# BUILDING TOGETHER

## Issues in Mutual-Aid Housing

The Human Settlements Division
Asian Institute of Technology
in co-operation with
The United Nations Centre
for Human Settlements (HABITAT)

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# B U I L D I N G  T O G E T H E R:

## Issues in Mutual-Aid Housing

by

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The Human Settlements Division
Asian Institute of Technology
Bangkok, April 1981

This paper and the accompanying film entitled "Building Together" were produced in cooperation with the United Nations Centre for Human Settlements (HABITAT), Nairobi.

# PREFACE

This booklet was produced as a teaching tool for practitioners involved in planning and building housing communities with low-income people in the developing countries. It utilizes the Building Together Project, now under construction in Bangkok, Thailand, as a case study of mutual aid in housing. The experience being accumulated in the implementation of the project has been reflected upon with the intention of bringing forward the key issues that anyone building together with people may face.

There are not many projects now being undertaken that use mutual aid as a fundamental principle uniting the people in their housing efforts. Most self-help projects involve individual families building their own houses. In mutual-aid projects, families build their houses together and allocate these houses among themselves only when they are basically completed. As such, mutual aid in housing poses special opportunities for people's participation and raises special issues concerning its actual practice.

This booklet was produced simultaneously with a teaching film bearing the same title. The structure of the film and the book are identical and the numerous issues discussed are dealt with in the same order in both. While the film concentrates on activities on the project site and on comments from participants and professionals involved with the project, the booklet uses these comments as starting points for the discussion of issues in a more general way. The booklet also aims at exposing the Project to closer scrutiny by presenting statistical data, and by raising many questions which require further investigation. These questions do not have ready answers. They require incursions into realms of which we are still largely ignorant.

Many of the ideas and observations presented in these pages are undergoing continual changes as the Project progresses. In this sense, this booklet is a mid-way evaluation exercise. A more comprehensive report must await the completion of the Project and the development of the community in the years to come.

Both booklet and film will be included in a new series of teaching films produced by the United Nations Centre for Human Settlements (HABITAT), Nairobi. Funds for production were contributed by UN HABITAT and by the Canadian International Development Agency (CIDA), through its generous support to the Human Settlements Division of the Asian Institute of Technology. The co-operation of Mr. Andreas Fuglesang, Dr. Dario Pugler and Mr. G.P. Asthana of UN HABITAT, who gave many suggestions throughout the production of the film, are gratefully acknowledged. Thanks are also due to the members of the Building Together staff, Paul Chamniern Vorratnchaiphan, Werayudh Santayanondh, Wiyada Tasakorn, Apichai Savananondh and Chitra Panyatrakul, who assisted in the making of the film as well as in the collection of data for this report. A. Bruce Etherington is gratefully acknowledged for the invention of the basic elements of the building system used in the Project, the interlocking blocks and joists decribed on pages 12-16. Permission to reproduce this material or to use the building system must be obtained from A. Bruce Etherington, the Human Settlements Division, Asian Institute of Technology, P.O. Box 2754, Bangkok Thailand. The technical drawings of Manu Kupadakvinij are also acknowledged with thanks.

Finally we must thank the participants of the Building Together Project for the many opportunities for learning that they have given us all, including those who may benefit from this presentation.

## A NOTE ON THE USE OF THIS BOOKLET AS A TRAINING MANUAL

This booklet is intended for use as a training manual, in addition to presenting the Building Together Project as a case study of mutual aid in housing.

The main training objective to be achieved by the use of this manual is the encouragement of independent and imaginative decision making on the subject. The manual assumes that everyone could be involved in decision making in such a project. It is structured in such a way as to point out to the variety of connections between the different decisions. Many of these decisions are interdependent. A change in one requires a change in the others. By disagreeing with one decision taken in the Project and by thinking through the changes that will be required in other decisions, students can be made aware of such interconnections.

Other than being linked to one another in many ways, there is nothing sacred about any one of the decisions taken in this Project. Everyone of them is subject to scrutiny and criticism. By focussing on the questions at the end of every section, students may come to realize the vulnerability of any one decision to criticism. Questioning the wisdom of any decision is the beginning of a creative search for better solutions. Since many of the questions are new and largely unexplored, students may benefit from a closer look at specific questions. Short essays exploring one or more questions may be useful. Discussions or formal debates on specific questions can also be of value.

If time permits, it should be possible to use this manual as a basis for designing a new mutual-aid housing project in any given context. Each section is then to be viewed as an exploration of a specific aspect of the design, whether it be a policy on the resale of houses, the choice of appropriate technology, or the length of the construction period. For the exercise to be most useful, students should be divided into teams, where each team explores all sections and produces an overall design. In such a manner, the connections between the various design decisions will come to have a deeper meaning. During the early stage, however, students can be assigned specific data collection and analysis responsibilities. The data thus generated can be used as a common data base for the design teams.

Letters to the authors, commenting on or criticizing various aspects of the Project, suggesting new directions, or asking new questions requiring further research, will also be of great value. They should be addressed to the Human Settlements Division, Asian Institute of Technology, P.O Box 2754, Bangkok, Thailand. Additional copies of the booklet are obtainable at this address as well. Copies of the film and the booklet are also available at the United Nations Centre for Human Settlements (HABITAT), P.O. Box 30030, Nairobi, Kenya.

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# INTRODUCTION

The Building Together Project is a small housing project currently under way in Bangkok, the capital of Thailand. When completed it will house nearly two hundred families. These families are now building their houses by themselves, but not individually. Groups of families are building clusters of houses together. When the basic houses are completed, the group allocates them among its members. Each family then gradually improves and completes its own house. This, in essence, is the idea of building together.

Building Together combines three fundamental objectives: shelter, community and self reliance. Shelter is a basic need of every family. Community is the immediate world in which people live and act together. Self reliance is the liberation of the poor from continued dependence and ignorance and their transformation into creative and constructive participants in the shaping of their destinies. The building of houses by the people themselves produces decent shelter. The building of community is founded on the trust and unity generated in the process of working together and making decisions together. Self reliance is built by increased understanding and awareness of common problems and by developing confidence through individual and common accomplishments.

The pursuit of these three objectives already raises a number of serious questions:

1. Whose objectives are they?

2. Do the people see the value of pursuing these objectives?

3. Can these objectives be realistically achieved?

These questions are difficult to answer in the abstract, while the prospects of building together are not sufficiently real. The Building Together Project was planned with a view to achieving these objectives in practice. It follows in the footsteps of several earlier mutual-aid efforts in housing, notably in El Salvador, Uruguay and Zambia, which will also be discussed in the pages that follow.

While the concept of mutual aid in housing is by no means new, there have been only a few attempts to apply it to low-income urban housing projects in recent years. Traditions of building together are age old, but most of them have been lost in the process of disorganized migration and resettlement in the slums and squatter settlements of the third world. New traditions and practices must gradually emerge. The Building Together Project explores the potential for rediscovering mutual aid and community traditions in a new urban setting.

Housing projects involving people's participation give rise to many issues which must be confronted and satisfactorily resolved. Many of these issues are closely interrelated and a resolution of one cannot take place without due attention to the others. Still, it is beneficial to study them and consider them one by one. We have thus attempted to articulate these issues as separate issues, while pointing out to the relationships between them as well. Twelve key issues have been identified. Each one is discussed in a separate section.

The discussion begins with the issue of the organizational set up most appropriate for carrying out self-help and mutual-aid housing projects. What are the most effective organizations for carrying out such projects? Can governments carry them out as successfully as non-government organizations?

Second, there is the issue of style in site management. Site management in projects involving participation is of a different nature than site management in ordinary building projects. What is the best way to manage mutual aid? How can efficiency be maintained?

Third, there is the issue of choice of self-help technology. There are specific requirements in building with unskilled labour. What are they? What is the role of prefabrication in mutual-aid work? What types of technology can add the most value to the people's labour?

Fourth, there is the issue of site organization into smaller cluster groups. These groups form the basic units of work organization as well as the basic units of the neighbourhood. What is their appropriate size? What are the problems of organizing the community into cluster groups?

Fifth, there is the issue of unequal efforts. People working together contribute different shares to the common effort. Some are more diligent than others. Some are weak, too busy or too disinterested to contribute a fair share. Yet all get similar houses in the end. What is the proper way to record and acknowledge the contribution of various members? How can injustices be minimized?

Sixth, there is the issue of lengthy construction. People who are busy earning a living cannot work on building their houses on a full-time basis. They can usually work only on evenings and weekends. Their attendance is rather irregular and this makes it difficult to meet targets. Construction proceeds slowly. Delays and slow progress, particularly during times of high inflation, increase costs and decrease morale. How can we properly estimate the time required for self-help construction? How can we reduce delays? To what extent are long construction periods a permanent feature of self-help projects?

Seventh, there is the issue of resale of houses to higher income groups. There are profits to be made through the sale of houses. Can building one's own house and becoming a member of a new community reduce the chances of resale? Are there effective mechanisms to reduce the tendency to resell? Should resale be restricted at all?

Eighth, there is the issue of cost recovery. Most housing projects for low-income people involve considerable subsidies. Yet, if subsidies are large and the funds limited, only the fortunate few will benefit. Can costs be recovered from participants? Is it possible to recover part of the cost through cross-subsidies between different income groups within the project? Can we identify all the subsidies involved? Can we measure them? Can we reduce them?

Ninth, there is the issue of house design. What is the appropriate design for houses in dense urban areas? Are there specific local traditions which must be heeded? Does mutual aid call for specific designs? What is the role of people's participation in design? How can we leave adequate

freedom to build for individual families while building identical houses during the mutual-aid process?

Tenth, there is the issue of scale of production. Experimental housing solutions must be replicable on a large scale if they are to be of any lasting value. Can self-help and mutual-aid housing be produced on a large scale? What changes will be required to expand production of houses?

Eleventh, there is the issue of reaching the poor. The majority of people in need of housing are poor and cannot afford the housing produced in the market. Can self-help projects reach the poor? Should they aim at reaching the very poor or whould they be limited to people with sufficient ability to pay?

Twelfth and last, there is the issue of community control. Urban housing projects are complicated to mount and to manage. To what extent can the people be involved in every stage of decision making? How can they be involved effectively? How can they gradually take over the self-management of their own community?

The following sections discuss these issues separately. The more general arguments surrounding each issue are presented first, followed by the application of the discussion to the Building Together Project. Questions arising from the discussion of the issue in the context of the Project are raised at the end of each section. No specific order was chosen for the presentation of issues. They are closely interrelated, and tend to occur quite randomly in any sequence of decision making concerning building together.

# I. INTERMEDIARY ORGANIZATION

"The objective of the Building Together Project is to create an opportunity for you to come and build your houses together".

Werayudh Santayanondh, Site Manager

The ability of the people to take effective housing action is limited. People can and do build their own shelter, but usually find it difficult to organize land, infrastructure and community services. They also find it difficult to gain access to financial resources, to manage construction, or to deal constructively with large numbers of government agencies.

For people's participation in housing to be effective, a structure is necessary in which the people's efforts will be channeled and co-ordinated to produce good results. There appears to be a significant role for intermediary organizations. Such organizations can provide the initial stimulus for organizing people. They can help the people in articulating their needs and aspirations into meaningful action programmes. And they can provide the necessary access to technical and managerial resources as well as to government bureaucracies.

Such intermediary organizations can be part of the government, as is the case in the Habitat Hyderabad Programme in India, a programme which has been successful in initiating people's participation in slum reconstruction activities on a large scale.[1] They can also be non-government agencies, such as the El Salvador Foundation for Minimum Housing and Development, which has been constructing thousands of low-income housing units using mutual-aid and self-help methods.[2] It is important, however, that they be legally recognized and free to operate effectively without unnecessary constraints.

The promoters of the Building Together Project, all members of academic institutions, government agencies and voluntary organizations, were united in their commitment to explore ways and means of assisting low-income people in gaining access to decent housing through their own efforts. Previous working experiences with slum communities in Bangkok have confirmed them in their belief that people's participation in housing, involving both mutual-aid and self-help construction, was an obvious and suitable means of building healthy, caring and self-reliant communities.

Neither the framework of an academic institution, nor the framework of an existing charitable organization or government agency, proved sufficiently flexible. It was decided to create a new organization, in the form of a non-

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[1] See Kumar, Yogesh, An Exploratory Study on the Progress of Habitat Hyderabad, Unpublished M.Sc. Thesis (Bangkok, Asian Institute of Technology, April 1980).

[2] See Ibanez, Antonio Fernandez, "La Fundacion Salvadorena de Desarrollo y Vivienda Minima", Desarrollo y Cooperacion, April 1978, p. 9.

profit association, the Building Together Association. Registration of the association promised to be lengthy and cumbersome. The remaining option for immediate action was to form an ordinary company, the Building Together Company, and to equip the company with a special charter for non-profit operation.

The Company was registered in August 1978, and the Association was subsequently registered in January 1981. Registering the Company has provided the organization with a legal status, enabling it to purchase land and to gain official access to government agencies as well as to donors. Grants provided by donors were used by the Company as no-interest loans, to be transferred to the Association upon its acquisition of a legal status.

The honorary shareholders and directors of the Company, all working voluntarily, provide the necessary contacts and insure access to experts and technical advisors. Some are staff members of the Human Settlements Division of the Asian Institute of Technology, which is using the Project site as a demonstration project for teaching and research. Others are professionals from the National Housing Authority of Thailand participating both officially, as counterpart staff in the Project, and unofficially, as people committed to housing the poor.

The Company also employs the services of full-time professionals, consultants, community organizers and social workers. The first project of the Company involves the construction of a new community in a rapidly growing suburb of Bangkok, aimed at housing two hundred families, mostly from nearby slum and squatter areas. The Project is not perceived of as a demonstration project alone. It is a learning experience for the Building Together Company and Association staff with a view to carrying out future projects, both independently and in co-operation with other groups. The Building Together organization is thus set up as a focal point for attracting and training young committed people in working together with the poor in housing and community building.

To date, the Company and the Association, and the combination of the two, have proved to be effective in carrying out the necessary tasks. The rather ambiguous image of a non-profit company has not prevented the organization from attracting funds from donors. After lengthy explanations, the concept has also been understood by the Project participants. The Company has retained an image of being strongly determined to recover its costs in operation. Foundations and associations in Thailand carry a strong image of being charitable, which sometimes makes people expect to be given something for nothing. In many cases, this attitude applies to their dealings with government agencies as well.

There are clearly three alternative organizations for building low-income housing. Houses can be built by contractors. They can be built by groups of people building together. They can be built by individual families themselves. These three types of organization can also be found in combination. Contractors can satisfy the goal of shelter. Families building themselves can build self reliance. People building together can build a community. All three in various combinations can build shelter, community and self reliance.

Decisions regarding the selection of an effective organization for housing the poor are not simple, and could involve complicated considerations. A number of important questions come to mind:

1. Is self help - and particularly mutual aid - restricted to non-government agencies, or can it be effectively practiced by government?

2. Can self-help and mutual-aid housing be developed by profit-oriented private developers?

3. What is the future of non-government housing organizations? What should be their proper relationship with the government?

4. What is the best form of organization for creating new experiments in housing? Are current forms of organization preventing the emergence of new knowledge?

## II. SITE MANAGEMENT

> "Some come to work and don't work. A few come to work and go off to sleep somewhere. Some, even while they work, they are half asleep...."
>
> Noi Suwanchinda, Cluster Foreman

The management of construction in self-help projects is of a different nature than project management in the building industry. It cannot rely on the employment of highly skilled labour or on the enforcement of industrial discipline - dismissals, bonuses and promotions. It is founded on the elimination of the distinction between consumers and producers. The people are expected to produce good quality housing because they are producing for themselves.

Mutual-aid projects are further distinguished from ordinary self-help projects in one important aspect: in self-help projects, the project management deals directly with individual families, and the families take on the responsibility for organizing and managing house construction. In mutual-aid projects, the project management deals with groups of families. The groups and the project management jointly take on the responsibility for house construction. In general such projects are, therefore, more difficult to organize. People are no longer working on their individual houses. They are working together toward the common goal of housing themselves.

The basic objective of site management for mutual-aid projects is to organize people to work together effectively. This is fundamentally a social task, not a technical one. It does not necessarily require strict supervision, sanctions or rewards. It may be achieved by dynamic leadership, inspiration and the building and sustaining of momentum and morale. Efficiency need not come into conflict with the building of community. Real savings, both in time and in cost, lie in the organization of the people into an effective and dynamic group. The group must come to realize the value of working together. Such realization is the key to further collaboration in community life. Conversely, the failure to work together productively may destroy the chances for further co-operation for a long time to come.

The potential advantage of working together is that, in addition to building a strong community spirit, it can also produce better houses than those constructed by individual self-help. Group members can develop special skills during the construction process and divide the work among themselves. They can also carry out tasks requiring large groups of people, or work in teams on specific building activities.

Whether these advantages can be realized or not depends, to a very great extent, on the organization of the people. The better organized they are, the higher the quality of work and the cheaper and faster the process of construction. In this sense, there is a lot to be learned from ordinary site management in the building industry. Contractors and developers have accumulated considerable experience in site management. Goodwill and concern for the people cannot always substitute for such experience. At the same time, experienced site managers with such goodwill and concern for the people

are difficult to find.

Site management in the Building Together Project is a combination of four distinct styles of management: contracted work, mutual-aid work, self-help work, and voluntary community work. These are divided into four, almost distinct, stages:[3]

1. The pre-construction stage: In this first stage, a private firm was contracted to build the site infrastructure, using its own labour and materials.

2. The mutual-aid stage: In this stage, groups of 16-20 families produce components for basic houses, and then assemble these houses in a cluster on the building site. The basic houses are allocated among members of the group by lottery after they are completed.

3. The self-help stage: At this stage, the families complete their houses by themselves, purchasing materials either from the Project store or independently. This stage may continue indefinitely.

4. The community services stage: Once the houses are built, the people take over the management of the community themselves and continue the construction of community services, using their own labour and resources. Possible projects include a child care center, a workshop, a community hall and a market.

The most difficult and most critical stage in the Project is the mutual-aid stage. At this stage, after a short period of orientation, groups of families spend very considerable amounts of time building the basic houses. These families do not know each other in advance and form relationships as the construction progresses. Newcomers, whether relatives, friends or families replacing other families, continuously join the group. Attendance tends to be irregular. People come to work during the evenings and weekends and sometimes during the day. No person can be expected to carry out an entire building operation for an entire cluster of houses. People continually shift from one task to another, depending on the particular need which arises on a particular day. Everyone is expected to be able to do everything, making it difficult for anyone to become expert at any one given task.

In such a situation, quality and efficiency can be insured in two ways: by supervision and by social control. In the Building Together Project, both have proven less than optimal. The relationship between the skilled supervisors and the self-help builders is unclear. The cluster foreman is usually more experienced. He cannot, however, expect obedience from the self-help builders because they perceive of him as someone working for them and not vice versa. Foremen feel that in their advisory role they cannot supervise properly. The people expect them to help in the actual work, and are not satisfied with simple supervision and instruction.

