull to combine some of their budget for individual projects with a local development fund. Technical assistance if available as much as possible from local sources and at the desired level. Skilled people with practical experience are often good trainers. The training may concern any activity that contributes to the development of the town and that is economically feasible. Depending on the local priorities this could be car mechanics, building skills, horticulture, textile handicrafts etc.,but also promising new techniques. As a positive side-effect the centre, in this phase already,can function as a JOBAGENCY (employment office).

In the THIRD PHASE additional workshops will be built by trainees. To become independent of exterior supervision, simple management courses will be started. Commercial initiatives by trainers, but especially the formation of trained PRODUCTION UNITS should be encouraged.

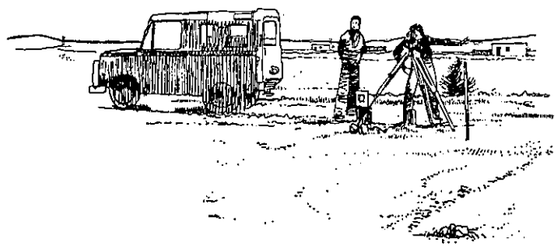
In the LAST PHASE these production units operate from the centre carrying out work on a commercial basis. Trainees are allowed to work in these units for at most one year. During this period they will have their salaries partly paid out in the form of equipment necessary for the execution of their trade, business or job. After this they will leave the centre and settle in town. As a final part of the training, the formation of small co-operatives or private businesses must be supported. Also recovery systems of project funds must get started up in this phase since the production units are generating income.

3. GEDAREF TOWN, SUDAN

The primate city of Sudan is the conurbation of Khartoum and Omdurman. It has a population of more than 3 million inhabitants. Gedaref is a secondary city in the east of Sudan. It is the commercial centre of an extensive agricultural region. The town has now around 160,000 inhabitants but has a high growth rate(6%). Its economy depends basically on agriculture and the presence of several banks indicates that substantial amounts of money are available.Still little investments are made in other sectors. Especially in the building sector profitable investments could be made. These investments are partly blocked by the lack of skilled labour and appropriate building techniques for construction on the black cotton soil with its poor bearing qualities.

PARTICIPANTS

Pastoralists and other rural inhabitants, who no longer find a living in their region of origin, come to Gedaref in the hope to find a job and a place to live. They sometimes find temporary jobs as seasonal labourers in agriculture. This, however, guarantees an income for only a few months a year. The rest of the year these SETTLERS are idle or try to make ends meet by doing odd jobs in the informal sector.



Several people in Gedaref have plans and IDEAS to start their own business. People that work for the government and earn a poor salary, people that have worked in the Gulfstates, small tradesmen etc.. Intelligent people who lack the financial and logistical support to materialize their ideas.

The LOCAL AUTHORITIES of Gedaref have shown on several occasions to be accessible to new ideas despite bureaucratic restrictions.

An important factor is the sensibilisation of the financial world : the influential CHAMBRE OF COMMERCE and the commercial banks. They have already shown interest in investments for the town but will only participate if some guarantee is offered, preferably by foreign institutions.

Economically Sudan is one of the poorest countries of the world and therefore many AID ORGANISATIONS work in this land and donate money for projects. It should be possible to get them interested in the development possibilities of secondary cities as Gedaref.

A LOCAL DEVELOPMENT CENTRE

A FUSION of these actors and ideas will make the start of a development centre in Gedaref feasible. In this city there are good chances that the start of a local development centre will trigger new activities and accelerate the economic development of Gedaref.
Skills that are needed are dealing with car- and machine mechanics for agricultural equipment and lorries, horticulture and well-digging for vegetable gardens and many skills in the building and construction sphere.

BUILDING THE TOWN (AN EXAMPLE)

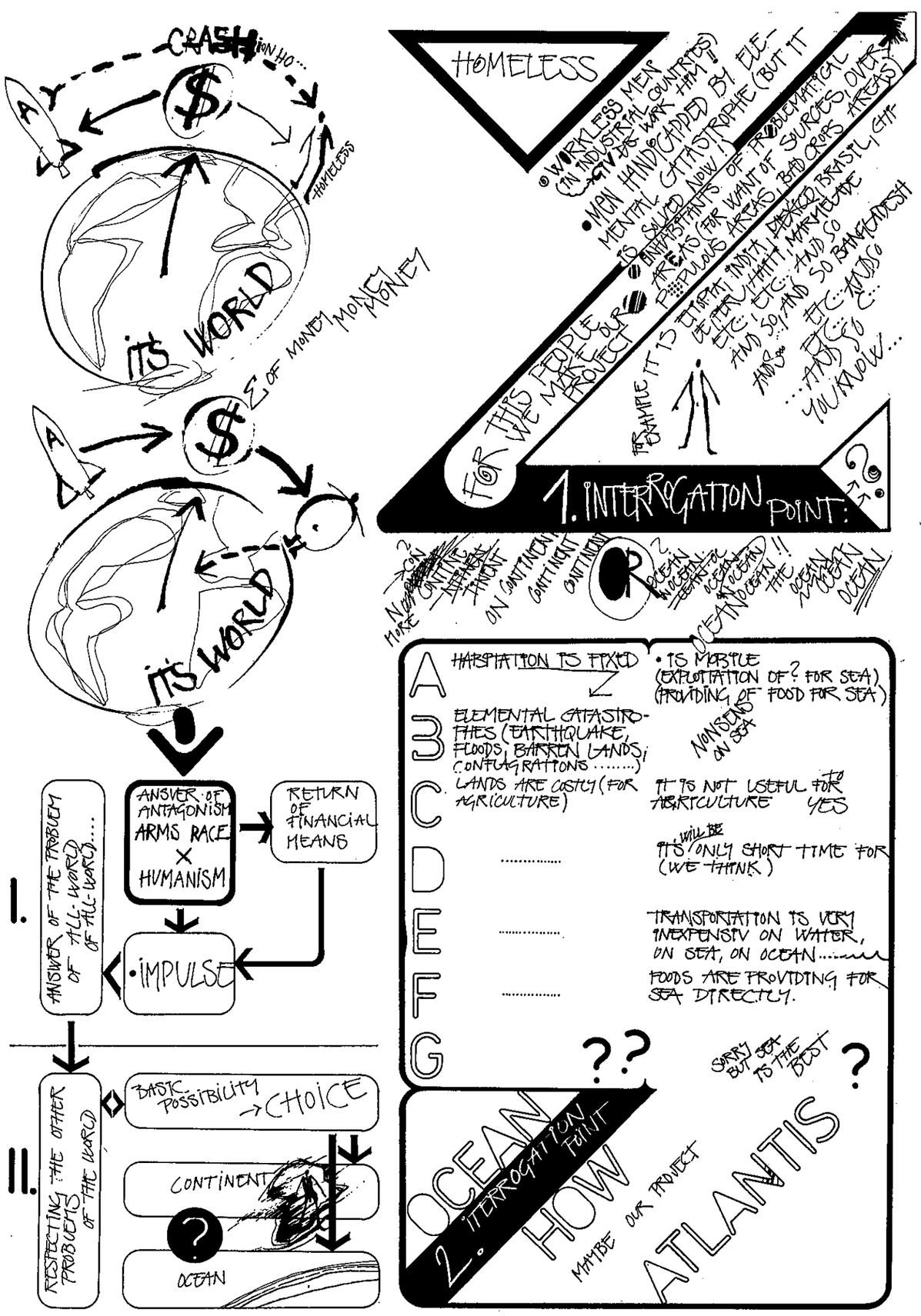
A Sudanese technician, who has worked in Saoudi Arabia, has learned there about a cheap and simple foundation technique for black cotton soils. He goes to the Gedaref development centre for help. He explains his idea and indicates what equipment is nessary. Some survey is done. Gedaref is in need of a simple building system, which makes the production of permanent houses in higher densities possible necessary. If his proposal is deemed to be a feasible project, money is borrowed from the local development fund, furnished by commercial banks and foreign aid. The equipment is made or bought.

In the meantime a group of young single settlers is admitted to the centre where they find very simple shelter and food. They are trained to use the equipment and build foundations according to the new technique. The technician followes a simple management course.

As soon as they have mastered the techniques, the group starts operating from the centre as a production unit. At this point repaying of borrowed money shall start. After one year the production unit will be strong enough to stand on its own feet and the workers will have saved enough money to find or build their own home.

Illustrations: Peter Branfield : Urban Project Manual, Building Research Establishment, UK: Third World Urban Housing, DUT: Gedaref Planning Studies.

dust 1987.


CRASH
$
ITS WORLD
HOMELESS
MONEY
$
ITS WORLD
I.
ANSWER OF THE PROBLEM OF ALL-WORLD OF ALL-WORLD....
ANSVER OF ANTAGONISM ARMS RACE × HUMANISM
RETURN OF FINANCIAL MEANS
•IMPULSE
II.
RESPECTING THE OTHER PROBLEMS OF THE WORLD
BASIC POSSIBILITY → CHOICE
CONTINENT
OCEAN
HOMELESS
• WORKLESS MEN (IN INDUSTRIAL COUNTRIES) → GIVE WORK HIM!
• MEN HANDICAPPED BY ELEMENTAL CATASTROPHE (BUT IT IS SOLVED NOW!)
• INHABITANTS OF FRAGILE AREAS (FOR WANT OF SOURCES OVER FABULOUS AREAS, BAD CROPS, ARGAS)
FOR THIS PEOPLE WE MAKE OUR PROJECT
EXAMPLE IT IS CLIMAT (INDIA, DESERT, BRASIL, CHAD, ETC.; HAITI, MARIGALANTE ETC.; AND SO AND SO AND SO AND SO ETC. AND SO BANGLADESH ETC. AND SO ...AND SO YOU KNOW...
1. INTERROGATION POINT:
?
OR
2. OCEAN OCEAN OCEAN OCEAN OCEAN !! THE OCEAN OCEAN OCEAN
A
B
C
D
E
F
G
HABITATION IS FIXED
ELEMENTAL CATASTROPHES (EARTHQUAKE, FLOODS, BARREN LANDS, CONFLAGRATIONS.....)
LANDS ARE COSTLY (FOR AGRICULTURE)
.....
.....
.....
• IS MARINE (EXPLOITATION OF? FOR SEA) (PROVIDING OF FOOD FOR SEA)
NONSENSE ON SEA
IT IS NOT USEFUL FOR AGRICULTURE YES
IT'S ONLY SHORT TIME FOR (WE THINK) IT WILL BE
TRANSPORTATION IS VERY INEXPENSIV ON WATER, ON SEA, ON OCEAN.....
FOODS ARE PROVIDING FOR SEA DIRECTLY.
??
SORRY BUT SEA IS THE BEST ?
2. INTERROGATION POINT
OCEAN HOW
MAYBE OUR PROJECT
ATLANTIS
ANTARCTIC
1
SMOOTH
2
1. 2.
3
WATER
4
-40°C COLD
WARMTH
5
ITS BOTTOM
HELP

LEGEND - PACE OF ACTIVITIES

1 SETTING AFLOAT BY MAN AN ICE MASSIF IN NECESSARY VOLUME / Ø 1000 M / TO GET FOUNDATIONS OF A NEW „MAINLAND" OF TEMPORARY NATURE

2 TRANSPORT I. / TO A PROPER NORDIC PORT / IN THE COURSE OF WHICH THE SURFACE OF THE FLOE IS TO BE WORKED TO ANABLE A PROTECTIVE SHIELD TO BE APPLIED.

3 CONSTRUCTION OF PROTECTIVE SHIELD / WHEN LYING AT ANCHOR IN THE PORT /
1ST LAYER - REFUSE OF PLASTICS AND THE LIKE.
2ND LAYER - (REINFORCING) REFUSE MIXED UP WITH HYDROFOBIC LIGHT ASH, CEMENT AND THE LIKE. THICKNESS ABOUT 1,5 M.

4 TRANSPORT II. / TO THE PLACE OF DESTINATION IN COASTAL WATERS OF TEMPERATE AND SUBTROPICAL ZONES /. WATER ORIGINATED

5 THROUGH THE EFFECT OF CONCENTRATED SOLAR ENERGY IS TO BE PUMPED OFF FROM THE CORE OF THE ICE MASSIF AND TO BE REPLACED BY A DEEPLY SUBCOOLED MEDIUM. (GAS) FIXING THE THICKNESS OF ICE MASS.

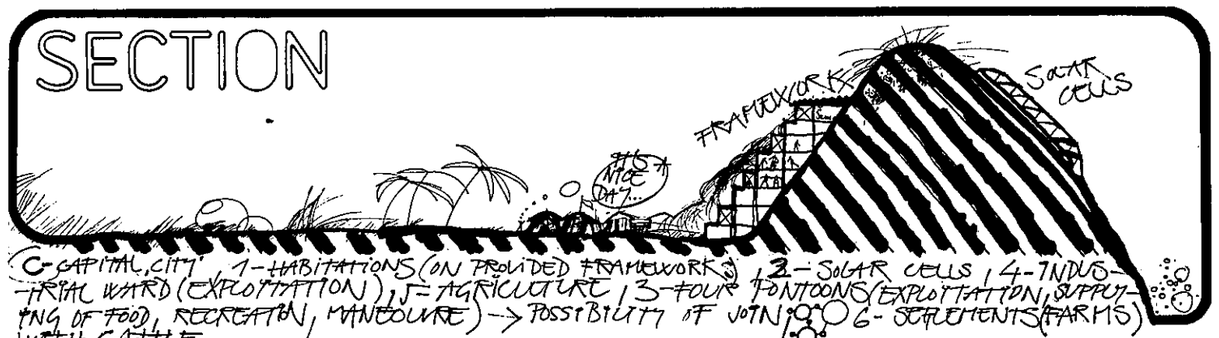
6 SETTLEMEND OF MAN MADE MAINLAND AFTER BEING ANCHORED IN THE PLACE OF NEED (OVERPOPULATED COASTS AND TRACTS OF BIG RIVERS, PLACES OF NATURAL CATASTROPHES, ETC.) (A) PUTTING ON A LAYER OF SOIL OF DIFFERENTIATED THICKNESS (B) INSTALLING SOLAR, WATER, WIND, AND OTHER ESTABLISHMENTS SATISFYING ECOLOGY TO COVER THE DEMAND FOR POWER OF THE NEW MAINLAND. (C) CONSTRUCTION STRUCTURES OF COMPLEX HUMAN SETTLEMENTS (ACCOMODATION - PRODUCTION - RECREATION - EDUCATION) (D) CORRESPONDING SHARE IN THE ECONOMIC AND SOCIAL DEVELOPMENT OF THE WORLD.

PAPER

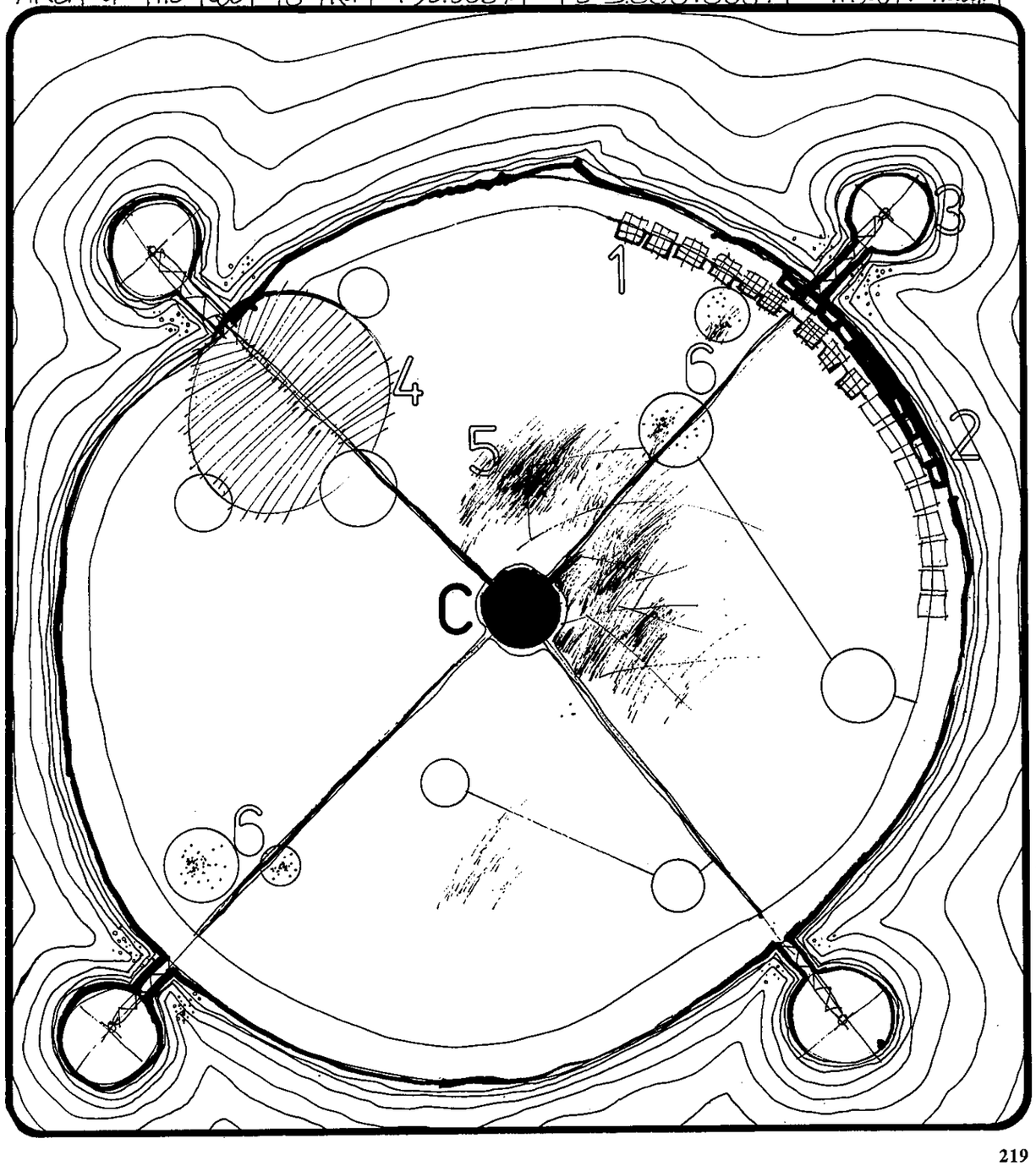
MOTTO: TO BE OR NOT TO BE THAT IS THE QUESTION
/ W. SHAKESPEARE: HAMLET, PRINCE OF DENMARK /

AT THE END OF XX CENTURY MANKIND OCCURS, AS A RESULT OF ITS OWN FAULTS, IN A SITUATION, WHEN IT FACES ITS SUICIDE. OWING TO HITHERTO INCOMPLEX DEVELOPMENT IT FACES THE PHANTOM OF NUCLEAR WINTER MENACING TO END ONCE AND FOR ALL THE EPISODIC EXISTENCE OF MANKIND SO SPORADIC IN THE COSMOS. ● THE PROBLEMS OF MAJORITY OF WORLD POPULATION LIVING IN PENURY CAN BE LOOKED UPON, BUT IN THIS COHERENCE, WHAT IS TYPICAL OF THIS COHERENCE IS ESPECIALLY IRRESPONSIBLE WAIST OF MEANS IGNORING OBJECTIVELY GROWING WORLD DISCREPANCIES. IT IS KNOWN THAT ARMAMENT EXPENSES ALL OVER THE WORLD AMOUNT TO ABOUT 700 BILLION OF U.S. DOLLARS. FOR THE LAST 20 YEARS THE EXPENSES HAVE INCREASED 5 TIMES. IT WOULD BE SUFFICIENT INVEST ABOUT 15% OF THE ABOVEMENTIONED SUM TO ELIMINATE STARVATION, ILLITERACY, AND THE MOST DANGEROUS DISEASES ALL OVER THE WORLD. ● THE DISCREPANCY BETWEEN DEVELOPED AND DEVELOPPING COUNTRIES AS TO THE FORMATION OF GROSS YEAR NATIONAL PRODUCT PER INHABITANT HAS INCREASED TO UNPRECEDENTED PROPORTION (1:135). SWITZERLAND 12 100 U.S. DOLLARS, BANGLADESH 90 U.S. DOLLARS (1970) ● THE SHARE OF DEVELOPING COUNTRIES IN THE FORMATION OF WORLD WEALTH HAS BEEN STEADILY DECREASING. NOWADAYS IT AMOUNTS ONLY TO ABOUT 12% IN SPITE OF THE FACT THAT THERE LIVE ABOUT 70% OF THE WORLD POPULATION IN THEM. FURTHER GROWTH OF POPULATION, HOWEVER, IS TO BE EXPECTED IN THE DEVELOPING COUNTRIES. THAT IS TO SAY THAT THE DISCREPANCES WILL GO ON INCREASING IF THE DECISIVE PROBLEMS OF THE MANKIND ARE NOT TO BE SOLVED FROM NOW ON I.E. (A) LIQUIDATION OF MASSED POTENCIALS OF NUCLEAR WEAPONS. (B) USING FREE MEANS TO ELIMINATE PRESENT DISCREPANCES IN THE WORLD. ● THE SUBPROBLEM OF ABOUT 100 MILLION HOMELESS PEOPLE AT PRESENT CAN BE SOLVED IF PRESUPPOSITIONS IN A AND B ARE FULFILLED. WITHOUT IT IT BECOMES ANOTHER ILLUSION A DANGEROUS DREAM OF ARCHITECTURES, A LOSS OF THE MOST PRECIOUS THING - THE TIME. ● THE DIFFICULTIES OF THE OVERPOPULATED DEVELOPPING COUNTRIES ARE MOSTLY OF QUANTITATIVE NATURE. THAT IS WAY WE, IN THE FRAME OF COMPETITION SECTION V., FORWARD TO YOUR CONSIDERATION THE PROJECT ATLANTIDA. ● THE HEART OF THE MATTER IS IN TEMPORARY (ABOUT 25 YEARS) BUT RELATIVELY IMMEDIATE ENLARGEMENT OF THE SURFACE OF WORLD'S OCEAN. IT IS A TASK ADAQUATE TO THE COMMON EFFORT AND ABILITY OF ADVANCED COUNTRIES. ● ITS REALIZATION WILL GAIN FOR THE MANKIND THE MOST PRECIOUS VALUE - THE LOST TIME IRRESPONSIBLY WASTED BY STICKING TO UNNECESSARY THINGS - PRIDE OF MIGHT AND EXTREME WELFARE. ● THE TEAMS OF EXPERTS ARE ABLE TO WORK OUT ALL CIRCUMSTANCES AND DETAILS OF THE IDEA WE HAVE FORWARDED, I.E. THE IDEA OF GIVEN FACTS OF COSMOS AND CIVILIZATION. 1) CONTINOUS FORMATION OF SOLID MASS ON THE BASIS OF WATER IN POLAR TERRITORIES. 2) CONTINOUS PRODUCTION OF WAIFSTAGE ALL OVER THE WORLD ESPECIALLY PLASTICS. 3) DEVELOPED ABILITIES OF THE MANKIND TO USE POWERS OF NATURE EFFICIENTLY. ● AT THE END OF THE EFFORT THERE IS A NEW MAINLAND BEING THE BEGINNING AND STARTING POINT OF SELF REALIZATION OF OVERPOPULOUS OF DEVELOPED COUNTRIES WITH OR WITHOUT A ROOF OVER ITS HEAD. THERE WILL BE NO APPROPRIATE UPHEAVEL IN THE DEVELOPING COUNTRIES WITHOUT THE EXISTENCE OF A NEW MAINLAND THERE WERE IT IS MOST IMPERATIVE (PROBLEMATIC AREAS). RELYING UPON PRESENT WORLD'S MAINLANDS LEADS TO CONTINUAL WORLD'S CONFLICTS. IT IS THE TASK OF THE MANKIND AS A WHOLE TO HELP TO THE SUFFERING POPULATION OF THE DEVELOPING COUNTRIES TO SETTLE AND EXPLOIT THE NEW MAINLAND CONSISTING OF THOUSANDS OF MAN MADE ISLANDS. ● NOTHING BUT CONCENTRATION OF HUMAN ABILITIES UPON ACTUAL PROBLEMS - THE EXPLOITATION OF OCEANS FOR THE NEEDS OF HOMELESS PEOPLE BELONGS (FOODSTUFS, RAW MATERIALS, POWER, AND FURTHER RESOURCES) WILL CHANGE HAMLETS QUESTION TO A MATTER OF PURE THEORY.

SECTION



C - CAPITAL CITY 1 - HABITATIONS (ON PROVIDED FRAMEWORK) 2 - SOLAR CELLS 4 - INDUSTRIAL WARD (EXPLOITATION) 5 - AGRICULTURE 3 - FOUR PONTOONS (EXPLOITATION, SUPPLYING OF FOOD, RECREATION, MANEOUVRE) → POSSIBILITY OF JOINING 6 - SETTLEMENTS (FARMS) WITH CATTLE
AREA OF THE ISLET IS FROM 750.000 M² TO 3.000.000 M² ABOUT. HOUGH



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CINTUS

UBICACION GEOGRAFICA

INTRODUCCION

COSTA RICA es un paquaño país de poco menos de tres millones de habitantes, con condiciones socioeconómicas bastante acaptables, paro que afronta un considerable déficit habitacional, de aproximadamente 150.000 unidades de viviando.
Su paquaña dimansión y escasos recursos minarales, hacan que el paquaño marcado de la construcción, se circunscriba a materiales tradicionales, locales o de importación haciando sumamanta onarosa la introducción de nuevos materiales y tecnologías, dadas los altos costos iniciales que conllevan.

Por lo antarior y gracias a diversas expariancias vividas, hamos considerado que el mejor aporte a la viviendo social de nuestro país consiste en utilizar los alamanitos tradicionales, con la mayor eficiancia constructiva, madianta sistemas conocidos que no impliquan costos directos o indirectos que encarazcan el valor de las casas.

Ademas, hamos de considerar, que el alto déficit habitacional, se daba fundamantalmanta a la crísis que azota a los países subdesarrollados, dada la escasa capacidad adquisitiva de las clases, más desposeídas, que marecan, como cualquier ser humano, tener a su alcance una viviendo digna.
Dentro de los antariores puntos de vista, nuestros actuales gobarnantes han establecido como objativo principal de su administración, un intanso programa de construcción de casas, tendiente a aliviar las necesidades habitacionales del país y al que asparamos contribuir con esta paquaño aporte.

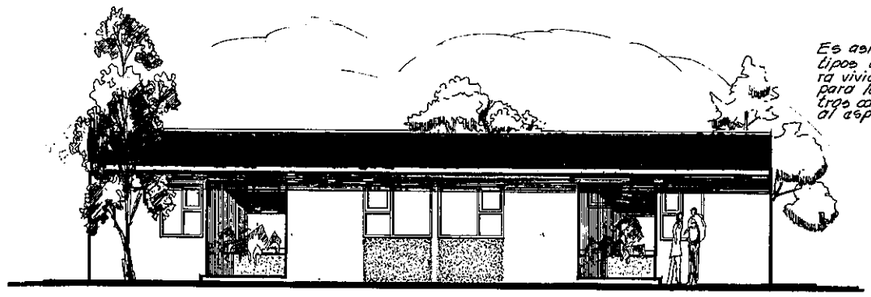
MEMORIA

Aún los más paquaños obras arquitectónicas requieran de un adecuado proyecto, que suministre al usuario del mismo, las mejores condiciones de utilización y viviendo de los mismos.

El desarrollo de proyectos, dentro de un conjunto, parmitan simplificar, haciendo más eficientes los recursos y los procedimientos constructivos, a la vaz que por el uso masivo de materiales y mano de obra, se pueden obtenar mejores precios unitarios a implantar sistemas de construcción que obedezcan a un proceso lineal, respondiendo a los principios de la industrialización, abaliando los costos de mano de obra, racionalizando el uso de los materiales y acortando los plazos de construcción.

Por otra parte, la edificación de conjuntos habitacionales, representa para países en desarrollo, el uso más eficiante del suelo y de la infraestructura básica, así como la posibilidad de diraccionar su construcción hacia los sitios de mayor necesidad, sin que no impliquen costos adicionales al erario, ante la necesidad del suministro de servicios públicos.

En vista de que los soluciones arquitectónicos deban responder, tanto a las necesidades de cada familia, como a la idiosincrasia de sus habitantes, es necesario generalizar y presuponer diversos aspectos para establecer los parámetros de diseño que respondan a una mayoría de los baneficiarios de los proyectos.

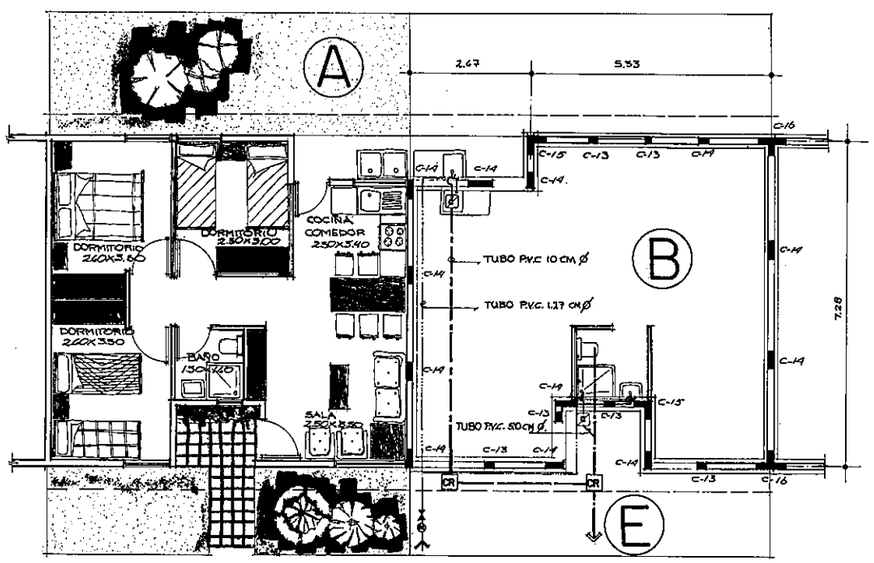


FACHADA PRINCIPAL.
ESC. 1:75.

FACHADA POSTERIOR.
ESC. 1:75

Es así como se establaciarán dos tipos de soluciones: el primero para viviendo urbana, y el segundo para la zona rural, ya que hasta tanto campesinos acostumbrados al espacio abierto, no acepten de buan grado la vacindad inmediata de sus casas.
Por tal razón, este proyecto se concibió librando en una colindancia la parad con el lote contiguo e insinuando esta interna separación en el lindaro contrario con lo que sicológicamente se logra, en principio la solución deseada.

En esa mismo sentido basados en las estadísticas demográficas de la población costarricanse, que establacían un promadio de 2.8 hijos por familia, determinamos como acansar da casa soluciones de tres habitaciones. Así mismo sobre la base de ± 5.000^{m2} (cinco mil colones) por metro cuadrado, de costo de construcción, se concluyó que la relación ingreso-pago de viviendo, considerando un máximo del 25% en el primer rubro, como capacidad familiar, era suficiente, dan los plazos e interesa locales para financiar proyectos de entre 48 y 55 m para viviendas en área urbana y un máximo de 60m en la zona rural, dirigidas a los estratos sociales de más bajos ingresos que demandan de soluciones.



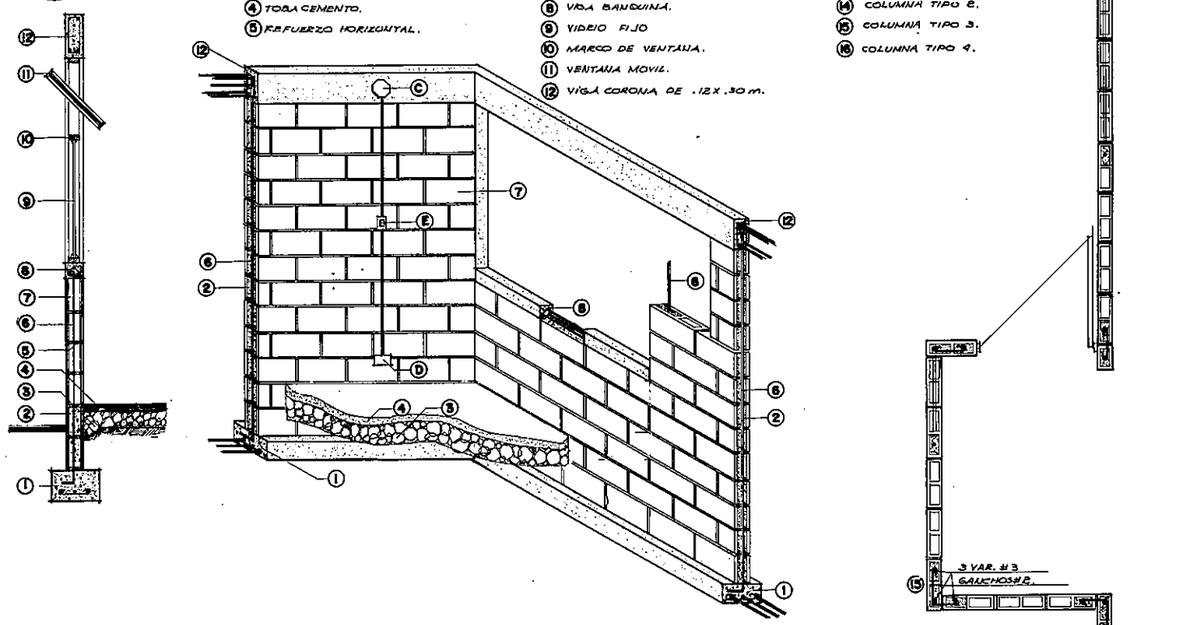
PLANTA DISTRIBUCION ARQUITECTONICA, ESTRUCTURAL Y MECANICA
ESC. 1:75

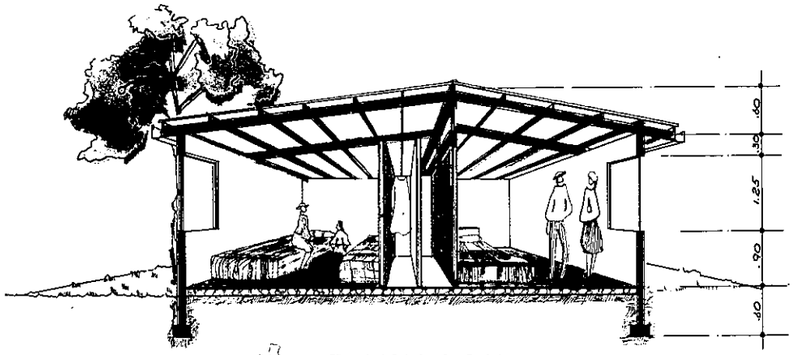
CASA TIPO URBANA.

DETALLES ESTRUCTURALES

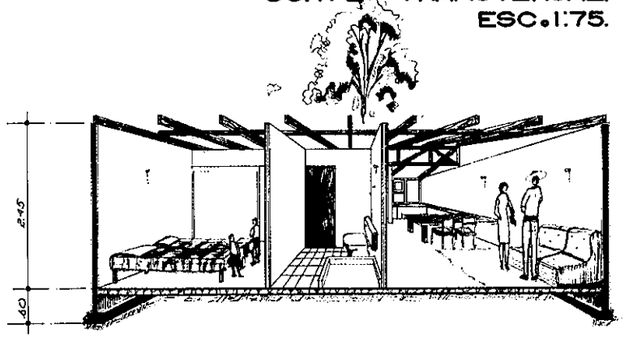
Ⓒ

① PLACA CORRIDA DE .15 X .35 m.
② BLOQUES DE CONCRETO RELLENOS.
③ LASTRE COMPACTADO.
④ TOBA CEMENTO.
⑤ REFUERZO HORIZONTAL.
⑥ REFUERZO VERTICAL.
⑦ BORDE DE CONCRETO.
⑧ VIGA BANQUINA.
⑨ VIDRIO FIJO
⑩ MARCO DE VENTANA.
⑪ VENTANA MOVIL.
⑫ VIGA CORONA DE .12 X .30 m.
⑬ COLUMNA TIPO 1.
⑭ COLUMNA TIPO 2.
⑮ COLUMNA TIPO 3.
⑯ COLUMNA TIPO 4.





CORTE TRANSVERSAL.
ESC. 1:75.



CORTE LONGITUDINAL.
ESC. 1:75.

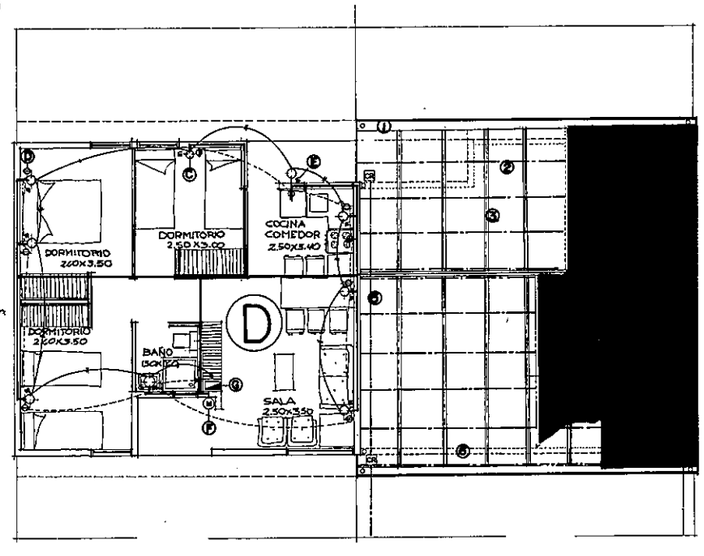
Ⓕ *El mismo principio de modulación, se aplica para la cubierta, de tal forma, que utilizando las medidas tradicionales de los materiales, estos no deban ser cortados o desperdiciados.*

Ⓑ Ⓒ *Una vez establecidos los parámetros anteriores se procedió a conceptualizar los sistemas constructivos a utilizar, orientados a lograr los menores costos con el mejor aprovechamiento de materiales locales, determinados por el uso de: concreto, bloques de concreto, madera, lamina acanalada de hierro galvanizado, perfiles del mismo material y fibro cemento, todos ellos de producción nacional con materias primas locales excepción hecha del hierro.*

Para un mejor aprovechamiento de los materiales se modularon horizontal y verticalmente los proyectos, al elemento básico, rígido, mas pequeño a utilizar que resulto ser el bloque de concreto de 12.x.20.x.40 cm. el que a su vez permite la integración a su forma, de los elementos estructurales verticales, eliminando la utilización de formaletas o encofrados.

Ⓔ *Asi mismo, en lo referente a las redes de instalaciones: eléctrica, Ⓓ de cañería, aguas negras y pluviales, se procuró dar la mayor aplicación a los materiales necesarios, al diseño geométrico del sistema, y su ubicación dentro la edificación, para abatir los costos iniciales y de mantenimiento, dentro de un alto sentido de calidad y seguridad.*

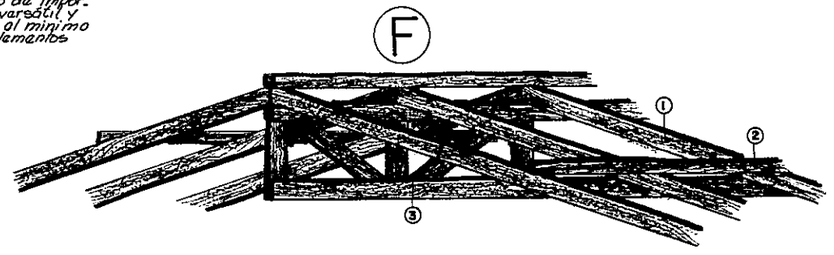
Es asi como el tratamiento de nuestras soluciones arquitectónicas, se basan en la utilización de múltiplos y submúltiplos de los elementos modulares, todos de uso tradicional en nuestro medio, que permitan el desarrollo intensivo inmediato de programas de vivienda, en amplia escala nacional, sin la necesidad de capacitación especializada de personal, a los menores costos posibles actualmente, lo que ubica a nuestros proyectos, dentro del SECTOR II preestablecido por CINVIS



① CAUCA HG # 28.
② CLAVADORES DE MADERA 6.25X2.5cm @1.00m.
③ CERCHA DE MADERA 12.5 X 3.8cm @ 1.00m.
④ CUMBRERA HG # 28.
⑤ TUBO P.V.C 7.6 cm ϕ.
⑥ PROYECCION LINEA DE CONSTRUCCION.
Ⓐ CUBIERTA LAMINA HG # 28. (.81 X 3.66 m).
Ⓑ CUBIERTA LAMINA HG # 28 (.81 X 2.44 m).
Ⓒ LAMPARA TIPO CAN DESCENTE DE PARED.
Ⓓ TOMA CORRIENTE DOBLE.
Ⓔ APAGADOR SENCILLO.
Ⓕ MEDIDOR.
Ⓖ TABLERO DE DISTRIBUCION.

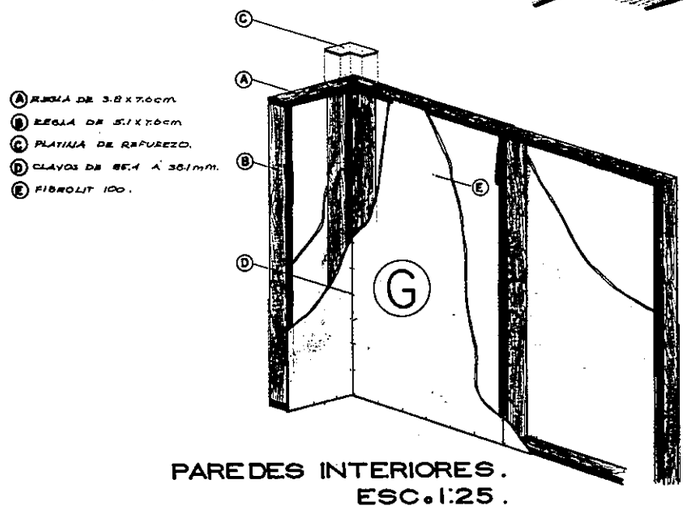
PLANTA ELECTRICA, TECHOS Y PLUVIAL
ESC. 1:75

Ⓖ *Igual principio priva para las divisiones interiores en "Muro Seco" sistema desarrollado localmente a base de fibra vegetal y cemento, que aunque desarrollado, por una empresa multinacional, ha sido fundamentalmente impulsado y promovido, por la división local, en busca de una sustitución al obsoleto cemento asbesto de cuyos componentes era producto de importación. Este sistema es sumamente versátil y adecuado para interiores, reduciendo al mínimo el desperdicio de las placas y sus elementos estructurales.*



F

ARMADO DE CERCHA.
ESC. 1:25



Ⓐ REGLA DE 3.8 X 7.6 cm.
Ⓑ REGLA DE 5.1 X 7.6 cm.
Ⓒ PLATINA DE REFUERZO.
Ⓓ CLAVOS DE 65.4 A 38.1 mm.
Ⓔ FIBROLIT 100.

① PIEZA DE MADERA SEMI-DURA DE 12.5 X 3.8 @ 1.00 m.
② CLAVADORES DE MADERA 0.25 X 2.50 c.m @ 0.65 m.
③ CERCHA ALMERCAVA.

PAREDES INTERIORES.
ESC. 1:25.

SHELTER FOR THE HOMELESS

CINTUS 1986/7 INTERNATIONAL COMPETITION

1 - ON THE PROBLEM

THE NEED FOR HOUSING - A PROBLEM OF EXISTENCE

THE ENERGY AND INGENUITY USED BY ANIMALS IN THE CONSTRUCTION OF THEIR SHELTERS OFTEN AMAZES US. THIS IS A PROBLEM WHOSE SOLUTION IS A CONDITION FOR SURVIVAL. FOR HUMANS THIS PROBLEM IS EVEN MORE CRITICAL, FOR WE KNOW THAT THE NATURAL CAPACITY FOR SURVIVAL OF ANY SPECIES DECLINES AS ITS LEVEL OF INTELLIGENCE RISES. HUMANS CANNOT HIBERNATE IN ORDER TO PASS THE CRUEL WINTER, AS DO THE GREAT BEAR OR SOME TINY CREATURES. ANY INSECT, WE ARE INFORMED BY THE NATURAL SCIENTISTS, HAS A CAPACITY FOR SURVIVAL A THOUSAND TIMES THAN THAT OF MAN. MAN CANNOT, FOR EXAMPLE, CHANGE HIS ENVIRONMENT. EVEN IF IT IS HOSTILE, HE MUST ADAPT HIMSELF TO IT. IF IT IS COLD ENVIRONMENT, MAN REQUIRES ARTIFICIAL THERMAL INSULATION. A SMALL BIRD, WHOSE WHEIGHT IS 50 - 150 GRAMS, KNOWS HOW TO BUILD HERSELF JUST ONE TYPE OF A SUMMER HOUSE: THORNY AND ROUND. WHEN THE THREAT OF WINTER APPROACHES, THIS DELICATE BIRD WILL CROSS THOUSANDS OF KILOMETERS OF DESERT AND OCEAN UNTIL SHE REACHES AN ENVIRONMENT SUITABLE AND AGREABLE TO HER.
INFERIOR CAPACITY FOR SURVIVAL IN A THREATENING ENVIRONMENT AND CLIMATE, DO NOT AFFORD A MAN WITHOUT A HOUSE ANY CHANCE FOR DEVELOPMENT BUT, EVEN IN THE BEST ENVIRONMENTAL AND CLIMATIC CONDITIONS, THE LACK OF HOUSING IS DIRECTLY PROPORTIONAL TO HIGH RATES OF SICKNESS, DRUG ABUSE AND CRIME.
THE FAILURE OF HOUSING IS NOT ONLY A SOCIAL AND MORAL FAILURE, BUT ALSO AN ECONOMIC FAILURE, FOR WE KNOW THAT IN LIVESTOCK FARMING, THE FIRST AND MOST WOTHWHILE INVESTMENT IS IN SHELTER FOR ANIMALS FROM THREATENING CLIMATE AND NATURAL CONDITIONS.

THE PROBLEM WILL WORSEN

THE WORSENING OF THE PLIGHT OF THE HOMELESS IS INEVITABLE. NOT ONLY NATURE, BUT CIVILIZATION, IT WOULD SEEM, IS WORKING AGAINST THEM: THE INDUSTRIES OF LUXURY AND AFFLUENCE HAVE POLARIZED POVERTY. THE SURPLUSES WHICH CIVILIZATION ACCUMULATES ARE WASTED ON ARMAMENTS AND ON HOT OR COLD WARS AND THE TECHNOLOGIES WHICH SERVE THEM. MEDICAL ACHIEVMENTS, FOR EXAMPLE, DO INDEED LENGTHEN LIFE SPANS AND INCREASE THE RATE OF LIVE BIRTHS, BUT, BY DOING SO, THEY DEEPEN THE POVERTY AND WORSEN THE LACK OF HOUSING. A SYMBOLIC AND TRAGIC EXAMPLE OF THIS DISTORTION CAN BE SEEN IF WE COMPARE THE TECHNOLOGIES OF TRANSPORTATION, COMMUNICATION, AUTOMATION AND ROBOTICS, WHICH ARE ALL DEVELOPING ASTOUNDINGLY AND THEIR ACHIEVMENTS SEEM TO MULTIPLY DAILY, WITH THE TECHNOLOGY OF BUILDING, WHICH IS "DEEP-FROZEN"" AND, PERHAPS, EVEN IN RETREAT - BY 2000 - 3000 YEARS SINCE GREECE AND ROME, OR 5000 - 7000 YEARS SINCE EGYPT AND BABYLON; ERAS WHEN BUILDING WAS THE "QUEEN OF TECHNOLOGIES". THE CONCLUSION FROM THIS SITUATION IS THAT EVEN IF SOCIETY WERE TO PLACE THE LACK OF HOUSING AMONG ITS MAIN CONCERNS, AS IS HUNGER, WE WILL STILL NOT BE ABLE TO FIND A SUITABLE SOLUTION IN OUR GENERATION. IT WILL FIRST BE NECESSARY TO CLOSE THE TECHNOLOGY GAP, WHICH HAS MADE BUILDING TOO EXPENSIVE, TOO SLOW AND TOO VULNERABLE TO THE AFFLICTIONS OF NATURE, CLIMATE AND TIME.

LESSONS FROM THE EXPERIENCE

CONVENTIONAL BUILDING TECHNIQUES CANNOT CONTEND WITH THE MAGNITUDE OF THE PROBLEM. THESE TECHNIQUES HAVE EXPLOITED TO SOME EXTENT, EXISTING KNOWLEDGE AND NATURAL MATERIALS IN THE TRADITIONAL VARIATIONS OF EACH COUNTRY BUT THEY HAVE FAILED IN REGARD OF QUALITY (EARTHQUAKES, STORMS, FIRE), ARE TOO EXPENSIVE AND THE BUILDING-TIME REQUIRED IS TOO LONG. (EXAMPLE : A BASIC HOUSE, 50 - 100 M2 IN AREA, REQUIRES A MINIMUM OF 7000 - 13,000 DOLLARS IN BUILDING MATERIALS, IN ADDITION TO 300 - 500 MAN - DAYS WORK). IN BASIC LOW-RISE, BOTH, PREFABRICATED AND INDUSTRIALISED CONSTRUCTION PROVED DISSAPOINTING. ALTHOUGH THEY DID IMPROVE AND CHEAPEN THE FACTORY PRODUCTION OF COMPONENTS, THE QUALITY OF THE FINISHED HOUSE RESULTED INFERIOR DUE TO JOINT-CRACKS AND LOW THERMAL-ACOUSTIC INSULATION. THE VERY HIGH COST OF TRANSPORT WASTES THE BALANCE OF ANY SAVINGS ACHIEVED. (CRANES AND TRUCKS FOR HORIZONTAL AND/OR VERTICAL TRANSPORTATION EQUAL 40 % OF THE TOTAL COST OF THE HOUSE !) WITH NO ADVANTAGE OF EITHER PRICE, OR QUALITY, THE VERY COSTLY PREFABRICATED AND INDUSTRIALISED BUILDING SYSTEMS (EHICH REQUIRE ENORMOUS INVESTMENTS IN FACTORIES AND TRANSPORT INFRASTRUCTURE) CAN ONLY BE JUSTIFIED FOR THE VERTICALLY REPEATED PROCESS OF HIGH-RISE BUILDING. AT THIS TIME, THE FOCUS OF DISTRESS IS PARTICULARLY IN THE AREA OF LOW-RISE BUILDING. (IN DEVELOPING COUNTRIES ALMOST 100 % OF ALL BUILDING IS LOW-RISE AND EVEN IN THE MOST INDUSTRIALISED COUNTRIES IT REACHES 30 % OF ALL BUILDING.). ANOTHER TECHNIQUE WHICH FAILED TO SOLVE THE PROBLEM IS "SELF-HELP", WHEREIN EACH NEEDING FAMILY IS GIVEN, ACCORDING TO ITS SIZE AND THE WEALTH OF THE LOCAL GOVERNMENT, SOME GALVANIZED SHEETS, BOARDS, BAGS OF CEMENT AND NAILS. WITH THESE MATERIALS AND SOME WRETCHED IMPROVISATION THEY CONSTRUCT A MISERABLE SHACK IN THE NEAREST SLUM, TO BECOME PART OF THE MONUMENT OF HUMAN SOCIETY TO SHAME AND DEGRADATION, - SUCH AS CAN BE SEEN ADJACENT TO ALMOST ANY CITY IN DEVELOPING COUNTRIES.

A SOLUTION CHARACTERISED : CONTRADICTING REQUIREMENTS

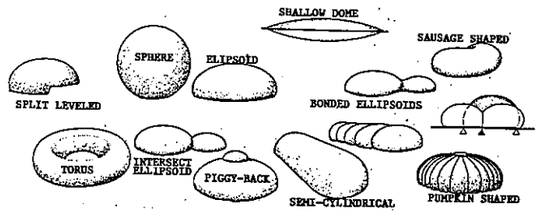
THE **COST** OF CONSTRUCRTION MUST BE REVOLUTIONARY REDUCED (WHICH MEANS MATERIAL AND LABOUR CONSIDERABLY LOWERED, WHILE **QUALITY**, IN EVERY ASPECT, MUST INCREASE (MORE COST IN MATERIAL AND LABOUR ?) **SELF-AID**, TRADITIONAL KNOW-HOW AND LOCAL INITIATIVE MUST BE ENCOURAGED (MEANING MORE IMPROVIZATION, BUT LESS DESIGN AND LESS CONTROLS) THE EXPLOITATION OF NATURAL **LOCAL MATERIALS** (WHICH IS A GREAT FACTOR IN THE ECONOMY, ASWELL AS IN THE ARCHITECTURAL ADABTABTABILTY IN THE ENVIRONMENT) CONTRADICTS THE USE OF HIGH-TECH, AND IGNORES THE ACHIEVMENTS OF PRE-FABRICATION AND, MAYBE NOT LESS IMPORTANT IS THE CONTRAST BETWEEN UNIFORMITY (IN SHAPE-DESIGN) WHICH IS CONTRIBUTING TO THE ECONOMICAL EFFECIENCY OF THE SYSTEM, AND THE **FLEXIBILITY** (IN SHAPE-DESIGN), WITHOUT WHICH, BUILDING CAN NEVER BE **INTEGRATED** IN THE NEIGHBORHOOD, CUSTOM AND TRADITION, TERRAIN AND TOPOGRAPHY, ASWELL AS CLIMATE AND NATURE, PRINCIPLES AND LESSONS THAT SHOULD NEVER AGAIN BE OVERLOOKED.
SUCH A SOLUTION (DEFINED TO LOW-RISE ONLY) IS A BUILDING METHOD DEMONSTRATED HERE (TO BE NAMED HEREIN "METHOD 978512"). THIS METHOD WAS DESCRIBED BY AN EXPERT OF THE "BATTELLE" ADVISARY GROUP (CITATION)...**THIS BUILDING METHOD, USING INFLATABLE FORMS, CAN BE CHARACTERIZED AS "AN INDUSTRIAL PRODUCTION OF HOUSES OF VARIOUS SIZES AND SHAPES, MADE OUT OF DIFFERENT BUILDING MATERIALS, OPERATING ON DIFFERENT SITES, WITHOUT THE NEED OF A FACTORY"... THE STRUCTURES, SHELL-SHAPED, CAN BE ERECTED ON ANY SOIL, ADAPTED TO ANY CLIMATE WITH LOWEST COST.**

2 - A SOLUTION PROPOSED

A LOW-RISE BUILDING SYSTEM

"978512" IS A METHOD OF BUILDING BY MEANS OF INFLATABLE MOLDS. THE SYSTEM IS BASED ON THE APPLICATION OF VARIOUS CEMENTITIOUS MATERIALS, OVER BALLOON-LIKE FORMWORK. IT IS THUS COMBINING THREE FEATURES OF EFFECIENCY: THE SHELL, WHICH IS NATURE'S MOST RIGID AND MOST ECONOMICAL STRUCTURAL DESIGN, THE PNEUMATIC MOLD, WHICH IS THE CHEAPEST FORM -WORK FOR CEMENT (100-200 RE-USES), AND UN-LIMITED VARIETY OF MATERIALS.THIS COMBINATION RESULTS IN THE UNPRECE -DENTED ACHIEVMENTS IN **STRENGTH, COST, SPEED OF CONSTRCTION, AND CLIMATIC PERFORMANCE.**
THIS PROCEDURE CALLS FOR A BALLOON OF ANY SIZE OR SHAPE TO BE ANCHORED TO A SIMPLE LIGHT-WEIGHT FOUNDATION, INFLATED AND MAINTAINED AT HIGH PRESSURE. LAYERS OF CEMEN -TITIOUS MATERIALS ARE THEN APPLIED TO THE SURFACE OF THE BALLOON. WITHIN 24 HOURS THE BLOWERS ARE DEACTIVATED AND THE BALLOON IS COLLAPSED, LEAVING BEHIND A FORMED DOME STRUCTURE. THE WINDOWS, DOORS, ELECTRICAL AND PLUMBING ARE ALL FORMED IN ADVANCE, DURING THE MOLDING OF THE STRUCTURE.

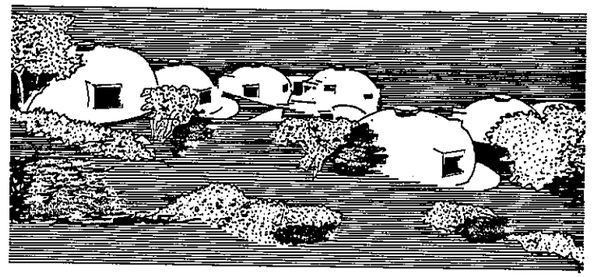
VARIOUS SHAPES OF PNEUMATIC MOULDS "TAILOR MADE" WITH HIGH-TENSILE TEXTILE COATED WITH PVC. INSIDE AIR PRESSURE 400 KG/M2 UP TO 1000KG



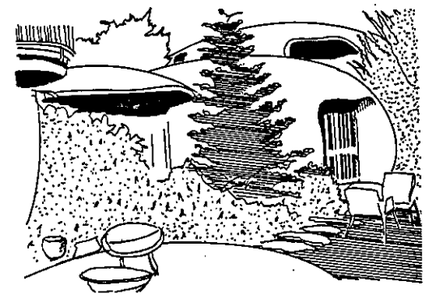
THE STATE OF THE ART APRIL '87

978512 HAS 44 PATENTS GRANTED PLUS MORE THAT ARE PENDING. RESEARCH AND DEVELOPMENT RESULTED IN PRACTICAL PROJECTS PERFORMED SINCE 1970 WHERE THOUSANDS OF STRUCTURES BEEN ERECETED IN ISRAEL, SICILY, BOLIVIA, IRAN ETC. MAINLY FOR HOUSING IN EARTHQUAKE AREAS, BUT ALSO FOR MILITARY, PUBLIC BUILDINGS, SHCOOLS AND KINDERGARDENS, TOURIST RESORTS, HOSPITALS, GYMNASIUMS, HALLS FOR INDUSTRY AND SILOS AND CONTAINERS FOR AGRICULTURE AND INDUSTRY. LATEST DEVELOPM -ENTS INCLUDE LARGE-SPAN SQUARE-FLOORED DOME-ROOFED HALLS, AND MODULAR PRE-FABRICATED PAVILLIONS, MADE OF GLASS REINFORCED CEMENT OR PLASTIC (SEE PAGE 4 HERE).
SCOPE OF EXPERIENCE WITH THIS METHOD COVERS:(A) **INFLATABLE FORMWORK** KNOW-HOW, DESIGN, MANUFACTURE AND FIELD APPLICATION OF AIR INFLATED MOLDS OF ALL TYPES, SHAPES AND DIMENSIONS.(B) DESIGN **AND ENGINEERING** OF DOUBLE-CURVED SHELL STRUCTURES CIRCULAR,ELLIPTICAL, HEMISPHERICAL, CURVILINIEAR AND ORTHOGONAL. JOINING SHELLS, OVERLAPS, INTERSECTIONS AND OPENINGS. EXPERTISE AND EXPERIENCE IN THE ERECTION OF SPACIOUS SHELL FORMED STRUCTURES. STABILITY,FOUNDATION, DETAIL SPECIFICATION COSTING AND SCHEDULING. ON-SITE OR FACTORY PREFABRICATION OF SHELLS, ALSO TRANSPORTABILITY OF SAID STRUCTURES BY LAND, SEA OR AIR (C) **INTEGRATION** OF SAID STRUCTURES IN VARIOUS CLIMATES AND DIFFERENT SOIL AND LANDSCAPE IN EXTREME CONDITIONS SUCH AS 4000 METERS ABOVE SEA LEVEL AT THE ANDES MOUNTAINS OF PERU TO THE DESERT CONDITIONS OF THE PERSIAN GULF (D) **PERIPHERAL EQUIP -MENT** FOR AIR-SUPPORTED MOLDS AND SHELLS: ROTATING SCAFFOLDS, BLOWERS, EMERGENCY BACK-UP SYSTEMS, AUTOMATIC AIR PRESSURE CONTROLS ANCHORAGE FOR EVERY TYPE OF FOUNDATION (E) **MATERIALS APPLICATION*** CEMENT, MORTAR, GYPSUM, NATURAL STONE, BRICK, BLOCK, CLAY BLOCK, MUD BLOCK, G.R.C.GLASS REINFORCED CEMENT, G.R.P. GLASS REINFORCED PLASTICS. POLYIURITHANE, HEAT INSULATION, CONDENSATION, GUNNITE, SHOTCRETE, SPRAY OR MANUAL APPLICATION OF G.R.P. AND G.R.C.

SANVITO LO CAPO SICILY. A VILLAGE RECONSTRUCTED AFTER EARTHQUAKE.



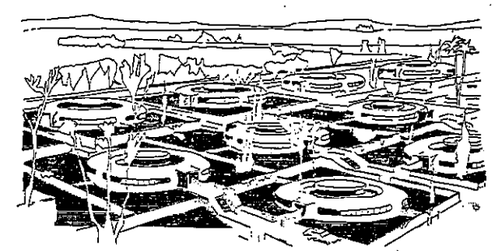
LOW RISE FAMILY HOME

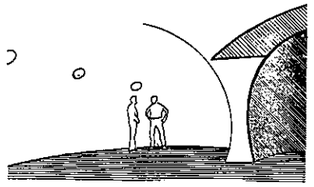


LOW-COST HOUSING PROJECT. EACH OF THESE DOUGHNUT UNITS COMPRISES 4 FLATS WITH NETT AREA OF 68.63 M2 PER FAMILY WITH A LOT OF LAND 156.25 M2. IMBUED WITH AN APPEAL RARELY ACHIEVED IN HIGH-PRICED NEIGHBOURHOODS, THESE UNITS ARE NOT ONLY LESS EXPENSIVE THAN THE LOWEST COST SOLUTION IN SINGLE STORY HOUSING, BUT ALSO PROVIDE ADDITIONAL GAINS: LOWEST IN LAND CONSUMPTION. ANOTHER WONDER OF THE CIRCLE: GREAT IN ROOM, ECONOMC ON LAND.

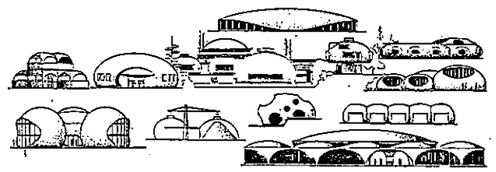
COST AND SPEED ACHIEVEMENTS

EXAMPLE "LOW-COST FAMILY HOME 60 M2". TWO BEDROOMS COMPLETE. WALL-SHELL DOUBLE CLAY BRICK 22 CM.ROOF-SHELL CEMENT SANDWITCH 15 CM = $ 7,000.- US$ 117.-/M2. EXAMPLE COST OF EQUIPMENT (100 RE-USES) MOULD 40 M2 FLOOR AREA, BLOWER, ANCHORAGE, CONTROLS AND CEMENT-SPRAYING MACHINE (FOR HIGH-TECH AREAS) US$ 25,000.- COST PER M2 BUILT-UP AREA = $7.- (SAME EQUIPMENT BUT FOR STONE OR BRICK APPLICATION = $ 4/M2.). SAVINGS IN COST OF CONSTRUCTION AS COMPARED WITH CONVENTIONAL CONSTRUCTION : PUBLIC BUILDINGS SCHOOLS 30% LUXURAY VILLAS 25% . CIVIL-DEFENCE BUNKERS (SKETCH AT BOTTOM) 30% . LOW-COST ANTI-SEISMIC SMALL FAMILY UNITS (IRAN,SICILY,BOLIVIA) 40%. **SPEED OF CONSTRUCTION:** SHELL 40 M2 FLOOR-AREA 3 - 5 DAYS. A 20 MEN CREW, WITH 2 SETS OF EQUIPMENT CAN BUILD 100 SHELLS PER YEAR. ANOTHER EXAMPLE: ONE "SKIN-MODULE" (PAGE 4) 6-40 MM THICK G.R.P. SERVING AS A "SKIN" FOR BRICK OR STONE "SELF-HELP"= $ 500 = $50-/M2

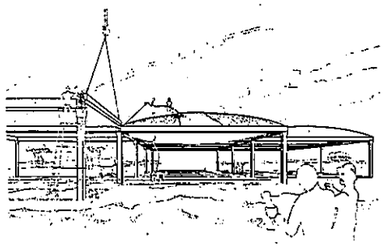




MILITARY APPLICATION: BUNKERS
HIGH-PRESSURE BALLOONS



SHELL STRUCTURES, PRODUCTS OF INFLATABLE MOULDS
DOUBLY-CURVED BUT FREELY DESIGNED TO NEED, TO FUNCTION



A SQARE APPLICATION : INDUSTRY HALLS
SHALLOW ROOF-SHELLS WITH PRE-CAST BEAMS

VARIOUS CONDITIONS CALL FOR DIFFERENT SOLUTIONS
EXAMPLES FROM EXPERIENSE WITH METHOD 978512

A. "TURN KEY" COMPLETE HOUSING PROJECTS (ON SITE CONSTRUCTION)

ORGENIZATION : INITIATED, PLANNED, FINANCED AND CONTROLED BY GOVERNMENTS.
DESIGNED, SPECIFIED, SUPERVISED AND MONITORED BY PROFFESIONAL STAFF.
TENDERED OUT TO GENERAL CONTRACTORS, USING LOCAL LABOUR. NO "SELF-HELP"
SPECIFICATIONS: "CLEVER" SANDWITCH SHELLS. SPRAYED LAYERS OF CEMENTITIOUS MATERIALS TOGETHER WITH LAYERS OF SYNTHETIC INSULATING MATERIALS.
INFLATABLE MOULDS IN COMBINATION WITH PRE-CAST AND PRE-FORMED COMPONANTS
ALL INSTALLEATIONS BUILT IN. COMPLETED TO THE STAGE OF "MOVE-IN"
BUILDING SPECIAL EQUIPMENT: PNEUMATIC MOLDS WITH AUTOMATIC CONTROLED BLOWERS
ELECTRIC SUPPLY OR CURRENT GENERATORS ON SITE.
ROTATING SCAFFOLDS. SPRAYING MACHINES. ALL OPERATED BY QUALIFIED TECHNICIANS.
RESULT EXAMPLE: SOME 4500 M2 OF PUBLIC BUILDINGS BUILT FOR THE MUNICIPALITY OF JERUSALEM 1980. FINAL COST ABOUT $ 500.-/M2 (COMPARED TO CONVENTIONAL CONSTRUCTION $800.-/M2) TIME SAVING (SPEED OF CONSTRUCTION) WAS ABOUT 50 % OF THE USUAL.

B. "SKELETONS ONLY"

THIS VERSION IS A "POOR BROTHER" OF THE PREVIOUS SUGGESTION..
HERE GOVERNMENT SUPPLIES THE FINISHED **SHELLS ONLY.** ALL THE REST IS LEFT TO THE INITIATIVE OF THE USER, SORT OF DO-IT-YOURSELF = "SELF HELP"
EXAMPLE : AFTER THE 1971-1972 EARTHQUAKE CATASTROPH IN SOUTH IRAN (15,000 DEAD) FOUR VILLAGES WERE RECONSTRUCTED BY THIS METHOD (GHIR, HANGUM, CHABIZ, ABU-ASKAR)
FIRST CONTRACT WAS 1000 UNITS ($ 1 MILLION = $ 1000 PER UNIT OF 40 M2 FLOOR AREA)
5 CM THICK, REINFORCED CONCRETE SHELLS ALONE (INCLUDING THE LIGHT FOUNDATION WHICH IS A 40/30 CM CIRCULAR BEAM CAST TOGETHER WITH THE 10 CM CONCRETE SLAB.)
THIS 7 METER DAMETER SHELL LATER COVERED BY "KA-GEHL" BLOCKS (SUN BAKED LOCAL CLAY REINFORCED WITH STRAW) FOR THERMAL PROTECTION IN THE HARSH WEATHER OF THAT DESERT. YOUNG FAMILIES RECIEVED ONE SHELL, LARGE FAMILIES = TWO SHELLS.
$1000 PER FAMILY WAS NOT TOO MUCH EVEN IN 1974, ESPECIALLY FOR A SEISMIC RESISTANT SHELTER, AS IT WAS PROVED LATER, WHEN NEW QUAKES CAME...

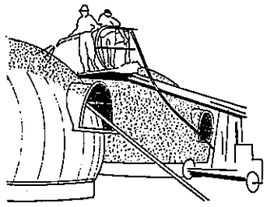
C. "RENT A BALLOON"

ALMOST LIKE RENTING A CAR.... RENT YOURSELF A SET OF EQUIPMENT, FOR JUST A FEW DAYS (THREE TO SIX DAYS, DEPENDING ON SIZE, CLIMATE, ETC.) COMING TOGETHER WITH THE EXPERT. THE EXPERT (WHO IS ALSO A QUALIFIED FOREMAN) WILL PERFORM THE CONSTRUCTION OF THE SHELL, USING THE HELP OF THE OWNER, HIS FAMILY HELP, AND HIS MATERIALS.
ORGENIZATION: ONE CREW OF TWO (2) QUALIFIED PEOPLE, USING TWO SETS OF EQUIPMENT, CAN BUILD 100 STRUCTURES IN EACH YEAR.
ADVANTAGES: SELF HELP HERE IS ALMOST 100% COST IS MINIMUM.
EXAMPLE: SINGLE FAMILY HOUSES ARE NOW BEING BUILT ALL OVER ISRAEL IN THIS METHOD. THE COMPANY RENTING THE EQUIPMENT (INCLUDING THE OPERATOR) CHARGES ABOUT $ 2000 PER HOUSE OF 150 M2. A REASONABLE SOLUTION FOR YOUNG COUPLES WITH LIMITED BUDGET.

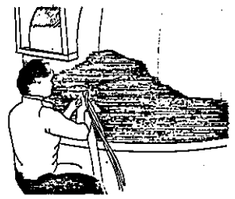
D. "CARRY AWAY A SHELL"

PRE-FAB MODULAR ROOM-SIZE "SKIN" MODULES ARE SUPPLIED FROM A LOCAL FACTORY, WITH OR WITHOUT FILLING COMPONANTS (SEE ILLUSTRATIONS ON THE RIGHT)
ORGENIZATION: A SIMPLE SET OF EQUIPMENT, VERY LITTLE MONEY INVESTMENT, AND SOME TRAINING, ENABLE TO FOUND A SMALL "FACTORY" WHICH WILL BE ABLE TO MANUFACTURE THESE G.R.P.SHELLS , IN ALMOST EVERY VILLAGE.
GLASS REINFORCED PLASTICS CAN EITHER BE SPRAYED OR HAND APPLIED.
FILLING COMPONANTS CAN EITHER BE PRE-CSAT, OR REPLACED BY CONVENTIONAL ART OF BRICK LAYING, STONE OR BLOCK MACONARY, ACCORDING TO THE AVAIABILTY OF SAID MATERIALS, AND SAID TRADITIONS OF BUILDING CONSTRUCTION.
SUCH A SMALL FACTORY CAN ALSO HELP TO SOLVE OTHER EVERYDAY PROBLEMS.BESIDE BUILDING.

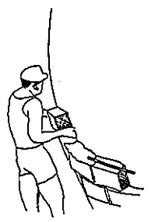
GUNNITE (STANDING ON A BALLOON)
HIGH DENSE CONCRETE (POOR INSULATION)
DRY MIXTURE CEMENT RICH 15 MM STONE



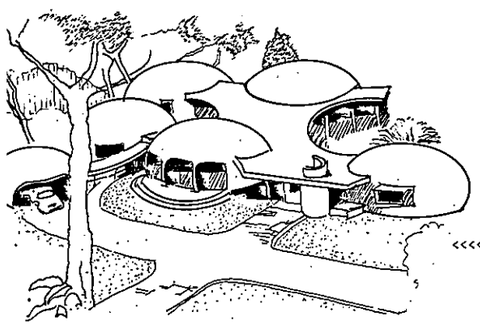
SHOTCRETE OR PLASTER SPRAY
LOW DENSE CONCRETE WITH THERMAL AGREGATES (STYROFOAM BIDS)7 MM STONE



CHOPPER-GUN G.R.P. SPRAY.
GLASSFIBER NEEDLES WITH POLYIESTER
(ALSO G.R.C.WHICH IS "CEMFIL" GLASSFIBER REINFORCED CEMENT. SHELL 6 -10 MM THICK

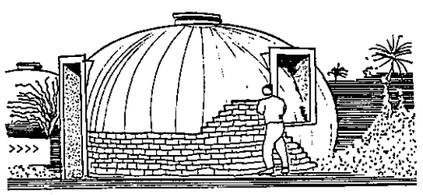


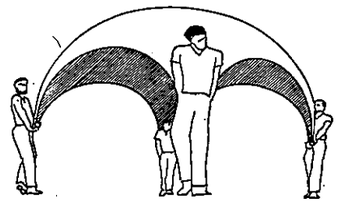
BRICKLAYING TRADITIONAL ART WITH ALL TYPES OF BRICKS. ALSO STONE MACONARY. ALSO BLOCKS.
WITH STEEL BAR REIFORCMENT (ABOUT 1KG/M2)
WALL 13 CM THICK (SIMULTANEOUS INSIDE PLASTER)
OR 25 CM THICK (DOUBLE BRICK)UP TO 2 M HEIGHT
(ROOF SHELL CAN BE A CEMENT SANDWITCH SHELL)



<<<<LUXURY VILLA

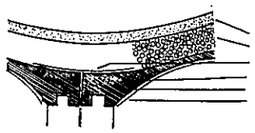
"RENT A BALLOON" >>>>



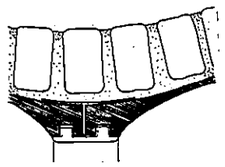


PRE-FAB MODULAR ROOM-SIZE G.R.P. "SKIN" MODULES

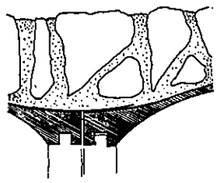
WEIGHING PER UNIT 150 KG. COST $ 500 . NEEDS NO CRANE.
STRONG ENOUGH TO BE HANDLED AND CARRY ANY LOAD: STONE ETC.
FLXIBLE ENOUGH TO BE PACKED IN "STACK" 6-12 ON A TRUCK.
MODULAR GRID DESIGN 3.2 x 3.2 M ASSEMBLED LIKE "LAGO" TOYS.
INSULATION AND EXTERIOR FINISH, SEE ILLUSTRATIONS FOLLOWING



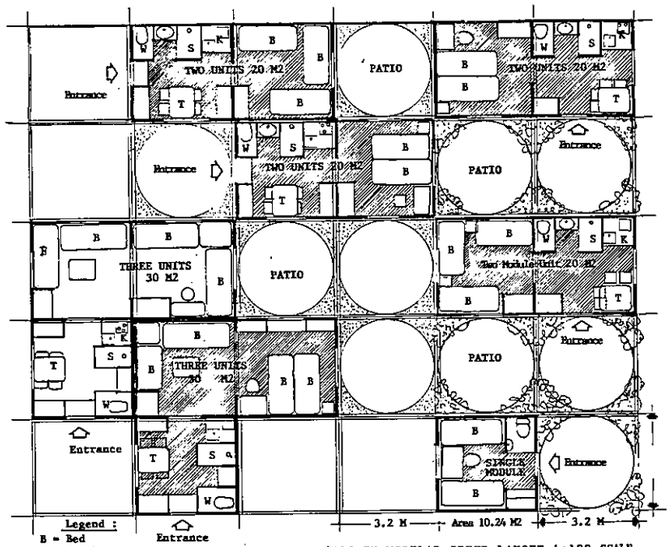
"HIGH-TECK" SANDWITCH FINISH :
EXTERIOR ACRYL-CEMENT STUCCO SPRAY 1 CM
FOAMED POLIURITHANE 2 CM SPRAY
PLASTIC ADHESIVE TAPE 20 CM WIDE
G.R.C. "SKIN" MODULE. 6 CM SHELL
(EDGES 4x4 CM REINFORCED)
INTERIOR ACCUSTIC PLASTER 1 CM



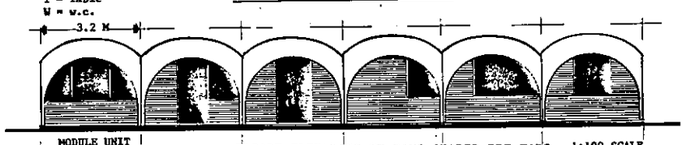
BRICK AND MORTAR FINISH
THE G.R.P."SKIN" MODULE IS WATERPROOF
IT IS STRONG ENOUGH TO SERVE AS A MOLD TO LAY THE BRICKS ON. THE ARCHED BRICK STRUCTURE TOGETHER WITH THE G.R.P. SHELL CREATE A STRONG AND INSULATED HOUSE.



RUBBLE STONEWORK FINISH
LIKE THE BRICK FINISH ABOVE.WITH MORTAR.
ALMOST ANY KIND OF STONE CAN BE USED.
ROCKWORK REQUIRES A LARGE QUANTITY OF MORTAR, AS MUCH AS 1/3 OF THE VOLIUM.
ALSO BLOCKS CAN BE USED WITH MORTAR.
ALSO "KAGEL" (SUN-BAKED STRAW REINFORCED LARGE-SIZE 40/50/60 CM)IN CERTAIN AREAS.



GRP FABS IN MODULAR GREED LAYOUT 1:100 SCALE
SINGLE UNIT, DOUBLE UNITS, TRIPLE UNITS.

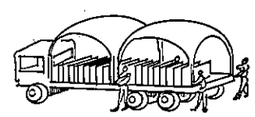


FACADE ELEVATION OF DOME-SHAPED PRE-FABS 1:100 SCALE
WITH OPENNINGS FILLED WITH PRE-FAB ELEMENTS

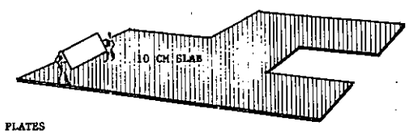
SPECIFICATION : DOME STRUCTURE, FACTORY MADE. GLASS REINFORCED PLASTICS. ERECTED ON CONCRETE SLAB. ON-SITE APPLICATION: FOAMED POLYURITHANE AND ACRYL CEMENT STUCCO (40 MM). WALLS PRE-FABRICATED ELEMENTS: POLYESTER PANELS COATED WITH GRC GLASS REINFORCED CEMENT 80 MM THICK.

GRP BUNGALOWS 978512 °SYSTEM

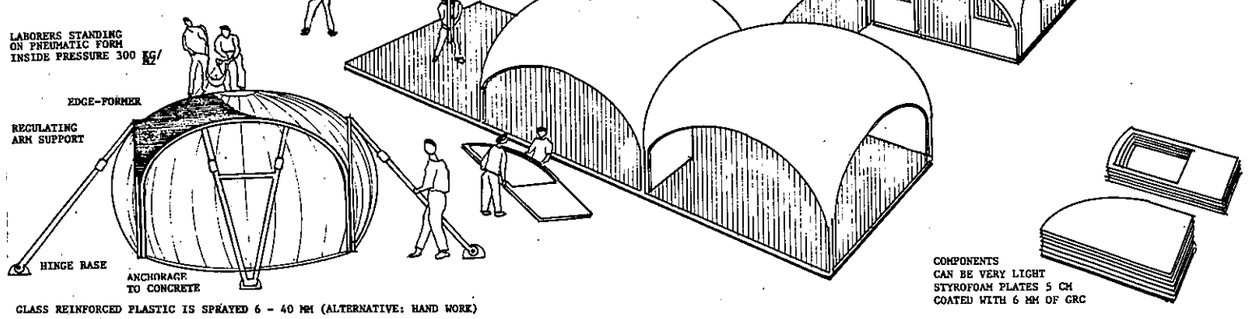
A PRODUCTION PLANT
A SMALL WORKSHOP "FACTORY"
WITH MINIMUM EQUIPMENT
EACH BALLOON MAKES 2 UNITS DAILY



MODULES CAN BE PACKED IN "STACK" LIKE DISH PLATES



ERECTION IN - SITu
"SKIN" MODULES ARE BROUGHT TO SITE
BY WHICLE AND BY HAND (150 KG EACH)



GLASS REINFORCED PLASTIC IS SPRAYED 6 - 40 MM (ALTERNATIVE: HAND WORK)

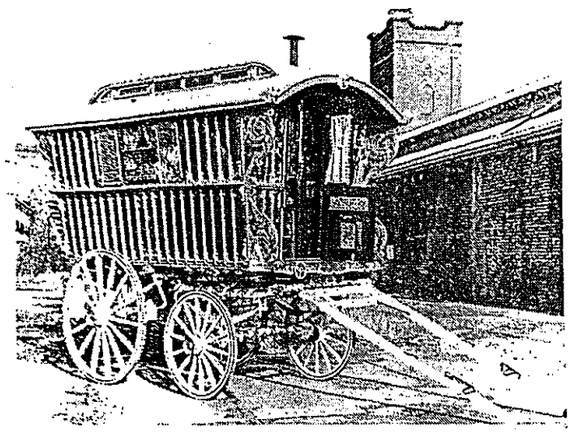
COMPONENTS
CAN BE VERY LIGHT
STYROFOAM PLATES 5 CM
COATED WITH 6 MM OF GRC

31228354

INTERNATIONAL UNION OF ARCHITECTS

INTERNATIONAL COMPETITION FOR SOLUTIONS ON NEW TECNOLOGIES FOR SOCIAL HOUSING

TITLE: THE GYPSIES' HABITAT



SECTION: V

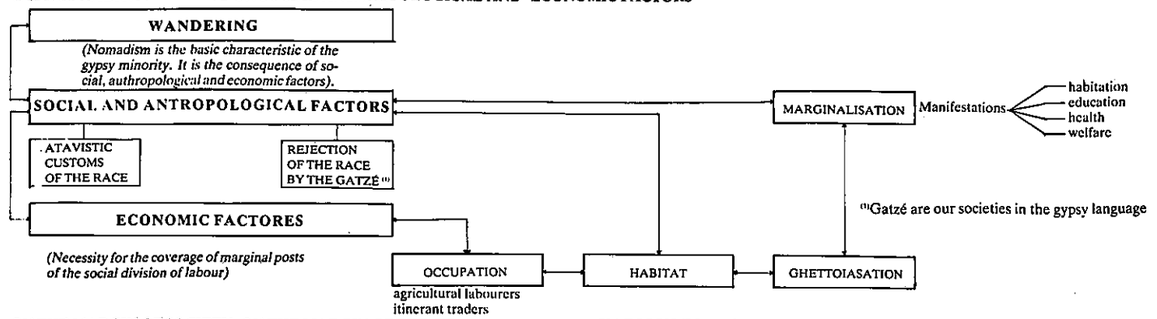
IN GENERAL

Today in Greece, there are about 150.000 gypsies. 140.000 of them are permantly or seasonally homeless.
PERMANTLY HOMELESS: Do not have any home anywhere in the country and are often travelling, searching for work.
SEASONALLY HOMELESS: Leave their homes for a greater or smaller period searching for work in other parts of the country.

GYPSIES NATIONAL AND SOCIAL ORGANISATION

The gypsies themselves consider that they have their own national and social organisation based on the tribe, the clan, the family, in any case ON KINSHIP.

GYPSIES HABITAT DEPENDS ON SOCIAL ANTHROPOLOGICAL AND ECONOMIC FACTORS



ON THE MARGIN OF SOCIETY, ON THE MARGIN OF THE CITY

Gypsies camp: - ***in the areas of the cities or villages around which they work***
- ***by national roads***
- ***on public or private property near rubbish dumps***

They lodge in: - ***tents***
- ***shacks***

They live: - ***in miserable conditions***
- ***in continuous fear of police***
- ***under harassment***
- ***without water, W.C. etc.***

THEY HAVE NO OPPORTUNITIES OF ORGANISING THEIR HABITAT IN FREE AREAS, IN HUMAN AND HEALTHY CONDITIONS. THEY ARE ALWAYS UNDER HARASSMENT

THE ENCAMPMENT IS CONSIDERED AS:

a congregation of families based only on kinship. Usually it is a clan composed of permanently or semi-permantly established families or seasonal ones, or both together.

an organised territory having its own «harmony based on»:

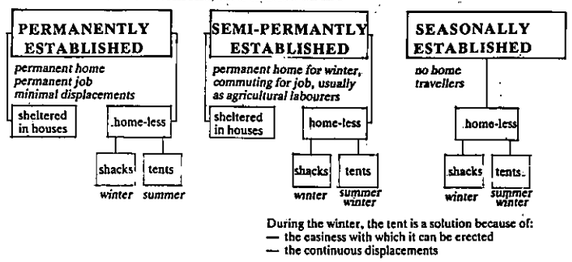
* the habital organisation which constitutes the basic cell of the territorial «tissue».
* the articulation of terretorial «tissue» based on kinship of families in encampment.

The *«centre»* of the encampment is the tent or the shack of the leader, by which usually, is the coffee-bar and the grocery.

HABITAT, from the ecological cultural standpoint, is **THE WHOLE OF THE ENVIRONMENTAL AND OTHER CONDITIONS THAT ALLOW THE EVOLUTION OF LIFE AND THE ARTICULATION AND EXPRESSION OF VARIOUS OPERATIONS IN THE SPACE.**

VARIOUS FORMS OF SETTLEMENTS

Although, nomadism is a basic characteristic of the gypsy minority, there are various forms of settlement, and modes of life



During the winter, the tent is a solution because of:
— the easiness with which it can be erected
— the continuous displacements

Habitat has no determitated limits in the surroundings of the *«shell»* nor is, there any clear distinction between the private and the public space. The privacy is adapted to the sociability.
The «inside» has a real continuity with the «outside» and viceversa.
THE HABITAT IS DIFFUSED INTO THE ENCAMPMENT. The *«shell»* is only included in the habitat. The kind of shell changes from tent to shack and viceversa, as the weather changes or when moving becomes necessary. When spring comes, Gypsies come out of the *«shell»*. They want to live in the open air. It is an atavistic custom and this is the authropological and cultural condition, on which is based the above mentioned organisation of their habitat.
In conclusion, **THE HABITAT OF GYPSIES IS THE WHOLE SPACE OF THE ENCAMPMENT. IT IS ALL THEIR OWN HOME.**

HABITAT ≠ **SHELL** but **HABITAT** = **SHELL** + **SURROUNDINGS** + **LITTLE TRUCK**

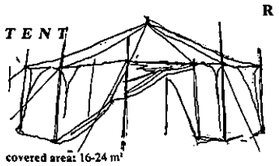
tent or shack — **so, HABITAT ENCAMPMENT**

Although the habitat, as indicated, is, in the same way, organised by all gypsies, there are some divergences between tribes, clans, deriving from cultural divergences which exist (sheme No 1). Different forms or dimensions of the shell appear, or different functions are carried out «inside» and «outside» of the shell.

SOME EXAMPLES AMONG THE MOST IMPORTANT TRIBES IN GREECE

R O M

T E N T



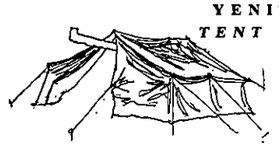
covered area: 16-24 m²
structure: metallic wooden.
non bearing structure: canvas
during the summer, usually all the sides of the bearing stucture are opened.

SHACK

covered area: 18-25m²
structure: wooden, truss and ridge board: wooden
non bearing structure: the sides from nylon(1)
the roof: calvanised steel sheets or wooden
the only opening: the door
(1) The nylon is nailed on the wooden stucture on both sides inside and outsides and so it functions as an plant nursery during the winter.

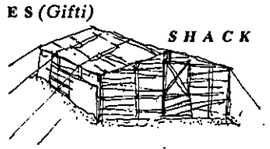
Y E N I T S E S *(Gifti)*

T E N T



covered area: 12-18m²
structure: metallic or wooden
non bearing structure: canvas
During the summer one or two sides of the non bearing structure are opened.

S H A C K



covered area: 15-22m²
structure: wooden
non bearing structure: sheets of wood or other materials as calvanised steel sheets (C.S.S.)
Roof: C.S.S.
The only opening: the door

LESS DEPENDENT on the Gatzé life and habitation

* The ground plan of the shell tends to be circular as was the *«shell»* of primitive man.
* It is one room as was the primitive one.
* No tables, beds, chairs etc.

MORE DEPENDENT on the gatzé life and habitation

THE GIPSY HABITAT IN HISTORY

from 14o cent.	tent	cavern	under bridges	fortress	cart	—	*(living in groups) travelling in groups)*
Today in Greece	tent	shack	—	—	small truck	house	*(non necesserely travelling in groups) (living in groups)*
Today in Europe	—	self constructions(1,2)	—	—	caravan(1)	house	»

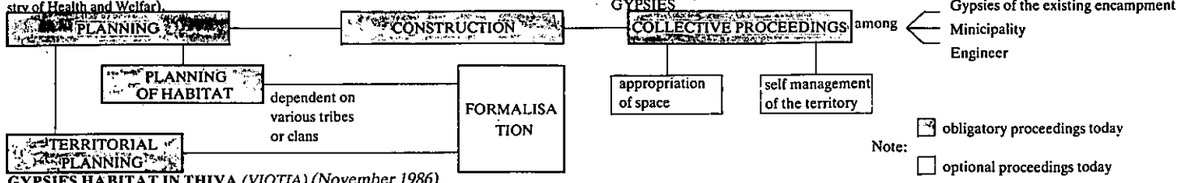
IT SEEMS TIIAT THE CARAVAN IS DEVELOPED TO THE CART (1) in organised gypsies' sites (2) *(in minimal cases from common materials found on the market)*

P U R P O S E

GIVING THE RIGHT OF HABITAT TO HOMELESS GYPSIES, *that means:*
FREE ENCAMPMENTS IN SPECIALLY DESIGNED AREAS, HAVING THE NECESSARY EQUIPEMENT FOR LIVING IN HEALTHY CONDITIONS
CONSEQUENTLY, NO MORE POLICE HARASSMENTS
MASS PLANNING AND MASS CONSTRUCTING OF HABITAT
FREE CHOISE OF ANY KIND OF SHELL BY GYPSIES THEMSELVES (caravans or selfconstuctions)
IN ANY CASE, GIVING TO GYPSIES THEMSELVES THE CHANCE FOR CHOISE BETWEEN THE TWO WAYS OF LIFE: permanent establishment in houses, or nomadic life in «habitat»

REQUISITES
— No policy of intervention or assimilation of the gypsy minority.
— Lessening of racial discrimination
— Sensitivisation of local authorities for the acceptance of gypsies Habitat in their territory.
— Legislative arrangements:
* *The low A5/696/FEK 243/11.5.83 of Ministry of Health and Welfar for the provision of gypsy encampments must be modified at some points:*
* *The designed areas must not be located at great distances from the city*
* *They must not be hidden*
* The lifting of the proibition on the right to use small trucks to draw caravans is also nesessary. *The low 281/FEK/84/A/73 must be modified. There are no tecnical obstacles.*

THIS MODIFICATION IS ABSOLUTELY NECESSARY. The small trucks (DATSUN) are not only a means of family transportation. It is also a means of livehood.
IT IS AN INDISPENSABLE ADAPTATION OF THE EUROPEAN EXPERIENCE TO THE GREEK REALITY OF TODAY
For those homeless Gypsies who want to aquire a house, the terms for obtaining a loan must be adapted to their reality and pecularity. They have no social insurance stamps (Loans from Organisation for labourers houses). They are not naturalised so they can not prove that they are in need. (Loans from Ministry of Health and Welfar).



GYPSIES HABITAT IN THIVA *(VIOTIA) (November 1986)*

The first habitat in Thiva, is designed after the territorial planning of habitats for all the Region and in Thiva also. It is designed for a clan of Roms. Two other ones must be designed in Thiva for different clans who are lining now separately and they want so, in future.

The construction was decided on by the Council of the Minicipality of Thiva. Then it was incorporated into the SANT programme, and initially, a funding of $120.000 was given. It occupies an area of 28.000m². 80 pitches (posts) are provided for permantly, semi-permantly established and seasonal families.

SOME DIRECTIONS FOR PLANNING
* The planning must be «flexible»
* Minimal traces of operations in design on territory
* Traffic of vehicules is not absolutely compatible with the habitat organisation.
* Equipment is a point of reference between families in a neighborhood and corresponds to the functions that express sociability.
* Different designed areas for permanent and seasonal families.
* Zones of trees separate them.

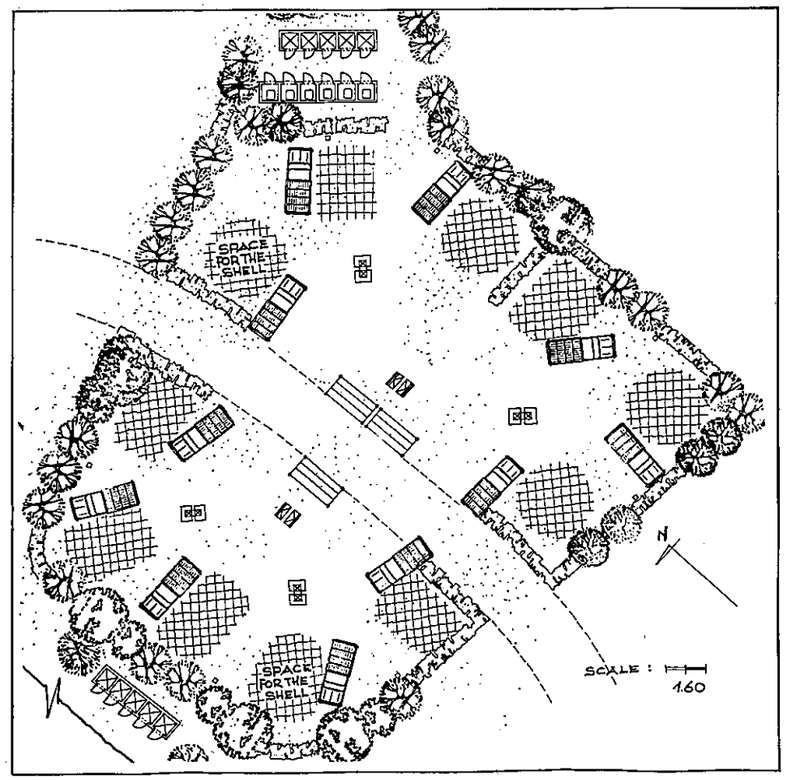
FINDINGS
* common residence of the 3 different groups (only some natural or artificial obstacles separate them)
* The permanent families usually live together with the semi-permanentv ones.
* They find themselves all together at the grocery and coffee-bar.
* The number of families who want to be in neighborhood varies, but it is not less than 3 or 4.
* The articulation of the territory of the permanents depends more on egological conditions, orientation etc, than the seasonal ones.
* The articulation is in groups.
* The operations carried out don't leave any traces on the territory.

PRINCIPLES OF PLANNING THE GYPSIES HABITAT
HABITAT ENCAMPMENT, so, PLANNING OF HABITAT PLANNING OF ENCAMPMENT
* *RESPECT FOR GYPSIES ECOLOGICAL AND CULTURAL TRAITS and more specificately, FOR THOSE DIFFERENTIATED ELEMENTS OF THE DIFFERENT TRIBES AND CLANS.*
* *ADAPTATION TO THE DIFFERENT FORMS OF SETTLEMENT OF THE GYPSIES WHO WILL USE THE HABITAT PREREQUISITES*
* *COLLECTIVE PROCEEDINGS IN PLANNING AND CONSTRUCTION OF HABITAT, BETWEEN THE USERS THEMSELVES THE LOCAL AUTHORITIES AND ENGINEERS.*
* *THE DISIGNED HABITAT MUST BE VERY CLOSE TO THE EXISTING ONE. (used by the gypsies, now)*

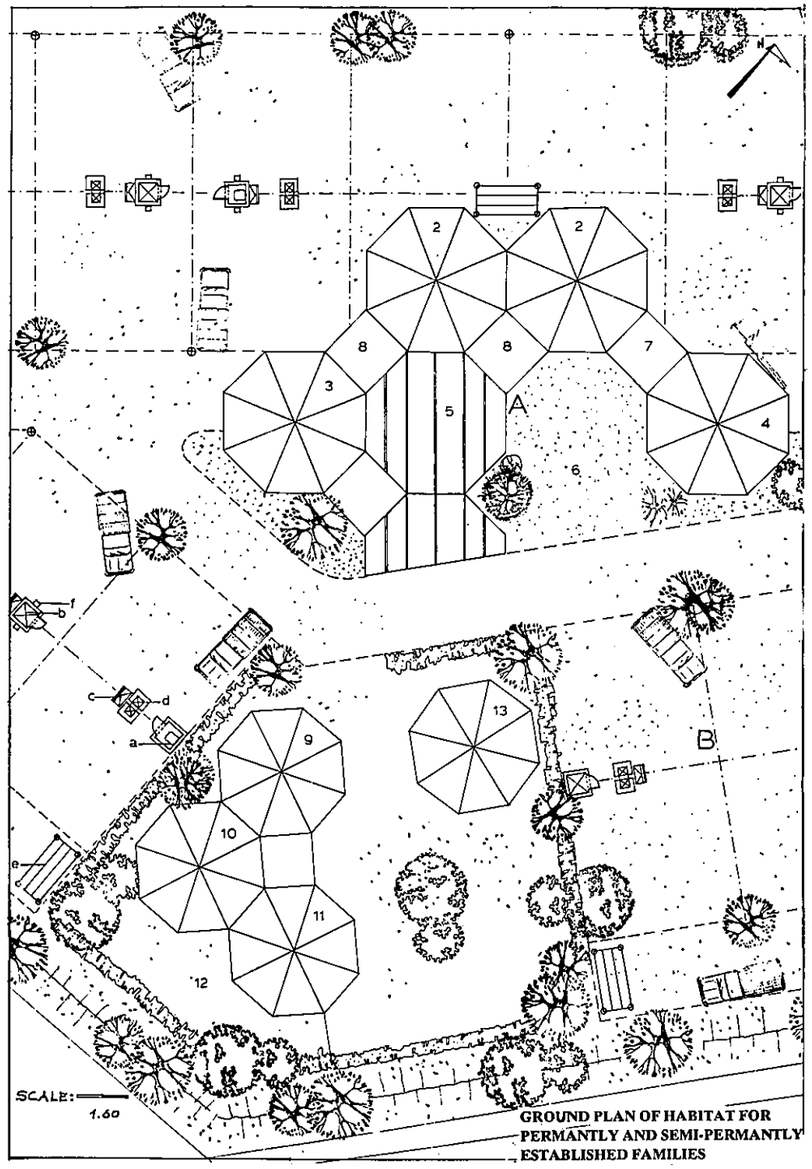
QUESTIONS OF MANAGEMENT
* RESPECT FOR THE KINSHIP FOR THE CHOISE OF THE POST IN THE DESIGNED AREA FROM ANY FAMILY
* IF POSSIBLE, PARTECIPATION IN MANAGEMENT BY GYPSIES THEMSELVES
* *Consequantly:* preservation of cleanlisess conservation of equipment
* CONTINUOUS COLLABORATION BETWEEN LOCAL AUTHORITIES AND GYPSIES

An one year study has been carried out on
* The total of families that live together
* the lenght of their residence
* the functions of life and habitat
* the articulation on territory

Various surveys have been carried out on the use of the space by the 3 differents groups (permanent, semi-permanent, seasonal) during the different seasons.