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[3] This division into stages is largely patterned after the practices developed in El Salvador. See Ibanez, op. cit.

Social control is also difficult. Thai culture prohibits outright scolding, especially among equals. It is a culture of non-interference. People prefer to ignore improper behaviour rather than risk confrontation. Complaints are usually passed on, sometimes indirectly and secretly, to higher authorities who must then resolve them. While major crises can be effectively dealt with in this manner, day-to-day management problems usually cannot.

To date a number of important problems in site management have been identified:

1. Waste of materials. There is insufficient awareness of the need to use materials economically. This is partly due to the current practice of not relating the price of the house directly to the consumption of materials by each cluster.

2. Quality of work. Although the people enjoy the overall results of their efforts, there are complaints about the quality of work of specific individuals. As mentioned earlier, it is difficult to enforce quality control. Other more diligent members must usually be relied upon to correct mistakes and negligent behaviour.

3. Irregular attendance. Initial plans to divide the people into teams and to assign each team a specific task have not been successful. People come to work whenever they are free and fail to come on agreed upon times and dates. They suffer no penalties for failing to appear as agreed. Others come late or leave early, making it difficult to form and maintain work teams.

4. Low labour productivity. People prefer to work in larger groups than necessary and to take turns doing difficult tasks. Work time is also used for forming social relationships and for meetings to discuss common problems. People are credited for the number of hours worked, and not for their outputs. For some, this is interpreted to mean that the most important objective is to collect hours rather than finish the houses.

The overall result has been an increase in the cost of materials, amounting to almost 20 per cent of the cost calculated from quantities of materials required, and a significant increase in the time required for the completion of houses. Initial estimates required 1,200 hours for the completion of one house. The first cluster required an average of 1,779 hours to do so, an increase of almost 50 per cent above the original estimates. These estimates were corrected and later houses were expected to be completed in 1,440 hours. This target has not been met either. The expected increase in efficiency with the accumulation of experience and with the acquisition of machinery and tools has not yet materialized. Later clusters have not attained any significant increases in efficiency beyond that achieved by the first cluster. The result has been longer-than-expected periods of construction, creating overall delays (see chart on page 38) and increased operating costs (see discussion in Section 6, pages 37-39).

A number of questions are currently being examined with the view of simplifying and improving site management:

1. Should the pre-construction stage and the self-help stage be expanded in order to reduce the volume of work during the mutual-aid stage?

2. Can part of the mutual-aid work be done through voluntary co-operation during the self-help stage?

3. If the total time required for construction cannot be shortened, can operating expenses be reduced to a minimum?

4. Should skilled labour be hired to lead self-help building teams to help meet targets, organize the people and insure co-operation with other teams?

5. Is the recording of working hours the best way to measure the people's contribution?

6. Should the work day be divided into specific work shifts, requiring both people and supervisors to work entire shifts?

7. Can a weekly production plan, based on people's commitment to attend, be made to work?

8. Should members be made to pay an application fee when they join, and fines for failing to attend at promised times deducted from them?

9. Should education and skill training be improved to increase quality and efficiency of work?

10. Should a formal work agreement be signed before construction commences, outlining in detail the expectations of all parties concerned?

All these measures may improve efficiency. We must remember, however, that the perception of efficiency by the Project staff and by the people are not necessarily identical. The people are interested in efficiency. They do not consider hard and ineffective work particularly enjoyable. They also prefer cheap houses to expensive ones. They do consider, however, other values, particularly when it comes to their comfort, their degree of control over building operations, and their self respect.

In attempting to answer questions of efficiency, we must keep in mind that true and effective answers will only emerge through dialogue with the people. We must realize that site management of self-help and mutual-aid projects must blend together the goal of efficiency and the goal of building a self-reliant community. This combination of goals requires a special type of management and special qualities in the managerial staff which will need time to come into being. We must therefore also ask ourselves:

1. How can we build a cadre of professionals who can effectively manage self-help and mutual-aid projects?

2. What type of training and experience would be valuable for such professionals?

## III. SELF-HELP TECHNOLOGY

> "The building system that we developed for the Building Together Project is especially designed to utilize unskilled labour".
>
> A. Bruce Etherington, Master Builder

Self-help and mutual-aid housing require a special technology. The final choice of technology is, of course, subject to specific economic and cultural conditions. A number of considerations, however, are specific to the self-help and mutual-aid process.

First, for the people to benefit most from participation in building their own houses, the value added to the production process by the people themselves must be maximized. To create value, materials should be purchased as raw as possible, and the use of skilled labour should be kept to a minimum. Machines and tools should be provided, whenever possible, to increase productivity. People can provide many hours of labour, but their labour must generate value.

Second, the technology must be suited to the limitations of unskilled people. Unskilled people find it difficult to work with precision. Thus, building components and building assemblies which do not require precision and have sufficient tolerances for errors are to be preferred.

Third, unskilled people do not remain unskilled for long. Given well-defined repetitive tasks, they soon become semi-skilled, and then skilled at performing these tasks. People learn. The technology must be divisible into simple, easy steps, each one with a beginning and an end. Special emphasis must be given to training and to learning by doing.

Fourth, in house construction, assembly is usually more complicated than the production of building components. To maximize the use of unskilled labour, as many components as possible should be prefabricated by the people. Prefabrication is a simple way of taking advantage of mutual aid. There are many advantages in producing components together, rather than having each family produce its own.

Fifth, the people must feel comfortable with the technology. They must feel free to modify and improve it, without having to depend on expert advice as the construction process progresses. They must master the technology. They must be able to repair, maintain and improve their houses over time. In this regard, participation is much simpler and more effective when traditional technology is used.

The technology adopted for the Building Together Project was selected with a view to maximizing the surplus created by the people themselves, given the special conditions prevailing in Bangkok. Traditional technology, which is largely based on wood, has been rejected for two reasons: During the past three years wood prices have surpassed the prices of steel and concrete. In addition, high urban densities increase the danger of fire, and local building codes require the use of fireproof walls. Although most of the participants in the Project live in wooden houses, they have expressed satisfaction with

the choice of concrete as a building material. They perceive the value of a strong and lasting structure.

To maximize the value added by the people, a self-help factory was constructed on the building site. During the first stage of construction, each cluster group works in the factory to produce all the components needed for the houses. The basic materials used are sand, gravel, cement, steel and small quantities of wood. The factory is designed to produce building components for one house a day: 500-600 concrete blocks, 16 floor joists, 50-55 short foundation piles, 16 concrete stairs, reinforcement bars for grade beams, and door and window frames.

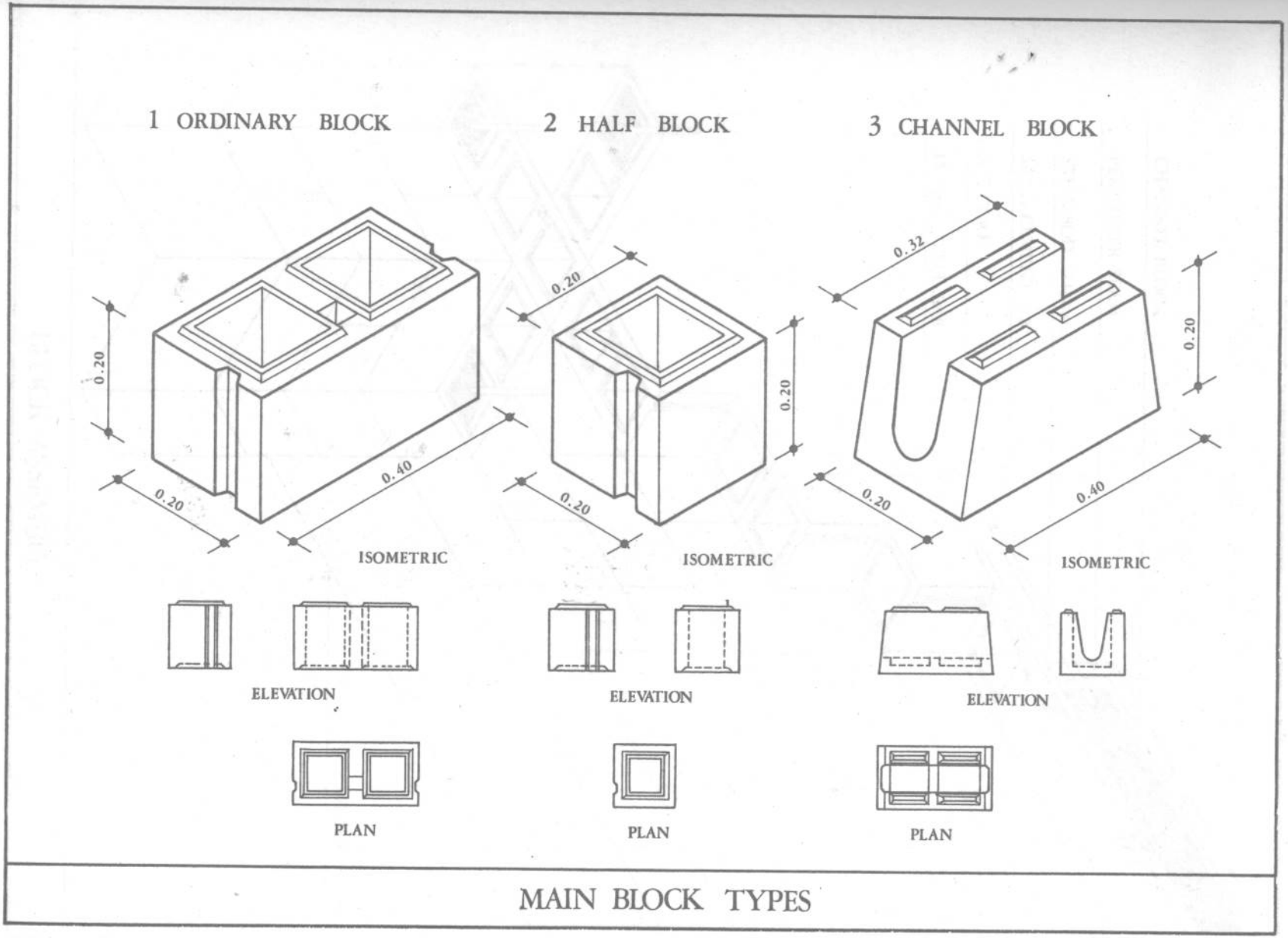
The blocks, which are interlocking and require no mortar for assembly, are produced with a simple block machine (see plate no. 5 on page 34 and drawings on pages 13 and 14). The floor joists, which fit into the interlocking blocks, are cast into simple steel moulds constructed on the site by skilled workers (see drawings on pages 15 and 16). The foundation piles are made in short 2.0 m. segments, which are then hammered into the ground with a simple piling rig, also constructed on the site (see plate no. 1 on page 17). Each pile is 6.0 m. long. The segment, which are hollow, are connected by small pieces of wood (see plate no. 2 on page 18 and drawing on page 19). The pile segments, as well as concrete stairs and grade beams, are also cast using steel moulds built on the site (see drawings on pages 20 and 21). All the components thus fit together into one integrated building system (see drawing on page 22).

The total investment in the self-help factory as of January 1981 was US $42,826, broken down as follows:

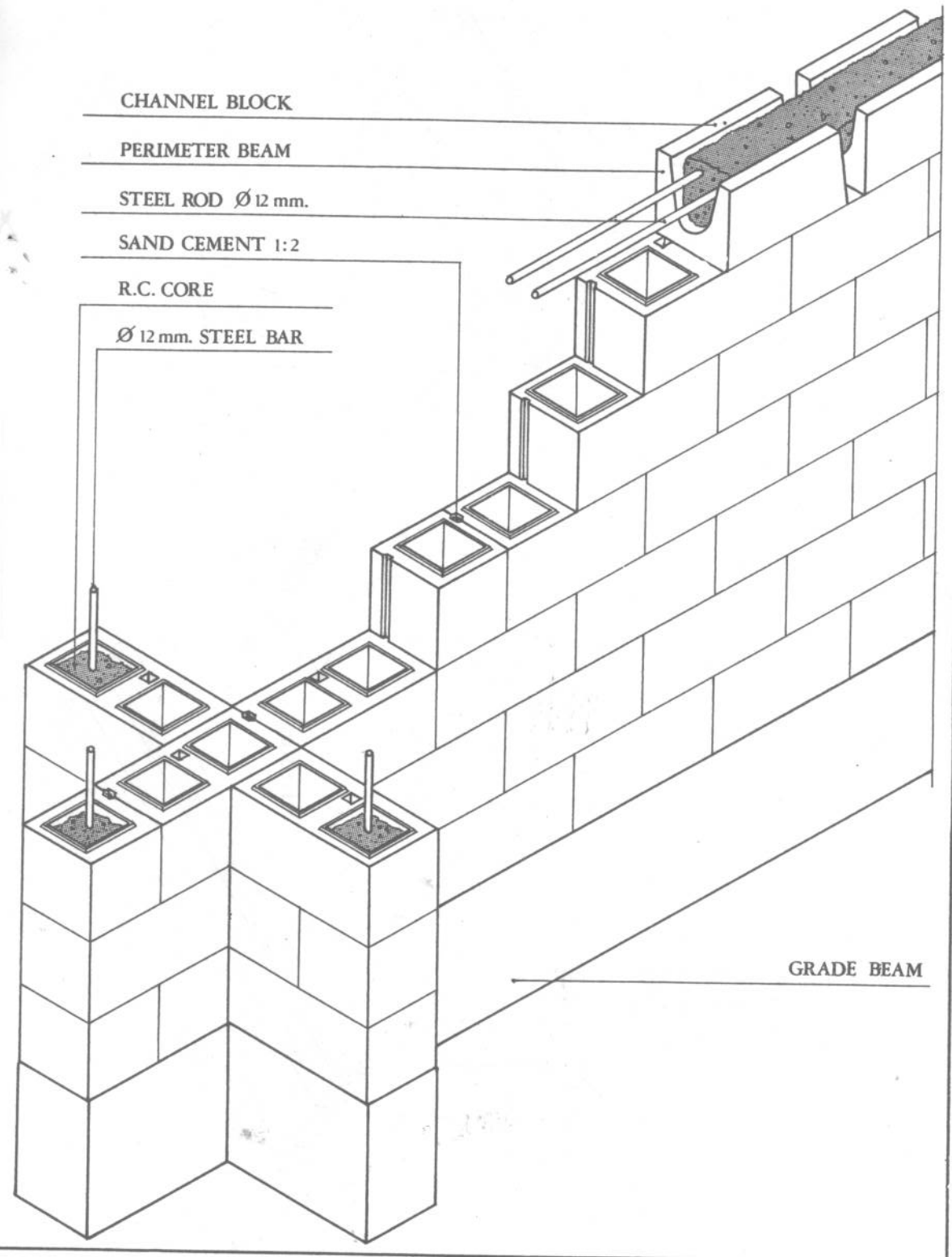
| | |
|---|---|
| Building materials for construction of the factory | US $ 15,475 |
| Machinery (including mixers, small truck, woodworking machines, piling rig, motors, trolleys, etc.) | 14,174 |
| Steel for production of moulds, piling rig and forms | 3,397 |
| Hired labour for construction of factory, machines, moulds and forms | 9,780 |
| Total | US $ 42,826 |

The building system developed for the Project has important advantages. The cost of materials is US $24.10 per $m^2$, and the total cost of construction is US $42.25 per $m^2$. This compares favourably with the prices of construction in Bangkok. A recent study cites US $79.50 per $m^2$ as the cheapest construction cost encountered in the city. The most frequently cited prices were between US $171.15 and 195.60 per $m^2$ for detached houses, between US $122.25 and 146.70 per $m^2$ for town houses and row houses, and between US $97.80 and 122.25 per $m^2$ for shophouses.[4]

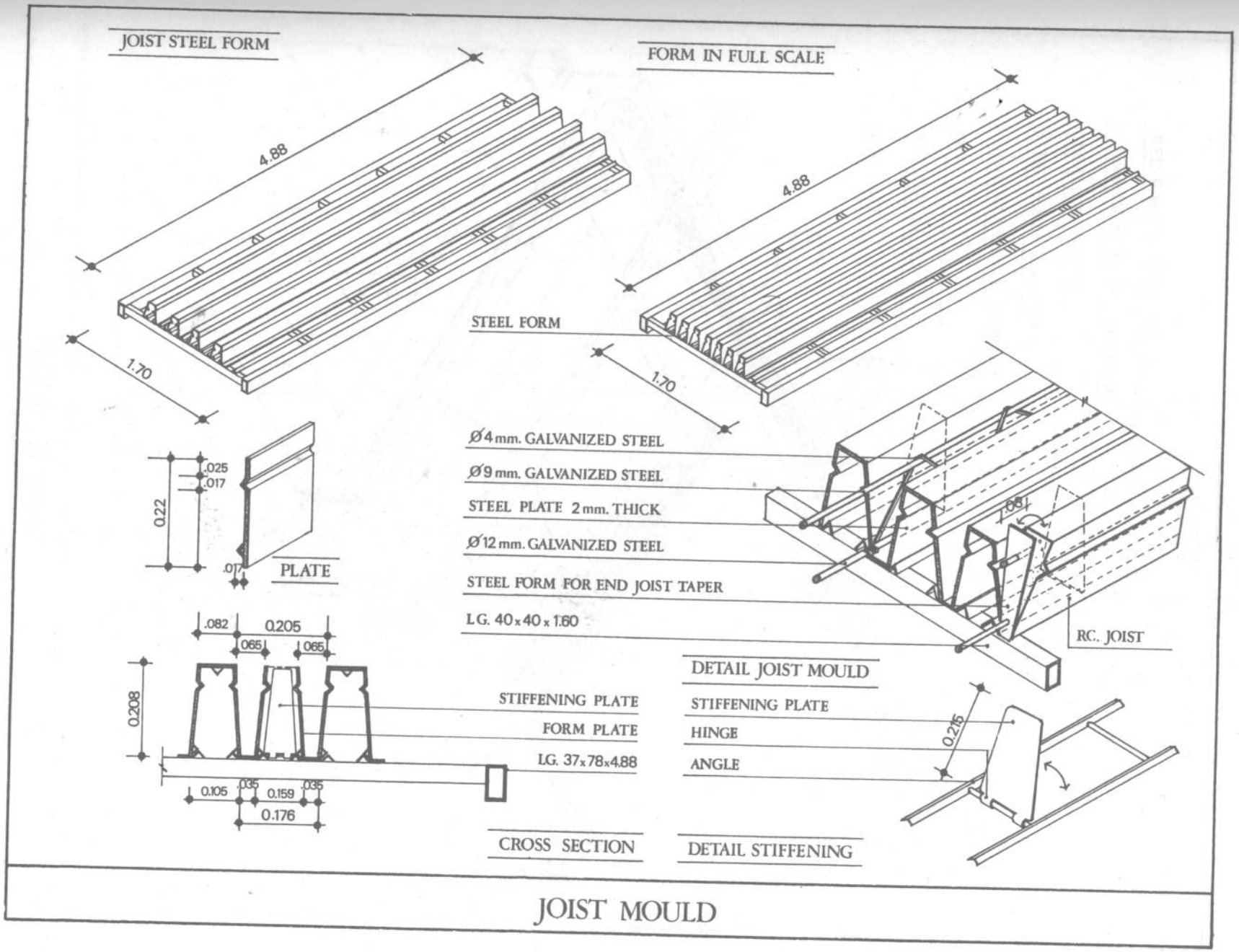
[4] National Housing Authority of Thailand, Present Standards and Prices in the Housing Market in Bangkok (Bangkok, NHA, 1980), p. 11.



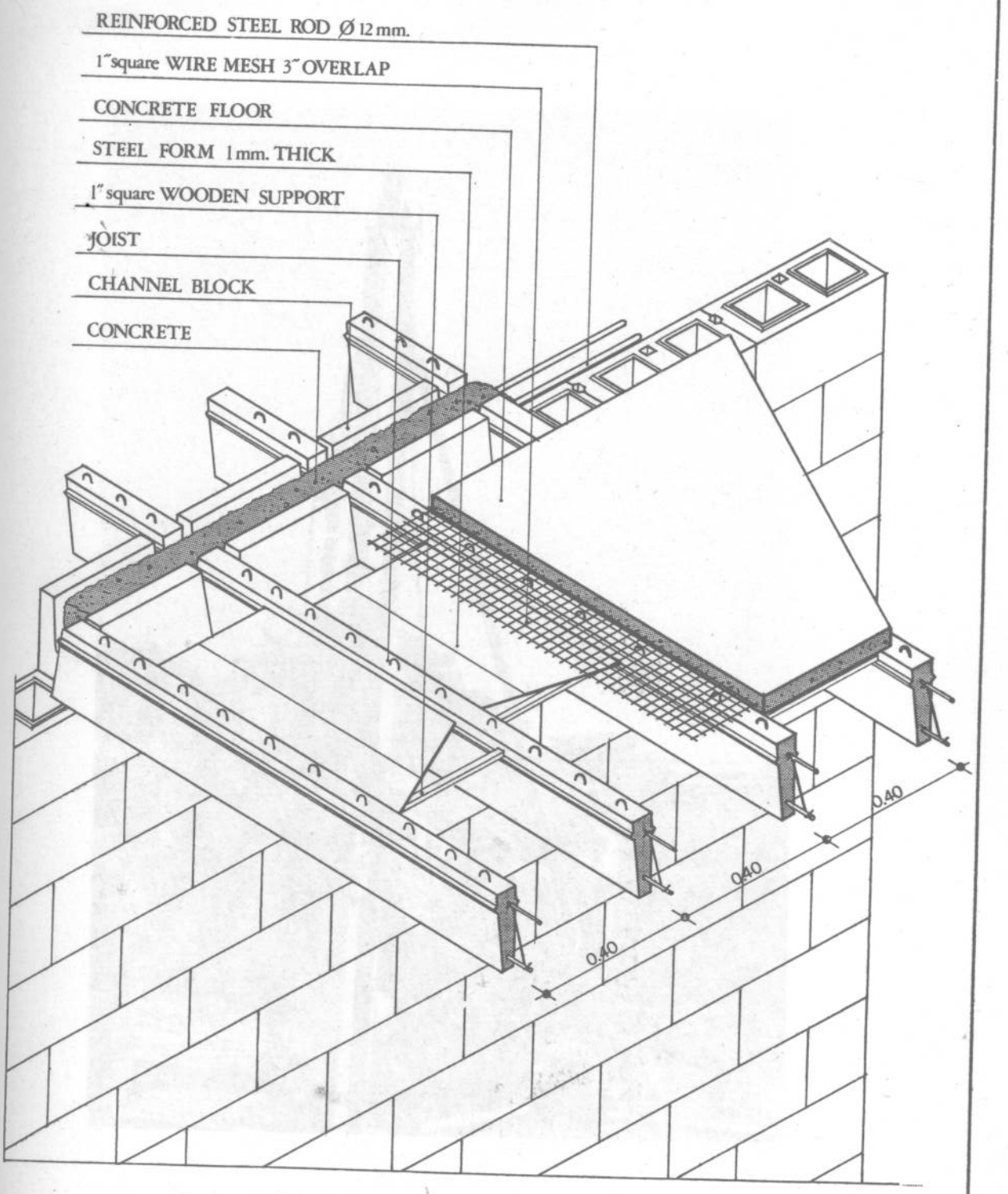

MAIN BLOCK TYPES




BLOCK ASSEMBLY


JOIST STEEL FORM
4.88
1.70
FORM IN FULL SCALE
4.88
STEEL FORM
1.70
Ø4 mm. GALVANIZED STEEL
Ø9 mm. GALVANIZED STEEL
STEEL PLATE 2 mm. THICK
Ø12 mm. GALVANIZED STEEL
STEEL FORM FOR END JOIST TAPER
L.G. 40 x 40 x 1.60
.025
.017
0.22
.017
PLATE
.082
0.205
065
065
0.208
STIFFENING PLATE
FORM PLATE
L.G. 37x78x4.88
0.105
035
0.159
035
0.176
CROSS SECTION
RC. JOIST
DETAIL JOIST MOULD
STIFFENING PLATE
HINGE
ANGLE
0.215
DETAIL STIFFENING

JOIST MOULD




FLOOR ASSEMBLY

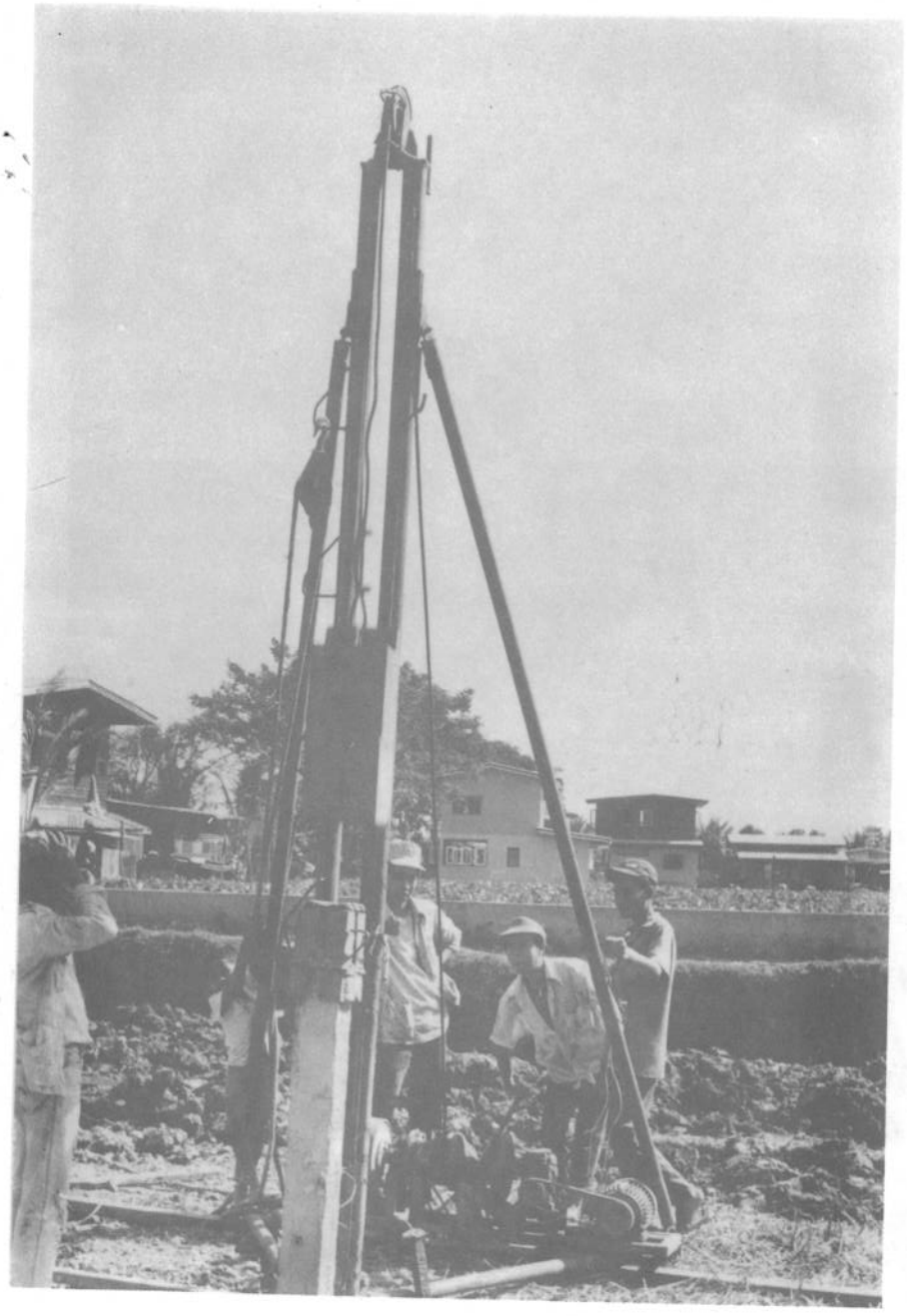
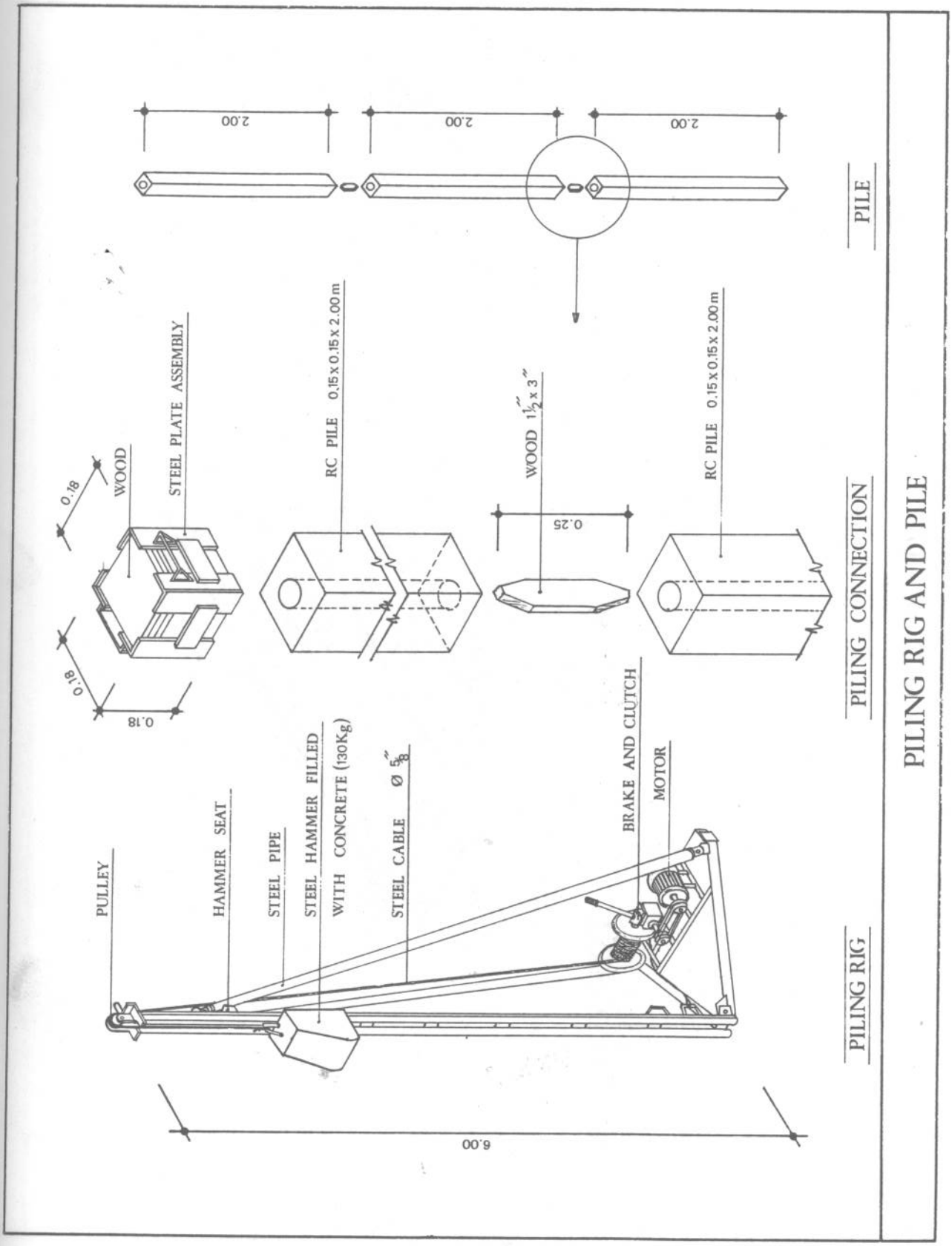
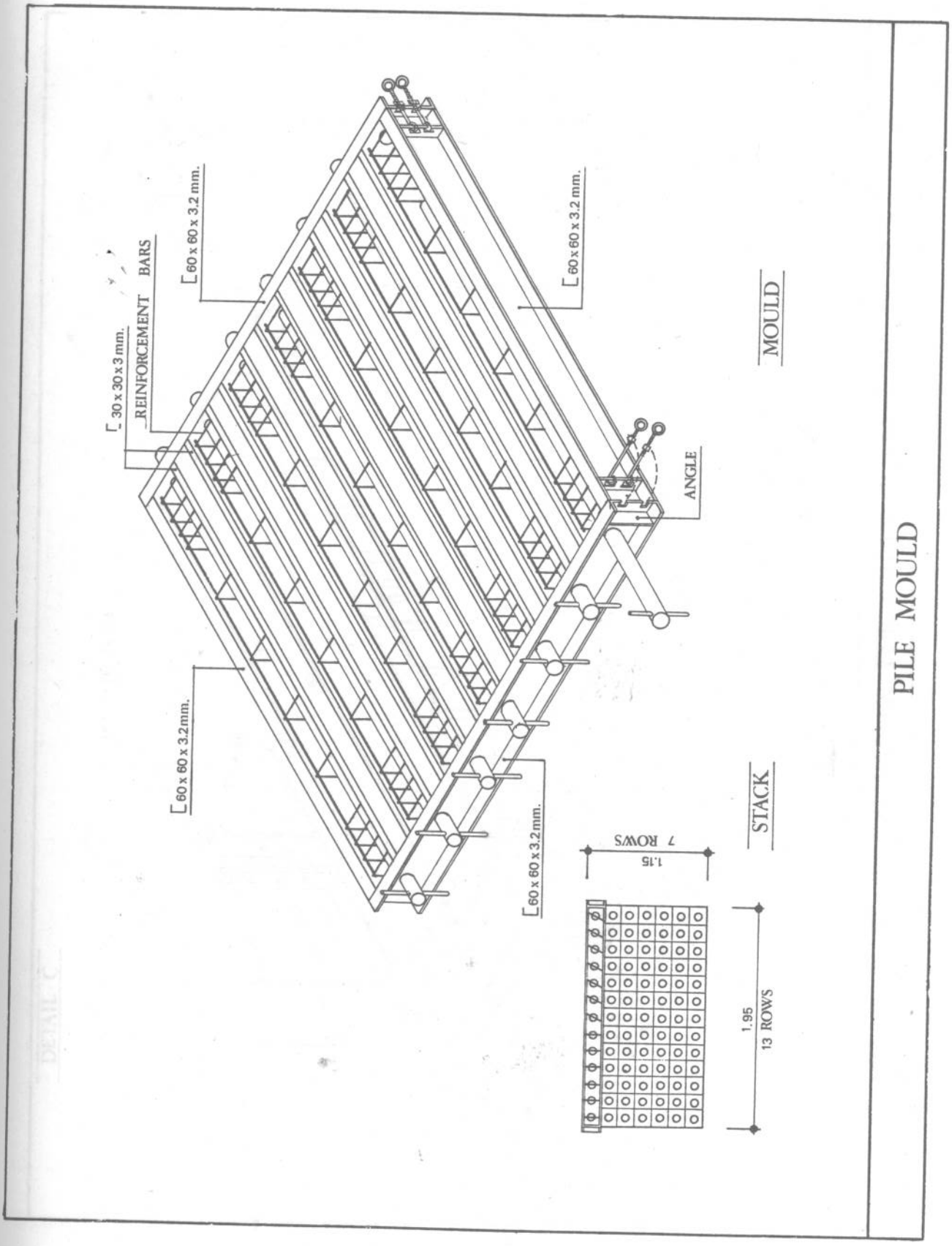
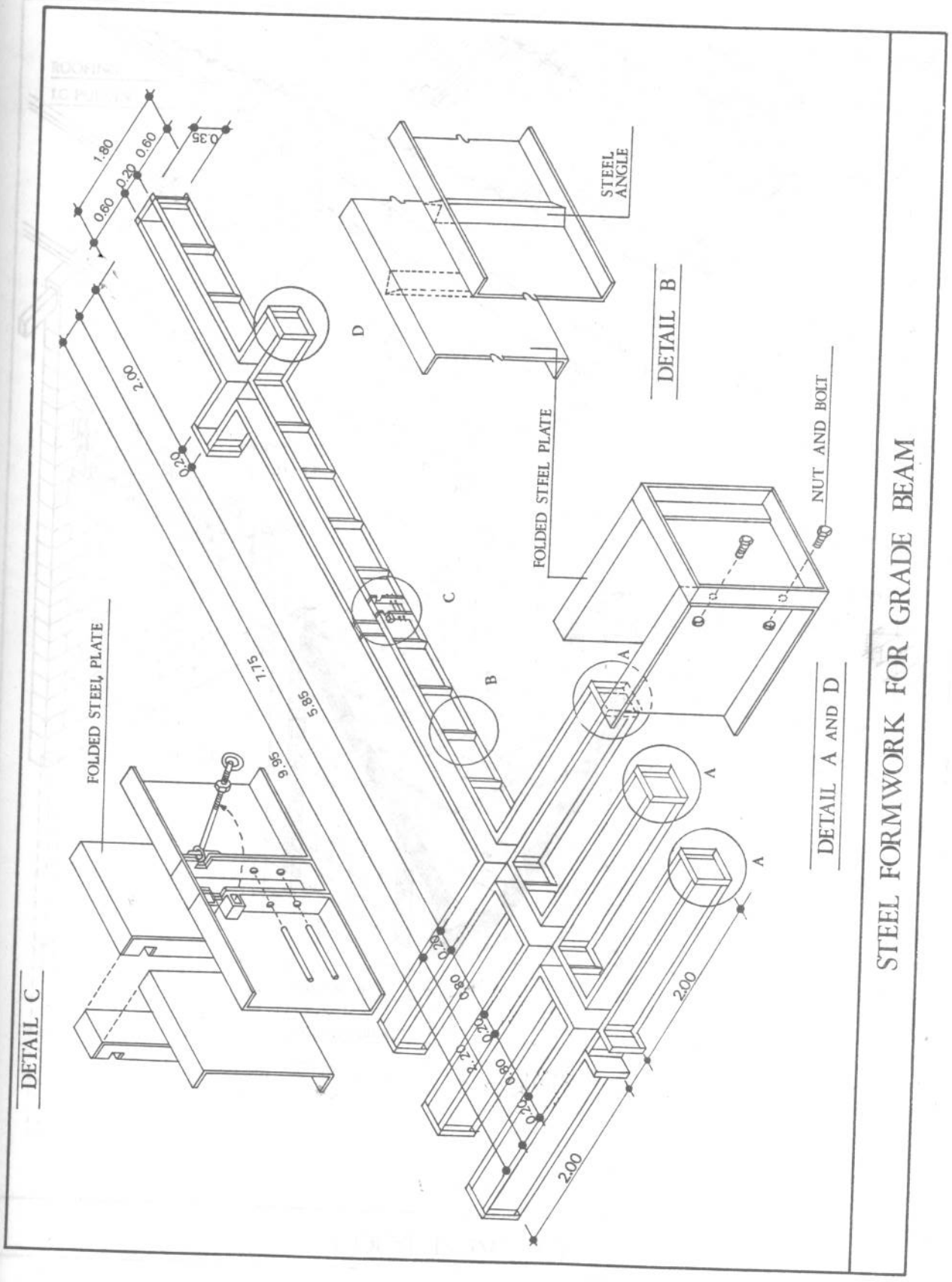