GROUND PLAN OF HABITAT FOR SEASONAL FAMILIES



GROUND PLAN OF HABITAT FOR PERMANTLY AND SEMI-PERMANTLY ESTABLISHED FAMILIES

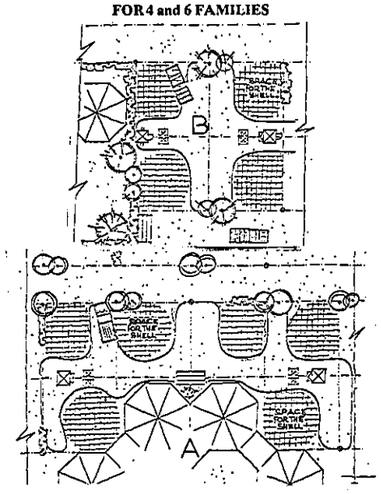
HABITAT INCLUDES:
1. office - reception
2. multi-purpose hall
3. coffee bar
4. grocery
5. semi-open space
6. open - air parlor
7. infirmary
8. W.C. and storeroom
9. preleminary school for children who have problems to the regular schools
10. pre-school
11. sheltered plant - nersery
12. plant - nersery in open air
13. dinning room

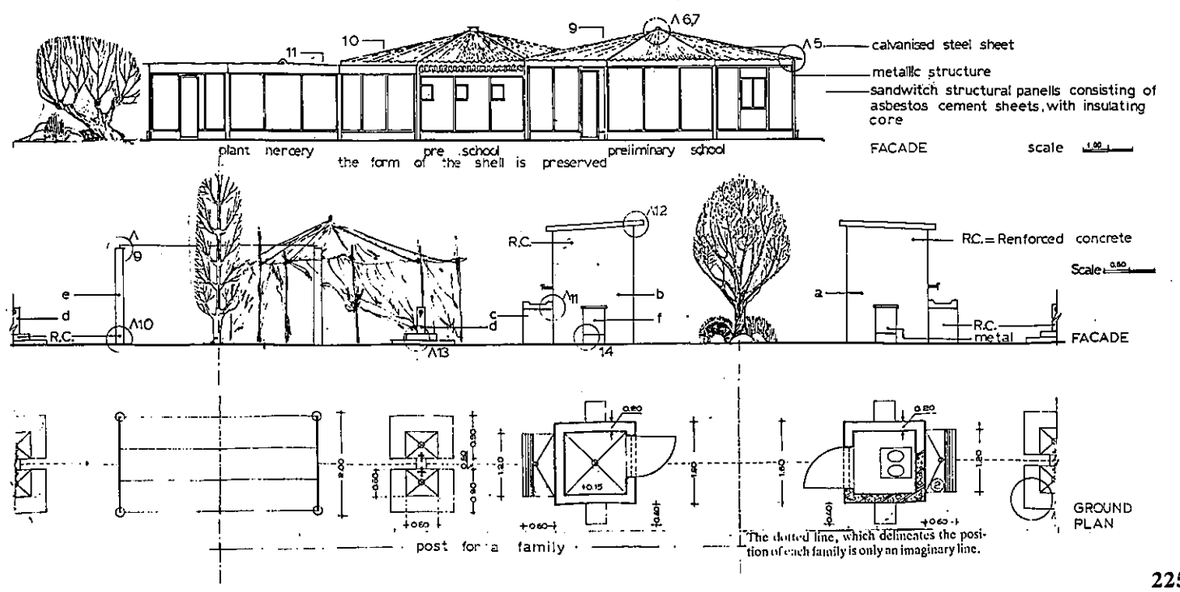
There are also uncluded stores, parkings for great trucks sheltered area for repairing the vehicules.
a. W.C.
b. shower
c. basin for washing cloths
d. spring
e. a place for streching cloths
f. a place for throw rubbish

The space for every family is determined by trees, electricity poles and the equipment.
It includes the *«shell»*, the small truck, the surroundings. The surroundings is a semi-public space which belongs to the total or the families who are in neighborhood.
In this space, some operations are carried out, such as: *washing (clothes and dishes) cooking, relaxing, sleeping, working etc.*
The dotted line, which delineates the position of each family is only an imaginary line.

SUPPLIES:
Electric supplies
Net-work piping
Fire fighting
The sewage treatment will be with the method of septic tunk.
The ground support has been constructed with the standards of athletic terraine, so that the rain-water shall be absorved.

EXAMPLES OF PROBABLE ORGANISATION FOR 4 and 6 FAMILIES





"Sorry I can't ask you in!"

Dublin Opinion 1931

INTERNATIONAL UNION OF ARCHITECTS, U.I.A.

Contribution for the United Nations International Year of Shelter for the Homeless

IYSH

INTERNATIONAL COMPETITION FOR SOLUTIONS

SECTION V

1.

PRIVATE RENTED ACCOMODATION

A STUDY OF DECLINE

INTRODUCTION

This study examines the relationship between "Homelessness" and the decline in the stock of privately rented accommodations and puts forward proposals for the revitalisation of the sector as a means of reducing the problem of "Homelessness".

THE HOMELESS

The kinds of people and the reasons for their homelessness are many and varied and there is evidence to believe that the problem is on the increase in Ireland.

WHO ARE HOMELESS ?

- Families.
- Single men and women of all ages.
- Single or separated parents who have left home with or without their children.
- People who have left Institutions (e.g. prisons residential child care, psychiatric care).
- Children who are neglected and who don't feel part of their family or community.
- Single persons who have migrated to large cities in search of work.

WHY ARE THEY HOMELESS ?

- Family problems.
- Marital problems.
- Violence.
- Drug abuse.
- Alcohol problems.
- Gambling.
- Losing or not having a job.
- No money.
- Eviction.
- Rent arrears.
- Awaiting social welfare payments.
- Bereavement.
- Pregnancy.
- Lack of information.
- Lack of support when leaving psychiatric hospital, prison or residential care.
- Natural disaster, e.g.. fire, flood etc.

SURVEY BY 'FOCUS POINT' GROUP

Year - September 1985/September 1986..

Number of homeless requesting assistance:	889
Number recently homeless:	706
Number living in Hostels:	178
Number preferring to live in Hostels:	25
Number preferring to live in the community:	664
Month of February 1986	
"New" arrivals in Hostels:	392

Increase in Homelessness = 14 PERSONS PER DAY!

2.

PRIVATE RENTED SECTOR - DECLINE

There are three basic forms of tenure in Ireland:

1. OWNER OCCUPIED.
2. LOCAL AUTHORITY RENTED.
3. PRIVATE RENTED.

THE PRIVATE RENTED SECTOR PROVIDES HOMES FOR MANY PEOPLE WHO CANNOT FIND ACCOMODATION ELSEWHERE AND IS VERY OFTEN A LAST REFUGE FOR THOSE ON THE VERGE OF HOMELESSNESS.

This sector has shown a CONTINUED DECLINE over the years.

FACTORS CONTRIBUTING TO DECLINE

- RENT CONTROLS
- SLUM CLEARANCE
- DISADVANTAGEOUS TAX POSITION OF PROPERTY OWNER
- LACK OF SUBSIDIES

DOMINANT FACTOR - RENT CONTROLS

Rent Controls introduced as a temporary measure during World War I to combat rent increases due to housing shortages. Controls continued by a series of Acts and permanent control was introduced in 1960. Act of 1960 amended to produce the 1967 (Amended) Act. New Housing Bill prepared and submitted to the Supreme Court in 1981.

RESULTS OF CONTROLS

Controlled rents were set and maintained at a level so low that property owners were unable or had no incentives to maintain their properties. Controlled tenants enjoyed protection from eviction and the benefit of very low rents but had to endure dwellings of very poor physical condition.

OUTCOME OF CONTROLS

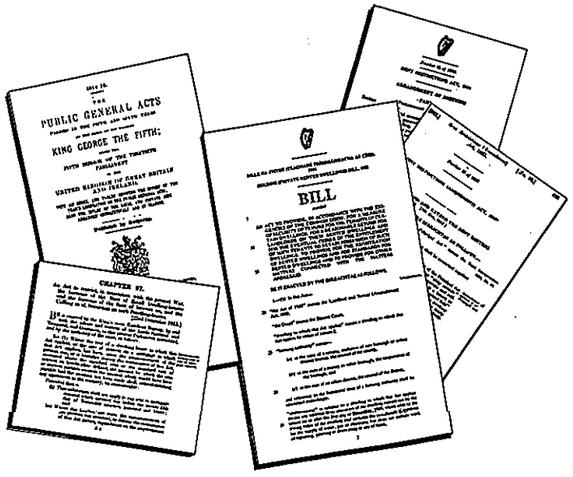
Supreme Court Decision (June 1981) declared parts of the 1960 Act to be *UNCONSTITUTIONAL.*

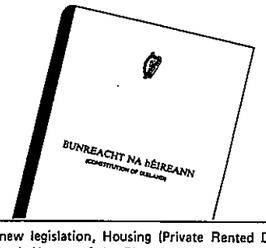
Supreme Court Declaration (February 1982) proclaimed parts of the 1981 Bill to be *UNCONSTITUTIONAL.*

STATISTICS

1899/1900	In Ireland and England the vast majority of dwellings were privately rented.
1914	Surveys show that 88% of dwellings are in the Private Rented Sector.

1946 (Census)		1979' (DoE Estimate)	
Owner Occupied	52.6%	Owner Occupied	76.1%
Private Rented	26.1%	L. A. Rented	11.8%
L.A. Rented	16.5%	Private Rented	10.4%
Other:	4.7%	Other:	1.7%
No.of Private Rented = 172,952		No.of Private Rented = 90,168	
1971 (N.E.S.C. Estimate)		1981 (THRESHOLD Estimate)	
No.of Rent Controlled 45,000/50,000		No.of Rent Controlled 31,500	





The new legislation, Housing (Private Rented Dwellings) Bill, 1981, was passed by both Houses of the Oireachtas but was then referred to the Supreme Court by the President in order to test its Constitutionality. In a judgment delivered on 19 February, 1982, the Court declared that Section 9 of this Bill, which would have allowed for rebate of rents for a five year period after the passing of the Bill constituted "an unjust attack on the property rights of landlords of controlled dwellings and would, accordingly, be in contravention of the provisions of Article 40, section 1, subsection 2 of the Constitution".

"What! Another Election? Are the slums goin' to be abolished all over again?"

Dublin Opinion 1927

INTERNATIONAL CONSIDERATIONS

The concept of a *"RIGHT TO HOUSING"* was spoken of at the League of Nations in the 1930's. After World War II the General Assembly of the United Nations adopted and proclaimed the "UNIVERSAL DECLARATION OF HUMAN RIGHTS", which incorporates the concept of a *"RIGHT TO HOUSING"*.

UNITED NATIONS

Universal Declaration of Human Rights. Article 25 of the Declaration commences as follows:
"Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing, and medical care and necessary social services.

NATIONAL CONSIDERATIONS

Efforts must be made to halt the decline and encourage the growth of the PRIVATE RENTED sector in Ireland for the following reasons:

- The sector houses a great variety of households.
- It provides shelter for those who cannot get shelter elsewhere.
- Alternative forms of tenure have not developed significantly.
- The demographic structure is at variance with other European countries.
- Third level activities are concentrated in a few urban centres.

Threshold then does see a long-term future role for private rented accommodation, or for some alternative tenure form which retains the many favourable assets of private rental which currently makes it attractive to so many households, as the only means of entering the housing system for many others; and as a last refuge for those households who cannot find shelter elsewhere.

REFERENCES:

THRESHOLD	Private Rented - The Forgotten Sector
FOCUS POINT	Towards a Settlement Strategy
HOUSING CENTRE	The Need for Social Housing
FOCUS POINT	Being Young and Homeless
D. DONNISON	The Case of the Single Homeless
CHERISH	Housing Policy as it affects Single Parents and their Children
THRESHOLD	Revitalisation and Decay in the Private Rented Sector
DUBLIN OPINION	

THE WAY FORWARD

In 1982 the voluntary group THRESHOLD produced a report entitled "PRIVATE RENTED - THE FORGOTTEN SECTOR", which examined this problem in great detail and made comprehensive recommendations for the future development and improvement of this sector.

It identified the major changes necessary as follows:

- *AMEND THE CONSTITUTION*
- *DEVISE A COMPREHENSIVE HOUSING POLICY.*
- *MODIFY DEVELOPMENT POLICY BIAS*
- *IMPROVE TENANCY SECURITY*
- *RESTRUCTURE HOUSING FINANCES*

THRESHOLD asserts that, although extra public expenditure would be required, much could be achieved by the reforming and redistribution of the existing system of Public Housing Finance, and it makes this important summary statement:

The objectives of such reforms must be to provide a legislative framework which maintains a fair balance between the interests of tenants and landlords so that the existing stock of private rented dwellings is maintained and standards improved; that this stock is added to as required; that the sector can contribute effectively to meeting housing needs and requirements and evolve into social forms of housing in the context of a housing policy which maintains the right to housing as its prime objective.

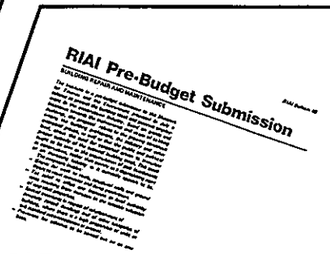
Threshold now recommends that strong consideration be given to revising the Constitution to include an Article guaranteeing the right to housing and that this should be seen as the first step towards devising a housing policy which would spell out in unambiguous terms the implications of the Constitutional guarantee.

The right to housing, quite clearly, alters the objectives of housing policy from an emphasis on the enlargement of the housing stock and improvement of the general housing situation to stress also the improvement of the living conditions of individual members of society. Accordingly, housing policy would then be evaluated not only on the basis of changes in the overall housing situation but also in terms of its effectiveness in dealing with individual situations and in improving conditions for specific groups of the population, especially those experiencing greatest hardship.

The policy bias in favour of building new housing in greenfield areas and of comprehensive housing redevelopment in the inner city as a means of bringing about higher standards overall needs to be modified so that greater efforts are made to bring obsolete and dilapidated dwellings up to standards comparable to those in new houses. Present policies and legislation are also lacking in that they fail to initiate adequate rehabilitation and improvement in the private sector.

It calls for the setting up of a system for regulating rents, for greater control over standards, the elimination of all forms of harassment and illegal evictions and the subsidisation of the housing costs of tenants, among others. Various new administrative structures are also proposed which would bring greater efficiency in the allocation of dwellings and justice in resolving the conflicting interests of landlords and tenants.

An immediate priority would be to restructure the whole system of housing finance so that subsidies going to housing are clearly based on need and not on tenure. Such need should be identified in all housing tenures and not just in owner-occupation and local authority housing.



SOLUTIONS FOR SOCIAL HOUSING

A. CONCEPT

In order to promote any scheme in a third World country education programmes are essential.

The first programme is to encourage people to acquire a "Self-Help Ethic". This could be promoted by the government of the country to create the climate for provision of shelter.

The accompanying advertisement for " A Sweet Home for Common Man" appeared in a Bombay newspaper in January, 1987 and is a perfect example of the "Self-Help Ethic".

BUILDERS TRAINING CLASS FOR SLUM DWELLERS AND TENANTS OF DILAPIDATED BUILDINGS, FIRST TIME IN INDIA, ORGANISED BY

'A SWEET HOME FOR COMMON MAN'

A Sweet Home for Common Man is a charitable Institution formed by K. K. Krishnan, Managing Director of K. K. Krishnan Construction Co. Pvt. Ltd., Builders for Common Man, and Capt. Prakash Kadam and others. In 1987, The International Year Of Shelter for The Homeless, we dedicate ourselves to give BUILDERS TRAINING to 1,000 slum dwellers and residents of dilapidated buildings, to organise all of them into co-operative housing societies and to start the actual construction of 1,000 buildings before the end of 1987. The BUILDERS TRAINING CLASSES will be conducted in Marathi by C. B. Bandekar (Chartered Architect), S. D. Chandane (Dy. Collector Retd.), A. N. Kale (Executive Engineer, BMC), A. R. Khatkhate (Consulting Engineer), G. D. Pawar (Supdt. of Land Records, Retd.) and Wasudeo S. Sathaye (Advocate & Notary) on 18.1.1987 at Samarth Vidyalaya, Kalina. Registration for first 250 Builder Trainees open upto 12.1.1987. Slum Dwellers and Tenants of Dilapidated Buildings: If you have the will power you can construct sweet homes for you and your friends. We appeal to you to awake, arise and organise and depute your representatives to register for Builders Training before 12.1.1987.

K. K. Krishnan, President, and
Capt. Prakash Kadam, General Secretary,
A Sweet Home For Common Man,
1, Sujata Apartments, Manipada,
Opp. Vidyanagari, Kalina, Santacruz (East),
Bombay-400 098. (Tel: 6123131)

The World Bank since 1972 has promoted a "learning by doing" programme which has reached into all third world countries with great success.

The fast economic and physical growth of cities has brought about a strong demand for shelter, water, sanitation, transportation and communications.

This has taken the form of upgrading existing settlements or developing new sites and services. The essential components of these schemes are the government commitment for their integration into urban planning and for the guarantee of land tenure. It is also essential that projects recover their costs.

Shelter programmes should have standards low enough to be affordable by the poor. This is a challenge to existing building codes and existing traditions. The rationalisation of government approvals is imperative before a scheme commences.

B. PLANNING

Shelter projects comprise existing settlement upgrading and new settlement projects.

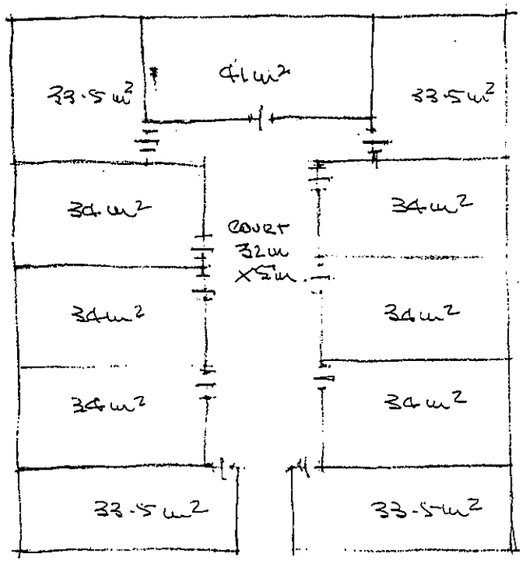
Existing settlement projects have political overtones. Such items as water supply, sewerage, electricity, roads and pedestrian path ways should be upgraded and clinics and schools included. The provision of credit for land tenure and construction should be made available.

New settlement projects are for people who have no existing home. These people are to be encouraged to construct their own homes on serviced sites. This can only be achieved by the provision of essential infrastructure and social services and easy access to loans to purchase land and finance construction. There will be basic design criteria for site size, height limits, type of construction and finish. Financial more than political considerations dominate in this instance.

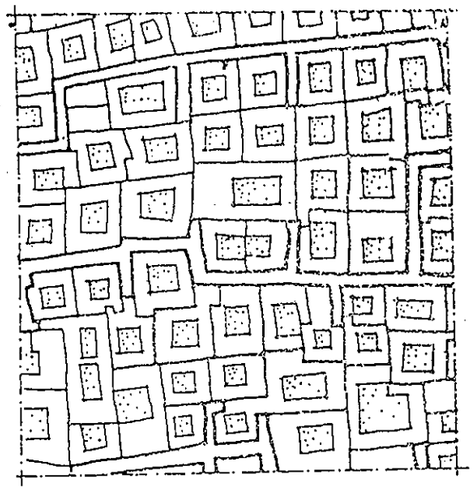
The two alternatives for financing each scheme are " outlay equals revenue" and " City tax imposition". It is important from the financial aspect to include commerce and industry participation as they will help subsidise the scheme and provide employment.

A co-operative scheme would be the vehicle for each settlement with shares allocated for existing land or realisable assets or participation. The only entrance to the scheme would be by shares. As with all co-operatives, loans are to be re-paid in a set period and will be financed by the Government, possibly through the World Bank.

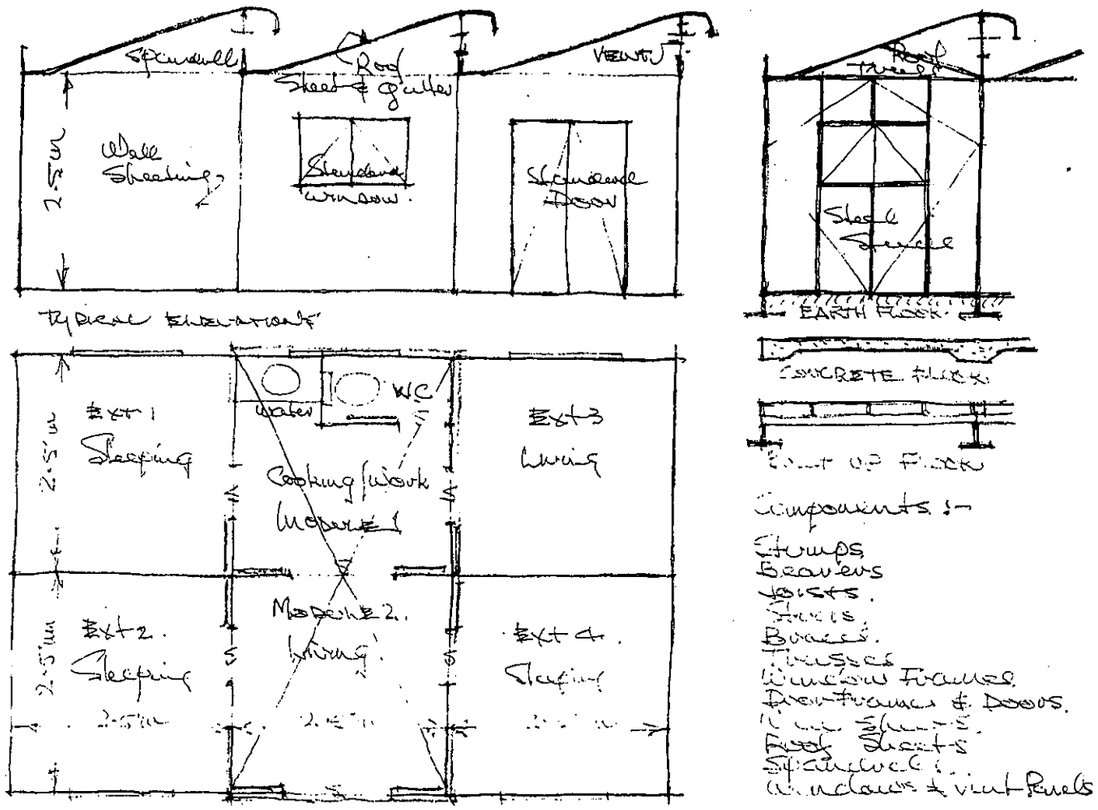
Settlements for slum upgrading will vary according to region as the two diagrams indicate. One is for an Arabic "Madina" dominated by pedestrian environment and planning for climate. The other is a typical scheme for slum upgrading in India making use of common walls and internal courtyards.



Typical Units in Indian Resettlement Scheme grouped around courtyards & sharing common walls



'Madina' with houses clustered in such a way to produce shade & protect from cement.



For new settlements the solution lies in small components able to be purchased from a co-operative by the owner/builder. The use of lightweight plastic or steel framing and panels (which is a new use of an existing technology) is recommended.

The above diagram shows a scheme based on a core unit of 2 modules each 2.5 m x 2.5 m, one comprising a living/sleeping area and the other a toilet/working/cooking area. Further modules may be added as finance permits.

C. MATERIALS

The materials to be used in the construction of existing settlements would depend on cost, availability, climate and social acceptance. As the participants are very low income earners the greatest facto. will be cost.

One would anticipate that basic shelter for resettlement could comprise a timber post and beam construction with a timber framed thatched roof and earth floor and canvas walls and could then run the gamut of all types through to masonry walls, masonry floor and terracotta tile roof on timber.

For new settlements, with the use of a basic steel frame there could be a multitude of finishes. Depending on culture, climate and availability of local materials, these could be metal, white-washed plaster over wire netting, rattan or canvas surfaced, with metal thatch or clay roofing.

D. CONSTRUCTION

In the case of resettlement the scavenging of materials will be a dominant feature in the type of construction. Basic rules will specify site, size, services, height, safety features and pedestrian access but the type of construction will most probably be load bearing with pitched roofs.

New settlements would have a co-ordinated set of basic rules as noted in planning. In the accompanying diagram a core module comprises metal framing for walls, roofs and floors. The floors could be earth, in situ concrete or a metal frame/composition floor. A complete core unit would have metal roofing sheets and metal walling together with window and door units or alternate finishes as noted in materials.

The largest component should be able to be handled by one person and screwed or bolted into position. A stock of these would be owned by the co-operative and purchased by the owner/builder from time to time. The essence of this scheme is participation by unskilled labour, self-help and the affordability of purchasing small items for immediate use.

There are steel manufacturers / fabricators who could make a profitable venture out of supplying a world market with these components.

E. REALISATION

The realisation of any of the schemes outlined is the promotion of the idea to the users and the education of administrators and builders.

The government of the area concerned should embrace the political and financial aspects by providing serviced sites including water and sanitation, or by declaring an existing slum area to be re-housed.

For the financial success of the scheme the government should relax building codes so that these schemes can be affordable and co-ordinate existing codes so that bureaucracy does not strangle the scheme.

It is important that employment, transportation and communications be co-ordinated so that the scheme is integrated into the city pattern.

The participation on a day to day basis of the owner/builder and the ability to pay for items from a very small income ensures that the scheme will eventually be self-supporting.

Finally a paper could be provided by the International Year of the Homeless Committee involving model legislation to purchase and resume land, model rules to set up and educate directors and builders of schemes and model basic building codes to cover the erection of schemes.

The Federal City Shelter

This design submission is for the adaptive re-use of a dilapidated 185,000 square foot former U.S. government office building. The building was built in the 1940s as temporary offices, later served as the Federal City College (FCC) and was subsequently abandoned. Since January 1984, the building served as an emergency shelter for up to 1000 homeless persons per night. In November 1984, the Secretary of Health and Human Services announced that the building would be developed as a model physical shelter with special attention to the preservation of the dignity of the homeless.

In the United States, homelessness is an enormous and complex national problem. While a more aware and concerned public has come to understand the situation better in recent years, the increase in homelessness continues to outdistance the creation of new services, services that are, in reality, the necessities for life. There is more pain and loneliness in the streets. More assaults and attacks. More injuries and illnesses of every kind. And, of course there are more needless deaths.

Most homeless people have a myriad of problems and needs; shelter is but one of them. The man or woman in for a night's lodging is also the person who lacks adequate nutrition, medical and mental health services, job counseling, housing counseling, drug and alcohol rehabilitation services, and support in obtaining other entitlements, benefits, and services.

Solutions to these problems are complicated by a lack of accessible resources and the sporadic nature of the services that are offered. For those reasons, shelter workers are often frustrated in their efforts to address the deeper needs of those they serve. If we are to help the whole person, there is a clear need to centralize regular and comprehensive services where the homeless are.

Thus, the physical rehabilitation of the FCC building is only the beginning of a larger effort. Once renovation is complete, the remodeled shelter will house a comprehensive array of resources and services that will enable those who are capable of living independently to do so. It will also allow the long-term disabled to live with dignity, until other living arrangements can be found or created for them within the community.

The design calls for the building to be subdivided into five independent shelters (four for men; one for women) with lounges, staff office, bathrooms, and dining areas in each unit. One Men's Overnight Shelter unit on the First Floor is designed to meet the special needs of the elderly and physically disabled including specially designed toilets, showers, sleeping cubicles and storage areas which are accessible and negotiable by persons in wheel chairs. The Women's Overnight Shelter unit is on the same floor and has been designed in response to the unique needs of homeless women including medical examination room, clothing room, activity rooms and accommodations for live-in staff.

The 4 men's units will house a total of 800 men. The 150-bed women's unit will include its own counseling and medical exam areas, so that complete services will be available to the women without them having to leave the unit.

The shelter is run almost entirely by a volunteer staff composed of people who originally came to the shelter as guests. Their work is augmented by that of volunteers from the wider community.

Overnight guests will be permitted to return each evening to the same overnight shelter unit and the same personal space. Beds will be located within cubicles with personal lighting and lockable storage. Guests returning to their cubicle at night will be freed from having to haul toilet articles, clothes, books, etc. around with them all day. They will be able to display a picture, calendar, or other personal decoration on their walls. They will have the important tangible space of their own to support the attempt to reconstruct their personal lives. The sleeping cubicle is the critically important and unique feature of the design. Once the prototype is developed, others creating or renovating shelters could easily install them to provide temporary emergency accommodations. Indeed, the nature of the system would make it possible to disassemble, move and re-install the units in a variety of building types and spatial settings, and in a way which is respectful of individual security, privacy and dignity.

The sleeping cubicles are arranged on each floor in a sample pattern designed to identify and clarify for the guests the circulation patterns linking the shelter unit elements. Color coding and lighting design will further enhance the organizational clarity.

The lowest level of the building will function as the link to 6 smaller sections above. Uses such as the kitchen facilities, laundry rooms, building storage and maintenance shops can be found here. The renovated shelter shops can be found here. The renovated shelter will also provide the following services, which will be made available to all of the homeless in the nation's capitol.

Medical Clinic--Comprehensive on-site medical care.

Infirmary--A 32-bed medical infirmary will provide around-the-clock care.

Mental Health Counseling--Care which will begin to draw those in need of mental health care back into the human community.

Post-Detoxification Unit--A 21-bed facility for those who have undergone drug or alcohol detoxification.

Dental Clinic--A dental clinic will close the gap left by inadequate and inaccessible care.

Legal Clinic--Attorneys will provide assistance through an Entitlements Clinic and a Landlord-Tenant Clinic.

Benefits Counseling-- Benefits counselors will provide simple advocacy for those entitled to government assistance.

Non-Profit Employment Agency--Job counselors will work with the homeless to identify jobs and provide support to help and newly-hired in their first weeks of work.

Housing Counseling--Volunteers will work with the homeless to locate affordable housing and to create self-sustaining permanent shared housing accommodations.

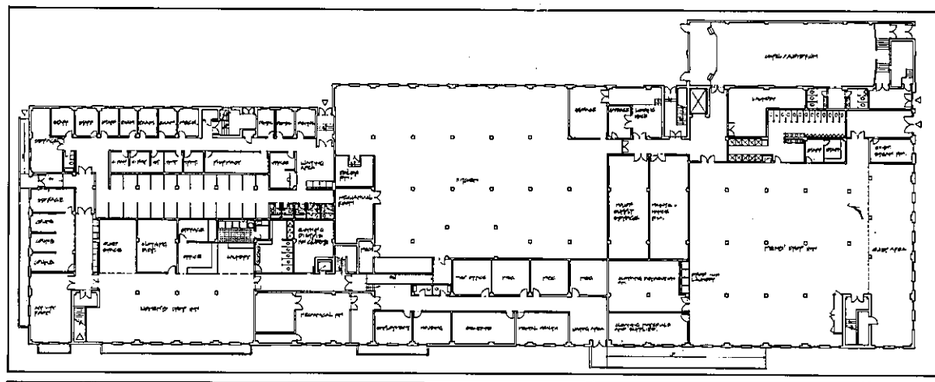
Veterans Benefits--Help homeless veterans to secure services to which they are entitled.

Continuing Education--Classes will be offered in literacy, street law, and other life skills.

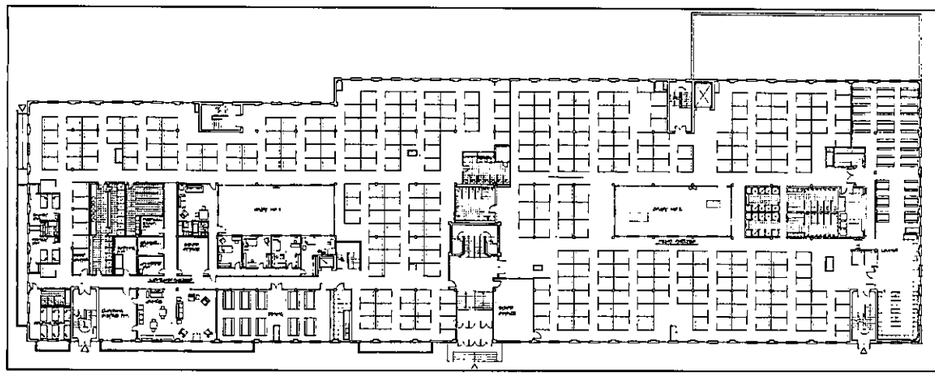
Because of its size and location and the circumstances surrounding its renovation, the new Federal City Shelter will be a genuine national model. It provides an approach and a process that lends itself to replication as a model of concern, cooperation, and the judicious and humane use of available community resources. It has the potential for the significant reduction of pain and suffering among homeless people all across the country. Once completed, this model will offer both symbolic and concrete inspiration for those seeking to deal with the problems and fate of the homeless everywhere.

PROJECT HISTORY

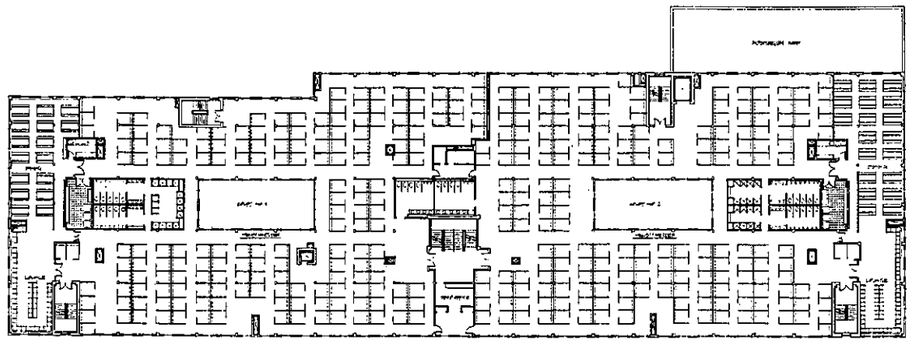
EXISTING BUILDING



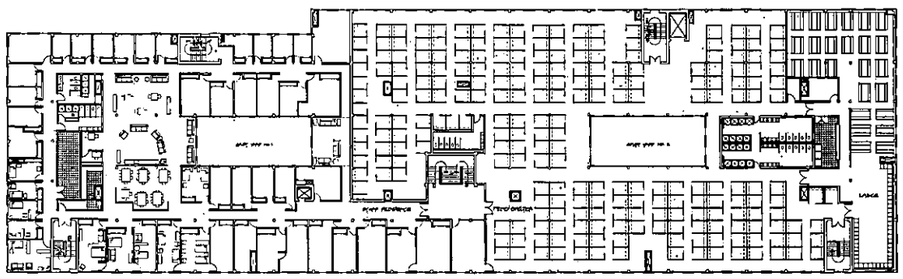
BASEMENT FLOOR PLAN



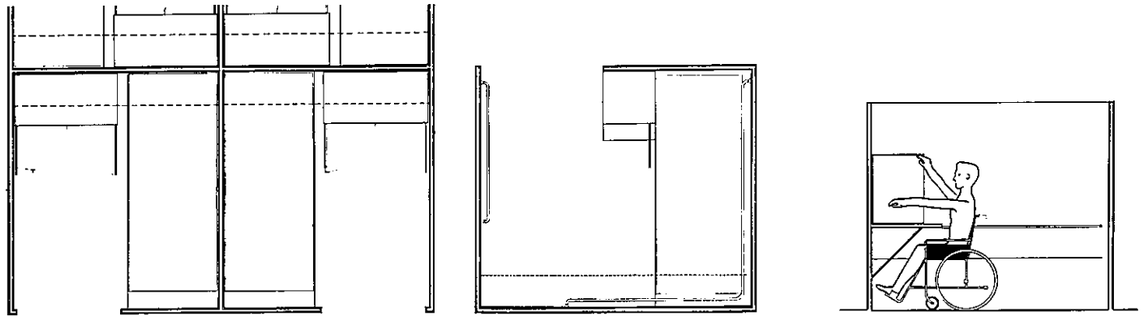
FIRST FLOOR PLAN



SECOND FLOOR PLAN

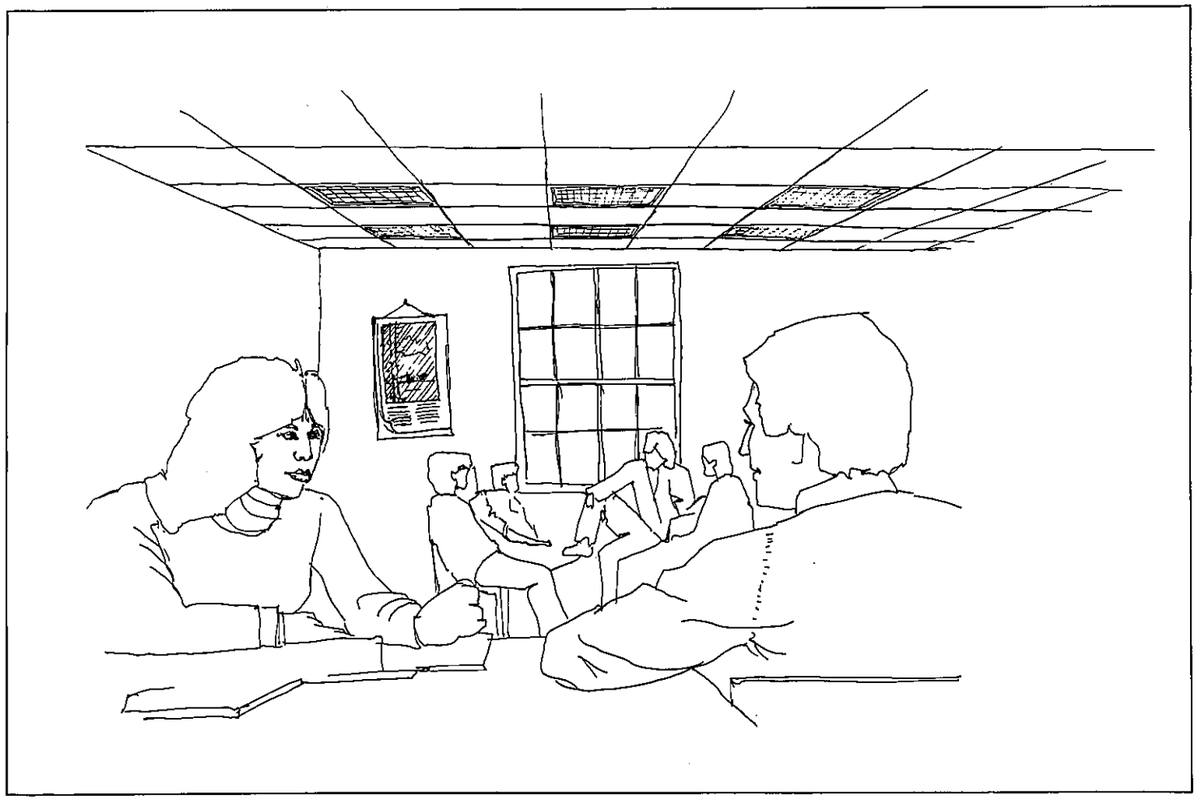


THIRD FLOOR PLAN

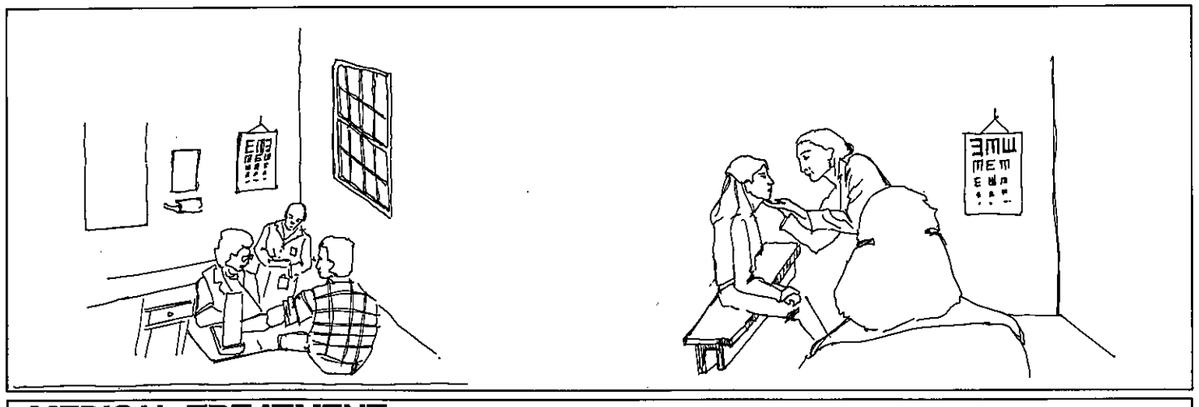


TYPICAL CUBICLE

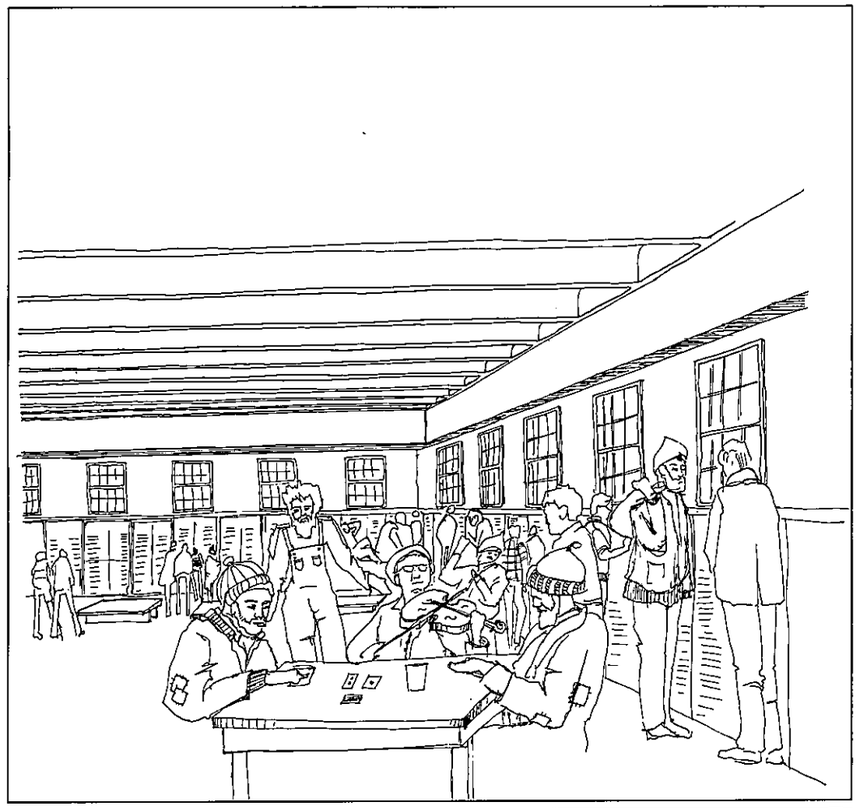
CUBICLE FOR HANDICAPPED



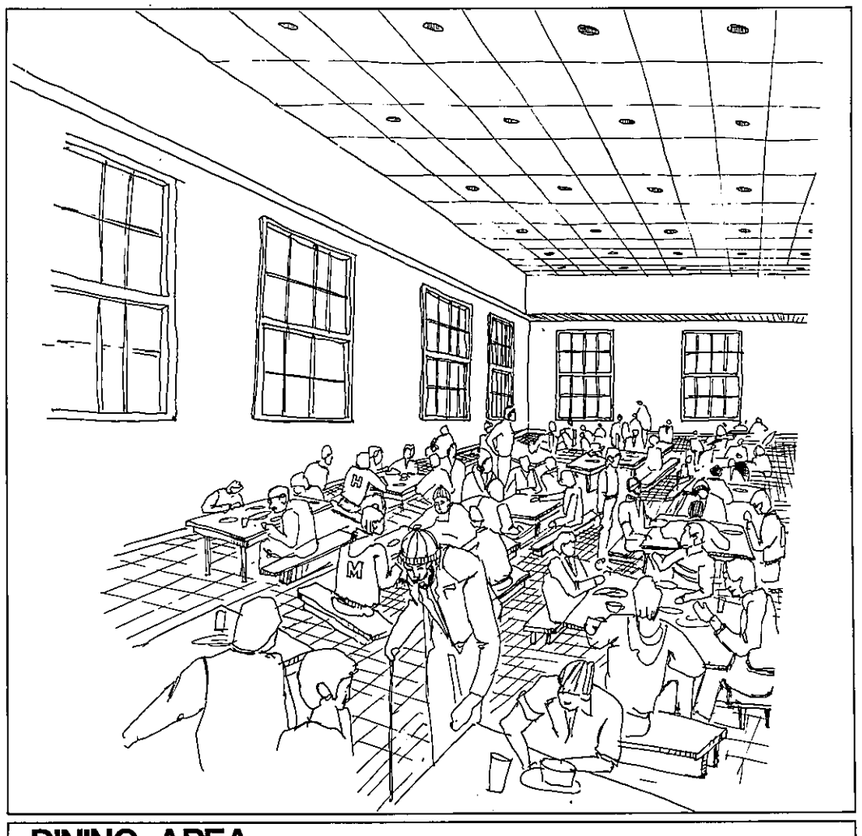
COUNSELING ROOM



MEDICAL TREATMENT

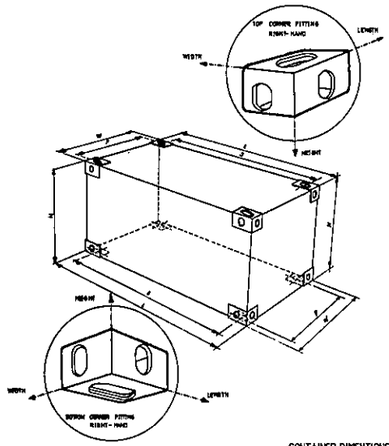


LOUNGE



DINING AREA

PROJECT No 72646441

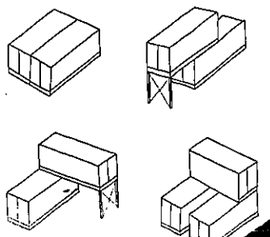


CONTAINER DIMENTIONS

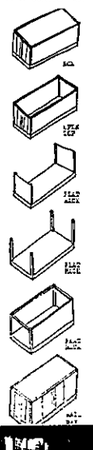
WIDTH (EXTERNAL) - CONTAINERS 1A, 1AA, 1B, 1BB, 1C, 1CC, 1D : 2438 mm (8 ft 0 in)
HEIGHT (EXTERNAL) - CONTAINERS 1A, 1B, 1C, 1D : 2438 mm (8 ft 0 in)
HEIGHT (EXTERNAL) - CONTAINERS 1AA, 1BB, 1CC : 2591 mm (8 ft 6in)

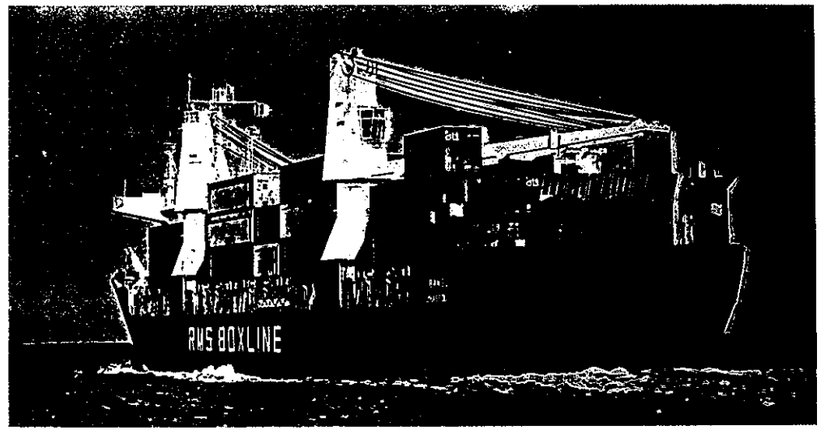
FREIGHT CONTAINER DESIGNATION	S			P		
	mm	ft	in	mm	ft	in
1AA 1A 1AX	11985	39	3 3/4	2259	7	4 15/16
1BB 1B 1BX	8918	29	3 1/4	2259	7	4 15/16
1CC 1C 1CX	5853	19	2 1/16	2259	7	4 15/16
1D 1DX	2787	9	1 3/16	2259	7	4 15/16

POSSIBLE COMBINATIONS



TYPES OF CONTAINERS





. HOUSING SORTAGE IS A 'HOT' REALITY FOR THE DEVELOPING COUNTRIES.

. IN SPITE OF WESTERN WORLD TRANSCENDENTAL MYTHICAL HUTS, 3RD WORLD IN A VERY BIG AND RAPPIDLY INCREASING PROPORTION LIVES IN REAL PRIMITIVE HUTS, IF NOT IN THE OPEN.

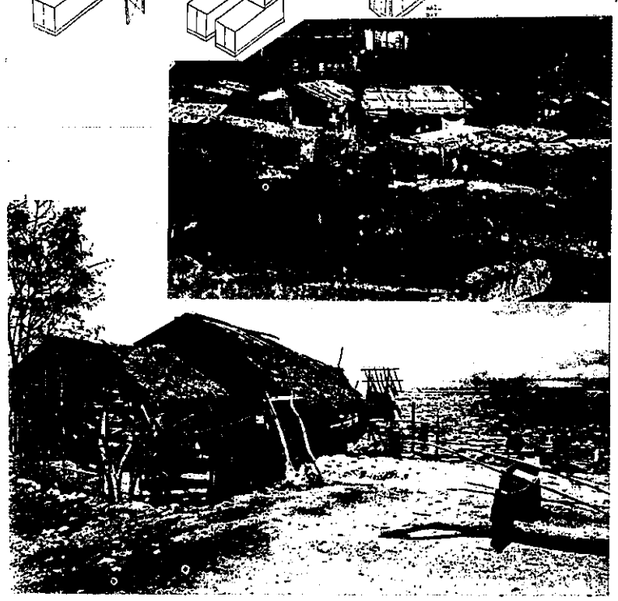
. DEVELOPING COUNTRIES REALITY SUGGESTS THAT ARCHITECTURE SHOULD BE MORE THAN SPACE AND FORM INQUIRY, OR HISTORICAL JUSTIFICATION TO DIVERSE INTELLECTUAL APPROACHES. AN INTERACTIVE RELATIONSHIP BETWEEN BUILDING, THE INDIVIDUAL AND SOCIETY, ON THE ONE HAND AND A REVOLUTIONARY CONCEPTUALIZATION BOTH IN SCIENTIFIC RESEARCH AND HOUSING POLICY ON THE OTHER, COULD ONLY BRING FRUITS.

. DEVELOPING COUNTRIES CONSTITUTE A MARKET OF SPECIAL SIGNIFICANCE FOR THE BUILDING INDUSTRY. FOR A LONG TIME TO COME THERE WILL REMAIN A GREAT DEMAND FOR BASIC MATERIALS FOR THE INFRASTRUCTURE, HOUSING AND INDUSTRIAL BUILDING; WHEREAS THE NEED FOR SOPHISTICATED PRODUCTS IS AS YET SUBORDINATE.

ALTHOUGH SOME TWENTY YEARS OLD, JOHN HABRAKEN AND MARTIN PAWLEY'S REVOLUTIONARY IDEAS ON USING WASTE CONSUMER INDUSTRIAL PRODUCTS FOR HOUSING PURPOSES ARE STILL AT THE HEART OF THE PROBLEM. SECOND USE RECYCLED MATERIALS, BY MEANS OF MARGINAL REDESIGN, CAN BE READILY ADAPTED AS BUILDING MATERIALS.

'The effective merging of two presently separated sectors of the economy, both using the same raw materials, offers perspectives for considerable savings, as well as a reduction in the conflict between advertised aspirations and those which are feasible for the majority of the people.
Because such a programme would take neither conventional building resources nor skilled labour from the precious reserves available to the government, it could coexist with any conventional housing effort. Its advantages could accrue from the exploitation of new resources and the conversion of the capitalistic basis of consumer ambitions into the raw materials for a societistic national effort.'

Pawley Martin 'Garbage Housing' Architectural Design No 765



INTERNATIONAL COMPETITION ON NEW TECHNOLOGY FOR THE RESOLUTION OF THE PROBLEMS OF SOCIAL HABITAT IN DEVELOPPING COUNTRIES

SECTION V.

NEW TECHNOLOGY IN SECOND USE

1ST CLASS TECHNOLOGY + **2**ND USE = **3**RD WORLD AFFORDABLE HOUSING

. CONTAINERS WHICH REVOLUTIONIZED CARGO TRANSPORTATIONS DURING THE LATE SIXTIES, PRESENT NOW A REMARKABLE SECOND HAND STOCK, FOR APPROXIMATELY US$ 1000 FOR A 7-10 YEARS OLD PIECE.

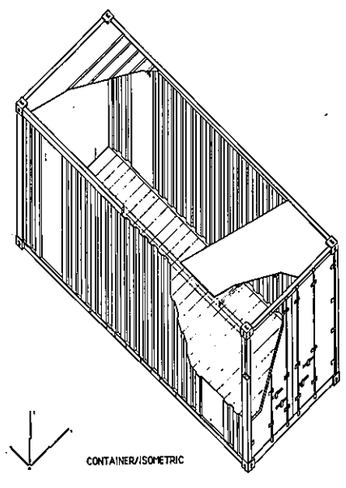
. Container is a prefabricated component, especially constructed in order to overcome unfavorable weather conditions and the extensive use during transportation. It has a high quality structure with adequate dimentions in order to be converted for housing under suitable alteration, if without any. It can easily be placed and assembled with other containers and also be placed one on top of the other (up 9 containers carrying max. load) allowing vertical assembly.

. Alteration can take place either in a shipyard or a local container rehabilitating industry, while transportation is a matter of routine.

. Containers are mass produced in Japan, Korea, USA, Canada and Europe (UK and France). The main source of supply is multinational shipping companies which distribute them.

. The average use of a new container (which costs about US $ 4000) ranges from 1 to 8 years. Their first-use life expires while usually being in a very good condition, mainly due to changes in transportation specifications. Local companies buy second-hand containers for transportation or dismantling.

. To avoid forgery, each container has been fitted with its special unique code (shown on it) given by the company which produced it. This way, useful information can be found (e.g. all previous users, load carried, maintainance, types of freight, dangerous cargoes etc.) pointing out if it suitable for housing.



CONTAINER/ISOMETRIC

3rd WORLD

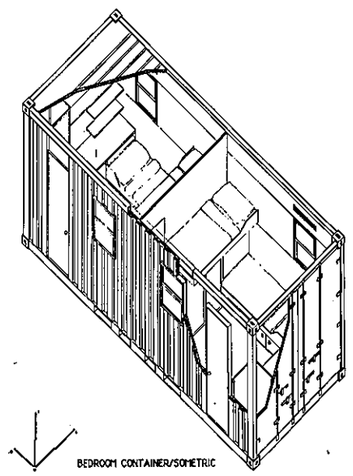
. countries, being in the transition from agriculture to industrialization and services, face strong low-income inner migration and dramatically increasing urbanization.

. metropoles, grow in such a way as to evade building and zonning plans.

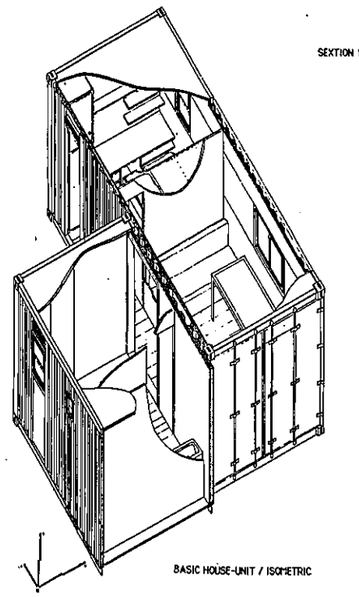
. economic and social pressures, very quickly over-come local week financial possibilities concerning big housing programs.

. governmental planning, borrows prototypes and patterns from 1st world countries forgetting the tremendous differences between low-income classes in the developing countries and working classes in the developed ones, while

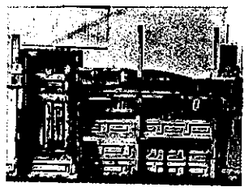
. people especially the relatively very poor, do not demand more costly housing than they can afford. Squatter settlement existance is the living evidence.



BEDROOM CONTAINER/SOMETRIC



BASIC HOUSE-UNIT / ISOMETRIC



FOR THE VERY POOR

. adaptation, to city living is difficult. The relation with open space (that immigrants carry from their native towns), stables and fences, yards and vegetable gardens enclosed within a group of houses mean a real family life.

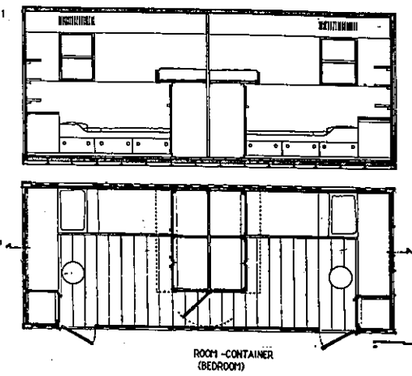
. land, is the important factor, connected with immigrants way of life. It assures continuity, it helps to the transition towards urbanization, it provides food and security solving immediate economic and social problems related to family life. Besides the addition of a room permits a daughter to get married, or a family to have an additional income by renting it.

. land ownership provides the immigrant with the required flexibility when first in an urban environment, being also, the basic school and educational means towards urbanization..

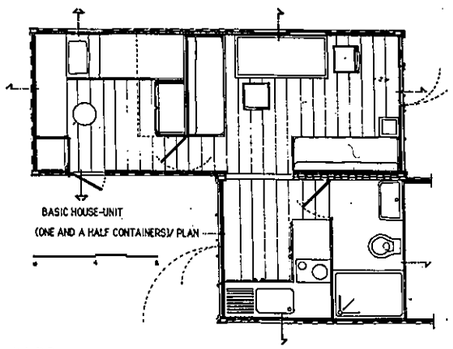
. shelter development, progresses incrementally with initiatives deliberately ignoring one or other aspects of the whole.

. architecture is built through time, most often by its own residents, unaware of what architects think, but very aware of inhabitants own skills, resources and limitations.

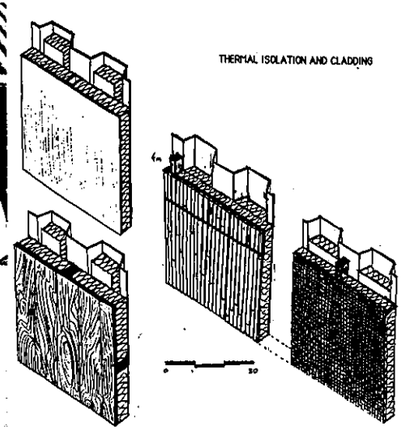
SEXTION 1 - 1



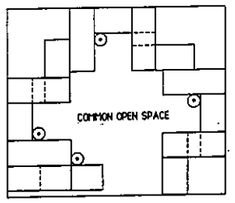
ROOM -CONTAINER (BEDROOM)



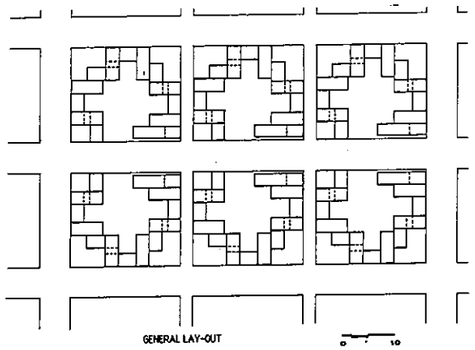
BASIC HOUSE-UNIT (ONE AND A HALF CONTAINERS)/ PLAN

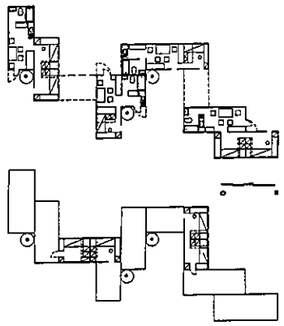


THERMAL ISOLATION AND CLADDING



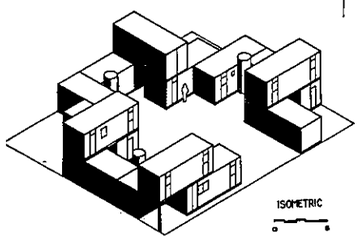
CLUSTER LAYOUT





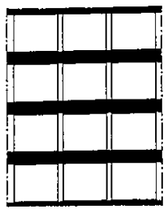
GROUND FLOOR

FIRST LEVEL



ISOMETRIC

GENERAL LAY-OUT

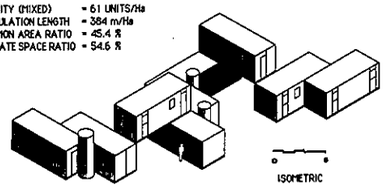


ALTERNATIVE ONE

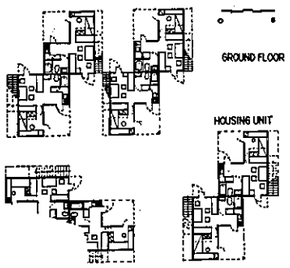
DENSITY (MIXED) = 112 UNITS/Ha
CIRCULATION LENGTH = 400 m/Ha
COMMON AREA RATIO = 50.4 %
PRIVATE SPACE RATIO = 49.5 %

ALTERNATIVE TWO

DENSITY (MIXED) = 61 UNITS/Ha
CIRCULATION LENGTH = 384 m/Ha
COMMON AREA RATIO = 45.4 %
PRIVATE SPACE RATIO = 54.6 %

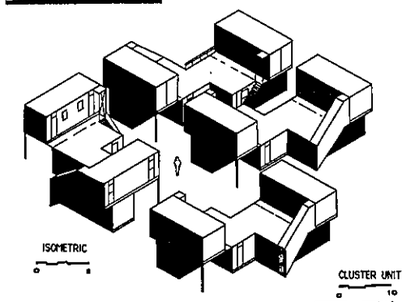


ISOMETRIC



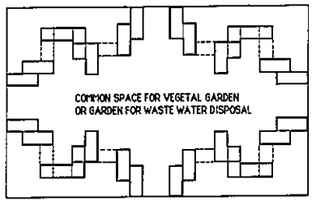
GROUND FLOOR

HOUSING UNIT



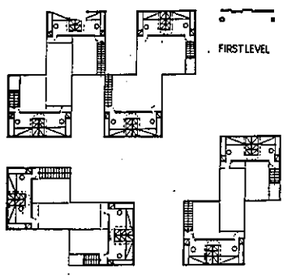
ISOMETRIC

CLUSTER UNIT



COMMON SPACE FOR VEGETAL GARDEN OR GARDEN FOR WASTE WATER DISPOSAL

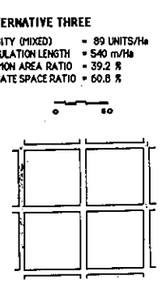
CLUSTER UNIT

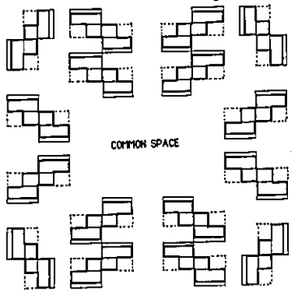


FIRST LEVEL

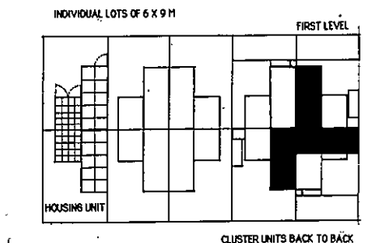
ALTERNATIVE THREE

DENSITY (MIXED) = 89 UNITS/Ha
CIRCULATION LENGTH = 540 m/Ha
COMMON AREA RATIO = 39.2 %
PRIVATE SPACE RATIO = 60.8 %





COMMON SPACE

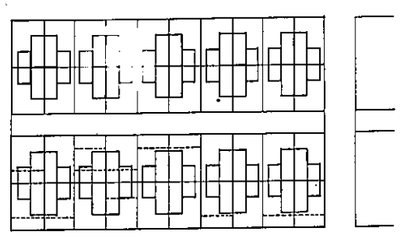


INDIVIDUAL LOTS OF 6 X 9 M

FIRST LEVEL

HOUSING UNIT

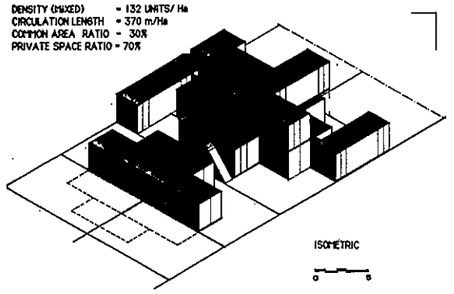
CLUSTER UNITS BACK TO BACK



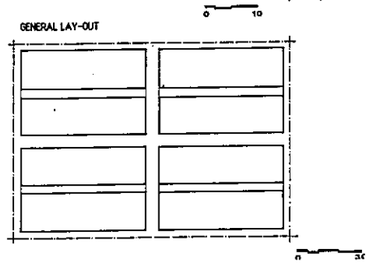
CLUSTER LAYOUT

ALTERNATIVE FOUR

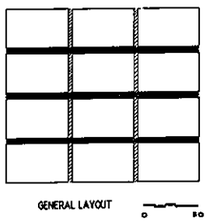
DENSITY (MIXED) = 132 UNITS/ Ha
CIRCULATION LENGTH = 370 m/Ha
COMMON AREA RATIO = 30%
PRIVATE SPACE RATIO = 70%



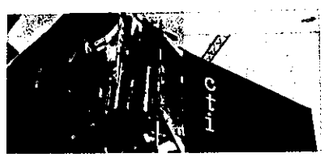
ISOMETRIC



GENERAL LAY-OUT



GENERAL LAYOUT



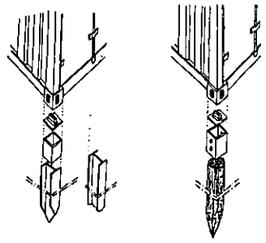
-Many and varying applications ,using container components ,can be proposed depending on a wide range of users, cultural, economic, climatic conditions ,land ownership etc.)

-The present study proposes some alternatives of housing layouts based on the same basic house-unit (one end a half container),and clusterunit (two house-units back to back (three containers)) and theirpossible development.

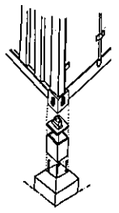
-It suggests two basic container conversions: a container -Room and a Bathroom - Kitchen pair container.

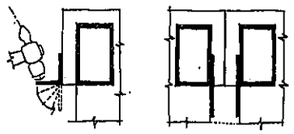
-Alteration would provide : Thermal insulation and interior cladding , integration of water supply, sewer and electricity installations, doors and windows as needed, even standert furniture.

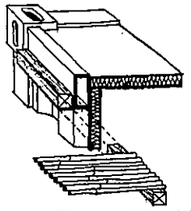
FASTENING MECHANISM

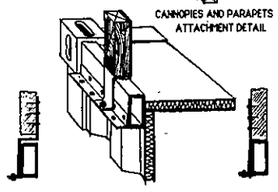


SUPPORTING ON TO THE GROUND

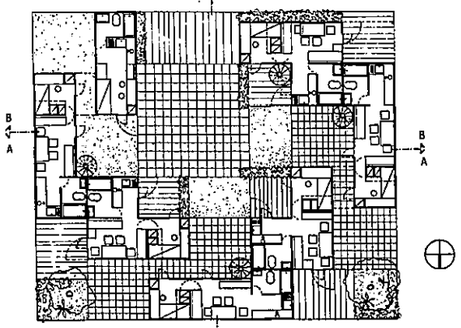




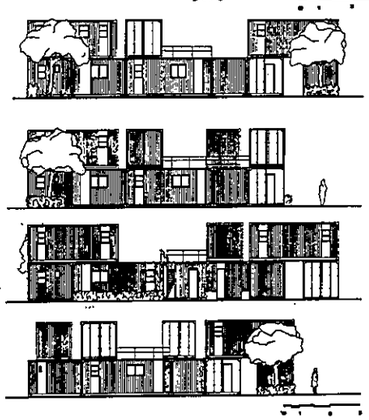




CANOPIES AND PARAPETS ATTACHMENT DETAIL



HOUSING UNIT - GROUND PLAN

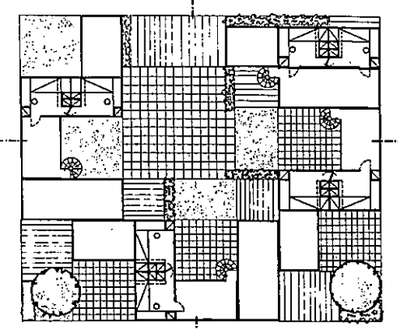


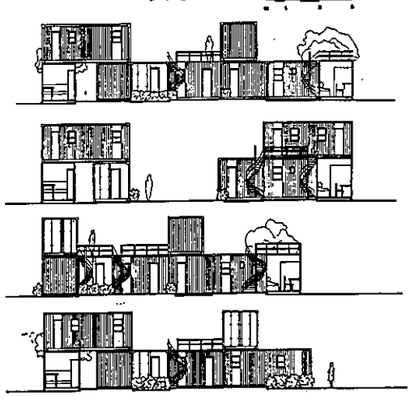
NORTHERN ELEVATION SECTION A-A

WESTERN ELEVATION SECTION B-B

SOUTHERN ELEVATIO SECTION C-C

EASTERN ELEVATION SECTION D-D





. CONTAINERS WHICH REVOLUTIONIZED CARGO TRANSPORTATIONS DURING THE LATE SIXTIES, PRESENT NOW A REMARKABLE SECOND HAND STOCK, FOR APPROXIMATELY US$ 1000 FOR A 7-10 YEARS OLD PIECE.

. Container is a prefabricated component, especially constructed in order to overcome unfavorable weather conditions and the extensive use during transportation. It has a high quality structure with adequate dimentions in order to be converted for housing under suitable alteration, if without any. It can easily be placed and assembled with other containers and also be placed one on top of the other (up 9 containers carrying max. load) allowing vertical assembly.

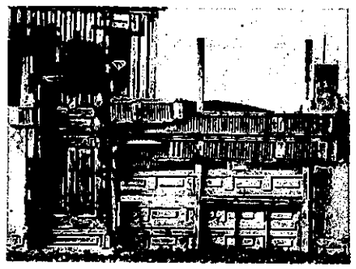
Alteration can take place either in a shipyard or a local container rehabilitating industry, while transportation is a matter of routine.

. Containers are mass produced in Japan, Korea, USA, Canada and Europe (UK and France). The main source of supply is multinational shipping companies which distribute them.

. The average use of a new container (which costs about US $ 4000) ranges from 1 to 8 years. Their first-use life expires while usually being in a very good condition, mainly due to changes in transportation specifications. Local companies buy second-hand containers for transportation or dismantling.

. To avoid forgery, each container has been fitted with its special unique code (shown on it) given by the company which produced it. This way, useful information can be found (e.g. all previous users, load carried, maintainance, types of freight, dangerous cargoes etc.) pointing out if it suitable for housing.

. From existing types (BOX, OPENTOP, FLAT RACK, RAILWAY) the small type : BOX, 20 feet (6m) is suggested, suitable for maximum payload of 23 tons approximately, already found in huge numbers around the world.



CONTAINER, AS AN INHABITABLE CELL, PRESENTS NUMEROUS SIGNIFICANT ADVANTAGES:

. VERY STRONG AND SIMPLE BASIC STRUCTURE.

. PURE GEOMETRICAL FORM AND PLAIN SURFACES.

. THE WAY IT STANDS ON THE GROUND DOES NOT AFFECT OR INJURES LAND.

. CAN BE EASILY RELATE TO FUTURE INFRASTRUCTURE.

. CONTAINER UNITS CAN BE EASILY ATTACHED AND LATER DETACHED FOR FURTHER USE OR RENEWAL.

. ASSEMBLING AND FASTENING IS A STANDARDIZED AND SIMPLE PROCEDURE (NO CRANE IS NEEDED, A " CLARK" VEHICLE CAN DO THE JOB).

. BUILDING WITH CONTAINER UNITS PROVIDES FLEXIBILITY OF SPACE THROUGH TIME, AND INCREMENTAL GROWTH OF THE DWELLING.

. CONTAINER-UNITS HABITAT IS AS SIMPLE AND INEXPENSIVE AS A CHILDRENS' PLAY WITH CUBES.

. ITS INNER SPACE CAN ADAPT TO MANY DIFFERENT USES.

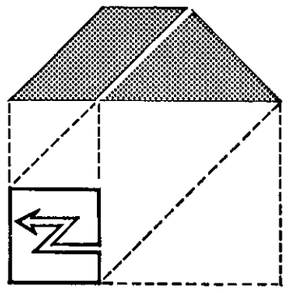
. THE BIG DOORS ON EACH OF ITS NARROW SIDES CAN UNIFY THE INNER SPACE WITH THE OPEN AND THE YARD.

. OTHER OPENINGS (DOORS,WINDOWS) CAN EASILY BE INSTALLED WITHIN THE 60 CM ZONES, RIGHT AND LEFT, ON EACH OF ITS LONG SIDES, WHERE THE VENTILATION FRISSURES,AS WELL AS ELSEWHERE ON ITS SURFACE.

. THEY ARE ALREADY PAINTED IN BRIGHT COLORS BUT CAN EASILY REPAINTED AND DECORATED BY ITS OWN USERS.

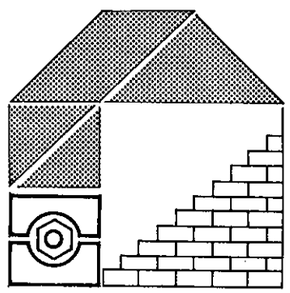
. LIGHT CONSTRUCTIONS ,DERIVING FROM TRADITION (OVERHANGING ROOFS, CANNOPIES,SEMI-CLOSED VERANDAS etc.), CAN BE EASILY ATTACHED OR ADDED TO CONTAINERS, ADAPTING THUS AND HUMANIZING THE INDUSTRIAL MATERIAL.

Nº 12451245



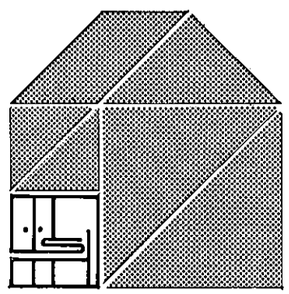
1ST PHASE

„THE FIRST HOUR AID"
SHORT TIME SOLUTION



2ND PHASE

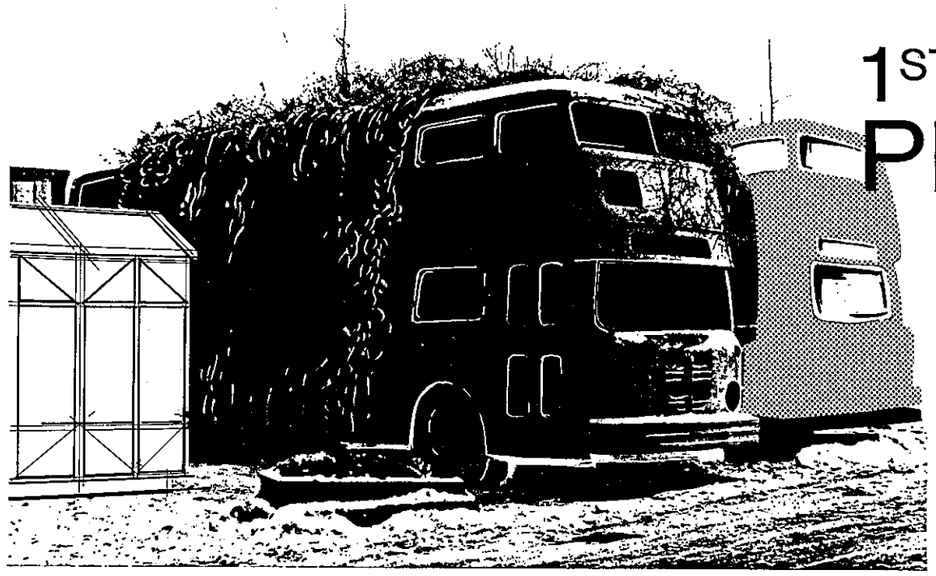
RECONSTRUCTION OF AVAILABLE, VACANT OBJECTS



3RD PHASE

NEW BUILDING FOR MOBILE OR IMMOBILE DWELLINGS

IN BERLIN OR ANYWHERE

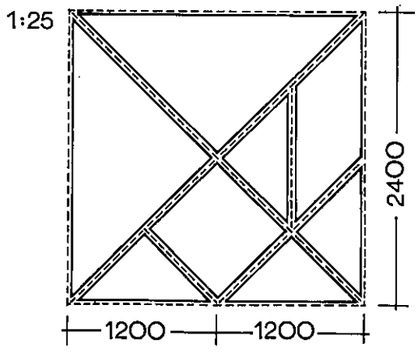


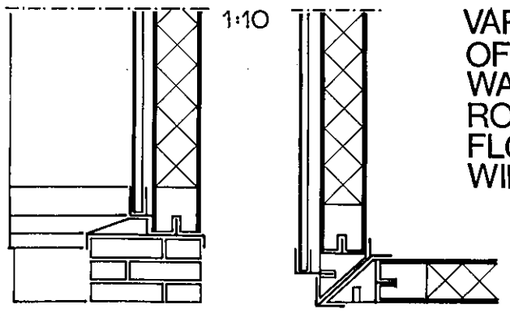
1ST PHASE

... DWELLINGS IN BUSES NO LONGER IN USE
CENTRAL AREAS – SYSTEM OF ELEMENTS

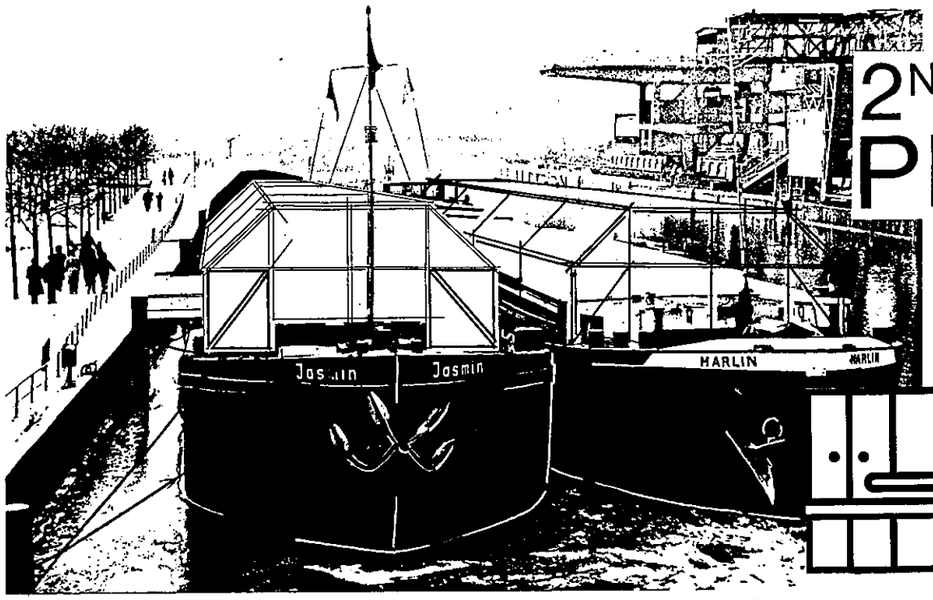
CENTRAL LOCATION

... DURING WINTER BOATS ARE ON DRY DOCK,
ROOFS DERIVED FROM SYSTEM OF ELEMENTS



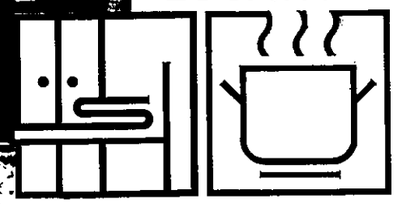


VARIABLE SYSTEM OF ELEMENTS :
WALL
ROOF
FLOOR
WINDOW



2ND PHASE

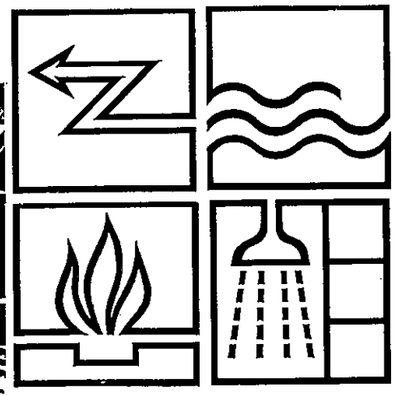
INDIVIDUAL LOCATION



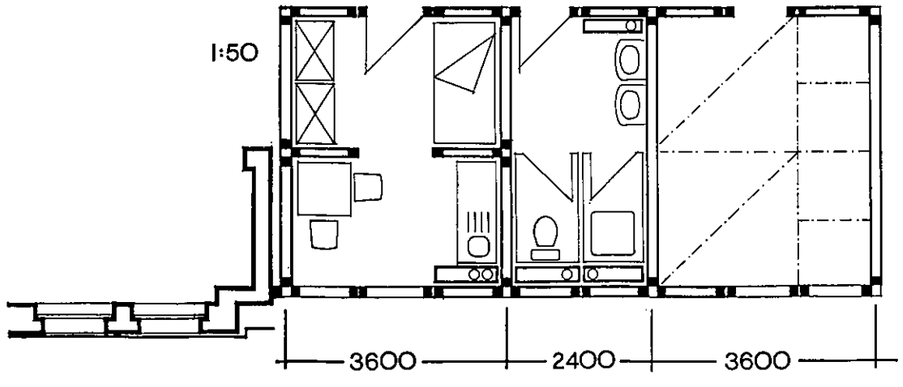
... COMMUNAL SETTLEMENT DEVELOPED FROM UNUSED BARGES

+

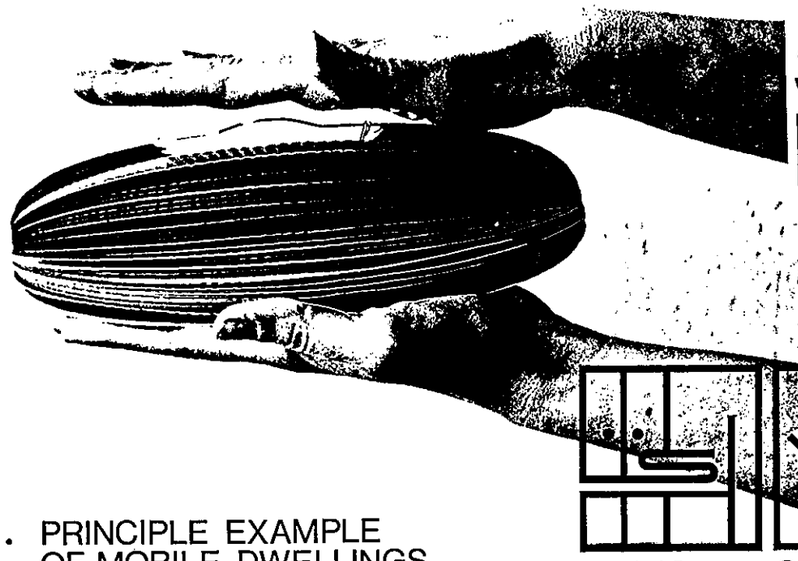
CENTRAL LOCATION



... UNUSED TRAIN STATIONS DEVELOPED AS SINGLE LIVING AREAS

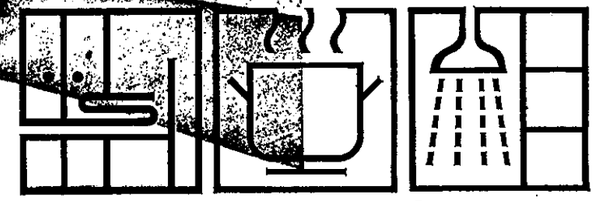


PRINCIPLE GROUNDPLAN LIVING AREA



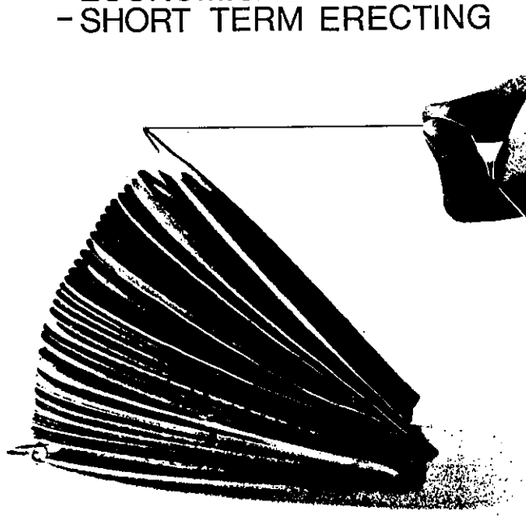
3RD PHASE

INDIVIDUAL LOCATION



LIVING- COOKING- SANITARY-AREA

... PRINCIPLE EXAMPLE OF MOBILE DWELLINGS
- ECONOMICAL TRANSPORT
- SHORT TERM ERECTING



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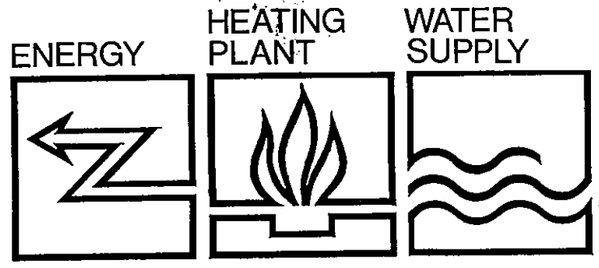
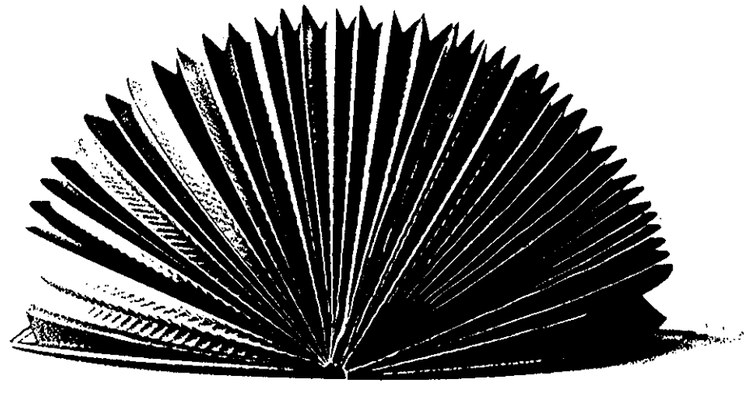
CENTRAL LOCATION

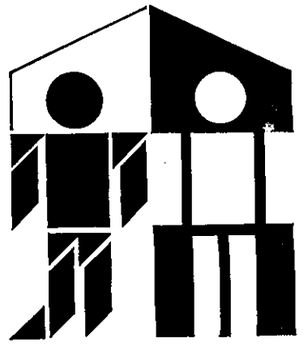
ENERGY

HEATING PLANT

WATER SUPPLY

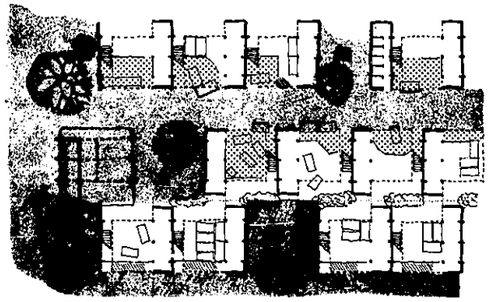






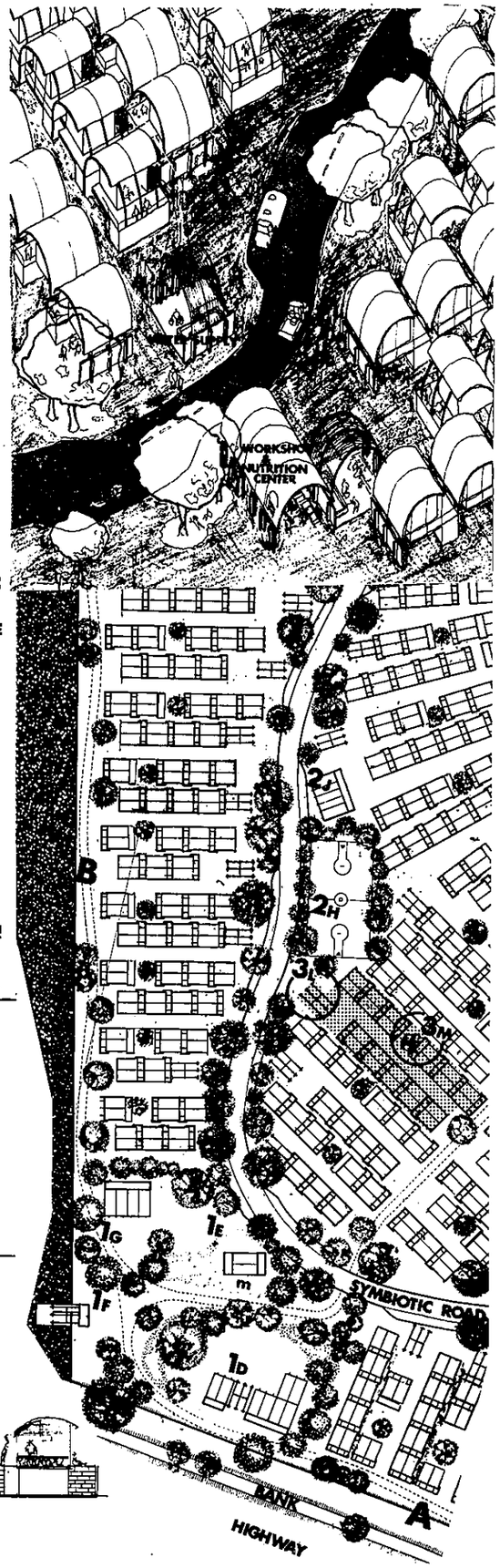
3M COMUNAL LAVATORY

3L PUBLIC WATER SUPPLY POINT



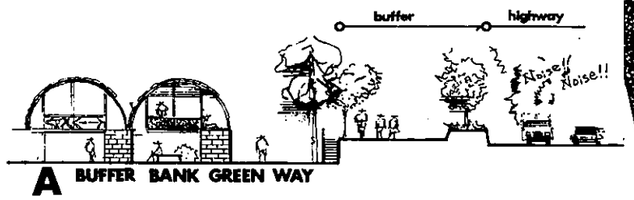
3 ALLEY 0 5 10m

PUBLIC
SEMI PUBLIC
PRIVATE

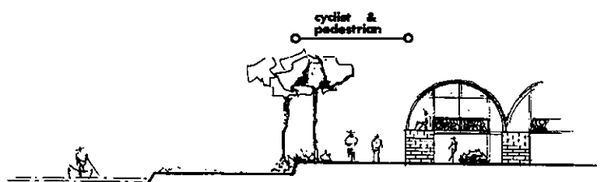


BOUNDARIES

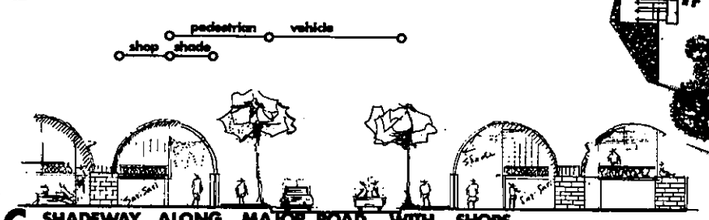
Creation/design of meaningful edge conditions, eg. end of alley, edge along major road, circumferential edge of purok common, et.



A BUFFER BANK GREEN WAY

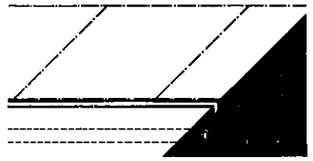


B RIVERSIDE GREEN WAY



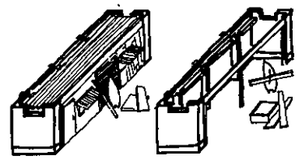
C SHADEWAY ALONG MAJOR ROAD WITH SHOPS

CONSTRUCTION PROCESS

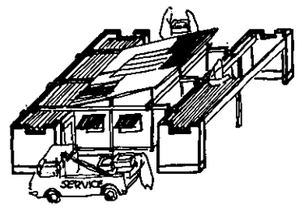


lots fixed by authorities.

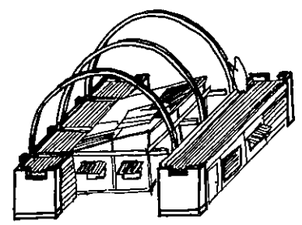
Erection of Utility core; Prospective resident commit to a set of components and build using their own labour and with the assistance of trained TYDA staff.



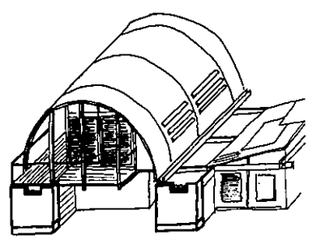
Residents start living in the utility core.



Intermediate ground floor stage; residents span beams between their utility core and the one next door, and cover them with roofing materials to meet their temporary demand.



When residents feel prepared to make further financial commitment, they embark on the Construction of Vault unit.

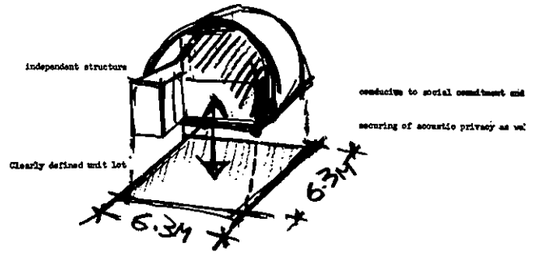


Dwelling unit is completed.