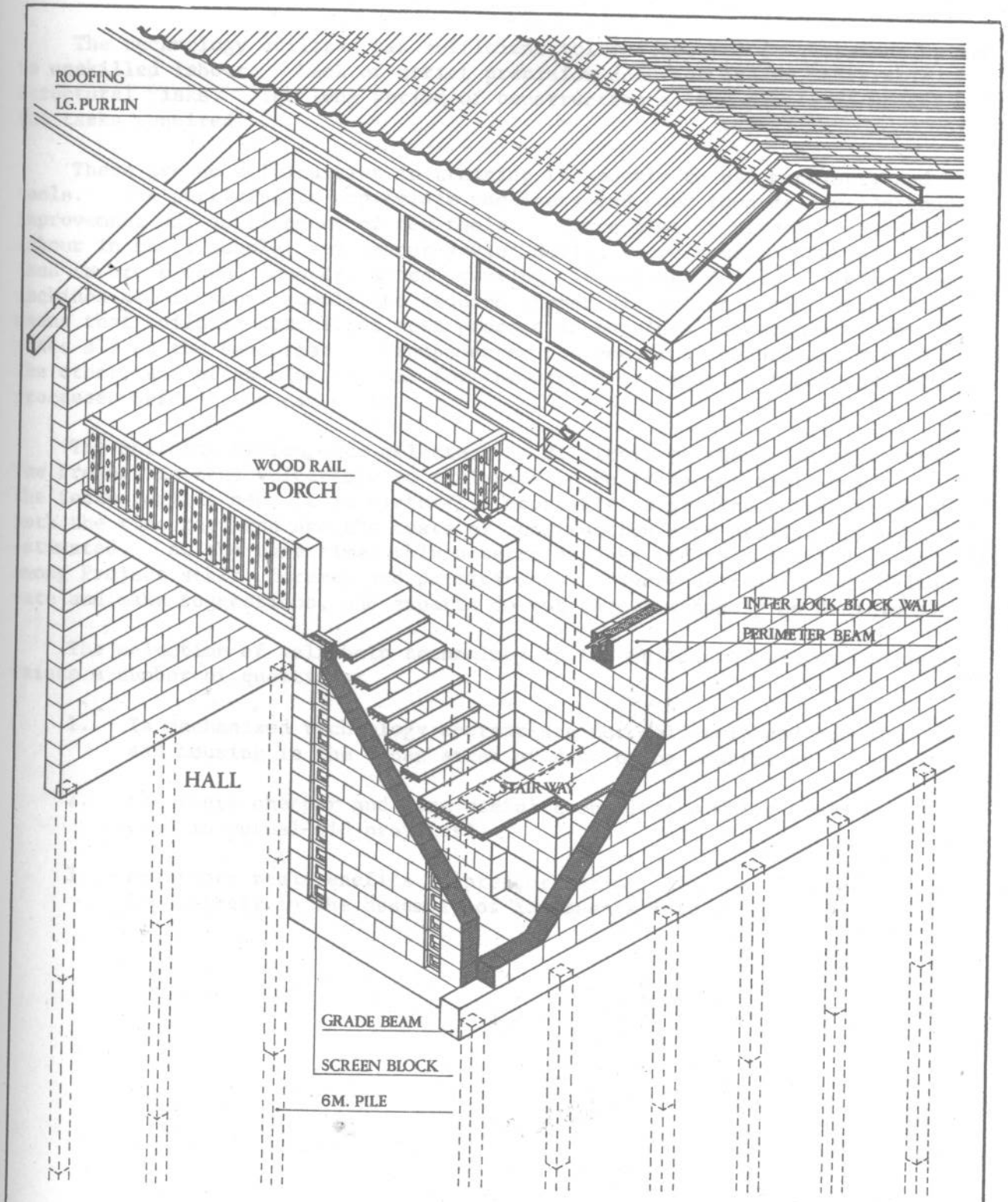
Plate 1: Pile driving team in action.

Plate 2: Short piles being unloaded on the site.


PILING RIG AND PILE
PILING RIG
PILING CONNECTION
PILE
PULLEY
HAMMER SEAT
STEEL PIPE
STEEL HAMMER FILLED WITH CONCRETE (130Kg)
STEEL CABLE Ø 5/8"
BRAKE AND CLUTCH
MOTOR
6.00
WOOD
STEEL PLATE ASSEMBLY
0.18
0.18
0.18
RC PILE 0.15x0.15x2.00m
WOOD 1½"x3"
0.25
RC PILE 0.15x0.15x2.00m
2.00
2.00
2.00


PILE MOULD
MOULD
STACK
7 ROWS
1.15
1.95
13 ROWS
ANGLE
60 x 60 x 3.2 mm.
60 x 60 x 3.2 mm.
60 x 60 x 3.2mm.
60 x 60 x 3.2mm.
30 x 30 x 3 mm.
REINFORCEMENT BARS


DETAIL C
FOLDED STEEL PLATE
9.95
7.15
5.85
2.00
0.20
1.80
0.60
0.20
0.60
0.35
D
C
B
A
A
A
DETAIL B
STEEL ANGLE
FOLDED STEEL PLATE
NUT AND BOLT
DETAIL A AND D
0.20
0.80
0.20
2.70
0.80
0.20
2.00
STEEL FORMWORK FOR GRADE BEAM




HOUSE ISOMETRIC

The technology utilized has sufficient tolerances, and is therefore suited to unskilled labour. Lack of strict precision does not create unbearable structural risks. The long period of construction allows people to master the tasks required.

There are no difficulties in training the people to use machinery and tools. The participants appreciate machinery and work towards the continuous improvement and development of new tools. Since time is always limited and labour in short supply, any labour-saving device is welcome. Machines do tend to break down, however, often causing unforeseen delays. In addition, machines are in short supply and require proper allocation among users. This means that building activities must proceed in sequence, and cannot take place all at the same time. Groups enter the construction process one after the other, and often have to wait for the preceding group to finish certain processes before they can start.

The building system, once selected, is difficult to change in mid-stream. The Project is thus vulnerable to inflation in building materials costs. If the technology is new, it is virtually impossible to predict costs correctly. Both the time required and the costs of construction were predictably underestimated. At the same time, this uncertainty has led to a feeling of equality among Project staff, foremen and participants. Everyone feels free to innovate and make suggestions, and experts do not have a monopoly on decisions.

The selection of self-help technology in the Building Together Project raises a number of questions:

1. Is mechanized technology appropriate for self-help and mutual-aid housing in the urban areas of developing countries?

2. Are there cheaper and more useful technologies which could be used in mutual-aid projects?

3. Are there real benefits in prefabrication, or does the added value lie largely in the assembly of components into complete houses?

# IV. SMALL CLUSTERS

"Dividing the Project into clusters simplifies site management and helps in community organization. People participate more readily in a smaller group".

Paul Chamniern, Project Director

People building together end up living together. In larger communities it is not possible for everybody to build together. In most mutual-aid housing projects, people are divided into smaller working groups and each group builds its own cluster of houses. In a number of mutual-aid projects around the world, the magic number 20 appears to be the most common size of the cluster. In the Santa Lucia Colony in El Salvador the average cluster size in 23.[5] In the mutual-aid housing projects organized by the El Salvador Foundation for Minimum Housing and Development, the number of houses in each cluster varies between 16 and 20.[6] In the Chawama Self-help Housing Project in Zambia, the optimal size of a construction group was reckoned at 20 families.[7] In the Building Together Project, clusters vary in size between 16 and 20 families (see site plan on page 25).

The division of the community into cluster groups appears to be justified from the point of view of community organization for construction as well as from the point of view of site planning. As quoted above, people participate more readily in a smaller group. Acquaintances are quickly established. Cluster members feel a special relationship to one another. Since people are building a number of houses together, they still need to retain the feeling that they are building for themselves. This feeling is lost with a larger group. A small group, on the other hand, must engage in all building processes from beginning to end. The larger the number of tasks, the more difficult it is to master all of them. Economy and efficiency, which can be attained through division of labour in larger groups, call for an increase in group size. After all, efficiency in the construction of large-scale housing projects by contractors rests on the principle that workers, skilled in one special activity, move from one house to another to cover the entire site.

Quite apart from construction management considerations, there are good reasons for breaking up a large community into smaller neighbourhood units.

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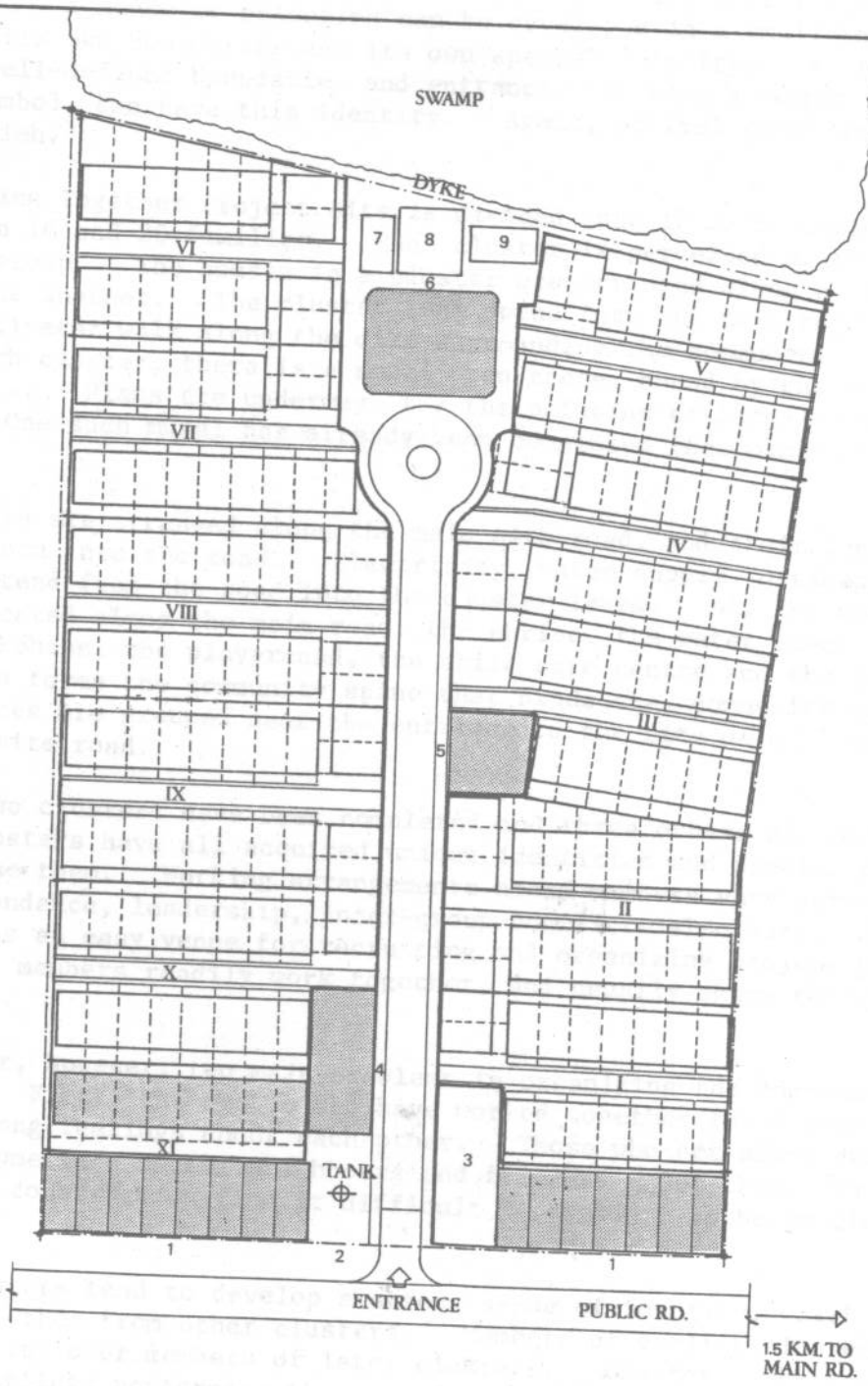
[5]Instituto de Vivienda Urbana de El Salvador, "Santa Lucia Colony Mutual-Aid Project", in Self-help Practices in Housing: Selected Case Studies (New York, United Nations, 1973), p. 45.

[6]International Bank for Reconstruction and Development, El Salvador Appraisal of a Sites and Services Project, IBRD Report no. 473a - ES, September 1974, p. 7.

[7]American Friends Service Committee, Chawama Self-help Housing Project, Kafue, Zambia (Philadelphia, AFSC, 1975), p. 25.




LEGEND:

1 SHOPHOUSES
2 PLAZA
3 MARKET
4 FACTORY
5 WORKSHOP
6 PLAZA FOR PLAYGROUND
7 CHILD CARE
8 SALA (PAVILLION)
9 SUMP

CLUSTER LINE
LOT LINE
BUILDING LINE

SITE PLAN

Large communities made up of small individual houses often increase anonimity and alienation. A sense of belonging can be developed in a small Nneighbourhood that has its own boundaries and its own special identity. A cluster of houses, with well-defined boundaries and entrances, sharing a common space or a common symbol, can have this identity. Again, optimal sizes are difficult to establish.[8]

The Building Together Project site is divided into 10 main clusters, each housing between 16 and 20 families. Each cluster is perceived of as a small neighbourhood group. The houses in a cluster are arranged along a short lane, facing one another. The cluster lane opens into the main road as well as into the perimeter walk along the dike surrounding the community. At the entrance to each cluster, there is a small open space, bound by one or two two-storey walls. Plans are underway for the painting of large murals on these walls. One such mural has already been completed (see plate no. 3 on page 27).

The clusters are arranged along the main site road, and their lanes and common spaces open into the road. Electricity, water supply, drainage and sewage pipes extend from the road into the cluster lanes. All the community services are located along the main road: the shrine, the water tower, the market, the workshops, the playground, the child care centre and the community hall. The road forms the community spine that binds the community together. Community services are grouped near the entrance to the site as well as at the end of the site road.

To date, two clusters have been completed and three others are under construction. Clusters have all acquired unique identities and special traditions that characterize them. Working arrangements among members vary between clusters. Attendance, leadership, inter-group conflicts also vary. The clusters serve as an easy venue for recruiting and organizing project participants. Cluster members readily work together, and usually share their food during mealtimes.

There appear, however, two main problems in organizing the community into cluster groups. First, the people who have worked together for a long time develop very strong feelings about each other. Those who get along during construction become very useful neighbours and friends. But those who have quarreled during construction find it difficult to continue to be in close proximity.

Second, clusters tend to develop a strong sense of identity, which sometimes tends to separate them from other clusters. Members of earlier clusters feel a sense of seniority over members of later clusters. Cluster members defend each other in conflicts concerning the use of tools and equipment. In short, the cluster organization, if allowed to develop on its own, makes it difficult for a community spirit to emerge. Developing a sense of unity among different clusters requires time. A Joint Community Committee, comprising two elected members of each cluster as well as workers and project staff members, has

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[8]See Alexander, Christopher, et. al., A Pattern Language (New York, Oxford University Press, 1977), pp. 197-203; and Alexander, Christopher, et. al., The Production of Houses, unpublished manuscript (Berkeley, Center for Environmental Structure, 1976), chapter 3.

Plate 3: Members of Cluster 1 and Project staff on completion day.

recently been established. The Committee is starting to generate a strong sense of community among members, and has begun publishing a community newsletter.

The organization of mutual-aid communities into small clusters still leaves the following questions unanswered:

1. How large can clusters be without the members losing the sense that they are building their own houses?

2. How small can clusters be without losing the advantages of building together?

3. What is the proper degree ot enclosure of a cluster that can insure sufficient privacy as well as an adequate sense of belonging?

Plate 4: Houses in Cluster 1 surrounding the cluster lane.

## V. UNEQUAL EFFORTS

"When you work together, you really feel for each other. But the others who didn't work themselves didn't care".

Witoon Thonglor, Cluster 1 member

Mutual aid is a co-operative effort. A co-operative effort is necessarily based on the perception of fairness and justice among the people. The most dangerous enemy of co-operation is exploitation. Many worthwhile projects involving active people's participation have failed as exploitative practices set in, and as some members began to benefit more than others or at the expense of others.

People's ability to work and to work effectively vary. Some are more diligent than others. Some have more time. Some are better workers. Some are better organizers. Others are weak, have many personal problems, and are easily distracted. These differences have to be understood and accounted for. Otherwise a sense of injustice builds up among the people.

There are two principles of allocation among people working together toward a common goal: "equal pay for equal work" and "from each according to his ability and to each according to his needs". The first implies that if you work more you should benefit more. The second, that regardless of how much you work you get what you need. In a voluntary association of people, the allocation principle chosen depends on their level of awareness and their concern for one another. Family groups or religious associations, as well as socialist communities such as the Israeli kibbutz, function according to the latter principle. Ordinary associations of people in work environments function according to the former.

In the Building Together Project, families apply for membership and are selected on the basis of their income, their family size, their housing situation, the location of their employment, their ability to contribute self-help labour and their willingness to participate in the communal effort. The large majority of families have had no previous association. Their only relationship is their common goal and their common background. By working together they slowly learn to trust one another and to become friends. But this process is not universal. Some members do not get along with others. This in turn affects their attendance. Their irregular attendance further complicates their relations with the harder working people. A feeling of hostility based on a sense of injustice sets in. Some work harder and some do not, but in the end everyone gets the same basic house. Since houses are allocated among cluster members by lottery, weaker members may even get a better house than those who worked hard.

The measure of work performance on the building site is limited to measuring the number of working hours that each family contributes. This measure has several critical disadvantages. It does not distinguish between household heads, family members or hired relatives and acquaintances. Neither does it distinguish between efficient and inefficient workers. People agree to work on the cluster until the basic houses are finished, an estimated total of 1,500 hours per family. Families who worked less hours pay, at the minimum

wage rate of US $ .30 per hour, to compensate those who worked more than the average number of hours to finish the houses.

This arrangement is still unsatisfactory. There are complaints, particularly directed at household heads who fail to show up for work and send in their wives, children or hired workers instead. The rule formulated by the people requiring each household head to contribute at least 15 hours a week has not been strictly adhered to. During the months of January and February 1981, for example, between 14 and 16 household heads out of a total 72 households currently working did not appear for work at all. In 2 families, only hired labour participated in building during this period. This would not have occured in ordinary self-help projects where each family is building its own house. In these projects heads of households play a significant role, both as contractors and as organizers of labour.

Since household heads do not participate fully, the bulk of construction activities is left to family members, especially the women, and to hired labour. Women are traditionally members of the construction labour force in Thailand. The Project is no exception and women, especially housewives who can work during the day, contribute an average of 42.3 per cent of the total working hours in the Project, as shown in Table 1 below. Again, there is an issue of unequal treatment here. The title for the land and the house is registered in the name of the household head. If a couple is separated, there is no adequate legal provision to insure fair allocation of common property.

Table 1: The Distribution of Working Hours Among Men, Women and Children, the Building Together Project, January 1981[a]

| Cluster | Average Hours per Family per Week | | | |
|---|---|---|---|---|
| | Men | Women | Children | Total |
| 1 | 23.70 (58.4%) | 16.23 (40.0%) | .64 (1.6%) | 40.57 (100.0%) |
| 2 | 19.04 (49.7) | 19.28 (50.2) | .02 (.05) | 38.34 (100.0) |
| 3 | 12.68 (50.9) | 12.22 (49.1) | - - | 24.90 (100.0) |
| 4 | 22.14 (62.2) | 13.34 (37.5) | .10 (.3) | 35.58 (100.0) |
| 5 | 35.82 (61.1) | 22.80 (38.9) | - - | 58.62 (100.0) |
| Average | 22.68 (57.3) | 16.77 (42.3) | .15 (.4) | 39.60 (100.0) |

[a]Figures for Cluster 5 are for February 1981.

There are also complaints about hired labour, especially young teenagers who are difficult to discipline. Generally, however, hired labour has been a welcome addition to the cluster work force, particularly in the case of members of earlier clusters who have been hired by families to assist in building later clusters.

Each cluster has had to adjust to different patterns of behaviour of members. While the first cluster underwent major crises concerning unequal work contribution, Cluster 2 did not experience any difficulties. Cluster 3 has had to resort to serious sanctions - two members were voted out of the group for absenteeism and for generally being unco-operative as well as troublesome. The group has also expressed a willingness to reward its hardest working member with the best house in the cluster. Meanwhile, Cluster 4 is currently facing a difficult situation of a different kind: one of the hired workers is an arrogant and agressive youngster, and the people are afraid to dismiss him for fear of violence.

The distribution of working hours among family members in the Project is given in Table 2 below. The contribution of household heads averages 25.7 per cent. Other family members contribute the bulk of the hours, 62 per cent, while hired workers contribute 12.3 per cent. The use of hired workers varies significantly between clusters, from virtually none in Cluster 1 to more than 27 per cent in Clusters 3 and 4.

Table 2: The Distribution of Working Hours Among Family Members and Hired Labour, the Building Together Project, January 1981[a]

| Cluster | Average Hours per Family per Week | | | |
|---|---|---|---|---|
| | Household Head | Family Members | Hired Labour | Total |
| 1 | 14.14 (34.9%) | 25.24 (62.2%) | 1.19 (2.9%) | 40.57 (100.0%) |
| 2 | 8.50 (22.2) | 26.51 (69.2) | 3.32 (8.6) | 38.34 (100.0) |
| 3 | 6.42 (25.8) | 11.48 (46.1) | 7.00 (28.1) | 24.90 (100.0) |
| 4 | 6.58 (18.6) | 19.00 (53.4) | 10.00 (27.3) | 35.58 (100.0) |
| 5 | 15.25 (26.0) | 40.58 (69.0) | 2.79 (4.8) | 58.62 (100.0) |
| Average | 10.18 (25.7) | 24.56 (62.0) | 4.86 (12.3) | 39.60 (100.0) |

[a]Figures for Cluster 5 are for February 1981.

The issue of unequal efforts is difficult to resolve. Proper measurement of contribution is indeed difficult. In the Chawama Self-help Housing

Project, written agreements to contribute a specified number of hours did not work. The people rejected the measurement of hours and adopted a more flexible attitude aimed at insuring that each member was contributing according to his or her ability, and was serious about participating in the group's activities. Sanctions were used to discipline slacking members.[9] In the Building Together Project, people insist on measuring hours; hour statistics are displayed on bulletin boards.

The people recommend a stricter official contract to be signed by members prior to joining the Project, committing them to a minimum number of working hours per week. It appears that different arrangements apply to different cultural circumstances and to different levels of political awareness.

A number of questions require further thought:

1. Are there better means to record or acknowledge the contribution of members, other than the recording of working hours?

2. Can a system of sanctions and rewards replace the need to measure the people's contribution?

3. What legal mechanisms are needed to insure that women share equally in the benefits created by their participation?

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[9]American Friends Service Committee, op. cit., p. 36.

Plate 5: Block making team in action. Women pouring mixture and operating the block machine and man carrying blocks to drying area.

## VI. LENGTHY CONSTRUCTION

"I have been working in this Project for more than a year. Of course, there were a lot of problems. The work went on too long. We were losing out on our regular incomes".

Pipop Pornpobchoke, Cluster 1 member

Self-help housing is not a full-time occupation. People can contribute labour only after they have worked to earn their regular incomes. A most critical parameter in self-help projects is the amount of time that people can be expected to contribute to the housing process on a regular basis. This will, of course, depend on their level and type of employment and on the specific arrangements for working hours in the project. Some people are available for only one day during the weekend, some for two, some during the evening, and some for the entire week. The less the weekly contribution of working hours, the more lengthy the construction of a given type of house. There is thus an important relationship between the total number of hours required to complete the house, the weekly contribution of working hours per family, and the entire duration of the construction period.

Table 3 below compares these three parameters in a number of mutual-aid projects. The Building Together Project is compared to four other mutual-aid projects:

1. The Chawama Self-help Housing Project in Kafue, Zambia, where 308 housing units were constructed between 1970 and 1973;[10]

2. The El Pepeto Colony in El Salvador where 529 units were constructed during 1974-1975 under the direction of the El Salvador Foundation for Minimum Housing and Development;[11]

3. The Santa Lucia Mutual-aid Project in El Salvador, where 460 housing units were constructed between 1964 and 1965;[12] and

4. The Mutual-aid Co-operatives organized by the Centro Cooperativista Uruguayo in Uruguay during the 1970's.[13]

As can be seen from Table 3, the weekly contribution of working hours by the members of the Building Together Project is considerably higher than in the other projects. Although there are major variations between clusters,

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[10] Ibid.

[11] Fundacion Salvadorena de Desarrollo y Vivienda Minima, Analisis del Proceso Evolutivo y de las Soluciones Autonomes Proyecto "El Pepeto", vol. II, (San Salvador, May 1979).

[12] Instituto de Vivienda Urbana de El Salvador, op. cit.

[13] Wibmer, Elinor, Planning and Control of Site Works: Application to Mutual Aid Cooperative Housing, BIE Bulletin no. 696 (Rotterdam, Bouwcentrum International Education, 1979).

Table 3: A Comparison of Hours Contributed, Hours Required to Complete House and Length of Construction Period in Selected Mutual-aid Projects

| Project | Hours per week per family | Total hours to complete house | Total months required |
|---|---|---|---|
| Building Together, Bangkok[a] | 40.57 | 1,779 | 10.12 |
| Chawama, Zambia[b] | 23.06 | 1,083 | 10.74 |
| El Pepeto Colony, El Salvador | 23.08[c] | 450[d] | 4.50[e] |
| Santa Lucia Colony, El Salvador[f] | 11.93 | 437 | 8.45 |
| Mutual Aid Cooperatives, Uruguay[g] | 20.00 | 1,686 | 19.38 |

[a] Data for the first completed cluster.

[b] Calculated by averaging data for clusters 2-5 in American Friends Service Committe, Chawama Self-help Housing Project, Kafue, Zambia, Appendix G.

[c] Fundacion Salvadorena de Desarrollo y Vivienda Minima, Analisis del Proyecto Evolutivo y de las Soluciones Autonomas Proyecto "El Pepeto", vol. II, (San Salvador, May 1979), p. 19.

[d] Conversation with Mauricio Escobar, former Operations Manager, El Salvador Foundation for Minimum Housing and Development in Bangkok, January 1981.

[e] Calculated from c and d above.

[f] Calculated from Instituto de Vivienda Urbana de El Salvador, "Santa Lucia Colony Mutual-aid Project", in Self-help Practices in Housing: Selected Case Studies (New York, United Nations, 1973), pp. 32 and 45.

[g] From Elinor Wibmer, Planning and Control of Site Works: Application to Mutual Aid Cooperative Housing, BIE Bulletin no. 696 (Rotterdam, Bouwcentrum International Education, 1979), p. 2.

the average weekly contribution of working hours in Building Together amounts to more than 40, almost double the rates for Chawama, "EL Pepeto", and Uruguay. The total number of months required to complete a house varies from 4.5 months in "El Pepeto", to 10.12 months in Building Together, to 19.38 months in Uruguay. Finally, the total number of hours required to complete the houses varies from 1,779 in Building Together to 437 in Santa Lucia Colony.

Initial plans in the Building Together Project to complete a cluster of houses in 5-6 months proved unrealistic. Families were expected to contribute up to 80 hours per week, with an average of over 60 hours per week, and the house was to be completed in 1,200-1,500 hours. In fact, families contributed 40 hours per week and the house required 1,750 hours and more to complete.

There were several reasons for delay in the construction of houses, quite apart from the optimistic expectations that members would contribute the required number of hours. Materials were available throughout the construction process, but there were often short delays in the supply of certain items. Machine breakdowns and lack of tools slowed down the work. In large measure, however, construction was delayed because of the lack of proper organization of labour on the site, some slackness in supervision and irregular attendance of members.

Apart from delays in the construction of individual clusters, there were delays in the initiation of new clusters. These were mainly due to the need for interviewing and house visits of new members, and a complicated process of selection of candidates to insure fairness and honesty. As a result, by the end of January 1981, the Project was already 9 months behind schedule. Completion of the Project is now expected to be 15 months behind schedule (see chart on page 38).

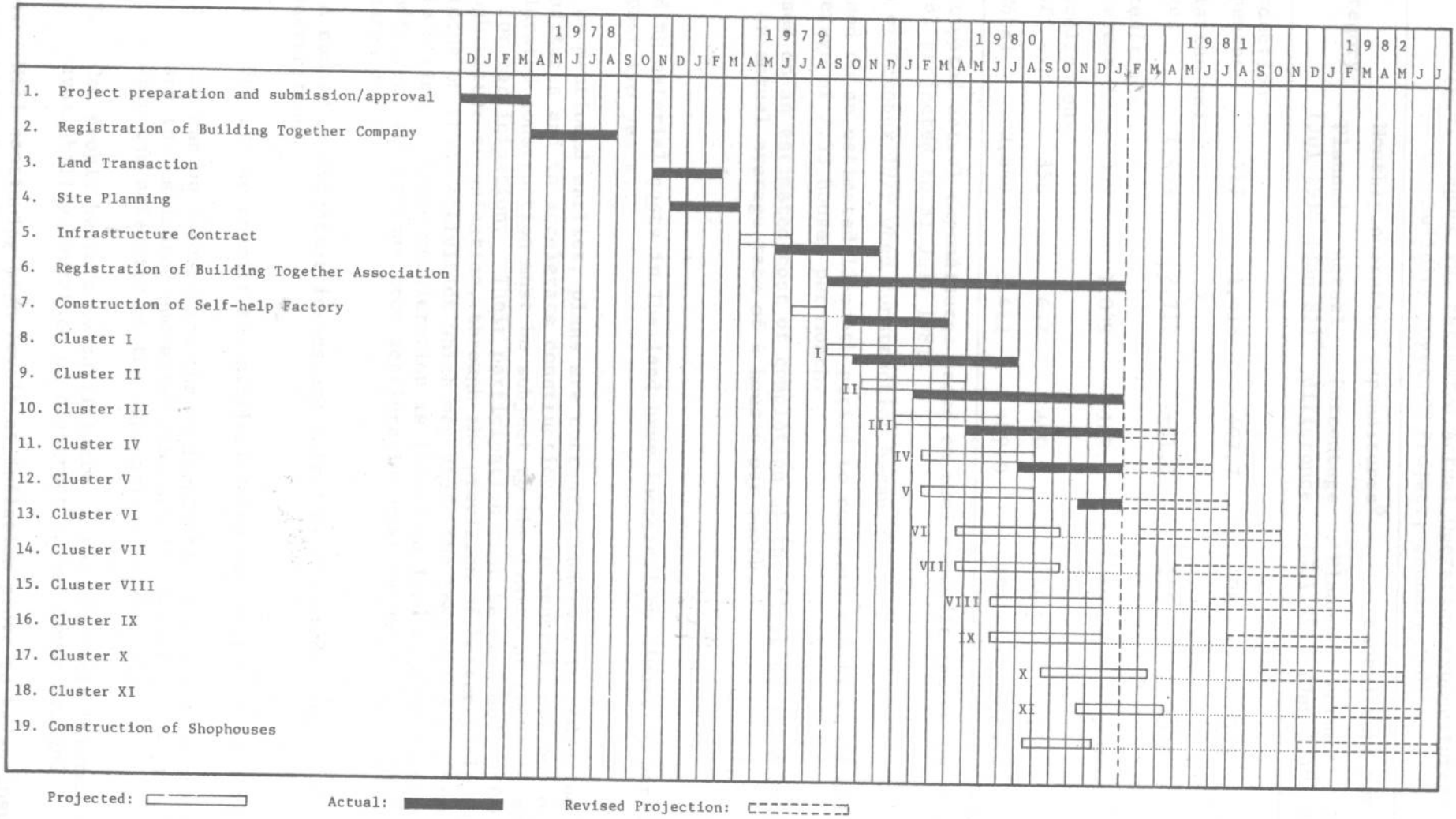
Clusters which were planned for completion and occupation in 5-6 months have taken more than 10 months to complete, and the time period between the initiation of one cluster and the next has more than doubled. These delays have led to considerable increases in the cost of houses. An additional increase in cost was due to the unexpected six-month delay in land subdivision and in the issue of mortgage loans to members by the Government Housing Bank. The effects of these delays can be clearly seen in Table 4 found on page 39.

Operating expenses in the Building Together Project exclude the cost of land and infrastructure, as well as the cost of construction of the factory and the cost of building materials. They include production expenses, salaries and wages of skilled workers and supervisory personnel, taxes and interest payments on construction loans, and other miscellaneous expenses. Expenditures on these items were grossly underestimated.

Monthly operating expenditures have averaged US $5,422, 89 per cent above the estimated expenditure of US $2,869 per month. Construction began in October 1979, and the first 88 units are expected to be completed by July 1981. This means that the rate of construction averages 4 houses per month. The output for February 1981 was 5.72 houses per month, still below the planned output of 7.33 houses per month. The longer period of construction thus seriously affected the operating expenditures per housing unit. Indeed, the actual total operating expenditures amounts to US $1,356 per unit, 246 per cent higher than the planned operating expenditure of US $392 per unit. Increased operating expenditures account for 60 per cent of the total increase in the cost of the house.

In a period of rampant inflation, slow construction processes as well as delays also have an adverse effect on the cost of building materials.

Projected and Actual Schedule of Project Activities as of 31 January 1981




Projected: ▭ Actual: ▬ Revised Projection: ▭

Table 4: Planned vs. Estimated Actual Operating Expenditures, the Building Together Project, January 1981[a]

| Category | Monthly operating expenditures[b] | | | Expenditure per unit | | |
|---|---|---|---|---|---|---|
| | Planned (Jul 79)[c] | Actual (Jan 81)[d] | Percentage difference | Planned (Jul 79)[c] | Actual (Jan 81)[d] | Percentage difference |
| Production expenses | 717 | 1,418 | +97.7 | 98 | 355 | +262.3 |
| Salaries and wages | 1,434 | 2,318 | +61.6 | 196 | 579 | +195.4 |
| Rates/taxes/ interest | 359 | 1,039 | +189.4 | 49 | 260 | +430.6 |
| Miscellaneous staff exp. | 359 | 647 | +80.2 | 49 | 162 | +230.6 |
| Total | 2,869 | 5,422 | +89.0 | 392 | 1,356 | +246.0 |

[a] Estimated actual expenditures based on real expenditures up to 31 January 1981 projected to 31 July 1981.

[b] As of October 1979 when construction began.

[c] Based on an estimated 12-month period to complete the first 88 units, at an average of 7.33 houses per month.

[d] Based on an estimated cost of completion of the first 88 units by July 1981, at an actual average rate of 4 houses per month.

Building material costs in Thailand have increased by almost 50 per cent over the past two years.

As mentioned earlier, plans are currently underway to reduce operating expenditures and to accelerate construction. In general, options open for accelerated construction must be subject to the limits of people's available time for participation. Their participation must be made more effective through better organization, through the provision of better tools, and through the focus on those activities which may yield the best value per hour of the people's time. Since acceleration is likely to lead to higher operating expenditures, the savings from acceleration must be weighted against the increased costs.

A number of important issues are raised by the discussion of the length of construction:

1. How can we predict the available time for self-help construction?

2. How can we incorporate the available time for house construction and the estimated operating expenses throughout the building period into the selection of the appropriate house design?

3. Can people be made to participate in the trade-off between time availability, duration of construction and house design?

4. Will continuing high levels of inflation prove to be an insurmountable obstacle to the expansion of self-help and mutual-aid projects which require long construction periods?