DESIGN CRITERIA FOR DWE

INCREMENTAL SELF AID CONSTRUCTION PROCESS

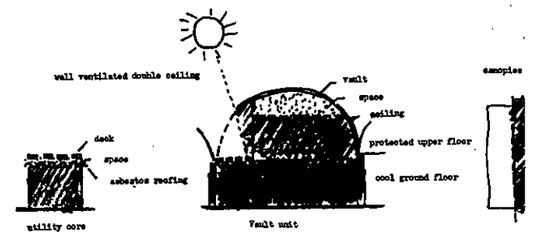
INDEPENDENT STRUCTURE ON CLEARLY DEFINED UNIT L



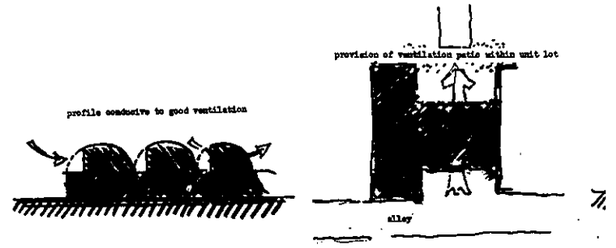
conducive to social commitment and

securing of acoustic privacy as wel

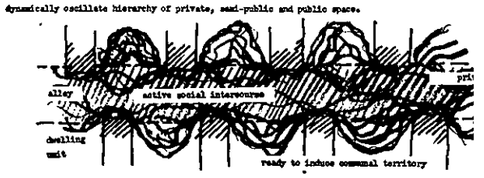
SUFFICIENT SHADE AND HEAT INSUBATION



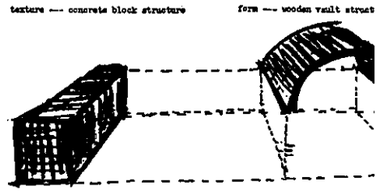
GOOD VENTILATION FROM MULTIPLE DIRECTION



PROVISION OF THRESHOLD



EXPRESSION OF PERMANENCY IN TEXTURE AND FORM



SELF AID HOUSING SYSTEM FOR PHILIPPINE

LLING

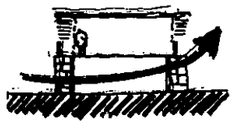
refer to construction process

DT

to long term self aid effort

l as visual one

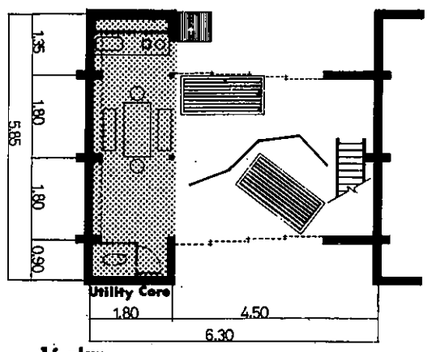
create shade
and threshold space



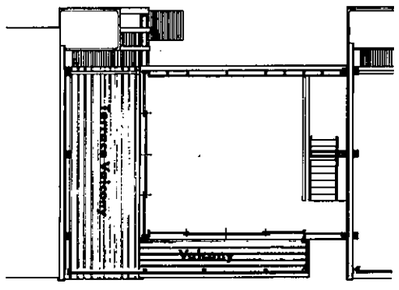
he territory expands into alley

DWELLING UNIT

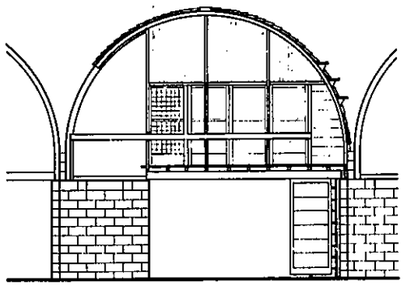
0 1 2m



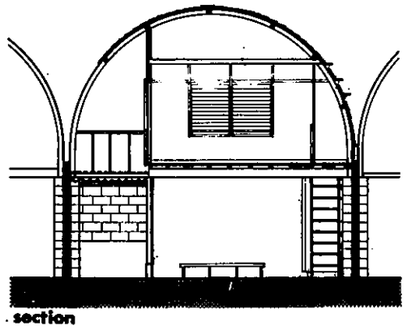
1f plan



2f plan



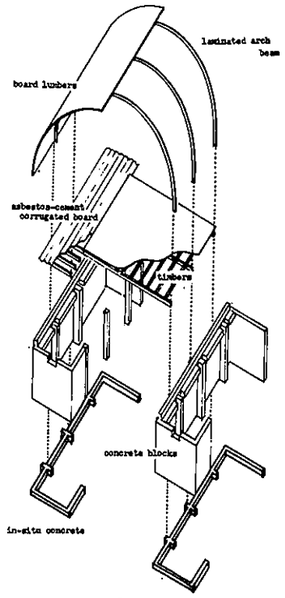
elevation



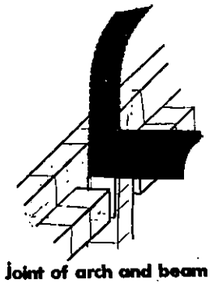
section

1f	Utility Core	10.53 sq.m
	Pilot	12.96
	Total	26.73
2f	Bed Room	13.77
Floor Area		40.50 sq.m

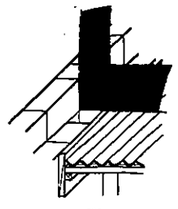
CONSTRUCTION METHOD



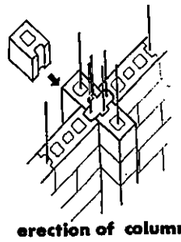
structural components



Joint of arch and beam



detail of utility core roof



erection of column

COMMUNITY TECHNOLGY AND STAGES OF DEVELOPMENT

House Lots & Infrastructure

TPDA devises and constructs unit lots and infrastructure. Latter includes: roads; drainage; public facilities such as communal lavatory, water taps and washing places; schools and other community buildings; sewerage systems; electricity supply.

. Establishment of Subsidiary Communal Facilities

A temporary workshop for making and storing building materials and components is built at the center of each purok common. The workshop produces timber components, including laminated arch beams, and architectural components such as window and door units. Production work is done by a core professional technical staff assisted by paid volunteers.

Additional items such as water storage tanks and tubs are also made at the workshop.

Public water supply points are established around each purok common. Those will supply water for the first stage construction of the utility core, which has an in-situ concrete foundation, light weight concrete block walls, and an asbestos roof. Later they will function as communal washing places for groups of houses along alleys.

Communal lavatories are also constructed parallel to the public water supply points, work being done by a TPDA construction team with paid volunteers (usually prospective residents).

A nutrition center is also planned for each purok.

place

. Introducing prospective residents

Prospective residents of the community are introduced to the site. They can either commute from where they live at the time, or they can erect a temporary shack on the unit lot where they will be constructing their own house.

. Construction of the Utility Cores

Prospective residents build the in-situ concrete foundations and lightweight concrete block walls, using their own labor, and with the assistance of trained TPDA staff. Those who are interested, and who demonstrate sufficient ability, could in turn be employed by TPDA to help other prospective residents.
Materials are mostly hire purchased.

Those subsidiary operations contribute in one way or another to preparation for prospective residents.

. Intermediate Ground Floor Stage

The completed utility core (10.53 sq.m.) can reasonably serve as a temporary home for a family of 2-3 persons. If a household expands and lacks the financial ability to commit itself to a proper second stage construction, any temporary structure can be added to the permanent utility core structure which is already there. However, the residents are strongly recommended to mean proper beams between their utility core and the one next door, and to cover them with roofing materials, to meet their temporary demand for extra ground floor space. Provision is made for recycling dismantable items such as temporary roofing and wall materials.

. Construction of Vault Units

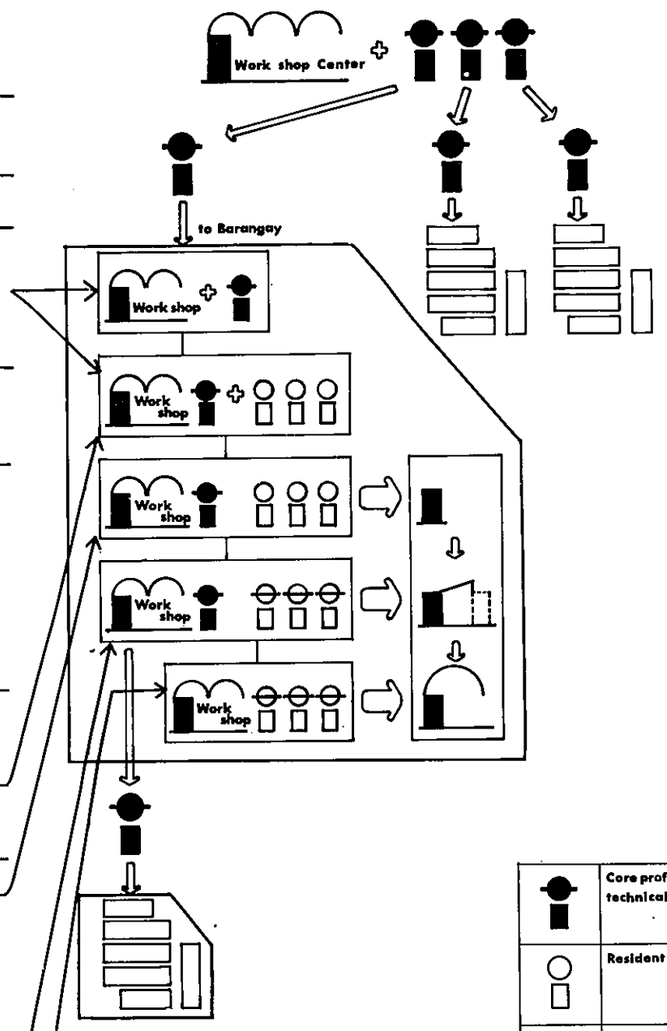
When residents feel prepared to make further financial commitments, they can embark on the construction of the vault unit. This is made almost entirely of timber components. There are beams; columns; laminated arch beams which are jointed by means of bolts and nuts; planks of wood for the floor and roof; sliding panels. When the vault is built, the dwelling unit is completed.

Advantages of the Vault Beam

The arch beam has the advantage of being structurally economical, and also enables the staged construction of the second floor without using columns and without disturbing the ground floor structure. The ground floor temporary roof can be removed after the vault roof is already completed.

Another advantage of the vault is that it catches the breeze entering on the open side of the arch (i.e. above the utility core) and funnels it through the open staircase down to the ground floor.

TRANSMISSION OF TECHNOLOGY



Improvement and refinement of dwelling unit

Private lavatories may not be installed for some time, but eventually communal lavatories will be supplemented by private ones. They will either rely upon the same vacuum car treatment, or adopt a self treatment (bacteria) unit.

Similarly, individual water tanks will eventually be installed.

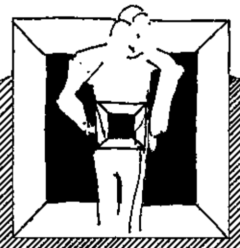
Once the basic structure is complete, residents will start to improve the quality of details such as exterior finishing, by replacing shabby/temporary materials with more refined ones, or replacing window and door units with better ones. Waste items can also be recycled. There is always plenty of scope to improve interior finishings and to acquire better furniture. These improvements and refinements will reflect individual taste, and are a means of acquiring identity and promoting a sense of belonging.

Note on Public Spaces and Facilities

Needless to say, parallel to the construction and improvement of the dwelling unit, public open spaces will also be taking on a better shape, mainly by the initiative of the residents. Alleys will be taken care of by those who live alongside them; the purok common and its facilities by the whole purok population; the hierarchy facilities and spaces by the barangay population. The hierarchy of these spaces more or less faithfully corresponds to community organization. The construction of communal facilities and spaces is done by both paid and unpaid volunteers. Depending on the nature and the manners of the work, but with the assistance of specialist staff.

	Core professional technical staff
	Resident
	Semi-skilled staff recruted from among residents
	Utility core
	Laminated arch beam
	Intermediate Ground Floor
	Vault Unit
Work shop	Work shop in Purok
Work shop Center	Work shop Center in Eco-Zone

1

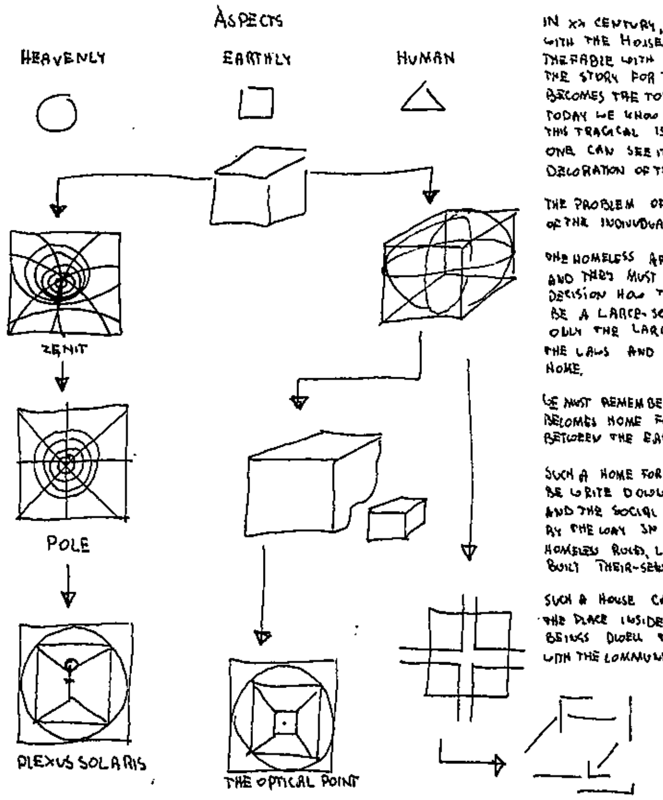


THEPRESENTATION OF THE SOLUTIONS.

WHO ARE HOMELESS? I THINK THAT NOT ONLY THESE, WHO HAVE NOT ANY THEIR OWN SHELTER, BUT ALSO THOSE, WHO HAVE NOT THEIR OWN HOME. THOSE, WHO HAVE THEIR FLATS INSTEAD HOME. THIS IS THE PROBLEM OF THE HUMAN CONDITION OF THE HUMAN BEINGS.

THE PEOPLE MUST LOOK AFTER SOLVING SUCH A PROBLEM FIRST, BECAUSE THE IDEA OF THE XVIII-CENTURY FALANSTER HAS FALLEN DOWN, WITH ITS LAST RECEPTION - MODERN SETTLEMENT.

WHEN PIRANESI HAD CONSTRUCTED HIS NEW VISION, HE HAD LOOKED AFTER THE POSSIBILITY OF THE CHOISE. IN THE SAME TIME THE IDEA OF THE SOCIAL COMUNITY HAD ARISED, WITH THE FREEDOM UNDER THE POLITICAL RULES. BUT TODAY, IT IS IMPOSSIBLE TO GIVE ALL THE PEOPLE THE CHANCE OF THE CHOISE. BUT THE GOVERMENT MAY NOT TO VIOLATE THEM.
TODAY THE REAL RULE CAN BE NOT THE FREEDOM USED BY THE REGIME EVEN THAT WITH THE DEMOCRATIC PROGRAM, BUT THE LAW AND THE DUTY OF THE THINKING.
ALL THE HUMAN BEINGS, THE REAL HOMELESS TOO MUST START TO THINK AND TO TRY TO UNDERSTAND THE WORLD, TO DO, THE WORLD BECOMES THEIR OWN. ALL, WE MUST STOP BE THE CLIENTS OF THE GOVERMENT AND THE STATE.
AND THEN WITHOUT ANY HELP ALL OF US START TO BUILT, IN THE TRUE SENSE OF THIS WORD.
NOT THE GOVERMENT OR ANY ANOTHER ORGANISATION MUST BUILT FOR THE HOMELESS, BUT THEY WITHOUT ANY PERMITION.
THE ORDER OF URBAN SCALE WILL BE THE END AND THE MEANS OF HUMAN THINKING.
THE NEW ORDER OF THE DWELLING, FOR THE HOMELESS ALSO, IS NOT FROM THE ARCHITECT'S REPERTOIRE.
THE POWER OF THE BUILDING IS FOR PEOPLE NOT FOR ARCHITECTS.



IN XX CENTURY, THERE IS SUCH A SITUATION WITH THE HOUSE, LIKE WITH THE FABLE. THE FABLE WITH ITS COSMIC SYMBOLIC BECOMES THE STORY FOR THE CHILDREN ONLY. THE HOUSE BECOMES THE TOY, AS WELL.
TODAY WE KNOW ONLY THE COMIC HOUSE. THIS TRAGICAL IS INSIDEUS ONLY, SOMETIMES ONE CAN SEE IT IN THE FURNITURE OR THE DECORATION OF THE HOUSE.

THE PROBLEM OF THE SHELTER IS THE PROBLEM OF THE INDIVIDUAL SENSE OF THE HOUSE.

THE HOMELESS ARE THE HUMAN BEINGS I THINK, AND THEY MUST HAVE THE POSSIBILITY OF THE DECISION HOW TO DWELL. MAYBE IT WILL NOT BE A LARGE-SCALE BUILDING, MAY BE ONLY THE LARGE-SCALE SOLUTIONS TO GIVE THE LAWS AND SOURCES TO THOSE WITHOUT HOME.

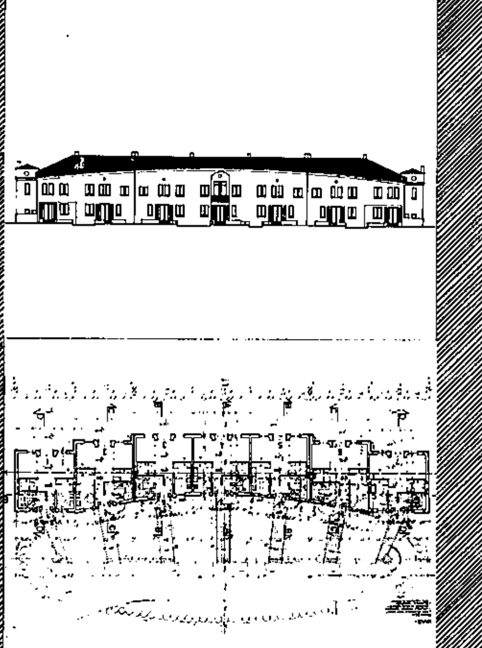
WE MUST REMEMBER THAT THE HOUSE WHICH BECOMES HOME FOR THE MAN HAS ITS EXTENTION BETWEEN THE EARTH AND THE SKY.

SUCH A HOME FOR YESTERDAY HOMELESS WILL BE WRITE DOWN IN THE WORLD STRUCTURE AND THE SOCIAL STRUCTURE. IT IS POSSIBLE ONLY BY THE WAY IN WHICH WE WILL GIVE THE HOMELESS ROLES, LAWS AND POSSIBILITIES. TO BUILT THEIR-SELVES.

SUCH A HOUSE CAN BE THE DWELLING AND THE PLACE INSIDE THE COMMUNITY. THE HUMAN BEINGS DWELL THERE HAVE NOT TO FIGHT WITH THE COMMUNITY.

● M. HEIDEGGER: BUILDING, DWELLING, THINKING.
WE ATTAIN TO DWELLING, SO IT SEEMS, ONLY BY MEANS OF BUILDING. THE LATTER, BUILDING, HAS THE FORMER, DWELLING, AS ITS GOAL. STILL, NOT EVERY BUILDING IS A DWELLING. BRIDGES AND HANGARS, STADIUMS AND POWER STATIONS ARE BUILDINGS BUT NOT DWELLINGS; RAILWAY STATIONS AND HIGHWAYS, DAMS AND MARKET HALLS ARE BUILT, BUT THEY ARE NOT DWELLING PLACES. EVEN SO, THESE BUILDINGS ARE IN THE DOMAIN OF OUR DWELLING. THAT DOMAIN EXTENDS OVER THESE BUILDINGS AND YET IS NOT LIMITED TO THE DWELLING PLACE. THE TRUCK DRIVER IS AT HOME ON THE HIGHWAY, BUT HE DOES NOT HAVE HIS SHELTER THERE; THE WORKING WOMAN IS AT HOME IN THE SPINNING MILL, BUT DOES NOT HAVE HER DWELLING PLACE THERE; THE CHIEF ENGINEER IS AT HOME IN THE POWER STATION, BUT HE DOES NOT DWELL THERE. THESE BUILDINGS HOUSE MAN. HE INHABITS THEM AND YET DOES NOT DWELL IN THEM, WHEN TO DWELL MEANS MERELY THAT WE TAKE SHELTER IN THEM. IN TODAY'S HOUSING SHORTAGE EVEN THIS MUCH IS REASSURING AS TO THE GOOD; RESIDENTIAL BUILDINGS DO INDEED PROVIDE SHELTER; TODAY'S HOUSES MAY EVEN BE WELL PLANNED, EASY TO KEEP, ATTRACTIVELY CHEAP, OPEN TO AIR, LIGHT, AND SUN, BUT - DO THE HOUSES IN THEMSELVES HOLD ANY GUARANTEE THAT DWELLING OCCURS IN THEM? YET THOSE BUILDINGS THAT ARE NOT DWELLING PLACES REMAIN IN TURN DETERMINED BY DWELLING INSOFAR AS THEY SERVE MAN'S DWELLING. THUS DWELLING WOULD IN ANY CASE BE THE END THAT PRESIDES OVER ALL BUILDING. DWELLING AND BUILDING ARE RELATED AS END AND MEANS. HOWEVER, AS LONG AS THIS IS ALL WE HAVE IN MIND, WE TAKE DWELLING AND BUILDING AS TWO SEPARATE ACTIVITIES, AND, AN IDEA THAT HAS SOMETHING CORRECT IN IT....
....THE REAL MEANING OF THE VERB BAUEN, NAMELY, TO DWELL, HAS BEEN LOST TO US....

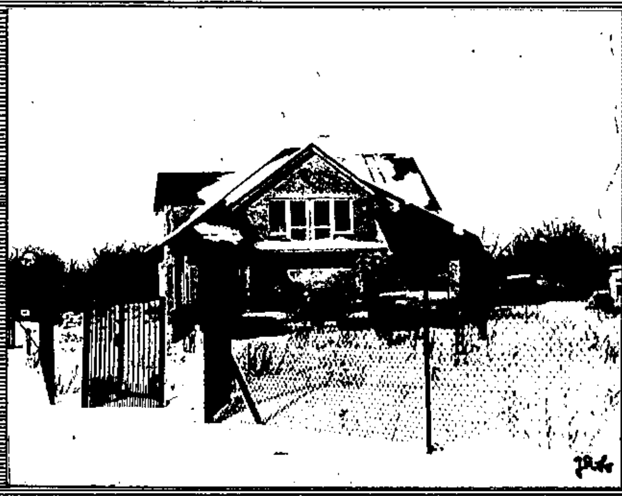
● DETACHED HOUSE NEAR WARSAW BY AUTOR.



● RICHARD BACH: JONATHAN LIVINGSTON LE GOELAND

CHIANG SAYS: REMEMBER JONATHAN, THAT THE PARADISE THIS IS NOT THE PLACE OR TIME, BECAUSE THE PLACE AND TIME ARE SO WITHOUT ANY MEANING..... JONATHAN, YOU WILL COME NEAR THE PARADISE IN THAT MOMENT, WHEN YOU WILL COME NEAR THE PERFECT SPEED BUT NOT FLYING THOUSAND OR MILLION MILE PER HOUR, OR WITH THE SPEED OF THE LIGHT. ANY FIGURE IS THE BOARD, BUT THE PERFECTION HAS NOT ANY BOARDS. THE PERFECT SPEED, MY SON, IS TO BE THERE....

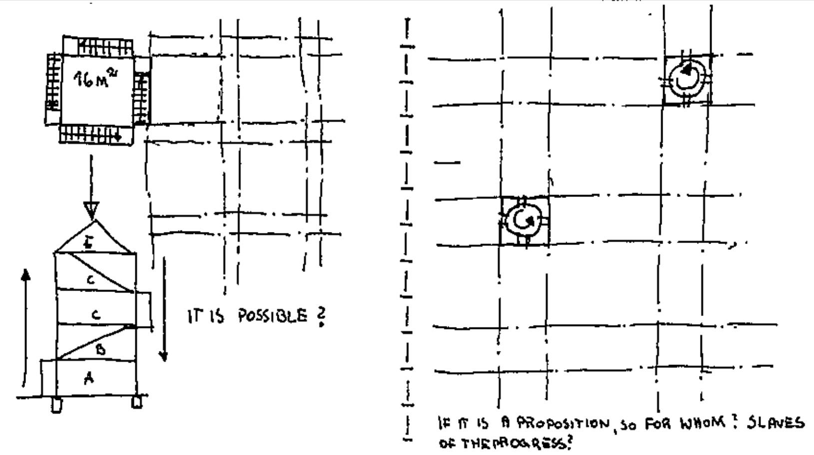
2



THE HOMELESS USUALLY MEANS WITHOUT HOME, BUT MONEY TOO. SO, THERE IS NECESSITY TO GIVE HIM, THEM. IN THE REPORT, SAYS ABOUT A HUNDRED MILLION WITHOUT SHELTER OF ANY KIND. TO GIVE THEM HOME=SHELTER MEANS TO TAKE MONEY FROM THOSE WHO HAVE IT, BECAUSE THE GOVERMENTS HAVE NOT SOURCES. WHY? COMMUNISTIC GOVERMENTS TOO.
TO GIVE SOURCES FOR SHELTERS MUST MEAN TO MAKE ACTIVE EVERY HUMAN BEING. MUST ONE-SELF BUILT HIS SQUARE OF THE EARTH.

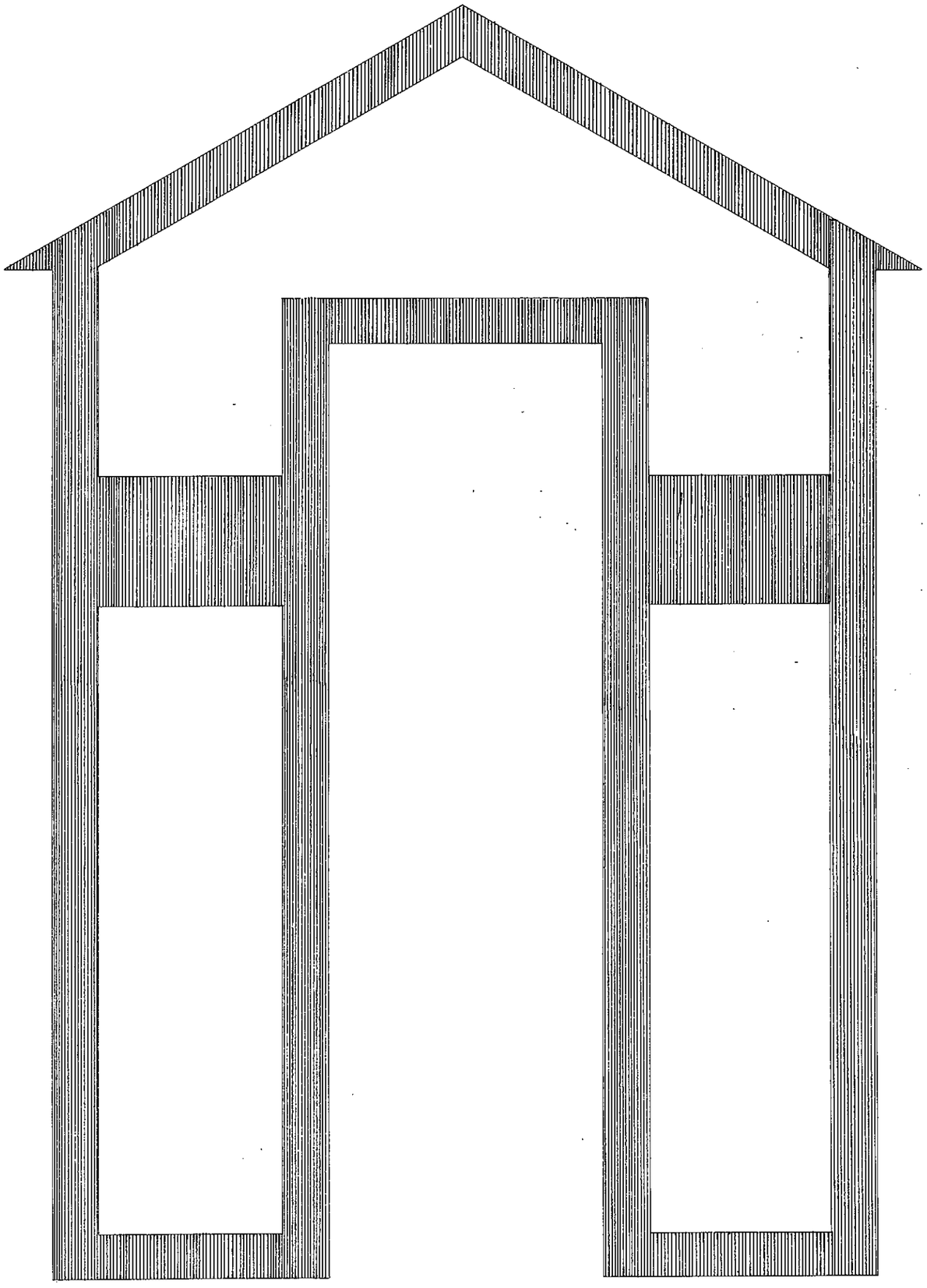
DURING LAST FOUR CENTURIES, THE PEOPLE PROJECT MANY IDEAS FOR THE CITY. ALL ARE UTOPIAS. IF WE GIVE PEOPLE THE POSSIBILITY TO DECIDE ABOUT THEM IN VERY, VERY SMALL COMMUNITIES WITH A LOCAL AUTONOMY AND THE LOCAL GOVERMENT, WE MAKE FROM ONE BIG PROGRAMME MANY VERY LITTLE PROGRAMMES, AND THIS WILL BE THE WAY TO SOLVE PROBLEM.

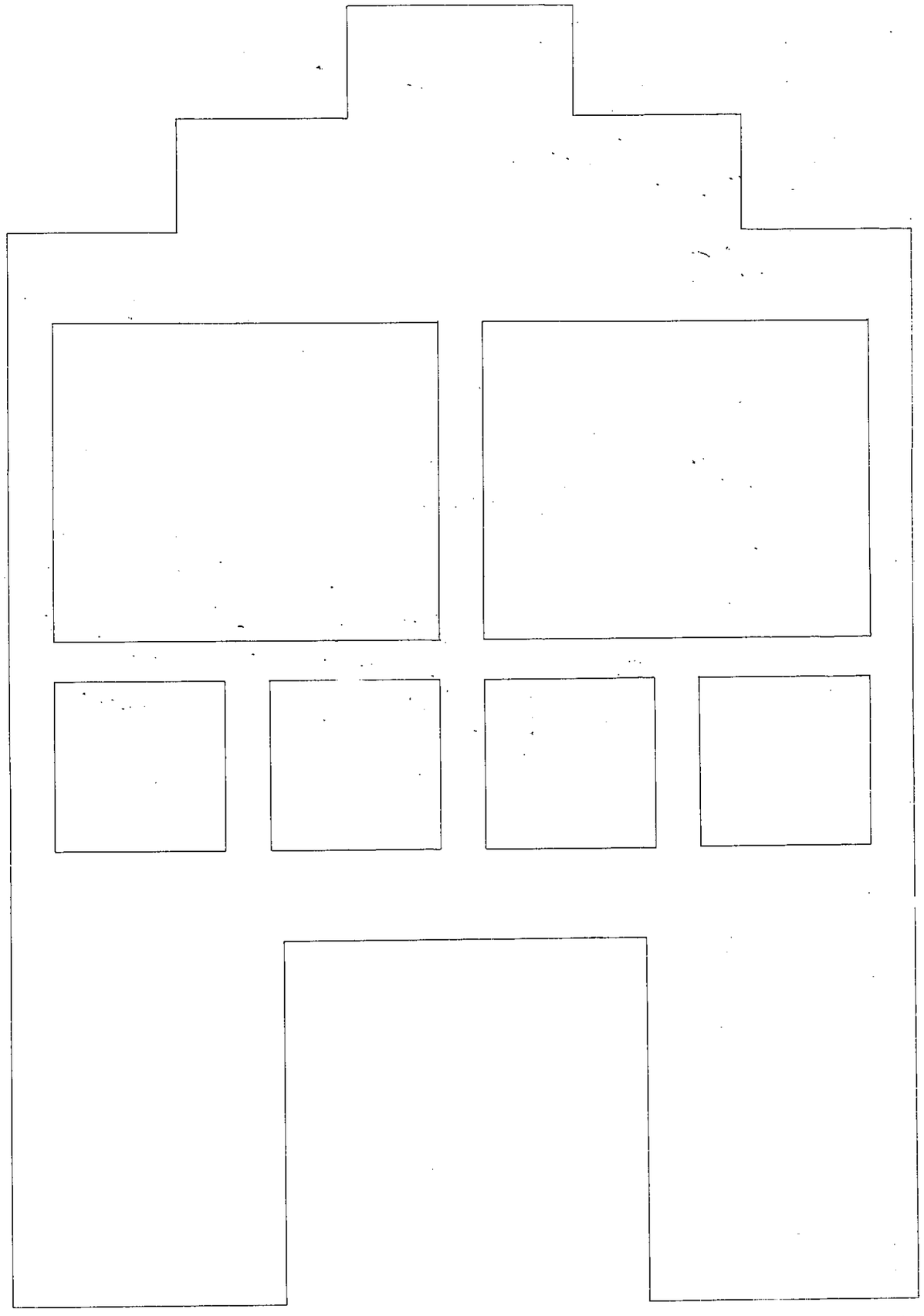
THIS COMPETITION-PRESENTATION, THIS IS A MORAL DUTY FOR EVERYBODY, BUT ONLY SOLUTION IS THAT:
LET PEOPLE THINK AND LIVE



IF IT IS A PROPOSITION, SO FOR WHOM ! SLAVES OF THE PROGRESS?

● M. HEIDEGGER. B-D-T..
BAUEN ORIGINALLY MEANS TO DWELL. WHERE THE WORD BAUEN STILL SPEAKS IN ITS ORIGINAL SENSE IT ALSO SAYS HOW FAR THE NATURE OF DWELLING REACHES. THAT IS, BAUEN, BUAN, BHU, BEO, ARE OUR WORD BIN IN THE VERSIONS: ICH BIN, I AM, DU BIST, YOU ARE, THE IMPERATIVE FORM BIS, BE. WHAT THEN DOES ICH BIN MEAN. THE OLD WORD BAUEN TO WHICH THE BIN BELONGS, ANSWERS: ICH BIN, DU BIST MEAN: I DWELL, YOU DWELL. THE WAY IN WHICH YOU ARE AND I AM, THE MANNER IN WHICH WE HUMANS ARE ON THE EARTH, IS BUAN, DWELLING. TO BE A HUMAN BEING MEANS TO BE ON THE EARTH AS A MORTAL. IT MEANS TO DWELL. THE OLD WORD BAUEN, WHICH SAYS THAT MAN IS INSOFAR AS HE DWELLS, THIS WORD BAUEN, HOWEVER ALSO MEANS AT THE SAME TIME TO CHERISH AND PROTECT, TO PRESERVE AND CARE FOR, SPECIFICALLY TO TILL THE SOIL, TO CULTIVATE THE VINE. SUCH BUILDING ONLY TAKES CARE - IT TENDS THE GROWTH THAT RIPENS INTO ITS FRUIT OF ITS OWN ACCORD. BUILDING IN THE SENSE OF PRESERVING AND NURTURING IS NOT MAKING ANYTHING. SHIP-BUILDING AND TEMPLE-BUILDING, ON THE OTHER HAND, DO IN A CERTAIN WAY MAKE THEIR OWN WORKS. HERE BUILDING, IN CONTRAST WITH CULTIVATING, IS A CONSTRUCTING. BOTH MODES OF BUILDING - BUILDING AS CULTIVATING, LATIN COLERE, CULTURA AND BUILDING AS THE RAISING UP THE EDIFICES, AEDIFICARE - ARE COMPRISED WITHIN GENUINE BUILDING, THAT IS, AS BEING ON THE EARTH, HOWEVER, REMAINS FOR MAN'S EVERY DAY EXPERIENCE, THAT WHICH IS FROM THE OUTSET "HABITUAL" - WE INHABIT IT, AS OUR LANGUAGE SAYS SO BEATIFULLY: IT IS THE GEWOHNTE. FOR THIS REASON IT RECEDES BEHIND THE MANIFOLD WAYS IN WHICH DWELLING IS ACCOMPLISHED, THE ACTIVITIES OF CULTIVATION AND CONSTRUCTION. THESE ACTIVITIES LATER CLAIM THE NAME OF BAUEN, BUILDING, AND WITH IT THE OF BUILDING, EXCLUSIVELY FOR THEMSELVES. THE REAL SENSE OF BAUEN NAMELY DWELLING, FALLS INTO OBLIVION....
....WE DO NOT DWELL BECAUSE WE HAVE BUILT, BUT WE BUILD AND HAVE BUILT BECAUSE WE DWELL, THAT IS, BECAUSE WE ARE DWELLERS. BUT IN WHAT DOES THE NATURE OF DWELLING CONSIST? LET US LISTEN ONCE MORE TO WHAT LANGUAGE SAYS TO US. THE OLD SAXON WUON, THE GOTHIC WUNIAN, LIKE THE OLD WORD BAUEN, MEAN TO REMAIN, TO STAY IN A PLACE. BUT THE GOTHIC WUNIAN SAYS MORE DISTINCTLY HOW THIS REMAINING IS EXPERIENCED. WUNIAN MEANS: TO BE AT PEACE. THE WORD FOR PEACE, FRIEDE, MEANS THE FREE, DAS FRYE, AND FRY MEANS: PRESERVED FROM HARM AND DANGER, PRESERVED FROM SOMETHING, SAFEGUARDED. TO FREE REALLY MEANS TO SPARE. THE SPARING ITSELF CONSISTS NOT ONLY IN THE FACT THAT WE DO NOT HARM THE ONE WHOM WE SPARE. REAL SPARING IS SOMETHING POSITIVE AND TAKES PLACE WHEN WE LEAVE SOMETHING BEFOREHAND IN ITS OWN NATURE, WHEN WE RETURN IT SPECIFICALLY TO ITS BEING, WHEN WE "FREE" IT IN THE REAL SENSE OF THE WORD INTO A PRESERVE OF PEACE. TO DWELL, TO BE SET AT PEACE, MEANS TO REMAIN AT PEACE WITHIN THE FREE, THE PRESERVE, THE FREE SPHERE THAT SAFEGUARDS EACH THING IN ITS NATURE. THE FUNDAMENTAL CHARACTER OF DWELLING IS THIS SPARING AND PRESERVING. IT PERVADES DWELLING IN ITS WHOLE RANGE. THAT RANGE REVEALS ITSELF TO US AS SOON AS WE REFLECT THAT HUMAN BEING CONSISTS IN DWELLING AND, INDEED, DWELLING IN THE SENSE OF THE STAY OF MORTALS ON THE EARTH. BUT "ON THE EARTH" ALREADY MEANS "UNDER THE SKY"....





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INTERNATIONAL COMPETITION MADRID/SPAIN 1986/87 BRIGHTON/UNITED KINGDOM SECTION V

NEW TECHNOLOGIES FOR SOCIAL HOUSING

•PROBLEM- UNDERDEVELOPED COUNTRIES (INCREASE OF POPULATION IS NOT PROPORTIONATE TO HOUSING)
-DEVELOPING COUNTRIES (DETERIORATION OF SOCIAL CONDITIONS GETS MANY PEOPLE TO SOCIAL OUTSIDE
-ALL COUNTRIES (VARIOUS CATASTROPHES REQUIRE TEMPORARY HOUSING)
-DEVELOPED COUNTRIES (MIGRATION OF POPULATION NATURAL, LABOR...)

•METHOD - THE CONTINUITY HAS TO BE ACCEPTED HOUSING CONDITIONS: PERFECT HYGIENE, INEXPENSIVE CONSTRUCTION, COMMODIOUS LIVING SPACE SOCIAL USEFULNESS

•GROUP DIVISION - (A) ABSOLUTE SOCIAL CASES "PEOPLE FROM CARD-BOARDS BOXES"
(B) PEOPLE WITHOUT FAMILIES HAVING MINIMUM OF FINANCIAL SOURCES, FAMILIES WITHOUT CHILDREN
(C) PEOPLE SEARCHING FOR PERMANENT OR TEMPORARY JOB FOR SMALL SALARY (FAMILIES WITH SMALL NUMBER OF MEMBERS)
(D) PEOPLE SEARCHING FOR PERMANENT OR TEMPORARY JOB - BIG COMPACT FAMILIES (GASTARBEITERS)

•PROPOSAL: "LUCKY TOWN"
LUCKY TOWN MEANS NEW HOME FOR NEEDY PEOPLE

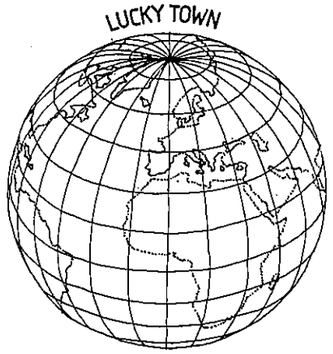
•OBJECTIVE OF LUCKY TOWN CREATION OF SOCIALY HOMOGENOUS ENVIRONMENT FOR SAME PEOPLE
-CREATION OF LAST CHANCE FOR PEOPLE WHO TOUCHED THE BOTTOM
-MAINTAINING OF SMOOTH NATURAL ACTIVITIES OF PRESENT TOWN CENTRES (REMOVAL OF HOBOS AND VAGABONDS)
-CREATION OF "NEW HUMAN BEING" IN NEW CONDITIONS FROM SOCIOLOGIC-PSYCHOLOGIC- POINT OF VIEW

•CHARACTERISTICS OF LUCKY TOWN
THE CONDITIONS OF SO CALLED NORMAL TOWN ARE BEING CORRECTED TO MINIMUM ACCEPTABLE LEVEL INCLUDING THE POSSIBILITY OF QUALITATIVE INCREASE AND UP TO CERTAIN LIMIT THE POSSIBILITY OF QUANTITIVE INCREASE

•EXPRESSION OF LUCKY TOWN
-COMPACTIBILITY
NARROW STREETS, SMALL SQUARES IN VIEW PENETRATION, STRONG VIEW CENTRELINES
-HOMOGENOUS AND YET VARIEGATET VIEWS AT STREET COMBINATIONS
-SIMILARITY TO "OLD TOWN"
-LOW STORIED BUILDINGS

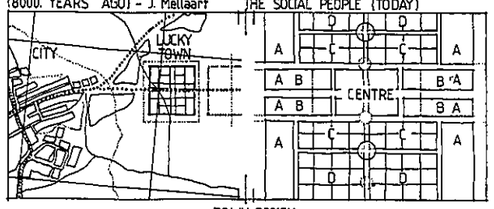
•TOWN DESIGN - SIMILARITY, PERFECT DISCIPLINE
-MAIN ROUTE INCL. STRONG CROSS AXIS
-CULTURE AND SHOPPING FACILITIES ARE LOCATED IN THE CENTRE
-GROUP (B) - STAYS IN HOTEL BUILDINGS (SOLOS ANDING) HAVING DIRECT CONTACT WITH COMMUNICATION JUNCTION
-GROUP (A) STAYS IN OUTSKIRTS IN SPECIAL BUILDINGS ("YMCA") BUT IN CLOSE CONNECTION WITH (B) AND TOWN CENTRE
-GROUP (C) STAYS WITH DIRECT CONNECTION TO CULTURE AND SHOPPING CENTRE IN SERIAL

LUCKY TOWN

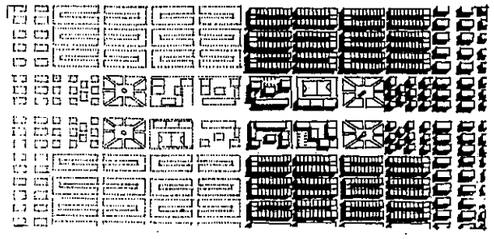


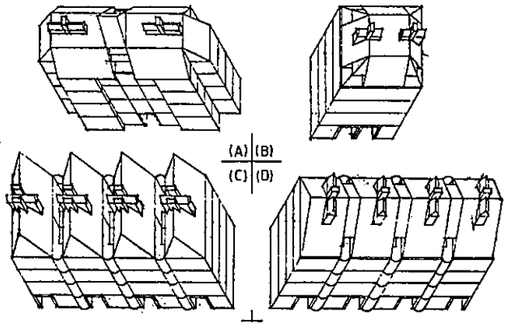
HABITATION IN CATAL HÜYÜK (8000. YEARS AGO) - J. Mellaart

LUCKY TOWN- DWELLING-PLACE FOR THE SOCIAL PEOPLE (TODAY)



TOWN DESIGN





HOUSES OR SOLO BUILDINGS HAVING THE POSSIBILITY OF STREET BUILDING-UP
-GROUP (D) STAYS IN MORE STORIED BUILDINGS MEZONET TYPE WITH CONNECTION TO CROSS AXIS
-JUNCTIONS OF CROSS STREETS WILL BE PROVIDED WITH FACILITIES IN GROUNDFLOORS
-WALKING LINES FROM BLINDS ALLEYS TO "COLLECTING" ROUTES
-STATIC TRANSPORT- CENTRALIZED IN THE CENTRE OF TOWN
-DYNAMIC TRANSPORT- ADJUSTED TO LOCAL CONDITIONS (IN ANY CASE ON MAIN ROUTE)

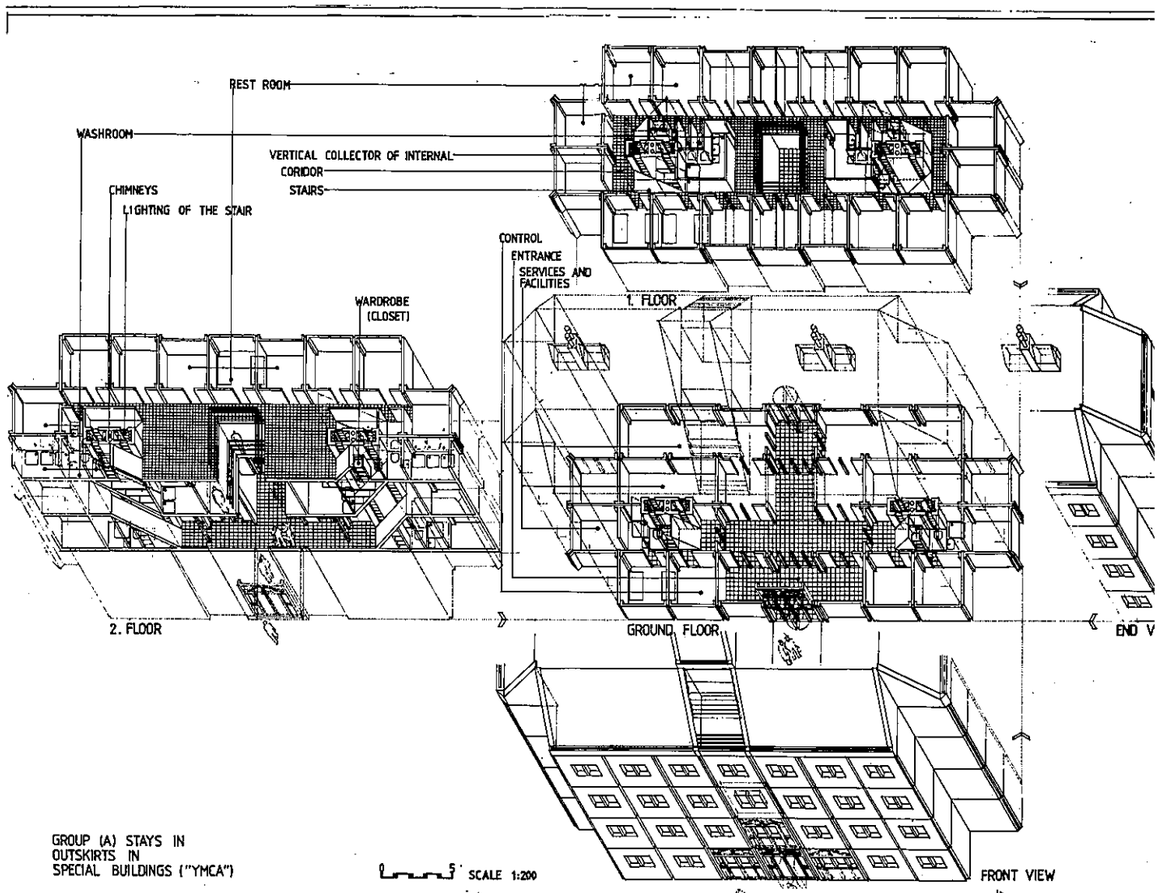
•SOCIAL ASPECTS OF THE DESIGN
-NEW POSSIBILITES AND WORKING CHANCES FOR MANY PEOPLE DURING THE CONSTRUCTION PERIOD AS WELL AS AFTERWARDS

•IMPLEMENTATION OF LUCKY TOWN
-GROUP (A) - SPECIAL TYPE OF BUILDING, SO CALLED "YMCA" LAYOUT: GROUND FLOOR-COMMON ROOM, DINNING ROOM, STOREYS: LIVING CUBICLES SEPARATED IN MINIMAL DIMENSIONS
-GROUP (B) - BUILDING OF HOTEL TYPE HAVING HIGHER STANDARD COMPARED WITH "YMCA" TYPE BUT SIMILAR, I.E. LAYOUT: DINNING ROOM COMMON ROOM, ETC. - GROUND FLOOR STOREYS ROOMS INCL. WASHROOMS
-GROUP (C) - BUILDINGS WITH THE POSSIBILITY OF SERIAL LOCATING IN STREET BUILDING UP POSSIBILITY OF LIVING GROUND FLOOR OR PROVIDING FOR OTHER FACILITES AS SHOPS LAUNDRIES, ETC.
-GROUP (D)- DITTO AS FOR (C) - WITH DIFFERENCE OF MEZONET TYPES APARTMENTS
-IN ALL CASES THE SPACE UNDER STAIR HORSE AND MIDDLE LANDING WILL BE USED FOR WASH ROOMS AND KITCHENS
-VERTICAL COLLECTOR OF INTERNAL SERVICES SERVING ALSO FOR VENTILATION AND LIGHTING OF STAIRS

•CONSTRUCTION MATERIAL: EASY APPLICABLE CONSTRUCTION SYSTEM ADDITIONAL MEMBERS

•BASIS OF DESIGN
-THE GRANTED ALLOCATION OF FUNDS FROM GOVERNMENT
-SERIAL MANUFACTURE OF CONSTRUCTION SYSTEM
-GOOD CHOICE OF LOCATION AND PROPER SITE PREPARATION
-PROPER MANAGEMENT OF CONSTRUCTION

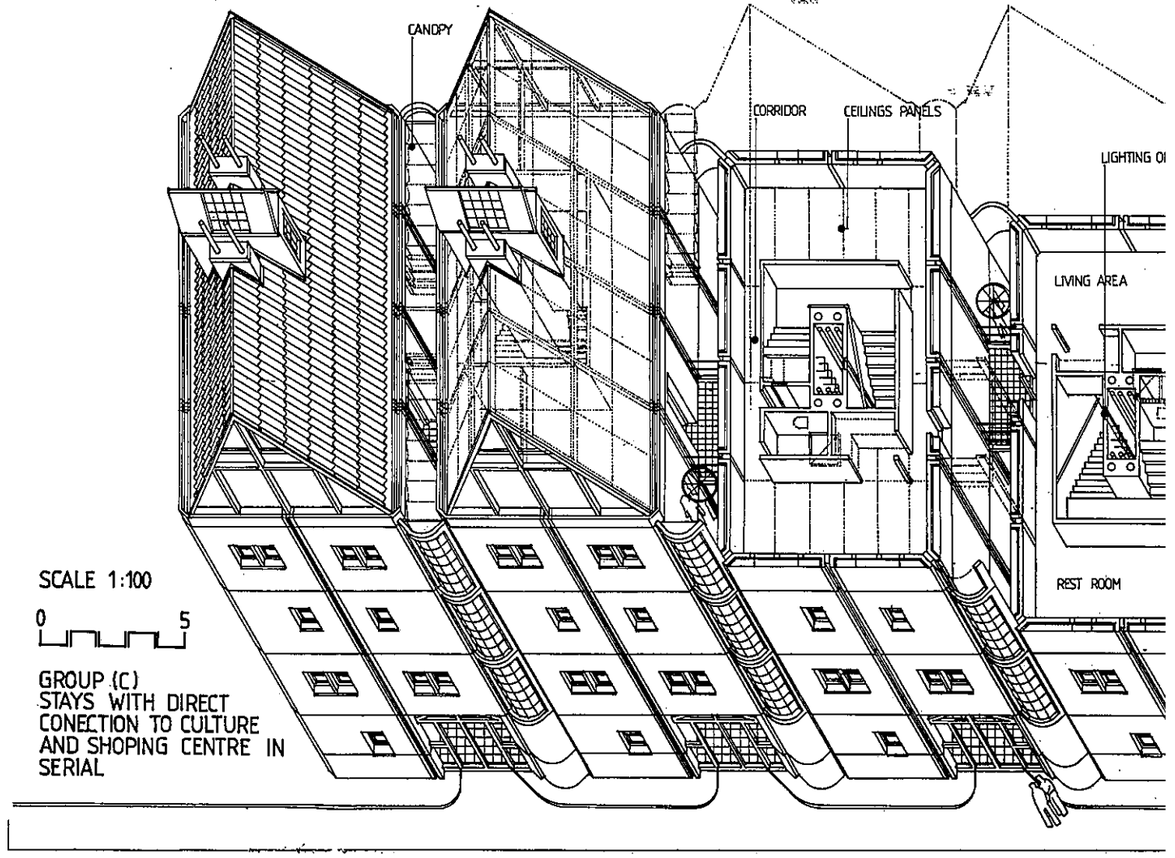
•RESUME
LUCKY TOWN WILL HELP TO SOLVE DIFFICULT SITUATION OF NEEDED PEOPLE MAINTAINING IN THE SAME TIME HUMAN CONDITIONS OF HOUSING WITH MINIMUM OF GOVERNMENTAL FUNDS (BY THE TIME BEING THE CONSTRUCTION WILL BE COMPENSATED BY RENTS)
"LUCKY TOWN" WILL RELIEVE THE CENTRES OF TOWNS WITH VAGABONDS AND HOBOS THESE PEOPLE WILL BE GIVEN THE CHANCE TO GET RID OF THE COMPLEX OF INFERIORITY AND TO BECOME HUMAN BEINGS



GROUP (A) STAYS IN OUTSKIRTS IN SPECIAL BUILDINGS ("YMCA")

SCALE 1:200

FRONT VIEW



SCALE 1:100

0 5

GROUP (C)
STAYS WITH DIRECT CONECTION TO CULTURE AND SHOPING CENTRE IN SERIAL

0 1 2 3 4 5
SCALE 1:30

DROP-SLIDE WINDOW
ERECTION OF PREFABRICATED CONSTRUCTIONS MEMBERS
TYPE OF THERMAL INSULATED CLADDING DEPENDS ON GEOGRAPHIC CONDITIONS
BASIC ELEMENT
DOOR
VERTICAL COLLECTOR OF INTERNAL SERVICES
CORRIDOR
RATE 17,5/28
CLOSET
UTILITY LOGGIA
DRYING OF CLOTHS
KITCHEN
A B
C D
WASHROOM
REST ROOM
LIVING AREA
LIGHTING OF UTILITY LOGGIAS
CANOPY

GROUP (D)
STAYS IN MORE
STORIED BUILDINGS
MEZONET TYPE WITH
CONECTION TO CROS AXIS

REST ROOM
WASHROOM
VERTICAL COLLECTOR OF INTERNAL
STAIRS
CORRIDOR
SERVICES AND FACILITIES
ENTRANCE CONTROL
CANOPY
LIGHTING OF THE STAIR
2. FLOOR
END VIEW
3. FLOOR
GROUND FLOOR
1. FLOOR
FRONT VIEW

GROUP (B) STAYS IN
HOTEL BUILDINGS
(SOLO STANDING)

0 1 2 3 4 5
SCALE 1:200

VOLUNTARY AND CO-OPERATIVE HOUSING: --

ITS POTENTIAL IN THE IRISH CONTEXT.

Dublin has surplus housing accommodation for the first time in 30 years. The length of waiting lists for Local Authority housing has been greatly reduced, and average waiting time has been halved, in the past four years. Dublin Corporation now offers its spare accommodation to single parents, to younger and middle-aged one-person households and other categories not previously readily housed by them.

Dublin's Housing Co-Ordinator claims that "Dublin has the best-housed population of any major European city".

However, apart from the 3,700 people on Dublin's housing list in January 1987, an unknown but possibly equal number may be homeless; largely unrecognised by the authorities, and sometimes even by themselves. Even if one excludes the Travelling Community, and the 1200 people living in Dublin's hostels, over 900 people contacted just one of the voluntary bodies which dealt with problems of homelessness in 1986.

Of this 900, 79% were less than 40 years of age and 28% were less than 20. 40% were women. This is not the usual image of the Irish homeless person as an over-40 male alcoholic.

HOMELESSNESS is not just a problem of having a roof over one's head. It has a lot do with the reasons and process which bring it about.
These can include families involuntarily sharing an overcrowded house. It can also involve poor housing environment and poor location relative to work opportunities, shopping and social facilities. The resulting ghettoisation and immobility can accentuate the powerlessness of people to improve their own situation, thus continuing social deprivation even as they provide shelter.

THE MISMATCH of accommodation to need may increase due to these factors, and may go unrecognised within our current concepts of the structure of housing provision. These concepts see the main structure comprising two sectors of estate housing:

PUBLIC	vs.	PRIVATE
(i.e. rented from the local authority)		(i.e. bought with the help of £5,000 grants, mortgage tax relief & subsidies)

However, the two have much in common;

STATE SUBVENTION by grants and reliefs

SUPPORT FROM INTERESTS, political and commercial, involved in their provision;

REMOTENENSS from the householder in the mechanisms which provide them; and

AIMED AT GENERALISED CATEGORIES of people; poor/rich, young/old, etc.

VOLUNTARY AND CO-OPERATIVE HOUSING by contrast introduces a new concept, and sees the fundamental division as between

SPECULATIVE	vs.	COMMISSIONED
(both of the above where the dwelling comes before the householder)		(where the founder householder dictates the form of housing, and all households contribute to upkeep)

This study investigates the potential of this third arm, of voluntary and co-operative housing, in the Irish context.

HOME-OWNERSHIP BUILDING CO-OPERATIVE

EACH MEMBER ORGANISES THE FUNDING OF HIS OR HER OWN DWELLING AND HOLDS TITLE

MEMBERS ARE SHAREHOLDERS IN THE CO-OP WHICH BUYS THE SITE AND ORGANISES THE DESIGN AND CONSTRUCTION OF THE HOUSES

SUITABLE FOR PEOPLE WHO WANT MORE CHOICE THAN CAN BE GOT IN SPEC. HOUSING, BUT CAN'T AFFORD ONE-OFF

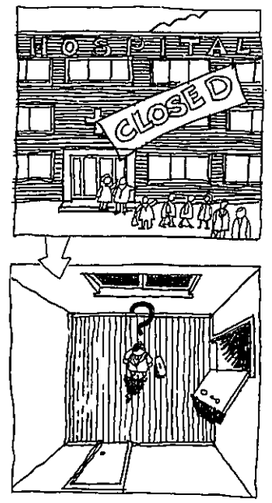
EXAMPLE: BALLYBRACK, CO. DUBLIN: GEOGHEGAN ARCHTS.

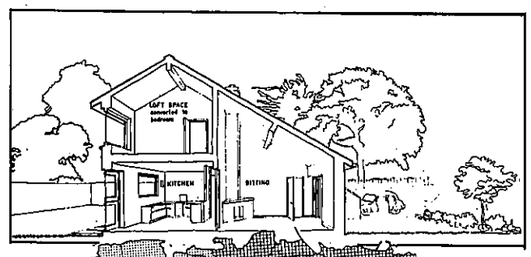
HOUSING ASSOCIATIONS

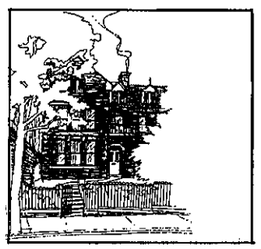
VOLUNTARY OR CHARITABLE GROUPS PROVIDING RENTAL ACCOMMODATION + MANAGEMENT SERVICES.

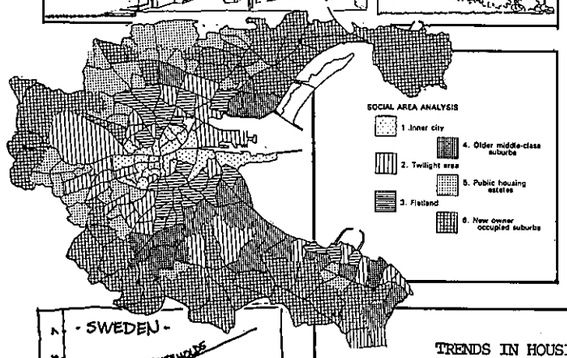
ESPECIALLY SUITABLE FOR PEOPLE WITH SPECIAL NEEDS: THE OLD, HANDICAPPED AND EX-INSTITUTION INMATES.

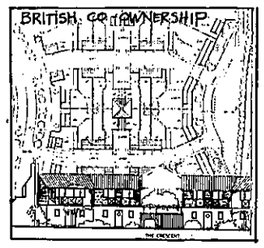
EXAMPLE: H.A.I.L., DUBLIN E. FITZERALD SELBY ARCH.

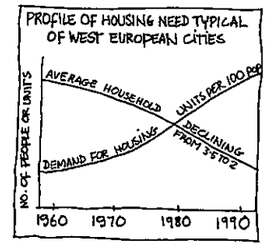


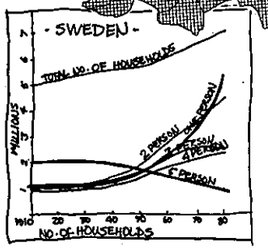












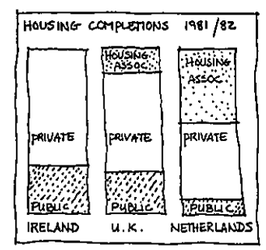
TRENDS IN HOUSING PROVISION

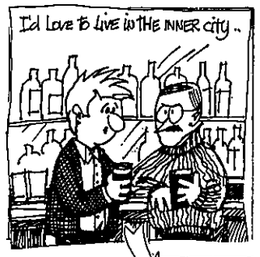
The Irish housing process is challenged by a combination of demographic and social changes. Firstly, there is a decline in household size and a parallel increase in the rate of household formation. Along with the decline in large-scale migration to Dublin of young workers, this will decrease demand for the typical suburban housing of the recent past.

Secondly, there is a new political will to shift the burden of caring for vulnerable groups from the institution to the community.

Thirdly, the evidence of social segregation and deprivation particularly in the Dublin area is a cause of mounting concern.

Fourthly, the crisis of our environment, both in terms of our decaying urban stock and the destructive suburban sprawl into rural areas, calls for decisive action.





CO-OWNERSHIP HOUSING
CO-OPERATIVES

EACH MEMBER HAS TITLE TO HIS OR HER OWN DWELLING

COMMON AREAS ARE SERVICED AND OWNED THROUGH A CO-OP

SUITABLE FOR PEOPLE USING BUILDING SOCIETY MORTGAGE FINANCE, WHO WANT NEITHER SPECULATIVE NOR 'ONE-OFF' HOUSES.

EXAMPLE: NORTH GREAT GEORGE'S STREET CO-OP, DUBLIN: THOMAS KIERNAN. ARCHITECT

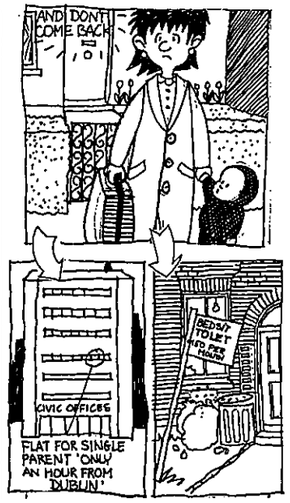
TENANT RENTAL
CO-OPERATIVES

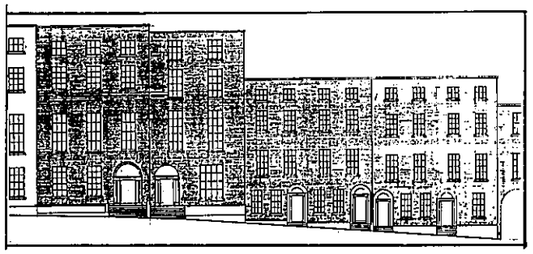
EACH MEMBER PAYS RENT TO COVER CAPITAL REPAYMENTS AND COST OF ALL SERVICES

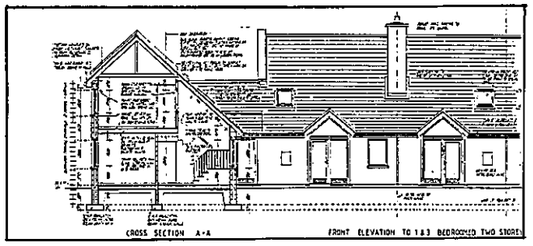
MEMBERS ARE SHAREHOLDERS IN THE CO-OP WHICH OWNS THE PROPERTY.

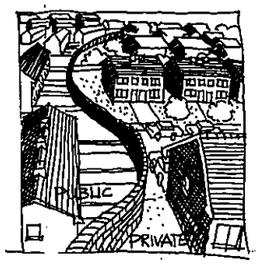
SUITABLE FOR PEOPLE FOR WHOM HOME-OWNERSHIP MAY NOT BE POSSIBLE, BUT WHO WISH TO PARTICIPATE IN A SELF-MANAGEMENT SYSTEM

EXAMPLE: BONNYBROOK, DUBLIN: GEOGHEGAN ARCHTS.









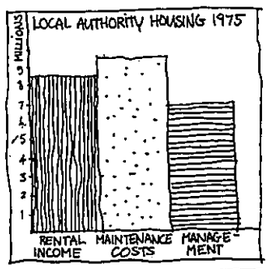
POTENTIAL OF VOLUNTARY & CO-OP HOUSING

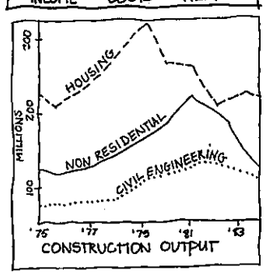
Develops a direct relationship to user & place; provides a catalyst for improving the environment and employment in poorer areas; and increases community awareness

Produces better cities and towns because of its bias towards small-scale infill & towards rehabilitation

Efficiency in use of public funds: none spent on housing maintenance and less on housing management; construction output and employment in housing can stabilise

Provides for people of special needs, of age, handicap or welfare support, in an integrated system of management. Co-ops can bridge divisions of public/private & owner/renter in an intermediate system





HOUSING IMPROVEMENT
CO-OPERATIVES

HOUSEHOLDERS IN AN AREA FORM A CO-OP TO CARRY OUT IMPROVEMENTS AND REPAIRS TO THEIR HOUSES JOINTLY

SUITABLE FOR PEOPLE IN RUN-DOWN AREAS WITHOUT THE CONFIDENCE AND THE RESOURCES TO IMPROVE THE HOUSES INDIVIDUALLY.

EXAMPLE: NABCO-PROJECT, PORTLAND ROW, DUBLIN: GERRY CAHILL, ARCHITECT

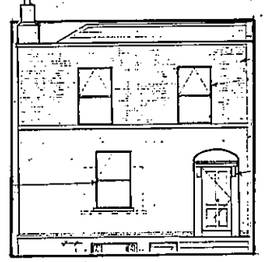
TENANT MANAGEMENT
CO-OPERATIVES

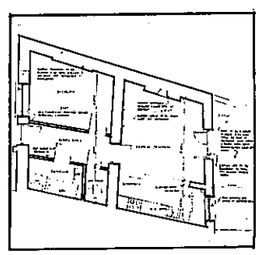
EACH MEMBER PAYS RENT BUT NO SERVICE CHARGE TO THE HOUSING ASSOCIATION OR LOCAL AUTHORITY

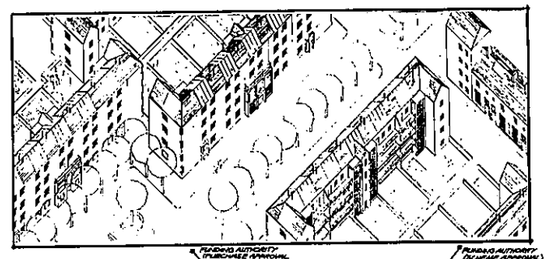
MAINTENANCE & MANAGEMENT ARE PROVIDED BY CO-OP

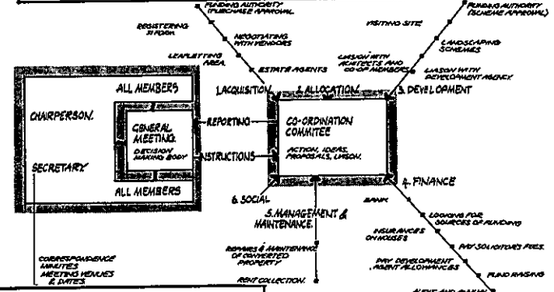
SUITABLE FOR PEOPLE WHO RENTED ACCOMMODATION BUT WANT RESPONSIBILITIES & BENEFITS OF SELF-HELP

EXAMPLE: PROJECT FOR SHERRIFF STREET, DUBLIN: QUAYS STUDY BY EMER O'SIOCHRU, ARCHITECT

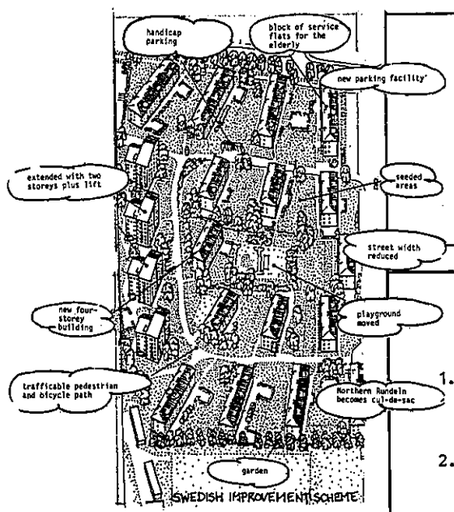






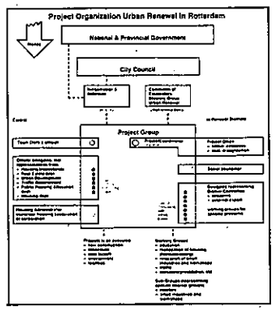


STRUCTURE OF HOUSING CO-OPERATIVE.



CONDITIONS NEEDED FOR GROWTH OF CO-OPERATIVE AND VOLUNTARY HOUSING

1. Local authorities should introduce an administrative system to deal with these forms of housing, and make sites available in inner city and town areas.
2. Equivalent State aid, including tax relief available to individuals, should be devised to assist co-ops and voluntary associations as legal entities.
3. Financial institutions should be encouraged to provide mortgage capital in the same way.
4. The capital subsidy scheme for non-profit and voluntary housing must be increased and improved for the disadvantaged, and State Housing Finance Agency empowered to lend to co-ops and associations catering for limited income groups.



COMMUNITY PARTICIPATION AND HOUSING PRODUCTION MECHANISMS FOR LOW-INCOME FAMILIES IN BRASIL

RECIFE METROPOLITAN REGION

REALITY:

COMMUNITY

. Social-economic-cultural factors

. Community strength (organization/ mobilization/ skill levels)

. Historical tradition in construction process

⇉

- Lack of housing
  . deficit of 350,000 units, increasing by 35-40,000 per year
- Lack of resources
- Urban caos
  . open spaces occupied by low-income, owner-built housing by means of auto-construction within the evolutionary housing philosophy

⇇

GOVERNMENT

. Previous attempts failed

. Currently positive political atmosphere

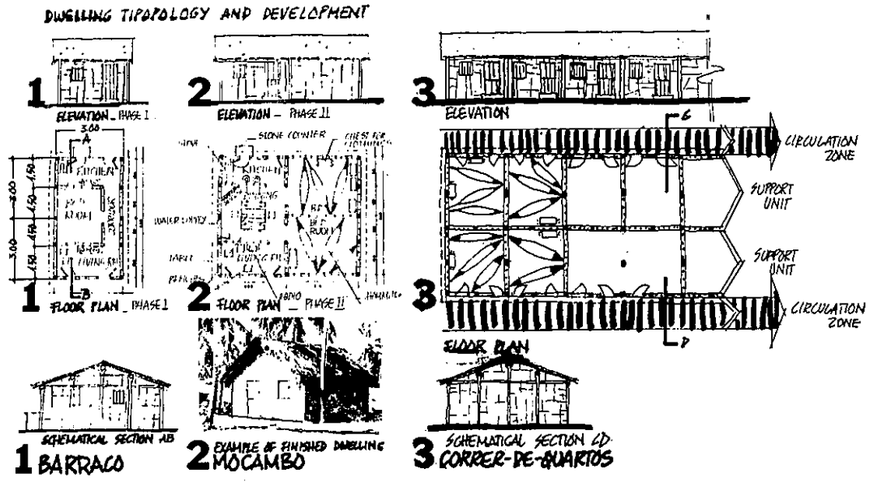
MAPSHOT MAY, 1974
SOURCE - FUNDAÇÃO DE DESENVOLVIMENTO DA REGIÃO METROPOLITANA RECIFE - FIDEM

1
2 3

1- low level lands
2- urban open spaces
3- hills

CORRER-DE-QUARTOS

DWELLING TIPOLOGY AND DEVELOPMENT



1 BARRACO
2 MOCAMBO
3 CORRER-DE-QUARTOS

"Community Participation and Housing Production Mechanisms for Low-Income Families in Brazil"

The following is a proposal, conforming closest to Secton II in the thematic areas suggested, concerning the use of community participation within the context of building low-cost urban housing for low-income families. The focal point of the project is Recife, the capital city of Pernambuco in the Northeast of Brazil. According to the 1980 census, the city's population is almost 1,300,000.

The primary emphasis of this discussion will be the importance of community participation in the construction of low-cost housing and many of its components, including: the importance of community participation from the initial decision making through the construction process, the organization of essential committees and the training of participants. Secondly, the discussion will include the essential, yet often over-looked area of monitorization and evaluation. Suggestions will be made as to how these three, community participation, monitorization and evaluation might be carried out in the low-income housing context.

The list is long of housing projects financed and built by government agencies to be given to needy families. These families have not, in most cases, taken part in any decision making prior to occupation of the housing and therefore have little feeling of participation or or commitment to the existing structure, its up keep or improvement. What is necessary therefore is housing planned and built by future dwellers, creating not only a personal commitment to the project, but also offering employment during the construction phase. Also during this phase, planning for future employment (selling goods and services) will be realized with the construction of shops. When ideas are originated by residents and design and construction are completed by them with the help of professionals, they will be more likely to maintain the housing, unlike the "contractor built schemes provided by the government and various funding agencies (see Skinner, 1983). As Hollnsteiner (1977) observed, "People know how to conceptualize, decide, implement and evaluate their own living arrangements and lifestyles." In "Community Participation: it's scope and organization" (1983), Skinner suggested that in the initial processes, residents be given as much freedom as is possible(within such limits as those set by finances and land availability). The boundaries he spoke of are created when plans are made or materials are provided in advance, before decisions are made by the citizens group.

The project we propose is for cities that, like Recife, have large poverty-stricken populations living on the outskirts of the city. It is our opinion, and has been substantiated by the writers previously mentioned and others, that community based citizen's groups are essential for successful programs.

In the communities involved, development and welfare committies will be strengthened if they exist. Where they do not, Social Workers will be responsible for mobilizing the community, helping them to be aware of needs and making suggestions to assure that, when one goal is reached there is always another ahead. Social Workers and other professionals will assist the leaders who have been chosen from within the community group to make sure realistic goals are being set and, one by one, accomplished. The group leader will act as a facilitator, taking the role of the communication link between the financial backers, citizens and other professionals involved. The leaders will be asked to report on all activities and assign responsibilities within the group. A community participation strategy will be developed incorporating the various types of communication techniques available (audio-visual, literature) for dissemination of information about the project to the community, or to the target population in case of site and services projects.

The various funding agencies involved will be requested by group leaders and their advisors to allocate funds for small scale business enterprises, physical development and welfare activities in order to help motivate the community. Larger projects only become successful due to the smaller accomplishments attained along the way.

An estimated cost of facilities required for employment generating activities will be provided before the project is begun. The income distribution of the target group will also be determined and an affordability analysis will be carried out. This analysis will help to match the types of housing and infrastructure proposed to what the target population can reasonably afford, or afford to maintain.

Monitoring mechanisms and key indicators of project development will be established, as well as what the reporting intervals from field workers, architects, engineers and the various members of the program's stages will be.

The monitoring and evaluation processes are equally as important as the community participation aspect of the project. "Monitoring and evaluation seeks to understand the causes for the various levels of programs and examines the appropriateness of targets and objectives," according to "The Working Guide on Housing Project Planning" (Rotterdam, Holland). The intended project will be evaluated continuously during the construction, immediately upon completion and at scheduled intervals after occupation. The monitoring and evaluation undertaken in the proposed project will be used to analyze the input and the output of the community. "Input" in this case includes a variety of costs: managerial, professional, household and community effort. "Output" is the resulting housing and social facilities, the level of satisfaction of those accomodated, together with other important aspects of the project (Working Guide on Housing Project Planning).

See Paul Barross (1978) for a discussion of the Centralist Philosophy" which sides with the view that the government should supply finished dwellings to the low-income target population.

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GUIDE LINES

- New architectural concepts adapted to the specific socio-cultural conditions	. Possibility of rearrengement of urban design . Feaseble solutions in "invaded" open spaces which allow settled communities to stay in these same spaces
- Alternative construction technologies based on the self construction process within the evolutionary housing philosophy	. Possibility of communities to participate in the construction process . Cost-effective solutions that make possible an increase the number of working communities
- Reorientation of investments and incomes	. Offer only the basic infrastructure making transfer possible to other areas . Warranty of apropriation of benefits by the communities
- Effective community participation in all stages of the process	. Solution agrees with actual needs of communities . Solutions agree with resourses available . Continuaty of the process begun
- Monitorization process	. Able to reach the objetives by means of feedback in all stages, including after intervention
- Reorientation of goverment action	Create the social-economical and institutional conditions for the implementation of the intervention

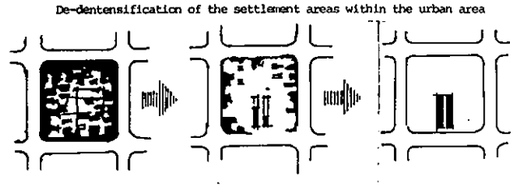
THE PROPOSAL DESIGN

This design is not proposed for specific area nor to a target group of people. Rather, it is a model design taking into consideration the morphological characteristics of the existing and previously attempted housing schemes created by the people themselves in their space occupying process. Previous dwelling have been built according to the socio-economic and culturals needs and conditions of the communities in the Recife Metropolitan Region (Pernambuco State, Brazil).

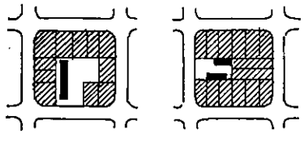
This proposal is based on the survey and empirical experiences made by architects Raúl di Lullo and Edgardo Martínez in Uruguay(*) Their results are very close similar to the idea of the popular "correr-de-quarto" observed in the areas intended to be worked on in Recife.

We would like to emphasize that the "correr-de-quarto"'s originate in the rural areas where they are used to shelter workers and, also, in the coastal areas for fishermen. They are very often used in the low levels areas, as well as in the hills where are built to follow the contours of the land.

(*) Raúl di Lullo and Edgardo Martínez "Vivienda Colectiva Urbana", paper presented at the Hogeschool, Eindhoven, Holland - November, 1980.

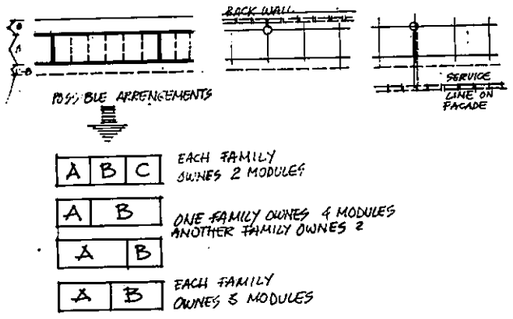


Rearrengement of urban design leaves open spaces available for income-generating and recreation activities

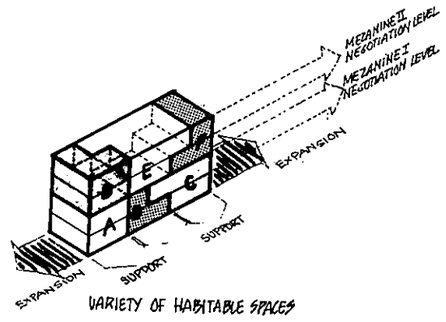


Feaseble solutions in "invaded" open spaces

. DESIGN CRITERIA

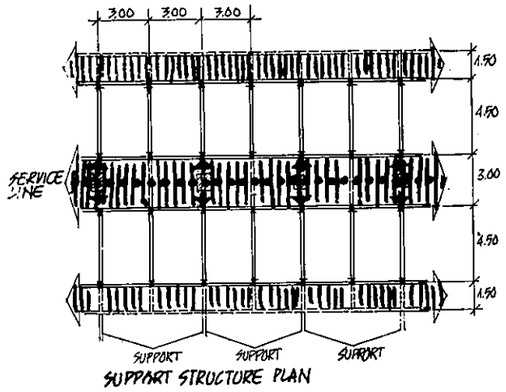


Possible height (with negotiation level - mezanine) will add possible multiplication of occupant's area



VARIETY OF HABITABLE SPACES

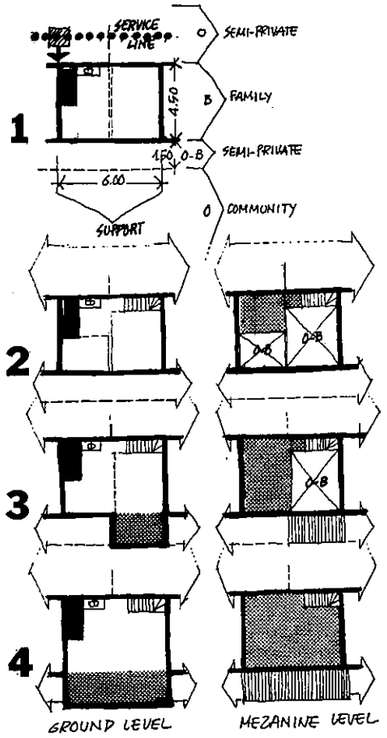
Flexibility (within a given area) for families of various sizes to negotiate with their neighbors as to how much space each family will occupy



SUPPORT STRUCTURE PLAN

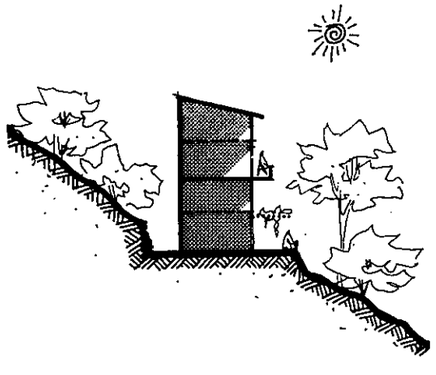
The support structure plan is based on the idea of the popular "correr-de-quarto" seen in the rural areas

. CORE UNIT EVOLUTION STAGES



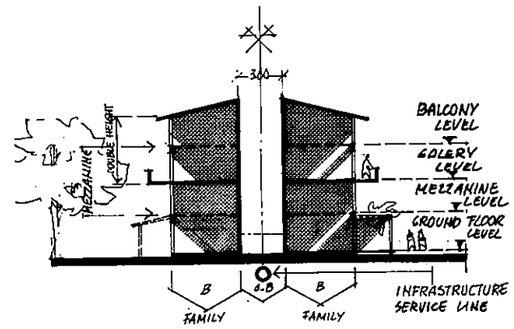
AREA LIMITS
VARIABLE 1 (MIN.) = 27.00 M²
VARIABLE 4 (MAX.) = 63,00 M²

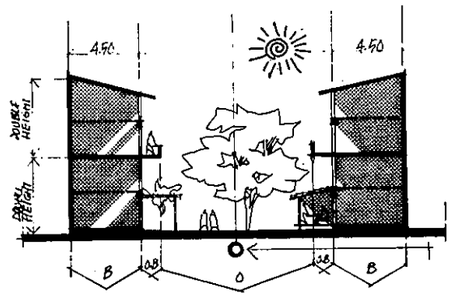
Each family will be able to build according to their financial situation



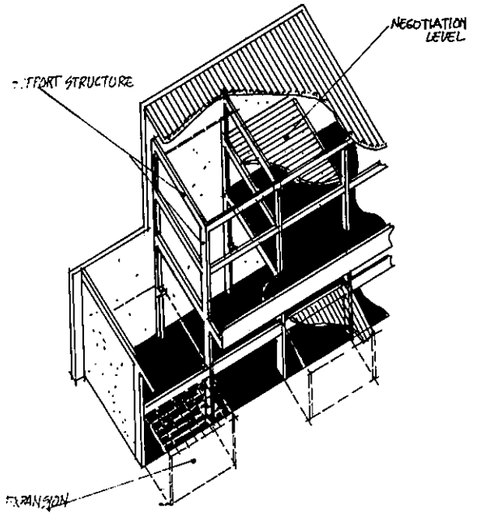
The linear design of the dwelling is adaptable to all types of topography

. According to the available area there are several urban arrengements to choose





Cost-effective solution for the infrastructural services, concentrating them in a service line



The evolutionary housing philosophy make utilization of low-cost building materials, available on the market, possible

The final lay-out of the settlement and floor plans of individual dwellings will be the result of community effort and participation

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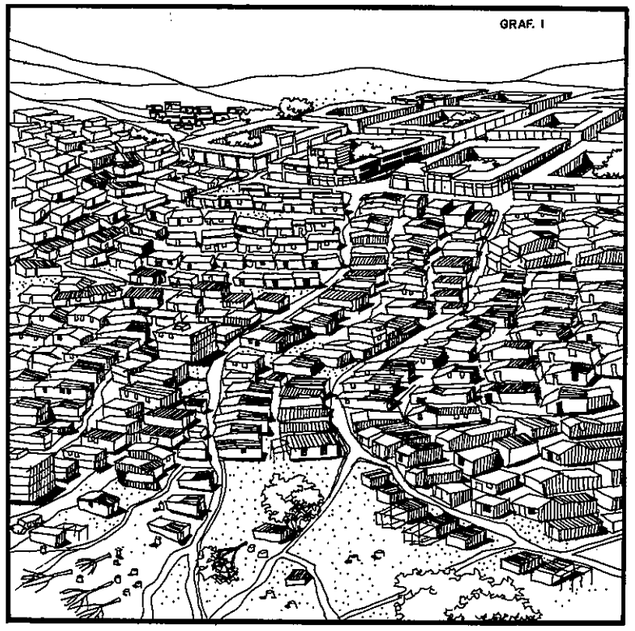

GRAF. 1

LA URBANIZACION PROGRESIVA UTILIZANDO CONDOMINIOS RESIDENCIALES CON VEREDAS VEHICULARES-PEATONALES.

(TRABAJO A SER INCLUIDO EN EL SECTOR V DEL TEMARIO DEL CERTAMEN INTERNACIONAL DE SOLUCIONES SOBRE NUEVAS TECNOLOGIAS DE LA VIVIENDA SOCIAL-CINTUS).

A. INTRODUCCION:

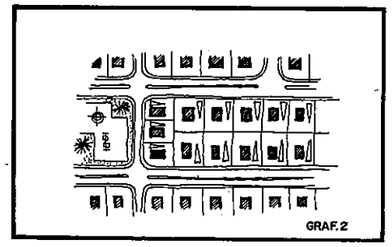
UNO DE LOS PRINCIPALES PROBLEMAS QUE CONFRONTAN LAS CIUDADES DE LOS PAISES EN DESARROLLO, SUBDESARROLLADOS O COMO SE LES QUIERA DENOMINAR, ES EL DE SU CRECIMIENTO ANARQUICO, DESORDENADO POR LA INVASION CAOTICA, ACELERADA E INCONTROLADA DE LOS TERRENOS LIBRES QUE LAS RODEAN (GRAFICO 1). EN VENEZUELA, POR EJEMPLO CERCA DE UN 41% DE LA POBLACION HABITA AREAS DE DESARROLLO ANARQUICO CON RANCHOS, FAVELAS, CALLAMPAS O CUALQUIER OTRO NOMBRE QUE LAS PRETENDAN IDENTIFICAR CON UNA POBLACION APROXIMADA A LOS 5 MILLONES DE PERSONAS EN 2.833 BARRIOS. EN SOLO 7 AÑOS ESTAS AREAS SE HAN DUPLICADO, PASANDO DE 1.240 BARRIOS A LA CIFRA ACTUAL Y LO MAS GRAVE: QUE EN LOS PROXIMOS QUINCE AÑOS, EN CASO DE CONTINUARSE "ENFRENTANDO" EL PROBLEMA HABITACIONAL DE NUESTROS PAISES CON LOS CRITERIOS ACTUALES (MUCHOS DE ELLOS COPIADOS DE REALIDADES MUY DIFERENTES A LAS NUESTRAS) SERAN INVADIDAS 56.500 NUEVAS HAS. LIBRES DE NUESTRAS CIUDADES, HACIENDO QUE LAS AREAS PLANIFICADAS DE LAS CIUDADES SE CONVIERTAN EN MARGINALES, A TRAVES DE SU INVASION POR FAMILIAS CON INGRESOS POR DEBAJO DE LOS 250 DOLARES AL MES, QUE REPRESENTAN EL 75% DEL TOTAL DE LA POBLACION DEL PAIS Y QUE NO PUEDEN OPTAR A LAS TIPOLOGIAS DE VIVIENDAS COSTOSAS QUE EL MERCADO TRADICIONAL PRETENDE OFRECERLES.

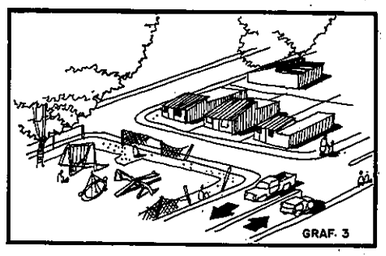
B. LAS SOLUCIONES TRADICIONALES.

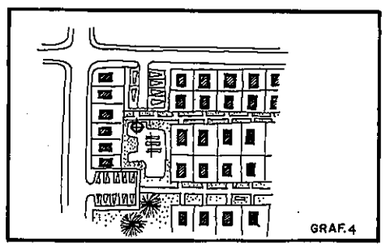
NUESTROS PAISES CARECEN DE LOS RECURSOS ECONOMICOS INMEDIATOS PARA ADELANTARSE AL PROBLEMA MENCIONADO, CON UN URBANISMO TRADICIONAL DE CALLES Y PARCELAS (GRAFICOS 2 Y 3) CON UN ALTO COSTO Y DONDE SE ORIGINA UNA GRAN PELIGROSIDAD POR EL TRAFICO DE VEHICULOS, NO CONFORMANDOSE VERDADERAS COMUNIDADES, DEJANDO AREAS LIBRES OCIOSAS DE DIFICIL Y COSTOSO MANTENIMIENTO. O CON UN URBANISMO DE ESTACIONAMIENTOS COMUNES Y VEREDAS PEATONALES QUE DAN ACCESO A LAS VIVIENDAS. (GRAFICO 4), AUNQUE DE MENOR COSTO, TIENE EL PROBLEMA DE QUE LAS PERSONAS PENETRAN CON SUS VEHICULOS A TRAVES DE LAS VEREDAS PEATONALES (GRAFICO 5) DESTRUYENDO EL CRITERIO DE DISEÑO UTILIZADO, SACRIFICANDO LOS ESPACIOS RECREACIONALES, AREAS INMEDIATAS A LAS VIVIENDAS Y AREAS LIBRES DE LAS PARCELAS.

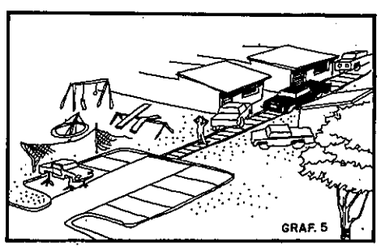
EN MUCHOS URBANISMOS TRADICIONALES, SE ESTABLECEN GRANDES TALUDES (GRAFICO 6) QUE PROVOCAN ELEVADOS COSTOS Y UN AISLAMIENTO ENTRE LAS VIVIENDAS (GRAFICO 7).

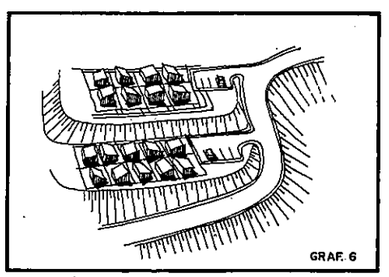
LA PROPUESTA QUE A CONTINUACION SE DESCRIBE ES UN INTENTO DE RESPUESTA A ESOS PROBLEMAS, BASADA EN EXPERIENCIAS PERSONALES DE MAS DE 20 AÑOS EN ESTA AREA, PROPOSICION QUE AUN SE HALLA A NIVEL EXPERIMENTAL EN VENEZUELA. A NIVEL DE URBANISMO DE BAJO COSTO.

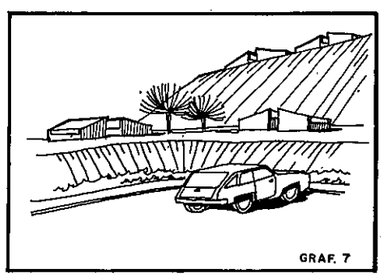

GRAF.2


GRAF. 3


GRAF.4

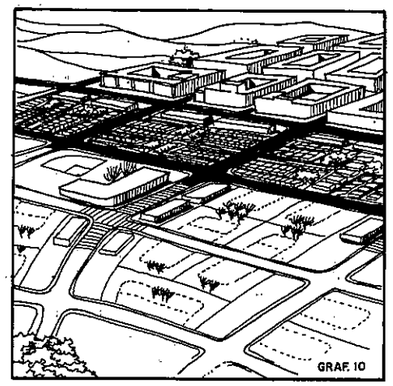

GRAF. 5

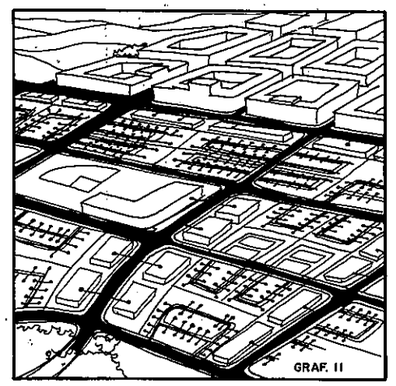

GRAF. 6

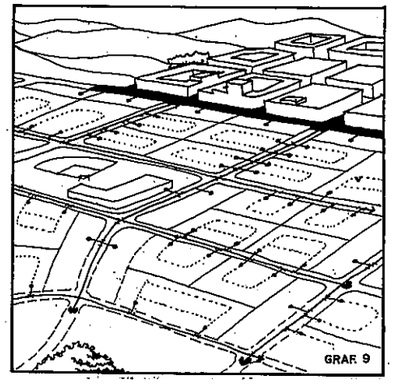

GRAF. 7

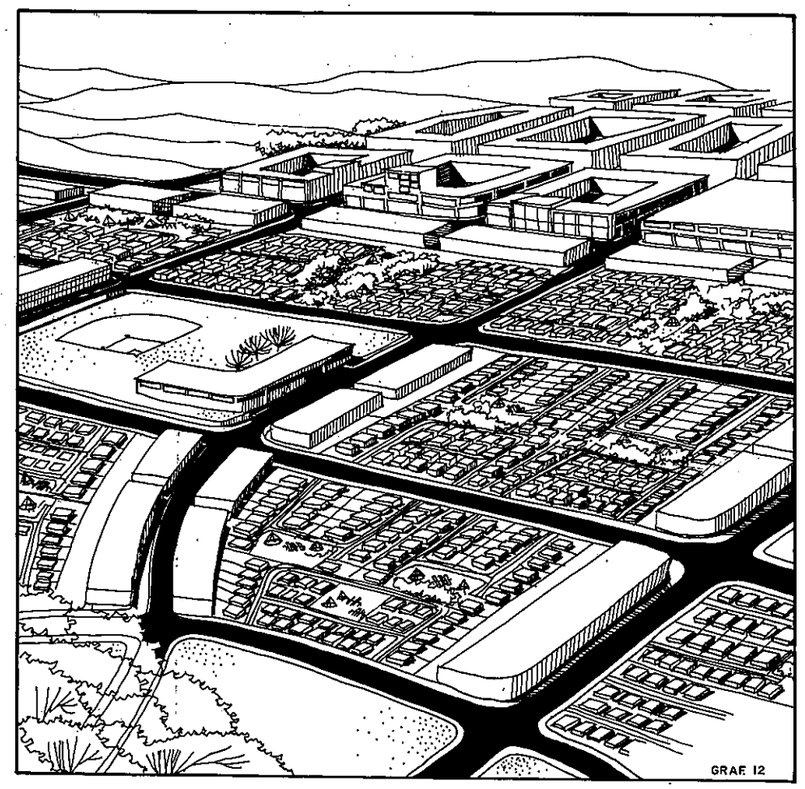
C. LA PROPUESTA.

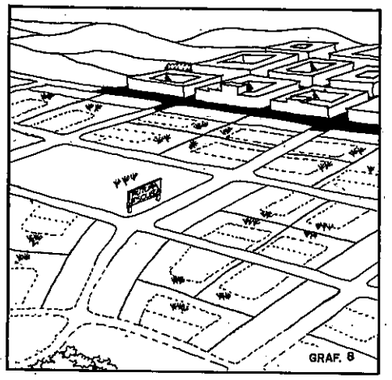
LA PROPUESTA ESTABLECE EL URBANIZAR EN FORMA PRIMARIA LOS TERRENOS SUJETOS A POSIBLES INVASIONES, (VIAS SIN ASFALTAR) CON MACROPARCELAS DE CONDOMINIOS ESTABLECIDOS CON VEREDAS VEHICULARES PEATONALES Y PREVISION DE AREAS DE SERVICIOS (ESCUELAS, ETC) (GRAFICO 8) CON REDES VIALES E INFRAESTRUCTURA BASICA: PILAS PUBLICAS Y CLOACAS (GRAFICO 9). PARA POSTERIORMENTE PERMITIR LA OCUPACION PROGRESIVA DE LOS LOTES (GRAFICO 10), COMPLEMENTANDO LOS SERVICIOS EN FORMA PROGRESIVA AGUA, LUZ, CLOACAS A TODAS LAS VIVIENDAS (GRAFICO 11) CONCLUYENDO CON CIUDADES HUMANAS Y ORDENADAS EN EL FUTURO (GRAFICO 12),


GRAF. 10


GRAF. 11


GRAF. 9


GRAF. 12


GRAF. 8

D. CONDOMINIOS.

D.1. DESCRIPCION (GRAFICO 13).

AUN CUANDO EN LA DESCRIPCION ANTERIOR EXISTEN CONDOMINIOS DE DIFERENTES USOS Y DENSIDADES, EN LA PRESENTE PROPUESTA ME LIMITARE A LOS CONDOMINIOS DE VIVIENDAS UNIFAMILIARES QUE PERMITEN LOS MENORES COSTOS Y LA AUTOGESTION DE LOS USUARIOS (A DIFERENCIA DE LA INADECUADA PALABRA "AUTOCONSTRUCION"), ESTOS CONDOMINIOS SE UBICAN EN MACROPARCELAS QUE PERMITEN EL ALOJAMIENTO DE 20 A 60 FAMILIAS, CON LOS SERVICIOS RECREATIVOS Y SOCIALES BASICOS, UTILIZANDO VEREDAS PEATONALES-VEHICULARES, ELIMINANDO EL USO DE ESTACIONAMIENTOS COLECTIVOS.