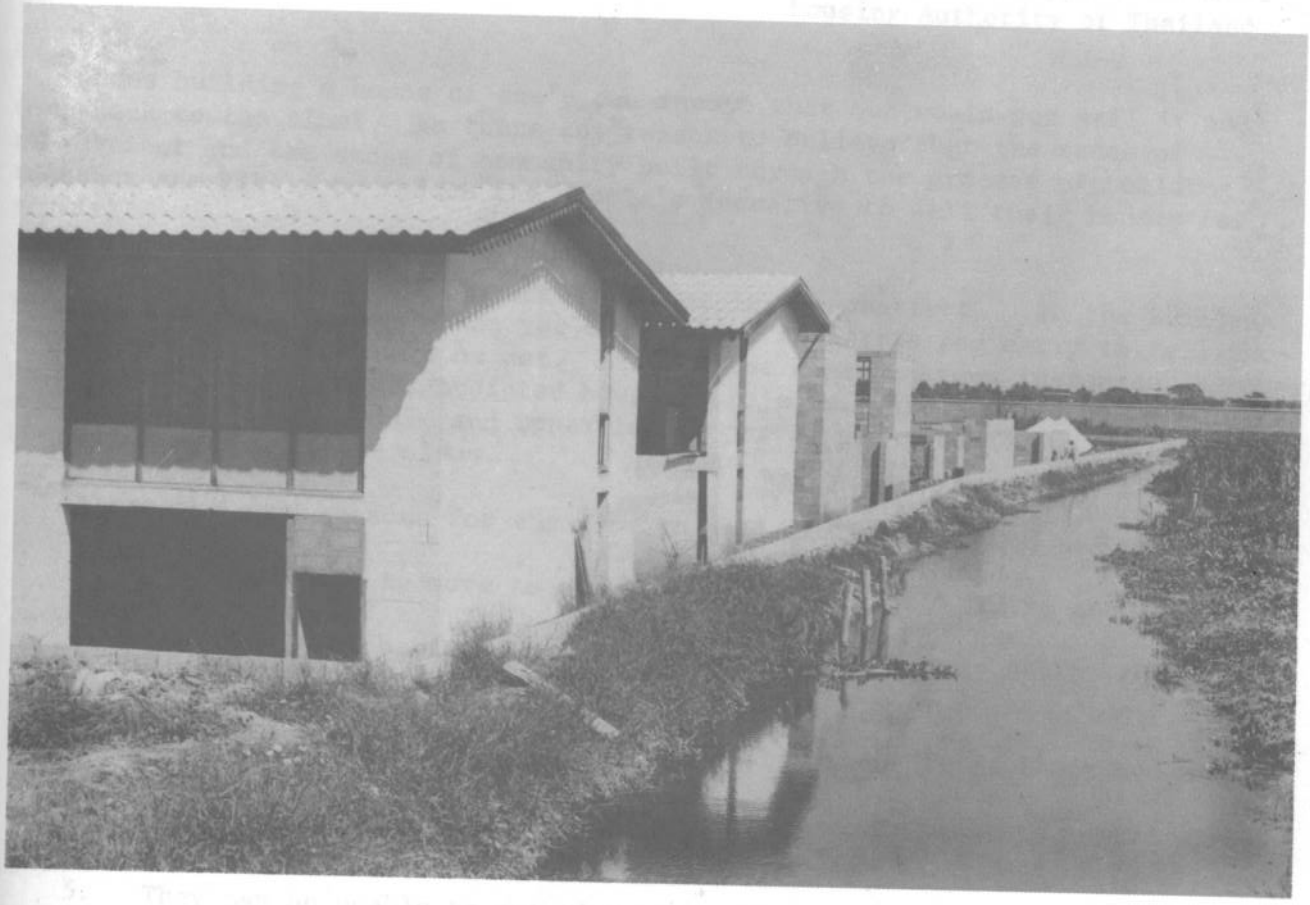


Plate 6: Construction in progress on the building site.

## VII. RESALE

"Even if the price of the house were raised to 100,000 baht[14] or more, I wouldn't sell it. It's priceless to me".

Samart Sookcharoen, Cluster 4 member

"Since the sale price is lower than the market price, the people are likely to sell for profit".

Sidhijai Thanphiphat, National Housing Authority of Thailand

Does building a house of one's own insure that one would not sell it and move back to the slum? Is there any reason to believe that the sense of achievement and the sense of community built through the process of building together are likely to reduce the people's incentive to sell their houses for profit?

These questions are difficult to answer in the abstract. In the Building Together Project, no resale has yet taken place and it is too early to tell whether the people will resell or not. There have been numerous instances, however, particularly in government-assisted housing projects, where low-income people did sell their houses to middle and upper income people and returned to their earlier homes, often in the slums.

There are good reasons for the poor to sell their houses:

1. They may need to move to another part of the town or the country.
2. They may have better uses for the money; housing may not be their highest priority.
3. They may want to realize the profits from the sale of their houses.
4. They may be unable to meet the required monthly payments, particularly in the earlier stages.
5. They may be unable to get along with their neighbours.

There are also good reasons for the not-so-poor to buy the houses of the poor:

1. Although they are not so poor, they cannot afford the houses provided in the private housing market.
2. The poor often sell below market price.

There is no question that in the Building Together Project substantial profits could be made from the resale of houses. The value generated in the con-

[14] US $4,890.

struction of the houses far exceeds the cost, and the houses are transferred to the people without profit. In addition, there are a number of subsidies involved in the transactions.[15] The overall effect is that houses are sold to participants considerably below market price. This is clearly seen in Table 5 below.

Table 5: Price Charged to Participants, House Cost and Estimated Market Value of Houses, the Building Together Project, January 1981[a]

| Category | Price charged to participants First 5 clusters | Price charged to participants Cluster 5 | Current cost per unit[b] | Estimated market value[c] |
|---|---|---|---|---|
| 1. House (excluding people's labour) | | | | |
| a. Building materials | 1,849 | 1,849 | 1,849 | |
| b. Factory[d] | - | - | 43 | |
| c. Operating costs | 799 | 1,099 | 1,356 | |
| Subtotal | 2,648 | 2,948 | 3,247 | |
| 2. People's labour[e] | - | - | 468 | |
| House subtotal | 2,648 | 2,948 | 3,715 | 4,000 |
| 3. Land | 978 | 978 | 961 | 1,800 |
| 4. Infrastructure | - | - | 508 | 1,200 |
| Total | 3,626 | 3,926 | 5,185 | 7,000 |

[a] In US $.

[b] Estimated actual expenditures based on real expenditures up to 31 January 1981 projected to 31 July 1981.

[c] Based on informal assessments.

[d] Cost allocated among 1,000 units.

[e] In kind.

The demand for these houses by middle income groups is expected to be high. According to a recent study of the private housing market in Bangkok by the

[15] For a complete discussion on subsidies and cost recovery, see pages 46-52.

National Housing Authority of Thailand, 95 per cent of the houses for sale in 1980 cost above US $10,000[16] while the ability to pay of 85 per cent of the households in the city was below US $9,000.[17] Most of the middle income group is thus being excluded from the private housing market in the city.

There are a number of reasons to regulate or restrict resale:

1. If people sell to higher income people, part or all of the subsidy, which was aimed at reaching the poor, will benefit higher income groups.

2. Housing conditions of the participants will not improve.

3. The community will lose its cohesion if many newcomers join.

4. Income differentials within the community will become larger.

There are also a number of reasons not to regulate or restrict resale:

1. There are a number of legitimate reasons for families to want to sell (see above).

2. People are willing to channel more of their incomes and savings into their houses precisely because they want a secure investment that will increase in value over time.

3. The house and land are the property of the individual owners and Thai law does not allow any restrictions on property transactions.

4. People may acquire a better income-generating investment by selling their houses.

5. The ability to sell their houses after they are finished insures the participants that they will not become poorer by joining the Project.

6. If they do sell, even for a modest profit, then at least part of the subsidy does reach the poor.

In the Building Together Project, there have been past attempts to restrict or regulate resale. The proposed strategy was to subdivide the land into clusters instead of individual plots, and to have all members of the cluster own the land jointly. The people and the Government Housing Bank were at first agreeable to the arrangement, and the land was subdivided into clusters accordingly. But as negotiations for mortgage loans with the Bank proceeded, the

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[16] National Housing Authority of Thailand, op. cit., Table 2, p. 6.

[17] Based on the Bangkok income distribution for December 1980, National Housing Authority of Thailand, ibid., p. 60, and assuming mortgage repayments not exceeding 25 per cent of household income for a period of 15 years at 14 per cent annual interest.

Bank insisted on individual plots as collateral for the mortgage loans. The land had to be subdivided again into individual plots, causing serious delay in the transfer of houses and plots to the people.

There are now no restrictions on resale after the first year of occupation. Other mechanisms have been contemplated and found wanting. A number of people are likely to sell for a variety of reasons. There is no strong reason for preventing them from realizing some profit, for they have generated the increased value of their houses by themselves. It seems more important to insure that they obtain the best price, if they do resell. The community may be able to provide the necessary services to facilitate resale and use the commission obtained for community development projects. Alternatively, leaving people in ignorance about land transfer procedures may postpone or frustrate sales. If resale becomes a community problem, the people will need to find ways to deal with it effectively.

The key questions which remain to be answered are:

1. Are there fair and effective mechanisms to restrict or regulate resale without severely limiting the people's willingness to pay for housing?

2. If not, are there any mechanisms to ameliorate the adverse effects of resale?

3. If not, should we be concerned about it at all?

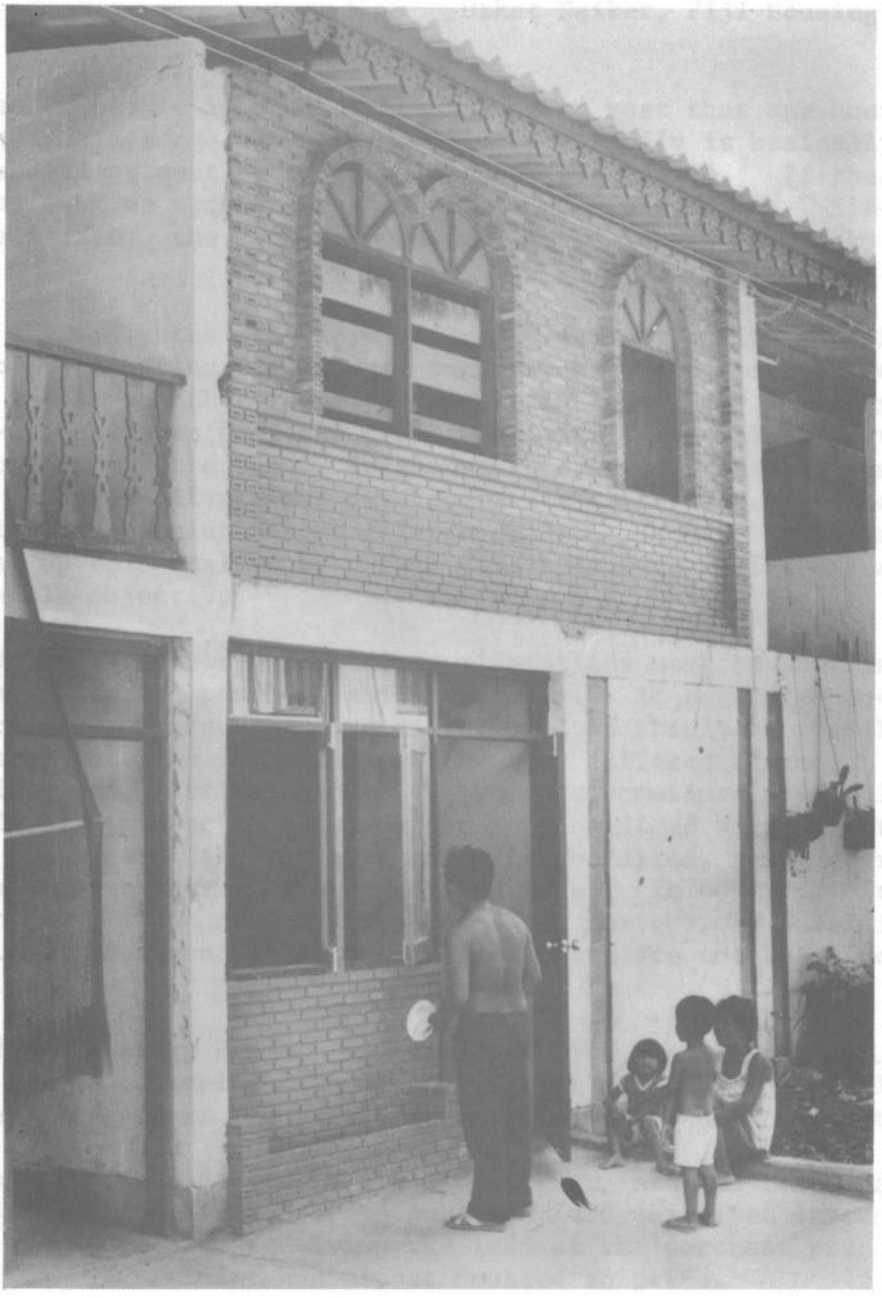

Plate 7: House in process of self-help improvement.

## VIII. COST RECOVERY

> "A house produced under these self-help schemes, with a little bit of subsidy, would actually result in a more satisfactory and better appreciated product".
>
> Utkat Naiker, Fiji Housing Authority

The number of people in need of housing is so vast that any housing arrangement which requires a large amount of subsidy per family is basically hopeless. Good housing solutions must be replicable on a large scale. If there are to be subsidies, they must be spread among a large number of people. Since subsidies will always be limited, the cost of housing must be largely borne by the people themselves.

This, in short, is the principle of cost recovery in its mild form. In i its radical form, the principle of cost recovery requires that all costs be borne by the people and that there be absolutely no subsidy. Among the sixty or more sites-and-services projects undertaken with financial support from the World Bank, none have yet achieved full cost recovery. The Bank considers cost recovery essential if private developers are to be encouraged to replicate these low-cost housing solutions on a large scale. As yet, no private developer has taken up this challenge. Full cost recovery remains a goal, rather than an attainable objective.[18]

To achieve cost recovery, several considerations must be kept in mind. Houses must be within the people's ability to pay. If subsidies are available, they must be calculated precisely and distributed as thinly as possible among as many people as possible. Subsidies take many different forms. They are sometimes obvious and sometimes hidden. They are sometimes difficult to calculate. In some projects, construction is subsidized with direct government grants. In others, the interest rate is subsidized, land is provided free, or administrative services are provided free. In others, infrastructure is provided free. Yet in others, over and above the obvious subsidies, the rate of default on repayment is very high, and costs are not being recovered from the people.

The Building Together Project was designed with cost recovery in mind and with a view to replicating it on a larger scale. The people participating in the Project are, however, receiving a number of important subsidies:

1. Some of the funds used in the Project are interest-free loans. In particular, the fund used to purchase land was given interest-free, and the people are receiving the land at the purchase price, while land in the vicinity has almost doubled in price.

2. There is a cross-subsidy within the Project, which results in the provision of free infrastructure to Project participants.

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[18] Lecture given in Bangkok by Mr. Anthony Churchill, Head, Urban Projects Department, the World Bank, in January 1981.

3. For the first five clusters, there is an additional subsidy to cover unexpected increases in material and operating expenses. These increases could not be fully charged to participants once construction started and the prices of the units had been declared.

4. Research and development funds borne by the Asian Institute of Technology, which uses the Project as a demonstration site, are not charged to the Project.

In addition, profits which would normally accrue to contractors are earned by the participants themselves, who generated the surplus value by building the houses. The Building Together Association does not even earn a profit from the sale of houses. The overall effect is that cash cost charged to participants for land, materials and operating expenses is almost US $3,000 below the estimated market price, as was shown in Table 5 in the preceding section.

Details of the financial arrangements in the Project are given in the paragraphs below.

Loans. Long-term mortgage loans for the purchase of house and land by the participants were provided by the Government Housing Bank, without any preferential terms. These loans are given to cover a maximum of 80 per cent of the cost of the house and are to be repaid over a period of 15 years, at an annual interest rate of 14 per cent.

Short-term loans for purchase of land, construction of infrastructure and the building of houses were of two types: interest-free loans and commercial loans. A total of US $409,700 was given to the Project as interest-free loans. Of this, US $359,431 was obtained from the revolving fund of the Building Together Association, and an additional US $50,269 was loaned from the Popular Housing Service for Latin America and Asia (SELAVIP) for a two-year period. The revolving fund of the Association is currently made up of two grants:

1. US $234,248 from Bread for the World, Germany, to be used for the purchase of land and the initiation of the Project; and

2. US $125,183 from the Royal Netherlands Government, to be used for the development of the infrastructure in the Project.

Since no interest is charged for the use of the revolving fund and since the rate of inflation in Thailand over the past two years has been in the order of 20 per cent per annum, the fund is rapidly losing its value and could not be used to replicate a project of this magnitude in the future unless supplemented by additional funds.

The land purchased with the revolving fund was subsequently mortgaged with the Government Housing Bank, in exchange for a short-term construction loan of US $100,000. Additional small overdrafts were obtained from other commercial banks. The rate of interest on these loans is 13 per cent per annum.

Cross-subsidies. As mentioned above, infrastructure is given to the participants free of charge, through a grant from the Royal Netherlands

Government. This subsidy will amount to approximately US $600 per unit, by the time the infrastructure is complete. It will be recovered, for use in future projects, through the sale of 15 shophouses constructed on the Project site at market prices.

There are risks involved in this scheme. The market in shophouses in Bangkok is currently undergoing a difficult period. An estimated 20,000-50,000 shophouses are now standing vacant, and shophouse developers are incurring serious losses. Still, prospective buyers have displayed considerable interest in purchasing shophouses on the Project site. At any event, there appears to be a number of alternatives for recovering the cost of infrastructure and the small subsidies given to the members of the first five clusters.

Given the cross-subsidy scheme, the Project is expected to recover all the revolving fund and to repay all the loans. Table 6 below details the projected incoming funds and expenditures in the Building Together Project from January 1981 until its expected completion in June 1982. Assuming that part of the revolving fund is now invested in the self-help factory and need not be recovered, the total cash on hand plus the cost of the factory will exceed the total value of the interest-free loans by July 1982.

Table 6: Updated Statement of Incoming Funds and Expenditures, the Building Together Project, January 1981-July 1982[a]

| | January '81 | July '81 | January '82 | July '82 |
|---|---|---|---|---|
| Incoming funds | 527,860 | 742,692 | 922,494 | 1,389,851 |
| Loans - interest-free | 409,700 | 409,700 | 409,700 | 409,700 |
| - outstanding overdraft | 105,249 | - | 48,900 | - |
| Income - sale of houses | - | 319,081 | 448,983 | 670,841 |
| - sale of shophouses | - | - | - | 293,399 |
| - other | 12,911 | 13,911 | 14,911 | 15,911 |
| Expenditures | 524,544 | 677,538 | 848,748 | 1,011,174 |
| Land | 192,194 | 192,194 | 192,194 | 192,194 |
| Infrastructure | 101,665 | 111,445 | 121,225 | 131,005 |
| Factory | 42,826 | 44,851 | 45,653 | 46,455 |
| Building materials | 96,895 | 209,772 | 332,735 | 428,209 |
| Production expenses | 25,772 | 31,200 | 39,561 | 53,792 |
| Salaries and wages | 36,022 | 50,985 | 72,367 | 106,584 |
| Rates/taxes/interest | 16,403 | 22,857 | 29,312 | 35,767 |
| Miscellaneous staff expenses | 12,767 | 14,234 | 15,701 | 17,168 |
| Cash on hand | 3,316 | 65,154 | 73,746 | 378,677 |

[a]In January 1981 prices. In US $.

Research and Development. Over and above the subsidies mentioned above, there is another hidden subsidy in the Project. The Project is a demonstration project of the Human Settlements Division of the Asian Institute of Technology, and there are a number or expenses borne by the Division which are not charged to the Project participants.