D.2. SERVICIOS:

a. AREA DE JUEGOS INFANTILES, CENTRO DE REUNIONES SOCIALES: DE LA AGRUPACION (TOTAL = 10-12 M2/FAMILIA). DEBIDAMENTE DELIMITADA Y CERCADA PARA USO EXCLUSIVO DE ESTAS 20-60 FAMILIAS (GRAFICO 14) LO QUE EVITARA LA PELIGROSIDAD Y EL ABANDONO TIPICO DE ESTAS AREAS EN LAS AGRUPACIONES DE BAJO COSTO.

b. BASURA:

DEPOSITO COMUN EN EL ACCESO DEL CONDOMINIO, SOBRE LA VIA PRINCIPAL, FACILITANDO EL USO DE ESTE SERVICIO. (GRAFICO 15).

c. ESTACIONAMIENTOS:

UBICADOS EN CADA PARCELA (EN CASO DE NO DISPONER DE VEHICULO EL USUARIO, PODRA UTILIZAR EL AREA ADICIONAL DE SU PARCELA COMO AMPLIACION DE LA VIVIENDA).

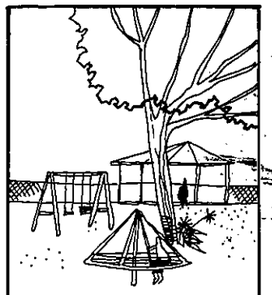
d. LAS VEREDAS CUNETAS PEATONALES-VEHICULARES. (GRAFICO 16) ESTAS VEREDAS FUNDAMENTALMENTE PEATONALES, PERMITEN EL ACCESO CONTROLADO Y EXCLUSIVO DE LOS VEHICULOS DE LOS HABITANTES DEL CONDOMINIO, SOLAMENTE PARA ACCEDER Y SALIR DE SUS VIVIENDAS, PUDIENDO SER UTILIZADAS ESTAS AREAS COMO AREA RECREACIONAL ADICIONAL POR TENER UN GRAN CONTROL VISUAL DESDE LAS VIVIENDAS. (COMO CUNETAS PERMITEN EL DRENAJE DE AGUAS DE LLUVIA. SOLUCIONES A ó B).

e. CONTROL: (GRAFICO 17). SE ESTABLECE UN CONTROL DE ACCESO Y SALIDA AL CONDOMINIO POPULAR DESDE LAS VIAS EXPRESAS EXTERIOR, QUE SE REDUCEN AL MAXIMO EN EL CONJUNTO. APARTE DE GARANTIZAR UNA GRAN SEGURIDAD EN EL MISMO, PERMITE UN MANTENIMIENTO FACIL DE REALIZAR POR LOS PROPIOS USUARIOS.

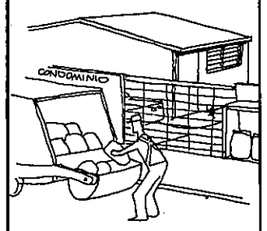
f. MOVIMIENTO DE TIERRA: (GRAFICO 18). SE PREVE ADAPTAR LAS PARCELAS A LA TOPOGRAFIA EXISTENTE, A FIN DE EVITAR GRANDES TERRACEOS, CON UNA CONFORMACION BASICA DEL TERRENO (GRAFICO a) PERMITIENDO SU ADAPTACION FUTURA POR LOS USUARIOS (GRAFICO b).

g. ACUEDUCTO, CLOACAS, DRENAJES, ELECTRICIDAD: (GRAFICO 19). EN TRAZADOS MUY SIMPLES Y ECONOMICOS DE POSIBLE CARACTER PROGRESIVO DENTRO DE LOS CONDOMINIOS EN LAS VEREDAS PEATONALES-VEHICULARES (VER EVALUACION ECONOMICA).

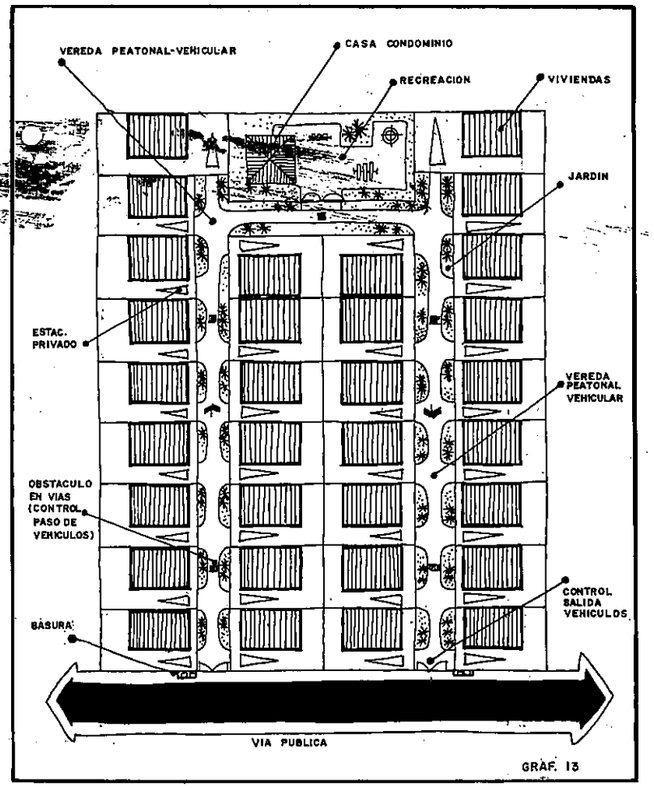
h. ESQUEMAS DIFERENTES. NO SE TRATA DE UN ESQUEMA TIPO A SER REPETIDO, SINO DE UN CRITERIO A SER ADAPTADO A DIFERENTES CONDICIONES TOPOGRAFICAS, ECOLOGICAS, SOCIOCULTURALES, PUDIENDO VARIARSE LOS TAMAÑOS DE PARCELAS, CARACTERISTICAS Y AREAS DE SERVICIOS, COMO PUEDE OBSERVARSE EN EL GRAFICO 21, DE UNA APLICACION DE ESTE CRITERIO EN UN DESARROLLO EN BARQUISIMETO, EDO. LARA. VENEZUELA.



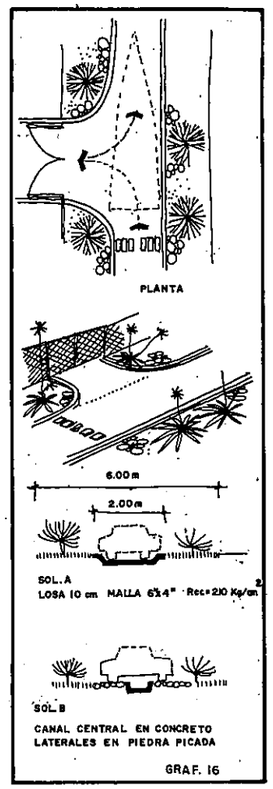
GRAF. 14



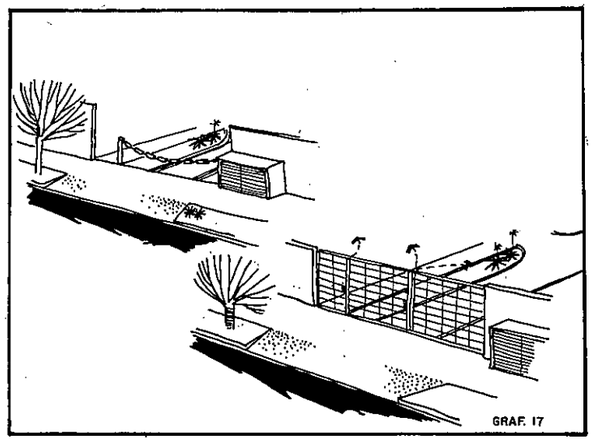
GRAF. 15



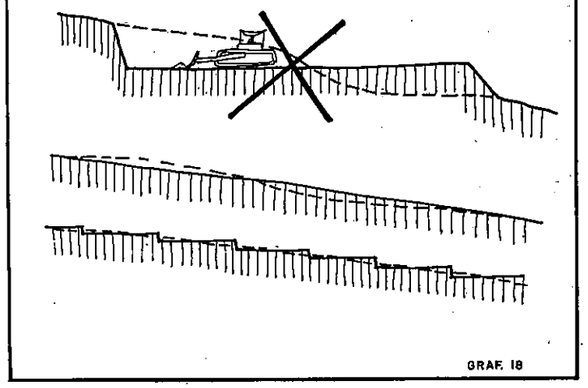
GRAF. 13



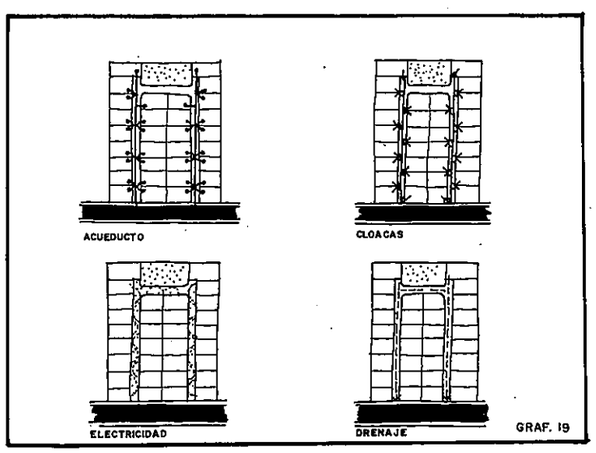
GRAF. 16



GRAF. 17



GRAF. 18



GRAF. 19

GRAF. 20

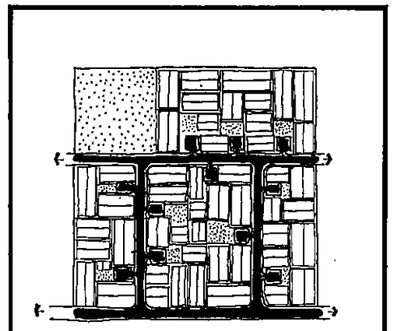
EVALUACION:

ESTA PROPUESTA, CONJUNTAMENTE CON LOS CRITERIOS MAS UTILIZADOS EN SOLUCIONES MASIVAS DE PARCELAMIENTOS POPULARES SE ANALIZO A TRAVES DEL ESTUDIO COMPARATIVO DE TRES AGRUPACIONES CON IDENTICO NUMERO DE VIVIENDAS (556 FAMILIAS), PARCELAS DE IGUAL TAMAÑO (10 X 15 M) E IGUAL PROGRAMACION DE SERVICIOS, UBICADOS EN TERRENOS CON PENDIENTE ENTRE 0 Y 3%, VARIANDO EXCLUSIVAMENTE LOS CRITERIOS DE DISEÑO URBANO UTILIZADOS; A SABER:

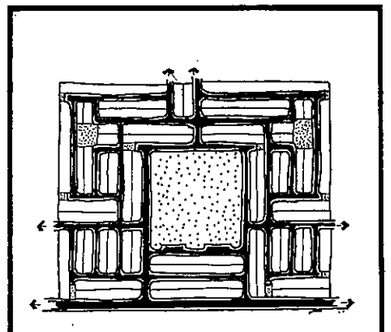
A) VIALIDAD PERIMETRAL CON ACCESOS PEATONALES A LAS PARCELAS Y ESTACIONAMIENTOS COMUNES (GRAFICO 21).
B) VIALIDAD DIRECTA A CADA PARCELA A TRAVES DE VIAS TRADICIONALES (GRAFICO 22).
C) VIALIDAD MIXTA: CON VEREDAS PEATONALES-VEHICULARES (GRAFICO 23).

ENCONTRANDOSE MARCADA DIFERENCIA DE LA SOLUCION C EN RELACION A LAS A Y B EN LO REFERENTE A: VIALIDAD VEHICULAR (GRAFICO 24-A) MAYOR DEMANDA DE AREA TOTAL EN LA SOLUCION B PARA UBICAR IGUAL NUMERO DE VIVIENDAS (GRAFICO 24-B) LO QUE INDICA UN SOBRECOSTO DEL 12% EN COSTO DE TERRENO REQUERIDO EXISTIENDO UNA GRAN DIFERENCIA EN COSTO POR PARCELA A FAVOR DE LA ALTERNATIVA C, REPRESENTANDO UNA REDUCCION DE COSTO DE UN 30% EN RELACION A LA ALTERNATIVA A Y DE APROXIMADAMENTE UN 53% EN RELACION A LA ALTERNATIVA B. (VER CUADRO 25). DONDE PUEDE OBSERVARSE QUE LA SOLUCION C TIENE UN COSTO POR PARCELA DE 8698 BS (395 $) Y LA SOLUCION MAS TRADICIONAL B TIENE UN COSTO POR PARCELA DE BS 17.396 (790 $) QUE CASI LA DUPLICA.

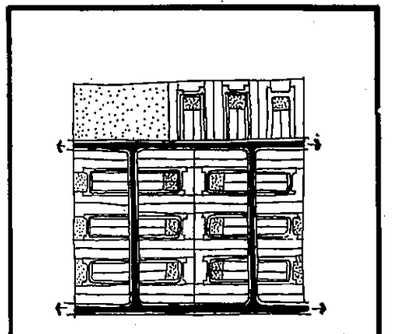
CON LA VENTAJA SOCIAL DE LA ALTERNATIVA C, DE AUSPICIAR UNA MAYOR PARTICIPACION DE LA POBLACION AL FOMENTARSE LA CREACION DE CONDOMINIOS CON UN MAXIMO DE 60 FAMILIAS QUE FACILITAN LA INTERCOMUNICACION SOCIAL Y FACILITAN EL USO Y MANTENIMIENTO DE LAS AREAS SEMIPRIVADAS, REDUCIENDO LOS COSTOS FUTUROS EN LOS DESARROLLOS E INCREMENTANDO LA SEGURIDAD PERSONAL EN LOS MISMOS A DIFERENCIA DE LAS TIPOLOGIAS DE URBANISMO TRADICIONALES QUE IMPOSIBILITAN ESTOS LOGROS. QUIZAS LO MAS IMPORTANTE DE ESTA PROPUESTA ES EL HECHO DE SER UN URBANISMO DE MUY SIMPLE DISEÑO, SIMILAR AL QUE ESTABLECIERON LAS LEYES DE INDIAS CON SU URBANISMO DE MALLAS ABIERTAS QUE DIO ORIGEN A CIUDADES COHERENTES, ORDENADAS Y FUNCIONALES, POR ELLO EN ESTA PROPUESTA SE TRATA DE RECUPERAR UN CRITERIO QUE SE HA IDO PERDIENDO.



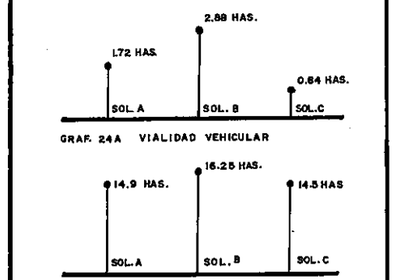
SOLUCION A GRAF. 21



SOLUCION B GRAF. 22



SOLUCION C GRAF. 23



GRAF. 24A VIALIDAD VEHICULAR

GRAF. 24B AREA DE TERRENO REQUERIDO

COSTO EN BOLIVARES POR UNIDAD DE VIVIENDA (1 USA $ = 22 Bs)

SOLUCION	AREA HA	NUMERO VIV.	MOVIMIENTO TIERRA	PAVIMENTO BROCALES ACERAS	CLOACAS	ACUEDUCTO	DRENES	VIALIDAD PEATONAL	TOTAL BS.
A	14.9	558	4.560	5.056	2.079	902	1.274	878	14.749
B	16.25	554	1.838	11.853	1.502	980	1.223	-	17.396
C	14.5	555	1.289	2.998	1.354	669	1.225	1.163	8.698

CONCLUSIONES:

a. EL DESARROLLO ANARQUICO DE LAS AREAS DE EXPANSION DE LA MAYORIA DE LAS CIUDADES DE LOS PAISES EN DESARROLLO, ES UNO DE LOS PROBLEMAS BASICOS A ENFRENTAR EN LOS PROXIMOS AÑOS, DADO SU VERTIGINOSO CRECIMIENTO QUE LAS HACE DUPLICARSE EN LOS PROXIMOS 15 AÑOS.

b. LA MAYORIA DE LOS CRITERIOS DE DESARROLLO URBANISTICO "NORMADO" QUE SE PRETENDEN IMPONER EN LA ACTUALIDAD, ESTAN PRODUCIENDO AGRUPACIONES RESIDENCIALES DE ALTO COSTO, DE DIFICIL CONSERVACION Y MANTENIMIENTO, AUSPICIANDO EL INDIVIDUALISMO, ENTORPECIENDO LA PARTICIPACION POPULAR Y CONFORMANDO AREAS DE GRAN PELIGROSIDAD URBANA.

RECOMENDACIONES:

1. ES URGENTE ESPECIALMENTE EN LOS PAISES EN DESARROLLO, LA REVISION DE LAS NORMAS QUE RIGEN EL DESARROLLO URBANISTICO DE LAS CIUDADES, CON LA FINALIDAD DE PROMOVER DESARROLLOS ADAPTADOS A NUESTRA REALIDAD SOCIO-ECONOMICA.

2. DEBERAN REALIZARSE PLANES MASIVOS DE URBANIZACION DE TIERRAS CON POTENCIAL DE SER INVADIDAS CAOTICAMENTE, ESTABLECIENDOSE UN URBANISMO DE CRECIMIENTO PROGRESIVO, CON ESQUEMAS QUE PROMUEVAN AL MAXIMO LA PARTICIPACION POPULAR Y FACILITEN LA AUTOGESTION DE LOS USUARIOS, TALES COMO EL PROPUESTO DE CONDOMINIOS RESIDENCIALES CON VEREDAS PEATONALES-VEHICULARES.

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SECTEUR V

Le sujet du concours "Nouvelles technologies pour la solution des problèmes de l'habitat social dans les pays en voie de développement" pose,inévitablement,une serie de problèmes d'approche considerables.
Notre contribution visera à reperer,bien que d'une manière générale,faute de place,quelques unes de ces problématiques.

1) Le problème des sans-logis,des marginaux,des habitants des favelas est un problème de grandes dimensions qui,chaque année s'avive,à cause d'une dynamique perverse,qui consiste d'une côté,dans la centralisation de toutes les fonctions dans les grandes villes,de l'autre dans la conviction que vivre dans la mégalopole soit la seule alternative à la misère et au manque de travail.
Une première partielle solution au problème pourrait se dégager de la réorganisation et des nouvelles fonctions données aux territoirs nationaux,selon les réelles ressources naturelles et humaines existentes. Une telle politique de gestion du territoire est,au présent,bien loin des prévisions car,du reste,elle impliquerait une réorganisation du syathème de gestion des multinationales,réduirait le réservoir de capacité de travail disponible à prix modique et permettrait,en réduisant l'émigration,la conservation de l'identité culturelle et sociale du travailleur.

2) Le problème (d'étudier des mécanismes simples pour donner un logis à tout le monde) se pose sur deux plans avec des urgences et des problématiques différentes:
a) les grandes villes
b) les zones décentralisées
Dans les grandes villes,dans les mégalopoles de l'Amérique latine ou dans les capitales de l'Afrique ou de l'Asie le problème des sans-logis ou des habitants des favelas se pose d'une façon urgente et qui ne peut pas être prorogée à cause de la dimension qu'il a atteint et du degré de déracinement et de dégradation qui s'est produit.
Dans les zones à désertification rapide,tel que le Sahel,où commencent à faire défaut les matières premières pour la construction,le problème,même en se posant d'une façon moins dramatique,toutefois est extremement urgent.

3) Il faut éviter quelques-unes des erreurs qu'on a faites jusqu'à présent soit dans le domaine urbanistique que de la réalisation des projets. Pour pouvoir faire le projets d'un habitat à travers un plan urbanistique ou pour pouvoir faire le projet d'une cellule habitative à réproduire en grande série, nous croyons qu'on ne peut pas faire abstraction du facteur humain et culturel des futurs bénéficiaires. On ne peut pas faire le projet d'un quartier,d'un habitat,d'une maison en considérant seulement la technologie,le nombre des établissements que l'on peut réaliser dans un temps donné,ni l'on ne peut supposer un système avec une technologie avancée et au même temps simple,un système qui puisse resoudre universellement tous les problèmes des habitats à prix modique et tout ça en faisant abstraction,comme cela arrive généralement,des bénéficiaires.
Il est nécessaire,à notre avis,de faire un projet selon les critères suivants:

a) étude anthropologique et urbanistique de la zone d'intervention. L'essentiel c'est de connaître à fond la réalité culturelle et humaine du référent. Du reste il n'est pas possible de considérer un seul standard du comportement national parce qu'il y a des cultures locales,sans parler des microcultures, qui constituent la structure portante de l'identité d'une nation,même si cela est souvent nié au nom d'une solidarité nationale supérieure qui unifierait le tout. Chaque population a son organisation économique,territoriale,culturelle et sacrale qui la rend différente et originale par rapport aux autres cultures limitrophes.
Il s'agit d'un phenomène de cohésion de groupe qui a permis de léguer jusqu'à présent des cultures extrêmement importantes.Des cultures et une histoire transmises par l'intermédiaire de la tradiction orale et des traces marquées sur le territoire et sur les bâtiments.
L'utilisation de l'espace privé et collectif prend auprès de chaque population des connotations et des valeurs très différenciées.
Le milieu intérieur et extérieur de la maison peut être très différent et change selon les usages religieux,culinaires et selon la valeur donnée aux outils etc...
Nous avons eu l'occasion d'observer,dans plusieurs cas,les dernières années,le total bouleversement de maisons projetées sans avoir pris en considération les coutumes et la façon d'habiter,mais pensées selon une mentalité eurocentrique ou bien selon une mentalité qui vise à resoudre seulement,coûte que coûte,les demandes.
Il y a des exemples de cette façon d'agir dans le monde entier et il est important de prendre acte de ces phénomènes pour éviter qu'ils ne réproduisent.
Un émigrant qui abandonne le lieu d'origine pour s'établir dans une grande ville est obligé à couper les ponts avec la communauté familiale traditionelle et il est disposé à n'importe quel sacrifice pour s'intégrer dans une activité de travail quelconque qui lui permet de pourvoir à la subsistance de sa famille: si,comme il arrive,même dans le privé il n'a plus la possibilité de se reconnaître,alors l'aliénation devient totale,le détâchement de ses racines est complet.
Les organismes de coopération nationaux et internationaux utilisent l'argent mis à disposition pour les aides aux pays émergents comme essort pour les industries nationales afin de recycler le surplus de production ou,quand même,d'organiser une production qui vise plus aux interêts des producteurs qu'aux besoins réels des pays aidés.
Les mêmes considérations sont valables aussi pour le bien-logement et pour les technologies qui sont exportées sans distinction et d'une façon acritique dans n'importe quel pays émergent.

b) vérification des outils traditionaux,des techniques locales de construction,des matériaux disponibles sur place à prix modique et des possibilités d'associer des technologies avancées à prix modiques et aisément utilisables par quiconque à des façons de construire traditionelles.

c) analyse des outils, des objets du culte, et des lieux de réunion, des éléments qui constituent l'ameublement, soit dans leur emploi que dans leur fonction de représentetivité.

d) Il faut vérifier quels sont les coûts du point de vue humain,économique,social et culturel pour produire une transformation radicale et il faut évaluer la possibilité de récupérer l'artisanat local,élément essentiel de la construction,et le sens esthétique local,en nette opposition aux interventions aseptiques importées qui n'ont aucun rapport avec les environnements.

e) Il existe des cultures où les bâtiments sont realisés personellement,d'autres où un maçon ou un artisan est delégué à la construction; il est important d'évaluer,donc,la possibilité de lier les deux expériences surtout pour les réalisations à prix modique dans les grandes villes.
e) Seulement la continuité dans la transformation peut permettre de ne pas detruire le territoire et le paysage davantage qu'on ne l'ait déjà fait jusqu'à présent.
Les cultures qui ne possèdent pas une langue écrite,par exemple,s'expriment d'une côté à travers la tradition orale confiée aux personnes âgées et aux chanteurs ambulants,de l'autre,à travers la réprèsentation iconographique sur les outils,sur les bâtiments,sur les lieux de culte ou de socialisation et à travers des traces sur le territoire,en symbiose complète avec le paysage. Le territoire,dans son ensemble,devient l'élément d'illustration de l'histoire et des évènements d'une culture d'un peuple et il est donc important qu'il ne soit pas détruit dans son ensemble.

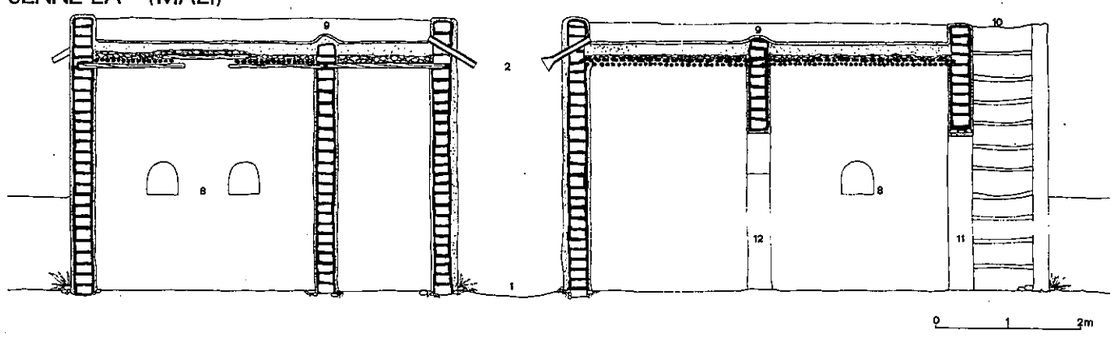
f) Il est important aussi de commencer à penser au recyclage de grandes zones centrales ou demi centrales des mégalopoles,maintenant en état de dégradation.
Il suffit de penser aux cortiços du Brésil ou aux conventillos de l'Argentine:bien que les deux typologies soient nées avec des structures très différentes,maintenant elles ont rejoint,pour densité d'occupation et dégradation,un dénominateur commun.
Autrement il suffit citer les zones de l'immigration,les quartiers qui sont nés et se sont agrandis avec une propre cohérence et une unité culturelle,souvent syncrétique,maintenant en état de transformation ou d'abandon.
Il y a beaucoup d'exemples parmi lesquels nous rappelons:la Boca et Baracas à Buenos Aires,la Moca et Bixiga à San Paolo,les alagados à Salvador de Bahia.
Au-delà du problème de la nouvelle édification,il y a,donc,la nécéssité d'une restructuration urbaine et d'une réhabilitation qui permettraient à une partie de la population pauvre de continuer à habitor dans le coeur de la ville en évitant sa mise en marge dans l'extrême banlieue.

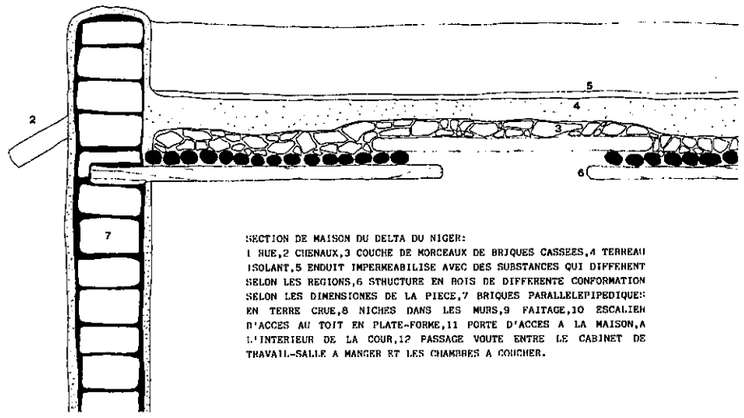
g) Seulement à ce moment là il est possible de commencer à prévoir un aménagement des interventions,même du point de vue urbanistique,qui ne soit pas celui habituel où le standar devient l'élément qui justifie tout choix.
Il ne s'agit pas de projeter les maisons traditionnelles en terre et boue et en bois où le bois n'existe peut-être plus ni de créer l'architècte qui s'intègre à la communauté dont il exprime les besoins,parce que; en tout cas,il sera toujours autre chose à l'égard de la realité où il se trouve.
Au contraire,il est necessaire de connaître à fond les cultures locales pour pouvoir en exprimer,sans les trahir,les besoins d'espace et les exigences culturelles en adaptant les instruments et les technologies à chaque réalité globale.

h) L'institution pour les pays émergents de cours de spécialisation en ethno-urbanistique,en anthropologie de l'habitat,et en projet utilisant des matériaux locaux à l'exemple de ce qu'a été fait,comme premier pas,au Brésil,en Argentine et en Italie.

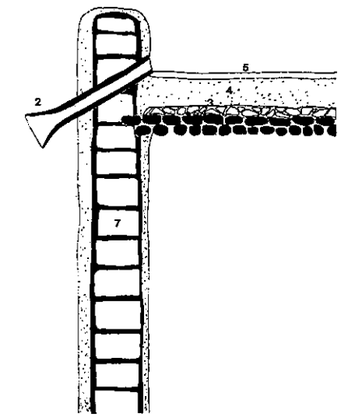
Les exemples qui suivent font partie d'une documentation que nous avons relevée dans plusieurs pays pour étudier les techniques d'intervention. Ils concernent l'habitat traditionnel (relèvement architecturaux et anthropologiques) de communautés d'agriculteurs et de pêcheurs du Mali (Afrique) et des exemples de situations urbaines qui peuvent être restructurées,dans les grandes villes de l'Amérique latine.

JENNE LA (MALI)

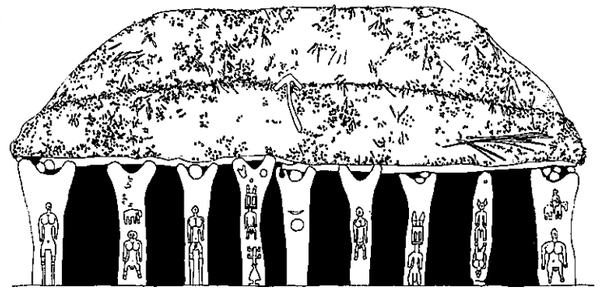




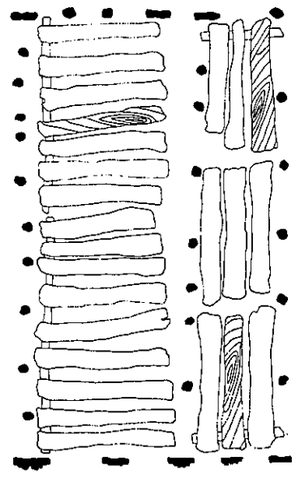
SECTION DE MAISON DU DELTA DU NIGER:
1 RUE,2 CHENAUX,3 COUCHE DE MORCEAUX DE BRIQUES CASSEES,4 TERREAU ISOLANT,5 ENDUIT IMPERMEABILISE AVEC DES SUBSTANCES QUI DIFFERENT SELON LES REGIONS,6 STRUCTURE EN BOIS DE DIFFERENTE CONFORMATION SELON LES DIMENSIONES DE LA PIECE,7 BRIQUES PARALLELEPIPEDIQUES EN TERRE CRUE,8 NICHES DANS LES MURS,9 FAITAGE,10 ESCALIER D'ACCES AU TOIT EN PLATE-FORME,11 PORTE D'ACCES A LA MAISON,A L'INTERIEUR DE LA COUR,12 PASSAGE VOUTE ENTRE LE CABINET DE TRAVAIL-SALLE A MANGER ET LES CHAMBRES A COUCHER.

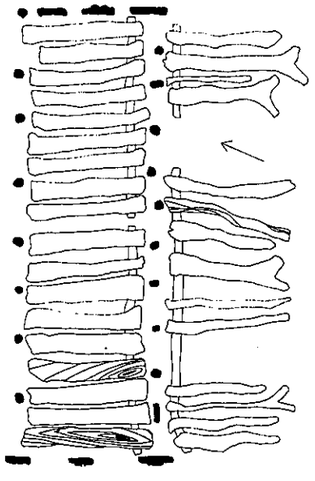


DOGON (MALI)

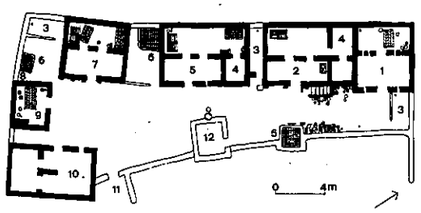


TOGU NA:MAISON COLLECTIVE DES HOMMES,
BATIMENT DE SOCIALISATION DE LA COMMUNAUTE

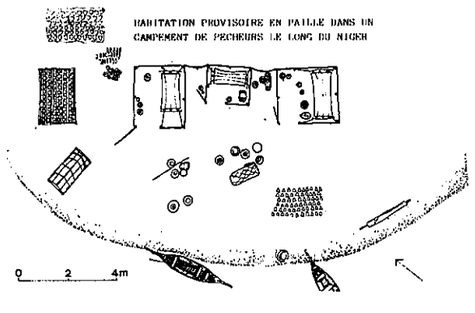




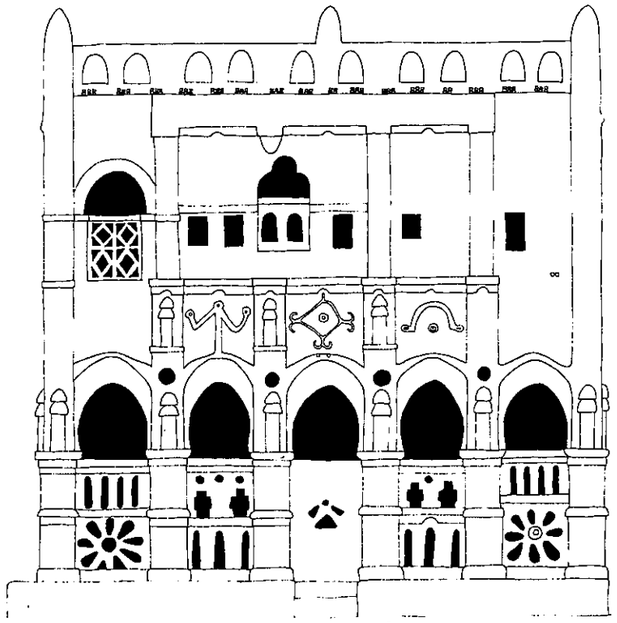
BOZO (MALI)



PLAN ET SECTION D'UNE HABITATION:
1 MAISON DE LA PREMIERE FEMME,2 MAISON DE LA DEUXIEME FEMME,3 TOILETTE,4 DEPOT POUR LE MILLET OU POUR LES OUTILS DE PECHE,5 MAISON DU FREIRE DU PROPRIETAIRE,6 FOUR POUR FUMER LE POISSON,7 MAISON DU PREMIER FILS ET DE SA PREMIERE FEMME,8 DEPOT DE RHIZOMES DE NENUPHARS,9 MAISON POUR LES HOTES,10 MAISON DU DEUXIEME FILS ET DE SA PREMIERE FEMME,11 ENTREE,12 BERGERIE.

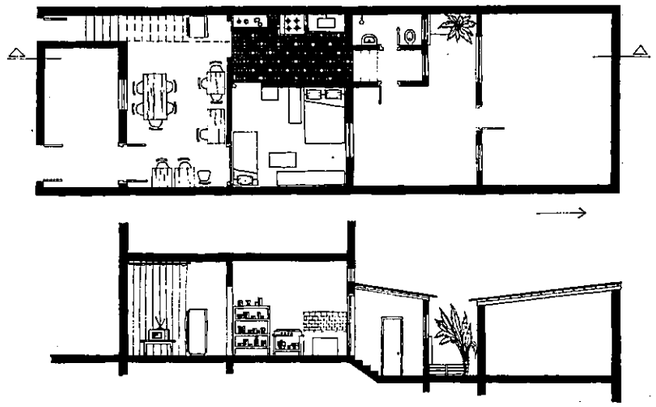


HABITATION PROVISOIRE EN PAILLE DANS UN CAMPEMENT DE PECHEURS LE LONG DU NIGER



BANDI MAISON COLLECTIVE DES JEUNES EN BANCO

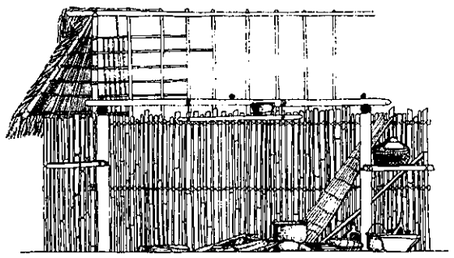
BIXIGA SAN PAOLO (BRESIL)

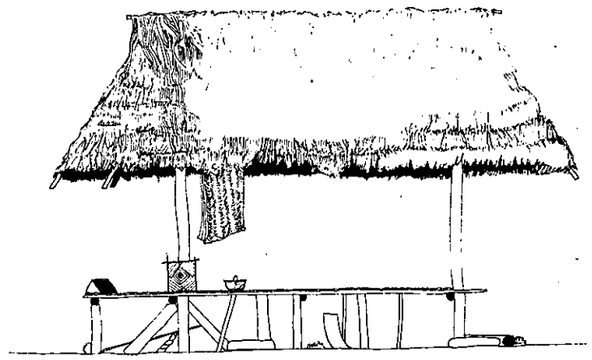


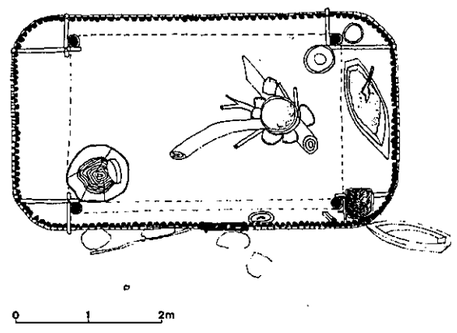
HABITATIONS DES EMIGRES ITALIENS (QUARTIER DE BIXIGA)

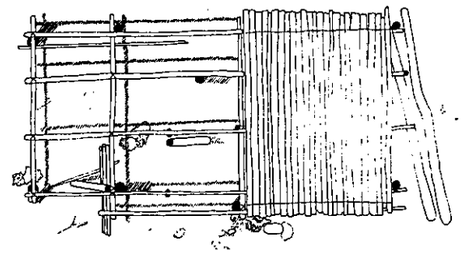
MACHIGUENGAS (PERU)

HABITATION MACHIGUENGAS (REGION DU MADRE DE DIOS)

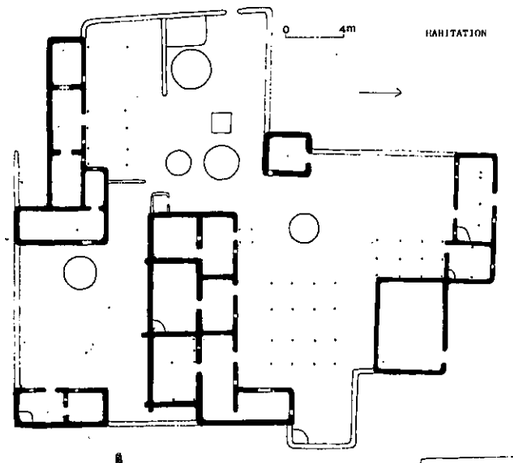




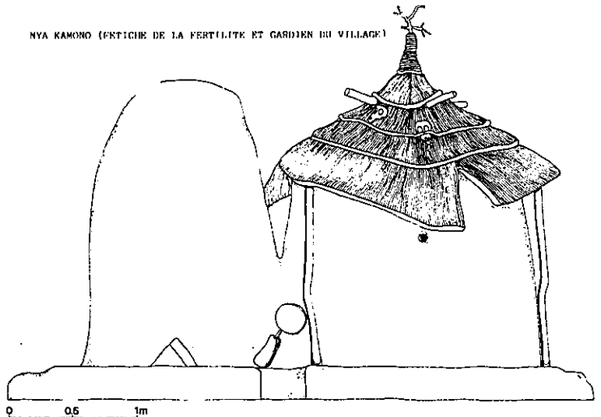




MINYANKA (MALI)

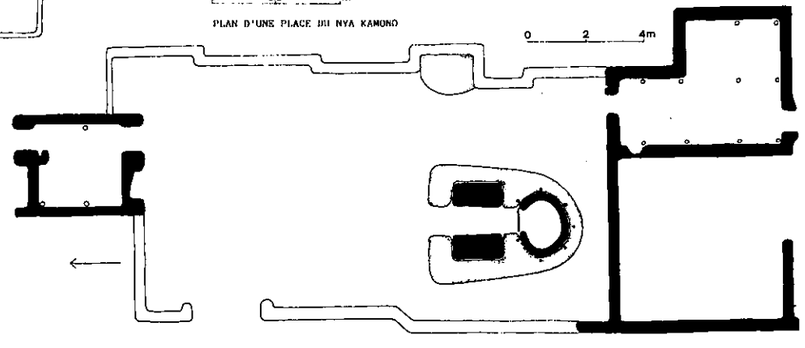


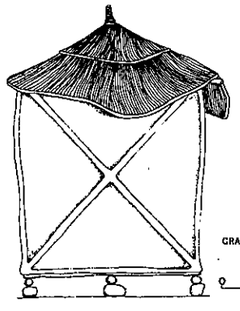
HABITATION



NYA KAMONO (FETICHE DE LA FERTILITE ET GARDIEN DU VILLAGE)

PLAN D'UNE PLACE DU NYA KAMONO





GRANGE

BUENOS AIRES (QUARTIER BOCA)

SAN PAOLO BRESIL
CURTICO DU QUARTIER
BIXIGA

MANAUS ALAGADOS

SALVADOR DE BAHIA ALAGADOS

IYSH

SECTION V

INTERNATIONAL UNION
OF ARCHITECTS, U.I.A.

Contribution for the United Nations
International Year of Shelter
for the Homeless

"HOUSING IN DEVELOPING COUNTRIES DEMANDS THE USE OF ALL THE SKILLS AND KNOWLEDGE THAT ARCHITECTS POSSESS, A SENSE OF BALANCE AND CONTEXT, AND A RESPECT FOR THE SKILLS, KNOWLEDGE, RESOURCES AND CULTURE OF THOSE WITH WHOM AND FOR WHOM THE ARCHITECT IS WORKING.....

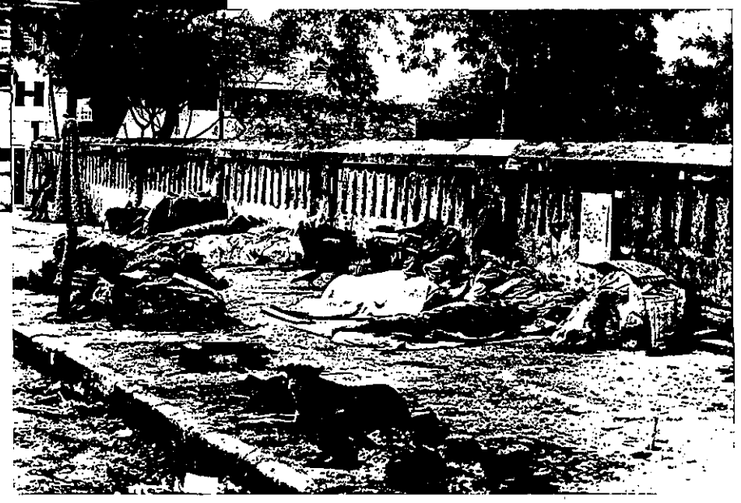
.....TO LEARN HOW TO CREATE BETTER HOUSING IN THE THIRD WORLD IS TO LEARN HOW TO DESIGN FOR THE FUTURE IN THE FIRST."

Nabeel Hamdi & Edward Robbins
A.R. August 1985.

THE REALITY

- More than ONE BILLION people, a quarter of the world's population, are either literally homeless or live in extremely poor housing & unhealthy environments.

- About 100 million people have no shelter whatsoever.



- By the year 2,000 an additional 150,000 people every day will have to find work, shelter & basic services. 300 million are already jobless, 700 million live in absolute poverty.

- By the year 2,050 world population will have grown from its present 4 billion to 11 billion people, of which 75% will be living in 3rd World cities.

- Less than 10% of all those in need of shelter have benefited from institutionally sponsored projects.

IS THE REAL ISSUE HOUSING ?

THE PROBLEM CAN BE POLITICAL, SOCIAL, ECONOMIC, CULTURAL, TECHNOLOGICAL.

SOLUTIONS WILL ONLY COME FROM A RADICAL REAPPRAISAL OF THE WESTERN INDUSTRIAL ORDER AND ITS CONCEPT OF DEVELOPMENT.

ARCHITECTS DO HAVE A ROLE TO PLAY; PERHAPS THEY SHOULD BEGIN AT HOME.

PROPOSAL

Starting with the premise that all human activities are interdependant, it was felt that there is a need to create clear links between peoples all over the world, break cultural and social barriers, and establish common ground on which to develop and share knowledge.

A means was sought which would :

- STIMULATE STUDY ASSOCIATED WITH HABITAT.
- BROADEN OUR UNDERSTANDING OF THE CONTEXT IN WHICH WE BUILD.
- LINK THE ISSUES RELATED TO DEVELOPMENT.
- USE THE RESULTS OF OUR LEARNING IN A PRACTICAL WAY TO IMPROVE LIVING CONDITIONS.

A framework for developing such a project existed :

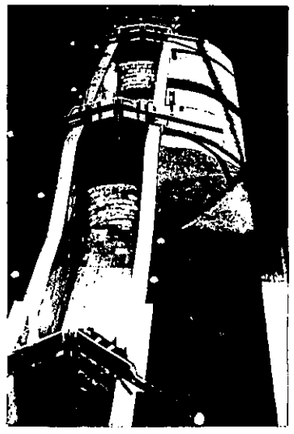
" THE WORK OF OUR HANDS "

is an initiative of the Irish Department of Education, begun in 1984.

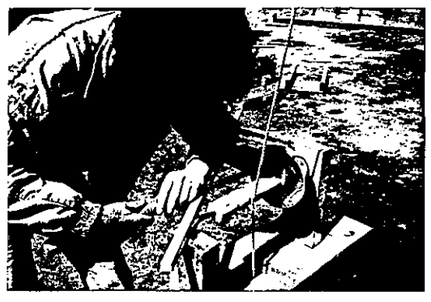
Practical projects are undertaken by school students as part of their Construction Studies course. These are used as a key to stimulate study associated with habitat, heritage, history, and science.

Since its inception students have collected, repaired, recorded, and researched the history and evolution of artifacts associated with the traditional life of town and countryside.

Many projects have been realised.



In one school students built & restored local artifacts such as wheels, barrels and seed fiddles. Having surveyed & recorded traditional houses in the area they then prepared drawings for a small building in which to house them. The seed fiddles were used to plant oats for thatch for their museum which they will build next year. The finished building will also act as a community centre.



In this school students built a working model, from the original engineering drawings, of a double lock on the nearby canal. They surveyed and made a measured drawing of a canal building which is to be restored as a community centre. It is hoped, through the project, to form links between schools located along the canal.

In another school students researched and recorded pole lathes used in the locality and then designed and built one using scrap materials. This is being used at present to build a spinning wheel. It is hoped in turn to develop them commercially, providing local employment.

POTENTIAL

It was felt that to develop and expand "The Work of Our Hands" to include a study of issues relating to shelter would be a positive step towards achieving the objective.

Over 8,000 senior cycle students, in approximately 280 schools throughout Ireland, are expected to take this course over the next two years.
This compares with approximately 70 students only per year entering the two professional schools of architecture.

IMPLEMENTATION

Several voluntary groups, national agencies and professional bodies have been approached, including The Department of Education, The Royal Institute of the Architects of Ireland, Development Agencies, and An Foras Forbartha (The National Institute for Physical Planning and Construction Research). The aim is to enlist their support for and involvement in the undertaking by Construction Studies students of projects concerning shelter and human settlement.

Students could examine traditional building forms from different parts of the world, considering in particular the forces that generated them, social and economic, as well as technological, climatic and cultural.

Aspects of settlement - water supply, sanitation, energy sources, building construction - could be examined through, for example, the study of local traditional methods.

Simple practical solutions could be proposed and tested.

PROMOTION & DISSEMINATION

It is proposed that the undertaking of projects could be encouraged, and their results publicised through :

- The creation of an award scheme.
- The exhibition, locally or nationally, of suitable projects.
- The presentation of projects in book form, or in professional publications.

Money raised by the exhibition of projects could be used, for example, to foster closer links between developing countries and Ireland by :

- The support of existing projects in developing countries.
- The organisation of work brigades.

PROGRAMME

Work is proceeding on the initial stages of setting up the programme.

A promotional video is being prepared and in-service courses for teachers in Construction Studies are scheduled for July of this year.

It is expected that the programme will be underway by September 1987, with the first projects due to be finished in 1988.

PHOTO CREDITS Vivant Universe, World Bank Photo, CIRIC, WHO, Peter Pennarts, Christian Aid, Trocaire, WFP, VSO.

THE URBAN WALL

THE COSTS OF PROVIDING EVEN MINIMUM LEVELS OF SHELTER, INFRASTRUCTURE AND SERVICES WILL BE ENORMOUS. THE WORLD BANK (1980) CALCULATES THE COSTS OF PROVIDING EACH HOUSEHOLD LIVING IN POVERTY WITH A BASIC UNIT OF SHELTER BY THE END OF THE CENTURY WILL BE BETWEEN US $160-170 BILLION (1975 PRICES). THIS WILL REQUIRE DEVELOPING COUNTRIES TO MAKE AN ANNUAL INVESTMENT OF US $5.8 BILLION FOR THE URBAN POOR AND US $2.3 BILLION IN RURAL SETTLEMENTS.

THE WORLD HEALTH ORGANIZATION ESTIMATES THAT ABOUT ONE-THIRD OF THE POPULATION IN DEVELOPING COUNTRIES ARE NOT SERVED BY POTABLE WATER SYSTEMS, THE POPULATION THAT LACKS ACCESS TO SANITATION SYSTEMS IS EVEN GREATER. STUDIES BY THE WORLD HEALTH ORGANIZATION CALCULATES THE COST OF PROVIDING URBAN AND RURAL SERVICES THAT MEET HABITAT TARGETS AT NEARLY US $ 92 BILLION FOR WATER SUPPLY AND US $41 BILLION FOR SANITATION IN 1975 PRICES (UNITED NATIONS, 1976).

THE PER CAPITA COSTS OF PROVIDING MANY SERVICES IS OFTEN LOWER IN SMALL AND MEDIUM SIZED CITIES THAN IN THE LARGEST METROPOLITAN AREAS. COSTS DECLINE WITH POPULATION SIZE TO ABOUT 75.000 AND THEN INCREASE AS CITY SIZE INCREASES. THESE FINDINGS UNDERSCORE THE IMPORTANCE OF PLANNING PHASED GROWTH AND DESIGNING SMALLER SUBPROJECTS THAT ALLOW FOR FUTURE EXPANSION WITHOUT REQUIRING HIGH UP-FRONT INVESTMENT IN INFRASTRUCTURE.

LAND VALUES RISE WHEN INFRASTRUCTURE AND SERVICES ARE ESTABLISHED. LANDOWNERS AND DEVELOPERS OFTEN LOOK WITH FAVOR UPON BARTER DEALS IN WHICH LAND IS EXCHANGED FOR SERVICES AND INFRASTRUCTURE. GENERALLY, LANDOWNERS OFER MORE LAND IN BARTER WHEN A DEVELOPMENT PLAN IS ECONOMICAL AND EFEICIENT; LANDOWNERS ARE NOT CONCERNED WITH THE COST OF DEVELOPMENT, BUT WITH THE QUALITY OF INFRASTRUCTURE THAT IS CREATED AND THE EFFECT IT HAS ON LAND VALUES.

WHEN DEVELOPMENT EFFORTS ARE WELL-ORGANIZED, FUTURE INHABITANTS CAN OFTEN WORK ON THE PROJECT IN EXCHANGE FOR PART OF THE LAND AND INFRASTRUCTURE COST.

"IT IS ESTIMATED THAT SITE-AND-SERVICES PROJECTS CAN PROVIDE APPROPRIATE HOUSING AT A COST ABOUT THREE TO FIVE TIMES LESS THAN PUBLIC HOUSING. SITE-AND-SERVICES PROJECTS ALLOW POOR HOUSEHOLDS TO KEEP MONTHLY PAYMENTS LOW AND IMPROVE THEIR HOUSING ONLY WHEN THEY HAVE ACCUMULATED SUFFICIENT RESOURCES. SITE-AND SERVICES PROJECTS ALLOW THE POOR TO PURSUE THEIR OWN HOUSING PRIORITIES, TO CONTRIBUTE TO THE CONSTRUCTION OF THEIR DWELLINGS AND TO USE LOCALLY AVAILABLE BUILDING MATERIALS." (SOURCE: ROBERT N. MERRILL, 1977.)

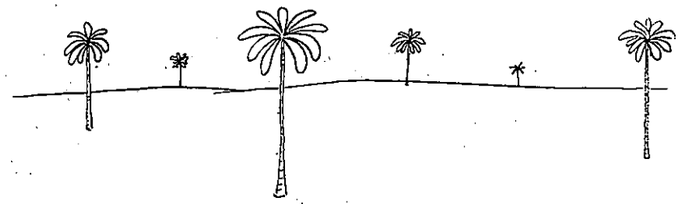
WE PROPOSE A CONCEPTUAL SITE-AND-SERVICES PROJECT DESIGNED TO MEET THE FOLLOWING OBJECTIVES:

LOW PRICE: LABOR, TYPE AND QUANTITIES OF MATERIAL COSTS ARE KEPT LOW BY USING ABOVE-GROUND PIPES.

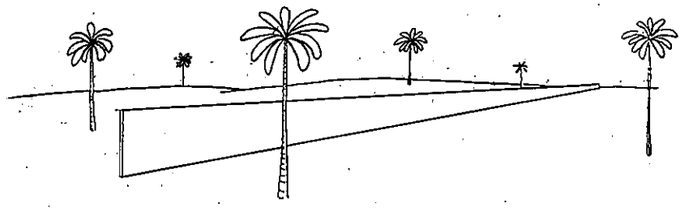
LOW CAPITAL INVESTMENT: THE INITIAL INFRASTRUCTURE CORE SERVES MODULAR 200 UNITS. AS THE COMMUNITY GROWS, EACH INFRASTRUCTURE CORE CAN BE CONNECTED TO A MORE SOPHISTICATED CENTRAL CORE. THE OLD SMALL MODULAR CORE UNITS MAY BE REMOVED TO A NEW SITE AND BE REUSED.

SIMPLE MAINTENANCE: FEATURES SUCH AS THE ABOVE-GROUND PIPES AND CORE FACILITIES SIMPLIFY MAINTENANCE PROCEDURES AND LIMIT THE NEED FOR EXPERTS.

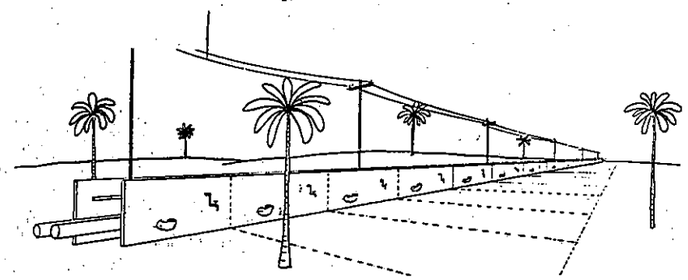
SELF-HELP: THIS SITE-AND-SERVICES CONCEPT ALLOWS TO PRACTICE ALMOST ANY KNOWN SELF-HELP HOUSE-BUILDING TECHNIQUES.



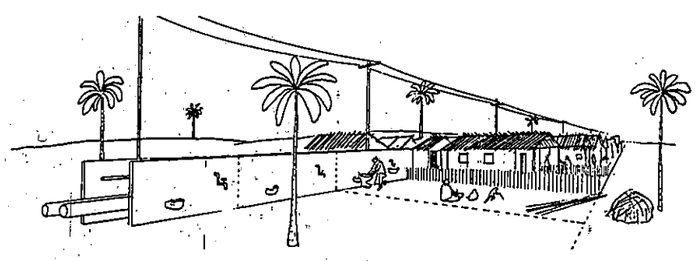
TERRITORY
- UNDEVELOPED, LOW-VALUE LAND
- BARTER DEAL TO FACILITATE LAND DEVELOPMENT FOR THE POOR IS SIGNED



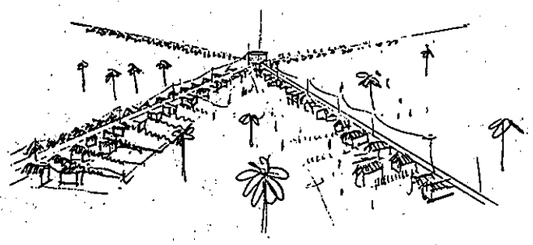
THE WALL
- THE FIRST STEP TOWARD DEVELOPMENT
- BRINGS ORDER TO SPACE



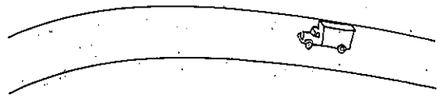
INFRASTRUCTURE
- THE ADDITION OF WATER, SEWAGE AND ELECTRICITY TURNS THE WALL INTO AN URBAN WALL
- LAND VALUE RISES AND A BARTER AGREEMENT IS COMPLETED WITH THE LANDOWNER



ROOF
- THE URBAN WALL IS THE FIRST ELEMENT OF THE SELF-MADE HOUSE
- COORDINATING AUTHORITY PROVIDES LAND, BUILDING MATERIALS AND GUIDANCE



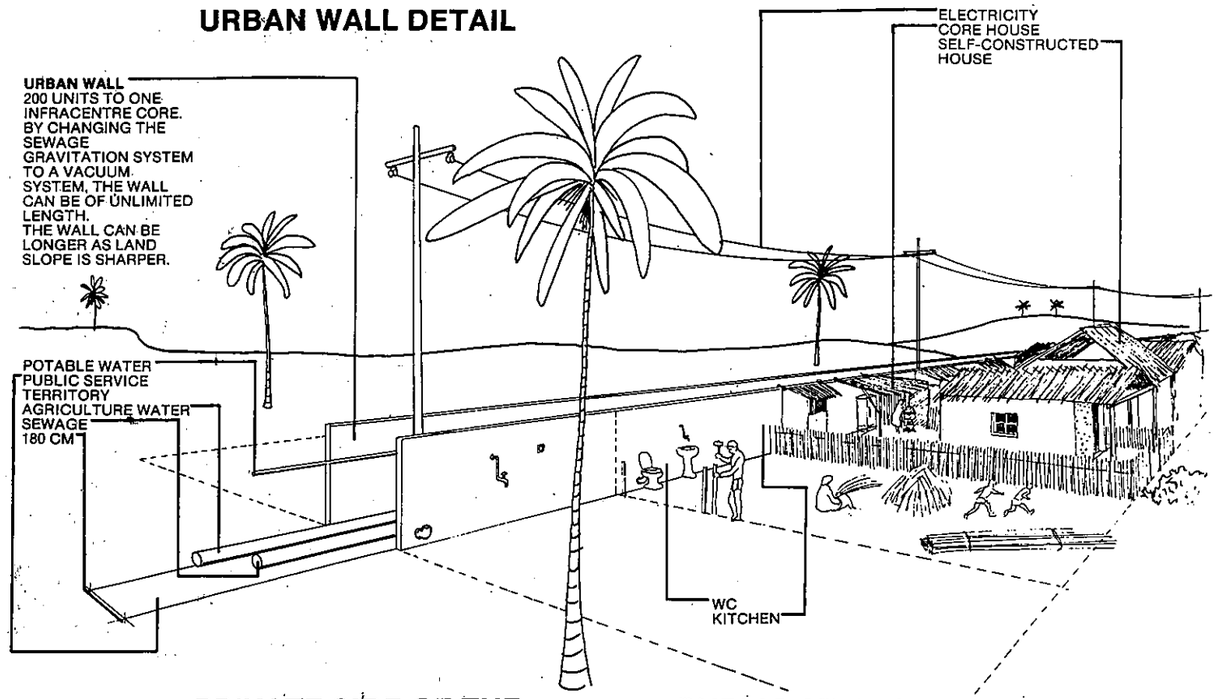
ENERGY
- ALL URBAN WALLS RELATE TO AN INFRASTRUCTURE CENTRE
- A COMMUNITY IS BORN



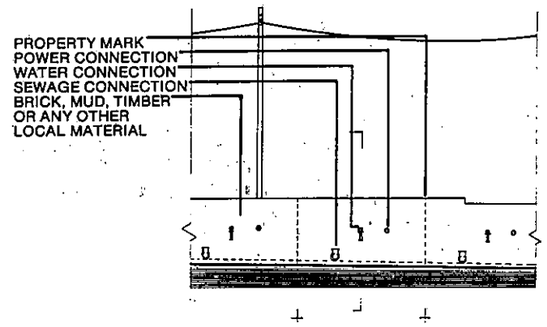
COMMUNICATION
- THE ROAD IS ONLY A RIGHT OF WAY; IT HAS NO BUILT-IN INFRASTRUCTURE

URBAN WALL

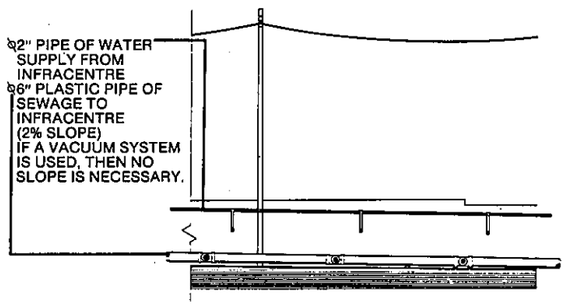
URBAN WALL DETAIL



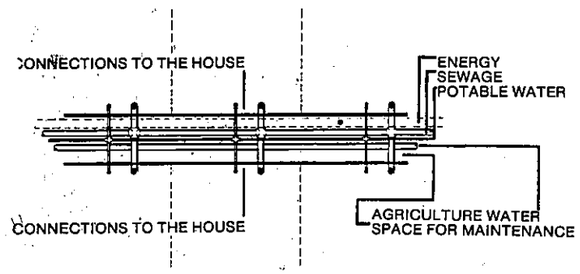
PRIVATE SIDE OF THE URBAN WALL



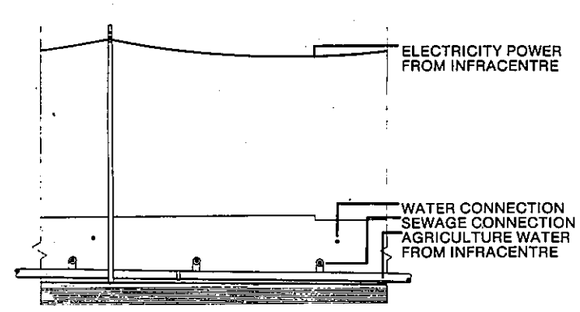
PUBLIC SERVICE SIDE 1 URBAN WALL



PLAN OF PUBLIC SERVICE TERRITORY

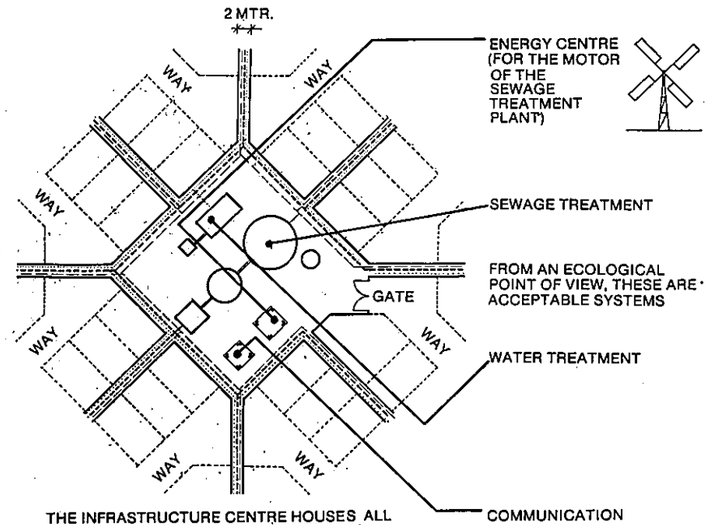


PUBLIC SERVICE SIDE 2 URBAN WALL

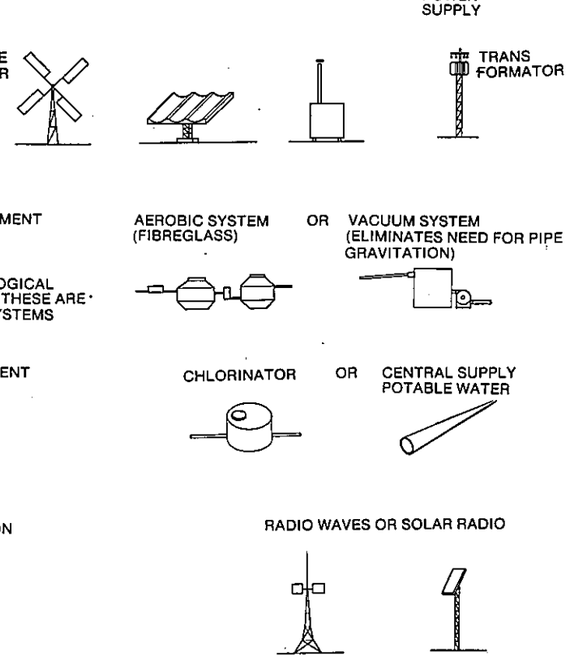


URBAN WALL

INFRASTRUCTURE CORE



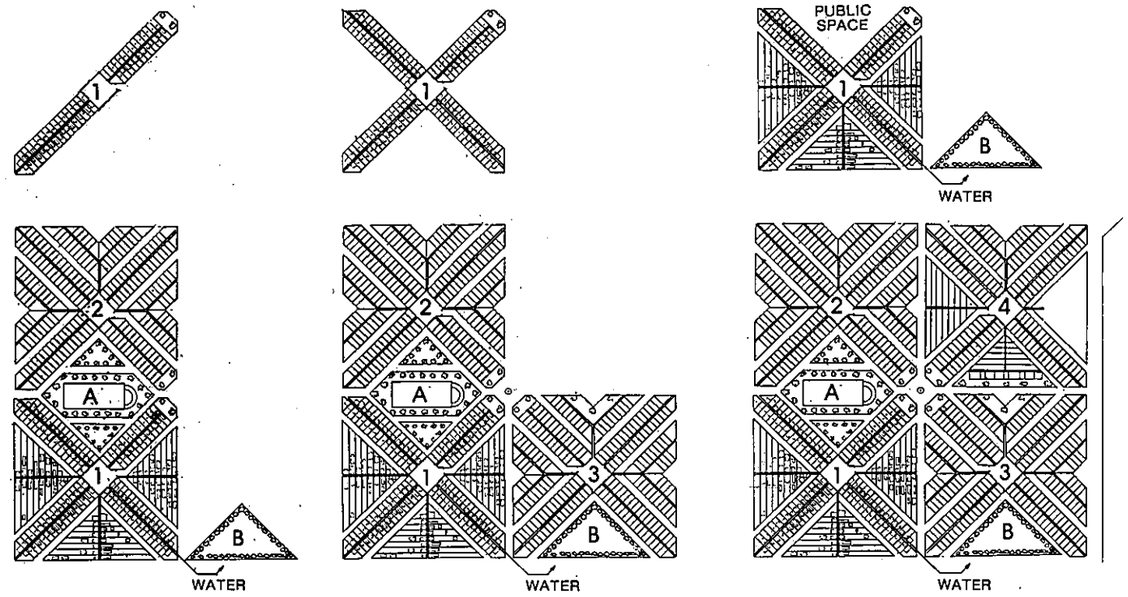
THE INFRASTRUCTURE CENTRE HOUSES ALL ESSENTIAL CIVIL ENGINEERING SERVICES.
THE INFRASTRUCTURE CENTRE ELIMINATES THE NEED FOR LARGE ONE-TIME INVESTMENTS (WHICH DEVELOPING COUNTRIES CANNOT FINANCE), AND ENABLES PROJECTS TO BE BUILT IN PHASES OF 200 HABITATION UNITS AT EACH STAGE, THUS KEEPING SERVICE LINES TO AND FROM THE CORE CENTRE SHORT.
UPGRADING THE INFRASTRUCTURE CORE: WHEN THE NUMBER OF BUILT AND INHABITED MODULES WARRANTS IT, THE AEROBIC SYSTEM (FIBREGLASS) WILL BE REPLACED BY A CENTRAL SEWAGE SYSTEM. THE AEROBIC SYSTEM CAN THEN BE USED IN ANOTHER SETTLEMENT.



DEVELOPMENT IN PHASES

THE CONCEPT OF THE PROJECT ALSO WORKS WHEN DEVELOPMENT IS NOT DONE ON CONTINUOUS PARCELS OF LAND, AS THERE IS NOT ALWAYS THE POSSIBILITY TO PURCHASE MORE THAN ONE OR TWO MODULES OF CONTINUOUS PLOTS OF LAND.

1,2,3,4: INFRACORE.
A: COMMUNITY BUILDING
B: AGRICULTURE FIELDS



URBAN WALL

Nuestra comunidad es un Tercer Mundo porque tenemos: analfabetismo/falta de trabajo/vivienda precaria constituida por ranchos/desnutrición/enfermedades como mal de chagas, tuberculosis...
*Nuestra comunidad es consecuencia de una sociedad injusta.
*Cuando en Villa Guillermina se cerró la Compañía inglesa que sacaba el tanino del quebracho, se acabó la única fuente de trabajo del Norte santafesino. Los ingleses nos habían dado todo, la casa el trabajo, en un círculo que no nos dábamos cuenta. Cuando se cansaron se fueron y nos quitaron todo, sin pensar en las familias que quedábamos. Se acabó el trabajo, no se reforestó y la gente se fue a otros lugares del país.
*Se produjo la migración y con ella el desarraigo: es desprenderse de algo que no se puede explicar. Para el hombre del monte el quebracho es todo... uno aprende a amar donde vivió. "Yo lloraba en Reconquista mirando al Norte" "Tal vez en Villa Guillermina está lloviendo..."
A pesar de todo acá nunca se perdió la alegría de vivir. Si cuando nos reunimos tiramos un pescado a la parrilla y a veces nos reímos de las cosas graves que nos pasan, es porque ésta es un forma de seguir viviendo.
*En la comunidad nos juntamos la misma gente, con las ganas de luchar. No aceptamos los trasplantes de modelos porque lo peor que podríamos hacer, es hacer una sociedad injusta dentro de nuestra comunidad. Estamos descubriendo que somos capaces de construir cosas cuando se nos da la posibilidad de participar.

LA HISTORICA DEPENDENCIA ECONOMICA Y CULTURAL NOS VA QUITANDO NUESTRA CAPACIDAD DE RESOLVER NUESTROS PROBLEMAS, Y LO QUE ES MAS GRAVE.... NUESTRA CAPACIDAD DE USAR NUESTROS RECURSOS...

EL DIAGNOSTICO GENERAL

"Argentina es un país del tercer mundo, pobre y dependiente por la situación económica..."

VASTOS SECTORES DE POBLACION NO SON ESCUCHADOS Y SE DESPRECIA SU CAPACIDAD DE PENSAR, DE DECIDIR, DE HACER, DE PARTICIPAR...

"Las políticas dictadas por los gobiernos no son las adecuadas para nosotros porque no participamos cuando se elaboran... no es que no queremos... no nos dejan participar."

hablan los pobladores

hablan los técnicos

"SUFRIMOS DE: Falta de trabajo porque las fuentes de trabajo no son las que la gente sabe hacer..."
"No hay educación ni salud para todos..."
"La política internacional está para que esto continúe..."
"Las grandes potencias tienen todo: riqueza material, poder, pero también buscan liberarse, porque dependen una de la otra, tienen su reglamento y están atadas a eso, entre ellos se la pasan haciendo reuniones... Un rico con su riqueza tiene un buen pasar, pero después... OPAITEMA... no hay nada"

Testimonio de los pobladores

- 3.000.000 DE UNIDADES DE DEFICIT HABITACIONAL Y SOLO UNA SOLUCION ESTEREOTIPADA DE VIVIENDA DISEÑADA SEGUN PATRONES FORANEOS.
- "LA VIVIENDA DIGNA" QUE NO TIENE EN CUENTA LAS PAUTAS DE VIDA Y CULTURA DE AMPLIOS SECTORES DE POBLACION DE NUESTRO PAIS, NI NUESTROS ESCASOS RECURSOS PARA INVERTIR.
- UNA SOLUCION QUE ADEMAS NO "LLEGA" NI POR LA CANTIDAD QUE SE CONSTRUYE, NI POR SU COSTO, A LOS SECTORES MAS NECESITADOS DE LA POBLACION.
- UNA SOLUCION QUE IGNORA LA CAPACIDAD DE PENSAR, PLANIFICAR Y HACER DE LOS SECTORES MAS CARENCIADOS.

"Hay un déficit de 3.000.000 de viviendas aquí".
"Las políticas son inadecuadas y hay intereses creados que sostienen estas políticas"
"Las reglamentaciones están para favorecer a otros y no a nosotros que lo necesitamos".
"Hay una producción insuficiente de las viviendas."
En Reconquista hay muchos baldíos, los dueños no construyen porque ya tienen donde vivir, hay mala distribución de la riqueza. Los fondos no llegan a nosotros los destinatarios.
"Nosotros aquí en Reconquista no nos enteramos cuáles son los criterios de distribución... y por qué no participamos en esa decisión ... no nos dan cabida".
"Las viviendas de Pucará son de varios pisos, cómo vamos a ir a vivir nosotros allá... no está de acuerdo con nuestras costumbres".

DIAGNOSTICO DE HABITAT

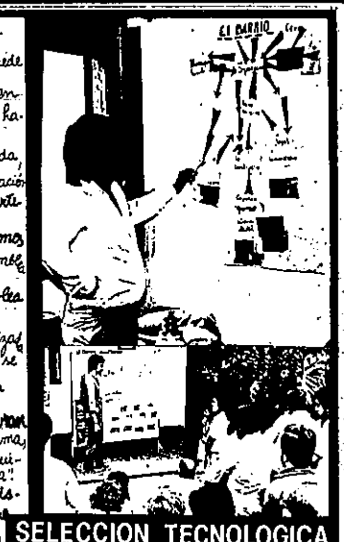
DESARROLLAMOS ESTE TRABAJO ENTRE TECNICOS Y POBLADORES

Nuestra comunidad es un asentamiento precario situado a 5 cuadras del centro de la ciudad y de la Catedral. Actualmente hay 400 familias que se ubicaron buscando refugio en la zona, a lo largo de un viejo camino cortado hacia el Puerto y en las partes más altas, porque se inunda fácilmente. Las familias venimos de Villa Guillermina, Villa Ana, Villa Ocampo, Tacuarendí, Chaco y Corrientes.

Con nuestra Organización estamos haciendo:
- la construcción de 120 viviendas de 32 m².
- construir y poner en marcha 5 talleres de producción que dan trabajo a 30 personas antes sin empleo.
- una guardería infantil, que organizamos y atendemos nosotros
- una proveeduría comunitaria que también atendemos nosotros.
- estamos capacitando a otros 4 grupos de pobladores, para que empiecen en sus regiones a trabajar como lo hacemos nosotros.

LOCALIZACION

"Un sistema noble y generoso": "Noble porque se lo puede trabajar, se lo puede elaborar, es una forma en que nosotros lo podemos hacer, además es fuerte. Generoso porque se brinda, se da y permite su utilización por todos y favorece la participación."
Cuando los técnicos nos propusieron el sistema, nosotros dijimos: tenemos que verlo, les pedimos que hagan la parecita. Se hizo ante una Asamblea, éramos 200 personas:
Los técnicos no saben que después que se fueron hicimos otra Asamblea y ahí comparamos con el ladrillo tradicional y bloques comunes.
La construcción con el sistema MAS no necesita mano de obra especializada y esta es la que nosotros podíamos poner para que el plan de viviendas se concretara.
Se tenía que dar la participación de la mujer y el hijo, porque el hombre no podía hacerlo tiene que trabajar...
Hoy después de todas las tormentas que han pasado, vemos que las casas no cimbran. *nos hemos apropiado del sistema, la gente defiende la bloquera, la cuidan, la quieren y defienden el sistema".
Y cobró vida: el bloque MAS el sistema en la comunidad y fue una sola cosa



SELECCION TECNOLOGICA

UNA METODOLOGIA DE ORGANIZACION POPULAR

+

UNA METODOLOGIA DE APOYO TECNICO INTERDISCIPLINARIO

Nuestros Valores

Creemos que la vivienda es la rueda de apoyo para que podamos cambiar. Nos permite vivir un proceso constructivo que no termina en la casa. Lo nuestro es una renuncia (a lo individual), por eso somos una comunidad es un proyecto comunitario. Cuando el hombre hace su casa se producen en él muchas cosas importantes.
Queremos ayudar a otros grupos como el nuestro. No queremos pensar solo en nosotros. Es un camino de construcción desde el ser humano. Para hacerlo tenemos que organizarnos, y:
- ayudar a la gente tal cual.
- ayudar al hombre a que descubra que es capaz
- pensar en que lo hacemos nosotros porque queremos y no porque lo dicen los de afuera.

No queremos quedarnos en la crítica, queremos aportar

Nosotros y los técnicos

Los técnicos nos pueden ayudar, pero en una relación horizontal. Nosotros somos capaces. El hombre es libre cuando puede elegir y decidir. ¿Nos dan posibilidades... o nos subestiman? (al técnico..) Dejame que yo tome... ¡¡entonces yo soy libre!! La verdadera ayuda te libera, sino, no es ayuda. Nosotros somos los diseñadores de nuestras casas. Pudimos elegir y decidir. Logramos un Encuentro con los técnicos. Lo nuestro ha sido posible. Nosotros tenemos que reconocer nuestras limitaciones y reconocer a los técnicos cuando estén al servicio de los pobladores.
Cuando se desarrolla una "Tecnología apropiada", nos la apropiamos y pasa a ser nuestra. Debemos defender nuestros valores, nuestra raíz, la persona a través del Protagonismo.
Tenemos que ser capaces de desarrollar lo nuestro para no depender.

UN CAMINO ALTERNATIVO QUE POTENCIE LA CAPACIDAD DE LOS SECTORES POPULARES PARA AFRONTAR SUS PROBLEMAS

MARCO REFERENCIAL TEORICO

A partir del reconocimiento de la dignidad e igualdad básicas de toda persona y de los derechos inalienables que de allí derivan, planteamos uno de los supuestos básicos de nuestro trabajo. Se trata del respeto, reconocimiento y valoración de las distintas formas culturales y modelos de desarrollo que se estructuran desde diversos grupos o estratos sociales, dentro de un país o región; de las diferentes relaciones históricas, regionales y étnicas con el medio natural; de las variadas formas de concebir las necesidades humanas y de los [illegible] para satisfacerlas.

OBJETIVO

Planteamos como objetivo de nuestro trabajo, el desarrollo de la organización autogestionaria de los grupos más carenciados y marginados de la sociedad.

ACTITUDES BASICAS

Del equipo técnico
Valoración y respeto de derechos, valores, cultura y modelos de desarrollo de los sectores populares.

De la comunidad
- autovaloración de la propia cultura.
- fe en las propias capacidades

PILARES FUNDAMENTALES

PROTAGONISMO ACTIVO

El respeto de este principio exige el reconocimiento de que el grupo es el sujeto y conductor de su propio proceso, según su propia visión de cambio y de desarrollo.

El Protagonismo Activo implica que en el proceso de solución de una necesidad, el grupo logre el desarrollo de:
- Capacitación: Desarrollo de capacidades individuales.
- Organización: Desarrollo de capacidades grupales.
- Poder: Ampliación del espacio de poder.

GRADUALIDAD

Es de fundamental importancia el abordaje gradual, por parte del grupo de problemas de complejidad creciente y acordes con sus capacidades de manera que el objetivo de satisfacción de la necesidad, nunca desborde su capacidad de conducción.

PARALELISMO Y SIMULTANEIDAD

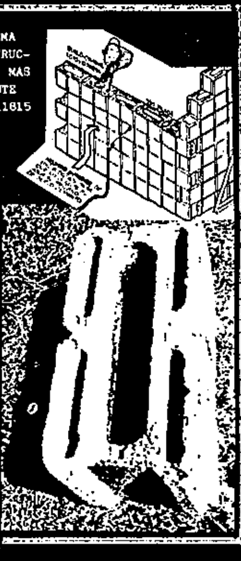
De las actividades de Planificación (diagnóstico-programación-ejecución y evaluación)

se desarrolla la capacidad de diagnóstico: programando, ejecutando y evaluando. Se desarrolla la capacidad de programar: ejecutando y evaluando. Se desarrolla...

EL ARQUITECTO CAPAZ DE POTENCIAR EN LOS POBLADORES SU CAPACIDAD DE DISEÑAR, DE CONSTRUIR...
APORTANDO SUS CONOCIMIENTOS TECNICOS PARA MEJORAR LAS SOLUCIONES...
APRENDIENDO JUNTOS EN UNA RELACION HORIZONTAL, EN BUSQUEDA DE UN LENGUAJE COMUN...

APOYAMOS A ESTA COMUNIDAD DURANTE 6 AÑOS EN DIFERENTES ASPECTOS, EL APOYO MAS IMPORTANTE QUE SE ESTA REALIZANDO ES EN EL PLAN DE VIVIENDA, DEL CUAL SE TOMAN COMO EJEMPLO PARA UNA MUESTRA DE APLICACION METODOLOGICA, LAS ETAPAS DE SELECCION DE TECNOLOGIA, DISEÑO PARTICIPATIVO Y CONSTRUCCION DE PROTOTIPO.
ESTA ES UNA DE LAS VARIAS EXPERIENCIAS QUE VENIMOS DESARROLLANDO DESDE HACE 15 AÑOS.

SISTEMA CONSTRUCTIVO MAS PATENTE Nº 211815



PROCESO DE DISEÑO-CAPACITACION

. Preparación del material necesario para la capacitación sobre el tema diseño.

PREMISAS DE TRABAJO
. Crear un ámbito de reflexión sobre sus pautas y valores culturales, sus formas de vida: qué quieren conservar o cambiar, y aquello que deseen incorporar.
. Aportar herramientas que posibiliten a los pobladores, expresar las ideas respecto de su vivienda.
. Ayudar a confrontar críticamente necesidades con posibilidades, aspiraciones con recursos.

MATERIAL DE TRABAJO
Se prepararon 3 tipos diferentes de material:
1)Un cuestionario guía como base para la discusión, cubriendo los siguientes temas: necesidades de espacio para el desarrollo de actividades; necesidades culturales; idea de barrio; costos.
2)Un audiovisual para motivar la reflexión con temas similares al cuestionario guía.
3)Elementos para conformar una maqueta desarmable: una base; lo necesario para armar viviendas; techos en pendiente; puertas y ventanas; pérgolas, pilares; horcones veredas; material de ambientación: árboles, personas, animales. Tarjetas con dibujos de cada actividad.

Primera experiencia y preparación de las personas de la comunidad.: Durante el ejercicio realizado surgieron reflexiones de una manera propia de vivir y querer la casa; pautas y valores culturales, aspiraciones y anhelos, de incorporar nuevas formas de resolver problemas que se reflejaron claramente en propuestas hechas con la maqueta. Al finalizar esta etapa de capacitación se analizaron los modos de trabajar el tema con las demás familias.

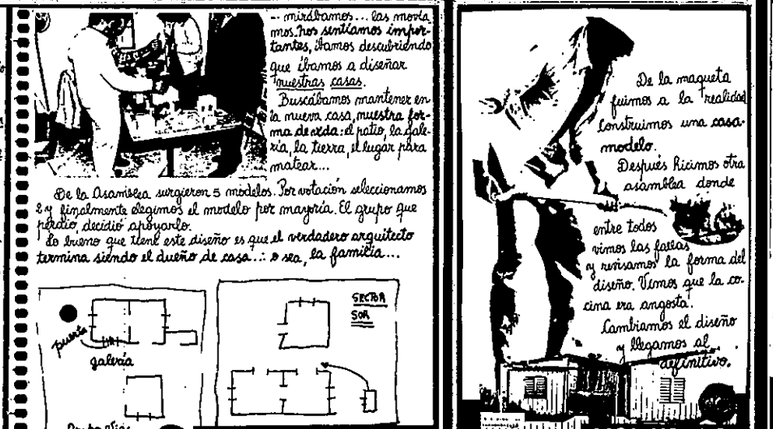
"Nos sentimos arquitectos de nuestras propias casas". Fueron varios pasos. Primero hicimos reuniones por sectores porque en el diseño no solo entraba la casa linda y grande, sino cuanto dinero había, y cuanta casa podíamos hacer.

Los técnicos nos propusieron un juego con maquetas con las cuales íbamos armando la casita que queríamos. Primero lo hicimos un pequeño grupo de nosotros con los técnicos. Al principio me pareció un juguito solamente. Cuando me di cuenta que íbamos a construir una casa, o 20, o 60, ya no me pareció un juego: ¡íbamos a hacer un barrio! Esto es bueno, buenísimo! Y lo hicimos en una asamblea. Éramos 200 más o menos. Preparamos varias mesas con maquetas; nos acercábamos de a uno... en grupos... las miradoras... las movíamos. Ahí sentíamos importantes, íbamos descubriendo que íbamos a diseñar nuestras casas.

Buscábamos mantener en la nueva casa, nuestra forma de vida: el patio, la galería, la tierra, el lugar para matear...

De la Asamblea surgieron 5 modelos. Por votación seleccionamos 2 y finalmente elegimos el modelo por mayoría. El grupo que perdió, decidió apoyarlo.

Lo bueno que tiene este diseño es que el verdadero arquitecto termina siendo el dueño de casa... o sea, la familia...



DISEÑO PARTICIPATIVO

De la maqueta fuimos a la realidad. Construimos una casa modelo.

Después hicimos otra asamblea donde entre todos vimos las fallas y revisamos la forma del diseño. Vimos que la cocina era angosta.

Cambiamos el diseño y llegamos al definitivo.

CASA MODELO

Lo primero que decidimos fue quedarnos en los mismos terrenos, allí donde habíamos y crecimos donde está nuestro arraigo. Los terrenos eran bajos y se inundaban, tuvimos que pensar en el relleno.

Antes de la casa modelo levantamos el Obrador, con techo de quincha, y el esfuerzo de las familias.

Un préstamo nos facilitó la compra de la Blaquerá y empezamos con los bloques. Después empezamos con las primeras 20 casas, como primera etapa. El lote fue hecho aprovechando los terrenos rellenados. Las familias fueron aprendiendo y enseñándose unos a otros.

Ya estamos trabajando en las segundas 60 casas y hemos completado las primeras 60.

Estimos que desocupar de ranchos los terrenos a usar. Entre todos levantamos un pozo semisurgente, más casitas de barro para alojar a la gente hasta que se terminen las casas.

Tenemos agua y luz y estamos mejorando las calles, ya que la lluvia es un problema.

Las casitas van creciendo y nosotros también.

PLAN DE VIVIENDA

NUESTRA METODOLOGIA

Hoy tenemos nuestra forma de hacer las cosas:

- **Participación**: nos hemos organizado por sectores territoriales: "las ramas", "las vías", "el pozo", "las 18" y "los 60". Tenemos que estar todos. Por eso trabajamos en subgrupos de familias, hasta la Asamblea donde tomamos las decisiones. En la participación están nuestros valores, nuestra raíz, nuestro pasado: la identidad. Vamos a pelear para que nos acepten como somos. Y pensar en el futuro.
- **Solidaridad**: es bajo entre nosotros, la vivimos cuando hay problemas, ayudando a mujeres y ancianos. Usamos la ayuda mutua porque aunque no es lo ideal, cuando el hombre se pone en marcha, soluciona!! Si nosotros no lo hacemos... ¿quién lo hace?... mientras esperamos soluciones... ¿qué le damos a nuestros hijos?
- **Conducción**: solo si nosotros conducimos hay protagonismo. Poco a poco fuimos haciendo y aprendiendo. Hoy la conducción de la obra física y social la hacemos las mismas familias.

Antes no sabíamos manejar el dinero. Hoy gestionamos financiamientos y elaboramos proyectos: **eso es autogestión**. Si nos organizamos para hacer, nos desarrollamos y somos protagonistas.

- **Motivación**: necesitamos tomar conciencia, ver lo importante que es la casa. Por eso nos preocupamos en buscar nuevos incentivos y apoyar a la gente en su trabajo y en su participación comunitaria.
- **Capacitación**: nos faltan conocimientos y la sociedad no nos deja saber. Tenemos talleres. Allí, ahora nos sentimos útiles porque aprendimos haciendo y nos hemos capacitado.
- **Trascendencia**: es romper el individualismo: es dar al otro. Lo nuestro tiene efecto multiplicador. Si termina todo en nuestra comunidad, no sirve. Si nosotros pudimos, sirve a otros. Ya estamos pasando nuestra experiencia a otros pobladores, ayudando a que descubran su identidad... a desarrollar lo propio para no ser dependientes.

NUESTRO PLAN DE VIVIENDAS Y NUESTRA ORGANIZACION.

Lo nuestro es un proyecto comunitario, entre todos:... "si mi comunidad no se realiza, mi hijo no se realiza". Buscamos construir nuestras viviendas y nuestra organización. ¿Cómo funciona nuestra organización?

Tenemos el AREA CONSTRUCTIVA, SOCIAL, ECONOMICA, DE TRABAJO Y DE CAPACITACION.

Todas las áreas están interrelacionadas. Trabajamos entre todos. La eficacia de las áreas se mide en los resultados.

El AREA SOCIAL es la columna vertebral de la organización.

Lo importante es "el modo" en que construimos "nuestras casas".

NUESTROS MODOS DE TRABAJO MAS IMPORTANTES

- LA ACCION - REFLEXION: SIEMPRE...
- LA AYUDA MUTUA ORGANIZADA...
- EL PROTAGONISMO DE NUESTRAS MUJERES...
- LAS REUNIONES DE TOMA DE DECISIONES POR GRUPOS PARTICIPATIVOS
- LA ROTACION DEL TRABAJO...
- LAS GESTIONES FUERA DE LA COMUNIDAD.
- LA CAPACITACION Y APOYO A OTROS GRUPOS PARA QUE ELLOS TAMBIEN PUEDAN!!

ATRAVES DE LA CONFLUENCIA DE TECNICOS Y POBLADORES

TRABAJO sobre la solución de necesidades básicas que implica apoyo técnico interdisciplinario

El trabajo se sustenta en el supuesto de que tanto el hombre como los grupos sociales se conforman y desarrollan fundamentalmente en el proceso de satisfacción de sus necesidades.

Una buena solución de la necesidad, es un elemento crucial para obtener el objetivo. El fracaso en la solución de la necesidad, puede significar para el grupo, desvalorización y rechazo de la experiencia y de la capacidad adquirida en el proceso.

La interdisciplina aquí planteada, es mucho más que el aporte oportuno de cada una por separado. En nuestro planteo, en nuestro trabajo y por los motivos antes explicados, el abordaje de las distintas disciplinas es simultáneo, en un análisis común del problema. Cada una aportará, desde su ángulo, hacia el mismo objetivo: pero NO mediante análisis paralelos, desconectada cada disciplina de las demás. No se trata de una sumatoria; muy por el contrario, es un solo abordaje simultáneo por distintas disciplinas entrelazadas, impregnadas unas de otras. En eso radica la riqueza e importancia de la interdisciplina.

ACUERDO DE TRABAJO

Relación clara y libre entre la comunidad y el grupo de apoyo.

METODOS CLAVES

CAPACITACION

Transferir conocimientos técnicos necesarios fundamentales para la toma de decisiones.

Autodiagnóstico

Posibilitar el auto-conocimiento de valores, necesidades, expectativas, prioridades y recursos de la comunidad

Programación Participativa

En forma democrática y participativa: fijar objetivos, diseñar alternativas programáticas para resolverlos. Saber elegir programas realistas.

Ejecución Autogestionaria

Desarrollar la capacidad de hacer autogestionario, revalorizando la propia capacidad y ampliando el espacio de poder.

Autoevaluación

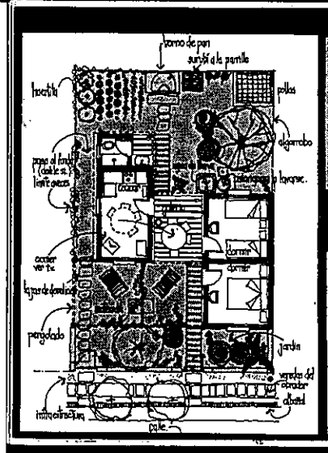
Posibilitar el aprendizaje a partir de la propia experiencia.

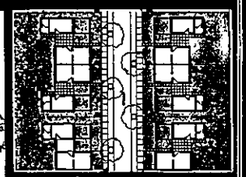
APROPIABILIDAD
Técnicas efectivas para resolver los problemas, pero posibles de ser apropiadas por la comunidad.

MODOS DE COMUNICACION ADECUADOS
Adecuación del lenguaje.
Simplificación de los planteos técnicos a sus elementos esenciales.

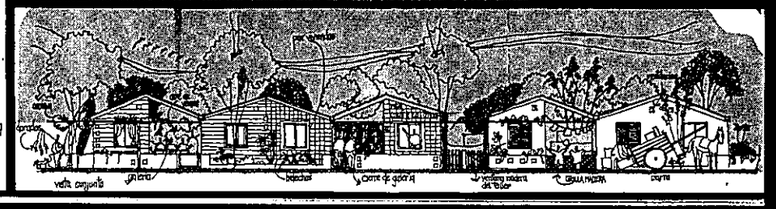
RECUPERACION DE LAS TECNICAS ESPONTANEAS
Potencializar las formas de hacer naturales de los grupos.

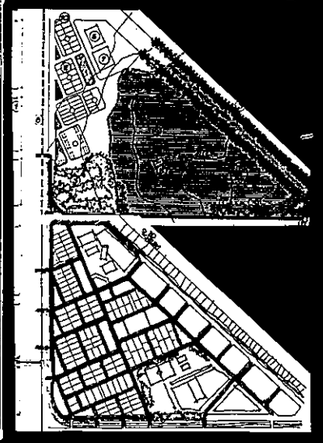
CARACTERISTICAS DE LAS TECNICAS A UTILIZAR EN LAS DISTINTAS DISCIPLINAS.





DESARROLLO DE DOCUMENTACION TECNICA (IMAGEN MODO DE VIDA) PARA ETAPAS SUBSIGUIENTES





EL PLAN DE VIVIENDA NO TERMINA ES DINAMICO DESDE LA APROPIACION INICIAL HACIA EL FUTURO DE LAS FAMILIAS

CONCLUSIONES Y PROPUESTA

LA SOLUCION DE LAS NECESIDADES DEL HABITAT POPULAR RESUELTA A TRAVES DE LA ACCION ORGANIZADA DE LOS POBLADORES CON EL ADECUADO APOYO TECNICO, LOGRA SATISFACER : HABITAT - COBIJO . IDENTIDAD GRUPAL . PARTICIPACION SOCIAL . FUENTE DE TRABAJO

Es posible la concurrencia de los pobladores y de los técnicos para la búsqueda de soluciones a los problemas del Hábitat sin perder su identidad.

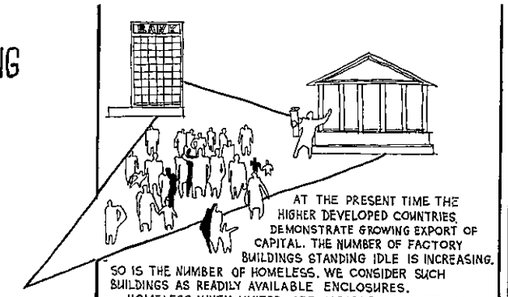
SE TRATA DE POTENCIAR LA CAPACIDAD DE CREACION, PLANIFICACION Y ORGANIZACION DE LOS SECTORES POPULARES A TRAVES DE :

APOYO TECNICO INTERDISCIPLINARIO QUE SE PROPONGA FUNDAMENTALMENTE EL DESARROLLO DE LA CAPACIDAD AUTOGESTIONARIA DE LOS GRUPOS A TRAVES DEL RESPETO PRIMORDIAL A SU ROL PROTAGONICO EN LA SOLUCION DE LOS PROBLEMAS QUE LOS AFECTAN Y EN UN PROCESO GRADUAL BASADO EN: EL AUTODIAGNOSTICO-LA PLANIFICACION PARTICIPATIVA-LA EJECUCION AUTOGESTIONARIA-LA AUTOEVALUACION

EL ESTADO DEBE PROVEER LINEAS DE CREDITO FLEXIBLES Y ACORDES A LOS PROCESOS DE CADA GRUPO, OFRECIENDO ALTERNATIVAS DE CREDITO QUE APOYEN LAS NECESIDADES DE LOS GRUPOS EN SUS PROCESOS, DESDE LEGALIZACION DE PROPIEDAD DE LA TIERRA, FINANCIAMIENTO PARA INFRAESTRUCTURA BASICA, BANCO DE MATERIALES, EQUIPAMIENTO PARA PEQUEÑAS PLANTAS DE PRODUCCION, ASISTENCIA TECNICA INTERDISCIPLINARIA, ETC. EL ESTADO DEBE PRODUCIR FLEXIBILIDAD Y CAMBIOS DE LEGISLACIONES QUE TRABAN TODO EL ACCIONAR DE GRUPOS POPULARES ORGANIZADOS

ESTA EXPERIENCIA SE UNE A MUCHAS OTRAS EN EL TERCER MUNDO PARA SOSTENER QUE HAY CAMINOS ALTERNATIVOS PARA LA SOLUCION DEL HABITAT POPULAR.