The Human Settlements Division has obtained a grant of US $20,000 from SELAVIP and additional grants totalling approximately US $30,000 from the Canadian International Development Agency (CIDA) for research and development activities in the Project. The funds have been used to create the Building Together Company and the Building Together Association, to build two demonstration houses at AIT, to recruit managerial and organizational staff, to conduct experiments, to publish newsletters, to purchase a project car, and to monitor and evaluate the progress of the project. In addition to these grants, faculty in the Division have been working voluntarily in planning, management and project supervision. The cost of part-time involvement of faculty, over a period of four years is approximately US $30,000.

We can estimate the total value of the subsidy given to each participant in the Project as follows:

1. The interest-free loans, excluding the infrastructure loan, total US $284,517. Invested for an average period of 2 years, at 12 per cent per annum, would have yielded US $73,381 in interest, or US $410 per unit.

2. The research and development subsidy, which includes a number of managerial expenses amounts to approximately US $80,000, or US $447 per unit.

The total outside subsidy to the Project as a whole is, therefore, US $857 per unit.

As mentioned earlier, it may not be logical to consider these as subsidies to participants, as they yield benefits to others as well. They are being presented here to provide an outer bound for future estimates. Extention of the Project on a large scale will not necessarily require the same type of expenditures.

To summarize, the Building Together Project as a whole can recover the revolving funds if managed properly to its completion. To that extent it will be achieving limited cost recovery. Another important measure of cost recovery is the people's ability to keep up the monthly payments. This will depend, to a certain extent, on the relationship between the people and the Government Housing Bank. The community is contemplating its own special measures to assist those in need so that they will not default on their mortgages.[19]

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[19] It is interesting to note that the El Salvador Foundation for Minimum Housing and Development has been very successful in recovering monthly payments on house mortgages from participants. The Foundation, which provides loans as well as builds the houses together with people, has an active group of social workers who investigate all cases of families having difficulties in payments and suggest compromise solutions. As of August 1977, the default rate amounted to only 1.9% of a total of US $1.5 million in loans. See Huang, John W., "Urban Project Management: Requirements for Success", in The Urban Edge, vol. 2, no. 8, October 1978, p. 2.

Cross subsidies within the Project do not effect cost recovery at all. In fact, to the extent that internal subsidies within projects can finance low-income housing at the expense of those able to pay at market prices, those opportunities should be fully utilized. We should, however, avoid situations where the hidden subsidies to the project far outweigh the cross subsidy element. In this case, the upper income groups are, in fact, subsidized as well.

Cost recovery, as we noted earlier, remains a distant goal. A number of questions concerning cost recovery merit further investigation:

1. Can we, or should we, expect full cost recovery from low-income people?
2. How can a given level of subsidy be justified as reasonable?
3. To what extent is the degree of participation of the people dependent on the level of subsidy in any given project?
4. Is there any reason to believe that mutual aid improves cost recovery?

# IX. HOUSE DESIGN

"Now that we are living here, we are quite proud to have built our own houses. The toilet, though, should have been left outside. It would have been less cluttered".

Srichuan Ruanghiran, Cluster 1 member

If costs are to be recovered, houses must be affordable by the people. The people must be able to pay for their houses and must have sufficient free time to construct them. These considerations place important constraints on house design. Once the income of the target population has been determined, and once their weekly labour contribution to the mutual-aid process is known, the limits on cost and time can be established.

An important consideration is the cost of land and the related cost of trasport. The cheaper the land is, the more inaccessible it tends to be. Savings on land purchase subsequently increase transport cost. For large families with two or three working people and with children going to school, transport expenditure can become a significant burden. Land must then be purchased at a good location, with good access to public transport. The use of expensive land, however, must be economical. The larger the plots and the larger the areas for community facilities, the higher the cost of land per unit.

High densities can be achieved with houses on individual plots of land, and do not necessarily imply high-rise apartments. Most urban low-income housing projects, particularly those promoting self-help, have adopted low-rise high density designs arranging houses in long rows along walkways or narrow lanes.

The Building Together Project has opted for purchasing land in a good urban location, 1.5 km. from a major transportation artery in a rapidly developing suburban area of Bangkok. The high cost of land (US $23 per $m^2$) requires a high density arrangement. Average plot size is 4.80 x 11.25 = 54.0 $m^2$, and the overall density on the site is 118 units per hectare.

The plots occupy 64 per cent of the total site area, thus leaving sufficient space for circulation and community facilities. During the mutual-aid stage cluster members produce identical basic houses, which are then allocated by lottery. Families complete or modify their houses in any menner they wish during the self-help stage.

Several ideas guided the design of the houses:

1. Land ownership. Houses must be built on individual plots of land, which would eventually be owned by their occupants.

2. Support. The basic houses should provide a structure which supports gradual improvement.

3. Economic activity. The house should be used as a means of production, rather than as a commodity being consumed.

4. Tradition. Thai traditions and life style should be incorporated into the design whenever possible.

5. Standards. To the extent possible, the houses should comply with building codes and standards so as to avoid unnecessary confrontation with the authorities.

6. High density. Houses must consume a minimum amount of land, to allow for the purchase of land in a good location.

These ideas have resulted in a basic house design which contains the following patterns:

1. Row house. Houses are arranged in rows, sharing common walls. The plots are long and thin and the houses are cross-ventilated.

2. Shell structure. The basic houses are two-storey structures, covering two-thirds of the plot area. No interior partitions are provided and only the upper-storey room is enclosed with outer doors and windows. The shell provides a support structure for easy gradual improvements, in contrast with a core house which is cheaper initially but more difficult to expand in a controlled manner, especially upwards.

3. Living upstairs. Following traditional Thai customs, living areas are located upstairs, and arranged in a strict sequence from the most public to the most private - stairs, verandah, living area and sleeping area. The verandah overlooks the cluster walkway and the street, and functions as an outdoor room.

4. Economic activity below. The ground floor space is left unfinished and only contains a toilet, a bath and a kitchen area in the back. It can be used for supplementing the income of the family, by opening a shop, a workshop, a restaurant, or by sub-letting the space for rental income (see plate no. 8 on page 53).

5. High plot coverage. The house covers 70 per cent of the plot, and the gross floor area is 76.8 $m^2$. The wide span of the floor joists makes it possible to cover a large area at a low cost and allows the people to partition the indoor space in many different ways,

6. Front and back courts. Small courts are provided in the front and back of the house to meet code requirements, to facilitate cooking, laundry and washing in the back, and to plant a small garden in front.

7. Indigenous decoration. Traditional carvings decorate the verandah and provide an aesthetic touch to the otherwise heavy appearance of the houses.

People's participation in the design of the houses was limited. Two demonstration houses constructed at the Asian Institute of Technology in 1979 were visited by the participants and several possible changes were discussed and consequently implemented. Generally, people have been satisfied with the

Plate 8: Living above, earning a living below.

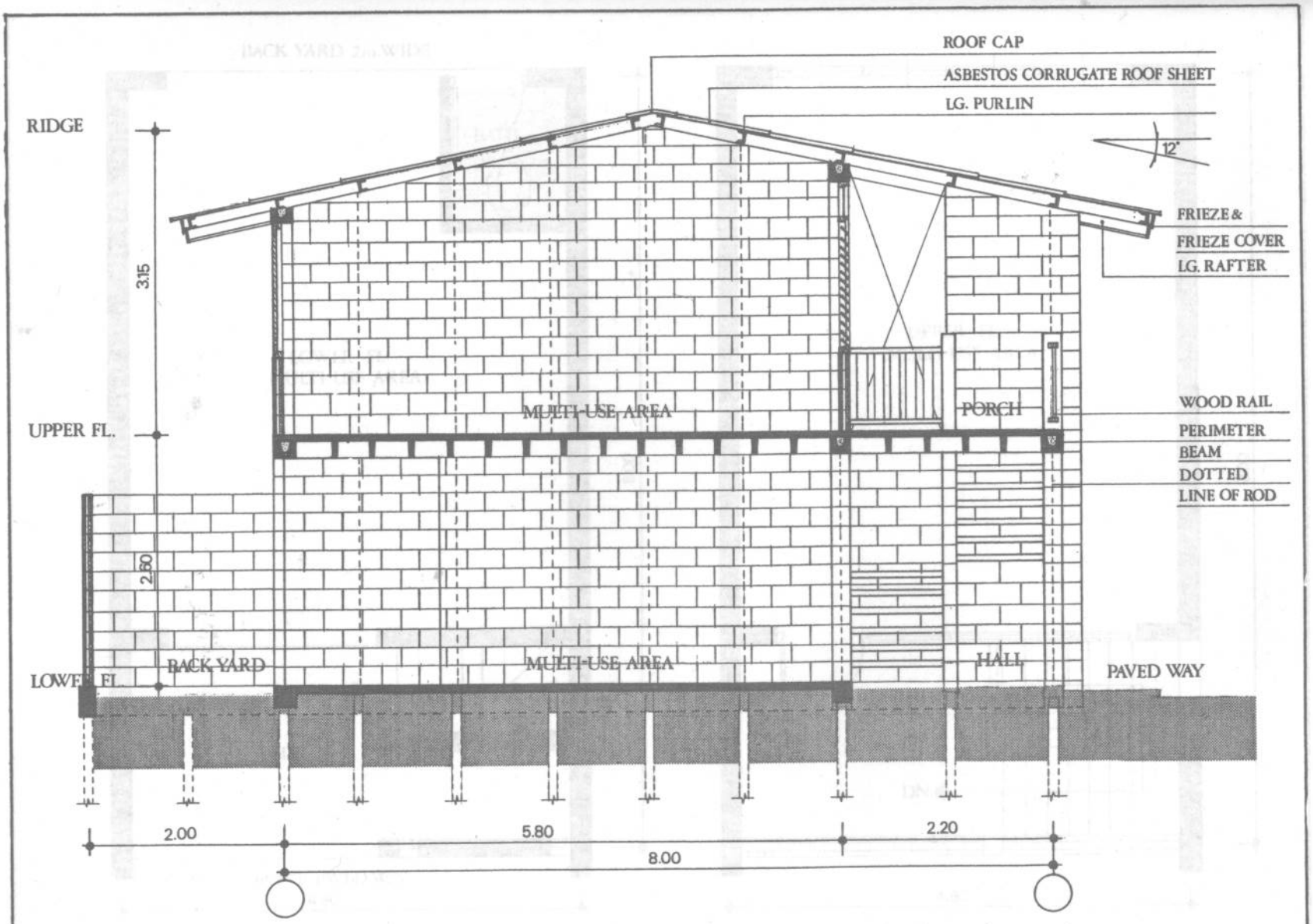
design of the houses. Thirty-five participants were surveyed in February 1981 to assess their reactions to the various features of the houses. Their responses are tabulated in Table 7 below.

Table 7: Levels of Satisfaction with Various Features of the House, the Building Together Project, February 1981

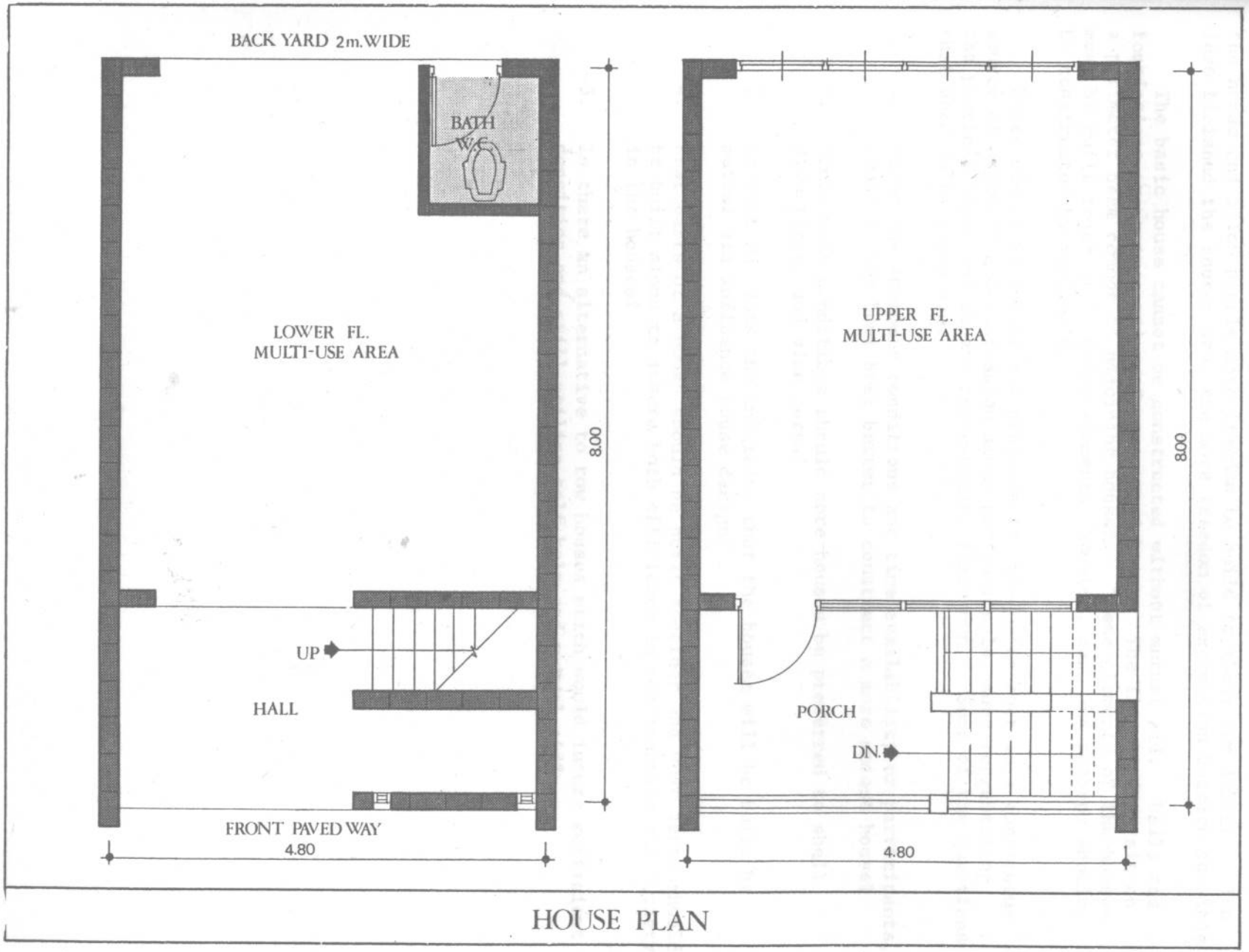
| Design Features | Highly Satisfactory (+2) | Satisfactory (+1) | Neutral (0) | Unsatisfactory (-1) | Highly Unsatisfactory (-2) | Weighted Average |
|---|---|---|---|---|---|---|
| 1. plot size (56 $m^2$) | 12 | 14 | 7 | 2 | - | +1.03 |
| 2. plot shape | 11 | 16 | 7 | - | - | +1.09 |
| 3. plot width | 11 | 16 | 5 | 2 | - | +1.03 |
| 4. common walls | 12 | 8 | 7 | 7 | - | +0.71 |
| 5. two storeys | 15 | 17 | 3 | - | - | +1.34 |
| 6. ground floor space for economic activities | 11 | 16 | 3 | 4 | 2 | +0.91 |
| 7. gross area of house (approx. 77 $m^2$) | 10 | 20 | 4 | - | 1 | +1,09 |
| 8. upstairs area (34 $m^2$) | 10 | 20 | 5 | - | - | +1.14 |
| 9. verandah upstairs | 15 | 12 | 7 | 1 | - | +1.23 |
| 10. stairs in front | 13 | 12 | 6 | 4 | - | +0.97 |
| 11. toilet near back area | 14 | 14 | 12 | 3 | 2 | +1.00 |
| 12. toilet inside ground floor | 5 | 6 | 4 | 17 | 3 | -0.11 |
| 13. small courtyard in back | 12 | 14 | 3 | 4 | 2 | +0.86 |
| 14. distance from front neighbour (6 m) | 14 | 16 | 4 | 2 | - | +1.23 |
| 15. distance from back neighbour (4 m) | 14 | 10 | 5 | 3 | 1 | +0.94 |

As can be seen from the examination of the table, most people appear to be satisfied with the design features of the house. Apart from the location of the toilet, which was necessitated by code requirements, a number of people have discussed moving the stairs to the back and locating the toilet under the stairs. Others feel the court at the back of the house, which is less than 2.0 m. wide, is less than satisfactory.

A number of people have erected walls and closed the verandah to increase the amount of space inside the house. In the future, it may be wiser to leave the installation of the partitions on the upper floor to the people themselves. This may result in a considerable saving on the basic cost of




HOUSE CROSS SECTION


BACK YARD 2m.WIDE
BATH
W.C
LOWER FL.
MULTI-USE AREA
8.00
UP
HALL
FRONT PAVED WAY
4.80
UPPER FL.
MULTI-USE AREA
8.00
PORCH
DN.
4.80

HOUSE PLAN

the house and allow people more freedom to build to their own liking. The less finished the houses are, the more freedom of expression becomes possible.

The basic house cannot be constructed without mutual aid. Walls and foundations are common and roofs are continuous. The floor joists sit on a perimeter beam common to adjoining houses. These elements of the houses must be built together. Other elements, however, can, and perhaps should, be constructed by self help.

House design in mutual aid projects for the urban poor is a continuous source of argument and discussion among professionals, some representing the people's views and others representing their own. Some of the questions that need to be asked are:

1. Given the economic conditions and time availability of participants, would it not have been better to construct a more modest house?
2. Under what conditions should core houses be preferred to shell structures, and vice versa?
3. In what way does the knowledge that the houses will be built by mutual aid influence house design?
4. What parts of a house should be built together and what parts should be built alone to insure both efficiency in construction and variety in the houses?
5. Is there an alternative to row houses which would insure sufficient densities and still utilize self help and mutual aid?

## X. SCALE OF PRODUCTION

"Mutual aid can be used to produce large scale projects for for low-income housing".

Mauricio Escobar, former Operations Manager, El Salvador Foundation for Minimum Housing and Development

Any experimental project must face the critical question: can it be replicated on a large scale? We have already discussed the need for cost recovery as a basic condition for replicating projects on a large scale (section VIII). If subsidies per unit are very large, repetition is largely ruled out. Other important conditions which must be satisfied are proper site management and effective production and assembly of houses. Large scale project work may not be able to rely on a small number of enthusaistic volunteers and may require more bureaucratic and streamlined procedures. The subsidies usually available for demonstration projects, particularly the research and development costs, may not be available. Similarly, financial arrangements that may apply to smaller projects, such as interest-free loans, may not be available for larger projects.

There is no doubt, however, that mutual aid housing can be built on a large scale, using procedures similar to those used in the Building Together Project. In fact, the Project was initiated following the experiences of the El Salvador Foundation for Minimum Housing and Development, which has been building a large number of low-income housing units over the past decade.