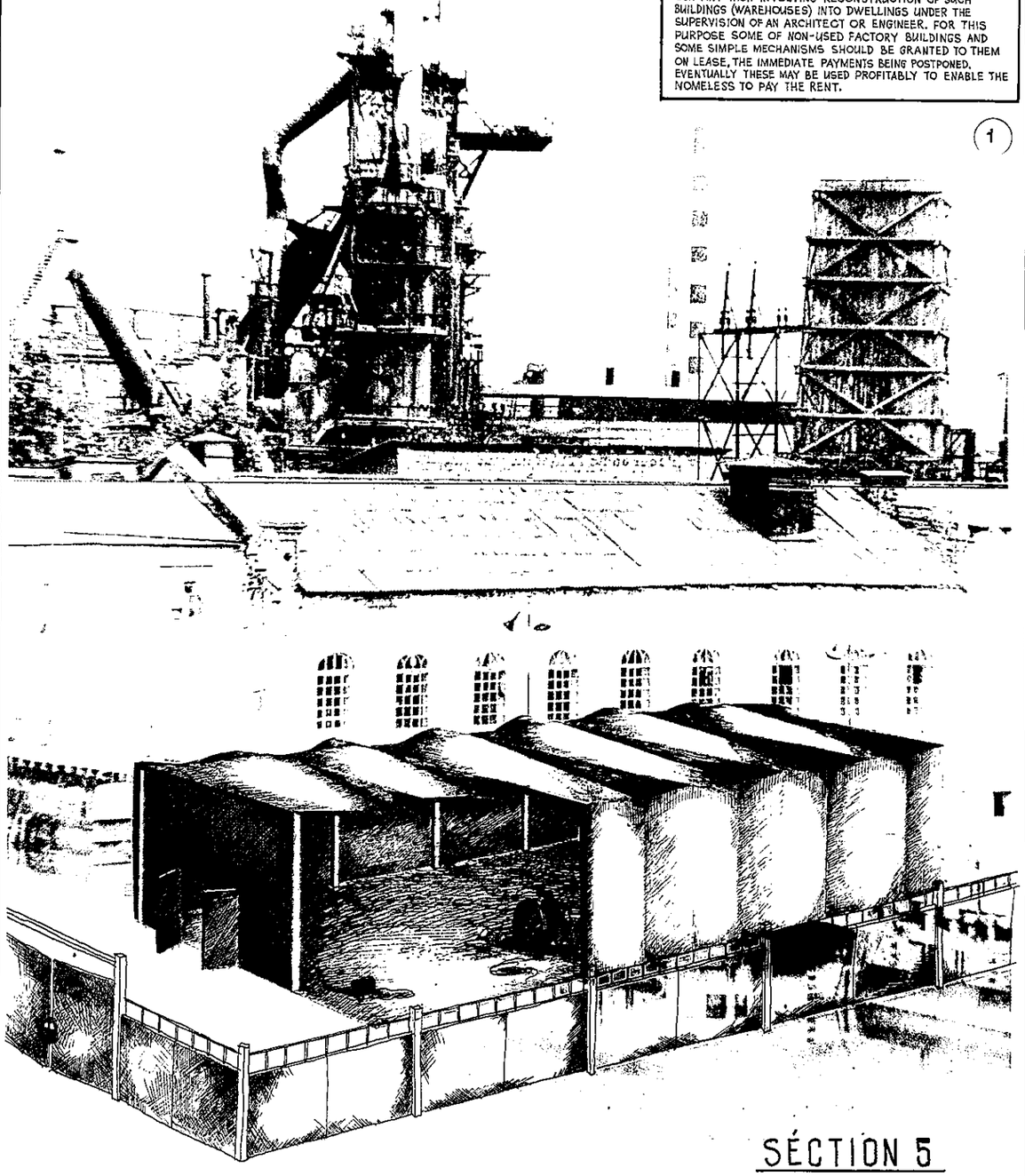
THE IDEA IS TO TURN ANY IDLE FACTORY BUILDING AND MECHANISMS INTO A DWELLING PROVIDING EMPLOYMENT AND INCOME FOR HOMLESS, AND TO CREATE A MEANS OF THE ANTHROPOGENEOUS-ENVIRONMENT ECOLOGICAL TREATMENT.



AT THE PRESENT TIME THE HIGHER DEVELOPED COUNTRIES DEMONSTRATE GROWING EXPORT OF CAPITAL. THE NUMBER OF FACTORY BUILDINGS STANDING IDLE IS INCREASING. SO IS THE NUMBER OF HOMELESS. WE CONSIDER SUCH BUILDINGS AS READILY AVAILABLE ENCLOSURES.

HOMELESS, WHEN UNITED, ARE CAPABLE OF CARRYING OUT ANY TASK INVOLVING RECONSTRUCTION OF SUCH BUILDINGS (WAREHOUSES) INTO DWELLINGS UNDER THE SUPERVISION OF AN ARCHITECT OR ENGINEER. FOR THIS PURPOSE SOME OF NON-USED FACTORY BUILDINGS AND SOME SIMPLE MECHANISMS SHOULD BE GRANTED TO THEM ON LEASE, THE IMMEDIATE PAYMENTS BEING POSTPONED. EVENTUALLY THESE MAY BE USED PROFITABLY TO ENABLE THE NOMELESS TO PAY THE RENT.

1

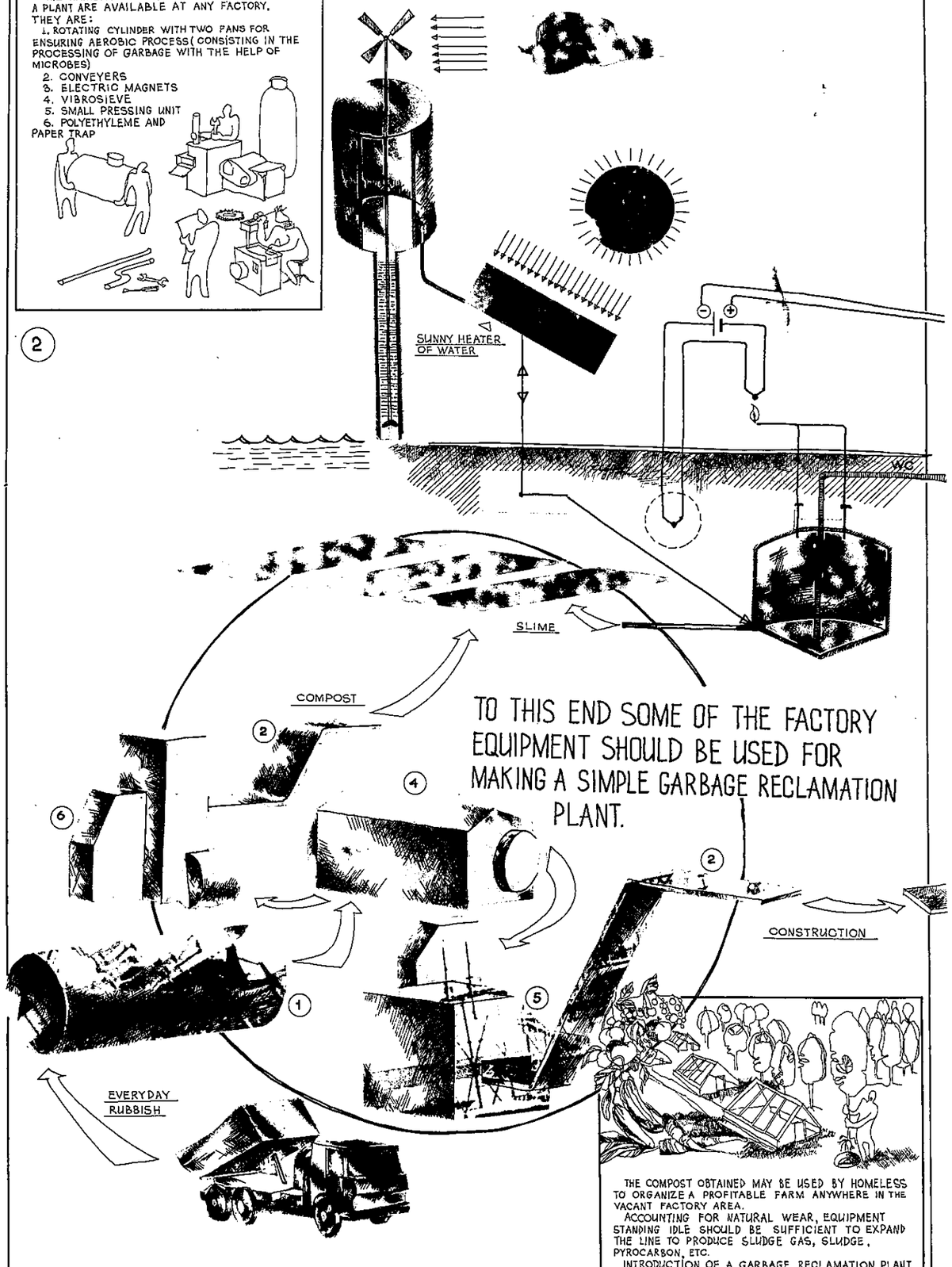


SÉCTION 5

MECHANISMS NECESSARY FOR MAKING SUCH A PLANT ARE AVAILABLE AT ANY FACTORY. THEY ARE:

1. ROTATING CYLINDER WITH TWO FANS FOR ENSURING AEROBIC PROCESS (CONSISTING IN THE PROCESSING OF GARBAGE WITH THE HELP OF MICROBES)
2. CONVEYERS
3. ELECTRIC MAGNETS
4. VIBROSIEVE
5. SMALL PRESSING UNIT
6. POLYETHYLEME AND PAPER TRAP

2



TO THIS END SOME OF THE FACTORY EQUIPMENT SHOULD BE USED FOR MAKING A SIMPLE GARBAGE RECLAMATION PLANT.

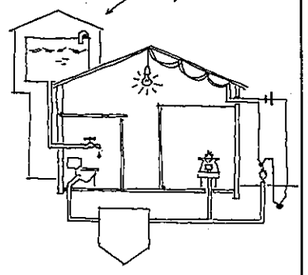
THE COMPOST OBTAINED MAY BE USED BY HOMELESS TO ORGANIZE A PROFITABLE FARM ANYWHERE IN THE VACANT FACTORY AREA.

ACCOUNTING FOR NATURAL WEAR, EQUIPMENT STANDING IDLE SHOULD BE SUFFICIENT TO EXPAND THE LINE TO PRODUCE SLUDGE GAS, SLUDGE, PYROCARBON, ETC.

INTRODUCTION OF A GARBAGE RECLAMATION PLANT INTO THE PROJECT SOLVES SOME ECOLOGICAL AND SOCIAL PROBLEMS. EXCESS WASTE MATERIALS MAY BE SOLD TO PAY BILLS.

SOLID FRACTION, PRODUCED BY THE PLANT, MAY BE USED TO MAKE STRUCTURES REQUIRED.

THE DWELLING IS EQUIPPED WITH ESSENTIAL SELF-CONTAINED ENGINEERING SISTEMS, WHICH CAN COVER THE EVERYDAY ENERGY NEEDS.



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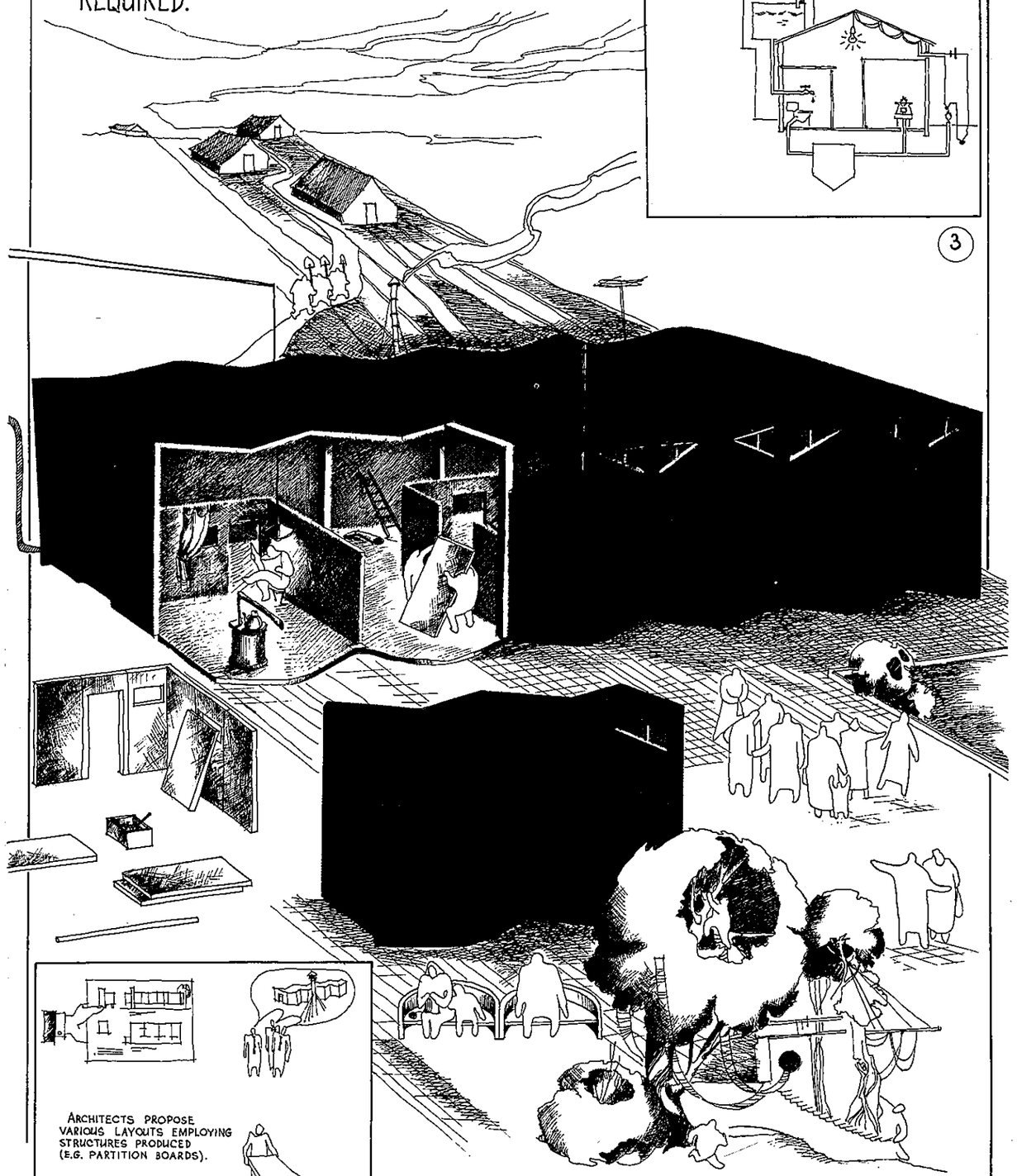
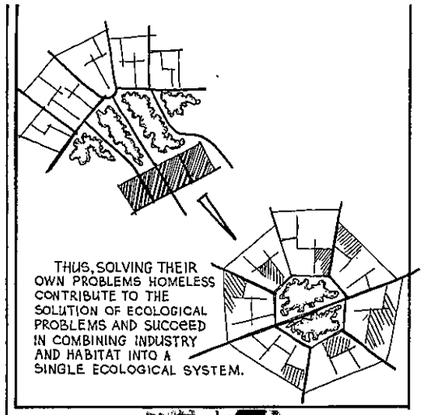


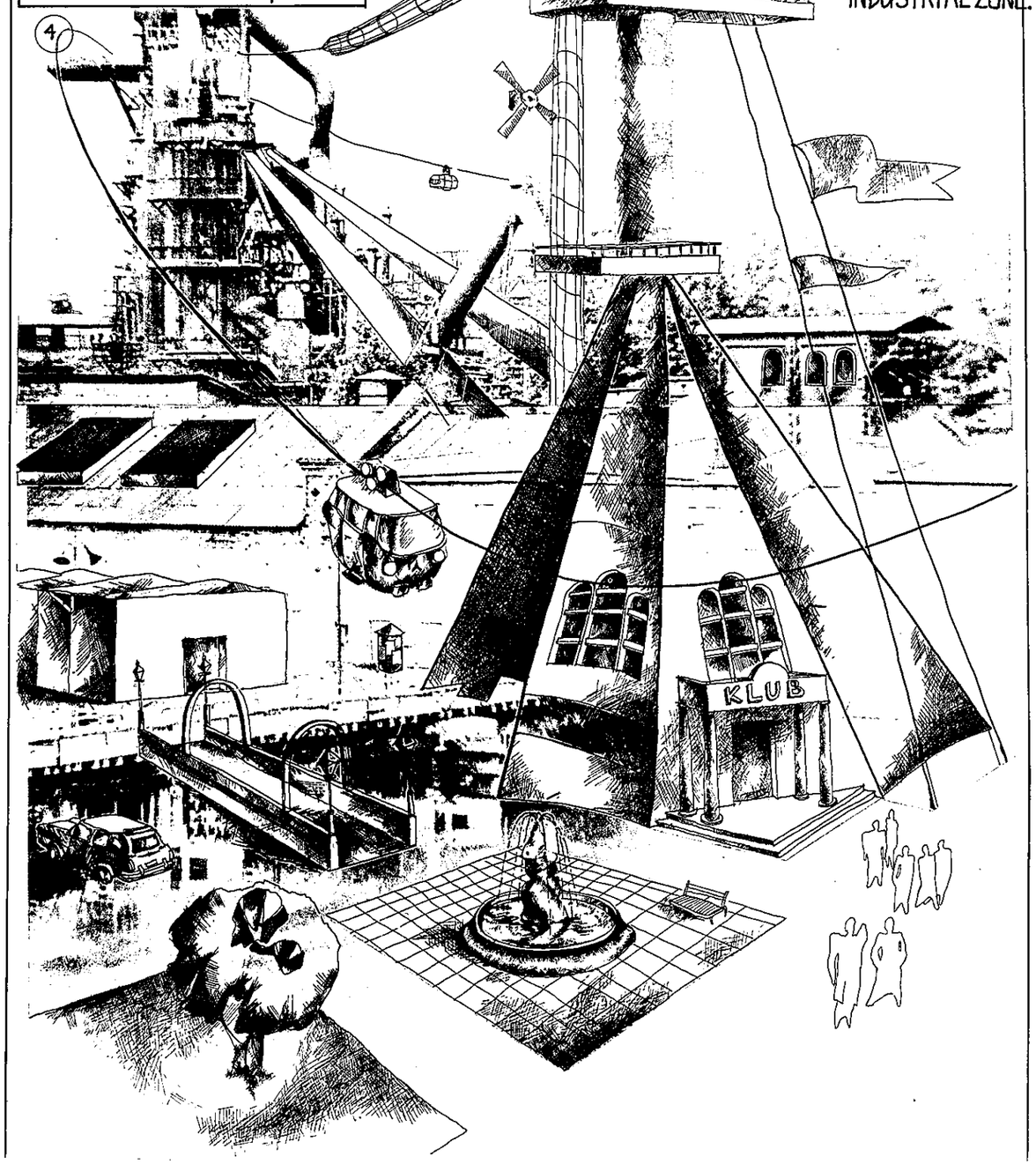
ARCHITECTS PROPOSE VARIOUS LAYOUTS EMPLOYING STRUCTURES PRODUCED (E.G. PARTITION BOARDS).

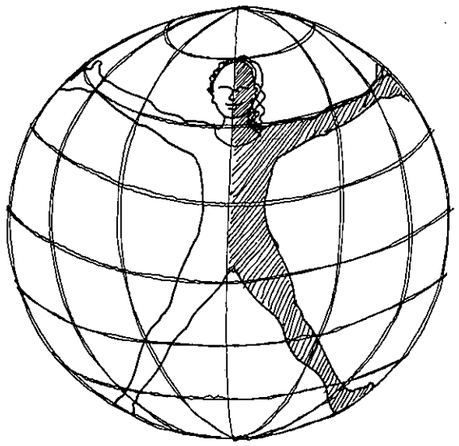


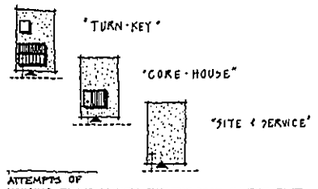
THUS, SOLVING THEIR OWN PROBLEMS HOMELESS CONTRIBUTE TO THE SOLUTION OF ECOLOGICAL PROBLEMS AND SUCCEED IN COMBINING INDUSTRY AND HABITAT INTO A SINGLE ECOLOGICAL SYSTEM.

STRUCTURES, SEPARATE COMPONENTS OF THE FACTORY ARE USED, IN COMBINATION WITH GARDENS AND LAWNS, ARRANGE DEFENCE IN OCCASION RENEWALING FACTORY, TO FORM A COMFORTABLE DWELLING AND SOCIAL ENVIRONMENT WITHIN AN INDUSTRIAL ZONE.

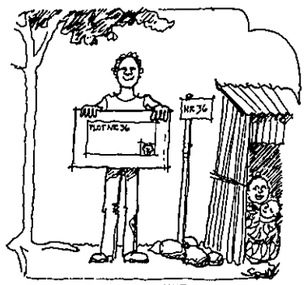
4





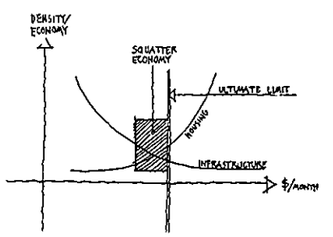


ATTEMPTS OF HOUSING PROGRAMMES FOR THE POOR IN THE PAST



THE RIGHT OF OWNERSHIP

THE PLOT MUST BE BIG ENOUGH TO PROVIDE SPACE FOR SURPLUS PRODUCTION. THIS IS MOSTLY CARRIED OUT BY THE WOMEN, WHO NEED TO BE CLOSE TO CHILDREN, HOUSE HOLD ETC.



* 0 PREFACE

Urbanization is rapid in the third world and squatter areas normally grow at a more rapid rate than the cities they belong to.

The reason for squatter settling is a way of life for the majority of urban dwellers in the third world, regardless of the reasons, be they colonial exploitation, international labour division, liberation warfare or natural calamities.
Since the 1960:ies, attempts have been made to deal with housing programmes for the poor, but none of them has had any impact compatible with the rapid growth of squatter settlements.
The only way to solve the housing problems on a wider range and on a larger scale is to accept the principle to upgrade squatter settlements:

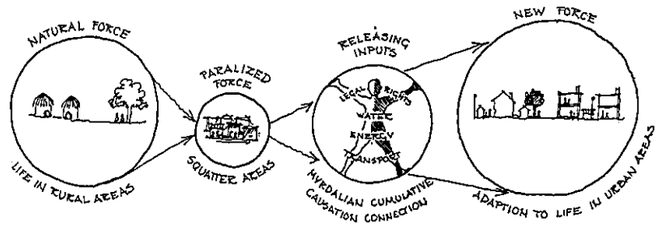
- By offering the squatters legal rights to settle and thereby to create the basic opportunities for investments.

- By supplying the inputs for a basic infrastructure, so that the individuals collectively can develop more adequate systems for healthy environment in the future.

- By helping people to organize their house construction themselves .....

- By utilizing all the creativity, the eagerness and the strength captured within the people themselves.

- BY RELEASING THE HUMAN FORCE ! -



* 1 THE RIGHT OF OWNERSHIP - LEGAL RIGHTS TO SETTLE

The right of ownership is in itself rather un-interesting. What is interesting is whether one has tenure rights. That is, tenure is a prerequisite for the desire to invest or better yet, a prerequisite for the spirit of self-help.

From the squatters point of view it is uninteresting whether it is a market economy or a planned economy. What is important for them is whether they can keep their houses.
This unfortunately creates large suburban areas of vacant lots which become expensive for society. Linear infra-structures, such as roads, water, electricity pass by these empty lots without anyone making use of it.

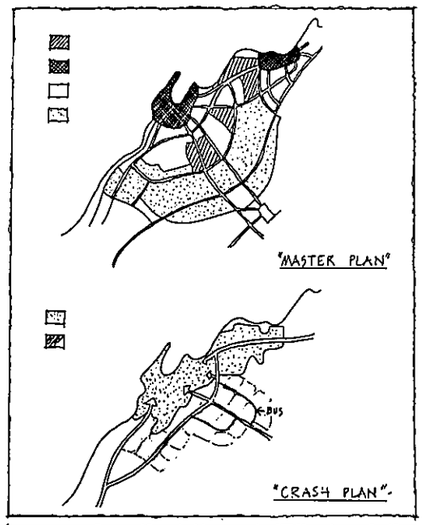
Thus it is important to create lawful means to prevent the holding of land for years without building on it.

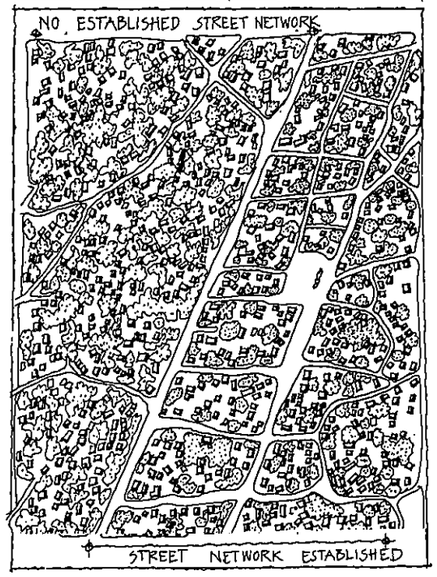
*2 ECONOMY / SOCIOLOGY

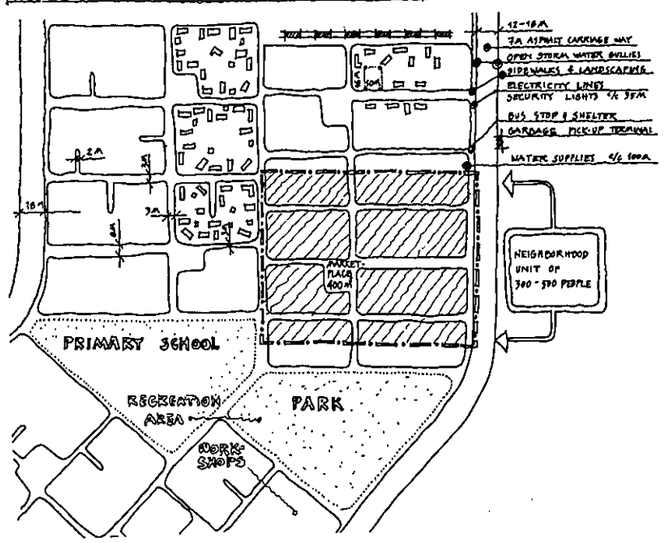
In squatter areas one is driven into different compromises, due to economic limitations. On one hand one would need larger land plots in order to have a better standard, eventually to have room for a small business one can live on, i.e. small work-shop. On the other hand one is forced to have smaller plots in order to afford water piping and be able to share infrastructure, which thus become cheaper.
A very important service is public transportation which presupposes a certain urban density in order to have economic justification.
A relevant question is how large families are and how many families can live on each land plot. In this case the established cultural family patterns determine the functional requirements.
In the large cities, however, the situation becomes more and more as it is in industrialised nations where isolation, small families and where single living becomes almost a rule. It is important to make use of the creative force which squatters often have since they come from the country side where they are used to dealing with problems and finding solutions for themselves.

A rational utilization of space may make it possible to live in a limited space, e.g. 100-150 m^2 per household. Since densification is necessary in order to avoid "overspill" in an upgrading project - and since multistory construction is economically unfeasible - it is necessary to find a mini-space on-ground solution.

The uneconomical low density of the squatter suburbs provoke high investment and running costs of linear infrastructure and public transport.







* 3 URBAN PLANNING

Construction goes on all the time - with or without urban planning.

Urbanization is an unmanageable force.

A land use "crash" plan with infrastructure compatibility is better than no plan at all. Worse than no plan at all is an un-realistic Master plan with a twenty year perspective but no directives for the coming three years.

Future conflicts with long term planning can be better handled with common sense than with detailed master plans. These are often day dreams for the future paralyzing immediate action.

* 4 INFRA STRUCTURE

The factors that have the greatest impact on improving living conditions are to be found outside the actual house: piped water, electricity, public transport, access for emergency vehicles, drainage, sewage, garbage collection, schools, playgrounds etc.

In order to have an effectiv economic distribution of infrastructure networks, it is necessary to open up new feeder corridors for mains and conduits in the midst of squatter settlements.

It is necessary to weigh the efficient lay-out of the heavy linear infrastructure and its welfare spread against the number of sacrified houses.

The feeder corridor should be designed with a width capable of channeling all essential utilities for the area:

- a central street with an asphalt strip for vehicles

- a public transport route with proper bus stops and shelters

- a main water conduit feeding the water taps located inside the squatter clusters

- main electric line with security lighting

- a garbage collection route with pick-up stations under hygienic control

- open storm water drainage gullies

- shade trees and other landscaping elements to be planted/installed

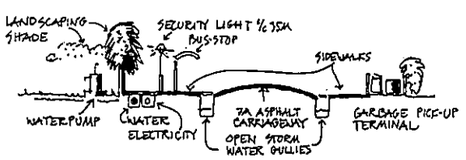
The investment in an asphalt street is considered worthwhile, not only for maintenance but also in order to reduce the strain on imported, expensive vehicles like buses, garbage trucks etc.

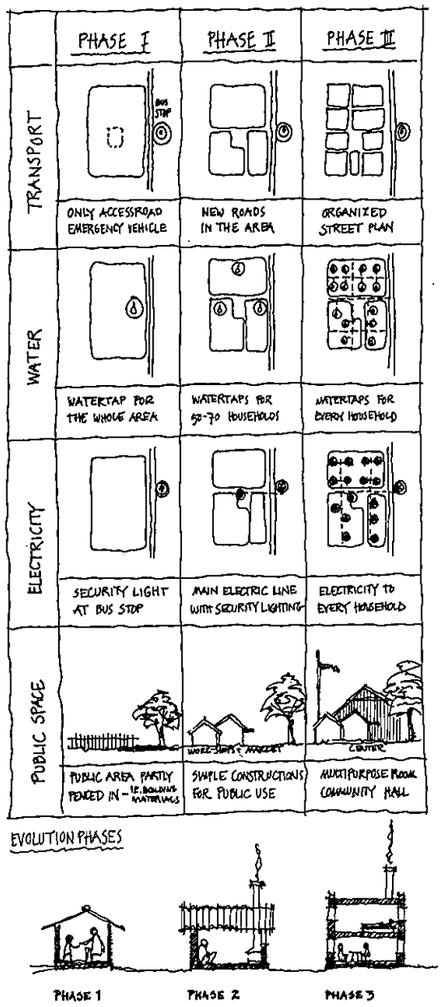
* 5 BASIC SERVICE FACILITIES

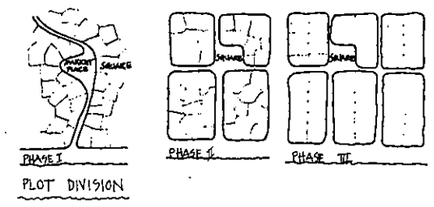
Primary School
Health Centre
Meeting Place - Multipurpose Hall
Workshops
Markets
Recreation Areas

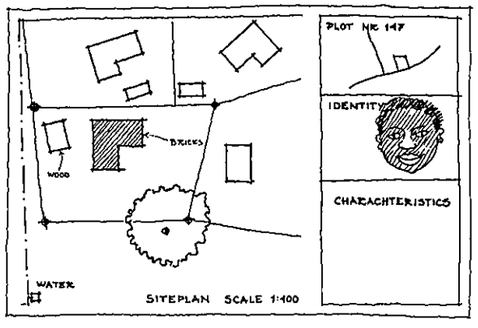
The local service facilities should satisfy the daily needs of well being, reducing at least part of unnecessary transportation and time expenditure for the dwellers. Location of a service unit should respect reasonable walking distances but its size must allow for a viable economical mode of operation.

The hierarchy of service levels correspond to populations ranging from 300 to 50,000 people. Some of these units could be combined in a center which may help to create an attractive sociocultural enviroment and give the area its own identity. Such nodes exists already at the market places.









* 6 QUESTIONS WHEN CONSIDERING AN UPGRADING PROJECT

- Is an area appropriate for housing in terms of enviromental conditions, drainage etc.?
- Is it compatible with a coming Master Plan or existing infrastructure networks?
- Is the density representative of squatter areas in general?
- Is the political organization and the level of mobilization strong enough?
- Are the existing social problems possible of being dealt with?

PEOPLE ORGANIZING THEMSELVES IN SQUATTER AREAS

* 7 FEATURES OF AN UPGRADING PROJECT

- Nobody should be forced to leave the area because of the project. All necessary relocations should take place within the settlement, preferably close to the previous site.
- House construction should be legalised but subject to a reasonable control if made in durable materials.
- No indemnification will be made by the government to relocate families. Any individual survival problems will have to be dealt with by the community.
- Inhabitants enjoying large compounds will have to cede space for relocated families.
- Reserving space for schools, day care centres etc. does not mean that financial resources are available. Implementation of these services may take years and evacuated land will have to be utilized by the community (sport fields, parks, agriculture) in order to avoid re-squatting and garbage disposal.
- The net density (persons/area for housing) would rise if the overall squatter density is to be maintained and overspill avoided.
- A test area is useful where concept of the upgrading plan can be displayed and the effects of house removals assessed.

* 8 AUTONOMOUS PLOT DIVISION

Relocated families usually want established space limits within which they do not feel as if they inhabit an area at the expense of other people.

The builders of new houses want to know the limits, not necessarily for putting up a fence, but in order to avoid wasted investments.

These requests may result in a self-made plot-division. In that case some policy guidelines may be necessary.

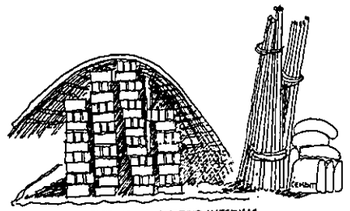
Existing trees and brickhouses should not be destroyed, nobody should be forced to move, plot division should always be voluntary within a block.

* 9 BUILDING CONTROL - HOUSE CONSTRUCTION LEGALIZED

A simple, fast routine of registration and building control is highly needed.

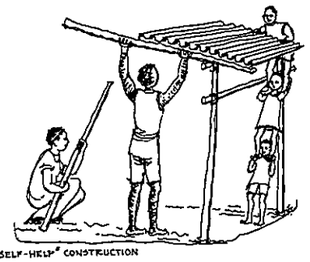
An A4-size card form may be sufficient. It is easy to photocopy, carries the essential information for localization of the houses, a schematic plan of the house and plot/compound in the scale 1:100, a few data on the materials and identification of the owner. The builder first places construction materials loosely on the ground in order to indicate the way he intends to build. The card is filled in on the spot.

Low cost 35 mm aerial photography is excellent for monitoring land use.

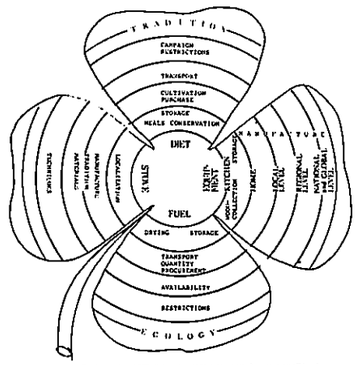


EFFORTS TO DEVELOP BETTER BUILDING MATERIALS ADAPTED TO THE LOCAL RESSOURCE BASE

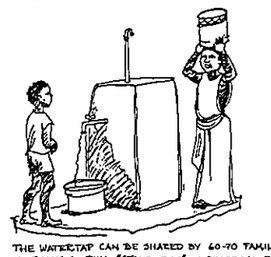
TOOLS TO RENT



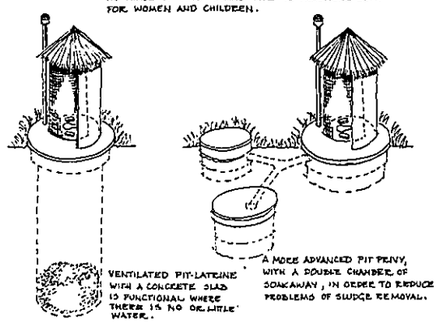
"SELF-HELP" CONSTRUCTION



CIRCLE DIAGRAM ILLUSTRATING HOW VARIOUS COMPONENTS OF MEAL PREPARATION (INNER CIRCLE) ARE RELATED TO EACH OTHER AND TO THE GENERAL SOCIETAL CONTEXT AT DIFFERENT LEVELS



THE WATERTAP CAN BE SHARED BY 60-70 FAMILIES IN PHASE 1. THIS "STAND-PIPE" IS PRACTICAL BOTH FOR WOMEN AND CHILDREN.



VENTILATED PIT-LATRINE WITH A CONCRETE SLAB IS FUNCTIONAL WHERE THERE IS NO OR LITTLE WATER.

A MORE ADVANCED PIT PRIVY, WITH A DOUBLE CHAMBER OF SCANDINAVIAN, IN ORDER TO REDUCE PROBLEMS OF SLUDGE REMOVAL.

* 10 HOUSE CONSTRUCTION

The approach to housing problems has to be on a general level. Such support can be offered in terms of facilitating building materials procurement, including transport and perhaps tool rentals. Involvment in the individual construction has to be completely avoided since technicians cannot be available in large scale.

However, densified private living space - calls for some sort of intervention on the micro level. The question of house construction can not be overlooked, and at least some recommendations have to be established. But, the approach has to stimulate ideas so that squatters can continue to solve their own problems as they always have done.

It is also necessary to accept a step-by-step upgrading of housing standards instead of a drastic renewal. Such a method is also more compatible with the general economic development of the squatter area. Therefore a densified one level habitat is the only solution and its construction has to be based on "self-help" as always.

Self-help is nothing new, it is not a "project" method. It is a self evident prerequisite for construction and has always been the solution to housing among the poor.

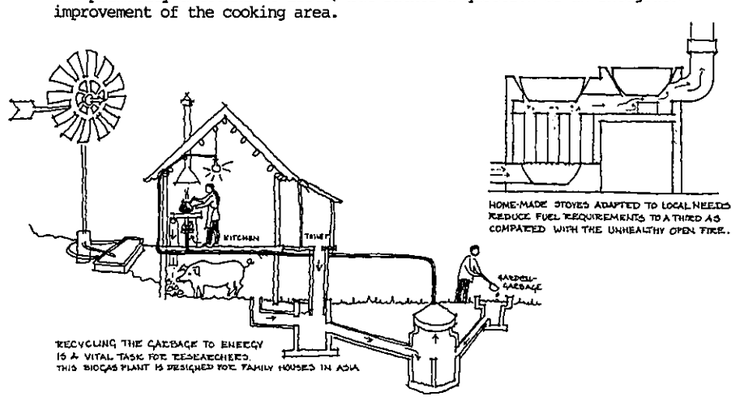
A two-level construction in the forseeable future is the logical result of evolutive density; however it requires in most cases the use of reinforced concrete.

* 11 ENERGY AND HEALTH

Cooking is one of the most energy consuming activities. To collect fuel is the task of of women and children. Many hours a day are spent hunting fuel. The costs of a household is also significant.

Current research indicates that in order to save household energy costs it is important to understand the components of meal preparation (food, equipment, fuel and stove/fire) and how they are related to each other and the general societal context. Savings of energy cannot be achieved if the energy saving stove isn't seen as an improvement of the kitchen, and corresponds to the users' need. The stove must be safe because many children suffer from burns acquired in the kitchen. Furthermore an indoor kitchenarea must be ventilated from smoke, heat and moisture.

Stovetypes used today are known since 2000 years before Christ, as archeologists have shown in Aquarossa, Italy. This shows that stoves are not primarily a technical issue, but rather a question of an integrated improvement of the cooking area.



RECYCLING THE GARBAGE TO ENERGY IS A VITAL TASK FOR RESEARCHERS. THIS BIOGAS PLANT IS DESIGNED FOR FAMILY HOUSES IN ASIA

HOME-MADE STOVES ADAPTED TO LOCAL NEEDS REDUCE FUEL REQUIREMENTS TO A THIRD AS COMPARED WITH THE UNHEALTHY OPEN FIRE.

* 12 SANITATION

Minimum living space could be substantially reduced if the sanitary systems could be made more satisfactory.

Often latrine and bathroom arrangements in smaller compounds sometimes occupies as much space as the house itself.

Another feature of a sanitary program is the incentive to put scarce cement where it has the best upgrading effect. Instead of piling up cement blocks on a compound for a future construction possibility (a completely passive investment until utilized), the cement could be used for latrine and bathroom floors, connecting walkways, kitchen surfaces, etc., where it would have a tremendous importance in raising the hygienic standard.

13155131

CUANDO LA CULTURA DEVIENE CASA Y LUGAR

1

HAY HOMBRES MITAD PEZ, MITAD VIENTO

PABLO NERUDA DICE EN UNO DE SUS POEMAS:
"HAY HOMBRES MITAD PEZ, MITAD VIENTO/ HAY OTROS HOMBRES HECHOS DE AGUA/ YO ESTOY HECHO DE TIERRA".

ERNESTO CARDENAL DESCRIBE EN EL POEMA "NINDIRI" UNA CIUDAD SIN CASAS Y SIN CALLES, DONDE LOS LUGARES ESTAN POBLADOS DE FLORES, DE AGUA Y DE ARBOLES FRUTALES.

JOAN MAC DONALD CUENTA EN "VIVIENDA SOCIAL" QUE LA VIVIENDA PRECARIA "NO TIE ESTRICTO AFUERA Y ADENTRO Y SE VIVE EN ELLA EN FORMA MAS PERMEABLE Y ARMONICA RESPECTO DEL MEDIO QUE EN LA MODERNA CAPSULA HABITACIONAL".

ESTOS HOMBRES, ESTAS CIUDADES, ESTAS VIVIENDAS SON UNA REALIDAD CONCRETA EN LOS PAISES DEPENDIENTES, SOLO QUE IGNORAMOS SU EXISTENCIA Y PLANIFICAMOS PARA LOS POBRES COMO SI ESTOS FUERAN NUMEROS Y SU ENTORNO FUERAN GRAFICOS ESTADISTICOS.

EN LA BUSQUEDA DE UN METODO QUE PUEDA TRABAJAR CON ESTAS SUTILES ESTRUCTURAS DEL ENTORNO HE CONSTATADO ALGUNAS COSAS INTERESANTES: 1) QUE LO QUE CONSTRUYEN LOS POBRES DE LAS GRANDES CIUDADES ES EXPRESION DE SU PROPIA CULTURA; 2)QUE ESTAS CONSTRUCCIONES SE TRANSFORMAN CON MUCHA RAPIDEZ, SUFRIENDO VERDADERAS METAMORFOSIS, Y QUE ESTAS TRANSFORMACIONES ESTAN SUJETAS A LEYES MUY PRECISAS ; 3) QUE EL ENTORNO Y LA VIVIENDA PRECARIA TIENEN MUCHA SIMILITUD CON UN ORGANISMO; 4) QUE EXISTEN ESTRUCTURAS VISIBLES E INVISIBLES EN EL ENTORNO.

PARA ESTRUCTURAR ESTAS OBSERVACIONES HE ENCONTRADO EN LA TOPOLOGIA UNA GRAN AYUDA, POR CUANTO ESTA NO OPERA CON NUMEROS SINO CON CUALIDADES Y CON COMBINACIONES DE ESTAS CUALIDADES.

CON ESTOS ELEMENTOS ESTOY TRATANDO DE ELABORAR UN METODO Y UN MODELO QUE SIRVAN DE AYUDA A QUIENES TRABAJAMOS EN O PARA LOS PAISES DEPENDIENTES.

EL OBJETO DE NUESTRAS OBSERVACIONES SON LOS BARRIOS DONDE YA SE HAN CONSOLIDADO EN FORMAS LA RELACION ENTRE FORMA Y CULTURA. PARA NUESTRO TRABAJO ESTOS BARRIOS CONSTITUYEN VERDADEROS LABORATORIOS DE INVESTIGACION. ALLI CONSEGUIMOS LA INFORMACION CUALITATIVA QUE NOS SERVIRA DE BASE PARA FUTUROS PROYECTOS.

ESTA PRESENTACION ES SOLO UNA PAUSA EN UN PROCESO DE INVESTIGACION QUE NO HA TERMINADO AUN. SOLO HE QUERIDO APROVECHAR ESTA OPORTUNIDAD PARA MOSTRAR LA NECESIDAD DE UNA BUSQUEDA EN ESTA DIRECCION.

CULTURA CASA Y LUGAR

CUENTA CHRISTOPHER ALEXANDER QUE LOS TRULLI DE APULIA NO HAN CAMBIADO DESDE LOS TIEMPOS PREHISTORICOS. A DIFERENCIA DE LAS CULTURAS VERNACULAS, LAS "CULTURAS URBANAS" ACTUALES CAMBIAN CONSTANTEMENTE, SE ADAPTAN, TRANSFORMAN EL MEDIO, A VECES CONSERVAN "VALORES", OTRAS VECES LOS RECHAZAN PARA ADOPTAR OTROS QUE VIENEN DE AFUERA. ESTO LO EJEMPLIFICA VICTOR PAPANEK ("DESIGN AND SOCIETY", LANGDON Y CROSS, ED.) MOSTRANDO CANTAROS DE PLASTICO DE TAIWAN ADOPTADOS EN GUATEMALA.

UNA CASA DE VALPARAISO (CHILE) ES UN ARTEFACTO LLENO DE SALIENTES, HUECOS, MASTILES, QUE SIRVEN PARA COLGAR LA ROPA LAVADA, PARA ACOMODAR MACETEROS, INSTALAR JAULAS DE PAJAROS. MUCHAS DE ESTAS CASAS HAN SIDO CONSTRUIDAS CON RESTOS DE DEMOLICION DE ANTIGUAS CASAS TRAIDAS DE INGLATERRA. ENTONCES SE INCORPORA LA "MANO" DE BRONCE QUE SIRVE PARA LLAMAR A LA PUERTA, LAS VENTANAS DECORADAS EN METAL, LAS GALERIAS CON VIDRIOS DE COLOR. SUS HABITANTES, AL UTILIZAR MATERIAL DE DESECHO PARA LA FABRICACION DE JUGUETES Y ARTEFACTOS UNEN SU PARTICULAR MANERA DE RAZONAR EN TORNO AL "OBJETO UTIL" A UN CONOCIMIENTO PARCIAL DE LA TECNOLOGIA MODERNA.

EL COLOR DE LAS CASAS, LA DECORACION DE LAS TIENDAS DE BARRIO, LAS COSTUMBRES, TODO ESTA MARCADO POR UNA CULTURA DE UN CARACTER MUY LOCAL.

CUANDO UNA FAMILIA QUE HA VIVIDO MUCHO TIEMPO EN ESTAS CASAS, SE VE FORZADA A TRASLADARSE A LA TIPICA "CASA PARA POBRES", PLANIFICADA POR EL GOBIERNO, AL POCO TIEMPO EMPIEZA A TRANSFORMAR SU NUEVA VIVIENDA SIGUIENDO SU MODO ACOSTUMBRADO, PERO INCORPORANDO SIEMPRE VARIABLES DE MUCHA CREATIVIDAD.

DESDE LUEGO, EN LOS PAISES DEPENDIENTES EXISTE UNA PRESION ENORME POR IMPONER UN MODELO CULTURAL UNICO, EN LAS PALABRAS DE AMADOU-MAHTAR M' BOW, "UNA TENDENCIA CRECIENTE A LA UNIFORMIZACION DE LOS GUSTOS Y DE LOS COMPORTAMIENTOS, A LA HOMOGENEIZACION DE CIERTAS NORMAS DE VIDA, DE PENSAMIENTO DE ACCION, DE PRODUCCION Y DE CONSUMO, TRANSMITIDAS POR LA DIFUSION ESTANDARIZADA DE LAS MISMAS SERIALES TELEVISADAS Y LOS MISMOS RITMOS MUSICALES, DE LAS MISMAS PRENDAS DE VESTIR Y LOS MISMOS SUEÑOS DE EVASION"

A LAS AREAS URBANAS DONDE SE DESRROLLAN FORMAS CULTURALES PROPIAS LES HE DADO EL NOMBRE DE "ESPACIOS CULTURALES", MI INTERES AL DESARROLLAR ESTE TRABAJO ES CONTRIBUIR AL RESCATE DE LOS VALORES ENCERRADOS EN ELLOS, NO SE TRATA DE ESTABLECER LAS BASES DE UNA "CULTURA DE LA MISERIA", SINO DE INVESTIGAR A FONDO CUAL ES LA RELACION QUE HAY ENTRE EL HABITANTE POBRE DE LAS CIUDADES Y SU CULTURA. DE INVESTIGAR COMO HA SIDO URDIDA ESA ESTRUCTURA FINA QUE LIGA LAS COSTUMBRES, LA FORMA DE PRODUCIR COSAS, LAS ESCALAS DE VALORES, LA FORMA DE VESTIRSE Y COMER, LA CONSTRUCCION DE LA VIVIENDA...

PROPONGO A LO LARGO DE ESTE TRABAJO UN METODO QUE, RESCATANDO LO FUNDAMENTAL DE ESTOS " ESPACIOS CULTURALES", DEBE SER CAPAZ DE FORMULAR DISEÑOS MAS ADECUADOS A LAS NECESIDADES MATERIALES Y ESPIRITUALES DE LOS MAS POBRES.

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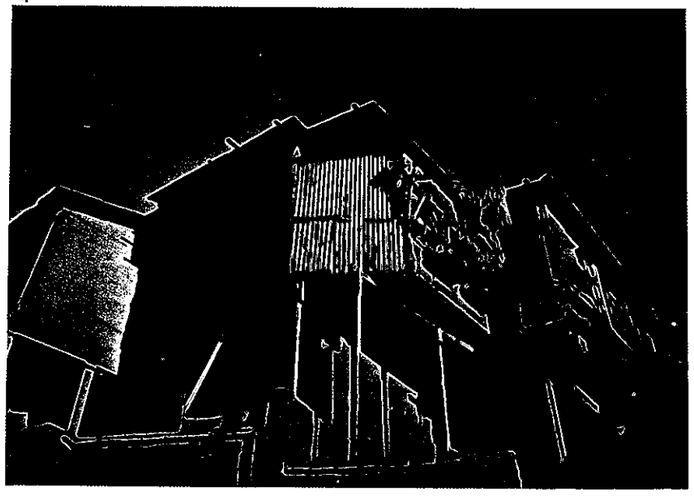

LA ARQUITECTURA ORGANICA DE LOS POBRES

LAS CASAS DEL VALLE DEL M'ZAB EN ARGELIA HAN DESARROLLADO A LO LARGO DE SIGLOS, RESPUESTAS PARA TODOS LOS REQUERIMIENTOS A QUE HAN SIDO SOMETIDAS, DESDE LA FORMA DE UNIRSE UNAS A OTRAS, HASTA LA MANERA EQUILIBRADA DE REGULAR LA LUZ A TRAVES DE DIVERSAS GRADACIONES DEL AZUL EN LOS INTERIORES, INCLUSO ELEMENTOS QUE SON APARENTEMENTE DECORATIVOS, RESPONDEN A UNA FUNCION.

A ESTA CAPACIDAD DE RESPONDER A CIERTOS REQUERIMIENTOS, CONFORMANDO UN SISTEMA DE RELACIONES FORMALES QUE EN SU CONJUNTO ES UNA RESPUESTA A LA TOTALIDAD DE LAS EXIGENCIAS AMBIENTALES, LA LLAMAREMOS ORGANICIDAD.

LAS VIVIENDAS DE LAS ARQUITECTURAS VERNACULAS SON MUY ORGANICAS, ANTROPOLOGICAMENTE RESPONDEN MUCHO MEJOR QUE LAS MODERNAS A LAS NECESIDADES DE LA FAMILIA Y DEL GRUPO SOCIAL.

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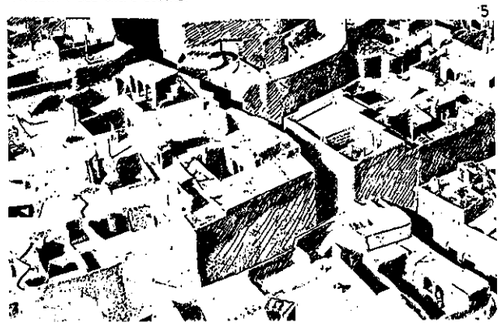

EN LA VIVIENDA PRECARIA ACTUAL EXISTE UNA NECESIDAD DE ORGANICIDAD. TOMO NUEVAMENTE UN EJEMPLO DE VALPARAISO (CHILE). LA CASA DE LA FIG.6 SEGURAMENTE EN UN COMIENZO OCUPABA MUY POCO LUGAR Y NO TENIA NADA MAS QUE LO NECESARIO PARA SERVIR DE REFUGIO. CON EL TIEMPO LOS PROPIETARIOS QUISIERON AGREGAR UN BALCON PARA SENTARSE FRENTE AL MAR Y QUE SIRVIERA TAMBIEN PARA COLGAR LA ROPA DEL LAVADO SIN TENER QUE BAJAR AL PATIO. COMO LA "SALA DE ESTAR" QUEDABA AL NIVEL DE LA CALLE (POR COSTUMBRE) TUVIERON QUE UTILIZAR UNOS PILARES MUY LARGOS COMO APOYO. ASI CON EL TIEMPO, PARA CADA NUEVO REQUERIMIENTO IBAN APARECIENDO NUEVAS RESPUESTAS. LAS FORMAS QUE ESTAS RESPUESTAS GENERAN SE VAN ESTRUCTURANDO POCO A POCO HASTA LLEGAR A CONFORMAR CONJUNTOS MUY ORGANICOS.

LAS VIVIENDAS DE LOS BARRIOS POBRES PARA QUE PUEDAN FUNCIONAR ADECUADAMENTE TIENEN QUE LLEGAR A ESTRUCTURARSE COMO UN ORGANISMO.

EN NUEVOS PROYECTOS PARA LOS HABITANTES POBRES DE LA CIUDAD NO ES LA VIVIENDA TERMINADA LO MAS IMPORTANTE, SINO LA CONFORMACION DE LOS ELEMENTOS ESTRUCTURALES DE UN ORGANISMO BASICO QUE TIENE QUE TRANSFORMARSE CON EL TIEMPO. A ESTE ORGANISMO LO DENOMINO "UNIDAD AMBIENTAL".

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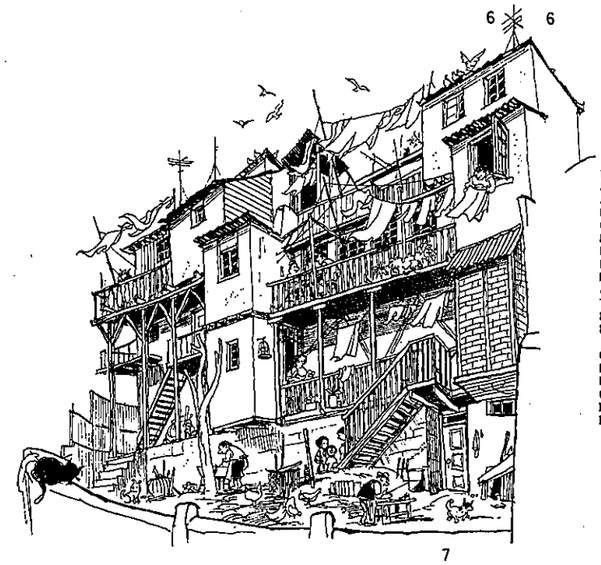

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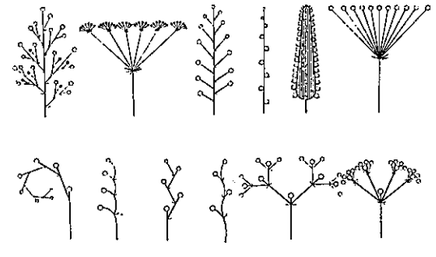

LA METAMORFOSIS

LA NOCION DE METAMORFOSIS O TRANSFORMACION ES CENTRAL EN ESTE TRABAJO. ELLA SE APLICA NO SOLAMENTE A LAS TRANSFORMACIONES MATERIALES (LA VIVIENDA, EL ENTORNO, LOS UTENSILIOS) SINO TAMBIEN A LOS CAMBIOS EN LA CULTURA.

SI OBSERVAMOS LOS BARRIOS POBRES DE LAS GRANDES CIUDADES LATINOAMERICANAS, VEREMOS QUE SON ORGANISMOS EN PERMANENTE Y ACELERADA TRANSFORMACION, DA LO MISMO SI SE TRATA DE UNA "FAVELA" EN RIO DE JANEIRO O DE UN "CONVENTILLO" EN UN CERRO DE VALPARAISO.

HAY OTROS PROCESOS DE TRANSFORMACION QUE AFECTAN CIUDADES ENTERAS. ESTOS SON MAS LENTOS Y TIENEN UNA GRAN ORGANICIDAD. ES EL CASO DE GARDAIA EN ARGELIA.

DE LA OBSERVACION DE AMBOS, PODEMOS SACAR MUCHAS ENSEÑANZAS

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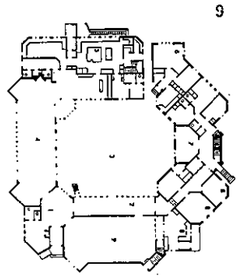

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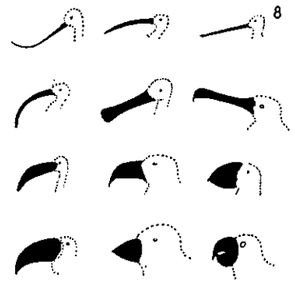

EN PRIMER LUGAR, ESTOS CRECIMIENTOS NO SON ALEATORIOS. ELLOS SE CIÑEN A LEYES BIEN PRECISAS DE TRANSFORMACION Y CRECIMIENTO. POR ESO ESTOS TEJIDOS URBANOS MIRADOS DESDE EL AIRE TIENEN MUCHA HOMOGENEIDAD.

EN SEGUNDO LUGAR, EXISTE CONTINUIDAD EN LAS TRANSFORMACIONES, ESTO QUIERE DECIR QUE CUANDO UNA FORMA PASA A SER OTRA, NO SE PRODUCEN RUPTURAS EN LA ESTRUCTURA PRIMERA.

EN TERCER LUGAR, GENERALMENTE LA CONSTRUCCION PARTE DE UN EMBRION, EL CUAL ES INCOMPLETO, PERO YA TIENE EL GERMEN DE DONDE SE DERIVARAN NUEVOS ORGANOS. EN EL DESARROLLO DEL EMBRION SOLAMENTE PODEMOS PREVER LA EXISTENCIA DE UNA TENDENCIA Y NO DE UN RESULTADO FINAL.

DADAS LAS CONDICIONES DE EXTREMA POBREZA EN GRANDES AREAS DEL MUNDO, NO PODEMOS PENSAR EN LA POSIBILIDAD DE DISEÑAR VIVIENDAS TERMINADAS O ENTORNOS COMPLETOS, CONSIDERANDO QUE EL CRECIMIENTO Y LA TRANSFORMACION SON PARTE DE LA CULTURA DE LA GENTE.

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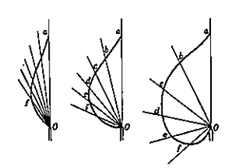

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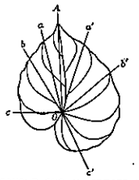

LA NOCION DE METAMORFOSIS IMPLICA UNA FORMA SIMPLE QUE AL CRECER Y TRANSFORMARSE VA GANANDO MAYOR COMPLEJIDAD. DICHA NOCION TIENE DOS AREAS DE ACCION DENTRO DE LA ARQUITECTURA, LA PRIMERA ES LA YA ENUNCIADA DE TRANSFORMACIONES A LO LARGO DEL TIEMPO. LA SEGUNDA SE REFIERE A UNA CONCEPCION ORGANICA DE LA FORMA, INCORPORADA AL LENGUAJE ARQUITECTONICO DESDE EL PRIMER MOMENTO DEL PROCESO DE DISEÑO. POR OTRA PARTE, LA METAMORFOSIS EN SU PRIMERA ACEPCION IMPLICA LA READAPTABILIDAD DE LOS ESPACIOS, DE MANERA QUE LO QUE SE CONSTRUYE EN UNA PRIMERA ETAPA SEA POSIBLE DE UTILIZAR DE OTRA MANERA MAS TARDE. ES IMPORTANTE QUE LAS DIVERSAS UNIDADES CON QUE SE TRABAJE PUEDAN DESARROLLARSE EN FUNCION DE SUS PARTES ESENCIALES Y QUE CADA PARTE SEA AUTOSUFICIENTE, ESTO ULTIMO QUIERE DECIR QUE FUTUROS CRECIMIENTOS PUEDEN SIGNIFICAR UN MEJORAMIENTO SUSTANCIAL, PERO QUE SI NO SE REALIZAN ESTO NO ES UNA CARENCIA O UN FRACASO.

COMPARTO LA AFIRMACION DE MAX-NEEF QUE DICE QUE" LA RENOVACION TIENE QUE PARTIR DE LA 'ALDEA' Y LLEGAR POCO A POCO AL ORDEN GLOBAL, Y NO AL REVES, PORQUE SOLO EN LA ALDEA SE DA LA ESCALA HUMANA QUE PERMITE LA PLENA PARTICIPACION DE TODOS EN LA DEFINICION DE LOS PROBLEMAS Y EN LA BUSQUEDA DE DEFINICIONES; SOLO EN EL ENTORNO A ESCALA HUMANA PUEDE FLORECER LA CREATIVIDAD, Y LOS GRUPOS HUMANOS PUEDEN DESRROLLAR UNA IDENTIDAD SIGNIFICATIVA".

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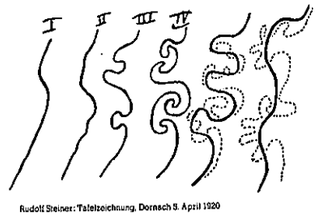

Rudolf Steiner: Tafelzeichnung, Dornach 9. April 1920

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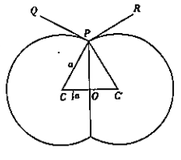


ELEMENTOS PARA UN MODELO

A) INSTRUMENTAL

PARA LA CONSTRUCCION DEL MODELO SE TRABAJA CON LOS SIGUIENTES CONCEPTOS:

-UNIDADES CULTURALES : DARE ESTE NOMBRE AL ELEMENTO ARQUITECTONICO MINIMO CON SIGNIFICADO CULTURAL, AL CUAL SE LE PUEDA ATRIBUIR EL CARACTER DE LUGAR. EL SIGNIFICADO TIENE QUE SER COMPARTIDO POR TODOS LOS MIEMBROS DE UNA COMUNIDAD.
LA DEFINICION DE UNA "UNIDAD CULTURAL" SUPONE UNA ACUMULACION DE INFORMACION DE MUY VARIADO TIPO, TENIENDO EN EL CENTRO LA INFORMACION ANTROPOLOGICA. UNA MEDICION DE ESTAS UNIDADES PODEMOS HACERLA MEDIANTE LA OBSERVACION DE LAS TRANSFORMACIONES QUE SE INTRODUCEN EN LAS VIVIENDAS (O EL ENTORNO) CUANDO DICHAS UNIDADES CULTURALES NO EXISTEN. ESTRUCTURALMENTE ESTAN CONFORMADAS POR UNA SERIE DE OPOSICIONES DEL TIPO INTERIOR/EXTERIOR, ABIERTO/CERRADO, ETC., LAS CUALES COMBINANDOSE ENTRE ELLAS VAN DEFINIENDO, EN RELACION AL HECHO CULTURAL O SOCIAL, UNA FORMA.

POR EJEMPLO, EN LOS PUERTOS SUDAMERICANOS EL BALCON ES UN VERDADERO CONDENSADOR DE ACTIVIDAD SOCIAL Y CULTURAL. ESTO HACE QUE SE LE ATRIBUYA UN SIGNIFICADO MUY PRECISO. UNIDADES MAS PEQUEÑAS QUE ESTE NO EXISTEN.

-UNIDADES DE VIDA : LLAMARE UNIDADES DE VIDA A LAS ESTRUCTURAS FORMADAS TOMANDO COMO ELEMENTOS CONSTITUYENTES MINIMOS LAS UNIDADES CULTURALES. UNA UNIDAD DE VIDA ES LA ESTRUCTURA QUE SUSTENTA, POR EJEMPLO, A UNA ANIMADA PLAZA ITALIANA.

-POLARIDADES (OPOSICIONES-DICOTOMIAS) : LA EXISTENCIA DE TODAS LAS COSAS ESTA DETERMINADA POR LA DE SU CONTRARIO, POR EJEMPLO:

CAMPO/CIUDAD
POBRES/RICOS
INTERIOR/EXTERIOR

EN LAS ZONAS DE ENCUENTRO DE LAS DOS PARTES DE UNA POLARIDAD SE GENERAN LIMITES O UMBRALES, EJ.: EL UMBRAL -PUERTA, EN LA POLARIDAD INTERIOR/EXTERIOR, AL ELEMENTO ARQUITECTONICO QUE LIGA ESTAS PARTES LE LLAMO ARTICULACION.

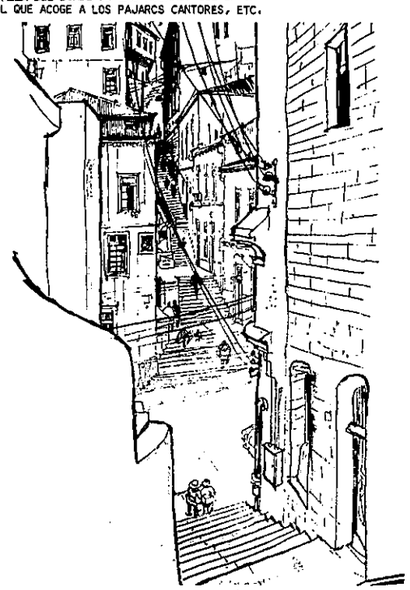
-ESTRUCTURA DUAL : CUANDO TENEMOS UNA ESTRUCTURA DEL TIPO
ABIERTO / EXTERIOR / CONVEXO,
TOMANDO LOS ELEMENTOS RESTANTES DE LAS DICOTOMIAS PODEMOS ESTABLECER UNA ESTRUCTURA DUAL DE LA ANTERIOR :
CERRADO / INTERIOR / CONCAVO

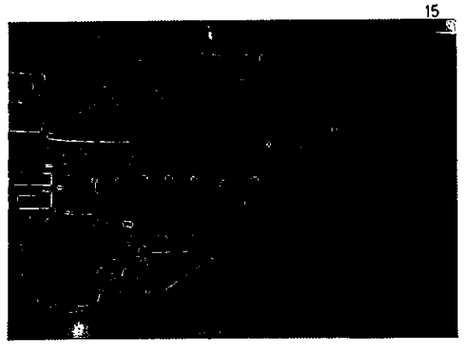
LA NOCION DE ESTRUCTURAS INVISIBLES DEL ENTORNO CORRESPONDE MUCHAS VECES A ESTRUCTURAS FORMADAS POR PARTES DE UNA ESTRUCTURA Y PARTES DE SU DUAL.

-PROGRAMA ORGANICO : ESTE SE DIFERENCIA DEL PROGRAMA TRADICIONAL EN QUE TRABAJA CON INFORMACION CUALITATIVA Y NO CUANTITATIVA.

LOS PROGRAMAS QUE TODOS CONOCEMOS FUNCIONAN CON ESTANDARES (METROS CUADRADOS, FAMILIA TIPO) Y CON UN CARACTER MUY DEFINIDO DE RECINTOS: DORMITORIO, COMEDOR, TERRAZA. ESTA MANERA DE DENOMINAR LAS COSAS SUGIERE DE INMEDIATO FORMAS CLICHES PARA ESTOS LUGARES.

EL PROGRAMA ORGANICO DESCRIBE LAS CUALIDADES DE UN LUGAR APOYANDOSE EN LA ESTRUCTURACION DE UNIDADES DE VIDA, DE ESTE MODO, UNA PLAZA DE 8.000 M2 SEGUN UN PROGRAMA TRADICIONAL , EN EL PROGRAMA ORGANICO ES: UN LUGAR DE USO PUBLICO, CON UNA DISTANCIA TAL ENTRE LAS VIVIENDAS QUE PERMITA CONVERSAR ; CON ACERAS ALTAS EN TODO EL ENTORNO QUE POSIBILITE SENTARSE A DISCUTIR; QUE LOS TECHOS DE LAS CASAS TENGAN GRANDES ALEROS QUE IMPIDAN EL PASO DEL SOL MAS ALLA DEL BORDE DE LAS ACERAS; QUE EN CADA ESQUINA SE PLANTE UN PLATANO, ARBOL QUE ACOGE A LOS PAJAROS CANTORES, ETC.





ESTO ES EVIDENTEMENTE UNA ESQUEMATIZACION. UN PROGRAMA ORGANICO SERA MUCHO MAS RICO EN LA MEDIDA QUE CONTENGA UNA INFORMACION CONCRETA.

- LIMITES : ESTE CONCEPTO EN MI TRABAJO SE REFIERE MAS A UMBRALES, BORDES Y MARGENES, QUE A LINEAS DEMARCATORIAS.

LA CONCEPCION DE LIMITE DE UN HOMBRE QUE VIVE EN EL DESIERTO DIFIERE ENORMEMENTE DE LA QUE TIENE EL HOMBRE DE LA CIUDAD O DE LA MONTAÑA. LOS LIMITES PERCIBIDOS POR LOS NIÑOS SON MUY DISTINTOS A LOS PERCIBIDOS POR LOS ADULTOS.

MAS QUE CON EL SISTEMA METRICO, NUESTROS LIMITES SE MIDEN EN ALCANCE DE LA VOZ, DE LA VISION Y DE ACUERDO A UNA CONCEPCION DE LA TERRITORIALIDAD.

- ESTRUCTURA Y SISTEMA : EL TERMINO "ESTRUCTURA" NO LO EMPLEARE AQUI EN EL MISMO SENTIDO QUE SE EMPLEA EN LAS CIENCIAS NATURALES, NUESTRO ENTORNO ESTA CONFORMADO POR ESTRUCTURAS VISIBLES E INVISIBLES, LA CONSTATACION DE ESTA REALIDAD IMPLICA UN CAMBIO CUALITATIVO EN LA COMPRENSION DEL TERMINO.

PODEMOS DECIR QUE UNA ESTRUCTURA ES EL CONJUNTO DE LOS ELEMENTOS CONSTITUYENTES DE UNA TOTALIDAD MAS LOS LAZOS QUE UNEN ESTAS PARTES, ESTOS ELEMENTOS NO ESTAN ORDENADOS DE CUALQUIER MANERA, SINO SIGUIENDO CIERTAS PAUTAS DE ORGANIZACION, LAS QUE ASEMEJAN NUESTRAS ESTRUCTURAS A ESTRUCTURAS TOPOLOGICAS.

LAS ESTRUCTURAS INVISIBLES ESTAN FORMADAS POR LAS PERCEPCIONES, POR LOS SIGNIFICADOS, POR LA MEMORIA COLECTIVA, TAMBIEN POR ESTRUCTURAS DUALES, VERDADEROS "NEGATIVOS" DE LAS FORMAS EXISTENTES.

UNA CORRECTA COMPRENSION DE ESTE CONCEPTO ES MUY IMPORTANTE PARA NUESTRO TRABAJO COMO ARQUITECTOS DE VIVIENDAS Y ENTORNOS MODESTOS. COMO LOS ELEMENTOS MATERIALES DE QUE DISPONEMOS SON BASTANTE PRECARIOS, UNA CORRECTA ESTRUCTURACION DE ELLOS PARA CONSEGUIR EL MAXIMO DE EFICACIA, ES DECISIVA.

CUANDO UNA ESTRUCTURA ENTRA EN FUNCIONAMIENTO ESTAMOS EN PRESENCIA DE UN SISTEMA.

- TOPOLOGIA / ESPACIOS TOPOLOGICOS / HOMEOMORFISMOS.

UN ESPACIO TOPOLOGICO TIENE MUCHAS CUALIDADES QUE PUEDEN CONTRIBUIR A ORGANIZAR ESTRUCTURAS DEL TIPO MENCIONADO ANTERIORMENTE. LA ESTRUCTURA TOPOLOGICA CONFORMA UNIONES ENTRE LAS PARTES MEDIANTE LAZOS DE SOLIDARIDAD, PRODUCE INTERSECCIONES, AGRUPA ORDENA, ADEMAS PERMITE CONCEPTUALIZAR ESTAS RELACIONES A TRAVES DE NOMBRES TALES COMO: PUNTOS DE ACUMULACION, CLAUSURA, INTERIOR, EXTERIOR, FRONTERA, ENTORNO.

MI OPINION ES QUE LA TOPOLOGIA CON LA CUAL NOSOTROS TRABAJAMOS TIENE QUE TENER SU PROPIA ORGANIZACION, UNA SITUACION SOCIAL NO TIENE POR QUE SIEMPRE ESTAR REGIDA POR PRINCIPIOS MATEMATICOS. LO QUE NOS INTERESA DE LA TOPOLOGIA SON SUS PRINCIPIOS ORGANIZATIVOS.

DE ACUERDO A LAS CARACTERISTICAS QUE VAYAMOS DESCUBRIENDO EN NUESTRAS ESTRUCTURAS, PODEMOS IR CREANDO NUESTRAS PROPIAS TOPOLOGIAS.

EJEMPLO DE ESPACIO TOPOLOGICO

SEA X UN CONJUNTO NO VACIO. UNA CLASE T DE SUBCONJUNTOS DE X ES UNA TOPOLOGIA DE X SI X SOLO SI T VERIFICA LOS AXIOMAS SIGUIENTES:

1) X , $\emptyset$ PERTENECEN A T

2) LA UNION DE CUALQUIER NUMERO DE CONJUNTOS DE T PERTENECE A T.

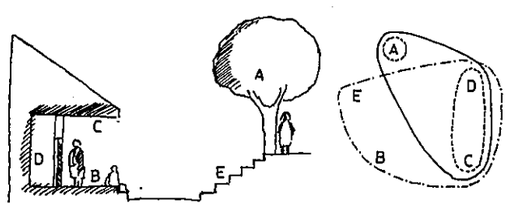
3) LA INTERSECCION DE DOS CONJUNTOS CUALESQUIERA DE T PERTENECE A T.

EL PAR (X, T) ES UN ESPACIO TOPOLOGICO.

EJEMPLO: $X = (A, B, C, D, E)$

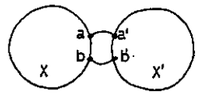
A = ARBOL
B = ACERA
C = ALERO
D = UMBRAL-PUERTA
E = ESCALERA

$T = [X, \emptyset, (A), (C, D), (A, C, D), (B, C, D, E)]$



HOMEOMORFISMO

CUANDO UNA FORMA PLANA (O UN VOLUMEN) SE TRANSFORMA SIN PERDER CIERTAS PROPIEDADES, ESTAMOS EN PRESENCIA DE UN HOMEOMORFISMO.



1. A TODO PUNTO DE LA FIGURA INICIAL LE CORRESPONDE UN PUNTO EN LA FIGURA TRANSFORMADA.
2. LA VECINDAD ENTRE CADA PAR DE PUNTOS DE LA PRIMERA FIGURA SE MANTIENE EN LA SEGUNDA.

B) MODELO

MI PREOCUPACION ACTUAL ES PODER CONSTRUIR UN MODELO QUE HAGA POSIBLE CONVERTIR LA INFORMACION ANTROPOLOGICA EN FORMAS UTILES.

EN ESTE CAPITULO QUIERO PLANTEAR RESUMIDAMENTE LAS BASES DE ESTE TRABAJO, ASI COMO LAS DUDAS Y LOS VACIOS DE INVESTIGACION.

PIENSO QUE ES POSIBLE TRABAJAR CON DOS MODELOS DIFERENTES QUE FUNCIONEN EN FORMA SECUENCIAL.

UTILIZO EL TERMINO MODELO PARA CARACTERIZAR UN ESQUEMA LOGICO QUE NOS PERMITA ORDENAR INFORMACION, PROCESARLA Y OBTENER UN RESULTADO.

EL PRIMERO DE ELLOS ELABORA UNA GRAN CANTIDAD DE INFORMACION SOCIOLOGICA Y ANTROPOLOGICA Y SU PRODUCTO ES EL "PROGRAMA ORGANICO" YA DESCRITO. EL SEGUNDO MODELO PARTE DE ESTE PROGRAMA Y SU PRODUCTO ES EL DISEÑO URBANO-ARQUITECTONICO TERMINADO. LO QUE RELACIONA AMBOS MODELOS ES SU CARACTER TOPOLOGICO, ES DECIR, AMBOS OPERAN CON CIERTAS CALIDADES ESPACIALES.

PARA SU CONFECCION CONSIDERO QUE LA UTILIZACION PARCIAL DEL METODO ESTRUCTURALISTA ES DE GRAN UTILIDAD POR SER ADECUADO PARA TRABAJAR CON INFORMACION TOPOLOGICA.

UNA DESCRIPCION DEL METODO ESTRUCTURALISTA ESCAPA A LOS LIMITES DE ESTE TRABAJO. QUISIERA SOLAMENTE CITAR A NILS CASTRO:
"TODO FENOMENO ESTA INTEGRADO POR UNA CANTIDAD DE ELEMENTOS CONSTITUYENTES, O PARTES MENORES RELACIONADAS ENTRE SI DE UNA MANERA ESPECIAL. LA TOTALIDAD O EL HECHO CONCRETO, NO RESULTA DE LA MERA SUMA DE LOS ELEMENTOS, SINO PRIMORDIALMENTE DEL MODO EN QUE ESTAN ARTICULADOS Y ACTUAN UNOS SOBRE LOS OTROS ".

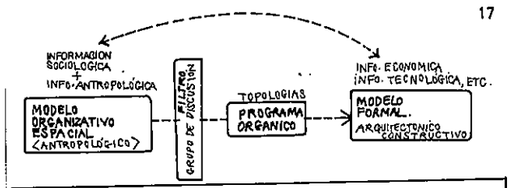
COMO ELEMENTOS CONSTITUYENTES TOMO LAS UNIDADES CULTURALES. COMO YA HE EXPLICADO, LA ESTRUCTURA TOTAL ES LA UNIDAD DE VIDA.

TODA LA INFORMACION RECIBIDA SE ORDENA PARA CONFORMAR UNA PRIMERA ESTRUCTURA QUE PUEDE SER LA REPETICION DE OTRA ESTRUCTURA EXISTENTE. ENSEGUIDA ESA ESTRUCTURACION PROVISORIA ES SOMETIDA A LA DISCUSION DE UN EQUIPO DE TRABAJO (ARQUITECTO, SOCIOLOGO, ANTROPOLOGO, USUARIOS, ETC.), EL CUAL DEFINE LA CONFORMACION DEFINITIVA DE LA NUEVA ESTRUCTURA.

FRENTE A UNIDADES DE VIDA DESEABLES ES POSIBLE ASUMIR TRES CRITERIOS:
1) ADOPTAR LA UNIDAD DE VIDA EXISTENTE ; 2) CONSTRUIR UNA UNIDAD HOMEOMORFA CON LA ANTERIOR ; 3) CONFECCIONAR UN PUENTE, ES DECIR, UN NUEVO ELEMENTO ENTRA A REEMPLAZAR A AQUELLOS QUE QUEREMOS ELIMINAR, SIN QUE SE PIERDAN LAS PROPIEDADES QUE NOS INTERESAN DE LA UNIDAD DE VIDA ORIGINAL.

UNA VEZ QUE SE HAN ESTUDIADO TODAS LAS CARACTERISTICAS Y PROPIEDADES DE LAS "UNIDADES CULTURALES" Y DE LAS "UNIDADES DE VIDA" QUE SE TOMAN COMO PAUTA SE PROCEDE A CONFORMAR UN ESPACIO TOPOLOGICO, DEFINIENDO CUIDADOSAMENTE LAS ARTICULACIONES, AGRUPACIONES Y CONCEPTOS.

PARA MI, UN PROBLEMA TODAVIA NO RESUELTO, ES EL DE DETERMINAR COMO SE TRABAJA CON LAS UNIDADES CULTURALES, DONDE ESTAN SUS LIMITES, QUE SE UNE CON QUE EN LA FORMA, ES CIERTO QUE ELLAS SE ESTRUCTURAN INTERNAMENTE DE ACUERDO A UN CONJUNTO DE POLARIDADES ? ESTAS Y MUCHAS OTRAS PREGUNTAS ESTAN TODAVIA SIN RESPUESTA.



ILUSTRACIONES.

1,2,3,4,6 VALPARAISO
5 GARDAÏA
7 FORMAS ORGANICAS
9 ARQUITECTURA ORGANICA (ASMUSSEN-JÄRNA)
8,10,11,12 METAMORFOSIS
13 TRANSFORMACION CELULAS
14-15, 18-21 VALPARAISO
16 TOPOLOGIA
17 DIAGRAMA MODELO

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EL ENTORNO CONSTITUIRA LA CASA GRANDE

DONDE TERMINA EL PENSAMIENTO RACIONALISTA EMPIEZA LA POESIA. ESTA ULTIMA ES TAMBIEN UNA FORMA DE PENETRAR EN LA REALIDAD, SOLO QUE CON OTROS MEDIOS. PARA COMPRENDER LAS SUTILES ESTRUCTURAS DEL ENTORNO NECESITAMOS DE UNA NUEVA FORMA DE ABORDAR EL TRABAJO CIENTIFICO, O TAL VEZ NO TAN NUEVA, PUES LA CIENCIA ANTES DE LA REVOLUCION INDUSTRIAL TAMBIEN ANDABA POR ESOS CAMINOS.

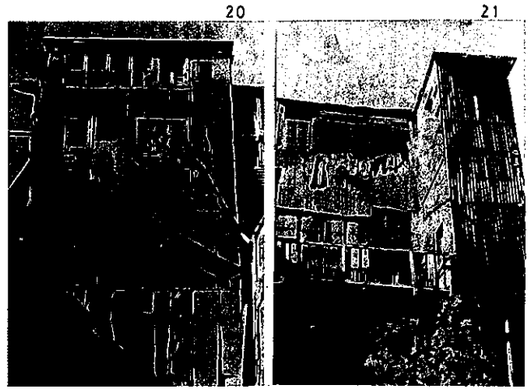
MUCHAS CONCEPCIONES DEL MUNDO VEN ENTRE EL HOMBRE Y LAS COSAS QUE LO RODEAN UN TODO CONTINUO. EL ANTROPOLOGO NORTEAMERICANO E. HALL NOS DICE QUE "SI SE TOCA UNA CULTURA EN UN PUNTO CUALQUIERA, TODO EL RESTO DE ELLA SE VERA AFECTADO".

LOS PROBLEMAS DE LOS MAS POBRES NO PUEDEN SEGUIR SIENDO TRATADOS COMO CUESTIONES AISLADAS. PARA LLEGAR A UN CONOCIMIENTO PROFUNDO DE ESTA REALIDAD Y DE LA RESPUESTA A SUS NECESIDADES NECESITAMOS DE UNA FORMA DISTINTA DE PENETRARLA, MUCHO MAS CERCANA A LA OBSERVACION Y A LA POESIA QUE A LAS ESTADISTICAS.

APARENTEMENTE NO HAY UNA RELACION DIRECTA ENTRE LO QUE SE COME Y COMO SE HABITA, O ENTRE LA VESTIMENTA Y NUESTRA VISION DEL MUNDO. LOS PUEBLOS CENTROAMERICANOS PUEDEN CONTARNOS MUCHO SOBRE EL MAIZ, PRESENTE YA EN EL "POPOL VUH", ALIMENTO ESENCIALMENTE ENLAZADO A SU CULTURA, Y MUCHOS PUEBLOS DEL NORTE DE AFRICA NOS PUEDEN HABLAR SOBRE ESA DESCLADORA PERDIDA DE IDENTIDAD QUE ACOMPAÑA AL CAMBIO EN LA VESTIMENTA.

LO "RACIONAL" ES QUE CUANDO SE PLANIFICA UN NUEVO BARRIO SE EMPIECE POR EL DISEÑO DE LAS VIVIENDAS, QUE ES, APARENTEMENTE LO MAS URGENTE. UN ESTUDIO QUE CONSIDERE LAS METAMORFOSIS Y QUE VEA AL ENTORNO COMO UN ORGANISMO, SEGURAMENTE NOS RECOMENDARA LO CONTRARIO : PRIMERO EL TEJIDO, DONDE CRECERAN Y SE TRANSFORMARAN LAS NUEVAS CELULAS. LA CONFORMACION PRIMORDIAL DEL ENTORNO COMO BASE PARA UN FUTURO DESARROLLO DE LA COMUNIDAD ES PARA LOS SECTORES POBRES MUCHO MAS LOGICO, HUMANO Y SALUDABLE. EL ENTORNO CONSTITUIRA LA "CASA GRANDE".

ESTE TRABAJO ES UN LLAMADO A ADOPTAR UNA POSICION NUEVA FRENTE AL PROBLEMA DE LA VIVIENDA, PARA LOGRAR UN RESCATE DE LO MAS VALIOSO DE LA CREATIVIDAD DE LAS CAPAS POBRES DE LA SOCIEDAD.



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VIVIENDA POPULAR Y ESPACIO URBANO... COL. DOCTORES MEXICO D.F.

EXTENSION TERRITORIAL.	1,958 201	km²
POBLACION ECONOMICAMENTE ACTIVA.	27.5	mill.
POBLACION OCUPADA SECTOR FORMAL.	10.0	mill.
POBLACION SECTOR INFORMAL.	17.5	mill.
POBLACION.	85	mill.

EXTENCION TERRITORIAL.	1,479	km²
POBLACION AFECTADAS POR LOS SISMOS.	90,000	pers
VIVIENDA PRODUCIDA POR AUTOCONSTRUCCION.	50	
POBLACION.	20	mill

ZONA DE TRABAJO

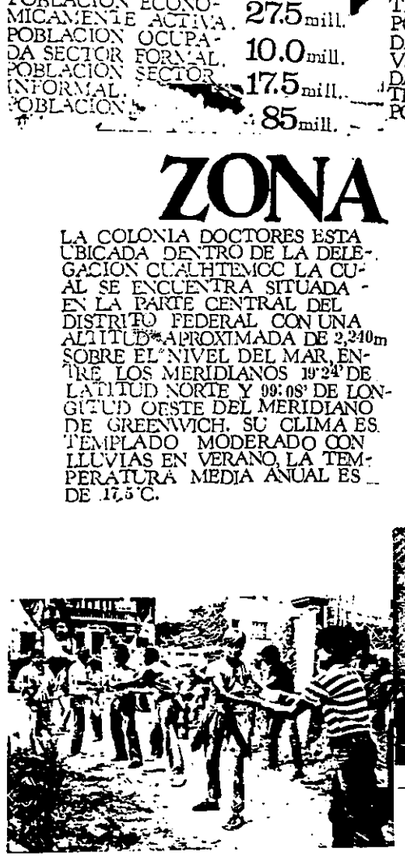
LA COLONIA DOCTORES ESTA UBICADA DENTRO DE LA DELEGACION CUAUHTEMOC LA CUAL SE ENCUENTRA SITUADA EN LA PARTE CENTRAL DEL DISTRITO FEDERAL CON UNA ALTITUD APROXIMADA DE 2,240m SOBRE EL NIVEL DEL MAR, ENTRE LOS MERIDIANOS 19°24' DE LATITUD NORTE Y 99°08' DE LONGITUD OESTE DEL MERIDIANO DE GREENWICH. SU CLIMA ES TEMPLADO MODERADO CON LLUVIAS EN VERANO, LA TEMPERATURA MEDIA ANUAL ES DE 17.5°C.

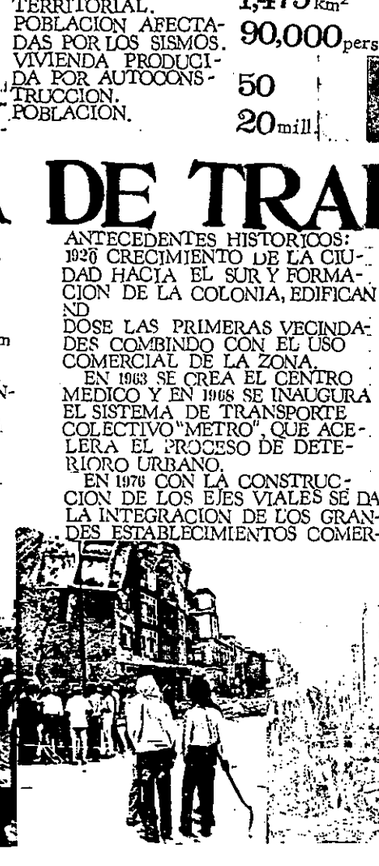
ANTECEDENTES HISTORICOS:
1920 CRECIMIENTO DE LA CIUDAD HACIA EL SUR Y FORMACION DE LA COLONIA, EDIFICANDOSE LAS PRIMERAS VECINDADES COMBINDO CON EL USO COMERCIAL DE LA ZONA.

EN 1963 SE CREA EL CENTRO MEDICO Y EN 1968 SE INAUGURA EL SISTEMA DE TRANSPORTE COLECTIVO "METRO", QUE ACELERA EL PROCESO DE DETERIORO URBANO.

EN 1976 CON LA CONSTRUCCION DE LOS EJES VIALES SE DA LA INTEGRACION DE LOS GRANDES ESTABLECIMIENTOS COMERCIALES DESPLAZANDO AL COMERCIO MEDIO Y POPULAR.

DETERIORO DE LA VIVIENDA
LA VIVIENDA SURGE DE CONDICIONES PRECARIAS, Y EL DETERIORO DE LA MISMA SE DA DE MANERA PAULATINA INCREMENTANDOSE ESTE A PARTIR DE LOS SISMOS DE 1985 DONDE POR MEDIO DE LA EXPROPIACION DE PREDIOS SE DA POR TERMINADO UN PERIODO DE MAS DE 40 AÑOS DE "RENTAS CONGELADAS" QUE PERMITIO A LOS DUEÑOS DE LOS INMUEBLES ABANDONAR EL MANTENIMIENTO DE LOS MISMOS Y A LOS POBLADORES SUBARRENDAR LOS CUARTOS DE VECINDAD...





VIVIENDA

MERCADO

PROPUESTA URBANA... ESC 1:500

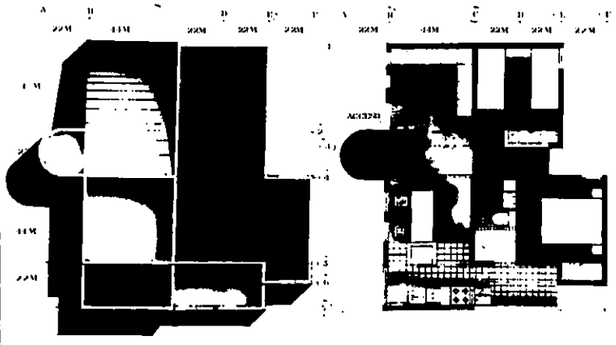
PROPUES CION DE URBANO..

LA VIVIENDA NO PUEDE SER CONDERADA COMO EVENTO AISLADO E INDEPENDIENTE SINO COMO ESPACIO QUE NECESITA PARA FUNCIONAMIENTO DE LA ARTICULACION E INTEGRACION CON SERIE DE EVENTOS COMPLEMETARIOS COMO SON EN ESTE CA LA ACTIVIDAD COMERCIAL CENTRADA EN EL MERCADO HIDALGO Y LA SERIE DE PEQUE TIENDAS COMERCIALES. ESTA TIVIDAD ACTUALMENTE SE ENFRENTA AL DESPLAZAMIENTO EJERCIDO POR EL CAMBIO EN

COMERCIO

VIVIENDA 1

TAPANCO



TECHOS

VIVIENDA 2

PLANTA... ESC 1:25

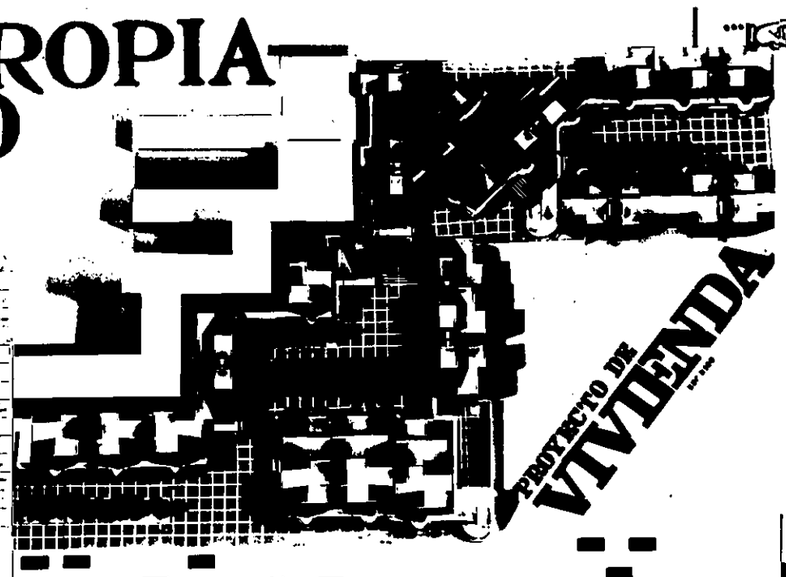
ALGO ACERCA DE... LA VIVIENDA

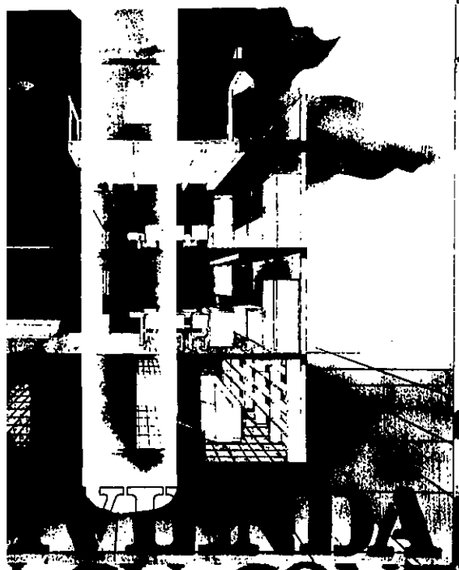
FACHADAS... ESC 1:100

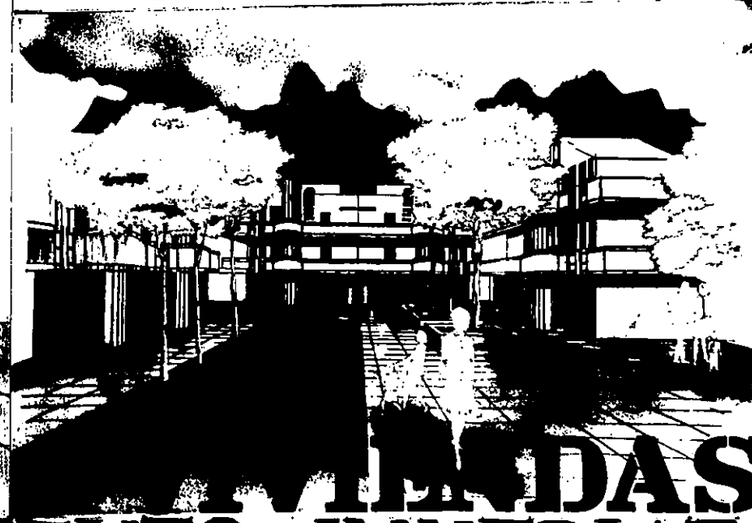
A DE APROPIA— ESPACIO

ESTRUCTURA URBANA Y USOS DEL SUELO, DE TAL MANERA LA PROPUESTA CONTEMPLA:

- FORTALECER EL PEQUEÑO COMERCIO Y EL COMERCIO POPULAR.
- REESTRUCTURACIO VIAL DE LA ZONA QUE PERMITA LA ARTICULACION DE LOS EVENTOS PRINCIPALES PRIORIZANDO EL TRAFICO PEATONAL SIN ELIMINAR EL TRAFICO VEHICULAR.
- LA COEXISTENCIA DE LA VIVIENDA CON EL COMERCIO.







LO TECNOLOGICO...

CARACTERISTICAS DE LA ZONA: 1. ALTA COMPRESIBILIDAD DEL TERRENO.
2. BAJOS INGRESOS PERCAPITA.

PROPUESTA:

EL NIVEL TECNICO ES CONTEMPLADO COMO AQUEL QUE PERMITA EN PRIMER INSTANCIA LA OPTIMIZACION DE LOS SISTEMAS TRADICIONALES LOGRANDO SU CONSOLIDACION Y ESPECIALIZACION, PERO PARALELAMENTE SE HACE NECESARIO SISTEMATIZAR LA EXPERIENCIA EN ESTE CAMPO MEDIANTE LA CREACION DE UN CENTRO DE INVESTIGACION QUE SE ORIENTE FUNDAMENTALMENTE HACIA LA VIVIENDA POPULAR.

PARA LA PRESENTE PROPUESTA TOMAMOS EN CUENTA EL MERCADO DE MATERIALES EXISTENTES, EL DINAMISMO Y CARACTERISTICAS PROPIAS DE LA INDUSTRIA DE LA CONSTRUCCION Y EVIDENTEMENTE LA CONDICION SOCIAL DE LOS POBLADORES.

PROPONEMOS UN SISTEMA CONSTRUCTIVO ALIGERADO:

EL SISTEMA CONSTRUCTIVO ALIGERADO QUE SE PROPONE, SE FUNDA PRINCIPALMENTE EN DOS ASPECTOS IMPORTANTES QUE SON SU BAJO COSTO Y SU REDUCCION DE PESO.

SE PROGRAMO EL DESARROLLO DEL TRABAJO POR ETAPAS QUE LES PERMITAN HACER USO INMEDIATO DE SUS VIVIENDAS.

SE PROPONE MEDIANTE EL USO DE MATERIALES ALIGERADOS QUE EXISTAN EN EL MERCADO, COMO PUEDEN SER LOS TABIQUES DE LA HUERTA, LA REDUCCION DE GASTOS POR CONCEPTO DE ACABADOS Y REVESTIMIENTOS QUE CONSERVEN LA APARIENCIA Y RESISTAN A LOS AGENTES DEL MEDIO AMBIENTE.

BAJO COSTO EN COMPARACION CON OTROS SISTEMAS CONSTRUCTIVOS TRADICIONALES.

VENTAJAS DEL TABIQUE HUECO COMO MURO INTEGRAL.

MAS LIGERO, REPRESENTADO EN EL VOLUMEN TOTAL DE LA OBRA MENOS PESO Y AHORRO EN CONCRETO Y ACERO.

NO REQUIERE DE ACABADOS FINALES O REVESTIMIENTOS TANTO EN INTERIORES COMO EN SUS EXTERIORES.

NO REQUIERE DE PINTURA O PASTAS.

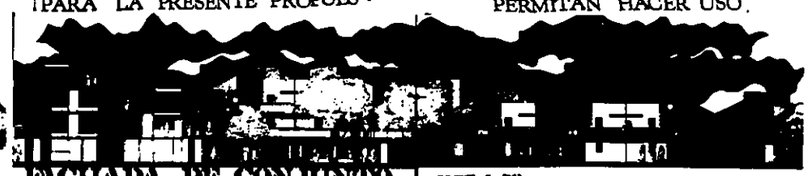
NO REQUIERE DE MANTENIMIENTO, DE RANURARSE PARA LAS INSTALACIONES ELECTRICAS, HIDRAULICAS Y SANITARIAS.

TIENE MAYOR DURABILIDAD Y RESISTENCIA A LOS AGENTES AMBIENTALES, COMO A LA POLUCION.

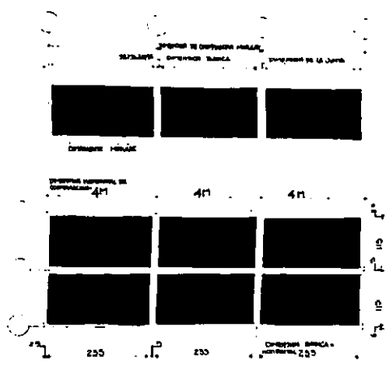
REDUCE LA POSIBILIDAD DE CREAR CONDENSACIONES POR SER UN MATERIAL HUECO Y NO GUARDAR HUMEDAD.

EN OBRA TERMINADA TODOS ESTOS FACTORES SUMAN UNA DIFERENCIA DEL 43% EN PROMEDIO, MAS BARATO QUE OTROS SISTEMAS TRADICIONALES.

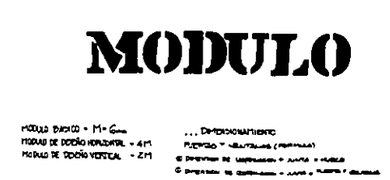
LA POSIBILIDAD DE UTILIZAR LA COORDINACION MODULAR COMO ELEMENTO RACIONALIZADOR DEL MATERIAL.

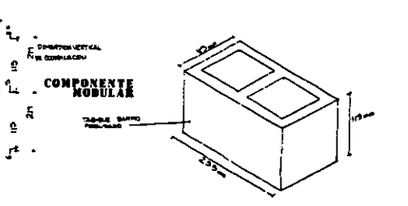


FACHADA DE CONJUNTO... ESC 1:50



MODULO



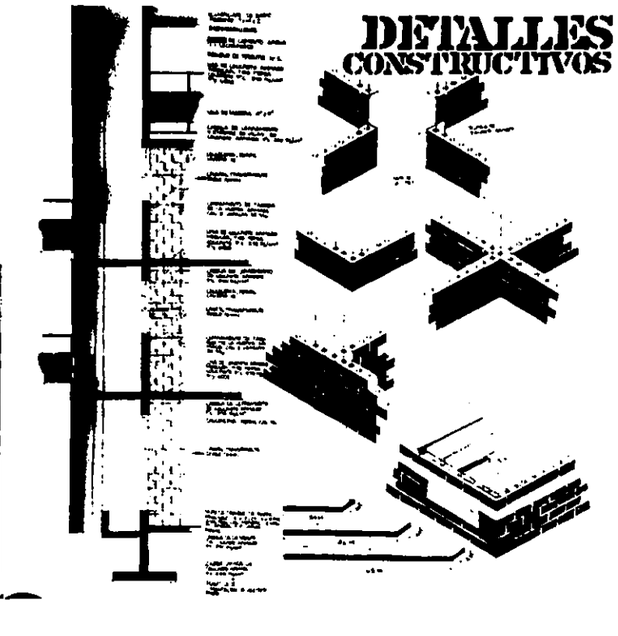


VIVIENDAS Y SU CONTEXTO INMEDIATO.....

- LA EVIDENTE DEMANDA DE VIVIENDA EN LA ZONA NOS LLEVA A PROPONER UN PROYECTO ACORDE A LAS NECESIDADES ESPECIFICAS Y CONTEMPLANDO LAS SIGUIENTES GARACTERISTICAS:
- SU ARTICULACION CON LOS EVENTOS URBANOS.
- UTILIZACION DE LA COORDINACION MODULAR COMO ELEMENTO DE OPTIMIZACION DE LOS MATERIALES.
- RESCATE DE AQUELLOS ESPACIOS QUE ELEVEN LA CALIDAD DE VIDA DE LOS POBLADORES.
- UTILIZACION DEL BINOMIO COMERCIO-VIVIENDA COMO SOPORTE QUE PERMITA UN INGRESO EXTRA PARA GARANTIZAR LA PERMANENCIA DEL POBLADOR EN LA ZONA.
- REDUCCION DE COSTOS EN ACABADOS TIEMPO DE EJECUCION Y MANTENIMIENTO.
- EL PROYECTO SE ENCUENTRA UBICADO EN 5 PREDIOS EXPROPIADOS A RAIZ DE LOS SISMOS DE 1985 COMPRENDIDOS ENTRE LAS CALLES DE DR. ARCE Y DR. BARRAGAN.

EL PROYECTO CONSTA DE 52 VIVIENDAS Y 52 COMERCIOS LA COMPOSICION FAMILIAR ATENDIDA ES DE 4 Y 6 PERSONAS.

DETALLES CONSTRUCTIVOS



A SEARCH FOR THE WAY AND METHOD TO PROMOTE SOCIAL COHESION IN URBAN SHELTER REDEVELOPMENT

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1. The Redevelopment of Old Urban Shelters — a Historical Necessity

Mankind has a rather favorable nature, i.e. the nature of being good at forgetting the past and optimistically facing the future. Nevertheless, the natural optimism is now undergoing setbacks for the reason that social changes are progressing so rapidly that the changed realities are replaced by new changes following one after another when there is no time for people to ponder over the reasons of the change. The currents of the Industrial Revolution has vigorously pounded at the traditional social fabrics, washed away historical traces of the human society and made a challenge to the traditional culture. The pounding has caused the high density and heterogeneity of the urban population and created a specific urban ideology, behavior and internal activity of the society, or in short, a so-called form of the urban living-style and culture. In the growth of the urban culture, new spiritual crises of mankind such as individualism, alienation of interpersonal relations, self loss, etc. are rapidly spreading. The ideas of making everything a commodity, blind search for material quality and exclusive concern about aethetical viewpoints are producing separation between the physical order and internal living order of modern cities. The explosion in the Pruitt Igoe Block of Saint Louis City, U.S.A. in 1973 has proved with irrefutable facts that organizational rules of the space environment of modern cities are unable to seek the balance between physical conditions, economy and society. The idea of being "eager for instant success and quick profits" and "not acting according to one's capability" are seemingly constituting distinctive features of the urban construction of the current period.

In the face of the current world and future challenge, how to correctly use modern technology to bring about a healthy development of the city and mould a happy home for mankind is the subject for modern architects to tackle as quickly as possible and the historical responsibility of them.

In contrast with developed countries, developing countries are in the new rising period. The industrial civilization and the idea of making everything a commodity are suddenly attacking when the traditions have not disappeared. The change of social fabrics, and permeation of modern living-style have caused the urban structure, space form and modern life to bring about a series of conflicts. As far as one of the human basic necessities- the urban living environment is concerned, in old urban residence areas after the shock of the Industry Revolution, the destruction of the original social fabrics, the decline of material condition, the excessive of environment and the expansion of residing populace have made old urban shelters far from satisfying the need of individual, family and social life of modern residents. Part of the old urban shelters is facing the demand of urgent redevelopment.

Because of the low physical quality and too long period of utilization, part of the old urban shelters is in the state of being "old and dangerous"(Fig 1). Some residence sections are low-lying and short of living accomodations and good ecological conditions (Fig 2). In some old urban shelters, there is too excessive environmental volume, severely insufficient residence space and serious environmental pollution. The previous balance of the physical and social orders has collapsed step by step. The "sihenyuan", or the compound with rooms around a courtyard, wich used to be occupied by a single household, has evolved into " a compound occupied by many households ", causing interference with the privacy of the family life and the separation of the traditional physical space form from the internal organization order of the modern residence life(Fig3).

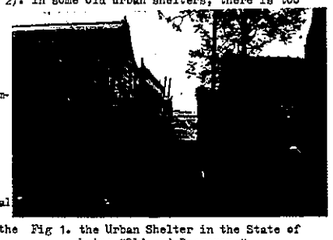


Fig 1. the Urban Shelter in the State of being "Old and Dangerous".

The deterioration of the physical and social environment of some old urban shelters has resulted in the destruction of the organizational order of the normal individual, family and social life of residents. This not only fails to meet the physiological and psychological demand of the residents, but brings about the worsening of the relation of neighborhood, making the residents lose the idea of "living in peace and contentment". Although a great many residents have a relatively strong feeling of being reluctant to leave the environment in which they have lived for long, they are eager to withdraw from the "modern" apartment house in order to get a "feeling of extrication". The degradation of the residence living quality and the destruction of the cohesion of the residence community resulting from the deterioration of the physical and social environment of old urban shelters have made it a historical necessity their redevelopment.

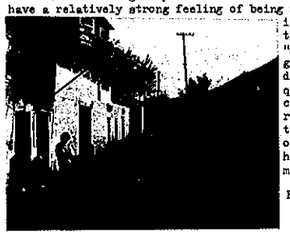


Fig 2. the Urban Shelter that are Low-lying and Dangerous.

2. Our Idea— Let Old Urban Shelters " Resuscitate "

Fig.3. A Compound Occupied by Many Households

The construction issues of old urban shelters is not only a construction problem of physical itentity but a social and political problem as well. As a result, it is necessary to adopt a form of corresponding comprehensive tackling to acquire the physical, economic and social balance. Some old urban shelters with higher quality and cultural value should be preserved and recovered to sustain their original appearance as the historical and cultural heritage. Some old urban shelters should be rehabilitated or redeveloped in a comprehensive way. As for the old districts with comparatively bad residential environmental quality and needing all-round redevelopment, our idea is to "let old urban shelters 'resuscitate'". "To resuscitate" not only refers to the renewal of the physical quality of old urban shelters, but also means the devetopm to the re-fostering of the "organic order". In the course of the "resuscitation" of the old urban shelters, we should make great efforts to recover the harmonic physical and social order which had grown prier to the shock of the industrial civilization so as to cause a reunification and organic growth of the modern residence living order and physical form order.

However, it is unfortunate that in the practice of the authentic redevelopment of old sections, architects and planners forgot long ago the natural and social rules of the "organic growth", which has led to the failure of the redevelopment practice of old urban shelters. The failure consists in the fact that the goal of the reconstruction plan purely stresses physical factors, but is devorced from organizing residential social order. Sociologists, economists and relevant social organizations are excluded from the group of decision makers. As consequence, the redevelopment of the old urban shelters has turned out to be a simple construction project(Fig 4,5). The practice such as the "blind development", "making use of every bit of space", "construction project to be carried out by any body who has the money", etc. has cause the inbalance between the newly-built shelter and the overall urban community system. In the residential environment formed of the "urgent" and "stereotyped" residential builds of international style, the physical enviroment does not truly reflects the internal organizational order of the residential community. The scattered redevelopment eager for instant success and quick profits has given rise to the waste of the limited construction funds when used. In the newly-built "residential machine", it is difficult for the residents to set up the close social grid. A strange environment is not able to form the unity of neighborhood, fostering of collectivism, commone value conception and life ideal of the residents. With the disappearance of the "traditions", the residential living space deplete with interpersonal intimate feelings has become "yesterday's community dream". In the field of narrow physical form, a distorted construction idea and practice has caused us to suffer great lossein the construction of human spiritual world (Fig 6, 7).

Fig 4. the "Blind Development" Made the Old Urban Shelters Redevelopment Has Turned Out to Be A Simple Construction Project.

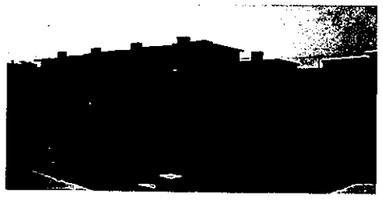


Fig 5. A Corner in Build Site in Old City—Xi'an.

Fig 6. A Old City Door in Xi'an

Fig 7. A Good Residentail Atomosphere in Traditional Residence "Alley".

From the viewpoint of shaping the survival space for mankind, it is mandatory to put into account all physical, social, cultural and aethetic problems in the correct planning and design. The only goal of planning and design is search for an organic unity between social, economic and physical factors. The evaluation of residence quality is hinged on the criteria whether the needs of the individual, family and social life of the residents can satisfied comprehensively. Any physical planning should take it as a starting point to stimulate the progress of social civilizatian and enable the spiritual world of the residents to be moulded in a good way. During the course of the redevelopment of old urban shelters, it is important to devote much attention to our real physical and economic conditions. Based on the reality and putting everything in the longterm consideration, the organic balance between the physical, economic and social factors be patiently sought for. By following the simplified "physical determinism" regardless of the "social criteria" of planning and design, it is not only impossible to truly overcome the housing and living problems, but is likely to reproduce the "Spiritual Homeless", thus engangering the current and future survival space of mankind and cut up our social, historical and cultural continuity.

Unlike products manufactured by machines, shelters can not be built willfuly according to the imagination of the designers. Being component parts of the organic body of the human society, they should be rooted in the soil of the society, cultivated naturally and grew up in an organical way. Any artificial control by a power will lead to the confusion and eventual decline of their internal order.

In the process of urban metabolism, a developing country should absorb the construction experience and draw a historical lesson from the developed countries. Based on the principle of "self-reliance", we should take advantage of all the resources available and work hard to explore the way and method to undertake the redevelopment of old urban shelters to enable the construction of the residents and cause the construction of the physical community to promote the re-growth of the spiritaul community of the residents at the same time. Applying modern technology to bring into being the "resuscitation" of the old city, thousands upon thousands of inhabitants will be enabled to have a comfortable home (Fig 8).

Fig 8. Aunt Ba' family Living in Old Urban Shelter

3. The Way and Method to Promote Social Cohesion in the Urban Residential Redevelopment

Taking the promotion of the residential social cohesoon as the goal, in the respects involved with the physical environmental design, investment, residential decision-making and rules, the author is trying to propose the following ways of solution:

(1). Organizing the Redevelopment Steps Able to Perfect the Community System

Old urban shelter have been formed step by step in the process of urban development. Therefore, in the course of redevelopment, it is not necessary to conduct a large-scale pull-down and displacement in search for "magnificent" construction appearance. It is needed to take steps of redevelopment by section and phase based on the all-round urban organizational structure and overall idea of the construction appearance to enable the redevelopment of each phase or part to form one or several "complete" residential social function unit in a relatively independent manner. In the end, the "function units" that are built up by phase will be put together to form a complete organizational structure of the residential community with comprehensive functions and complete physical environment. Taking these construction steps will be conducive to saving construction investment, shortening construction period and obtaining utilization results as early as possible. Moreover, the investment, construction steps and improvement of the housing and living quality are enabled to be more closely combined with each other and the limited financial and material resources are made to get optimal economic and social results. Through the redevelopment by phase, the complete urban community system will become more and more perfect.

(2). Organising Rational Channels and Distribution Plans of Investment

Taking advantage of the superiority of the "planned economy", it is comparatively reasonable to raise construction funds from the state, local contruction unit and residents in a combined way and attract extensive social funds for the residential redevelopment program.

Considering the social development, a better plan of raising funds is the personal purchse of the shelter and the providing of residential subsidies by the state or local construction units. For instance, the program can be made in such a way that the state or local construction unit provides two-thirds of the price of the home; the residing individual pays the remaining one-third; and the right to occupy the home will belong to the residing individual but be registered and managed in a unified way by the state after the residence house has been built up. This practice is able to maintain a balance between the state, construction unit and individuals and promote the initiative of the residing individuals in the raising of funds, management and maintenance of the residence house. Such a practice has undergone experimentation and begun to yield relatively favorable social results in some regions of China. As for the residents unable to raise enough funds, the state, local construction unit or national bank will provide part of low-interest loans or installment program for them to encourage these people to work hard to improve their living conditions. In addition, there should be diverse accomdation criteria in the residence house after its completion to encourage part of residents with better financial resources to raise their living standards, and to solve the problem of providing poor household with residence with the minimum standards.(Fig 9).

Linked with the steps for the redevelopment of shelters, the distribution plan and management rules of the capital construction in estment should be formulated on the basis of the communities in the section and the simultaneous implementation of the construction of physical, social and living facilities, and green space together with the redevelopment of shelters. By so doing, the distribution of investment will be kept in conformity with the building of the "complete" residential social function units.

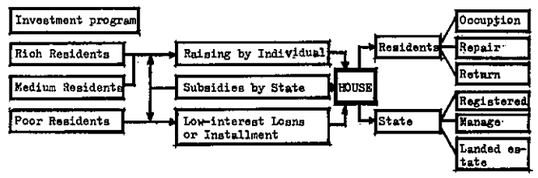


Fig 9. Diagram of A Investment Program.

(3). The Promoting Role of Residence Policies and Urban Construction Decrees

The social objective of the residence policies and construction decrees for the redevelopment of old urban shelters should consist in encouraging the initiative for residing individuals to better their residential environment, to promote a favorable balance between the demand of the residing individuals and society, and narrow the discrepancies between the rich and poor. The distribution program of the redeveloped shelters should be discussed and prepared together by the housing authorities of the local government and social organizations of local inhabitants with the individuals drawn to take part. The residence policies and decrees should attach much attention to the initiative for the residents to keep things in their own hands to make the "amiable neighbors" live together in the new environment. The residents of different physical and cultural types should be made to live together as far as possible through the residence distribution program so as to bring about sufficient social "fusion". The relevant decrees should be coducive to the restraining of the behavior against the common benefits of residents and social need. In coordination with the program of raising funds and purchasing residence, the decrees should also permit a reasonable "social flow" of inhabitants to prevent the new "family relationship" produced in the new environment due to the long-term fixation in the residential location and having an unfavorable effect on the development of order society.

(4). The Housing System Adaptable to the Community Pattern

The organizational design of the housing system should be orientated to the adaptation of the community life and increase of the "satisfaction feeling" of the residents. The design should be based on the principle of "suiting measures to local conditions" and "using local materials". The multi-level technical structure must be adopted depending on different districts and physicaloonditions. Starting from the organization of the life of the residents, a "general" or "specific" system that is adapted to the community form is organized to form a organic whole from "housing components" - "housing living unit" - "dwelling complex of neighborhood community" —— to meet the need of "individual - family - - social life". And this will bring about the multiple living selection of residents and flexibility of space utilization.

(5). The Physical Environment Organization to Enable Social Cohesion

The redevelopment of the physical environment organization of old urban areas consists in the re-establishment of the physical environment order which suits the modern urban life, and creation of the community living space which is full of social cohesion. As a result, great attention should be given to the design of the basic social function living unit. Considering the neighborhood social faborics and the organization of the favorable neighborhood social life circle, the population size of the basic social function living unit should be limited in the range from 80 through 150 households, i.e. from 300 to 600 persons.

In addition, when organizing the physical environment with social cohesion, the most crucial factor is to design the neighborhood public space, which should be taken as an "arena" to attract the residents to participate in the community life, and to raise the design quality of the "arena". The size of the neighborhood public space should be limited in the "one-minute" time-space, and the theme in space should be built tied with the life of the neighborhood community. For example, in the community, the public hall, residents' committee, small-size educational center, home for elder people, etc. will be set up. The

redeveloped neighborhood public space should have a clear-cut boundary, system of space territories and indentifiability.(Fig 9, 10, 11).

The internal traffic space of the basic social function unit should be designed as the place for the residents to promote their social communication.

The residents of old urban shelter usually cherish special social feelings with the environment in which they have lived for long time. Therefore, the redeveloped environment must have remarkable features to truly express the community image of the residents. It is necessary to draw creative source material from the physical and cultural features of the traditional housing and living environment, so that the redeveloped environment may refelect a cultural succession. And this will be instrumental to the successful moulding of the environmental aethetic features adaptures adaptable to the feeling demands of the residents.

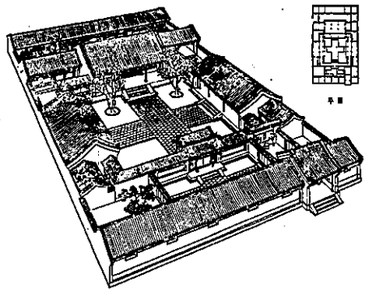


Fig 9. A typical Chinese Siheyuan,It's Space Form can Engender the Cotripetal Force Which is Necessary for Inhabitant' Living Environment.

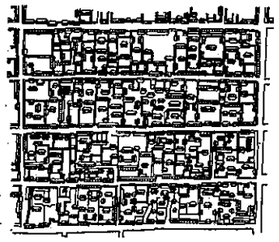


Fig 10. A Typical Chinese Tridational "Alley Block" Structure, There is Clear Space Terratories, Boundary and Space Procedure.

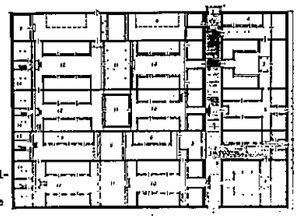


Fig 11. A tridational Chinese Dwelling,There is Clear Space Procedure and the Identifiable Physical Space Order.

(6). The Construction Activities Undertaken by the Society and Residents

The redevelopment of urban shelters is a matter of the entire society. Hence, the undertaking ranging from the planning to construction should be completed with the participation of the governmental agencies, planners, architects, sociologists, and residing individuals. It is of great importance to organize aspecial urban residence development institution which can represent the local government. The institution should consist of responsible experts, lead the redevelopment and coordinate the relation between various departments. It is needed to bring into play the role of the residents' committee of the urban residence in the redevelopment program to enable it to act as the "Accuser" in the interest of the community and to responsible for coordinating the relation between residents, goverment and designing department. It is feasible to organize self-building units to build, for instance, cooperative houses on their own by using social funds or those raised by individuals, under the management of the urban resident grass-root social organization. The main for planners and architects is to direct the self-building actitivities of the residents to the higher lever of specialized construction. They should explain to the residents the guiding ideas of unified planning and the fundamental principles of the comprehensive conception, charts of main technical requirements and drawings of the three-dimension space.(Fig 12).

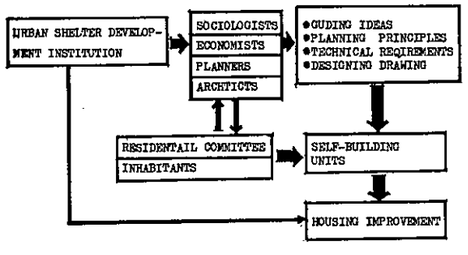


Fig12. Diagram of A Construction Activities

Furthermore, another important work of the urban residence development organization, planners and architects is to make use of various opportunities and forms to let the residents understand the significance ofthe redevelopment and the planned picture of the future. For example, there can be practice of organizing special lectures, exhibitions of the plans, designing drawings and models, and extensive spreading of relevant information through broadcasting and newspapers. All these activities are helpful to making the redevelopment of urban residences morepractical, bringing about full confidence of the residents in the government and construction departments, and accelerating the improvement of the liying enviroment (Fig 13).

Fig 13. A Site of City Planning exhibition in the Street.

(4) My Conclusions

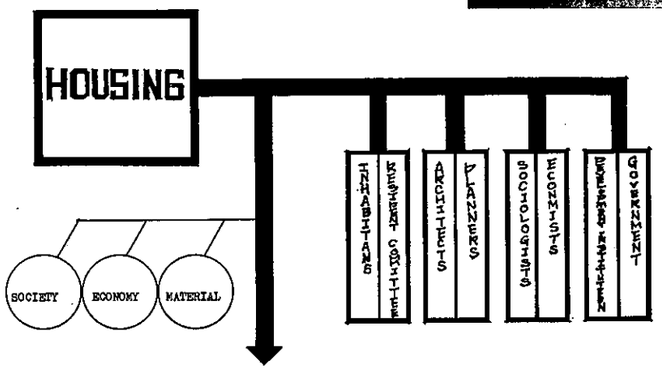
When this paper will be end, I hope my colleagues will be sure me deeply. The redevelopment of the urban shelter is an extremely complicated social an political problem. The solution of the problem will undoubtedly bring about a transformation of a fundamental nature to the whole urban environment. Only by doing creative designing work not considering pursonal fame and gain and defying difficulty, can the planners and architects enable the redevelopment practice of urban residences to approach or complete the general goal of moulding living space for maikind and bring into being the cohesion of the residing community.

(5) A Illustrative Example

(see next page)

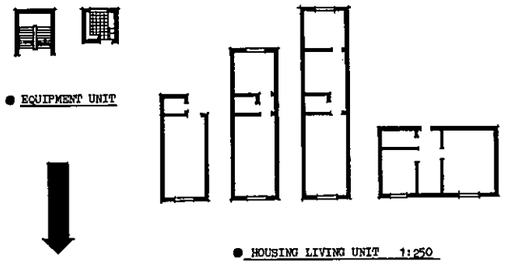
A EXAMEPLE

● PRESENT SITUATION IN THE SECTION WHICH SHOULD BE RE-DEVELOPMENT



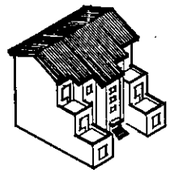
● THE ENVIRONMENT FEATURE AROUND REDEVELOPED SECTION

●HOUSING PLANNING

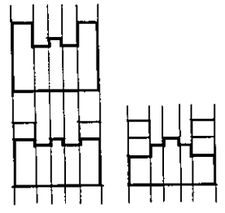


● EQUIPMENT UNIT

● HOUSING LIVING UNIT 1:250



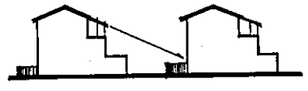
● A HOUSING UNIT

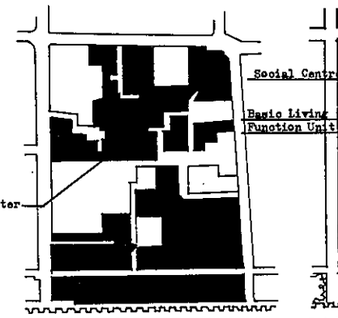


● HOUSING UNIT

HOLLOW BRICK-OUTSIDE WALL

CONCRETE INTERNAL WALL AND COMPONENTS



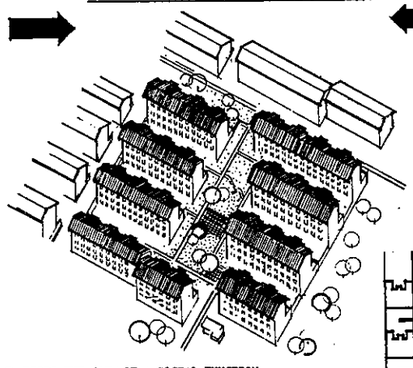


● PLANE FIGURE OF PRESENT SITUATION OF THE SECTION THAT SHOULD BE REDEVELOPMENT

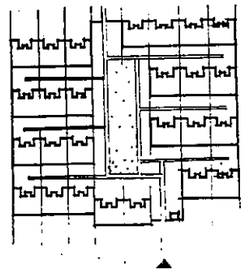
● A NEW PLANING OF RESIDENCE ORGANAZE STRUCTURE

SPACE DESIGN PRINCIPLES:

- TO LIMIT POPULATION SIZE AND SPACE SIZE
- TO BUILD A THEME IN SPACE.
- TO LIMIT THE TERRITORIES OF SPACE
- TO PROVIDE COMMUNICATIONAL CANNELS IN SPACE
- TO EXPRESS THE MEANING OF SPACE

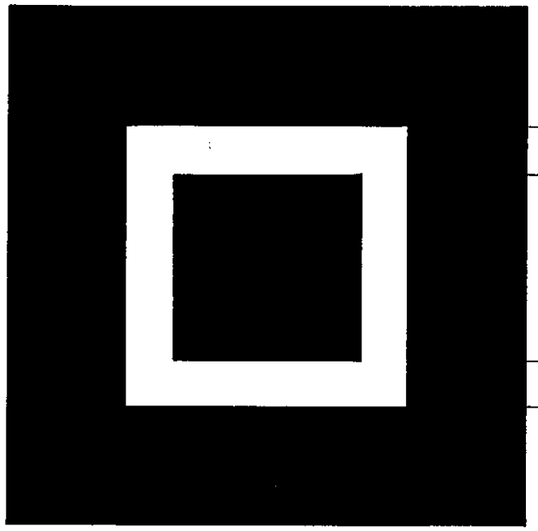


● BIRDS-EYE VIEW OF A SOCIAL FUNCTION LIVING UNIT



PLANE OF LIVING UNIT

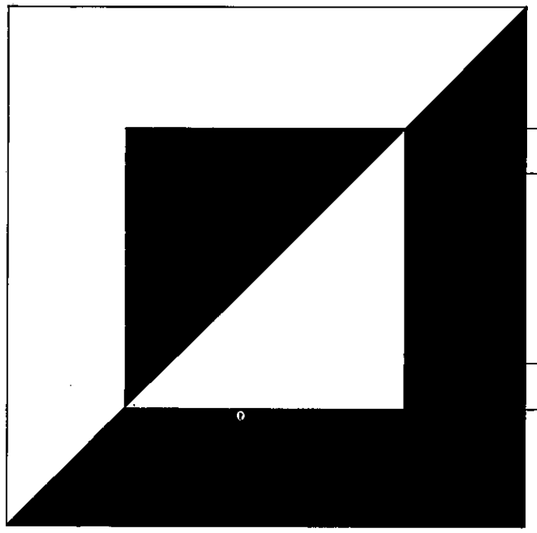
●HOUSING SYSTEM



THE PRE INDUSTRIAL PHASE – TRIBERAL INTEGRATION
– LIMITED POSSIBILITIES OF HIERARCHICAL AND SPATIAL MIGRATION.
– THE ROLE OF AN INDIVIDUAL IS DEFINED BY THEIR POSITION IN A SOCIAL GROUP.
– THE MULTIGENERATION FAMILY HOME – AN AGRARIAN VILLAGE.
– THE PROBLEM OF HOMELESSNESS PRACTICALLY DOES NOT EXIST.

THE PROBLEM OF HOMELESSNESS CAN'T BE SOLVED EVEN BY THE MOST NOBLE CAMPAIGNS OF THE ARCHITECTS.

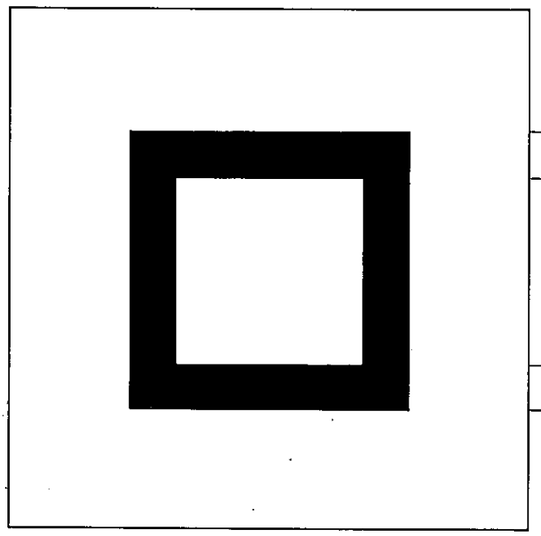
THE FIASCO OF THE ATHEN'S CHART, THE HABITAT CAMPAIGN ETC. PROVED CLEARLY THAT THOSE KINDS OF ACTIONS ARE INEFFECTIVE.



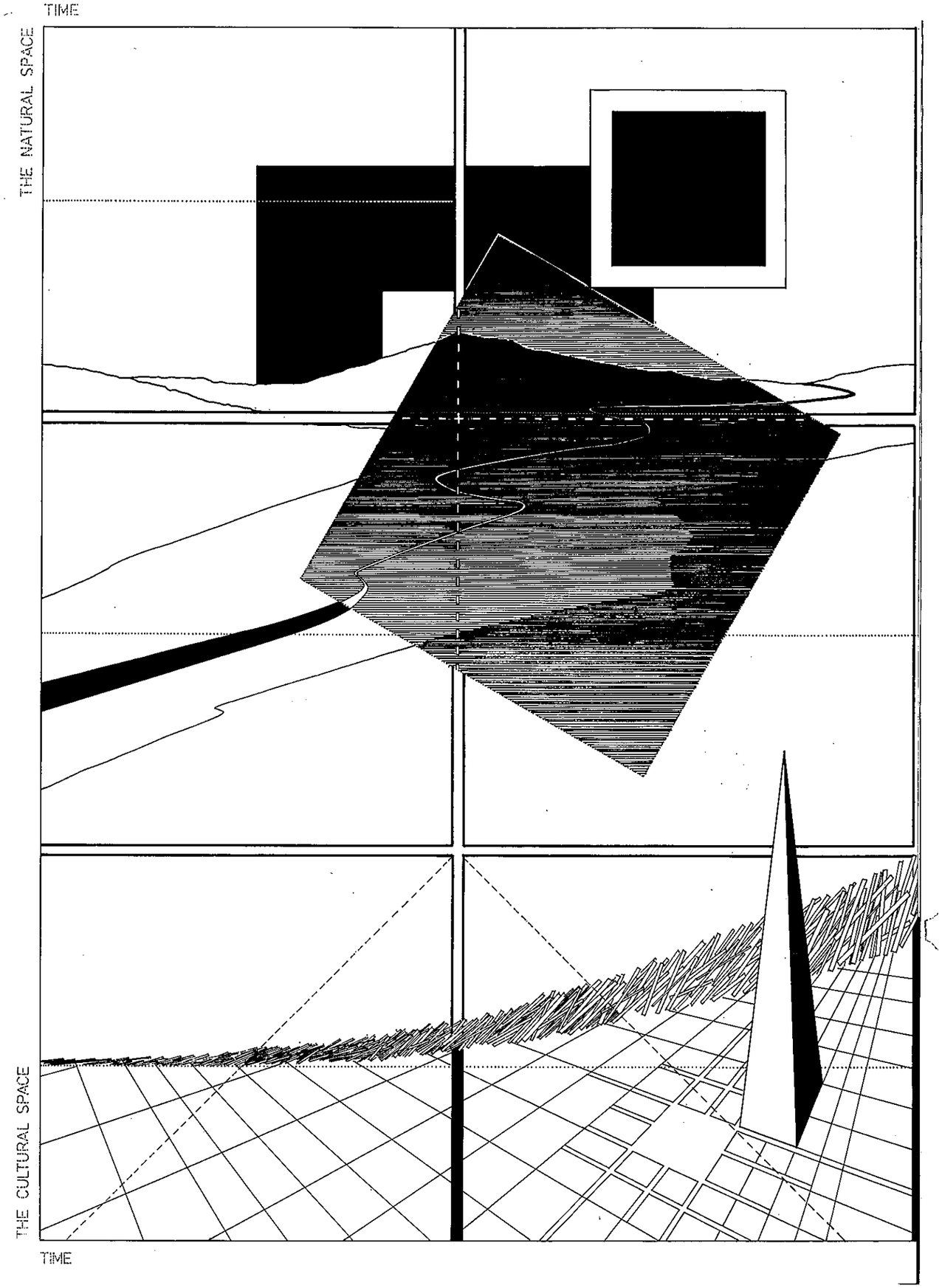
THE INDUSTRIAL PHASE – DISINTEGRATION
– POTENTIALLY GREAT POSSIBILITIES OF MIGRATION OF AN INDIVIDUAL.
– VARIOUS ROLES OF AN INDIVIDUAL IN VARIOUS GROUPS WITH INCOHERENT SYSTEMS OF NORMS.
– MULTIFAMILY BLOCK OF FLATS – THE TOWN.
– HOMELESSNESS IS A MASS PROBLEM.

THE TASK OF AN ARCHITECT IS TO OBSERVE AND INTERPRETATION THE MULTIDIMENSIONAL REALITY OF MODERN CIVILIZATION AND NOT TO IMPOSE HIS OWN VISION OF THE WORLD.

AN ARCHITECT IS NOT A DEMIURGE BUT AN ARTIST.



THE TOOL-INDUSTRIAL PHASE – RETURNED INTEGRATION
– SELF-LIMITED EXPANSION OF AN INDIVIDUAL BASED ON A DELIBERATE CHOICE.
– THE ROLE OF AN INDIVIDUAL IN THE SOCIAL STRUCTURE CREATED BY THE INDIVIDUAL HIMSELF.
– A HOME FOR THE FAMILY IS A GROUP OF PROFESSIONALS – A PLACE TO LIVE IN AND WORK AT – AN ELECTRONIC VILLAGE.
– POSSIBLE HOMELESSNESS IS A DELIBERATE INDIVIDUAL CHOICE.

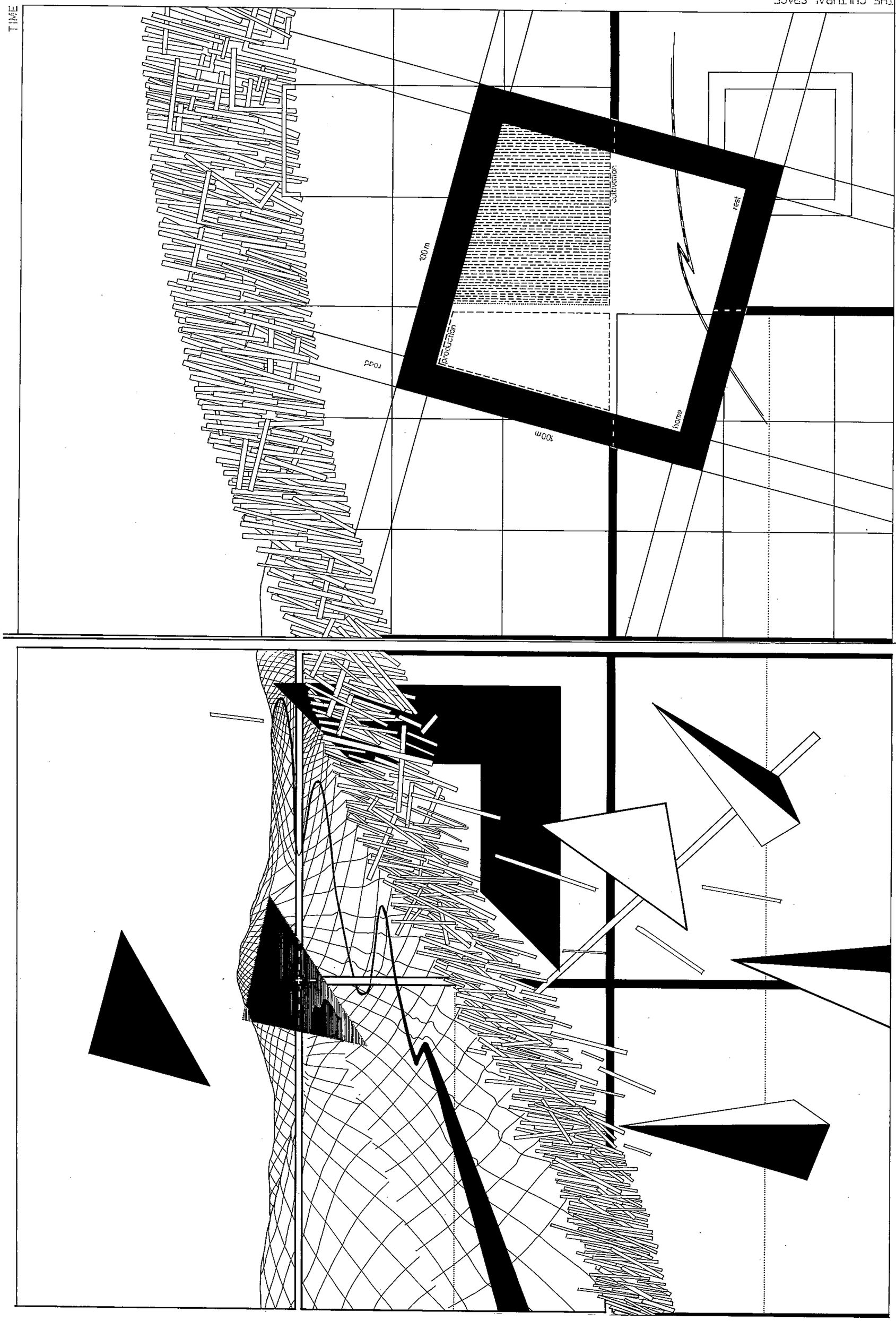


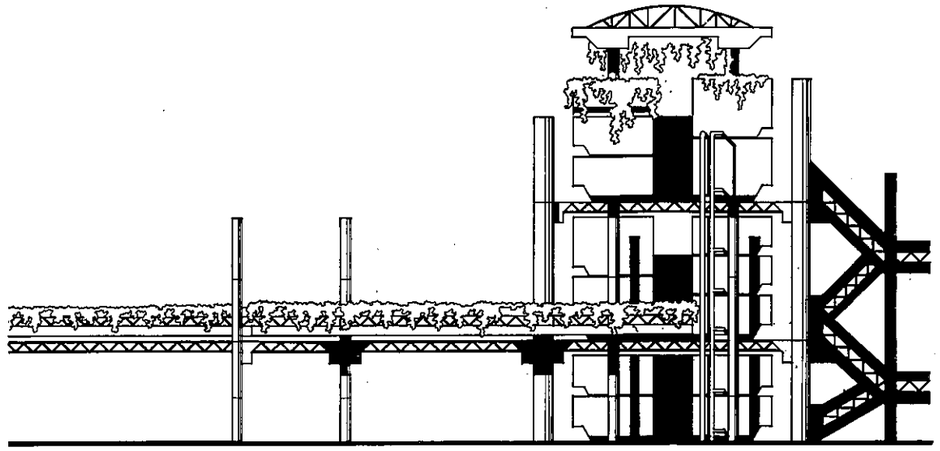
THE CULTURAL SPACE

THE ART

THE NATURAL SPACE

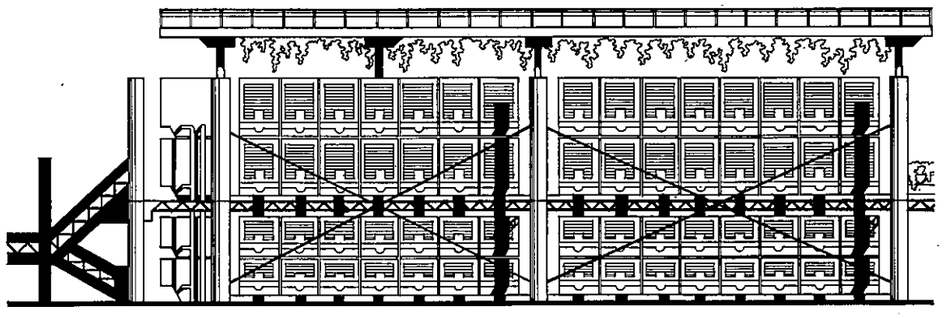
TIME





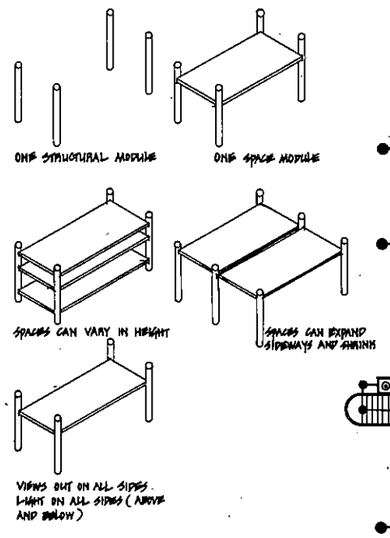
FRONT ELEVATION

scale 0 3 10 6M 20Ft

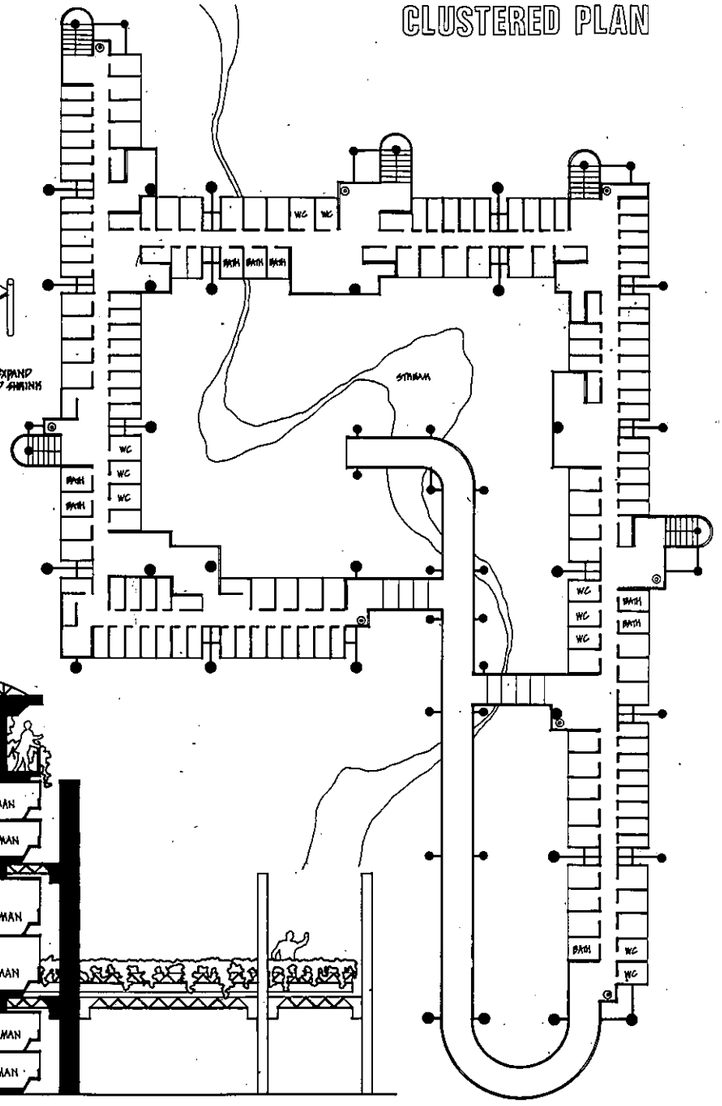


SHELTER FOR THE HOMELESS

CONCEPT DEVELOPMENT



CLUSTERED PLAN



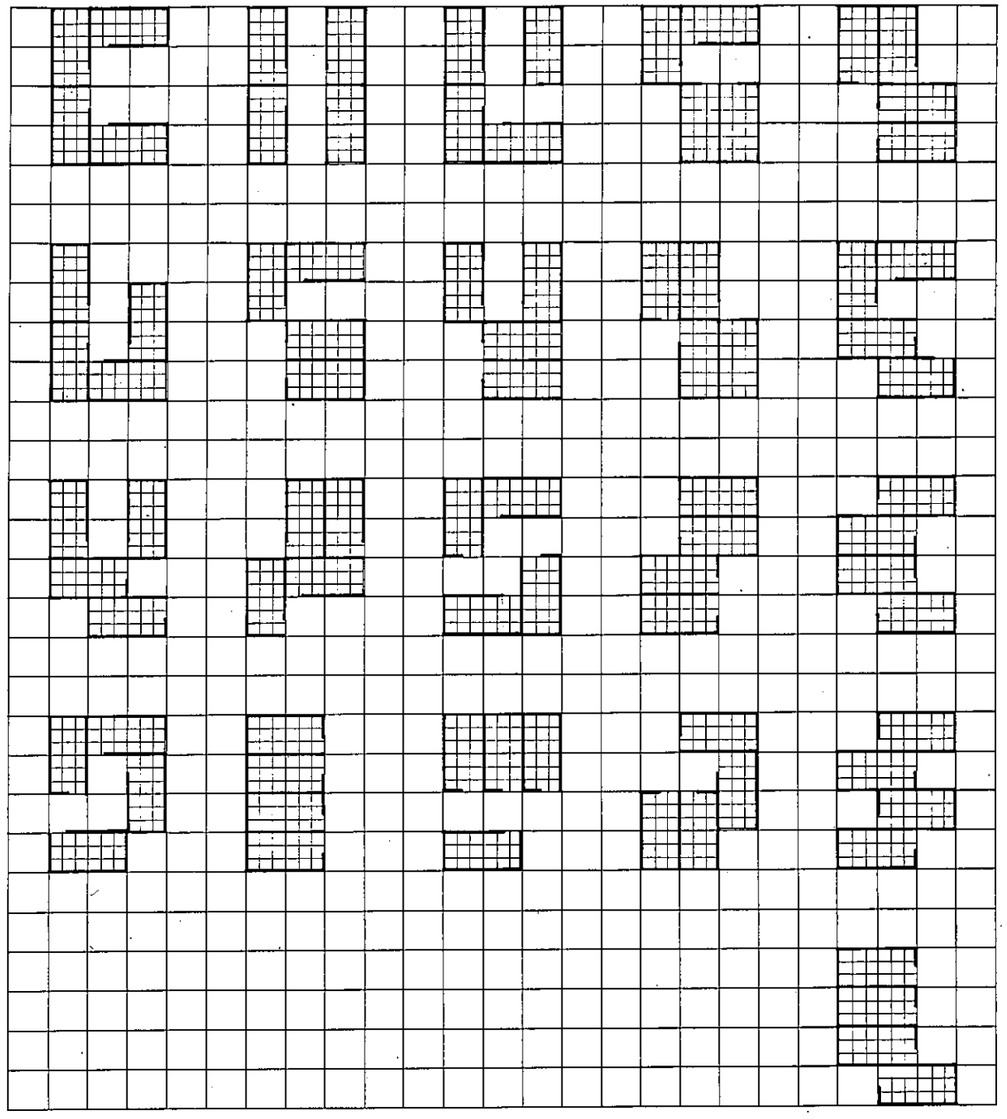
SECTION scale 0 3 10 6M 20Ft

THE POST AND BEAM STEEL FRAMED STRUCTURE ENABLES TO IDENTIFY WAYS WHICH CAN EXPAND INTO MORE ORGANIC FORMS → SENSITIVE TO LIGHT ANALYSIS → ABLE TO CREATE MORE VARIED AND APPROPRIATE SPACES.

THE STEEL COLUMNS WITH BRACKET, SUPPORTS THE BEAM GRID (TRUSS) CONSTRUCTION OF THE FLOOR, BUILDINGS ARE ARRANGED TO EXPOSE, GIVE THE BUILDING TEXTURE, SCALE AND SHADOW.

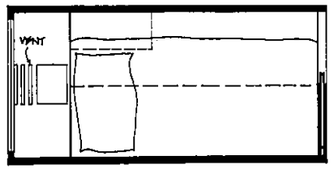
ALL STRUCTURAL ELEMENTS AND SLEEPING UNITS ARE PRECAST AND PREFABRICATED OFF-SITE, EASY TO INSTALL AND TAKE APART.

THE STAIRS AND RAMP PENETRATE AND LINK THE VARIOUS LEVELS AND HEIGHTEN THE VIEWERS' PERCEPTION OF FORMS IN SPACE AND LIGHT.

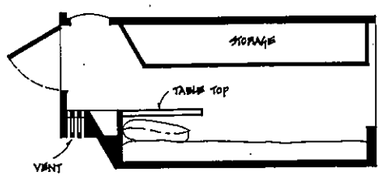


UNIT OF MEASURE

IT IS NOT ONLY A MEASUREMENT FOR THE CONSTRUCTION OF BUILDING, IT EVOLVES INTO AN AESTHETIC MODULE THAT ORDERS THE STRUCTURE, MATERIALS AND SPACE OF ARCHITECTURE. THE RELATIVELY SMALL SIZE OF THE MODULE ALLOWS THE RECTANGULAR SPACES TO BE FREELY ARRANGED IN LINEAR, STAGGERED OR CLUSTERED PATTERNS.

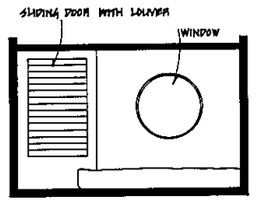


PLAN

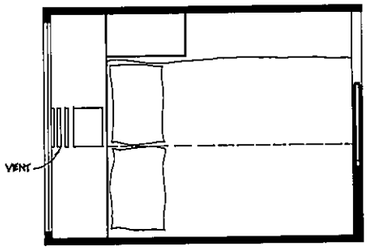


SECTION

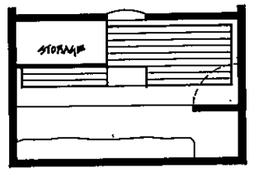
1 - MAN UNIT



INSIDE VIEW-REAR

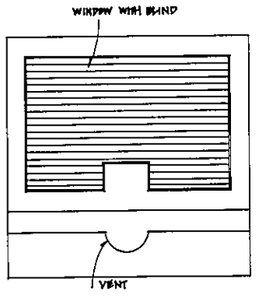


PLAN

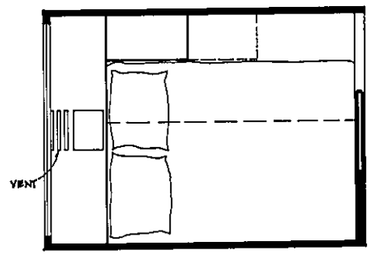


INSIDE VIEW-FRONT

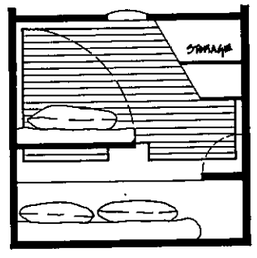
2 - MAN UNIT



OUTSIDE VIEW-FRONT



PLAN



INSIDE VIEW-REAR

3 - MAN UNIT

scale 0 1/2 1 1/2 M

FIBER GLASS IS CHOSEN TO BE USED FOR THE UNITS. THE UNITS CAN BE PREFABRICATED OFF SITE, LIGHT IN WEIGHT AND EASY TO INSTALL. IT IS RESISTANT TO MOISTURE. THEIR STRENGTH AND STIFFNESS CAN BE INCREASED THROUGH THE ADDITION OF HIGH-STRENGTH FILLERS WHICH ACT AS REINFORCING AGENTS. IT CAN BE USED IN SEVERAL DIFFERENT FORMS DEPENDING UPON THE DESIGN. IT HAS EXCELLENT CORROSION RESISTANCE.
URETHANE FOAM IS PROPOSED TO BE USED FOR INSULATION, IT IS MOST APPROPRIATE WHERE A HIGH R-VALUE MUST BE ACHIEVED IN A LIMITED SPACE OR IRREGULARLY SHAPED DESIGN.

#05284993

1987

INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS (IYSH)
INTERNATIONAL COMPETITION FOR SOLUTIONS

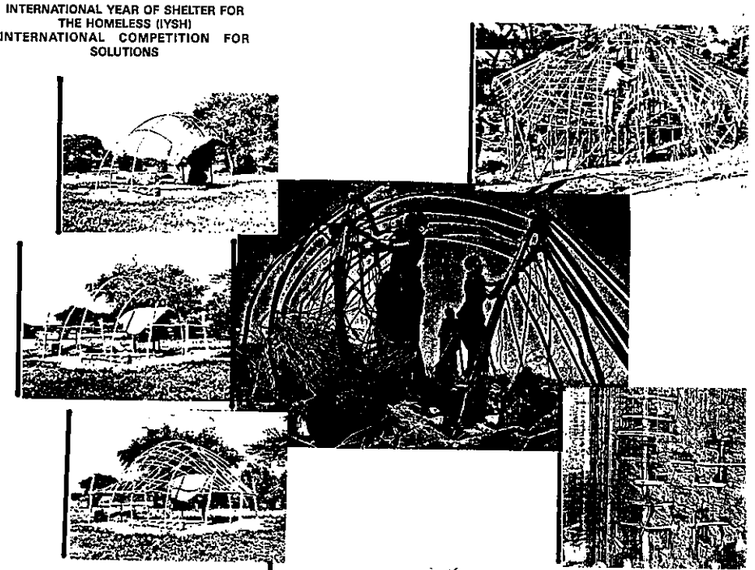
THIS PROPOSAL IS SUBMITTED IN SEVERAL LEVELS, ACCORDING TO THE DEGREE OF FINANCIAL POSSIBILITIES OF THOSE WHO NEED SHELTERS.

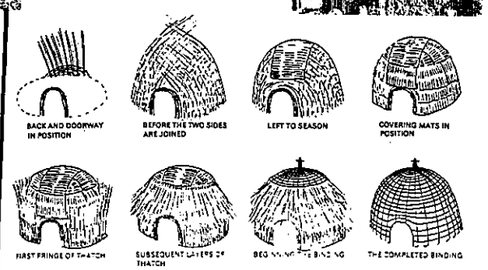
ESSENCIALLY, THE PROPOSAL IS BASED ON THE S E L F = H O U S I N G (" DO IT YOURSELF"). MOST OF THE INHABITANTS LACKING HOUSING ACCOMODATION, ARE LIVING IN COUNTRIES WITH GOVERNMENTS UNABLE TO AFFORD TO THE PEOPLE THIS PRIMARY NEED. BESIDES THIS, SHELTER, HOUSING AND ALL THE ASSISTANCES WHICH IS AFFORDED TO PEOPLE WITHOUT THEIR ACTIVE INVOLVEMENT, IS ENDANGERED FOR FAILURE; BEING NOT EVALUATED ENOUGHT. HOUSING, WITHOUT ACTIVE PARTICIPANTS =STANDING ALWAYS THE PROBLEM OF FINANCIALS = IS ERRECTED IN A HUMBLE LEVEL. ACCORDINGLY, THE INHABITANTS WILL BE DISAPPOINTED FROM THE ASSISTANCE; THEY BECAME DETACHED EMOTIONALLY FROM THEIR ENVIRONNNEMENT AND AFTER A NUMBER OF YEARS, THEY FALL INTO SLUMS.

SOCIOLOGISTS INSIST, THAT ONLY ASSINTANCE WHITH ACTIVE PARTICIPANTS OF THE ASSISTED, CAN SUCCEED. SO, THE MAIN ASSISTANCE CONSIST IN G U I D A N C E, COMMUNAL AND PROFESSIONAL.

C O M M U N A L = FOR SELF-ORGANIZATION FOR MUTUAL AID SPREADING OF THE KNOWHOW NECESSARY FOR BUILDING IN " D O I T Y O U R S E L F " SYSTEM AND FOR DEALING WITH COMMUNITY AND URBANISTIC ISSUES.

P R O F E S S I O N A L = GUIDING OF THE SETTLERS = EVEN OF THE UNSKILLED ONES IN BUILDING = FOR CONSTRUCT THEIR OWN HOME IN A HIGHLY UNSOPHISTICATED WAY; A PROCESS OF THE SIMPLEST TECHNOLOGY, WHICH CAN BE TAUGHT IN THE SHORTEST TIME, APPROPRIATE FOR THE WHOLE FAMILY'S PARTICIPATION AND WITH BEST RESULTS WHICH IS ALLOWED BY THE SIMPLE TECHNOLOGIE, EWEN IN THE FACE OF SKILLED PERSONS WORK.





THE GUIDANCE IS AFFORDED BY PEOPLE INSTRUCTED IN HIGH SCHOOLS, UNIVERSITIES OR CRAFT SCHOOLS = ON SHORT COURSES, TO ENABLE THEM FOR GUIDANCE OF OTHER PEOPLE, AND SO TO WIDESPREAD THE NECESSARY KNOWLEDGE. ACCORDING TO THE USE OF THE BUILDINGS (DWELLINGS, SOMTIMES WORKSHOPS AND OF PUBLIC USE) AND THE MAXIMUM PARTICIPATION OF THE WHOLE FAMILY OR THE COMMUNITY.

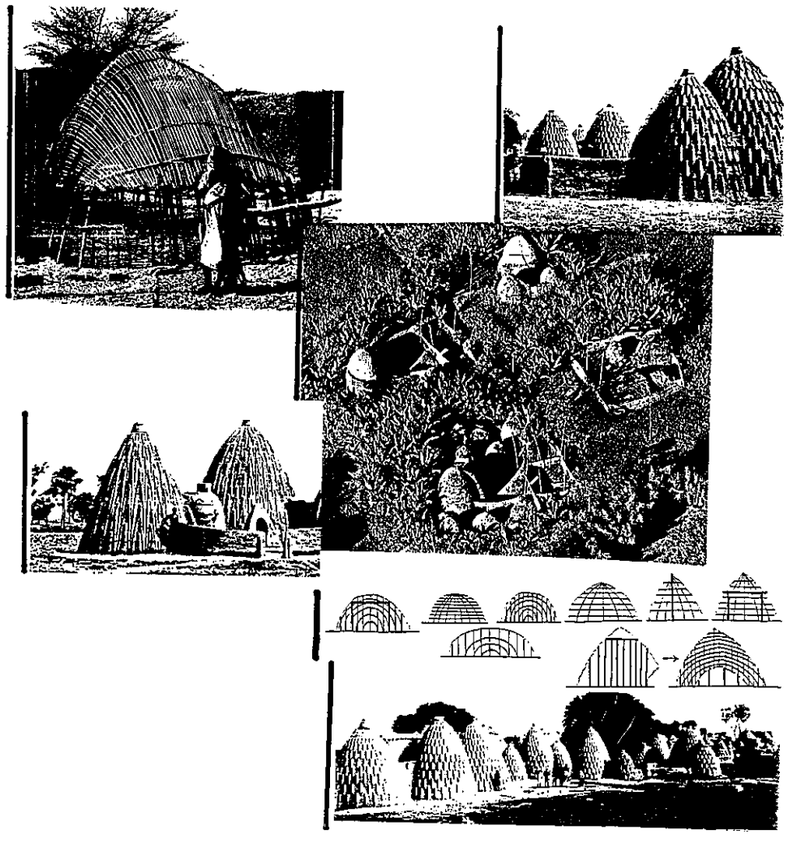
THE ARTISTIC VALUES OF THE DWELLING HAVE A VERY HIGH IMPORTANCE = IN ADDITION THE FUNCTIONAL ONES. IF THE HOUSE LACKS THIS, PEOPLE WILL BE ENSTRANGED FROM THEIR OWN ENVIRONMENT, WITH THE FEELING THAT THEY ARE KEPT ON A SUB= LEVEL IN THEIR HOUSING.

IN THIS PROPOSAL THE AESTHETIC VALUES ARE SELFINCLUDED, BEING THE BUILDING PROCESS ORIGINATE FROM BIOLOGICAL AND PSYCHOLOGICAL PROCESSES OF THE WHOLE MEMBERS OF THE COMMUNITY. THE RETURN TO THOSE VALUES IN BUILDING, WILL AWAKE EARLY MEMORIES AND WILL OCCURE FEELING OF RELAXATION.

THE PROPOSAL IS BASED ON THE F E R R O C E M E N T BUILDING PROCESS AND THE SO CALLED " PRIMITIVE" HOUSING AS WELL.

AS MENTIONED ABOVE, THE PROPOSAL IS APPROPRIATE FOR ALL THE FINANCIAL LEVELS OF POSSIBILITY, STARTING FROM THOSE HAVING NOTHING BUT THEIR WORKING FORCE, UNTIL THE HIGHEST INDUSTRIALISED FERROCEMENT BUILDING PROVIDED BY THE GOVERNMENT = = ALL APPROPRIATED TO THE DEGREE OF POWERTY.

THE MATERIALS USED IN FERROCEMENT CONSTRUCTION, THE MORTAR AND METALLIC FIBRES (IRON MESHES, THE CHEAPEST ONES) ARE CONVERTED AT THE LOWEST DEGREE, IN ORGANIC FIBRES EXISTING ON THE SITE (REED, BAMBOO, BUSHES, BRANCHES AND STRAW) AND THE MORTAR IS EXCHANGED IN ADOBE=MUD, STRENGHTENED WITH A SMALL AMOUNT OF CEMENT OR CEMENT SUBSTITUTES, MADE FROM STROW ASHES OR WASTE MATERIALS REMAINING FROM OIL INDUSTRY; OR IN THE INTERMEDIARY DEGREES, ONLY PARTIAL SUBSTITUTION OF THE MENTIONED MATERIALS.



THE TRAINING OF THE GROUPT LEADERS WILL DEPEND ON THE EXISTING MATERIALS ON SITE AND THE HABITUAL SKILLS IN THE REGION, APPROPRIATED TO THE LOCAL FINANCIAL LEVEL.

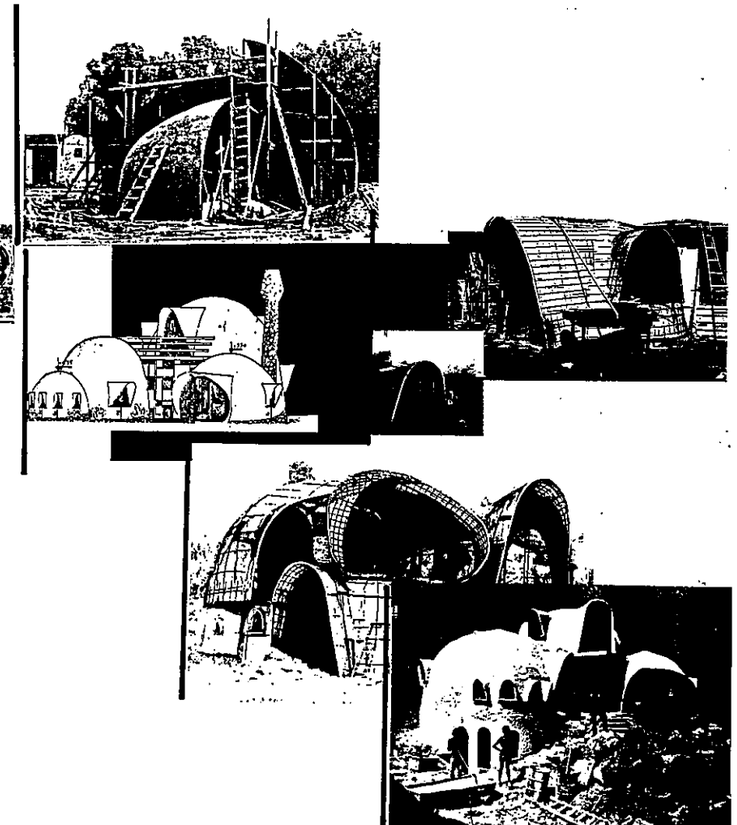
ALTHOUGTH THE SIMPLINESS OF THE MENTIONED TECHNOLOGY OF FERROCEMENT AND SUBSTITUTES, THE PROPOSED SPACE=FORMS, MAKES ERRECTION EASIER AND GIVES ADDITIONAL STRENGHT, THEY RESOLVE THE CRUCIAL PROBLEM OF ARCHITECTURE (EWEN THE NAME OF THIS PROFESSION DERIVES FROM HIER): THE ERRECTION OF THE ROOFING. ACCORDING TO THE PROPOSED BUILDING METHOD, THE WALLS AND THE ROOF ARE MONOLITHIC= AN OTHER ADVANTAGE OF THE SIMPLE ERRECTION.

. . .

WE ALL WITHOUT EXCEPTION LIVED OUR FIRST NINE MOUNTHS IN A ROUND OR OVAL SPACE. PSYCOLOGISTS INSIST THAT WE REMEMBER THIS VAGUELLY. EVEN THE FIRST ARCHITYPS OF FORMS, WHICH GRASPED OUR CONSCIOUSNESS, WERE ROUND. OUR HIGHEST SATISFACTION CAME FROM THERE. WE REMEMBER THIS TOO. PERHAPS THOSE MEMORIES ARRISE IN PEOPLE WHO SPENT TIME IN THE MENTIONED SPACE STRUCTURES WHICH ARE BUILT BY THE PROPOSERS IN A HIGH TECHNOLOGICAL DEGREE; OTHERWISE IT WILL BE DIFFICULT TO EXPLAIN THE ENTHUSIASM AND JOY THAT PEOPLE EXPERIENCE WHILE STAYING EVEN A SHORT TIME IN THOSE STRUCTURES.

. . .

THE ARCHITECTURE OF MOST SOCIATIES, BUT ESPECIALLY OF THE WESTERN ONES, IS A PRODUCT OF THE MASCULINE=PATRIARCHAL SOCIETY; STRAIT LINES, RIGHT OR OTHER UNGLES, FORMS WHICH ALMOST DON'T EXIST AMONG THE LIVING CREATURES. BEING THE PATRIARCHAL CULTURE THE ESSENCE OF WESTERN SOCIETY, THE = SO CALLED = "PRIMITIVE" SOCIETIES REJECTED THEIR OWN ARCHITECTURAL INHERITANCE, AND UNDER THE WESTERN INFLUENCE, BUILT THEIR NEW BUILDINGS IN ANGULAR FORMS, ON THE AIM THAT THOSE ARE MORE ADVANCED, AND CONSTRUCTED THE T I N= WAKE BARRACS. FROM THE SAME ATTITUDE THEY ANTICIPATED FROM THOSE DWELLINGS TO BE BETTER AS THEIR TRADITIONAL EARTH=CONSTRUCTIONS IN WHICH EWEN THE NOT= FUNCTIONAL ORNAMENTS WERE AN ESSENCIAL COMPONENT; NO MORE ORNAMENTAL ADDITION, BUT A NECESSARY FUNCTION OF THE LIFE AND OF THE QUALITY OF LIFE.

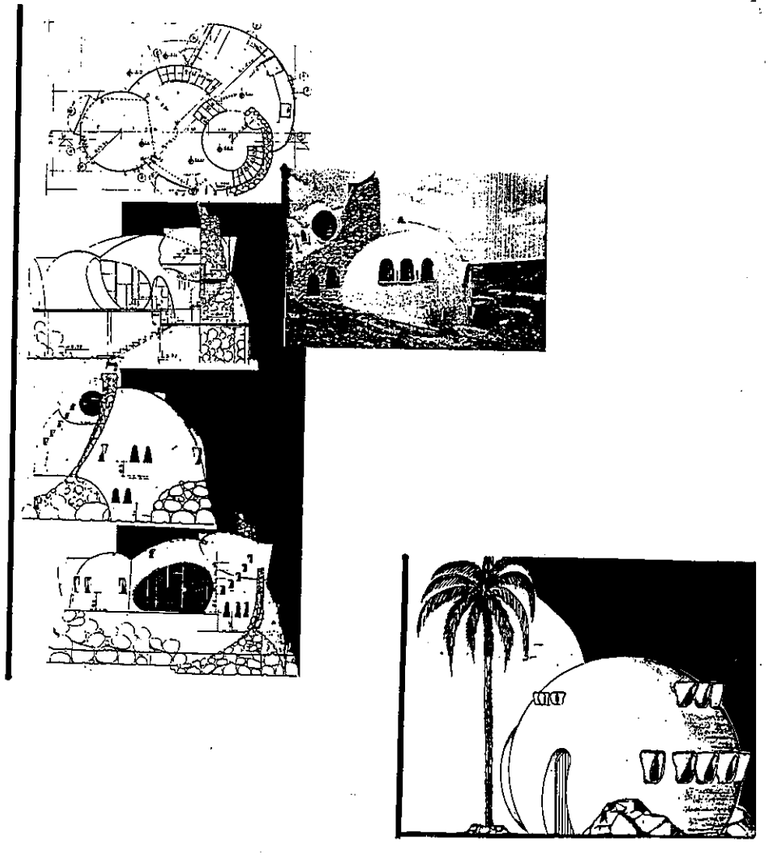


WITH THE PROPOSED BUILDING SYSTEM, WE MIX-INTO THE CONSTRUCTION THE F E M A L E COMPONENT (THE ROUND, OVAL= SOFT LINES) WHICH ARE STEP=ELEMENTS IN THE MODERN ARCHITECTURE, AND WE CREATE THE VERY REFLECTION OF SOCIETY: WOMEN AND MEN LIVING TOGETHER. WE HELP BY THIS TO ESTABLISH THE RIGHT BALANCE IN SOCIETY, INCLOUDING THE M A T R I A R C H A L ELEMENT IN THE EXISTING PATRIARCHAL CULTURE.

AN OTHER CULTURAL ASPECT OF THE CONSTRUCTION IN FERROCEMENT AND THE POSSIBILITY THAT THE WHOLE FAMILY CAN TAKE PART IN THE ERRECTION OF THEIR HOME WITH THEIR OWN HANDS = = = IS IN THE IMPROUVING OF THE CREATIVE PROCESS, SO LACKING IN THE INDUSTRIAL SOCIETY.

THE INDUSTRY AND "MODERN" LIFE, DECOMPOSED THE PROCESS OF PRODUCTION IN MANY COMPONENT PARTS, UNTIL THE WORKER EVEN DIDN'T KNOW FOR WHAT SERVES THIS SEPARATED PART WHICH HE HAS PRODUCED. IN THE PRE=INDUSTRIAL TIME, PEOPLE HAD AN INTIMATE RELATIONSHIP WITH THEIR HANDIMADE PRODUCTS. THE INDUSTRY ENSTRANGED PEOPLE FROM THEIR WORK AND MEN BECAME THE SLAVE OF THE MACHINES.

THE PROPOSED BUILDING PROCESS WILL INVOLVE PEOPLE IN A CREATIVE ACTIVITY, BUILDING THEIR HOMES, A PROCESS WHICH IS THE HIGHEST HAPPINESS OF MEN: THE CREATION, THE CREATIVE LIFE. IT WILL ASSURE A CLOSE CONTACT WITH THEIR HOME= MADE= HOME; CONTACT WHICH IS MORE IMPORTANT EWEN AS HIGHT SKILL AND WELL MADE PRODUCT.



CONSTRUCTION PROCEDURE

Before starting construction the following should be ready:

1. Frames of the large windows, made of iron, and those of the small windows, made of tin with holes in the edges for attachment.
2. The plan for electrical wiring and other installations.

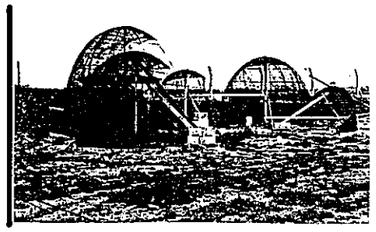
The tools needed: good tin shears (parrot bill), small and large cutters for no. 10 and nos. 4-6 bars, high ladders, baling wire, scaffolding, welding equipment (optional) and tough work gloves to avoid laceration of the hands by the sharp edges of the expanded mesh.

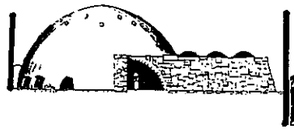
Step-by-step Instructions

1. Plotting the structure: determination of the center of the dome, its circumference and all openings.
2. Levelling of the area and digging of holes for foundation plates if columns are planned.
3. The foundation for the dome: placement of "U" blocks or digging of a trench 200 mm wide and 200 mm deep.
4. Placement of reinforcement within the blocks and also on the ground surface to make a floating floor. The openings are replotted if these were disturbed during the digging.
5. Pouring of concrete into the blocks and onto the floor surface to cover the reinforcement and making a ferrocement "apron" to keep water away from the foundation, leaving spikes or short pieces of pipe projecting from the blocks and edges of the floor.

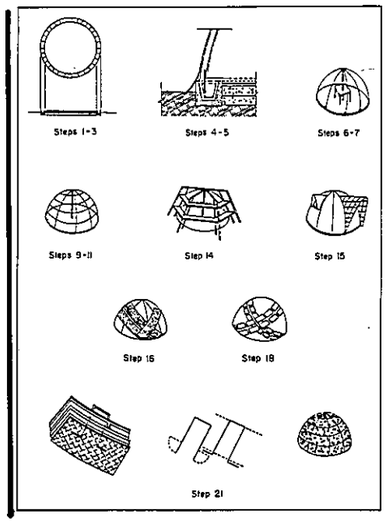
Construction of the Dome

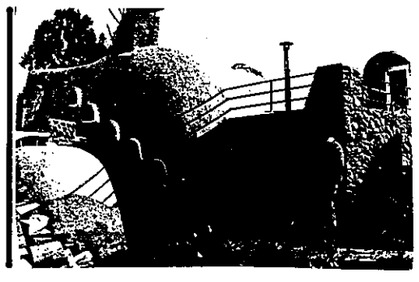
6. Placement of a column which will serve as support for the structure during the process of construction at the spot designated to be the highest part of the dome (together with a ladder to be able to reach its top).
7. Fixation at the head of the column of an iron disc 400 mm in diameter to which there are attached short sections of pipe 400 mm in length (using only a single screw to permit mobility), in accordance with the number of radial bars and also with the number of pipes projecting from the foundation or floor.
8. Cutting of the radial iron bars to equal lengths or to lengths which accord with the different levels of the floor.
9. Insertion of the radial iron bars (ϕ 8-10-12) into the pipes attached to the central disc and into the corresponding pipes in the foundation below. If there are only projecting spikes these should be topped with small pieces of pipe for insertion of the radial bars.
10. Tying of the bars to the pipes or spikes at two sites, above and below, or welding them to the pipes or spikes, taking care not to have the radial bar cross the planned openings for windows and doors (this is why it is so important for the short pipes to be mobile).
11. Placement of the horizontal bars (ϕ 8 ribbed iron) so as to form concentric rings within the dome, at distances of 400-450 mm one from the other, beginning from below and working upwards to a site less than 2 m from the top point of the dome—all the time taking care not to cross the area of the openings. For the small openings the bar can be moved above or below but with the large openings the bar stops when it reaches the frame and is tied or welded to it.
12. The radial and horizontal bars are now *tied* together and *not* welded since this will create deformations in the exactness of the perimeter. Welding should be used only for closing the rings formed by the horizontal bars. Instead of welding, overlapping and tying may be used.
13. Addition of horizontal bars and, if necessary, radial bars as well between the openings if there are large areas left without reinforcing iron. This is important to maintain the curve and avoid formation of straight surfaces.
14. Construction of inner and outer scaffolding with safety railings, to make it possible to work conveniently up to all parts of the dome.
15. Placement of the large frames for the openings. Already attached to these will be the sections of wire mesh (ϕ 3-4 with holes of 15-20 mm) approximately sized so that they will reach the perimeter of the dome. The upper part of the "visor" will project farther out than will the lower part (of course, varied forms can be planned).





16. Tying of the ends of rolls of expanded mesh (ϕ 0.7-0.9) or chicken wire so that they are at an angle of 45 degrees with the floor and parallel to one another, with an overlap of about 40-100 mm. The lower end of the wire is tied down and it is then rolled over the iron bars, throwing it onto the other side of the dome. Before the other end is tied down to the bottom on the other side the wire is slightly stretched. The second layer of mesh is attached in the same way but perpendicular (or almost perpendicular) to the first layer, again on the slant and with overlapping. A few ties are made to fix the mesh temporarily to the iron bars.
17. Temporary placement of window frames at the desired location.
18. Slabs of insulating polystyrene foam are laid down in two layers, also on the slant, the second layer being laid perpendicular to the first. Each slab is fixed temporarily, using one or more wires (ϕ 0.12 mm), depending on the weather conditions. When it is windy tying must be done very meticulously and it is best to wait for a calm day. Care should also be taken that the joint of the slabs be covered by the slabs of the second layer so as to prevent creation of "heat bridges." Instead of polystyrene other materials such as polystyrene foam, rock wool or organic fibers can be used.
19. Covering with expanded wire from the inside. It is best to work with relatively short sections of wire (3-4 m) or plates of mesh (0.50-1.60) if this is available. These should be tied only enough to keep them from falling. If two inner layers of mesh have been planned, the second layer is also applied. Here again the two layers are on the slant and perpendicular to one another. In the vicinity of the windows shorter sections are used so that the inner side of the visor is not covered.
20. Prior to, or during, the application of the inner layer of mesh, installation is made of all the tubing for electrical wires and water pipes, with the tubing inserted within one of the layers of polystyrene foam (the polystyrene is cut with a knife as necessary). In all cases, one water pipe must reach the top of the dome, to permit attachment of a sprinkler to be used for cooling on very hot days.
21. Final tying of all the layers of mesh together, using staples. This work is done in pairs, one person inserting the tie (baling wire 1.5-2 mm) while the other twists it outwards, using a bent tube 200-250 mm in length, which gives more effective leverage than pliers. No more ties should be used than are necessary. The aim is to bring the layers of mesh close enough together so that there is no sagging or bulging. The ties will be from 300-400 mm distant from one another, as needed. Any sagging of the wire mesh makes it more difficult to apply the mortar and will only result in waste of mortar without adding appreciable strength. The mesh and polystyrene have been applied at an angle since the strength of the mesh is greater in its length than in its width. Placing them along horizontal and vertical lines would lead to bulging because of the curved shape and this is avoided by laying them on the slant.
22. The visors of the windows are now fixed permanently into place. These visors are constructed with wire meshes. They should be completed and ready as units before being put in place and fixed permanently.
23. At this stage the entire structure should be gone over carefully to ensure that it is evenly tied with no sagging or bulges and that the visors are firmly in place.
24. Application of mortar, using a mixture of 1 unit of cement and 2 units sand. It is advisable not to use sand which is calcarous (quarry sand) and could damage the mesh but real beach sand, particularly in the first layer. The mortar mixture is first applied to the outside and then to the inside of the dome, from the bottom to the top, and finally to the visors. Care should be taken not only to cover the mesh but to have the mortar penetrate between each layer of the wire mesh, including the radial and horizontal bars.
25. An additional application of mortar is made both outside and inside so that the wire is no longer visible and irregularities disappear, but no more than that. Finally, cement slurry is smeared over the entire surface to close all the pores.
26. Most important! The mortar must be kept moist beginning from 4-6 hours after its application, that is, immediately after it has solidified, and continuing for 7 whole days. Fixed sprinklers should be used to achieve continuous wetting, night and day.
27. Plastering: After two layers of plaster containing one of the many water-resistant materials available locally have been applied, a third layer is sprayed on, as coarsely as possible, using aggregate from 30-50 mm (some find the coarse plaster attractive inside the dome as well).

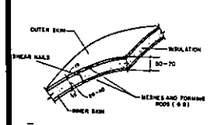




Systems of Ferrocement

Construction with reinforced concrete components of single or double curvature may lead to significant economic advantages provided that a practical manufacturing process is developed so that the efficiency of the system or component in load transferring is exploited. Presently used materials in civil engineering structures (reinforced concrete) enable only construction of large curved components like single or combinations of shells of revolution or hypars. The precondition for efficiency is the ability to do away with complex formwork which by itself when used for large units is an expensive construction problem.

The approach proposed in this work overcomes the above difficulties and problems, and facilitates low-cost, efficient and high quality construction of structures made of shell type components and systems for a wide range of applications. The method is based on a typical shell cross-section which is a sandwich made of two 10 mm - 15 mm skins parted by a layer of 20 mm - 60 mm flexible polystyrene boards. The thickness of the core depends on the thermal insulation requirements. The skins are mechanically connected by "shear nails" (Fig. 1).



a. Section, flower packing shed.

b. Arrangement of mesh.

c. Insulation.

d. Completed structure.

Typical section and stages of construction of flower packing shed.

SHAPES OF COMPONENTS AND SYSTEMS

a selection of possible configurations for components and systems. All of these are simple to manufacture in a *free form* process. Therefore the functional and structural optimum shape may be obtained regardless of the usually inevitable question of *how to construct economically*. The variety of forms widened the range of possible applications of ferrocement. One- and two-way components and systems, and mixed combinations are shown. Some of these shapes have already been used and they are described in the following section.

Analysis

A number of housing units and other applications have been built or are in the process of final design. Because of the complexity of the overall system, only estimates can be made in order to have some analytical verification. Generally, sandwich type structures should be analyzed for three modes of failure:

a. Material failure due to stresses exceeding the material strength.
b. General instability failure in which the whole shell fails with the core and skins acting together.
c. Local instability failure in which the skin buckles.

The basic dome unit used in the following applications provides adequate resistance against all three types of failure because of the following reasons:

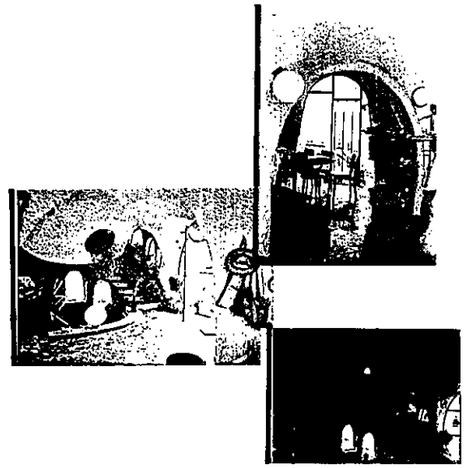
a. The overall depth of the section (≃ 70 mm) is relatively large in relation to the small span of the shell. This thickness is required for insulation purposes.
b. The skins (15 mm thick), which are relatively thick for a sandwich type section, together with the shear nails, prevent local buckling.

For example, the critical load for a 10.0 m diameter sandwich dome can be estimated The actual load on the shell is ≃ 0.1 t/m², therefore a very high safety factor of 58 is provided

In addition the effect of overturning moments due to wind loads has to be considered.

Thermal and shrinkage effects are of minor influence because of the dispersion of steel in the skin. No cracks have been noticed in the existing structures which have suffered temperature changes between −10°C and + 35°C.

In recent years ferrocement has rapidly won the recognition and popularity as a versatile construction material it undisputedly deserves. Beyond the technological advantages of ferrocement, the cultural aspects concerning one of the most important aspects of the modern industrialized society, namely, the relationship between people and their home emerges. In the modern world, orthogonal structures have come to be vastly predominant while curved forms are rare in spite of the clear superiority of the curved form over the flat one in many aspects like structural efficiency, volume containment, reduction of surface area and others. Industrialization favors the use of straight lines and angular intersections which are in many ways unnatural. The industrial applications of curved forms is difficult to carry out and therefore the more harmonious rounded shapes have been disappearing over the twentieth century. The particular attraction of ferrocement lies in the unlimited possibilities which it offers for shaping a structure without being dependent on sophisticated construction methods. In this way the individual can become the master of his home not only by getting or buying one but by actually participating in the building process itself. Ferrocement can also be regarded as one of a series of materials like wood and metals enabling people to develop constructive hobbies used for improvement of the home and its surroundings. The construction procedure is easy to learn and therefore opens ways to overcome frustrations emerging from people's inability to influence their close environment. Ferrocement technology as demonstrated here in it surely one of the leading materials.



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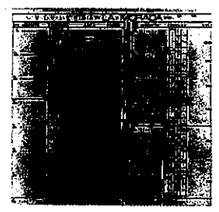
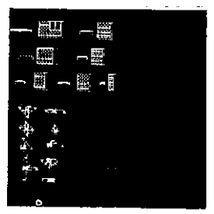
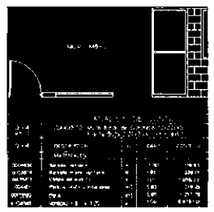
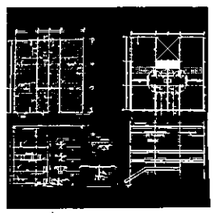
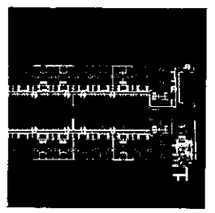
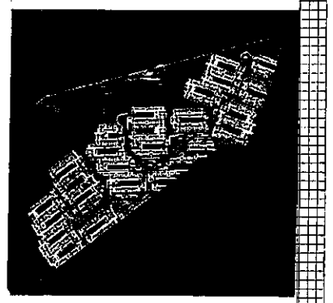
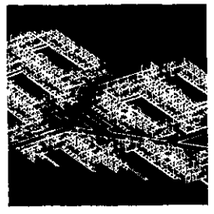
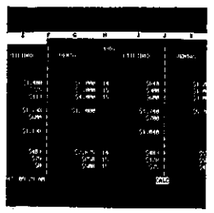
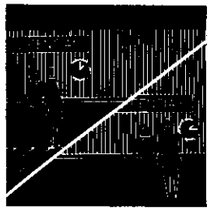
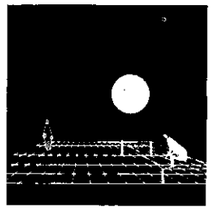
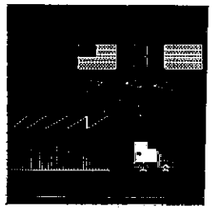
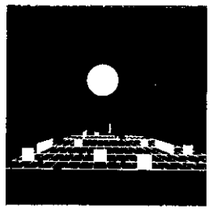
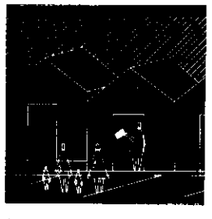
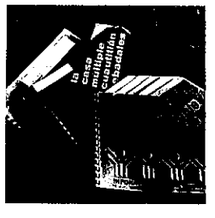
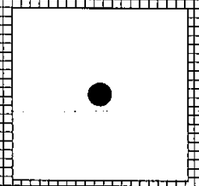
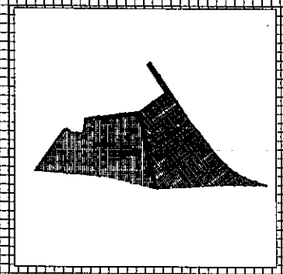
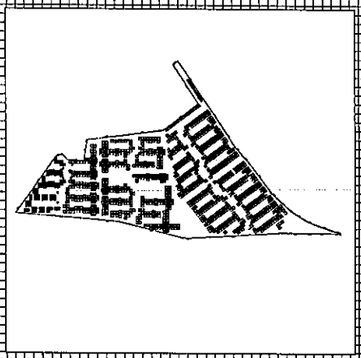
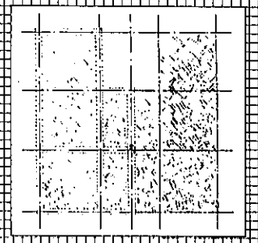
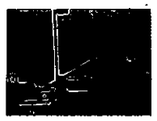









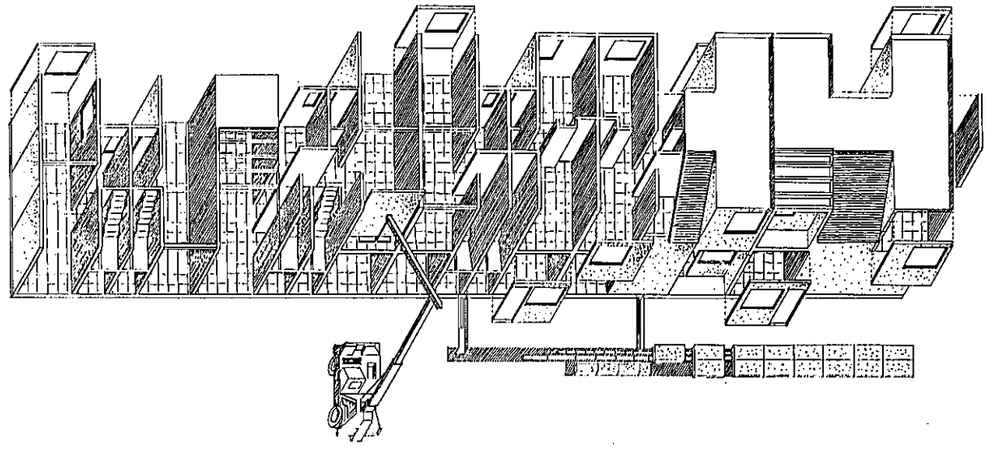






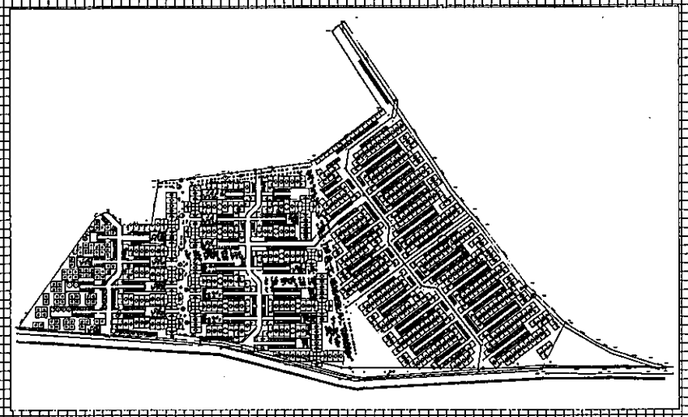
ANTECEDENTES

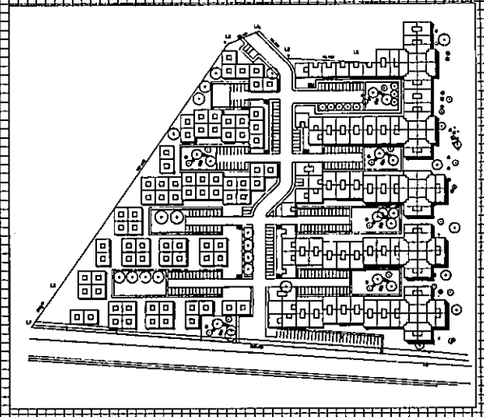
Iniciamos hace 15 años nuestra participacion en el campo de la vivienda de interes social. Durante este periodo diseñamos nuestros prototipos de vivienda asi como conjuntos urbanos, siempre con la inquietud de buscar nuevas y mejores soluciones. En estos años planteamos "LA CASA MULTIPLE" (viviendas con crecimientos interiores) mediante espacios de DOBLE ALTURA en las areas sociales para permitir al morador aumentar su area util de acuerdo a sus necesidades, viviendas ecologicas autosuficientes, edificios "PLAZA" con areas centrales de convivencia baños tripie uso "RADIAL", concentracion de instalciones en soluciones verticales con duc- tos registrables, etc., una serie de ensayos en los cuales posteriormente detectamos defectos y virtudes. Al paso del tiempo observamos que el plantear una solucion nueva en cada proyec- to significaba mayor costo y tiempo de ejecu - cion. La promocion completa de conjunto de interes social abarca entre otros puntos: estu - dios de factibilidad, anteproyecto, proyecto eje - cutivo, presupuesto de obra, autorizaciones y licencias, edificacion, urbanizacion, infraestruc - tura, equipamiento, supervision de obra, manua - les de mantenimiento y administracion. Conside - ramos ideal el plantear un solo SISTEMA INTE - GRAL DE VIVIENDA DE INTERES SOCIAL, que per- mita simplificar y optimizar todo el proceso abar- cando todas las etapas de una promocion tenien- do como meta: MENOR COSTO, MENOR TIEMPO Y MAYOR CALIDAD. Para tal objetivo se realiza un estudio que consta:

I INVESTIGACION
II PROPUESTA
III EJECUCION

La investigacion abarco: proyeccion de la vivienda 1984–2000 en nuestro pais, estudio sociologico a nivel vivienda y urbano, sistemas constructivos, financiamiento diseño urbano y de vivienda. La investigacion nos proporciono elementos suficientes para obtener resultados practicos que pudieramos aplicar. En la actualidad se ha aplicado el SISTEMA INTEGRAL DE VIVIENDA DE INTERES SOCIAL en los conjuntos El Trebol (2280 viv), Tulyehualco (3030 viv), Metepec (933 viv), Lerma (808 viv) los cuales se encuentran en obra y 10 conjuntos mas que se encuentran en pro- yecto.







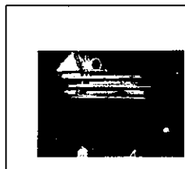
CONCLUSIONES

DISEÑO URBANO

- Dividir los grandes conjuntos en "CELULAS" condominiales no mayores de 60 viviendas, para lograr una mejor organizacion, mantenimiento, convivencia, asi como escala humana
- Lograr un minimo de vialidades vehiculares
- Prioridad al peaton mediante soluciones que permitan ligas directas a areas recreativas, comerciales asi como educativas
- Cambios de perspectivas en el sentido formal (vertical y horizontal)
- Soluciones horizontales en un 85%
- Evitar zonas de lavado y tendido en fachadas principales
- Agrupaciones que permitan cerrarse al exterior con control de acceso
- Sistema modular que optimice el uso del suelo mediante ensambles sin areas desperdiciadas
- Solucion que permita adecuar el proyecto a cualquier altimetria y planimetria de terreno
- Factibilidad de lograr densidades de 700 hab/Ha en solución horizontal y solo vertical por motivos especificos. La variedad horizontal-vertical enriquece los planteamientos
- Conservar la identidad de los espacios urbanos como el PATIO y la PLAZA con sus diferentes jerarquias
- Lograr vialidades de baja velocidad mediante CERRADAS
- Rescatar los valores de la arquitectura colonial mexicana
- Solucion que permita modificar en cualquier momento el area de la vivienda sin afectar el diseño urbano. (variaciones de viviendas de diferente costo sin afectar urbanizacion).