From the time of its legal registration as a non-profit organization in El Salvador in 1970 to mid-1978, the Foundation built, together with the people, a total of 3,133 housing units. 2,122 more units were under construction at that time. The 1978-1982 five-year plan of the Foundation calls for the construction of an additional 19,700 units, comprising 29 per cent of the total production of housing units in El Salvador for that period. The production capacity of the Foundation during 1978 was 2,000 units per year, and was expected to double during the early 1980's.[20]

Initial estimates indicate that, with a number of modifications, the Building Together Project could be replicated in Bangkok on a large scale without an increase in costs. This could be done as follows:

1. The pre-construction stage would be expanded. Instead of stopping at the provision of major infrastructure work, pre-construction would also include piling and the laying of ground beams.

2. The building materials factory would be manned by hired labour. Fully operational, it could easily produce the building components for one house per day. With additional investment, it may be expanded to produce two or more per day. Additional factories may be built if necessary.

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[20] Ibanez, op. cit., p. 9.

3. People would be organized into small groups of 15-20 families and allocated building plots. After an initial education course, they will decide among themselves what they prefer to build together and what they prefer to build themselves. Families may decide to allocate plots at any stage of the construction.

Since the people would not be producing the building components themselves, there would be no delays in the material production stage and all clusters in the project could start almost at the same time.

Using these procedures, the cost of the houses is expected to be considerable reduced because production would be more efficient and total construction time shorter.

The total time required to produce one house, as actually experienced by Cluster 1, is 1,779 hours. With some increase in efficiency and site organization, the time may be reduced to 1,440 hours. These hours may be broken into the various activities during production and assembly. The time required for each of the major building activities is shown in Table 8 below.

Table 8: Time Required to Complete Mutual-aid Building Activities, the Building Together Project, January 1981

| Activity | Time Required to Complete one House | | |
|---|---|---|---|
| | Per cent of Total Hours | Hours (Planned) | Hours[a] (Actual) |
| Production | | | |
| 1. Foundation piles | 10.2% | 146 | 181 |
| 2. Floor joists | 3.1 | 45 | 55 |
| 3. Blocks | 12.2 | 176 | 217 |
| 4. Stairs | 0.7 | 10 | 13 |
| 5. Door and window frames | 5.2 | 75 | 93 |
| Subtotal | 31.4 | 452 | 559 |
| Assembly | | | |
| 1. Pile driving | 12.5 | 179 | 222 |
| 2. Grade beams | 8.5 | 123 | 152 |
| 3. Block walls and stairs | 23.4 | 337 | 416 |
| 4. Floor casting | 12.4 | 178 | 220 |
| 5. Roofing | 4.2 | 61 | 75 |
| 6. Utilities | 1.6 | 22 | 27 |
| 7. Woodwork installation | 2.9 | 43 | 53 |
| 8. Painting, finishing and cleaning | 3.1 | 45 | 55 |
| Subtotal | 68.6 | 988 | 1220 |
| TOTAL | 100.0 | 1440 | 1779 |

If, for example, the production of all the components as well as pile driving and grade beam assembly were done during the pre-ceonstruction stage, the total planned number of hours required to complete a house would be reduced to 686. If families were to contribute 25 hours a week, the houses would be completed in 6.3 months. Overall project completion time will also be reduced because many people will be engaged in construction at the same time. This assumes the expansion of the Building Together Association, enabling it to handle larger projects in a fashion similar to the development of the El Salvador Foundation for Minimum Housing and Development. Under such an arrangement, the non-government housing sector in Thailand could begin to deliver considerable numbers of low-income housing units. The National Housing Authority of Thailand has now recognized this potential and has budgeted US $10 million for non-government organizations involved in low-income housing in its new five-year plan. The Government Housing Bank has also expressed interest in increasing the scale of production of Building Together. It may also be feasible to explore other organizational arrangements, involving government as well as non-government organizations, and possibly involving international financial institutions.

The alternative described above is only one alternative:

1. Are there more appropriate alternatives for large-scale construction of housing using mutual aid?

2. Are there any other reasons, not discussed above, why the Building Together Project cannot be replicated on a larger scale in Bangkok?

3. Is it necessary for Building Together to expand its construction activities or is it sufficient to continue production on a smaller scale and let others draw the possible lessons from these smaller projects for large-scale production?

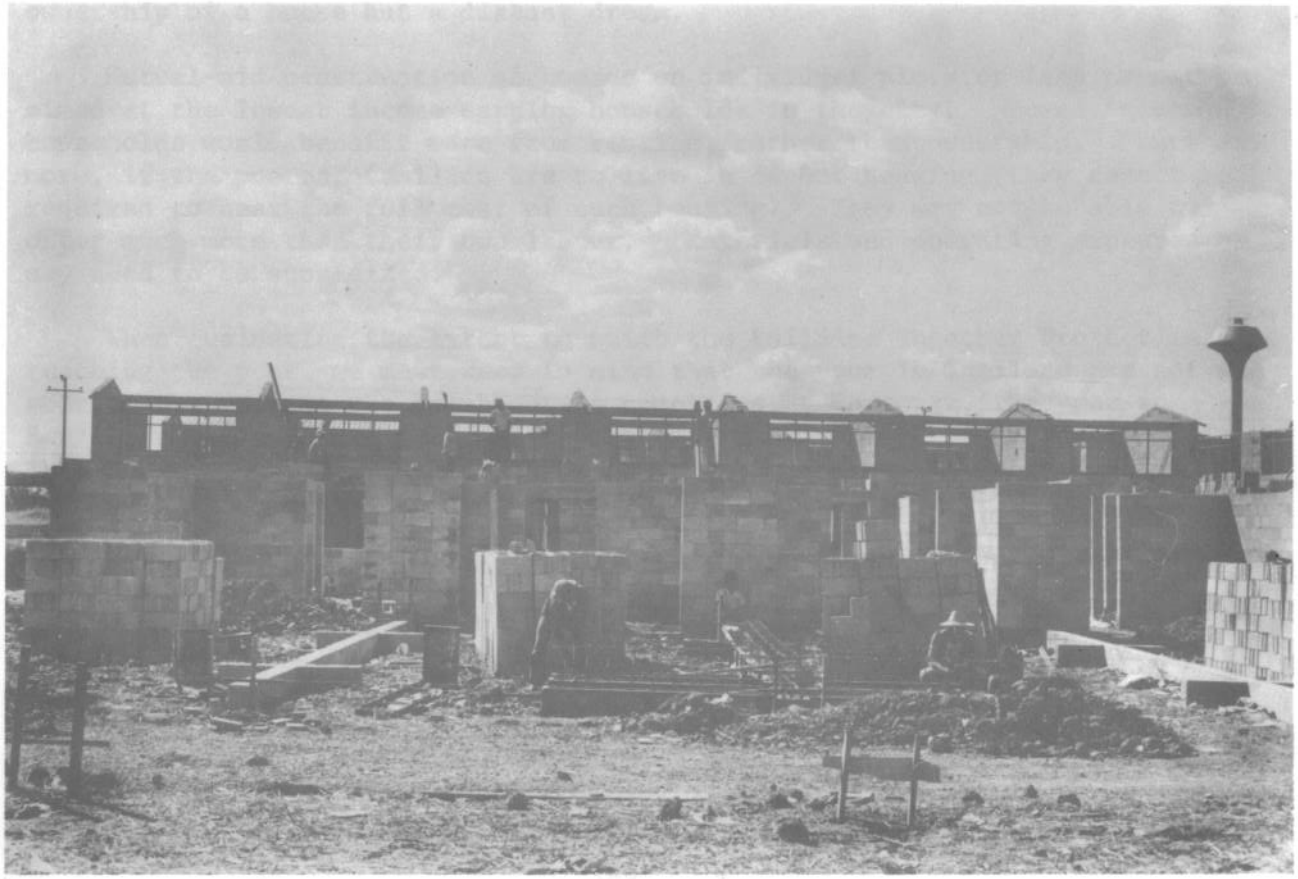

Plate 9: Pouring of grade beam delaying progress in wall building.

## XI. REACHING THE POOR

"It is clear that the people participating in this project are poor".

Jorge Anzorena, Popular Housing Service for Latin America and Asia (SELAVIP)

The majority of people in need of better housing are the poor people now living in slums and squatter settlements in the large cities of the developing world. It is towards these people that housing efforts must be directed. For very poor people, however, housing is a relatively low priority and the ownership of a house but a distant dream.

Mutual-aid construction of houses on individual plots of land cannot be aimed at the lowest income earning households in the city. Lower income households would benefit more from renting, rather than ownership. Furthermore, if the poorest families are to live in decent housing, they cannot be required to bear the full cost of such housing. They may not be able to offer much more than their own labour. Materials and operating expenses may need to be subsidized.

When evaluating the extent to which the Building Together Project is reaching the poor, we must keep in mind that the poor in Thailand are not as poor as the poor in the neighbouring countries. Moreover, the poor in Bangkok are considerably richer than their relatives in the rural areas of Thailand. The income distribution in Bangkok is given in Table 9 below.

Table 9: Income Distribution in the Building Together Project, Compared with the Income Distribution in Bangkok, December 1980

| Cumulative Percentile (Bangkok)[a] | Monthly Household Income (US$) | Cumulative Percentile (Building Together) |
|---|---|---|
| 10% | 111 | 0.0% |
| 20 | 144 | 9.1 |
| 30 | 173 | 30.7 |
| 40 | 206 | 58.0 |
| 50 | 241 | 80.9 |
| 60 | 278 | 86.4 |
| 70 | 326 | 95.5 |
| 80 | 419 | 100.0 |

[a] Calculated from National Housing Authority of Thailand, Present Standards and Prices in the Housing Market in Thailand, (Bangkok, NHA, 1980), p. 60.

The Building Together did not aim at reaching the first 20 per cent of the lowest income households in Bangkok, those earning below US $144 per month. It aimed at 20-30 per cent of the households in the next income category, those earning between US $144 and US $241 per month. As can be seen from Table 9, more than 80 per cent of the Project participants earn below US $ 241 per household per month. About 58 per cent earn less than US $206 per month. Although these figures are calculated from incomplete data, it can be inferred that the Project is reaching the low-income people in Bangkok. This is by no means an indication that the Project is suitable for low-income people in other countries. Given the economic conditions in other countries, other designs, other standards and other procedures may be necessary to reach a population of comparable poverty.

The next important question to be answered is: are these people able to pay for their houses?

Ability to pay for housing requires savings for down payments as well as sufficient income to make regular monthly payments. The level of savings among the families is low, and they cannot pay the required 20 per cent of the cost of the house as a down payment. Down payments in the Project are therefore broken down into two portions:

1. A cash down payment of approximately US $200, to be paid in two installments of US $100 each.

2. A down payment of approximately US $450 in mutual-aid labour. A family works up to a total of 1,500 hours, each hour credited with US $.30 toward the down payment.

This arrangement has made it possible for the people to meet the down payment requirement of the Government Housing Bank without undue difficulty.

Can the people meet the monthly payments? In calculating the monthly ability to pay of the people, it is usually estimated that the people can pay approximately 25 per cent of their monthly incomes to cover housing expenditures. This estimate varies considerably, depending on economic circumstances. Usually, the poorer the people, the lower the percentage of their monthly incomes they could afford to pay for housing. The percentage of monthly income to be paid in installments by participants in the Building Together Project is given in Table 10 below.

About 74 per cent of the families are required to pay less than 25 per cent of their incomes, and the rest are required to pay more. This has been caused by unexpected increases in the cost of houses. An attempt to introduce progressive repayments, which would require lower monthly payments during the first year, increasing regularly over the years as incomes rise, failed to gain the approval of the Government Housing Bank. In addition to the monthly payments, families may have to pay US $5 or more per month for utilities: water, electricity and garbage collection. Nevertheless, people are generally satisfied with the level of payments and quite a number of them have repeatedly requested higher loans to complete their houses, knowing fully well that these would mean an increase in monthly installments.

Table 10: The Distribution of Monthly Payments for Housing as Percentage of Income, the Building Together Project, January 1981

| Monthly Payments as Percent of Income | Number of Families | Percentage Distribution |
|---|---|---|
| 5 - 10 % | 4 | 4.6 |
| 10 - 15 | 8 | 9.1 |
| 15 - 20 | 24 | 27.3 |
| 20 - 25 | 30 | 34.1 |
| 25 - 30 | 15 | 17.0 |
| 30 - 35 | 7 | 7.9 |
| 35 - 40 | 0 | 0.0 |
| Total | 88 | 100.0 |

The Building Together Project will have failed to produce houses within the reach of the people if their incomes were not raised in the future, to meet their increase housing expenditures. For this purpose, houses were built to accomodate a variety of economic activities on the ground floor, leaving sufficient room for living above. Houses can be used for shops, workshops, restaurants, sub-letting of rooms, and other income-earning opportunities. The community itself will contain income-generating properties, a deep well and a market which could provide the needed income for community maintenance. Other activities, such as vocational training, education on access to loans for small businesses, involvement of government and non-government organizations engaged in improving income opportunities, increased contacts with small shops and workshops needing assistance and the like, may further increase the potential of the community to fend for and to enrich itself rather than to impoverish itself through the consumption of expensive housing.

A number of questions concerning the issue of reaching the poor have been raised:

1. How can we reach poorer families?

2. If the people participating in the Project are not the poorest of the poor, should they be subsidized at all?

3. Are not the houses too good for low-income families? Should we not build to lower standards?

4. How many families can be expected to benefit from income generation activities?

5. Since the monthly payments are rather high, should we expect a large number of defaults on monthly payments? How many people will sell because of their inability to meet the monthly payments?

6. What special measures can be adopted to protect people from losing their houses through defaults on monthly payments?

## XII. COMMUNITY CONTROL

"I think it is clear that this Project belongs to us members".

Chalerm Chura, Cluster 3 member

The poor will always remain poor as long as they depend on outside assistance, whether from the government or from other charitable organizations, for their basic needs. To leave the orbit of poverty, the people must become self-reliant and able to fend for themselves. This is difficult to achieve alone and easier to achieve together.

The two fundamental goals of the Building Together, other than the provision of shelter, are the development of community and self reliance, or put together, to develop a self-reliant community. It may be said that each of the three goals is the means to achieve the other two. In this context it is important to bear in mind , however, that mutual aid is not necessarily the most efficient way to construct houses. It may be possible to construct the same houses faster and cheaper using low-paid hired labour. The pursuit of community and self reliance, however, requires a deeper understanding of what costs are required to attain what benefits.

The Building Together Project recruits its members largely from slums and squatter areas in the vicinity of the Project site. People come as strangers to one another. They are grouped together at random. The group begins to work together and slowly forms relationships. Trust begins to build up, sharing grows and mutual responsibility develops. Working agreements are arrived at, and a sense of community gradually develops.

Participation in the early stages of the Project was limited. Since members were recruited only after land was purchased, the site prepared and the basic designs of the houses decided upon, their contribution to the design of the houses and the site plan was very limited. The main reason for delaying the recruitment of participatns in the early stages was the feeling that there were too many uncertainties, that it was not clear whether the Project could in fact be implemented, and that in the long period required for planning and land acquisition the people would lose interest. However, since the beginning of construction the people have become more involved in the on-going planning and design decisions.

The cluster groups is the fundamental unit of organization in the Project. Its size insures knowledge of each member by name. Clusters organize their own work, assigning tasks among themselves, and putting social pressure on members to carry out their tasks properly. Clusters also have the power to dismiss members who fail to participate adequately in the building process.

During the early stages, it was difficult to identify and encourage cluster members to take on leadership responsibilities within their clusters. The people seemed to be accustomed to leadership by people of higher status and education. Peer leadership was not accepted and a number of leaders who were officially elected were later undermined by their fellow members. However, as the Project progressed, real leaders began to emerge

It has now been possible to create a Joint Community Committee, comprising two elected members of each cluster, together with members of the Project staff. The Committee has taken on the major decision-making responsibilities in the Project. Most staff meetings have been cancelled and the staff meets together with community members on a weekly basis to discuss emerging problems and to formulate solutions. The Committee reviews the Project accounts and progress in construction. Members have been critical of a number of site management procedures and have decided to become more involved in site management. They have initiated a number of campaigns and have taken on themselves the publication of a new community journal. It is clear that the people are gaining in confidence and are becoming ready to take over the management of their own community.

When the construction of the basic houses and shophouses will be completed, the Building Together staff will largely withdraw from the community, leaving it for the Community Committee to manage by itself. It is envisioned that the community will organize itself as a co-operative and register itself as a legal organization.

The success of the Community Committee will depend on its ability to unify the people under its leadership and to carry out a number of important tasks:

1. the provision of water from the community well;
2. the maintenance and operation of the dike and the storm drainage system;
3. sewage and garbage disposal, with the help of the Municipality;
4. cleaning of paths, walkways and open spaces;
5. landscaping;
6. building of community facilities and management of community activities;
7. organization of savings, with the help of the Credit Union League; and
8. conflict resolution.

All these tasks require a new attitude. They require a concern for the group, a concern larger than the people are accustomed to. It requires the overcoming of selfishness. It requires the building of trust. It requires the increased consciousness of common problems of community members as well as other people still living in the slums.

It is too early to tell whether such an attitude can and will develop. Many questions remain unanswered:

1. Once the houses are finished, can the community maintain the interest of members in co-operating?

2. How will the community react to new members who buy or rent houses, or parts of houses?

3. Would a better sense of community develop if people were selected from one place prior to joining the Project?[21]

4. How will such a community organization relate to other organizations? Will there still be an interest in helping other slum people after the community members succeed in escaping the slums?

5. To what extent will the community be vulnerable to outside political pressures and manipulations? How can it benefit from them or resist them?

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[21] The Project is currently testing the possibility of recruiting more organized groups. All members of Cluster 6 are being recruited from the Government Printing House Union.

Plate 10: Sunday cluster meeting at the site.

## CONCLUSION

One of the key working hypotheses on which the Building Together Project was based was that as more and more issues were confronted and resolved, the number of problems and crises would gradually diminish. Although difficult to measure statistically, it can be said with a high degree of certainty that this has proven to be untrue. The number of problems facing the Project at any one time has remained approximately the same. No sooner is a problem solved than a new problem vigorously takes its place.

There may be an important lesson to be learned here. Planning and decision making are continuous activities. The influence of any decision is, at the most, temporary. The situation changes rapidly and requires new plans and new decisions. Planning starts out as the making of preparations. It gradually becomes vigilance, watching constantly to insure that the overall picture, although constantly changing, remains clear and consistent and does not lose its vitality through short-sighted pragmatic decisions.

The success of any given project is closely linked to the degree to which all the participants can be made to understand and share in the overall picture, the vision, toward which they are moving. This can insure that all will be moving in the same direction, although its precise course may not be known in advance. To a great extent, each project carries the personal mark of those participating in it at any given time. Participation is not anonymous. It is highly personal. It involves intense interaction between actual people. As such, no institutionalized participation can guarantee results. The results are largely the creative efforts of specific individuals coming together at a specific histrocial juncture and making their personal mark on the flow of events.

The built-in uncertainty in projects involving people's participation is, in actual fact, its creative potential. When everything is known in advance, there is no room for participation other than as cogs in someone else's machine. This is not real participation. Real participation can only be open ended. Here lies its greatest limitation and its greatest potential.

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