VIVIENDA

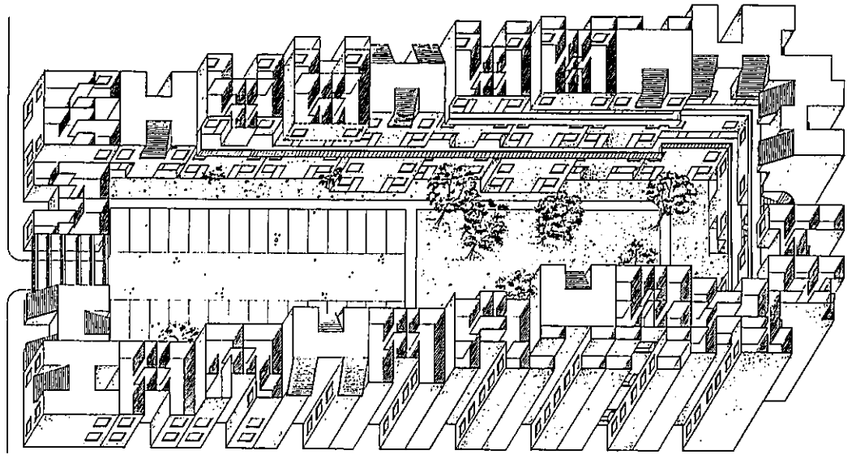
- Espacios libres que permitan a cada familia obtener una solucion interna a sus necesidades
- Opcion a que el propietario crezca su vivienda en una morada digna
- Diversidad de areas las cuales permitan adecuarse a cualquier programa de cualquier organismo de vivienda
- El cuadro es la figura geometrica que permita tener la maxima area con el minimo perimetro (solo el circulo lo supera pero por ensambles, aprovechamiento, se desecha). Las viviendas deberan diseñarse en base a este principio
- El sistema constructivo debera ser "ABIERTO" el cual permita adecuarse a cualquier procedimiento de construccion ya que variara segun la region y el clima
- Debera ser un sistema de construccion ligero con entrejes iguales y componentes tipificados
- La vivienda debera ensamblarse en forma horizontal asi como vertical sin afectar jamas el deplece de sus componentes (el cuadro permite ensamblarse por cualquiera de sus cuatro lados la cual permite libertad en el diseño urbano
- El sistema propuesto debera abarcar cualquier area requerida
- El planteamiento debera lograr viviendas de un nivel, dos niveles asi como edificios de tres, cuatro y seis niveles sin ----- jamas variar o afectar sus componentes

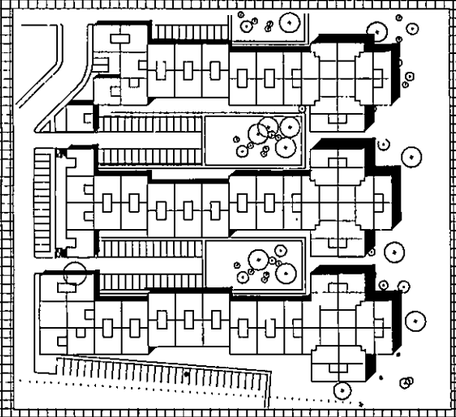


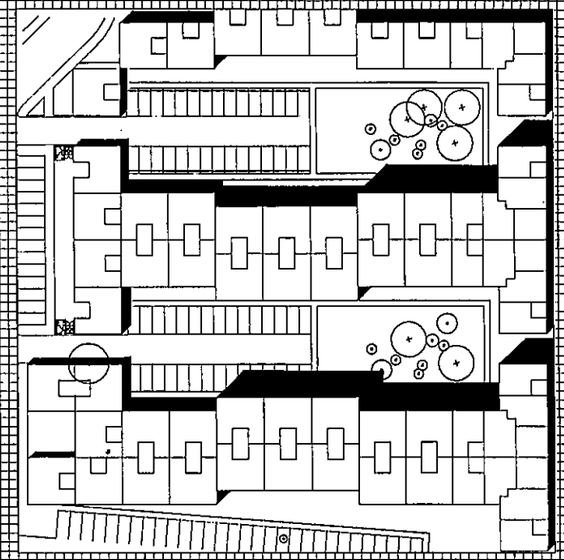
PROPUESTA

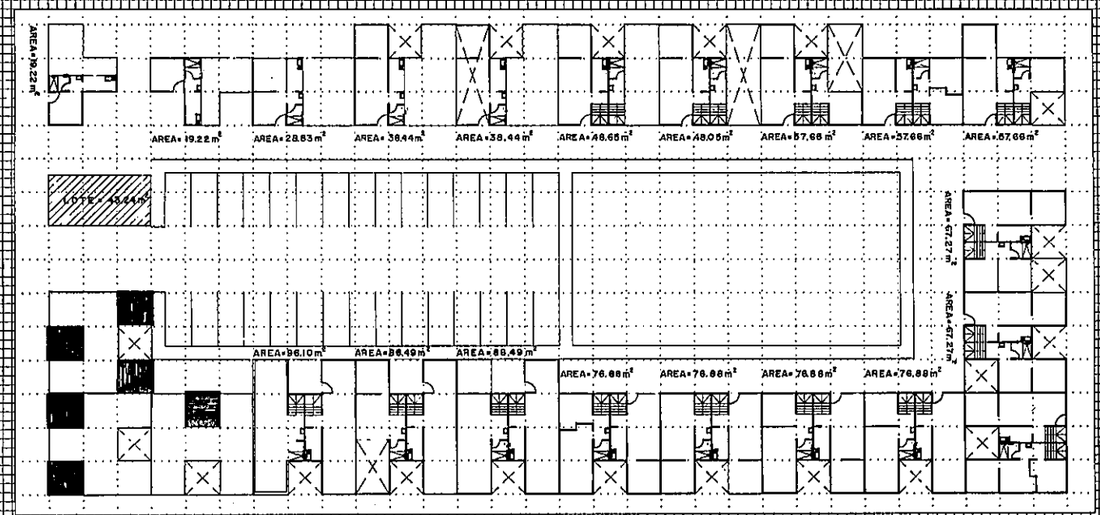
Se diseno un sistema integral que permite "ARMAR" una promocion completa teniendo toda la informacion prefabricada y optimizada, pudiendose adaptar a cualquier programa arquitectonico, economico, sistemas constructivos, terreno y region logrando: MENOR COSTO, MENOR TIEMPO DE EJECUCION, MAYOR CALIDAD

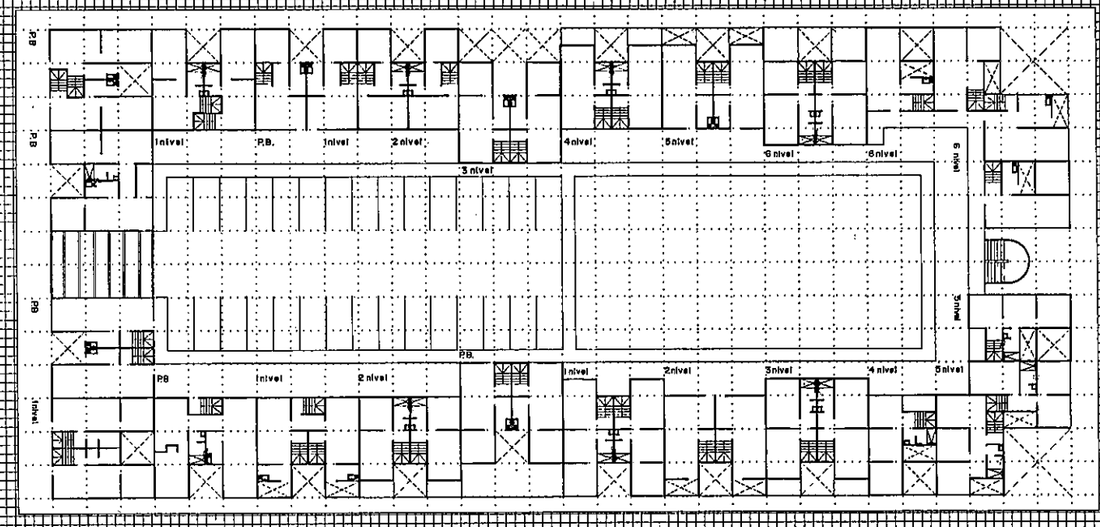
Esta informacion se encuentra almacenada en computadora ya que todo el planteamiento se apoya fundamentalmente en el programa AutoCAD (Computer Aided Design). El sistema que se plantea se basa en una "MODULACION TOTAL". Se modula desde el espesor de los muros 0.10 mts., modulo interno de 0.30 mts., modulo habitable interno 3.00 mts. y modulo vivienda 3.10 mts., modulo condominial, modulo vialidades, modulo andadores, etc.; todo esto se controla y ordena en una malla espacial de 3.10 x 3.10 mts. a ejes, siendo esta malla adaptable a otras necesidades. Las viviendas estan formadas por componentes horizontales y verticales optimizados y tipificados, de las cuales contamos con 48 variantes de vivienda con los mismos componentes (pudiendo existir mas alternativas). Cada componente tiene su desglose de materiales y mano de obra teniendo un costo que se actualiza en forma mensual. Se le entrega al promotor mensualmente el costo actualizado de estos 48 prototipos para efectos del estudio de factibilidad, asi como el armado definitivo de proyectos. Las viviendas conforman diferentes celulas condominiales conteniendo toda la informacion completa y se "TEJEN" dentro de una malla especial. Las vialidades, andadores y jardines tambien existen como bloques de informacion para simplemente insertarse en los conjuntos siendo armados con gran precision, mejor calidad, menor costo y menor tiempo. La posible produccion masiva para este sistema podra abatir aun mas el costo y colaborar a resolver el problema tan critico que existe en la vivienda de interes social en nuestro pais. Los proyectos se pueden obtener en plazos cortos con buena calidad. Los presupuestos de obra son inmediatos ya que se cuantifica al mismo tiempo que se diseno. La obra se simplifica notablemente. Los componentes que la conforman se iran **perfeccionando** dia a dia hasta lograr un producto superior. Existen valiosos esfuerzos aislados en el campo de la vivienda pero creemos que la unica solucion es una esfuerzo colectivo de organismos de vivienda, promotores, bancos, constructores e industriales con un solo fin: resolver el problema habitacional en nuestro pais











Section V

INNOVATIVE IDEAS FOR COST EFFECTIVE HOUSING DEVELOPMENT

1.00 Introduction.

The Housing problem could be defined as the requirement to find a solution to Satisfy the emotional, physiological and economical needs of the people within the resource constraints.

1.10 The optimum utilization of resources is the prime means to achieve the affordable house. In an urban housing development, the land and infrastructure (mainly roads) are the major cost component.

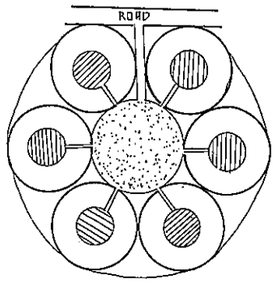
1.20 This paper examines ways of maximizing land utilization and the ways of reducing infrastructure costs, mainly urban context where the problem is more acute.

2.00 Urban Macro Planning in the Context of Housing Development.

Land is scarce in urban areas. The application of an appropriate concept is therefore of paramount importance in order to maintain control over land costs. Moreover haphazard planning and the absence of Macro planning at a National level can cause under utilization of urban land. The following strategic ideas are proposed for use in urban areas to provide some solutions to these problems.

2.10 Self Contained Zones or Neighbourhood Groupings.

It is evident that a huge amount of city land is unnecessarily wasted on road space for circulation. A more efficient use of land can be provided if self contained zones are developed each with their own place of work, place of entertainment, shopping centre and school. This would both reduce travel time and the land required for circulation.



Key

Economic Infrastructure (Light Industries)

Social Infrastructure (community hall,school,market,Ect.)

SELF CONTAINED ZONE

Fig (a)

2.20 Creating Multiple Use of Space

The substitution of conventional access roads with that of open squares to give access to houses is a more effective use of land. This way land for circulation (that is for roads) is more effectively integrated with the land for jobs and places for community activities.

3.00 Housing Layout Pattern

Variation in the following elements could help in forming different layout patterns.

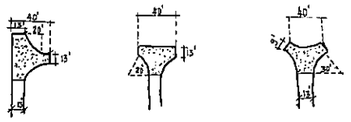
(i) Roads (ii) Footpaths
(iii) Planned open Spaces (iv) Subdivisions of Land

3.10 Roads.

To aid the the reduction of infrastructure costs road length and width should be reduced tobare minimum.The actual pattern of street networks however is dependant on topographical conditions.Roads following along contours are cheaper.Rectilinear grids are basically suited to flat land If the land form is hilly,curvilinear streets in combination with certain straight roads ,may be more appropriate.

3.11 Minor Access Roads.

Minor access streetsmay be more cost effective as minor loops than cul-de-sacs. Figure (b) shows different types of turning spaces for cul-de-sacs with 13' carriage ways.

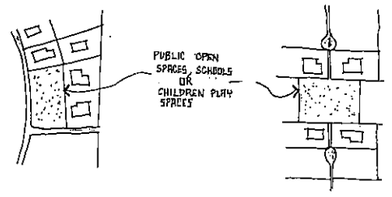


134 sq.yds 95 sq.yds. 81sq.yds.

Fig (b)

3.20 Footpaths.

Cost could be reduced by providing footpaths rather than roads. Services under paths are much cheaper than under roads. A pedestrian approach gives safe access to child play spaces, school, etc. Generally, paths along contours are easier to negotiate although on undulating sites footpaths can be provided across the contours in the form of steps to give shorter access routes. Public open spaces should be linked where ever possible to separate pedestrian circulation from vehicular routes. Fig (c)



Conventional Practice Preferred Option

Fig (c)

3.21 Pedestrianizing The Housing Site

Reducing the road networks in housing layouts and pedestrianizing sites with footpaths (walking distance is kept as short as possible) and positioning the common facilities at a focal point would reduce the cost of infrastructure, figure (d).

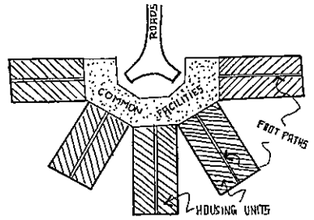


Fig (d)

3.30 Open Spaces.

Open spaces are required for Sunlight, Air flow and other diverse functions such as play areas and other social activities.

Local Authorities stipulate certain light plane angles and certain distances factors to regulate front, rear and side open spaces in terms of building height to satisfy the environment and social requirements Houses may be planned and grouped around play grounds for children and other open spaces used for social activities so that building by-laws are satisfied.Additional open spaces specially provided to satisfy Local Authority requirements may therefore not be necessary.

Plots may be entered through open spaces rather than roads. The common spaces in between the plots could be used as multi functional spaces such as play areas for children and places for social activities so that there is no need to provide additional open spaces for those activities. This would also have the effect of reducing the length of roads.

3.40 Sub Division of Land or Plots.

Plots are made of various sizes but the shape has continued to be rectangular. The plot proportion 1.5:2 to 2.0:1; The short dimension is always front to minimize the Network length per plot. A change of plots to the radial or triangular shape is required to facilitate the creation of circular or hexagonal clusters, which give many economic possibilities.

4.00 Grouping of Plots

In practice a large variety of groupings are used by planners and architects to achieve different spatial and visual effects besides satisfying diverse functional requirements. The choice of grouping plays a crucial role in optimizing the land use and achieving a higher density. The advantages of the closer groupings are as follows:

(i) - Optimum utilization of land

(ii) - Reduction of the length of roads

(iii) - Reduction of cost of infrastructure

(iv) - Optimum use of building elements (eg. Common walls)

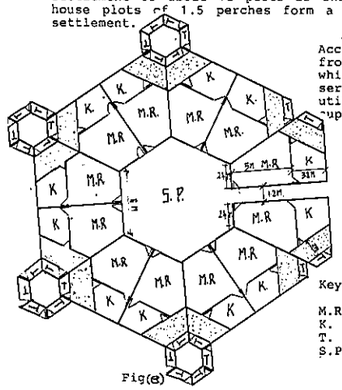
(v) - Achieving higher density

(vi) - Land development cost is less

(vii) - Can preserve more trees

4.10 Hexagonal Cluster Settlement

Triangle plots can be grouped together to form a hexagonal settlement of about 12 plots as shown in figure (e). The house plots of 1.5 perches form a nucleus in a gathered settlement.



Fig(e)

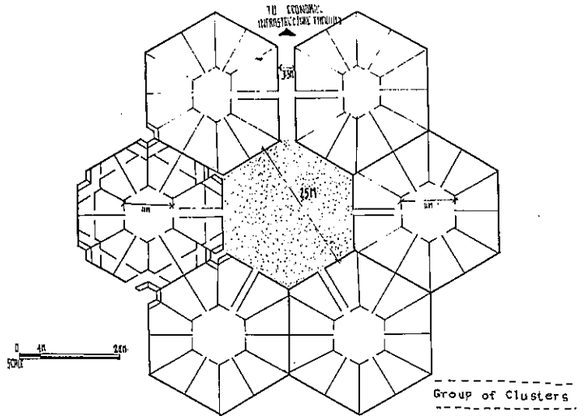
Access to the plots is from the central core area which also acts as a service area for the utilities such as water supply and lighting.

The toilets are grouped together at the rear of the plots. The Bio Gas plant can be located to serve the group of plots as a sewage disposal system and to provide minimum energy needs.

Key:

M.R. Multipurpose room.
K. Kitchen.
T. Toilet.
S.P. Semi-public Space.

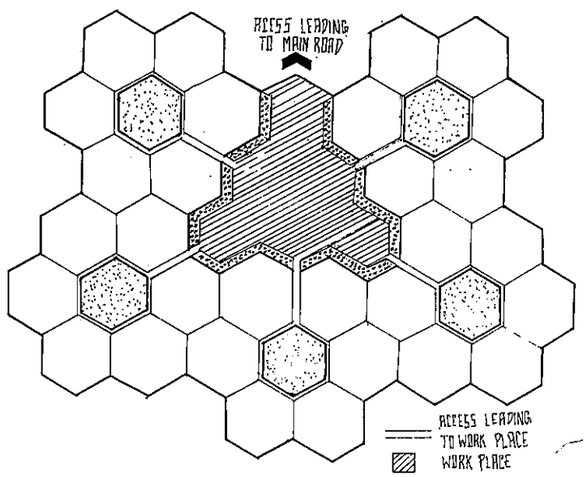
Six hexagonal clusters can be further grouped as shown in figure (f) to form a larger hexagonal pattern with the central open space for social infrastructure (community centre, school, shops, health centre, day care centre).



Group of Clusters

Fig (f)

The self contained zones can be again further developed as shown in figure (g) to provide employment facilities in the centre. The maximum travelling distance to the place of work from the plots is 120 metres. The working place has to cater for a population of 1500 persons.

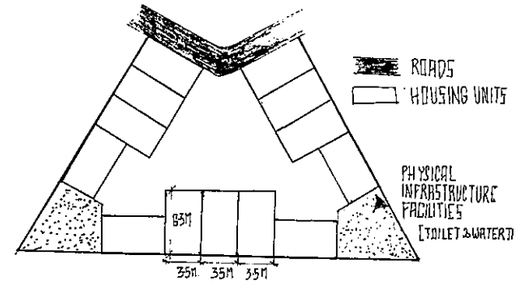


Selfcontained zones

Fig (g)

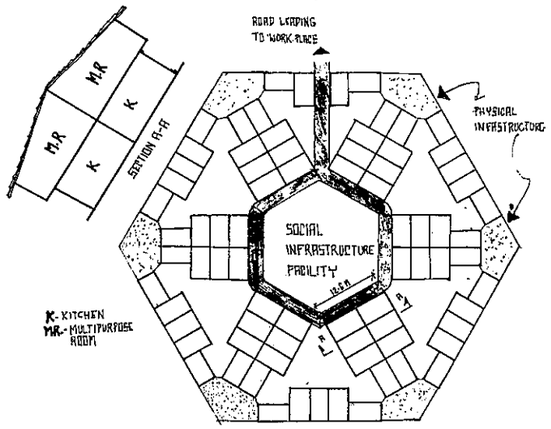
4.20 Trianglar Cluster with Rectangular Plots.

Rectangular shape of plots (housing units) grouped around triangular open space to form a triangular cluster as shown in figure (h). The utilities (water supply, sewage toilets) are located in the corner of the triangle. The six triangular cluster can be grouped in the pattern of a hexagon forming a bigger cluster with a central open space for community activities (schools, shops, markets and recreational centres) as shown in figure (i).



Detail of Triangle cluster.

Fig (h)



Group of Triangular Clusters.

Fig (i)

The hexagonal clusters can be gathered around a hexagonal open space to provide space for work places (economic infrastructure facilities). The working places will be less than 120 metres from the housing units. It will cater for about 450 households from about six cluster groups with a population of more than 2000 people.

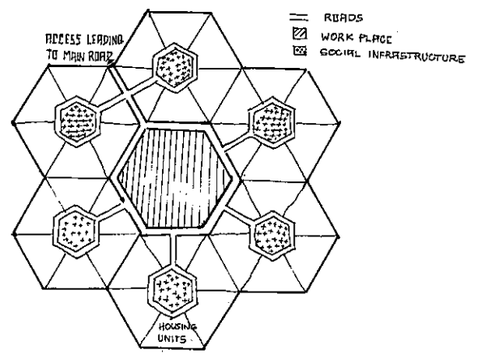


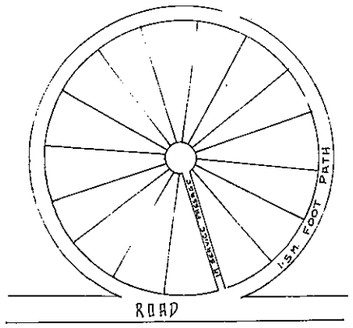
Fig (j)

4.21 Dwelling

The dwelling units for these layouts have been designed as two storey row houses with the kitchen on the ground floor and a multi purpose room at the first floor. The size of each unit at ground floor level is 5.3 metres by 3.5 metres and the first floor is 6.3 metres by 3.5 metres giving a total area of 40.6 square metres.

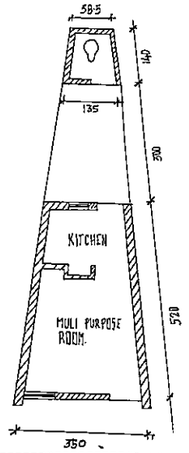
4.30 Circular Cluster of Radial Plots.

The radial plots group to form a circular cluster figure (k). The approach to the radial plots can be given either from the circumferential boundary or from the central core areas. For the smaller plots land use is more economical when approach is from the periphery. Though the plots are radial, the dwellings have been designed with regular rectangular rooms to fit into the radial plots as shown in figure (l). The latrines are located at the rear and wedged in between the sides of the plot around the central core area. The service core area can be approached from the public street through the passage provided between two adjacent plots. Only a single service connection is required for the whole cluster of plots.



Circular Cluster of Radial plots.

Fig (k)

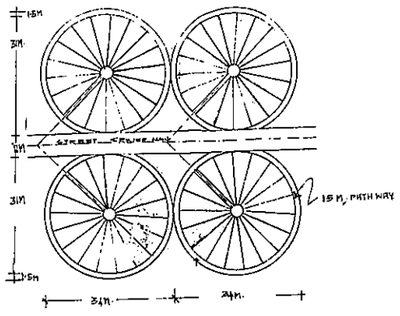


Detail plan of Radial Plot.

Fig (l)

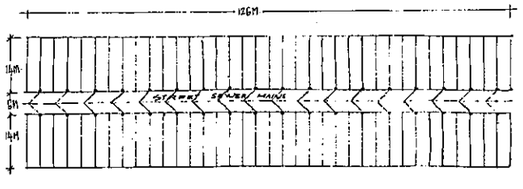
In the network of utilities where radial plots are adopted it is not only possible to reduce the length but also the depth at which the main is laid.

The grouping of radial clsters figure (m) illustrates the efficiency in the use of utilities. Here the diameter of each cluster is 34 metres (31m +3m) for 47 square metre plots. For the 72 rectangular plots (figure (n) requires multiple connections, similar area and a minimum width of 3.5 metres, the length of utilities required is 126 metres The number of service connections required for 72 radial plots will be only 4 while 36 service connections will be required for rectangular plots.



Circumferential Approach to Radial Layouts.

Fig (m)



Rectangular Layout.

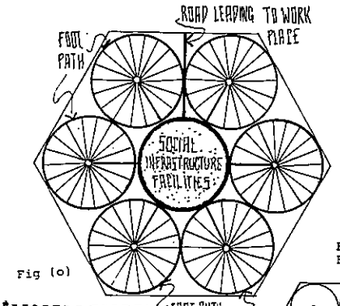
Fig (n)

4.31 Sewage Disposal - Bio Gas Plant.

The grouping of the sanitary blocks (toilets) around the central core area which is obtained with the radial, design forms a very convenient location for a Bio gas plant for a group of 16 families.

4.40 Circular Clusters.

Six circular clusters can be grouped in a circular form or located in the pattern of a hexagon with a central open space for social infrastructure (community centre, school, market, and children's play area) which will be within 60 metres from the plot of 47 square metres as shown in figure (o).

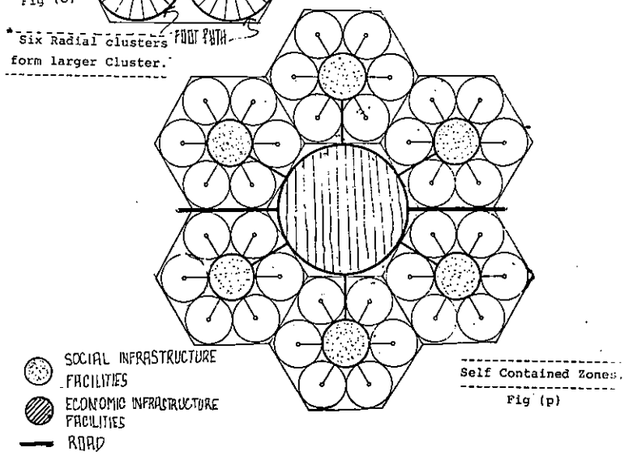


Six Radial clusters form larger Cluster.

Fig (o)

The self contained zones can be developed as shown in figure (p) by the positioning the work place in the centre along the radial links to the group which is located around in a hexagonal pattern. The work place (economic infrastructure) will be less than 160 metres from the plots and will cater for about 650 households from a group of six with a population of more than 3000.

For Smaller cluster detail see Figs (k) & (l)



Self Contained Zones.

Fig (p)

4.50 Rectangular or Square Cluster with Rectangular Plots

Rectangular plots gathered around the rectangular or square open spaces to form a cluster. These are linked to the work place by roads. The utilities for these plots (sewage, water supply and electricity) are positioned closer to the road. The common area in between the plots can be utilized for social activities. The figure (q) below shows some examples.

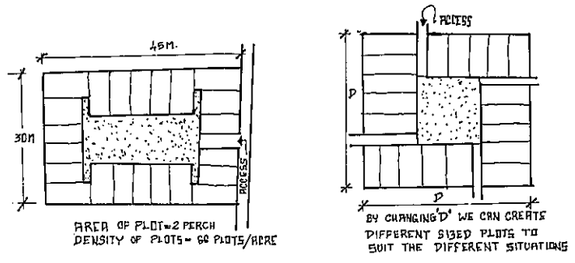
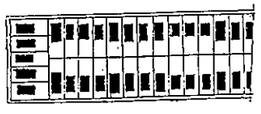


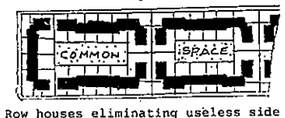
Fig (q)

4.51 Row Houses



Narrow side yards
Poorly lit and poorly ventilated side rooms
No common play space

Fig (r)



Row houses eliminating useless side yards
Well lit and well illuminated rooms
Plus ample common play space

Fig (s)

More efficient use of land and an economical form of construction could be achieved by arranging the houses in rows the above figure (r) and figure (s) show an exemple.

5.00 Case Studies

5.10 Low Income Urban Housing Scheme in Sri Lanka

This Scheme is located in Negombo (satellite town of the main city of Colombo). This satellite town 32 kilometres north of Colombo on the west coast of Sri Lanka.

5.11 Site Description.

Neighbourhood:	Residential.
Population Density:	100 persons per acre (existing).
Land Value:	Comparatively low (30$ US per perch).
Occupations:	Predominantly fishermen.
Income Group:	Low income 15$ US per month
Site Conditions:	Flat surrounded by lagoons; most of the area is covered by marsh.
Infrastructure Availability:	Public Water supply available along the existing road. 3 Phase Electricity is available along the existing road

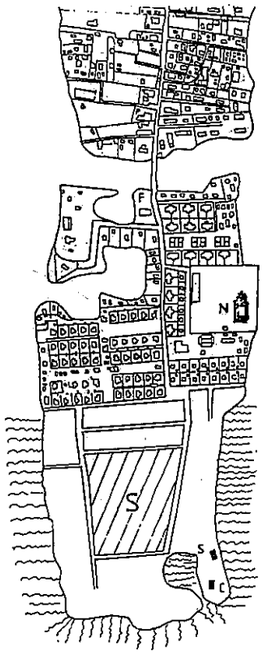
Figure (t) shows the location of the site in relation to the social amenities.

KEY

Scale, 1 : 3170

265 Feet to one inch

F - Fish Market
P - Post Office
C - Church
S - School
N - Nursery
S - Proposed site for Housing



Location Plan of Site in Relation to the Social Amenities.

Fig (t)

5.20 Analysis of the Different Options of Layout.

Three options of schematic layouts were prepared. Table I gives an analysis of the different options.

TABLE I.

	Option 1	Option 11	Option 111
Length of Road	360m.	66m.	99m.
Length of foot path	-	-	125m.
Percentage of private Land	90%	80%	70%
Area of Semi public space (communal area)	-	100 Perches	85 Perches

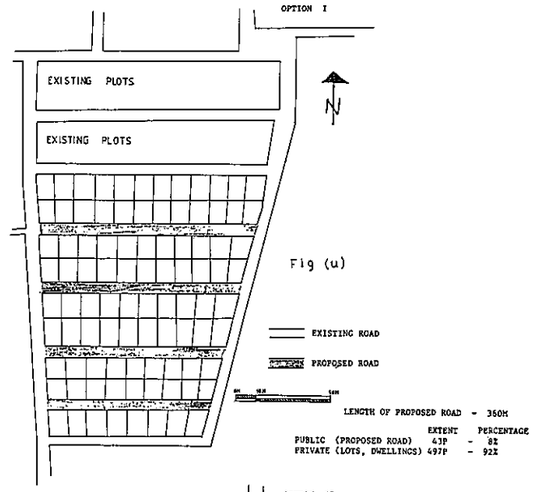


Fig (u)

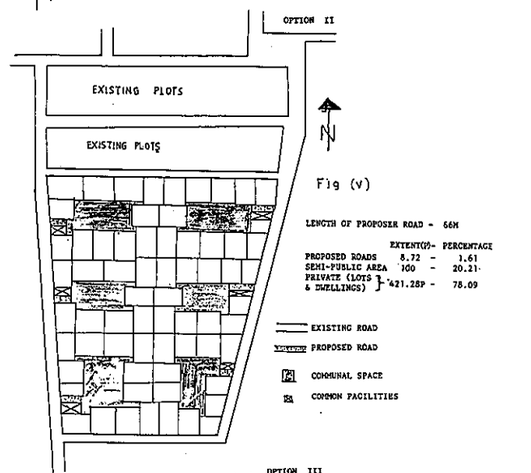


Fig (v)

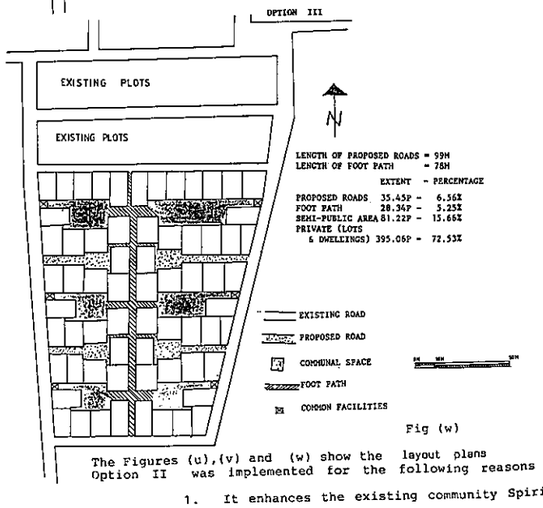


Fig (w)

The Figures (u),(v) and (w) show the layout plans Option II was implemented for the following reasons :-

1. It enhances the existing community Spirit.
2. Infrastructure cost is less.
3. Area of road is very much less than the other options.
4. Common spaces are provided within the cluster to dry their nets since their occupation is fishing.

Option I was rejected, mainly due to its lower network efficiency.

Option III was rejected, mainly due to the following reasons:

1. Its lower percentage of Private spaces
2. The semi-private spaces behind the plots have unclear ownership and responsibilities.
3. Function of foot path is questionable in view of the importance peripheral roads and their greater efficiency.

NOT COMPETING
FUNDACION LEOZ

FUNDACION RAFAEL LEOZ ESPAÑA

CERTAMEN INTERNACIONAL DE SOLUCIONES SOBRE NUEVAS TECNOLOGIAS DE LA VIVIENDA SOCIAL (CINTUS)

FUNDACION RAFAEL LEOZ
PARA LA INVESTIGACION Y PROMOCION DE LA ARQUITECTURA SOCIAL

PRESIDENTE
CARMEN AYUSO DE LEOZ
DIRECTOR DEL TRABAJO
SALVADOR GAYARRE ARQ.

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OBJETIVOS GENERALES

LA FUNDACION RAFAEL LEOZ ES UNA INSTITUCION BENEFICO-DOCENTE, QUE TIENE POR OBJETO LA INVESTIGACION Y PROMOCION DE LA ARQUITECTURA SOCIAL.

SE BASA EN LAS TEORIAS Y CONCEPTOS QUE SOBRE EL ESPACIO ARQUITECTONICO Y SU - ORIGEN GEOMETRICO-TOPOLOGICO FUERON ELABORADOS POR RAFAEL LEOZ, SE ABORDA EL PROBLEMA A PARTIR DE UN REPLANTEAMIENTO EN DOS VERTIENTES: LA DEL DISEÑO Y LA DE LA CONSTRUCCION INDUSTRIALIZADA.

CAMPOS DE INVESTIGACION

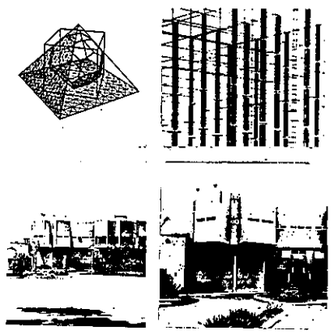
EL PROGRAMA DE INVESTIGACION SE CENTRA BASICAMENTE EN TRES NIVELES:

A) INVESTIGACION PURA: DONDE SE DESARROLLAN DIFERENTES ASPECTOS, TANTO GEOME-- TRICOS, ANTROPOLOGICOS, CONCEPTUALES, DE COMPORTAMIENTO, ETC.

B) INVESTIGACION APLICADA: SE PARTE DE ALGO CONOCIDO. SE TRATA DE REALIZAR ESTUDIOS EN PROFUNDIDAD CON INTENCIONES CONCRETAS.

C) INVESTIGACION DEL PRODUCTO: SE INVESTIGA UN PRODUCTO DETERMINADO, SU COMPORTAMIENTO, POSIBLES MATERIALIZACIONES Y SUS RESULTADOS EN LA PRACTICA.

EN ESTOS MOMENTOS LA FUNDACION HA CENTRADO SU CAMPO DE INVESTIGACION TOMANDO COMO BASE DE REFERENCIA EL TEMA DE LA VIVIENDA, POR SU AMPLITUD E IMPORTANCIA PARA, DESDE ALLI, EXTENDER CONSECUENCIAS A LOS RESTANTES.



CONCRETAMENTE, SE ESTAN DESARROLLANDO PROYECTOS DE INVESTIGACION EN TEMAS COMO:

A) PROTOTIPOS DE VIVIENDAS POR AUTOCONSTRUCCION EN LAS REGIONES AUTONOMICAS DE ANDALUCIA, EXTREMADURA Y CANARIAS.

B) PROPUESTA DE HABITAT PARA SAO TOME - AFRICA.

ESTOS TRABAJOS PRETENDEN DEMOSTRAR LA APLICACION DE LA METODOLOGIA DE INVESTIGACION DE LA FUNDACION, BASADA EN LAS TEORIAS DEL ARQUITECTO RAFAEL LEOZ.

CABE INDICAR QUE LO QUE AQUI SE PRESENTA, ES UN AVANCE DE ESTAS INVESTIGACIONES Y POR LO TANTO, RESULTADOS PARCIALES.

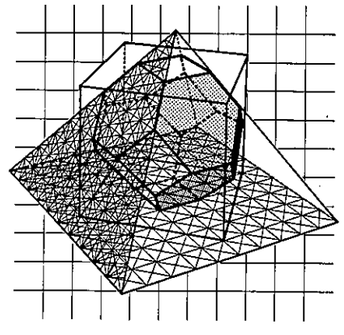
LA INVESTIGACION

LA INVESTIGACION REPRESENTA SOLO UN ESTADO DE ANIMO, UNA ACTITUD AMISTOSA Y FAVORABLE A LO QUE PUEDE SIGNIFICAR UN CAMBIO.

SUPONE LA MENTALIDAD QUE RESUELVE LOS PROBLEMAS, OPUESTA A LA MENTALIDAD QUE PREFIERE DEJAR LAS COSAS COMO ESTAN. ES EL ESPIRITU DEL QUE COMPONE MUSICA - Y NO DEL MERO VIRTUOSO. ES LA MENTE DEL MAÑANA EN VEZ DE LA MENTE DEL PASADO. ES EL OPTIMISMO FRENTE AL PESIMISMO Y, EN ULTIMO TERMINO ES LA FE EN LA HUMANIDAD FRENTE AL ESCEPTICISMO ANTE ELLA.

PARA DESENVOLVERSE CON EXITO EN UN AMBIENTE PROPIO PARA LA INVESTIGACION HACEN FALTA LAS SIGUIENTES VIRTUDES: HUMILDAD, IMAGINACION, PERSEVERANCIA, SENTIDO DEL ORDEN Y, SOBRE TODO, PACIENCIA.

RAFAEL LEOZ



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METODOLOGIA DE TRABAJO

INVESTIGACION PURA

"EL ESPACIO, COMO TODA MATERIA SOBRE LA QUE EL HOMBRE PUEDA ACTUAR DINAMICAMENTE, ADQUIERE UN VALOR SUBJETIVO QUE CAMBIA CON CADA INDIVIDUO, Y UN VALOR OBJETIVO QUE PERMITE TRATARLO EN FORMA LOGICA Y MATEMATICAMENTE"

RAFAEL LEOZ

EN LA GEOMETRIA INORGANICA EXISTEN BASICAMENTE CUATRO POLIEDROS FUNDAMENTALES QUE MACIZAN EL ESPACIO, ES DECIR, QUE SU YUXTAPOSICION LLENA EL ESPACIO SIN DEJAR INTERSTICIOS. ESTOS SON: EL HEXAEDRO O CUBO, EL PRISMA DE BASE HEXAGONAL, EL POLIEDRO DE LORD KELVIN Y EL - ROMBODODECAEDRO. LOS MISMOS QUE NOS PRODUCEN CUATRO REDES ESPACIALES FUNDAMENTALES:

A) RED TETRAOCTAEDRICA, QUE COMO SU - NOMBRE INDICA; ESTA FORMADA POR LA YUXTAPOSICION DE TETRAEDROS Y OCTAEDROS. DENTRO DE ELLA PODRIAMOS SITUAR AL TE-- TRAEDRO, OCTAEDRO, CUBO OCTAEDRO, TE - TRAEDRO TRUNCADO, POLIEDRO DE LORD KELVIN, ETC.

B) RED DE PRISMAS TRIANGULARES FORMADA POR ACOPLAMIENTO DE PRISMAS TRIANGULA - RES EQUILATEROS.

C) RED CUBICA FORMADA POR CUBOS.

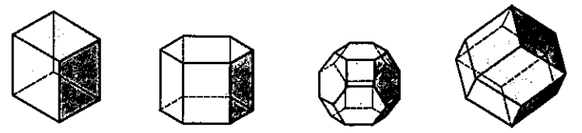
D) RED ROMBODODECAEDRICA FORMADA POR - ROMBODODECAEDROS, PUDIENDOSE ESTAS CUATRO SUPERPONERSE, FORMANDOSE UNA SUPER-RED ESPACIAL INORGANICA.

NO OBSTANTE, EL MATERIALIZAR MEDIANTE MODELOS EN EL ESPACIO ESTAS REDES, ES UNA LABOR ARDUA, Y EL TRATAR DE UTILIZARLAS PARA PROYECTAR SOBRE ELLAS, PRACTICAMENTE IMPOSIBLE. TENEMOS PUES, QUE REPRESENTARLAS EN EL PLANO MEDIANTE PROYECCIONES O SECCIONES PLANAS DE ELLAS. DE ESA FORMA, EL PROYECTISTA TRABAJA SOBRE UNA RETICULA PLANA QUE REPRESENTA - UNA O VARIAS REDES ESPACIALES.

LAS MAS IMPORTANTES RETICULAS PLANAS OBTENIDAS POR PROYECCION O SECCION DE LAS REDES ESPACIALES SON LAS SIGUIENTES:

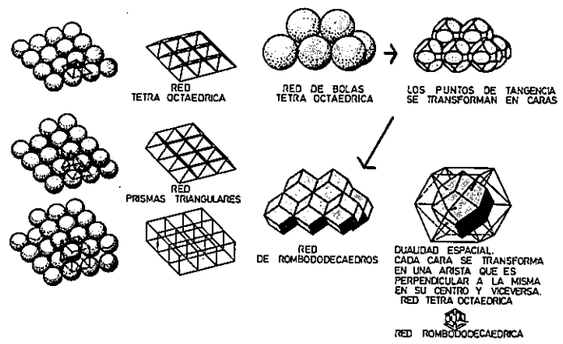
- RETICULA DE LA ESCUADRA
- RETICULA DEL CARTABON
- SUPERPOSICION HEMIPITAGORICA Y ESCUADRA.
- RETICULA HEMIPITAGORICA

POLIEDROS FUNDAMENTALES QUE MACIZAN EL ESPACIO.

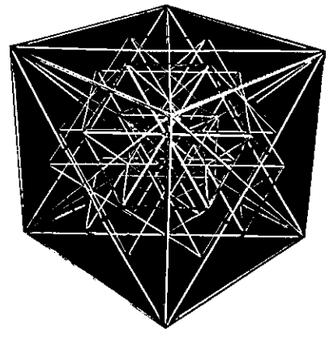


CUBO — PRISMA EXAGONAL — POLIEDRO DE LORD KELWIN — ROMBO DODECAEDRO

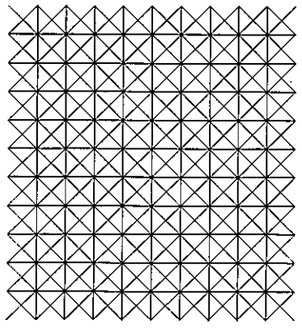
REDES ESPACIALES FUNDAMENTALES



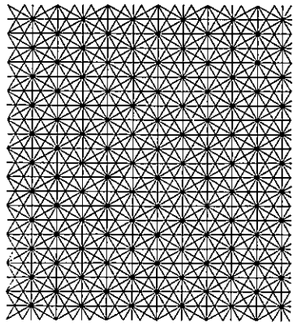
SUPER RED ESPACIAL



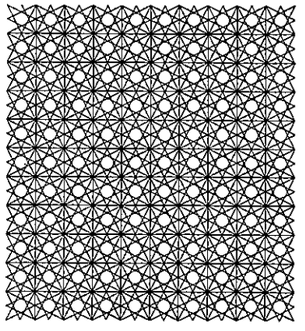
RETICULA DE LA ESCUADRA



RETICULA DEL CARTABON



RETICULA HEMIPITAGORICA



INVESTIGACION APLICADA

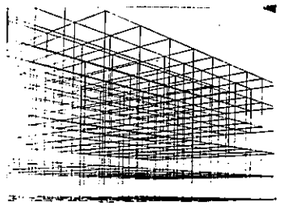
AL ANALIZAR UN EDIFICIO SE PUEDEN INDEPENDIZAR TRES GRUPOS DE ELEMENTOS CONSTRUCTIVOS QUE, EN ALGUNOS CASOS, PUEDEN ESTAR MAS O MENOS CONFUNDIDOS ENTRE SI, PERO QUE, DE CUALQUIER MANERA SE REFIEREN A LA SOLUCION DE LOS PROBLEMAS TIPICOS Y CONVIENE INDIVIDUALIZARLOS PARA EFECTUAR UN CORRECTO ANALISIS Y PROPONER SOLUCIONES QUE, DESDE UN PRINCIPIO, CONSIDEREN ESTA PROBLEMATICA DESDE SU RAIZ.
ESTOS TRES TIPOS SON:
1.- LA MACROESTRUCTURA: SUSTENTACION E INSTALACIONES QUE SIRVEN A LA CELULA
2.- LA PIEL: PROTECCION Y VINCULACION CON EL MEDIO EXTERIOR.
3.- LA CELULA HABITABLE: CONFORT INTERIOR Y EQUIPAMIENTO.
DESDE ESTE PUNTO DE VISTA, CADA GRUPO SE PUEDE TRATAR ESPECIFICAMENTE, PARA ACERCARLO A -- LOS COMPORTAMIENTOS OPTIMOS. AL MISMO TIEMPO QUEDA CLARO QUE EL NIVEL DE INDUSTRIALIZACION DE CUALQUIERA DE LAS PARTES NO REQUIERE INEVITABLEMENTE LA DE LAS OTRAS. ESTA CONDICION ES FUNDAMENTAL SI PRETENDEMOS INCIDIR EFICAZMENTE, DESDE ESTE MOMENTO, EN LA CONSTRUCCION MASIVA DE VIVIENDAS, YA QUE MUCHOS METODOS TRADICIONALES SIGUEN SIENDO MAS ECONOMICOS Y FLEXIBLES PARA RESOLVER ESTOS PROBLEMAS.
"EL APROVECHAMIENTO DE LAS IDEAS ENUNCIADAS, ES TAN UTIL A LA CONSTRUCCION TRADICIONAL COMO A LA PREFABRICADA, PERO EL APROVECHAMIENTO QUE DE ELLA PUEDE HACERSE CRECE, Y ADQUIERE SU MAXIMA RELEVANCIA CUANDO LOS MEDIOS SE INDUSTRIALIZAN Y LA TIPIFICACION, INCLUSO EN LA FASE DE PROYECTO, SE CONVIERTE EN NECESARIA".
SE DESARROLLAN TAREAS DE INVESTIGACION QUE, DE ACUERDO A LOS PRINCIPIOS ENUNCIADOS ANTE -- RIORMENTE Y BASADOS EN LOS CONCEPTOS A QUE SE ARRIBARA EN TERMINOS DE GEOMETRIA PURA, SE - DIRIGEN A APROXIMAR MAS ESPECIFICAMENTE A LA TAREA ARQUITECTONICA METODOS DE TRABAJO RIGUROSOS QUE PERMITAN EL USO SISTEMATICO DE LA INDUSTRIA MODERNA.

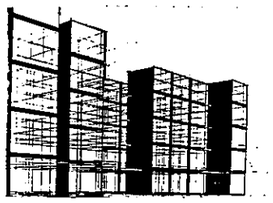
"UNA RESPUESTA INTEGRAL A LA PROBLEMATICA DEL "HABITAT" REQUERIRA CONTINUIDAD EN EL TIEMPO DE LOS ESTUDIOS Y ALCANCES LOGRADOS: NO OLVIDEMOS - QUE EL MAS GRAVE PROBLEMA HUMANO DE NUESTROS DIAS ES QUE CADA UNO DE NOSOTROS ESTAMOS DEJANDO DE HACER LO IMPORTANTE PARA RESOLVER LO URGENTE, QUE YA NOS ESTA ATROPELLANDO A TODOS"

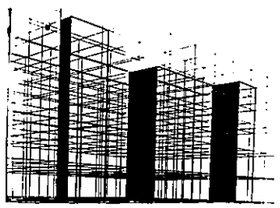
RAFAEL LEOZ

ELEMENTOS CONSTRUCTIVOS DE UN EDIFICIO

CONCEPTO	LOCALIZACION	CARACTERISTICAS	MATERIALIZACION
MACROESTRUCTURA	VARIA SEGUN EL SITIO, CLASIFICACION, SUELO; CARGAS, ETC.	AUTONOMA RESPECTO DE LA CELULA. APOYO DE LA CELULA. TIPOLOGIA.	CONSTRUCCION POR ELEMENTOS. PERMITE LA FACILIDAD DE CONDUCTOS (HORIZONTAL Y VERTICAL). PESO VARIABLE (SEGUN MATERIALES) TRANSPORTABLE.
CELULA	INDEPENDIENTE DEL SITIO. UNIVERSAL.	AUTONOMA RESPECTO DE LA MACROESTRUCTURA. SE APOYA EN LA MACROESTRUCTURA CONTINENTE. DEPENDE DE LAS ACTIVIDADES, TIPOLOGIAS.	CONSTRUCCIÓN POR ELEMENTOS NORMALIZADA EN RELACION CON LA CONSTITUCION DE LA CELULA. TRANSPORTABLE LIGERA
PIEL	DEPENDE DEL: CLIMA ORIENTACION NATURALEZA	TIPOLOGIAS DE SU CONSTITUCION EN RELACION A LAS NECESIDADES INTERIORES (ALBERGADAS LAS CONDUCCIONES) Y EXTERIORES	CONSTRUCCION POR ELEMENTOS NORMALIZADA EN RELACION CON LOS COMPONENTES. PESO VARIABLE SEGUN LOS MATERIALES EMPLEADOS DE ACUERDO CON EL CLIMA DE LA CELULA Y CON LAS CONDICIONES EXTERIORES TRANSPORTABLES.







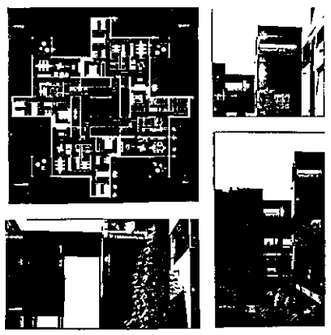
INVESTIGACION DEL PRODUCTO

EN ESTE CAMPO CONVIENE VINCULAR LOS CONCEPTOS GEOMETRICOS CON LAS ALTERNATIVAS DE DISEÑO, CON ESTO SE PRETENDE DEMOSTRAR QUE DICHAS TEORIAS SON APLICABLES A REALIZACIONES TAN VARIADAS, COMO VIVIENDAS SOCIALES, URBANISMO, ESCUELAS, PABELLONES DESMONTABLES, EDIFICIOS PUBLICOS, BARRACONES MILITARES, ESCULTURAS, DISEÑO TEXTIL JOYAS, VIDRIERAS, MOSAICOS, ETC., POSIBILITANDO CON ESTOS UNA INTEGRACION DE LAS ARTES.
ACTUALMENTE SE PROFUNDIZA COMO DEBE SER LA VIVIENDA EN DIFERENTES CONDICIONES CULTURALES, CLIMATOLOGICAS, GEOGRAFICAS, SOCIALES, ECONOMICAS Y TECNICAS. PUESTO QUE EL OBJETIVO FUNDAMENTAL DE NUESTRO TRABAJO ES LA BUSQUEDA DE UN CONTROL DEL ESPACIO UNIVERSAL ARQUITECTONICO POR METODOS Y MEDIOS NO LIMITATIVOS AL DISEÑO Y CON POSIBILIDADES DE ASIMILAR PROCESOS DE INDUSTRIALIZACION DE TODO TIPO Y QUE SIRVA A NUESTRAS TECNOLOGIAS, ESTE NIVEL TIENE QUE SER PERFECTIBLE Y RECICLABLE EN EL - SENTIDO DE EXPERIMENTAR Y MEJORAR PERMANENTEMENTE.

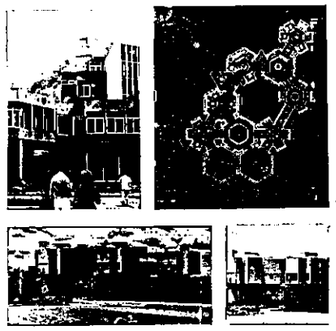
"LO MISMO DE RIGUROSO O INEXACTO ES PARTIR/ EN NUESTRO TRABAJO, DESDE EL PUNTO DE VISTA DE LA PROGRAMACION Y DEL COMPORTAMIENTO HUMANO PARA LLEGAR AL DISEÑO, QUE BASARSE EN/ SISTEMAS ESPACIALES TOPOLOGICOS, TAN GENERALES Y ELASTICOS QUE DEN, A PRIORI, LA SEGURIDAD DE PODER SER ADAPTADOS, A POSTERIORI, A TODAS LAS NECESIDADES QUE SE NOS PLANTEEN./ DESDE LUEGO, ACTUALMENTE ESTE ULTIMO CAMINO/ HA SIDO MUCHO MAS EFICAZ PARA NOSOTROS QUE/ EL ANTERIOR, AL MENOS EN LOS TRABAJOS QUE HEMOS REALIZADO HASTA AHORA"

R. LEOZ

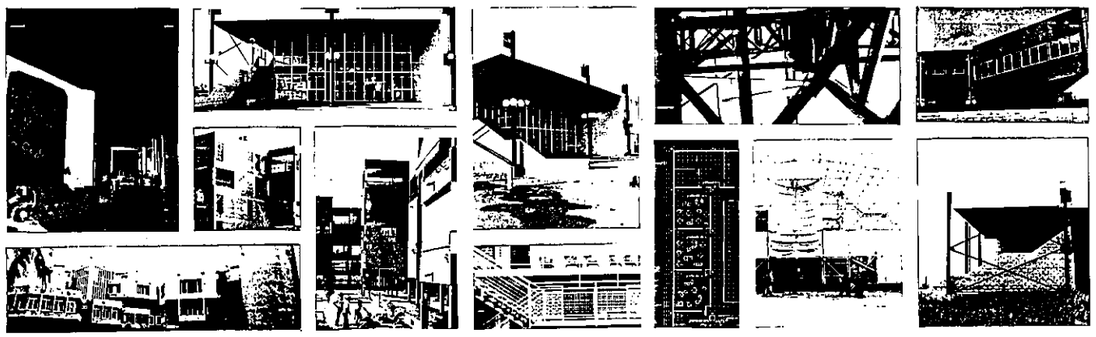
VIVIENDAS EXPERIMENTALES EN TORREJON DE ARDOZ (MADRID) - 1975
FUNDAMENTOS:
ESTAS VIVIENDAS EXPERIMENTALES PROPUESTAS AL MINISTERIO DE LA VIVIENDA Y PROMOVIDAS DIRECTAMENTE POR EL I.N.V. EN TORREJON DE ARDOZ, HAN SIDO CONCEBIDAS PARTIENDO DE UN MODULO ESPACIAL DE 3,40 MTS. x 2,40 MTS x 2,75 MTS. QUE RESUELVE EN SUS MEDIDAS LAS DE UN DORMITORIO TIPICO.
LAS DISTINTAS TIPOLOGIAS QUE, PARA FACILITAR SU NORMALIZACION, SIEMPRE TIENEN LA MISMA MODULACION, ABARCAN DESDE LAS DE DOS DORMITORIOS DE DOS CAMAS HASTA LAS DE CINCO DORMITORIOS Y ESTAN CONSTITUIDAS DESDE CINCO HASTA DIEZ CELULAS IGUALES, DE 11.56 M2 DE SUPERFICIE CADA UNA.
LAS DIRECTRICES GENERALES QUE SIEMPRE SE HAN SEGUIDO A LO LARGO DE ESTE PROYECTO SINGULAR, LO HAN SIDO PARA CONSEGUIR UNA GRAN VERSATILIDAD EN LAS SOLUCIONES DE LAS VIVIENDAS Y DE SU ENCADENAMIENTO Y AGRUPACIONES DE CUATRO PLANTAS ALREDEDOR DE UN NUCLEO DE CIRCULACIONES VERTICALES, QUE TAMBIEN ADMITIRIA MUCHAS OLUCIONES DIFERENTES, SEGUN LA CONVENIENCIA DE CADA CASO, PRODUCIENDOSE UNA JUGOSIDAD ESPACIAL MUY SUGESTIVA.



EMBAJADA DE ESPAÑA EN BRASILIA- 1972
FUNDAMENTOS:
ENTRE LAS FORMAS ENGENDRADAS POR EL SISTEMA DE MACIZAR EL ESPACIO QUE UTILIZA LA FUNDACION, SE ELIGIO UNA DE LAS DEFORMACIONES EQUIVOLUMETRICAS DE LA FAMILIA TIPOLOGICA DE LOS HIPERPOLIEDROS: EL HIPERPRISMA EXAGONAL. ESTE ESTA COMPUESTO DE CUATRO PRISMAS EXAGONALES SUPERPUESTOS. DE LAS CARAS DEL SEGUNDO PRISMA SE PROYECTAN SEIS PARALELEPIPEDOS DE BASE RECTANGULAR Y CARAS CUADRADAS. LA PROYECCION ORTOGONAL AL PLANO HORIZONTAL COINCIDE CON UNA DE LAS TRAMAS BASICAS QUE EMPLEA LA FUNDACION.
LA RETICULA UTILIZADA HA SIDO LA DEL CARTABON. LAS UNIDADES BASICAS SE COMBINAN IMPRIMIENDO AL CONJUNTO UNA ORGANIZACION FUNCIONAL. PARA INDIVISUALIZAR LAS FUNCIONES SE UTILIZAN LOS PARALELEPIPEDOS DE LAS UNIDADES QUE SE PROYECTAN AL EXTERIOR COMO MIRADORES, TERRAZAS O GALERIAS. LOS PATIOS SE ARTICULAN A TRAVES DE VARIADOS TIPOS DE CONEXIONES CON ESPACIOS CIRCUNDANTES Y SIN DIFERENCIAS ENTRE EL INTERIOR Y EL EXTERIOR.
EL VOLUMEN DE VIVIENDAS SE CONTRAPONE COMO MASA A LOS VANOS DE LOS PATIOS DE LA - EMBAJADA Y CANCILLERIA.

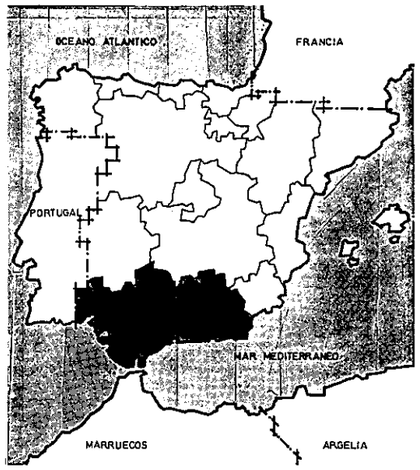


OTROS TRABAJOS DE INVESTIGACION DESARROLLADOS POR LA FUNDACION

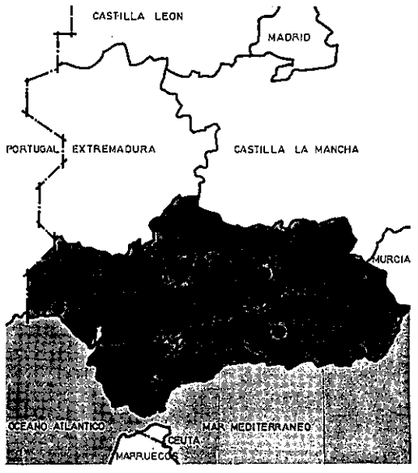


PROTOTIPOS VIVIENDAS ANDALUZAS

MARCO SITUACIONAL



LA AUTONOMIA DE ANDALUCIA ABARCA TODO EL SUR DE ESPAÑA, CONSTITUYENDO SU REGION MAS EXTENSA, CON UNA SUPERFICIE DE 87.268 KMS^2.
SU POBLACION ES DE 6.441.755 HABITANTES, CASI LA SEXTA PARTE DEL TOTAL NACIONAL, Y POSEE UNA DENSIDAD DE 74 HAB/ KM^2. SE LA SUELE DIVIDIR EN: ANDALUCIA ORIENTAL O ALTA PORQUE ES LA PARTE MAS MONTAÑOSA (ALMERIA, GRANADA, JAEN Y MALAGA) Y EN ANDALUCIA OCCIDENTAL O BAJA, PORQUE ES MAS LLANA (CADIZ, CORDOBA, HUELVA Y SEVILLA)
EL CLIMA ES TIPICO DEL MEDITERRANEO, CALIDO CON LAS VARIACIONES PROPIAS, TANTO DEL TERRENO COMO DE LA ORIENTACION. LA SUPERFICIE PARA LA AGRICULTURA ES EXTENSA Y MUY FERTIL, EL VALLE DEL GUADALQUIVIR ES EL MAS RICO DE LA PENINSULA, Y A SU VEZ ES LA REGION CON MAYOR RIQUEZA MINERA. EL PUERTO DE HUELVA ES EL PRIMERO DE ESPAÑA EN PRODUCCION PESQUERA, ANDALUCIA POSEE 812 KMS. DE COSTAS. EN CUANTO AL TURISMO RESUMIREMOS QUE: POSEE PLAYAS DIVERSAS, SIERRAS CON PAISAJES BELLISIMOS Y MILENARIAS RIQUEZAS HISTORICAS Y ARTISTICAS.
SU PROTAGONISMO LLEGA A SU CULMINACION CON EL DESCUBRIMIENTO DE AMERICA, CONVIRTIENDOSE EN LA "PUERTA"DE LA AMERICA HISPANICA. CON RESPECTO A LOS SECTORES DE ACTIVIDAD, LOS SERVICIOS ES EL MAS DESARROLLADO, SEGUIDO DE LA AGRICULTURA Y POR ULTIMO LA INDUSTRIA. DE CADA 100 ANDALUCES, 30 TRABAJAN EN EL CAMPO, 19 EN LA INDUSTRIA, 9 EN LA CONSTRUCCION Y 43 EN LOS SERVICIOS. LA SITUACION DE POSTERGACION SE DEBE AL RETRASO INDUSTRIAL Y AL LATIFUNDISMO, LO QUE GENERA GRANDES EMIGRACIONES Y MUCHO "PARO". FALTAN MAS DE 300.0000 VIVIENDAS.



ANDALUCIA ESTA COMPUESTA POR OCHO PROVINCIAS:
- ALMERIA: PRIMERA PROVINCIA ESPAÑOLA EN PRODUCCION DE HORTALIZAS. ES LA MAS SECA. GRAN EMIGRACION.
- CADIZ: ES LA PROVINCIA ESPAÑOLA QUE MAS PARADOS DA. POSEE LA CIUDAD MAS ANTIGUA DE EUROPA (GADIR). ES LA MAS POBLADA.
- CORDOBA: CENTRO GEOGRAPICO DE ANDALUCIA. SU CAMPIÑA ES LA MEJOR TIERRA DE EUROPA. TERCERA PROVINCIA ESPAÑOLA EN LATIFUNDIOS. POSEE UNIVERSIDAD.
- GRANADA: POSEE EL ...YOR EXPONENTE ARTISTICO DE LA CULTURA ARABE ANDALUZA. ES LA MENOS INDUSTRIALIZADA: MAYOR NUMERO DE MINIFUNDIOS Y UNA DE LAS ULTIMAS ESPAÑOLAS EN RENTA.
- HUELVA: PRIMERA PROVINCIA ESPAÑOLA EN MINERIA. ES LA MENOS POBLADA. POSEE EL UNICO POLO INDUSTRIAL ANDALUZ QUE HA FUNCIONADO.
- JAEN: PRIMERA PROVINCIA NACIONAL EN PRODUCCION DE ACEITUNA Y LA TERCERA EN PRODUCCION AGRARIA. POSEE EL MAYOR INDICE DE EMIGRACION.
- MALAGA: ES LA MAS CHICA, LA SEGUNDA EN PARADOS Y HABITANTES. PLAYAS PRIVILEGIADAS. POSEE UNIVERSIDAD.
- SEVILLA: ES LA MAS GRANDE Y CON MAS POBLACION, LA DE MAYOR PRODUCCION AGRARIA, LA SEGUNDA EN LATIFUNDIOS. Y LA PRIMERA EN RENTA POR PERSONA. CAPITAL DE ANDALUCIA.

OBJETIVOS

-TRABAJO DE INVESTIGACION APLICADA DIRIGIDO A LA DEFINICION DE TRES PROTOTIPOS DE VIVIENDAS URBANAS (UNIDADES MODELICAS SISTEMATIZADAS), DE BAJO COSTO, QUE SINTETICEN TIPOLOGIAS ARQUITECTONICAS REGIONALES, EN CUANTO A FUNCION, MORFOLOGIA Y TECNOLOGIA.

-LAS PROPUESTAS,MATERIALIZABLES MEDIANTE FORMULAS DE AUTOCONSTRUCCION, DEBERAN APORTAR A LO TRADICIONAL MEJORAS EN LAS ACTUACIONES DE ESTE TIPO, DE GRAN ARRAIGO EN ESTE AMBITO TERRITORIAL.

-ACABADO DISEÑO CONCEPTUAL DE LAS EDIFICACIONES Y DE LAS PROPUESTAS DE CONJUNTOS QUE, SIN EXCLUIR OTROS FACTORES,PROPONGA TECNICA Y RESOLUCIONES SENCILLAS, ORDEN EN LA EJECUCION DE LA OBRA Y FORMA DE REPRESENTACION COMPRENSIBLE AL NIVEL DEL USUARIO/CONSTRUCTOR.

-CALIDAD HABITACIONAL Y TECNICA, POR INCORPORACION DE MATERIALES ADECUADOS, UTILIZANDO TECNOLOGIA PROBADA E INCORPORANDO COMPONENTES INDUSTRIALIZADOS, CUANDO ESTOS SE JUSTIFIQUEN EN TERMINOS DE SIMPLICIDAD, RENDIMIENTO Y COSTOS.

PREMISAS

-ADECUACION A LAS NECESIDADES DE LA POBLACION DESTINATARIA Y SUS POSIBILIDADES ECON. Y FINANCIERAS.

-ADECUACION A LOS CONDICIONANTES TIPOLOGICOS Y TECNOLOGICOS DE LA ZONA.

-CONSIDERACION DE LAS POSIBILIDADES DEL USUARIO MEDIANTE FORMULAS DE AUTOCONSTRUCCION.

-POSIBILIDAD DE INTRODUCCION DE ELEMENTOS INDUSTRIALIZADOS.

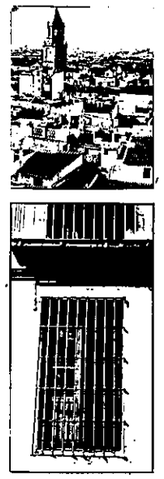
-RESPETO Y DEFINICION DEL ENTORNO FISICO Y/O URBANISTICO SEGUN CADA LOCALIZACION RESPECTIVA.

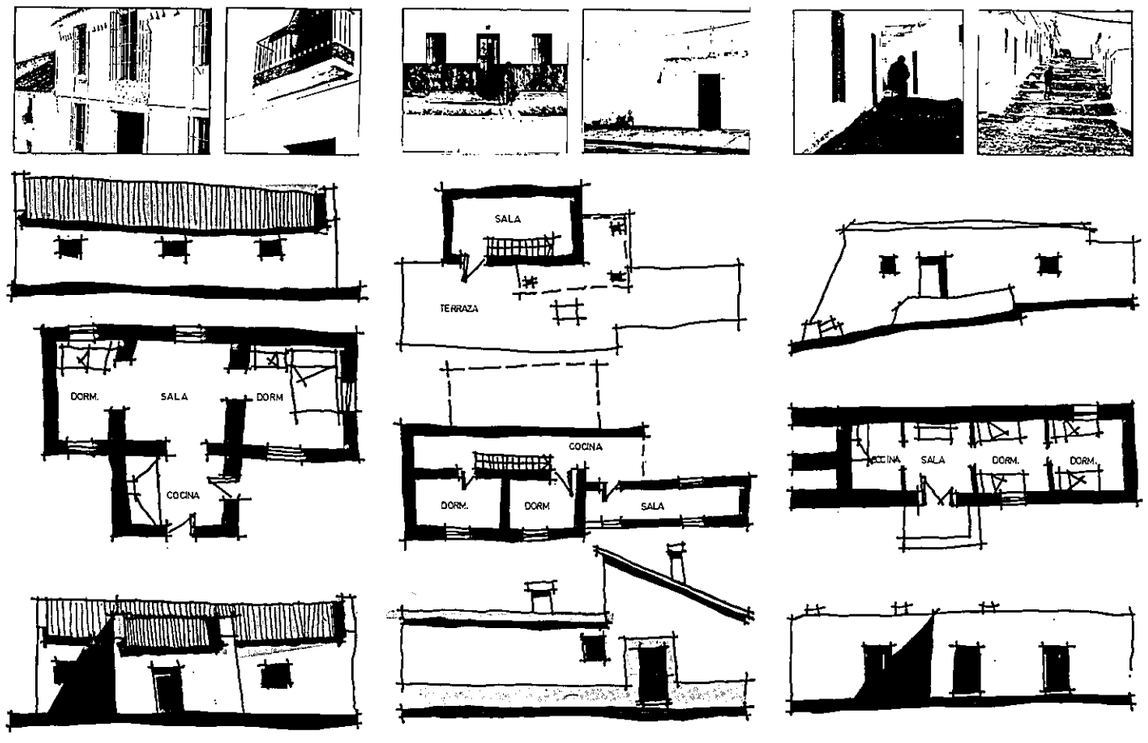
-EL PROGRAMA ARQUITECTONICO SE BASARA EN LA LEGISLACION VIGENTE RESPECTIVA: REAL DECRETO SOBRE PROMOCIONES SOCIALES DE V.P.O.. AUTOCONSTRUCCION TUTELADA Y VIVIENDAS EN EL MEDIO RURAL Y LEGISLACION DE VIVIENDAS DE PROTECCION OFICIAL. MINISTERIO DE OBRAS PUBLICAS Y URBANISMO ORDENANZA D/4:
VIVIENDA 2 DORMITORIOS: 50 M2 A 70 M2
VIVIENDA 3 DORMITORIOS: 60 M2 A 90 M2
VIVIENDA 4 DORMITORIOS: 70 M2 A 90 M2

00000002

ANDALUCIA "EL BLANCO INFINITO"

EL PAISAJE ARQUITECTONICO ANDALUZ ESTA IMPREGNADO DE AIRES AFRICANOS EN LOS PATIOS, EN EL BLANQUEO DE LAS CASAS, EN AZULEJOS, ARCOS Y PASADIZOS, EN CALLEJAS ZIGZAGUEANTES, O EN LAS CASAS DE PEQUEÑOS VOLUMENES..... LA HUELLA ARABE HA PERDURADO DURANTE SIGLOS.
UN RASGO QUE UNIFICA LA DIVERSA ARQUITECTURA POPULAR DE ANDALUCIA ES UN ESPECTACULO DE ORNAMENTACION Y COLOR EN QUE EL BLANCO ES SIEMPRE OBSESIVO CORTIJOS Y HACIENDAS, CASAS DE CUBIERTAS PLANAS DE ALMERIA O LAS ALPUJARRAS, CUEVAS Y ESE CONGLOMERADO DE MUCHOS ELEMENTOS QUE HEMOS DE LLAMAR "CASA ANDALUZA"
LA INFLUENCIA ARABE, QUE SUELE LLEGAR A TRAVES DEL MUDEJAR Y DEL MOZARABE, TAMBIEN ESTA PRESENTE EN LA ARQUITECTURA POPULAR DE LA REGION. POR EJEMPLO, EN LA ABUNDANCIA DE PATIOS, QUE ERAN EL CENTRO DE LA VIDA FAMILIAR ARABE.TAMBIEN TIENEN EL MISMO ORIGEN OTROS ELEMENTOS DE LA ARQUITECTURA POPULAR ANDALUZA, COMO LAS PAREDES DECORADAS CON AZULEJOS DE ALGUNAS ZONAS O EL BLANCO CONSTANTE DE LAS CASAS.SON, TAMBIEN POR INFLUENCIA ARABE,CASAS GENERALMENTE DE VOLUMEN PEQUEÑO, CON MAS ALTURA EN LA PLANTA BAJA.LOS MATERIALES MAS EMPLEADOS SON LA TIERRA, EL BARRO Y LA CAL.LA MADERA SE USA FUNDAMENTALMENTE EN ESTRUCTURAS DE VIGUERIAS DE PISOS Y CUBIERTAS. NO HAY ,SIN EMBARGO,UNA TIPOLOGIA COMUN A LAS OCHO-PROVINCIAS NI SIQUIERA LA LLAMADA CASA TIPICA ANDALUZA, QUE APENAS SALE DE LA PROVINCIA DE SEVILLA. LO QUE SI HAY SON ELEMENTOS QUE VAN ENLAZANDO SUCESIVAMENTE UNAS ZONAS CON OTRAS, Y ESO PUEDE PERMITIR HABLAR DE UNA CASA ANDALUZA EN LA QUE DIFICILMENTE SE ENCONTRARIA UN RASGO COMUN A TODAS LAS ZONAS.



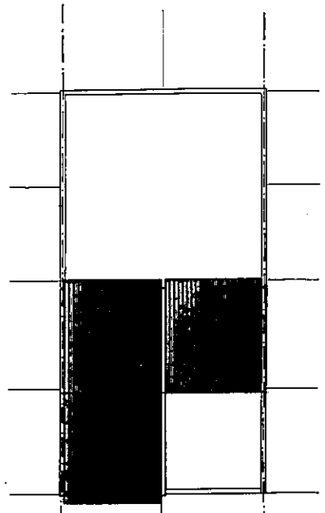


-ES UNA CASA DE DIMENSIONES MAS BIEN REDUCIDAS, POR INFLUENCIA ARABE, Y GENERALMENTE DE DOS PLANTAS, LA SEGUNDA DE LAS CUALES UNAS VECES ES EL GRANERO (DOBLAO, SOBERADO).
-LA VIVIENDA ANDALUZA VA SIEMPRE ENCALADO POR DENTRO Y POR FUERA, Y SOBRE EL BLANCO DE LA-FACHADA DESTACA LA PORTADA RESALTADA Y VENTANAS GRANDES, CON REJAS SOBRESALIENDO DEL PLANO DE LA FACHADA, APOYADAS SOBRE UN ZOCALO SALIENTE.
-EL PATIO, CASI SIEMPRE INDIVIDUAL, ES OTRA CONSTANTE DE ESTE TIPO DE VIVIENDA.

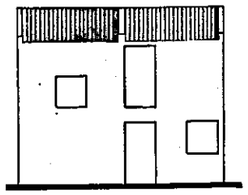
-SU ELEMENTO MAS CARACTERISTICO ES EL TERRADO PLANO DE LA CUBIERTA QUE ES DE LAUNA (ARCILLA MAGNESIANA).
-AUNQUE TAMBIEN LAS HAY DE UNA PLANTA, LAS EDIFICACIONES MAS COMUNES SON DE DOS PLANTAS, GRANDES CHIMENEAS Y HUECOS PEQUEÑOS O MEDIANOS.
-EL ENCALADO, AUNQUE MUY GENERALIZADO ES POBRE Y DESCUIDADO Y SE APLICA DIRECTAMENTE SOBRE EL MAMPUESTO.
-LA SUPERFICIE DEL TEJADO ES UN PLANO CONTINUO Y LOS MUROS ESTRUCTURALES NO SOBRESALEN.

-CONSTRUCCIONES COMPACTAS, SIN PATIO, RECTANGULARES, DE CUBIERTA EN TERRAZA PLANA Y CARENTES DE MOTIVOS ORNAMENTALES. EL ACCESO ES DIRECTO, SIN ZAGUAN Y LA PRIMERA HABITACION ES UNA ESPECIE DE COCINA,COMEDOR Y CUARTO DE ESTAR A UN TIEMPO.
=EL ELEMENTO QUIZA MAS CARACTERISTICO DE ESTA-VIVIENDA,EL TECHO, ES PLANO Y DE TIERRA APISONADA.
-LA CUBIERTA ESTA FORMADA POR ROLLIZOS DE MADERA SIN LABRAR, ENCIMA DE LOS CUALES SUELE COLOCARSE UNA ALFOMBRA DE CANIZOS.

PLANTA DE CUBIERTAS



VISTA ANTERIOR



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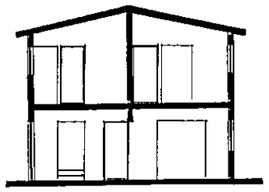
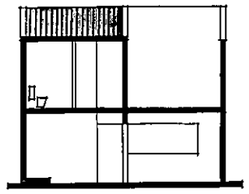
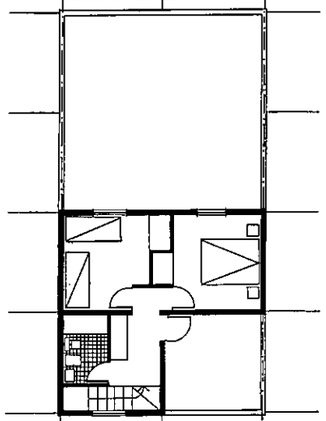


VISTA POSTERIOR

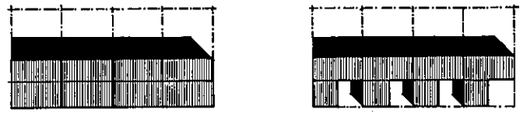
SECCION



PLANTA SUPERIOR: 3 MODULOS

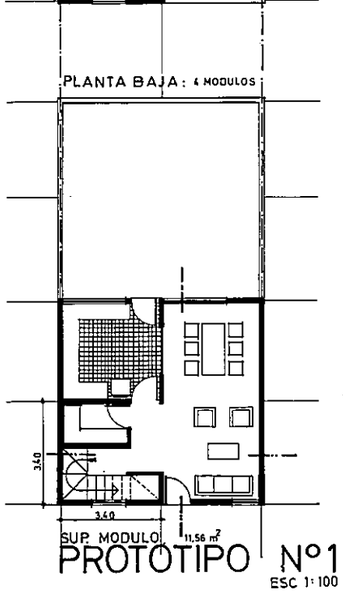


AGRUPAMIENTOS PROPUESTOS



VISTAS AGRUPAMIENTOS

PLANTA BAJA: 4 MODULOS

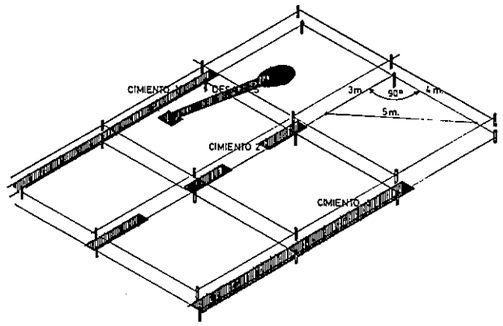


SUP. MODULO 11,56 m²

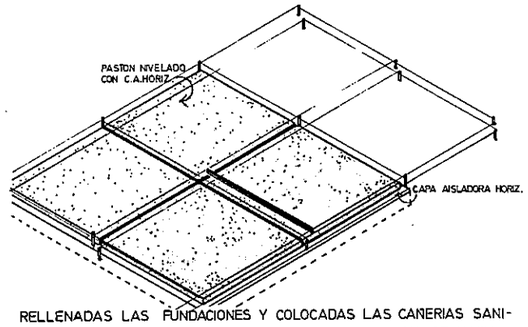
PROTOTIPO Nº1

ESC 1:100

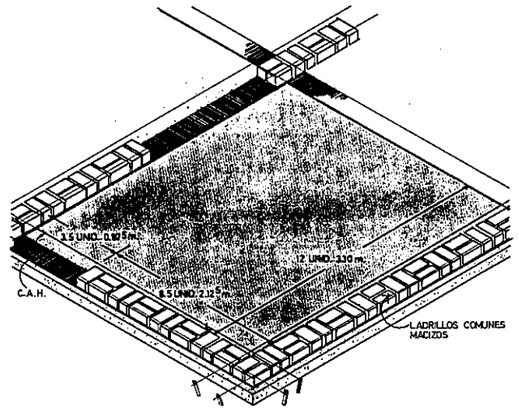
ETAPAS BASICAS EN LA OBRA DE AUTOCONSTRUCCION DE VIVIENDAS



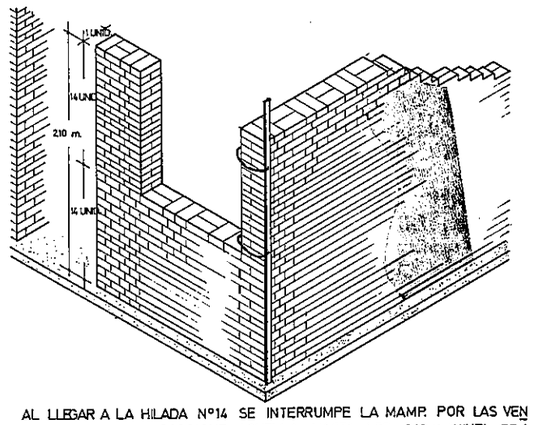
REPLANTEAR EL TERRENO MARCANDO LOS MODULOS, CLAVANDO ESTACAS O CONSTRUYENDO UN CORRAL. SE MATERIALIZAN LOS EJES Y ANCHOS DE / MUROS. SE EXCAVAN LOS CIMIENTOS Y LOS CONDUCTOS PARA DESAGÜES



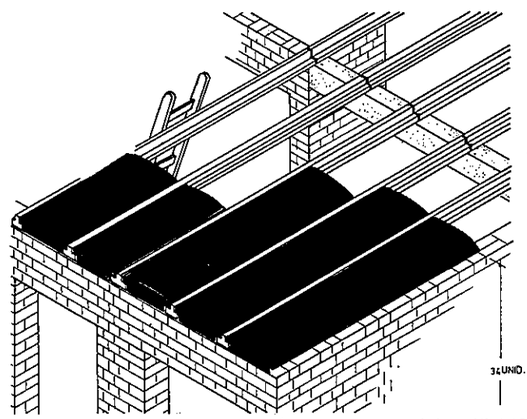
RELLENADAS LAS FUNDACIONES Y COLOCADAS LAS CAÑERIAS SANITARIAS, SE COMPLETA LA MAMPOSTERIA DE FUNDACION, SE HACE / LA CAPA AISLADORA HORIZONTAL Y SE CONSTRUYE EL CONTRAPISO



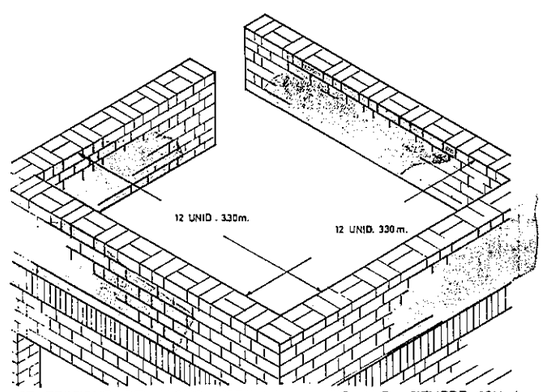
SE COLOCAN GUIAS NIVELADAS DE ACUERDO A LA ALTURA DE CADA / HILADA (LADRILLO + MORTERO), DEJANDO LOS VANOS PARA POSTERIOR MENTE COLOCAR LAS RESPECTIVAS CARPINTERIAS



AL LLEGAR A LA HILADA Nº14 SE INTERRUMPE LA MAMP. POR LAS VENTANAS, LUEGO SE PROSIGUE AQUELLA HASTA LOS 2.10 m. (NIVEL DE / LOS DINTELES)



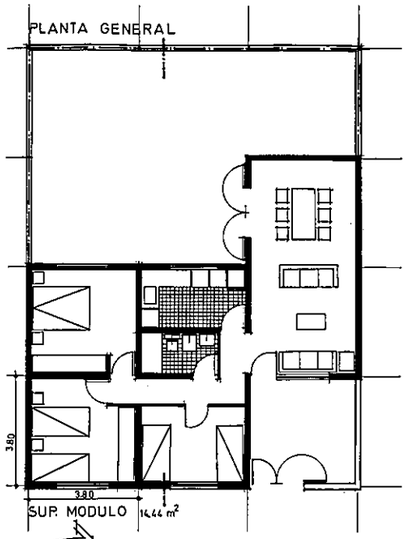
AL LLEGAR A LA HILADA Nº34 (1º PLANTA) DEBERAN COLOCARSE LAS PIEZAS DEL FORJADO (VIGUETAS Y BOVEDILLAS) PARA LUEGO PROCEDER A HORMIGONAR LA CAPA DE COMPRESION



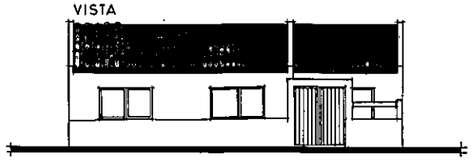
SE PROSIGUE DEL MISMO MODO EN LA 2º PLANTA, SIEMPRE CON / 12 UNIDADES POR CADA LADO DEL MODULO Y ASEGURANDO QUE EN HILADA SE PRODUZCA TRABA

PROTOTIPO Nº2
esc. 1:100

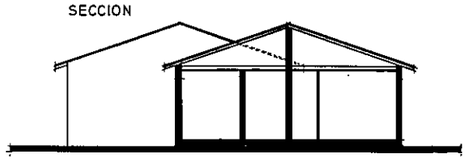
PLANTA GENERAL



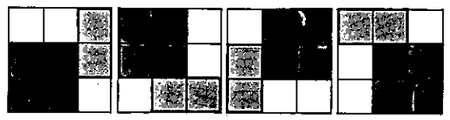
VISTA

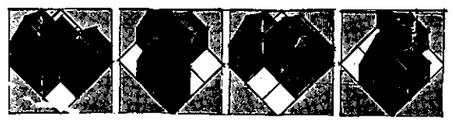


SECCION

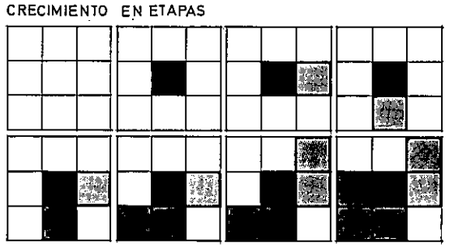


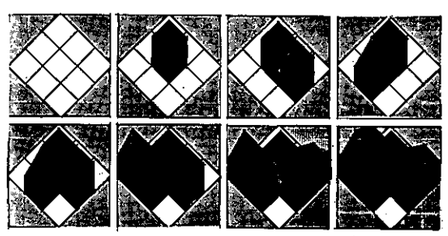
POSIBILIDAD DE ROTACION



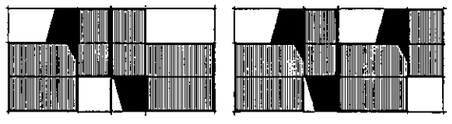


CRECIMIENTO EN ETAPAS





AGRUPAMIENTO PROPUESTO



VISTA AGRUPAMIENTO

AGRUPAMIENTO PROPUESTO

VISTA AGRUPAMIENTO

TECNOLOGIA

FASES DE LA OBRA DE AUTOCONSTRUCCION

(1) REPLANTEO: TRAZADO DE LOTE Y DE VIVIENDA, UTILIZANDO PARA ESCUADRAR EL TRIANGULO 3, 4, 5.

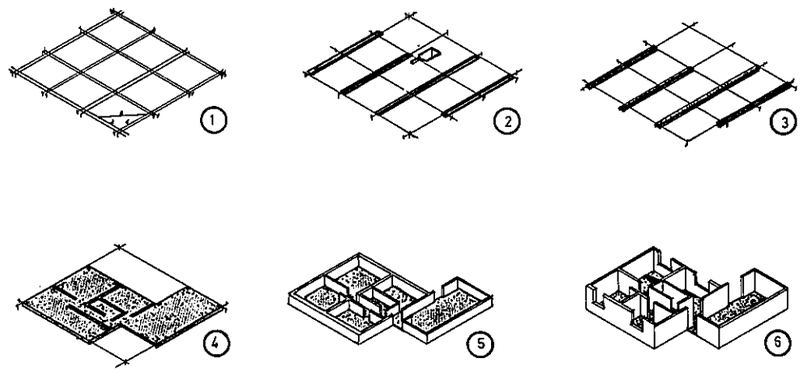
(2) EXCAVACION DE CIMIENTOS Y DEL SANEAMIENTO.

(3) CIMENTACION Y COLOCACION DE CAÑERIA DE SANEAMIENTO.

(4) CONTRAPISO Y REPLANTEO DE TABIQUES.

(5) ELEVACION DE MUROS HASTA ANTEPECHOS DE VENTANAS.

(6) ELEVACION DE MUROS HASTA DINTELES.



(7) ELEVACION DE MUROS HASTA CUBIERTA.

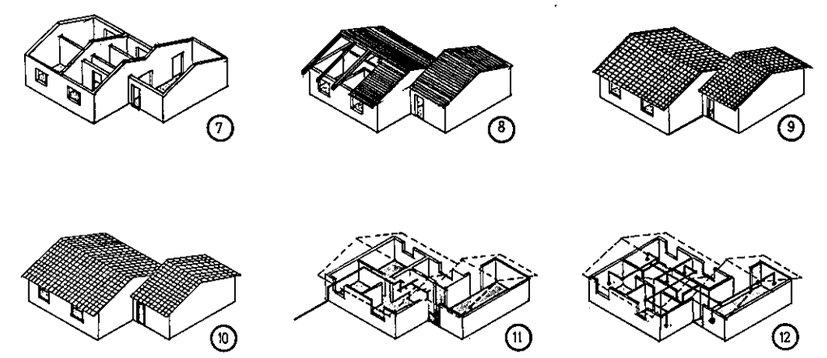
(8) COLOCACION DE VIGAS DE MADERA Y ENTABLONADO.

(9) COLOCACION DE AISLACIONES Y TEJAS.

(10) COLOCACION DE MARCOS Y CELOSIAS EXTERIORES DE PROTECCION.

(11) INSTALACION SANITARIA.

(12) INSTALACION ELECTRICA.



(13) INSTALACION DE GAS.

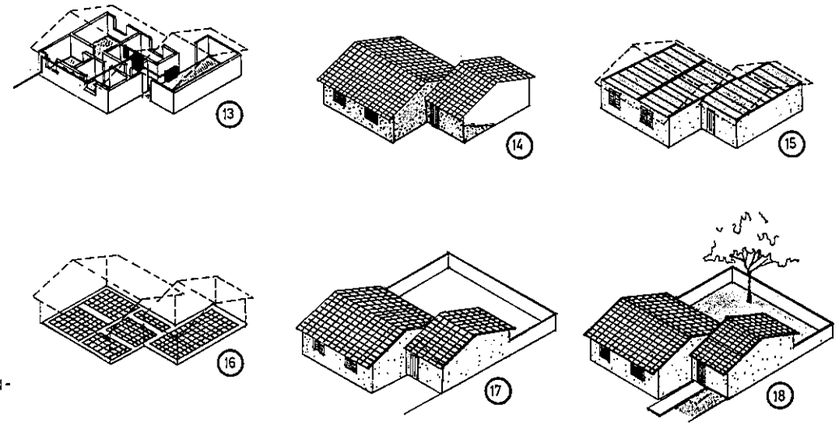
(14) REVOCOS EXTERIORES, INTERIORES Y REVESTIMIENTOS EN SERVICIO Y COCINA.

(15) COLOCACION DE CIELORRASO SUSPENDIDO.

(16) COLOCACION DE SOLADOS.

(17) CONEXION Y HABILITACION DE LOS SERVICIOS.

(18) TERMINACIONES GENERALES, PINTURA, CAMINERIA EXTERIOR, CRISTALES, ETC.



00000003

PLANTA DE CUBIERTAS

PLANTA BAJA: 4 MODULOS

PLANTA SUPERIOR: 3 MODULOS

380

380

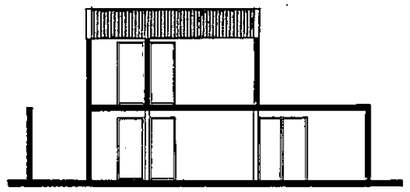
SUP. MODULO: 14,44 m²

PROTOTIPO Nº3

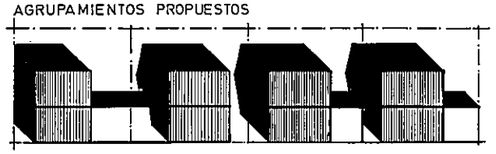
ESC. 1:100

VISTA ANTERIOR

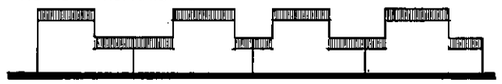
VISTA POSTERIOR



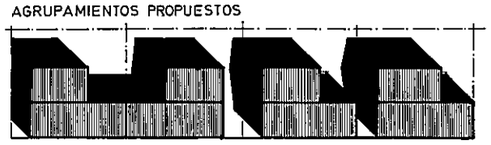
AGRUPAMIENTOS PROPUESTOS



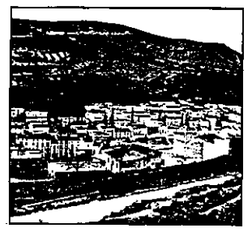
VISTAS AGRUPAMIENTO



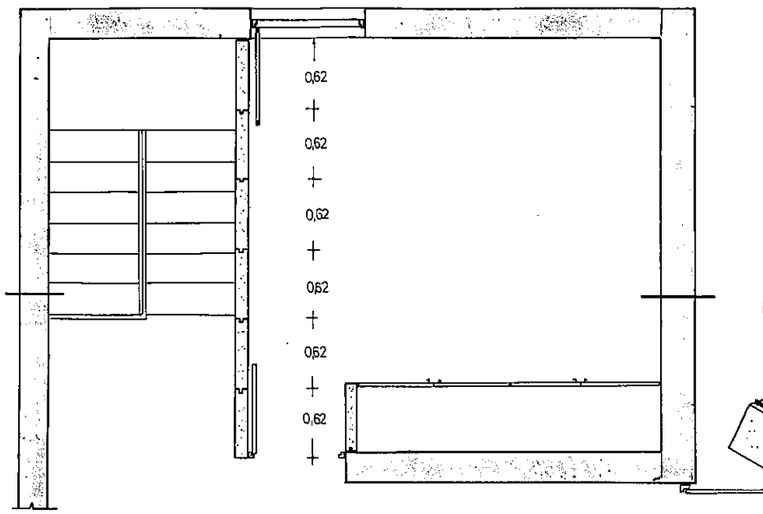
AGRUPAMIENTOS PROPUESTOS



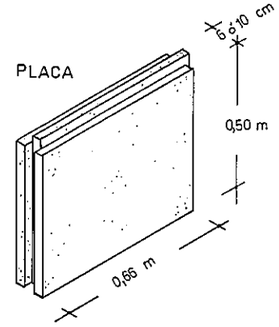
VISTAS AGRUPAMIENTO



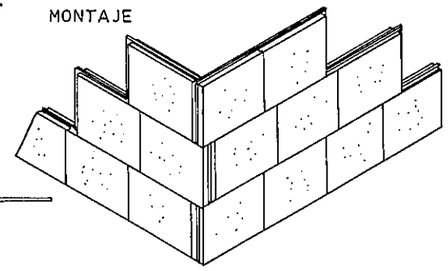
PLANTA SUPERIOR



PLACA



MONTAJE

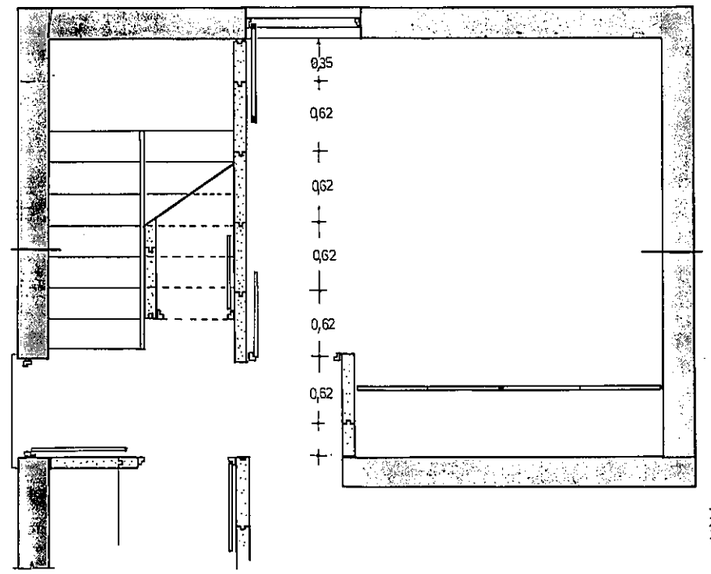


SISTEMA DE PLACAS DE YESO DE 0,66 x 0,50 x 0,06 á 0,10 M. QUE SE ENCASTRAN ENTRE SI POR MEDIO DE UN MACHIEMBRADO.

SE COLOCAN EN HILADAS SUCESIVAS COMO CUAQUIER MAMPUESTO, UTILIZANDOSE UN PEGAMENTO QUE FORMA PARTE DELSISTEMA.

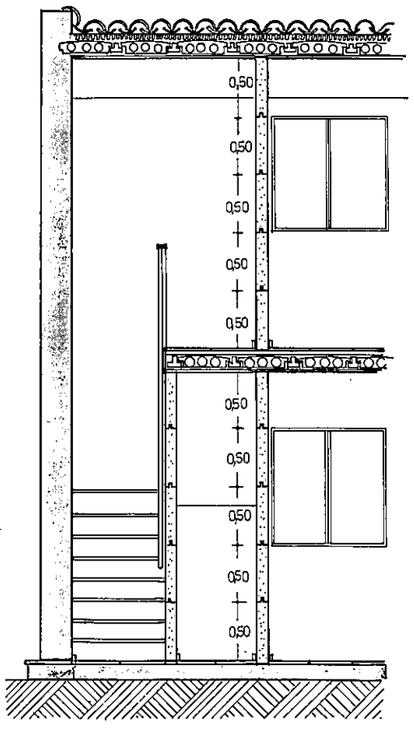
SE OBTIENE UN TABIQUE DE BUENA CALIDAD DE TERMINACION SUPERFICIAL Y ADECUADA AISLACION ACUSTICA.

PLANTA BAJA



ALTERNATIVA DE TABIQUE INTERIOR NO PORTANTE
ESC. 1:25

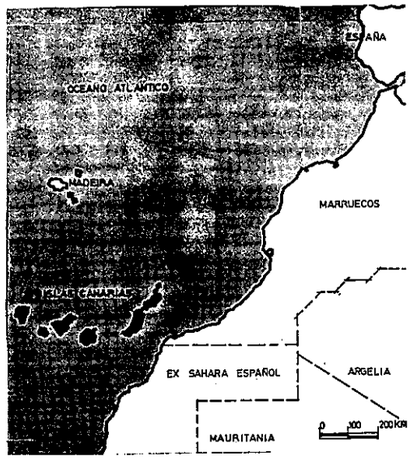
SECCION



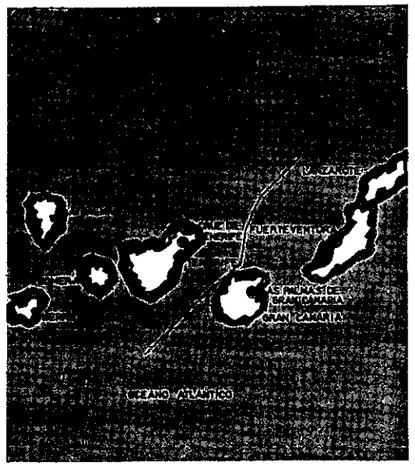
TECNOLOGIA

PROTOTIPOS VIVIENDAS CANARIAS

MARCO SITUACIONAL



EL ARCHIPIELAGO CANARIO ESTA SITUADO AL NOROESTE DEL CONTINENTE AFRICANO EN SU ZONA SUBTROPICAL, DISTANCIADO 100 KM DE AFRICA Y A 1.000 KM DE CADIZ. SIETE ISLAS PRINCIPALES Y SEIS ISLOTES SON LAS ISLAS CANARIAS, CON UNA SUPERFICIE DE 7.541 KM2, CON 1.444.626 HABITANTES, CON UNA DENSIDAD DE 191 HAB/KM2 Y CON UNA TASA DE CRECIMIENTO ANUAL DE 2,5%.
LA SITUACION ESTRATEGICA DE LAS ISLAS LAS CONVIERTE EN UN LEGIADO DE LAS RUTAS ENTRE EUROPA, AMERICA Y AFRICA.
LA POSICION GEOGRAPICA, LA PEQUEÑEZ Y EL FRACCIONAMIENTO DEL TERRITORIO, LA ESCASEZ DE RECURSOS NATURALES, LA SUPERPOBLACION Y DESEQUILIBRADA DISTRIBUCION POBLACIONAL, LAS ELEVADAS TASAS DE CRECIMIENTO VEGETATIVO Y LA CONSTITUCION FISICA INSULAR, FIGURAN ENTRE LOS FACTORES MAS DETERMINANTES DE LA REALIDAD CANARIA.
EN 25% DE LA SUPERFICIE ES IMPRODUCTIVA (LA MEDIA NACIONAL ES DE 6 A 10%) DEBIDO AL ORIGEN VOLCANIDO, LO QUE GENERA FALTA DE RECURSOS NATURALES Y MATERIAS PRIMAS.
EL DESPLAZAMIENTO DEL MEDIO RURAL ES ALARMANTE. LA CONSTRUCCION Y EL TURISMO FUERON UNA ALTERNATIVA. SOLO LAS ZONAS DE CULTIVOS DE EXPORTACION (PLATANOS, FLORES, PRODUCTOS TROPICALES DE INVERNADERO, ETC:) SIGUEN GENERANDO MEDIOS. LA INDUSTRIA ES INSIGNIFICANTE.
EL AGUA ES ESCASA Y UNO DE LOS MAYORES DESAFIOS A RESOLVER. LA VIVIENDA ES OTRO PROBLEMA, CON HACINAMIENTOS EN MAS DEL 4%, VIVEN TRES Y MAS PERSONAS POR HABITACION, MIENTRAS QUE LA MEDIA ESTATAL APENAS LLEGA AL 1%.



LAS ISLAS CANARIAS ESTAN ORGANIZADAS EN DOS PROVINCIAS:
- LAS PALMAS: CONFORMADA POR GRAN CANARIA, FUERTEVENTURA Y LANZAROTE:
GRAN CANARIA, DONDE ESTA LA CAPITAL (611.435 HAB) - POSEE UNIVERSIDAD, AEREOPUERTO INTERNACIONAL Y UNO DE LOS PUERTOS DE MAYOR TRAFICO.
FUERTEVERNTURA: SU POBLACION SE DEDICA PRINCIPALMENTE A LA PESCA POR SU PROXIMIDAD AL BANCO SAHARIANO. PUERTO Y AEREOPUERTO.
LANZAROTE: ES LA ISLA MAS SEPTENTRIONAL Y MENOS MONTAÑOSA. SU CLIMA ES MUY ARIDO Y SU SUELO ES MUY VOLCANICO.
- SANTA CRUZ DE TENERIFE: CONFORMADA POR TENERIFE, LA PALMA, LA GOMERA Y HIERRO.
TENERIFE: ES LA ISLA MAS EXTENSA, ES DE ORIGEN VOLCANICO Y SE HALLA EL PICO MAS ALTO DE ESPAÑA (EL TEIDE(3.710 MTS). TIENE UNIVERSIDAD, PUERTO IMPORTANTE Y DOS AEREOPUERTOS.
LA PALMA: ES LA MAS OCCIDENTAL DEL ARCHIPIELAGO, DE ORIGEN VOLCANICO, ES LA FAVORECIDA EN CUANTO A LLUVIAS.
LA GOMERA: ES LA ISLA MAS MONTAÑOLA. SU ECONOMIA SE BASA EN EL CULTIVO DE REGADIOS DE PLATANOS Y TOMATES
EL HIERRO: ES LA MAS PEQUEÑA (278 KM2). SUS COSTAS SON ACANTILADAS. CLIMA ARIDO, POCAS LLUVIAS.





OBJETIVOS

-TRABAJO DE INVESTIGACION APLICADA DIRIGIDO A LA DEFINICION DE TRES PROTOTIPOS DE VIVIENDAS URBANAS (UNIDADES MODELICAS SISTEMATIZADAS), DE BAJO COSTO, QUE SINTETICEN TIPOLOGIAS ARQUITECTONICAS REGIONALES, EN CUANTO A FUNCION, MORFOLOGIA Y TECNOLOGIA.

-LAS PROPUESTAS, MATERIALIZABLES MEDIANTE FORMULAS DE AUTOCONSTRUCCION, DEBERAN APORTAR A LO TRADICIONAL MEJORAS EN LAS ACTUACIONES DE ESTE TIPO, DE GRAN ARRAIGO EN ESTE AMBITO TERRITORIAL.

-ACABADO DISEÑO CONCEPTUAL DE LAS EDIFICACIONES Y DE LAS PROPUESTAS DE CONJUNTOS QUE, SIN EXCLUIR OTROS FACTORES, PROPONGA TECNICA Y RESOLUCIONES SENCILLAS, ORDEN EN LA EJECUCION DE LA OBRA Y FORMA DE REPRESENTACION COMPRENSIBLE AL NIVEL DEL USUARIO/CONSTRUCTOR.

-CALIDAD HABITACIONAL Y TECNICA, POR INCORPORACION DE MATERIALES ADECUADOS, UTILIZANDO TECNOLOGIA PROBADA E INCORPORANDO COMPONENTES INDUSTRIALIZADOS, CUANDO ESTOS SE JUSTIFIQUEN EN TERMINOS DE SIMPLICIDAD, RENDIMIENTO Y COSTOS.

PREMISAS

-ADECUACION A LAS NECESIDADES DE LA POBLACION DESTINATARIA Y SUS POSIBILIDADES ECON. Y FINANCIERAS.

-ADECUACION A LOS CONDICIONANTES TIPOLOGICOS Y TECNOLOGICOS DE LA ZONA.

-CONSIDERACION DE LAS POSIBILIDADES DEL USUARIO MEDIANTE FORMULAS DE AUTOCONSTRUCCION.

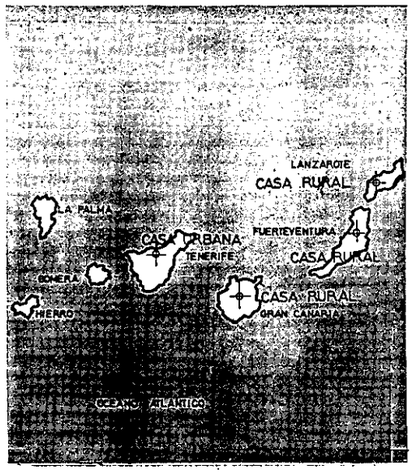
-POSIBILIDAD DE INTRODUCCION DE ELEMENTOS INDUSTRIALIZADOS.

-RESPETO Y DEFINICION DEL ENTORNO FISICO Y/O URBANISTICO SEGUN CADA LOCALIZACION RESPECTIVA.

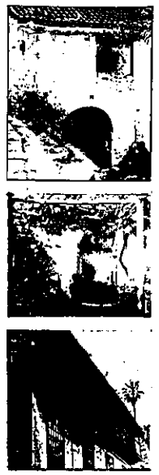
-EL PROGRAMA ARQUITECTONICO SE BASARA EN LA LEGISLACION VIGENTE RESPECTIVA: REAL DECRETO SOBRE PROMOCIONES SOCIALES DE V.P.O. AUTOCONSTRUCCION TUTELADA Y VIVIENDAS EN EL MEDIO RURAL Y LEGISLACION DE VIVIENDAS DE PROTECCION OFICIAL. MINISTERIO DE OBRAS PUBLICAS Y URBANISMO ORDENANZA D/4:
VIVIENDA 2 DORMITORIOS:50 M2 A 70 M2
VIVIENDA 3 DORMITORIOS:60 M2 A 90 M2
VIVIENDA 4 DORMITORIOS:70 M2 A 90 M2

00000004

CANARIAS "VENCER A LOS ELEMENTOS"

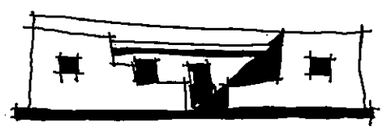


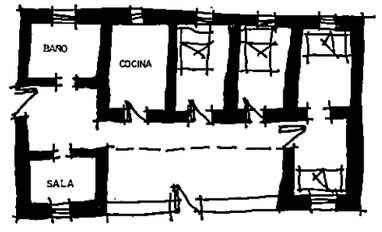
"VENCER A LOS ELEMENTOS".DESDE LOS LEGENDARIOS GUANCHES,EL HOMBRE CANARIO SE HA VISTO OBLIGADO A SUPERAR LAS LIMITACIONES SECULARES DEL ARCHIPIELAGO. EL CLIMA, LA ESCASEZ DE AGUA Y DE LOS MATERIALES DE CONSTRUCCION HABITUALES EN LA PENINSULA, HAN DADO ORIGEN A UNA ARQUITECTURA POPULAR - QUE, JUNTO A LA CAL, EMPLEA PIEDRAS BASALTICAS, TOBAS,TOSCAS VOLCANICAS- Y TRONCOS DE PALMERA... EN UNA IMAGINATIVA Y SORPRENDENTE ADAPTACION AL-MEDIO.
EN MATERIA ARQUITECTONICA,CASI TODO ES POPULAR EN CANARIAS.
CON POCA ARCILLA,ESCASA AGUA, ESCASISIMA MADERA, MUY CONTADOS ELEMENTOS, CONSIGUE HACER INSOLITAS COMBINACIONES AUN DEFENDIENDOSE DE LOS RIGORES-NATURALES, EL ARQUITECTO POPULAR CANARIO CONSTRUYE CASAS QUE SE ABREN AL EXTERIOR. EN LATIFUNDIOS Y MINIFUNDIOS, DE LA HACIENDA HIDALGA COLONIAL A LA CASA DEL PEON, NOS ENCONTRAMOS CON UNA GRAN TIPOLOGIA BLANCA O DE - GRISES PIEDRAS BASALTICAS, MADERA DONDE LA HAY, TEJA SI QUEDA, ARCILLA , CAL DONDE ES POSIBLE, GRUESOS MUROS, SENCILLOS VOLUMENES SIEMPRE INTEGRADOS CON EL PAISAJE QUE EN ELLOS PENETRA GRACIAS A LOS INCOMPARABLES RECINTOS CONSTRUCTIVOS QUE DIBUJAN PATIOS CON FORMA DE "C" O CON FORMA DE "L". UNA MISMA Y UNIVERSAL TIPOLOGIA CON ALGUNAS VARIACIONES EN LANZAROTE Y FUENTEVENTURA.
CON NO POCAS AMENAZAS SOBREVIVE LA CASA POPULAR, FUNDAMENTALMENTE SIMILAR EN TODAS LAS ISLAS, YA SEA CAMPESINA, URBANA O MARINERA. COMO TAMBIEN PUEDAN CUEVAS HABITADAS INCLUSO, Y ALGUN OTRO TIPO DE CONSTRUCCION DEL PUEBLO.

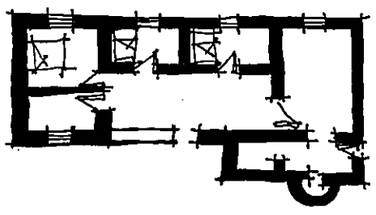
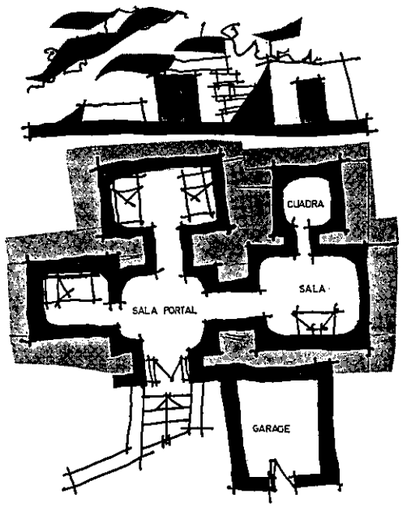










LA CASA RURAL, HA TENIDO QUE ADAPTARSE TAMBIEN A LOS POCOS MATERIALES,PIEDRA,MADERA Y BARRO.
LA PIEDRA ES GENERALMENTE BASALTICA, OSCURA.
SE USA EN MAMPOSTERIA CON BARRO, AL QUE A VECES SE AÑADE PAJA. DADA LA ESCASEZ Y MALA - CALIDAD DE LAS ARCILLAS, EN LUGAR DE LADRILLOS Y TAPIALES SE EMPLEAN TOBAS O TOSCAS VOLCANICAS. ARCILLAS PARA TEJAS.
SE DISPONEN EN MODULOS.LOS MATERIALES CONDICIONAN LA IMPLANTACION DE SOLIDOS MUROS DE - MAMPOSTERIA DE PIEDRA DEL LUGAR LA DISPOSICION DE LOS MODULOS ES EN PLANTA RECTANGULAR- EN TANTO EN CUANTO LAS PAREDES SON NECESARIAMENTE MUROS DE CARGA.LAS CUBIERTAS PUEDEN SER TERRIZOS INCLINADOS SIN TEJA LOS HUECOS, RECTANGULARES Y ALARGADOS SE DISPONEN, SIGUIENDO NORMAS SIMETRICAS.
HAY PORCHE O EMPORRADO, PUES EL EXTERIOR TIENE GRAN IMPORTANCIA ORIENTADAS AL SUR, PARA EVITAR VIENTO DEL NORTE.

- PREDOMINIO DE LAS VIVIENDAS DE UNA SOLA PLANTA.
- CASA CRECEDERA A PARTIR DE MODULOS INICIALES, ACABANDO EN CONJUNTOS QUE SE DISPONEN EN "L" O "C", ALREDEDOR DE UN PATIO CENTRAL.
- LOS HUECOS CONVENCIONALES SON ESCASOS: PUERTA Y ALGUNA VENTANA.
- MUROS DE PIEDRA, FIRME SOSTEN DE CUBIERTAS- PLANOS O INCLINADOS.
BLANCO SOBRE EL OSCURO TERRENO VOLCANICO.
- LA DE FUENTEVENTURA, ES CASI DEL MISMO - COLOR DEL SUELO, PORQUE EL MURO DE PIEDRA DEL LUGAR SE DEJA AL AIRE .
- HABITACIONES PLANTA CUADRADA, ALBEADAS EN SU INTERIOR.
- EN AMBAS ISLAS, LAS CARPINTERIAS DE LOS HUECOS, SIEMPRE DE FORMA RECTANGULAR VERTICAL, - SE COLOREAN DE VERDE O AZUL CLARO.
- CHIMENEAS (LANZAROTE) ELEMENTO DISTINTO Y ORIGINAL.

LA CUEVA CANARIA DE HABITACION NO DEJA DE PARECERSE A LA VIVIENDA POPULAR CONSTRUIDA.
FRISO RECTO, HUECOS RECTANGULARES, REMATE SUPERIOR DE MOLDURA PARA IMPEDIR QUE EL AGUA DE LLUVIA INUNDE LA ENTRADA.
LA COCINA TAMBIEN OFRECE SEMEJANZA CON LA CASA NORMAL:
CASI SIEMPRE QUEDA FUERA, YA SEA EN OTRA PEQUEÑA CUEVA O EN UN EDIFICIO AÑADIDO .
LOS TECHOS DESCRIBEN LEVES BOVEDAS Y POSEEN - ESQUINAS DE ANGULOS MATADOS.

PLANTA DE CUBIERTA

PLANTA BAJA 4 MODULOS

PLANTA ALTA 5 MODULOS

3.10

3.10

SUP. MODULO 9.61 m²

VISTA ANTERIOR

SECCION

VISTA POSTERIOR

SECCION

AGRUPAMIENTOS PROPUESTOS

VISTAS AGRUPAMIENTOS

AGRUPAMIENTOS PROPUESTOS

VISTAS AGRUPAMIENTOS

PROTOTIPO Nº 1

ESC. 1:100

SISTEMATIZACION DE ELEMENTOS-UNIDADES A PARTIR DEL MODULO 3.00 m. x 3.00 m.

esc. 1:25

3,00 MTS.

2 UNID.

2 UNID.

2 UNID

8 1/2 UNIDADES

2 UNID.

2 UNID.

2 UNID.

4 1/2 UNID.

Ⓓ DINTEL PREFABRICADO

BLOQUES DE HORMIGON COMPRIMIDO

ANTEPECHO O O ALFEIZAR PREFABRICADO

+5,50

9

8 UNID.

+2,80

11

Ⓓ

9 UNID.

5 UNID.

+0,10

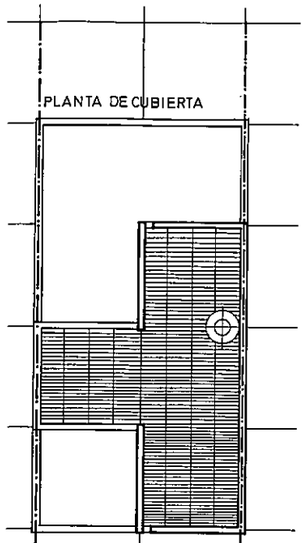
TECNOLOGIA

PROTOTIPOS VIVIENDAS CANARIAS

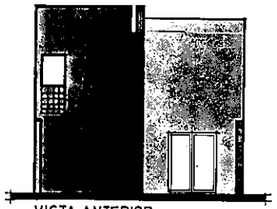
PROTOTIPO Nº2

ESC. 1:100

PLANTA DE CUBIERTA



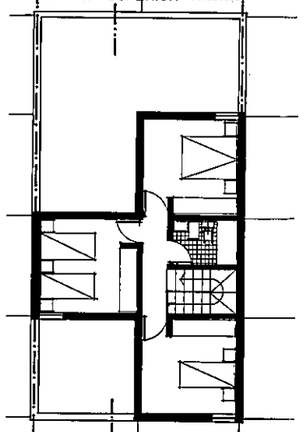
VISTA POSTERIOR



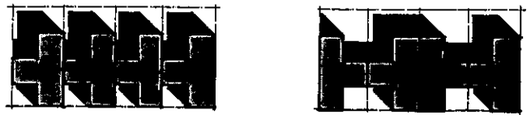
VISTA ANTERIOR

SECCION

PLANTA SUPERIOR 4 MODULOS



AGRUPAMIENTOS PROPUESTOS

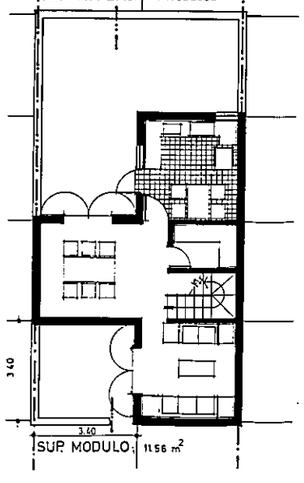


VISTAS AGRUPAMIENTOS

AGRUPAMIENTOS PROPUESTOS

VISTAS AGRUPAMIENTOS

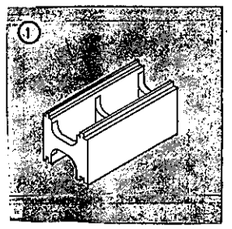
PLANTA BAJA 4 MODULOS

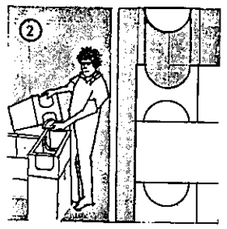


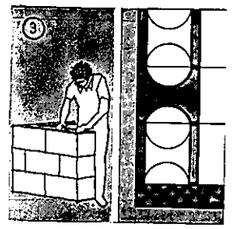
00000005

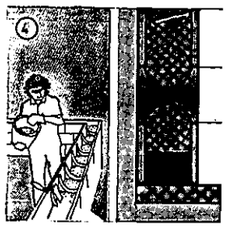
SUP MODULO: 11.56 m²

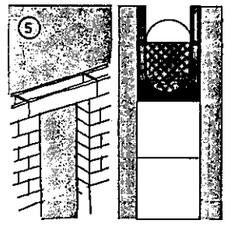
TECNOLOGIA

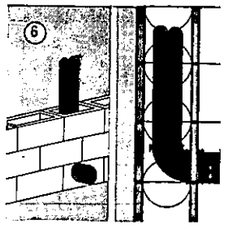


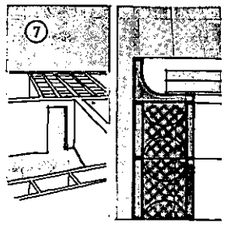












(1) ENCOFRADOS PERDIDOS AISLANTES DE POLIESTIRENO EXPANDIDO DE 25x 25x 50 CM., ENCASTRABLES ENTRE SI.
K TERMICO = 0,25 KCAL / H.M² ºC
AISLACION ACUSTICA = 48 DB / M²

(2) SE COMIENZA COLOCANDO LAS PIEZAS AL IGUAL QUE BLOQUES HUECOS Y ENCASTRANDOLAS ENTRE SI Y CERRANDO LAS UNIONES Y ESQUINAS CON PIEZAS AL EFECTO.

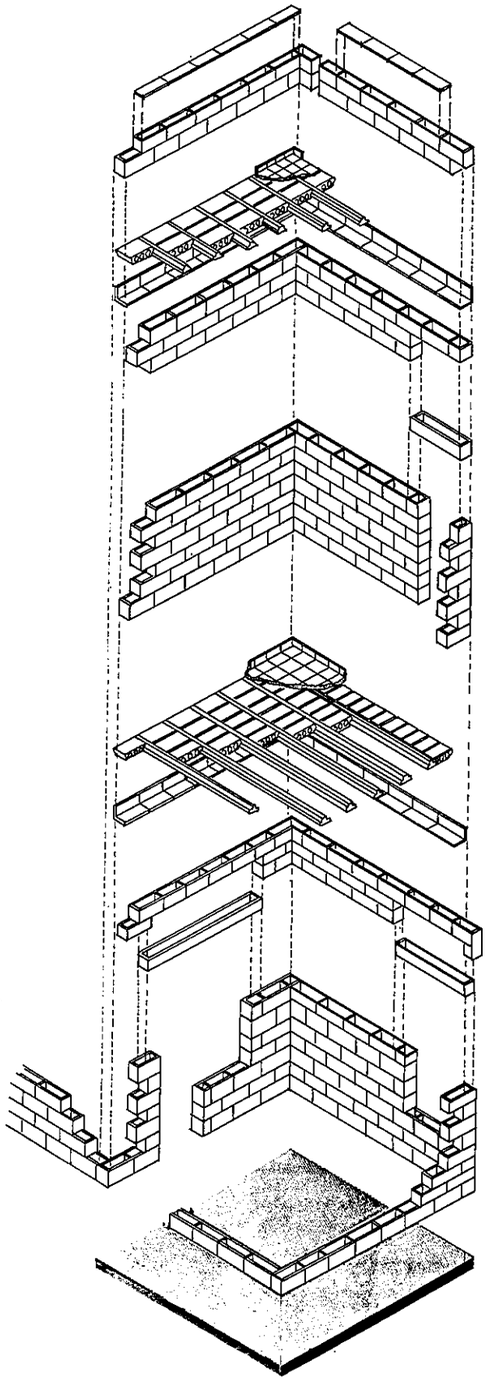
(3) COLOCAR TRES HILADAS ANTES DE EMPEZAR EL VERTIDO DE HORMIGON.

(4) SE COLOCA UNA PRIMERA CAPA DE 10 CM. DE HORMIGON CON UN HIDROFUGO.

(5) LUEGO SE CONTINUA LLENANDO CON HORMIGON SIMPLE EN DOSIFICACION NORMAL HASTA EL NIVEL DE UN PISO. EXISTEN ELEMENTOS PARA DINTEL.

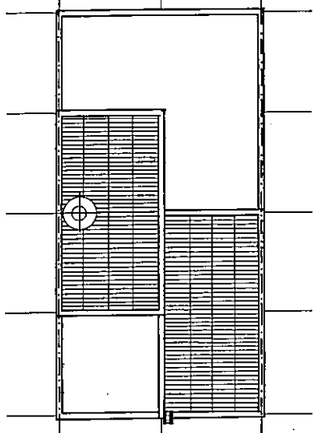
(6) SE DEBEN UBICAR LOS CONDUCTOS ANTES DE LLENAR. LAS CAÑERIAS DE MENOR DIAMETRO SE ALOJAN EN LA PARED INTERIOR DE POLIESTIRENO DE 5 CM. DE ESPESOR.

(7) AL DIA SIGUIENTE DE LLENADO DEL PRIMER NIVEL, SE COLOCA EL FORJADO Y SE SIGUE CON EL PISO SUPERIOR. ADMITE LA APLICACION DE YESO AL INTERIOR Y AL EXTERIOR UN ENFOSCADO APLICADO A UNA MALLA DE ALAMBRE.

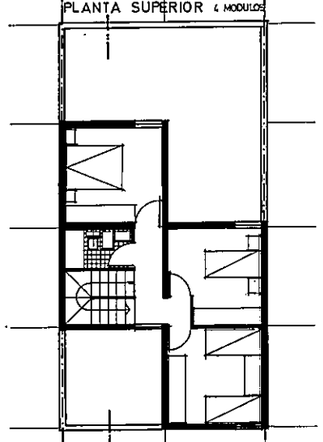


ALTERNATIVA DE NUEVA TECNOLOGIA CONSTRUCTIVA : ENCOFRADO
NO RECUPERABLE
AISLANTE

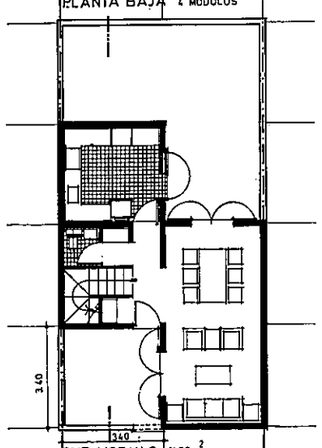
PLANTA DE CUBIERTA



PLANTA SUPERIOR 4 MODULOS

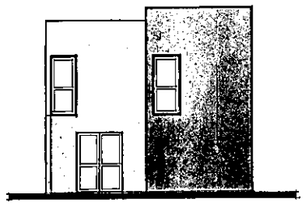


PLANTA BAJA 4 MODULOS

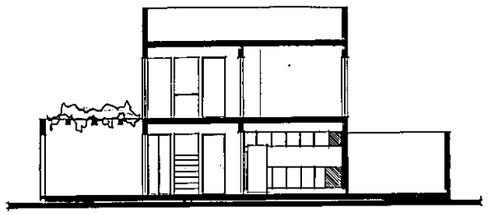


SUP. MODULO 11,56 m²

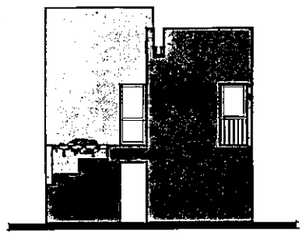
VISTA ANTERIOR



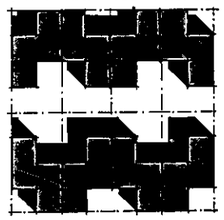
SECCION

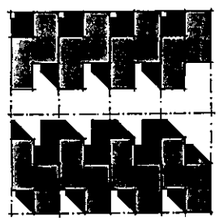


VISTA POSTERIOR



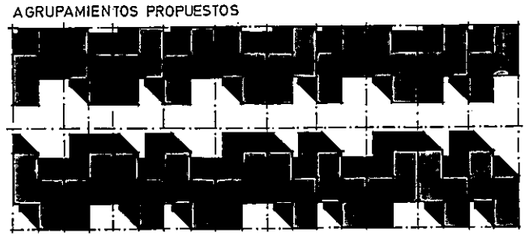
AGRUPAMIENTOS PROPUESTOS





VISTAS AGRUPAMIENTOS

AGRUPAMIENTOS PROPUESTOS



VISTAS AGRUPAMIENTOS

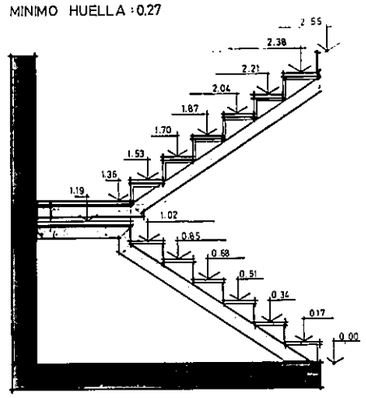
PROTOTIPO Nº 3
ESC 1:100

LEGISLACION DE VIVIENDAS DE PROMOCION OFICIAL

M O P U

D4/ ORDENANZA 19 ESCALERAS ESC. 1:25

ANCHO DE PASO : 0.85
ANCHO DE OJO : 0.10
MAXIMO CONTRAHUELLA : 0.19
MINIMO HUELLA : 0.27



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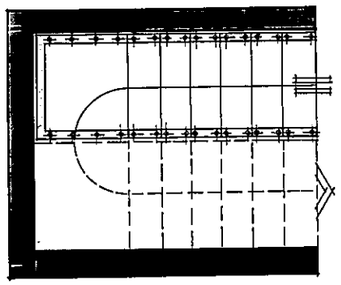
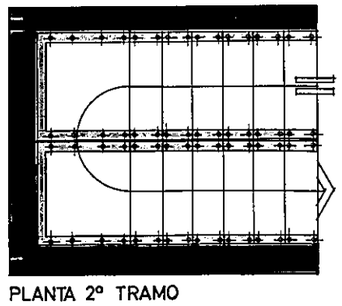
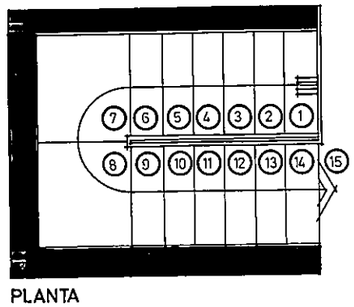


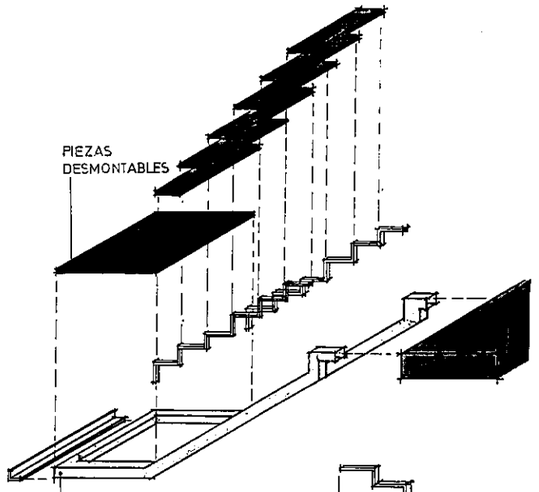
PLANTA 1º TRAMO



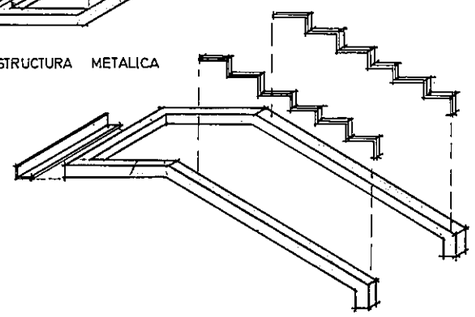
PLANTA 2º TRAMO

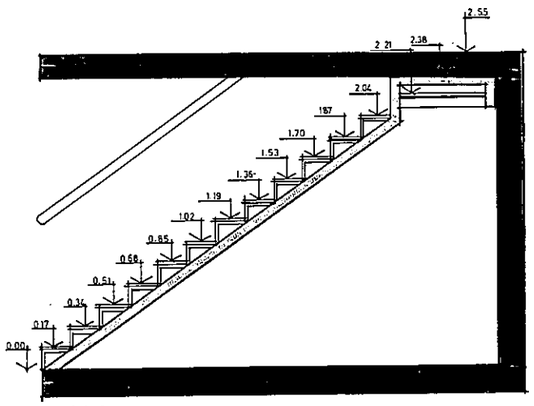


PLANTA



ESTRUCTURA METALICA





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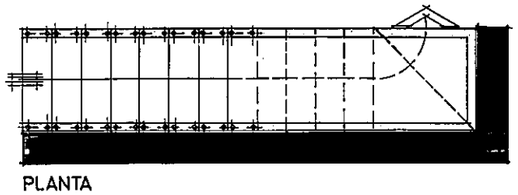

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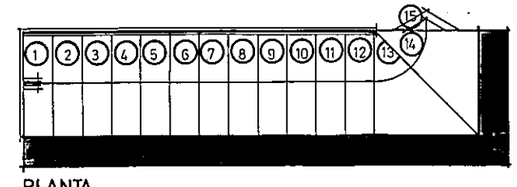
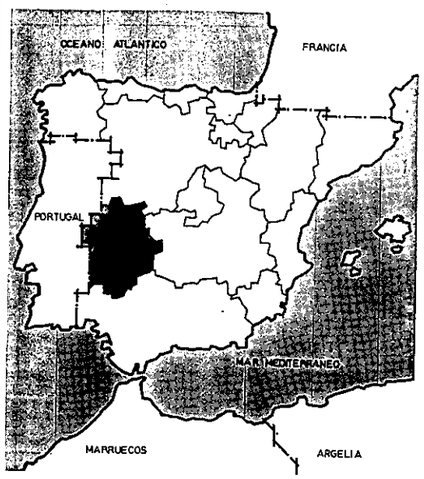


PLANTA

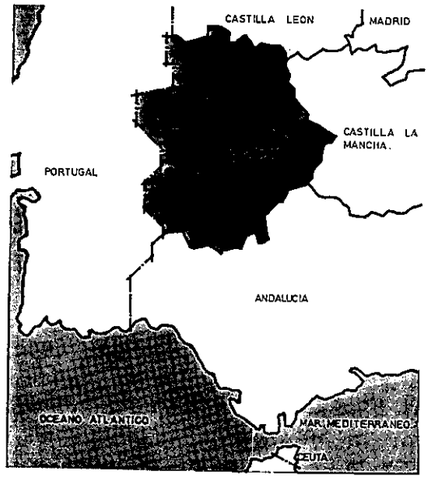
TECNOLOGIA

PROTOTIPOS VIVIENDAS EXTREMEÑAS

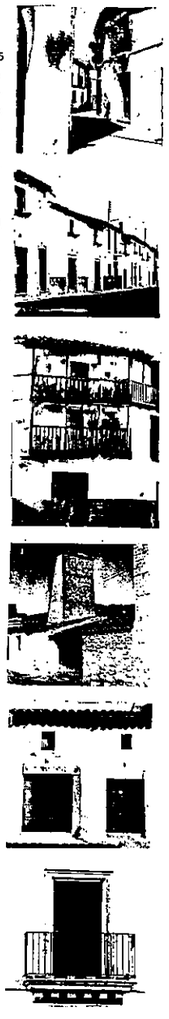
MARCO SITUACIONAL



LA EXTENSION DE LA AUTONOMIA DE EXTREMADURA ES DE 41.602 KM2, LO QUE VIENE A SIGNIFICAR ALGO MAS DEL 8% DE LA NACION Y CON UNA POBLACION DE 1.050.119 HABITANTES, Y CON UNA DENSIDAD DE 25 HAB/KM2.
SE ENCUENTRA AL OESTE ESPAÑOL, LINDANTE CON PORTUGAL. SU TERRENO SE PUEDE DIVIDIR EN TRES GRANDES CONJUNTOS.
SIERRAS, PERILLANURAS Y CLAROS Y VEGAS, QUE SE DISPONEN, EN GENERAL, EN EL SENTIDO DE LOS PARALELOS.
LA SEDE DEL GOBIERNO AUTONOMICO ES LA CIUDAD DE MERIDA. EL CLIMA SE PUEDE CONSIDERAR MEDITERRANEO, CON VERANOS CALUROSOS Y SECOS, CON -- MULTIPLES INFLUENCIAS OCEANICAS Y CONTINENTALES.
LA RECONQUISTA DE EXTREMADURA DEFINIO LA FORMA LATIFUNDISTA Y LA APARICION DE LA DIALECTICA AMOS/JORNALEROS, COMO DOS UNICAS CLASES SOCIALES ENFRENTADAS, DEFINIENDOSE UNA SITUACION DE ESTANCAMIENTO CRONICO.
ES DE RESALTAR EL ESPIRITU PIONERO DE LOS EXTREMEÑOS, ENCABEZADO POR GRANDES CONQUISTADORES: CORTES, PIZARRO, ETC:
ES UNA REGION DE TRADICION AGRICOLA Y GANADERA, ALEJADA DE LOS CEN -- TROS VITALES DE LA ECONOMIA ESPAÑOLA.
LA EXPLOTACION RACIONAL DEL CAMPO, BASADA EN UN GIGANTESCO PLAN DE REGADIO, HA DISMINUIDO EN PARTE LA NECESIDAD DE EMIGRAR. LA AGRICULTURA CONSTITUYE EL PRINCIPAL RECURSOS (TRIGO, OLIVO, HORTALIZAS, TABACO, ALGODON, ETC), SEGUIDO DE LA GANADERIA OVINA TRANSHUMANTE, LA PRODUC -- CION DE CORCHO Y LA GANADERIA PORCINA.
HAY 360.000 EXTREMEÑOS ACTIVOS Y 101.100 PARADOS.
EL DEFICIT HABITACIONAL ES OTRO GRAN PROBLEMA SOCIAL DE EXTREMADURA.



EXTREMADURA ESTA DIVIDIDA EN DOS PROVINCIAS:
- BADAJOZ: ES LA PROVINCIA MAS GRANDE DE ESPAÑA, CON UN AREA DE 21.657 KM2 Y CON UNA POBLACION DE 635.375 HABITANTES, DE LOS QUE 114.361 VIVEN EN SU CAPITAL: BADAJOZ. HAY QUE DESTACAR MERIDA, POR SU IMPORTANCIA POLITICA (42.000 HAB) SU POBLACION ACTUA EN LOS SIGUIENTES SECTORES: AGRICULTURA, EL 26,9%; INDUSTRIA: 10,7%; CONSTRUCCION: 9,3%; Y SERVICIOS:53,5%. POSEE UNA DENSIDAD DE 29 HAB/KM2. HAY 211.200 ACTIVOS Y 67.400 PARADOS.
- CACERES: ES LA MAS SEPTENTRIONAL. SU SUPERFICIE ES DE 19.945 KM2, CON UNA POBLACION DE 414.744 HABITANTES, QUE SUPONE UNA DENSIDAD DE 21 HAB/KM2, DE LOS QUE 70.044 VIVEN EN LA CAPITAL: CACERES. POR SU IMPORTANCIA DENTRO DE LA PROVINCIA HAY QUE RESALTAR A PLASENCIA, CON 52.178 HABITANTES; POR SU ACTIVIDAD ECONOMICA; Y A TRUJILLO POR SU IMPORTANCIA CULTURAL (45.000 HAB)
HAY EN CACERES 148.800 HABITANTES ACTIVOS Y 33.700 PARADOS. LOS CACEREÑOS ACTIVOS SE OCUPAN EN: AGRI-- CULTURA 32,5%; INDUSTRIA 10,1%; CONSTRUCCION 10,4%; Y SERVICIOS 4,7%.



OBJETIVOS

-TRABAJO DE INVESTIGACION APLICADA DIRIGIDO A LA DEFINICION DE TRES PROTOTIPOS DE VIVIENDAS URBANAS (UNIDADES MODELICAS SISTEMATIZADAS), DE BAJO COSTO, QUE SINTETICEN TIPOLOGIAS ARQUITECTONICAS REGIONALES, EN CUANTO A FUNCION, MORFOLOGIA Y TECNOLOGIA.

-LAS PROPUESTAS, MATERIALIZABLES MEDIANTE FORMULAS DE AUTOCONSTRUCCION, DEBERAN APORTAR A LO TRADICIONAL MEJORAS EN LAS ACTUACIONES DE ESTE TIPO, DE GRAN ARRAIGO EN ESTE AMBITO TERRITORIAL.

-ACABADO DISEÑO CONCEPTUAL DE LAS EDIFICACIONES Y DE LAS PROPUESTAS DE CONJUNTOS QUE, SIN EXCLUIR OTROS FACTORES, PROPONGA TECNICA Y RESOLUCIONES SENCILLAS, ORDEN EN LA EJECUCION DE LA OBRA Y FORMA DE REPRESENTACION COMPRENSIBLE AL NIVEL DEL USUARIO/CONSTRUCTOR.

-CALIDAD HABITACIONAL Y TECNICA, POR INCORPORACION DE MATERIALES ADECUADOS, UTILIZANDO TECNOLOGIA PROBADA E INCORPORANDO COMPONENTES INDUSTRIALIZADOS, CUANDO ESTOS SE JUSTIFIQUEN EN TERMINOS DE SIMPLICIDAD, RENDIMIENTO Y COSTOS.

PREMISAS

-ADECUACION A LAS NECESIDADES DE LA POBLACION DESTINATARIA Y SUS POSIBILIDADES ECON. Y FINANCIERAS.

-ADECUACION A LOS CONDICIONANTES TIPOLOGICOS Y TECNOLOGICOS DE LA ZONA.

-CONSIDERACION DE LAS POSIBILIDADES DEL USUARIO MEDIANTE FORMULAS DE AUTOCONSTRUCCION.

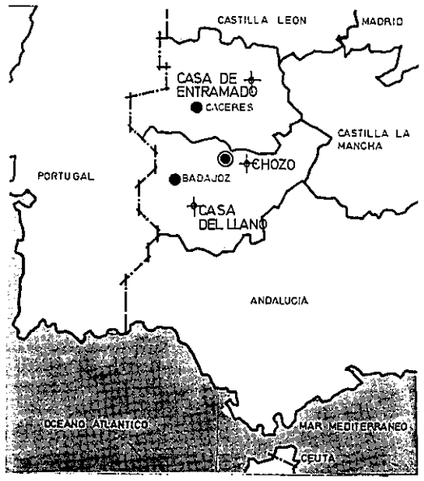
-POSIBILIDAD DE INTRODUCCION DE ELEMENTOS INDUSTRIALIZADOS.

-RESPETO Y DEFINICION DEL ENTORNO FISICO Y/O URBANISTICO SEGUN CADA LOCALIZACION RESPECTIVA.

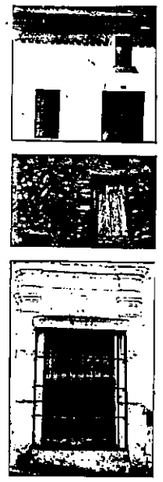
-EL PROGRAMA ARQUITECTONICO SE BASARA EN LA LEGISLACION VIGENTE RESPECTIVA: REAL DECRETO SOBRE PROMOCIONES SOCIALES DE V.P.O., AUTOCONSTRUCCION TUTELADA Y VIVIENDAS EN EL MEDIO RURAL Y LEGISLACION DE VIVIENDAS DE PROTECCION OFICIAL. MINISTERIO DE OBRAS PUBLICAS Y URBANISMO ORDENANZA D/4:
VIVIENDA 2 DORMITORIOS: 50 M2 A 70 M2
VIVIENDA 3 DORMITORIOS: 60 M2 A 90 M2
VIVIENDA 4 DORMITORIOS: 70 M2 A 90 M2

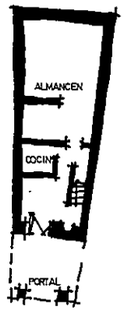
00000006

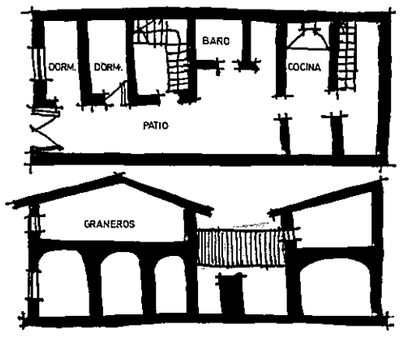
EXTREMADURA "BLANCO DE LOS LLANOS"

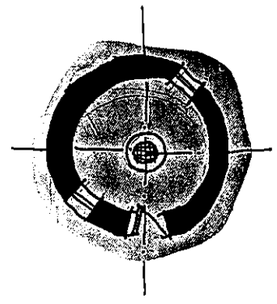


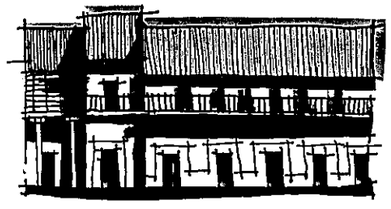
EN CUANTO A TIPOLOGIAS, BASICAMENTE PUEDE HABLARSE:
-DE LA CASA SERRANA (AL NORTE DEL TAJO) YA SEA DE VIVIENDAS DE ENTRAMADO DE MADERA O CONSTRUCCIONES DE PIEDRA.
POR SER UNA REGION DE LLUVIAS FRECUENTES Y SUELO IMPERMEABLE Y ROCOSO, DA LUGAR A CASAS DE DOS O MAS PLANTAS, CON ESPACIOS SUPERPUESTOS PARA EL ALOJAMIENTO DEL CAMPESINO, DEL GANADO Y DE LAS COSECHAS. EL NIVEL INFERIOR SE DESTINA A CUADRAS, PAJAR, BODEGA Y ALMACEN DE APERO.
EL NIVEL MEDIO ES LA VIVIENDA DEL CAMPESINO Y EL NIVEL SUPERIOR ALBERGA EL GRANERO Y LA SOLANA PARA SECADERO.
LA ABUNDANCIA DE MADERA Y ESTE TIPO DE CONSTRUCCIONES PERMITEN OTRA SERIE DE ELEMENTOS DE GRAN UTILIDAD, COMO BALCONES, GALERIAS, ESCALERAS, ETC.
-LA CASA DEL LLANO, HORIZONTAL, AMPLIA, BLANCA Y DE ESCASA ALTURA (EN EL CENTRO Y SUR DE EXTREMADURA). DOMINA LA CASA DE UNA PLANTA, SUELE TENER UN SEGUNDO NIVEL, REDUCIDO, UNICAMENTE SE ENCUENTRA EL GRANERO (SOBERAO, DOBLAO, TROJE, SEGUN LA ZONA) AISLADO ASI DE LA HUMEDAD Y DE LOS ROEDORES, MIENTRAS QUE EL NIVEL INFERIOR SE DESTINA A VIVIENDA.
-VIVIENDAS ELEMENTALES, YA SEAN ESTAS CHOZAS O CASAS REDONDAS SON ESPACIOS PERMANENTES O TEMPORALES, E INCLUSO PORTATILES CON MINIMAS CONDICIONES DE HABITABILIDAD.
LA CASA REDONDA AUN PUEDE VERSE DISEMINADAS POR LA SIERRA DE GATA Y SUS PROXIMIDADES, DONDE SE LES DA EL NOMBRE DE ZAHURDONES. EN CAMBIO, EN AHIJAL, DONDE APARECEN AGRUPADAS Y TIENEN UN CARACTER MAS PRIMITIVO, SE LES LLAMA MURUS.

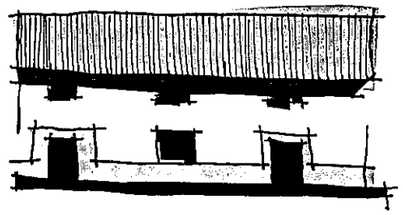












LA CASA DE ENTRAMADOS PUEDEN TENER DOS PLANTAS, AUNQUE LO MAS FRECUENTE ES QUE TENGA TRES.
PLANTA BAJA, HAY UN ZAGUAN QUE EN MUCHOS PUEBLOS LLAMAN PATIO, ASI COMO CUADRAS, GALLINEROS, BODEGAS, ETC.
SEGUNDO NIVEL, SE UBICAN LAS SALAS Y DORMITORIOS, MIENTRAS QUE EN EL ULTIMO PISO SE ENCUENTRA EL DESVAN, EL GRANERO, UN VOLADIZO PARA SECADERO DE FRUTAS Y LA COCINA.
TECHO, ES DE TEJO ARABE Y A DOS VERTIENTES, PARA FACILITAR EL DESPLAZAMIENTO DE LA LLUVIA FRECUENTE.

LA CASA DEL LLANO (SOLUCION HORIZONTAL) SUELE CONTAR CON UN PEQUEÑO PATIO ABIERTO QUE SEPARA LA VIVIENDA DEL CAMPESINO DE LOS ESPACIOS ECONOMICOS, TALES COMO ESTABLO, CUADRA, BODEGA.
SEGUNDO NIVEL SOLO SE ENCUENTRA EL GRANERO O PAJAR. EXISTEN, MUCHAS VARIANTES DE ESTA CASA DEL LLANO EN FUNCION DE ELEMENTOS QUE VAN DESDE EL EMPLEO O NO DE LA PECULIAR BOVEDA DE LADRILLOS HASTA EL ASPECTO EXTERIOR. GENERALMENTE LO MAS NORMAL ES QUE SEA GRANITICA.
TAMBIEN SE USA EL TAPIAL O EL ADOBE.
UN ELEMENTO MUY PECULIAR SON LAS GRANDES CHIMENEAS RECTANGULARES QUE APARECEN SOBRE TEJADOS DE TEJA ARABE.

EL CHOZO (REFUGIO TEMPORAL) EXTREMEÑO ES UN ESPACIO DE HABITACION QUE REUNE UNAS CONDICIONES DE HABITABILIDAD INFIMAS, CON UNA SIMPLEZA ESPACIAL Y DE DIMENSIONES MUY PEQUEÑAS.
GENERALMENTE SU PLANTA ES CIRCULAR Y EL PERFIL CONICO SE CONSTRUYE INTEGRAMENTE CON ELEMENTOS VEGETALES COMO POLOS ARQUEADOS Y HACES DE CEREALES.
ESTA VIVIENDA SUELE TENER UNOS CUATROS METROS DE DIAMETRO Y LLEGAN INCLUSO A LOS DOS METROS DE ALTURA, Y SU TECHO ES DE FALSA CUPULA CON UN HUECO EN EL CENTRO PARA ENTRE LA LUZ Y SALGA EL HUMO. EN OTROS CASOS, LA CUBIERTA PUEDE SER TAMBIEN DE ROLLIZOS DE MADERA Y PAPA DE CEREALES.

PLANTA DE CUBIERTA

VISTA ANTERIOR

VISTA POSTERIOR

SECCION

PLANTA SUPERIOR : 3 MODULOS

PLANTA BAJA 3 MODULOS

PLANTA ALTERNATIVA

VISTA ALTERNATIVA

SECCION

3.80

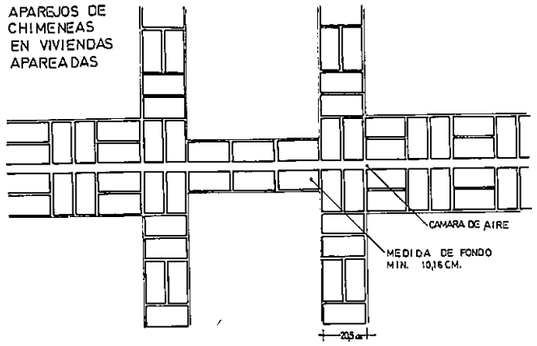
3.80

SUP. MODULO 14.44 m²

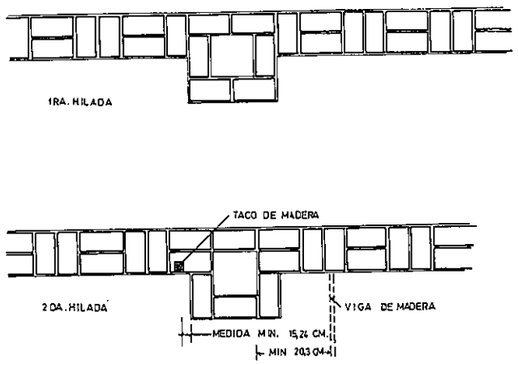
PROTOTIPO Nº1

ESC.1:100

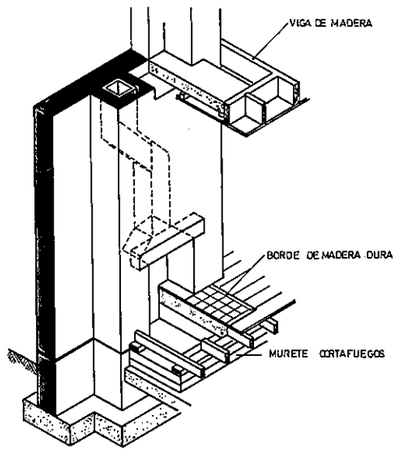
APAREJOS DE CHIMENEAS EN VIVIENDAS APAREADAS



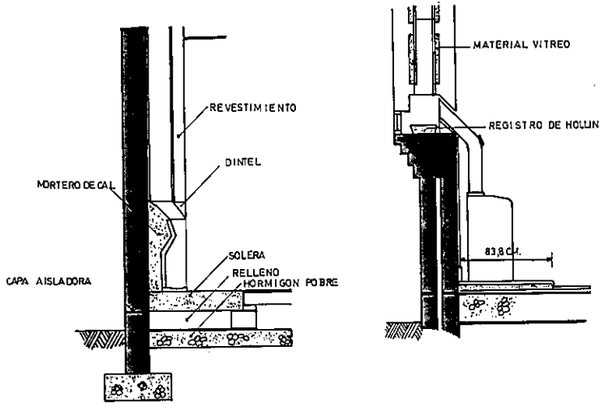
APAREJOS DE CHIMENEA (CANAL DE HUMOS)



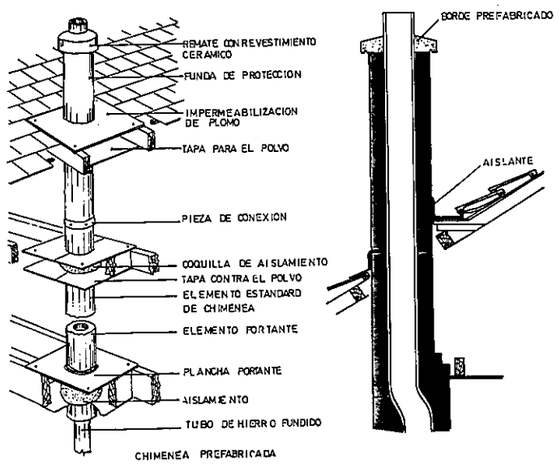
AXONOMETRICA CONSTRUCTIVA



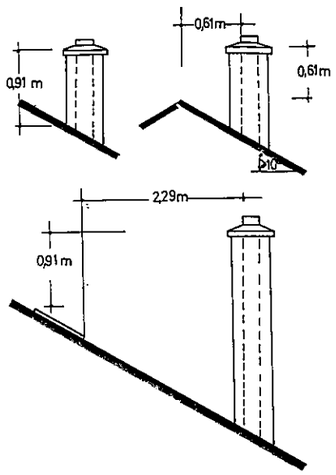
SECCIONES



DETALLES



MEDIDAS MINIMAS



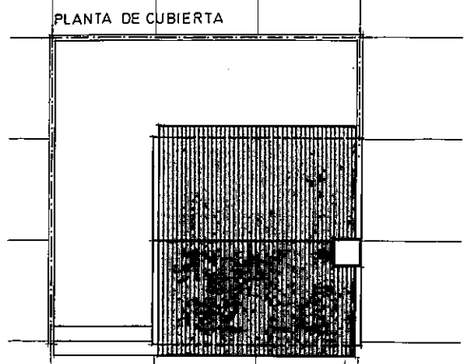
TECNOLOGIA

ESC. 1:25

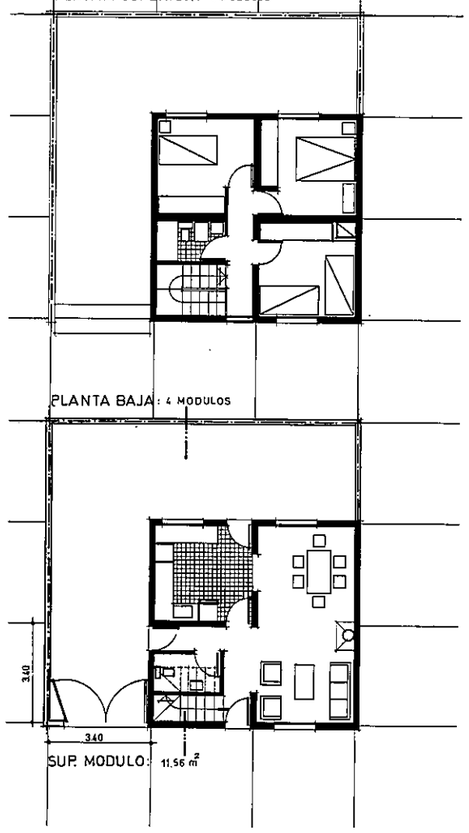
PROTOTIPO Nº2

ESC.1:100

PLANTA DE CUBIERTA



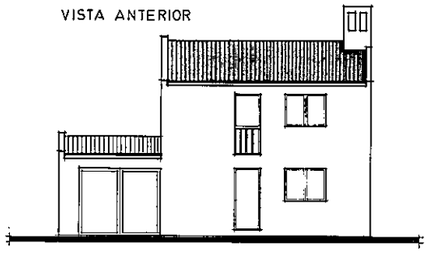
PLANTA SUPERIOR: 4 MODULOS



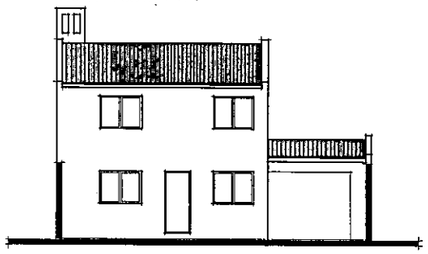
PLANTA BAJA: 4 MODULOS

SUP. MODULO: 11.56 m²

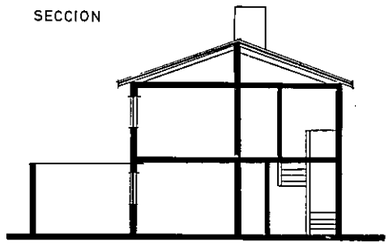
VISTA ANTERIOR



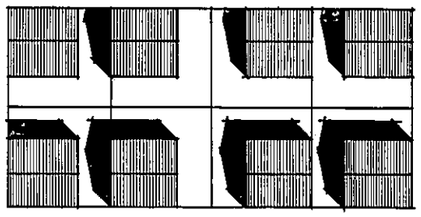
VISTA POSTERIOR

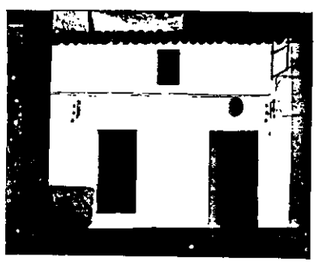


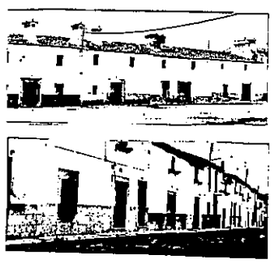
SECCION



AGRUPAMIENTO PROPUESTO







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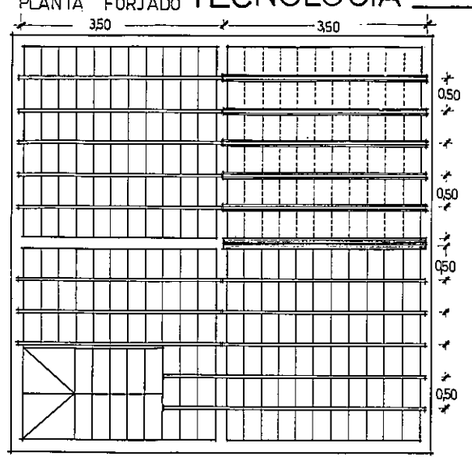
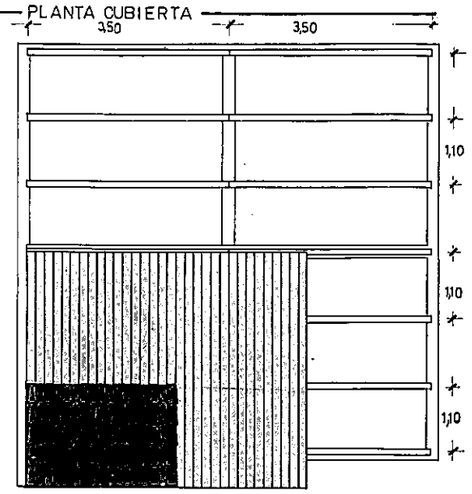
TECNOLOGIA

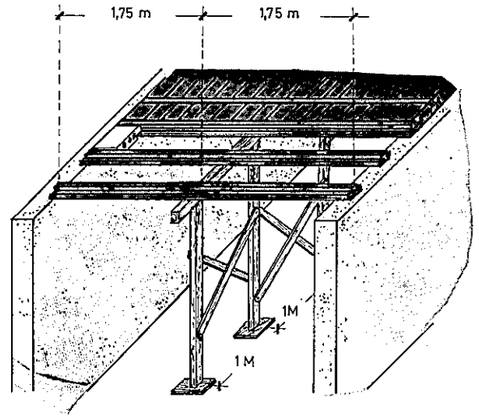
PLANTA FORJADO



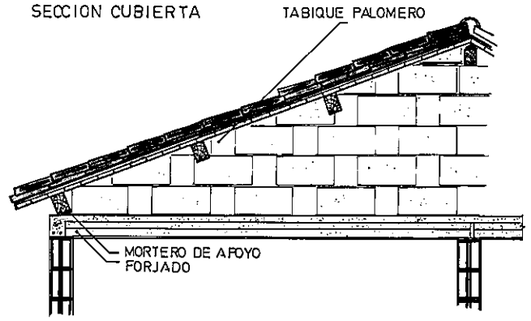
PLANTA CUBIERTA



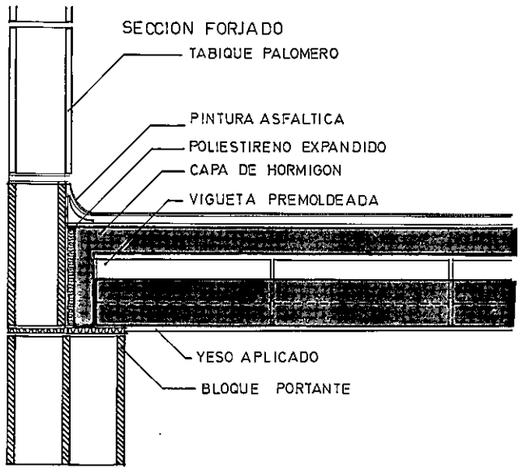
DETALLE DE APUNTALAMIENTO



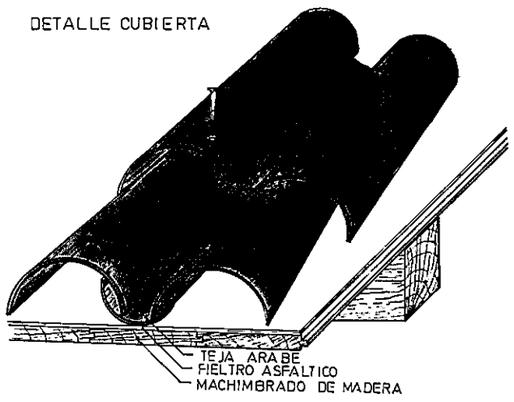
SECCION CUBIERTA

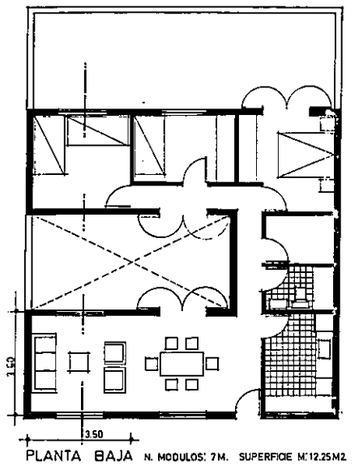


SECCION FORJADO



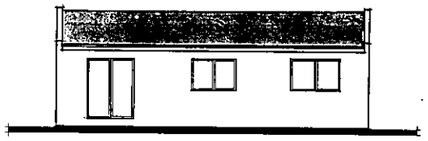
DETALLE CUBIERTA



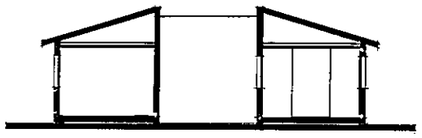


PLANTA BAJA N. MODULOS: 7 M. SUPERFICIE M°12.25 M2.

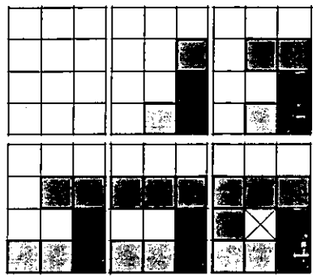
VISTA ANTERIOR



VISTA POSTERIOR

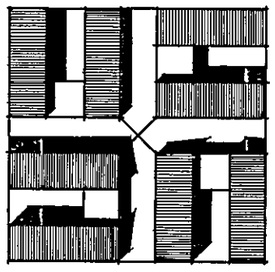


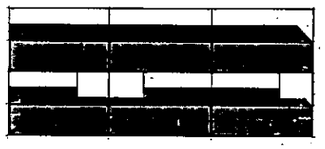
SECCION



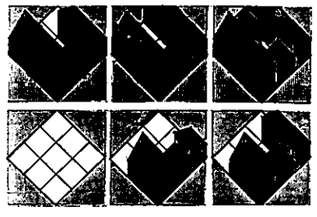
ESQUEMA DE CRECIMIENTO EVOLUTIVO

AGRUPAMIENTOS PROPUESTOS

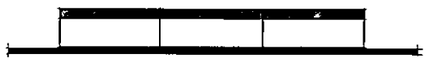


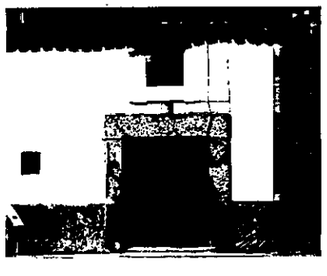


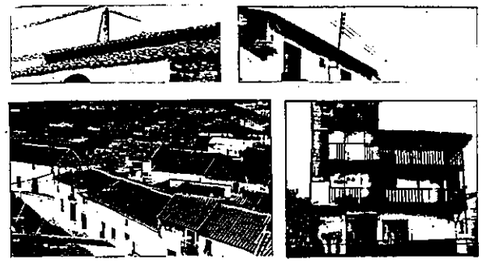
VOLUMETRIA DEL CRECIMIENTO

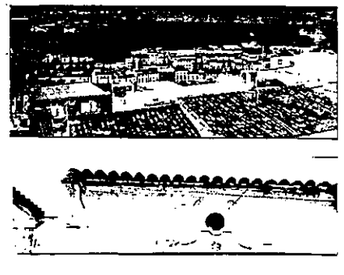


VISTAS DE AGRUPAMIENTOS









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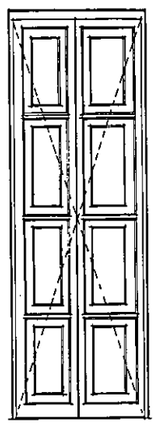
ESC 1:100



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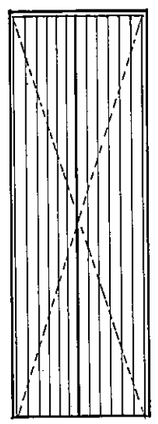

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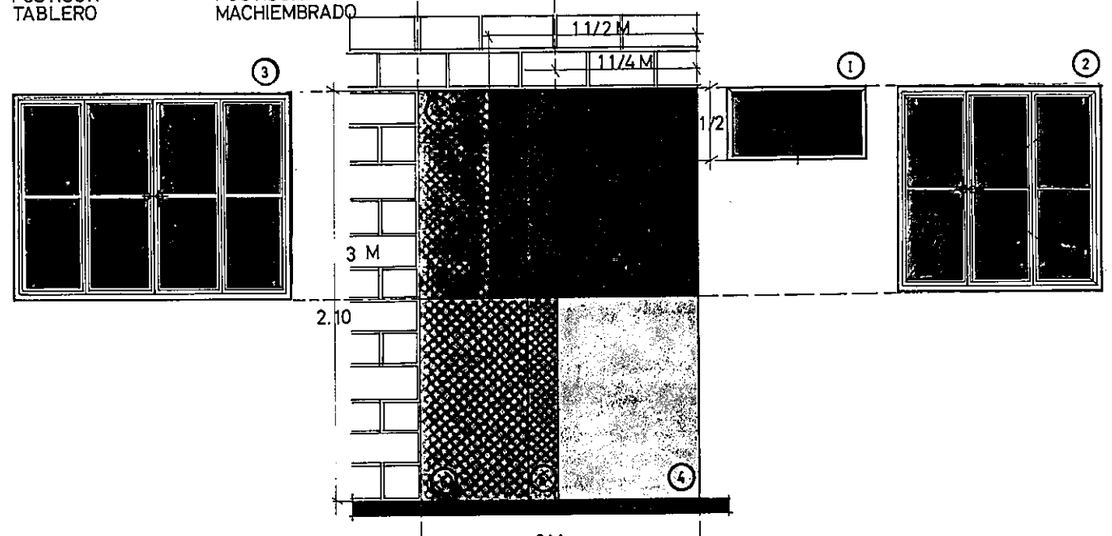
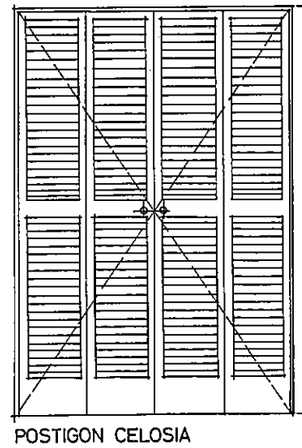
MODULACION DE CARPINTERIA SEGUN MODULO CELULA Y LADRILLO PROPUESTO

1 MODULO -	0.70
1 1/4 MOD.-	0.875
1 1/2 MOD.-	1.05
2 MODULOS-	1.40
3 MODS:-	2.10





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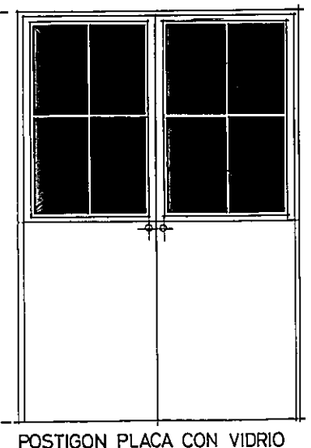


POSTIGON PLACA CON VIDRIO

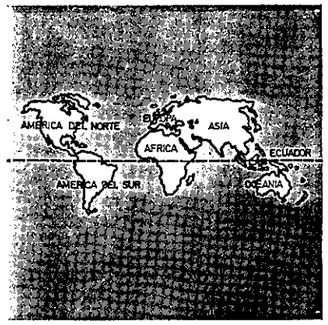
TECNOLOGIA
ESC 1:15

HABITAT SAO TOME

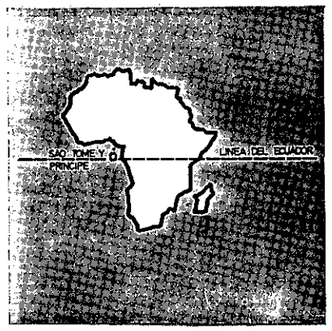
PROPUESTA

EL PAIS

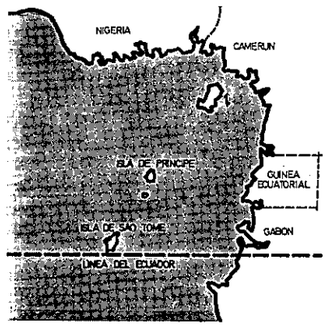
LA REPUBLICA DEMOCRATICA DE SAO TOME Y PRINCIPE ESTA SITUADA EN EL/ GOLFO DE GUINEA, A 300 KMS. DE LA COSTA AFRICANA, SIENDO ATRAVESADA POR EL ECUADOR. EL PAIS ESTA CONSTITUIDO POR DOS ISLAS PRINCIPALES: LA DE SAO TOME Y LA DE PRINCIPE, DISTANCIADAS 150 KMS.
CON UN AREA DE 1000 KMS² Y CASI 100.000 HABITANTES, ES EL SEGUNDO ESTADO MAS PEQUEÑO DE AFRICA. ES INDEPENDIENTE DESDE EL 12 DE JULIO / DE 1975, DESPUES DE HABER SIDO COLONIA PORTUGUESA POR MAS DE 400 // AÑOS.
EL ORIGEN DE LA POBLACION DEL PAIS ES COMPLEJO: COLONOS DEPORTADOS/ DE PORTUGAL Y ESPAÑA, CAMPESINOS FRANCESES Y GENOVESES, ESCLAVOS // PROCEDENTES DE LAS COLONIAS PORTUGUESAS AFRICANAS DE DIFERENTES ETNIAS, ETC., PRODUCIENDOSE RAPIDAMENTE UN COMPONENTE MESTIZO QUE HASTA HOY ES CARACTERISTICO.
EL CLIMA DE LAS ISLAS ES CALIDO, OCEANICO, MUY HUMEDO Y LLUVIOSO.// EL VIENTO PREDOMINANTE ES EL DE DIRECCION SUR-SURESTE.



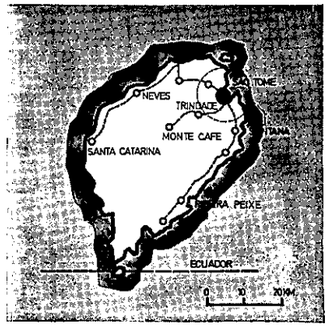
LA CONFORMACION ABIERTA Y NO TRADICIONAL DE LA SOCIEDAD SAOTOMENSE/ LLAMA LA ATENCION, EN LA MEDIDA EN QUE HA EVOLUCIONADO CONSIDERABLEMENTE DESDE EL ULTIMO SIGLO, DEBIDO A QUE LA SOCIEDAD ESCLAVISTA // QUE DESAPARECIO EN 1878 DEJO NUMEROSAS HUELLAS.
LA NATURALEZA HIBRIDA LUSO-AFRICANA DE LA CULTURA LOCAL ES EVIDENTE. LA IMBRINCACION DE COMPONENTES ES TAN ANTIGUA QUE LOS ELEMENTOS DE/ LOS MISMOS ESTAN FUSIONADOS Y SUS PUNTOS DE CONTACTO ESTRECHADOS. / MEZCLA INTIMA DE DOS MUNDOS UNIVERSOS CULTURALES.
SE HABLA EL "FORRO"; CRIOLLO DEL PORTUGUES CON AGREGADOS DE LENGUAS/ AFRICANAS. LA RELIGION ES LA CATOLICA Y SE PRACTICAN OTROS CULTOS / (ANIMISTAS, ETC).
EL MOVIMIENTO DE LIBERACION DE SAO TOME Y PRINCIPE (MLSTP) ES LA // FUERZA POLITICA DIRIGENTE DEL PAIS. EL ORGANO PRINCIPAL DEL ESTADO/ ES LA ASAMBLEA POPULAR, QUE ESCOGE A SU VEZ UNA COMISION PERMANENTE EL PRESIDENTE ES EL JEFE DEL ESTADO, Y ES ELECTO POR UN PERIODO DE/ CUATRO AÑOS POR LA ASAMBLEA.



LA ISLA DE SAO TOME, DE 25 KMS DE ANCHO POR 38 KMS DE LARGO, TIENE/ UN RELIEVE ACCIDENTADO, SIENDO LOS 1300 M. LA COTA MEDIA DE SUS MONTAÑAS MAS ALTAS UBICADAS EN EL CENTRO.
DE ESTAS CIMAS NACEN ABUNDANTES RIOS-LAS AGUAS, QUE DESCIENDEN EN / CASCADAS ATRAVESANDO LA DENSA FLORESTA.
LA VEGETACION ISLEÑA ES EXUBERANTE DESTACANDOSE DISTINTAS VARIEDA-/ DES DE MUSAS (BANANAS) Y PALMERAS (COCOTEROS Y PALMAS DE ACEITE).EL CACAO, INTRODUCIDO A PRINCIPIOS DEL SIGLO PASADO, SE EXTENDIO MUY / RAPIDAMENTE, CONVIRTIENDOSE AL INICIO DE ESTE EN EL PRINCIPAL CULTIVO (CUBRE UNAS 20.000 HAS), SEGUIDO DEL COCOTERO. SAO TOME ES UNO / DE LOS PRINCIPALES EXPORTADORES MUNDIALES DE CACAO.
LA AGRICULTURA REPRESENTA EL 45% DEL P.B.I. LA TEMPERATURA AMBIENTE Y EL REGIMEN DE LLUVIAS POSIBILITAN UN RENDIMIENTO IMPORTANTE DEL / SUELO MUY FERTIL, LO CUAL GENERA QUE LA ECONOMIA REPOSE INTEGRAMENTE SOBRE LA AGRICULTURA, QUE DA TRABAJO AL 50% DE LA POBLACION ACTIVA.

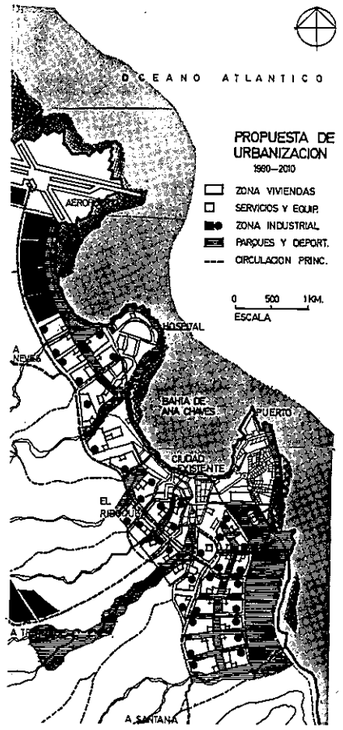


LOS ESFUERZOS GUBERNAMENTALES ESTAN DIRIGIDOS A CONSEGUIR REDUCIR / LA DEPENDENCIA A TRAVES DE LA IMPLANTACION DE DIVERSOS "PLANES ECONOMICOS". LA NACIONALIZACION DE LAS ROCAS-LATIFUNDIOS COLONIALISTAS FUE EL PRIMER PASO, AL CONVERTIRLAS EN COOPERATIVAS AGRICOLAS.
EN LA ISLA DE PRINCIPE SE LOCALIZAN CERCA DE 6.000 PERSONAS, EL RESTO EN LA DE SAO TOME (84.000 HAB.) Y A SU VEZ SE ESTIMA QUE EL 40% DE ESTOS HABITANTES EN LA CIUDAD-CAPITAL-DE SAO TOME, EN UN RADIO / DE 5 KMS.
LA CIUDAD, UBICADA AL N.E. DE LA ISLA, ALBERGA ALREDEDOR DE 20.000/ HABITANTES Y LA MAYOR CONCENTRACION SE PRODUCE EN LA PARTE SUROESTE DE LA MISMA, EN EL RIBOQUE. OTROS CENTROS POBLACIONES ESTAN, EN / / GRAN PARTE, SITUADOS EN LAS PROXIMIDADES DE LOS CASCOS DE LAS HA- / CIENDAS COOPERATIVAS (EX ROÇAS), SOBRE TODO EN LA COSTA ORIENTAL Y/ PARTE NORTE DE LA OCCIDENTAL.
LA DENSIDAD ISLEÑA ES DE 120 HAB./KM². EL 75% DE LA POBLACION OCUPA/ EL MEDIO URBANO Y EL RESTO LAS COOPERATIVAS RURALES (90% DEL TERRI/ TORIO).



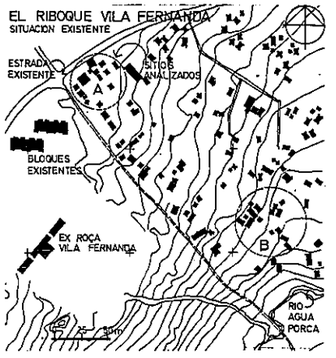
LA CIUDAD

LA CIUDAD DE SAO TOME ESTA SITUADA A ORILLAS DEL MAR ALREDEDOR DE LA BAHIA/ DE ANA CHAVES, POCO PROFUNDA Y PROTEGIDA DE LOS VIENTOS. TRES VIAS-ESTRADAS PRINCIPALES DAN ACCESO A LA MISMA: UNA SURESTE, UNA DEL OESTE Y OTRA NOROESTE, Y QUE JUNTO CON OTRAS MENORES-RUAS-SE REUNEN EN LA ZONA DEL MERCADO,VERDADERO NODO DEL CASCO ANTIGUO. ESTA ZONA CONSOLIDA, CON ORIGENES EN LOS SIGLOS XVI Y XVII, ESTA CONSTRUIDA EN ESTILO COLONIAL PORTUGUES. ESTA DENSAMENTE OCUPADA Y CARACTERIZADA POR SU MIXTURA DE USOS.
AL ESTE DE DICHO CASCO SE UBICA EL PUERTO, AL NOROESTE EL HOSPITAL Y MAS AL NORTE EL AEROPUERTO. A LO LARGO DE LAS VIAS DE ACCESO, Y A MODO DE PERIFERIA, HAN SURGIDO ZONAS DE ASENTAMIENTOS ESPONTANEOS MUY DENSOS Y EN DONDE / PRIMA, DEBIDO A LA ESCASEZ DE RECURSOS Y MATERIALES, LA AUTOCONSTRUCCION.// SE GENERA UNA ARQUITECTURA POPULAR Y DE SUBSISTENCIA, "EL RIBOQUE" ES LO // MAS PARADIGMATICO. EN ESTAS CONDICIONES PRECARIAS VIVEN ALREDEDOR DE 12.000 PERSONAS.
EN 1978 EL GOBIERNO ENCARGO A EMPRESAS SUECAS LA ELABORACION DE UNA PROPUESTA URBANA PARA EL PERIODO 1980-2010. EL CRECIMIENTO POBLACIONAL ES DEL 3% Y EL MOVIMIENTO MIGRATORIO HACIA SAO TOME ES DE 1 A 2%

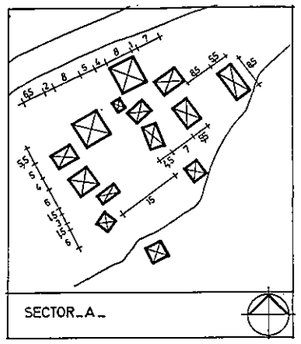


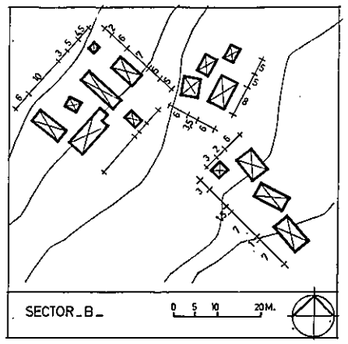
SE RESOLVIO QUE SAO TOME CREZCA LINEALMENTE, A/ LO LARGO DE LA/ COSTA EN DIRECCION NORTE-SUR Y QUE AVANCE HACIA EL OESTE SOBRE LOS CERROS, QUE SON APTOS PARA VIVIENDAS. PLANTEO MAS ACORDE CON LA RED VIARIA EXISTENTE Y DE ACUERDO A LAS DISTANCIAS.

LA PROPUESTA DE URBANIZACION 1980-/ 2010 ESTABLECE UNA DENSIDAD DE 200/ HAB./HA., LO QUE SUPONE VIVIENDAS / COLECTIVAS DE TRES NIVELES COMO ALTURA MEDIA, PERO DADA LA SITUACION/ DE CARENCIA GENERAL ES IMPOSIBLE LOGRARLO POR MUCHISIMO TIEMPO.

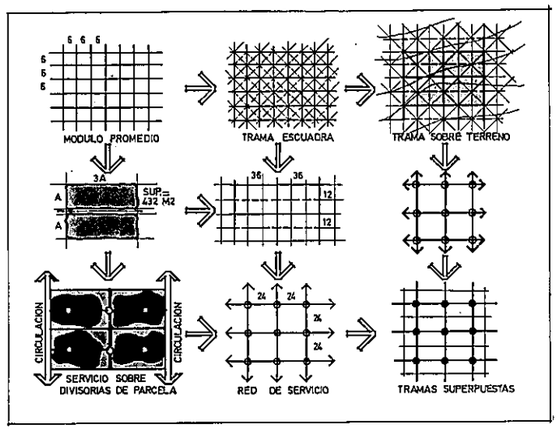


EL RIBOQUE COMO LA MAYORIA DE LA PERIFERIA NO ESTAN SERVIDAS DE LA INFRAESTRUCTURA MINIMA REQUERIDA: AGUA POTABLE, ELECTRICIDAD Y DESAGUES. DE ACUERDO A LAS PAUTAS SOCIOLOGICAS DE LOS ASENTADOS, LOS AGRUPAMIENTOS DE VIVIENDAS SE DEBEN A LAZOS SANGUINEOS O DE AMISTAD. EL NUCLEO FAMILIAR PROMEDIO ES DE 8 A 12 MIEMBROS, DESDE LACTANTES A SENILES, INCLUYENDO PARIENTES Y/O AMIGOS. UNA CARACTERISTICA TIPICA ES EL USO DE FOGONES EXTERNOS PARA COCINAR Y EL RECURRIR AL "MATO" (NATURALEZA) PARA LA ELIMINACION DE RESIDUOS ORGANICOS. LOS SAOTOMENSES SON EXTROVERTIDOS Y DE ACTIVIDADES COMUNITARIAS. LAS VIVIENDAS, UBICADAS EN MEDIO DE LA VEGETACION, SON ELEMENTALES, DE MADERA (ESTRUCTURA Y CERRAMIENTOS) Y DE PLACAS METALICAS, SOBREELEVADAS DEBIDO A LA TOPOGRAFIA Y AL CLIMA.
LOS LIMITES ENTRE LO URBANO Y LO RURAL SE HACEN INDEFINIBLES. LA DENSIDAD PROMEDIO ES DE 80 HAB/HA.





DE LOS SECTORES CUALIFICADOS SE EXTRAJERON CONCLUSIONES: PROXIMIDADES, CRITERIOS DE VECINDAD, MEDIDAS Y SUPERFICIES DE LOTEOS Y PERSONALIZACIONES, CIRCULACIONES, ORIENTACIONES, ETC.
CON TODA ESTA INFORMACION SE CONFECCIONARON PREMISAS DE DISEÑO, PARA TRADUCIRLAS LUEGO EN UN "PROGRAMA"



LA PROPUESTA"HABITAT SAO TOME" LO QUE PRETENDE ES COLECTIVIZAR LAS COCINAS Y LOS SERVICIOS (DUCHAS Y RETRETES) PARA QUE LA PROVISION DE INFRAESTRUCTURA SEA MAS ECONOMICA, PARTIENDO DE LA PROPUESTA 1.980-2.010. ES DECIR UNA URBANIZACION INCIPIENTE QUE CON EL TIEMPO SE PUEDA MEJORAR HASTA LLEGAR A LA CONCRECION PLANTEADA EN EL PLAN GENERAL.

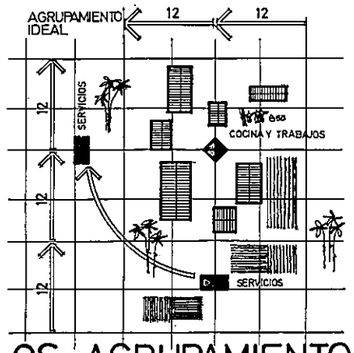
DEL ESTUDIO DIMENSIONAL Y FORMAL DE LOS AGRUPAMIENTOS,ADOPTAMOS COMO MEDIDA PROMEDIO EL MODULO DE 6 METROS, Y LA RELACION DE 3 A 1 EN LOS LADOS DE LAS PARCELAS.

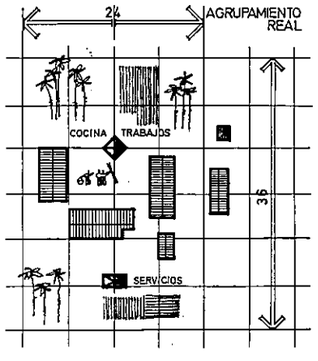
EL NUMERO DE INTEGRANTES DE LOS GRUPOS SEGUN DATOS SOCIOLOGICOS ,ES DE:

GRUPO MINIMO	6 PERSONAS	
GRUPO PROMEDIO	12 PERSONAS	432 M^2
GRUPO COMPUESTO HASTA	28 PERSONAS	864 M^2

DE LAS RETICULAS DE TRABAJO DE LA FUNDACION RAFAEL LEOZ,ADOPTAMOS LA DE LA ESCUADRA,QUE POR SU SIMPLICIDAD POSIBILITA UN RAPIDO Y FACIL TRAZADO EN EL TERRENO, TANTO PARA LA DIVISION DE PARCELAS COMO PARA LA INFRAESTRUCTURA DE SERVICIOS.

LA DISTANCIA MAXIMA A RECORRER HACIA LOS SERVICIOS Y LAS COCINAS EN TODOS LOS CASOS NO SERA SUPERIOR A LOS 30 METROS, UBICANDOSE ESTOS SOBRE LAS LINEAS DIVISORIAS EN EL FONDO DE LAS PARCELAS.

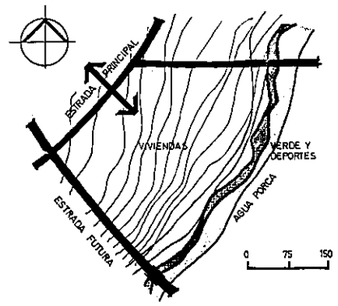


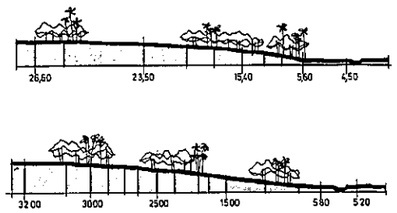


LOS AGRUPAMIENTOS

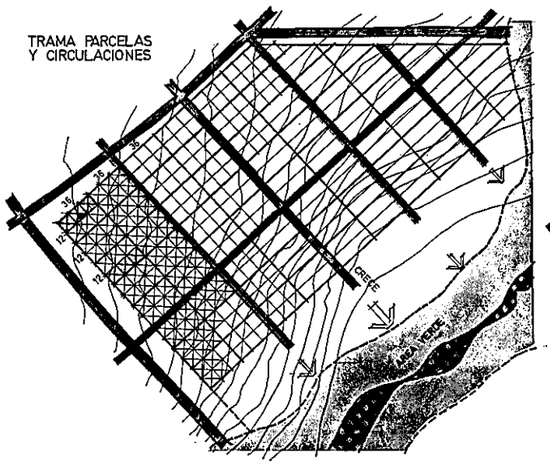
LA DENSIDAD PREVISTA PARA EL HABITAT SAO TOME, ES DE 120 HAB/HA. SE CONSIDERARON LAS TENDENCIAS DE CRECIMIENTO Y LAS MIGRACIONES.

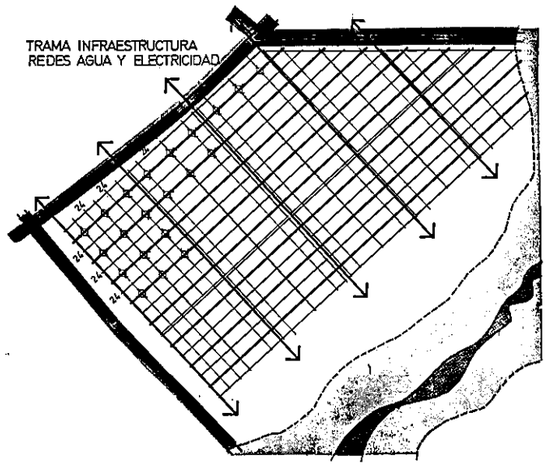
EN LA PRESENTE PROPUESTA TAMBIEN SE RESPETAN LOS USOS DEL SUELO ESTABLECIDOS POR EL PLAN 1.980-2.010



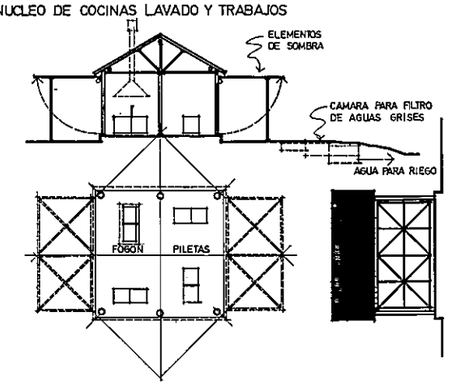


PLANTA Y CORTES TERRENO
VILA FERNANDA (RIBOQUE)

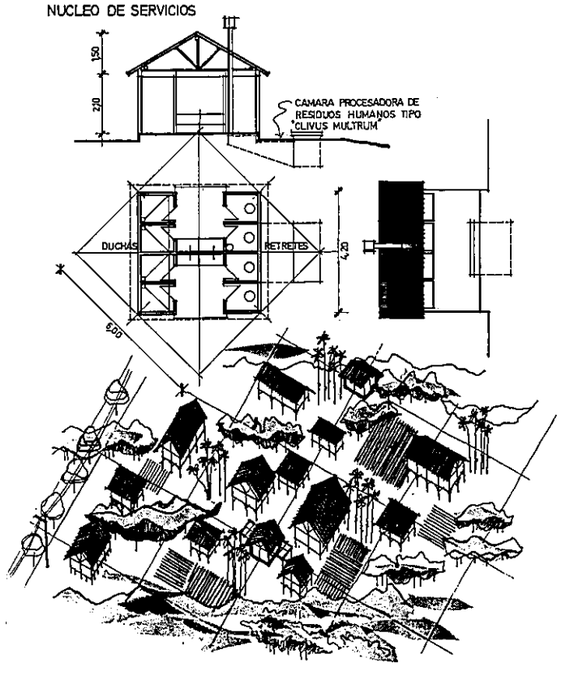




NUCLEO DE COCINAS LAVADO Y TRABAJOS



NUCLEO DE SERVICIOS



SISTEMA CONSTRUCTIVO TRADICIONAL EN MADERA

EL HABITAT PROPUESTO

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	13577531	Guzmán Negrón, Eliseo; Luisoni Prada, Emilio	Las Camelias, 288, 2.° piso. San Isidro, Lima	Peru	12
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	63747287	Martinelli, Marcelo Roberto; Trovant, Ricardo Alberto	Calle Sarmiento, 850, 10.° piso. 9000 Comodoro Rivadavia Chubut	Republic of Argentina	16
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	26038700	Rostvik, Harald N.	Sateingaten, 87. 4000 Stavanger	Norway	24
	19341941	Bravo Cartabio, Enrique, Fernán; Novaro Bocco, Ricardo	Ramos Carrión, 11, 5.° G. 28002 Madrid	Spain	26
	18181817	Barjin, Serjio; Kozelcova, Elena	yl. Jkalova g 41/2, 29. CCCP 107120 Moscow	USSR	28
SECTION I	97538642	AamoB, Hukonaú, TynmapeBa, Cerma, AamoB, Kupur, KockakneB, Acen, Bomeba, Banepur.	Byn. A bmargeb 16. Coonr	Bulgaria	34
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NOTES ON THE EDITION

1. The winning projects are published in first place, after the Minutes of the Jury, although they also figure at the author's index in the section in which they competed, markerd in boldface.
2. The projects submitted to the contest are grouped by sections, and in alphabetical order, by the name of the author heading the competing team.
3. The projects arrived after deadline have been included in the corresponding sections, marked in the index with an asterisk.
4. The Organizing Committee decided to include in Section V those projects not specifying the section in which they competed.
5. The projects not competing presented by Foundation Leoz from Madrid (Spain) are published separately.
6. Entering for Arab Republic of Egypt National Section.
7. Entering for Colombian National Section.
8. Entering for Finnish National Section.
9. Envelope without personal data.

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