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INTRODUCTION

Following a disaster, AID is often called upon to assist in reconstruction activities by helping to provide new, replacement housing for the disaster victims. In many cases, the victims will not only have suffered the loss of a building, but may also have lost their land or access to it as a result of the disaster or circumstances arising from the disaster. Thus, AID may be asked to assist in helping to provide both safe sites for reconstruction and replacement housing.

For the AID program planner, there are a number of decisions which must be made prior to initiating a reconstruction program. These include:

1. The total number of people to be served.
2. Which economic groups to serve.
3. Whether the primary emphasis will be urban or rural.
4. Whether to become involved in land acquisition.

A major consideration is that the majority of housing reconstruction approaches that can be taken by a foreign agency are limited to providing assistance to persons who own land or have long-term tenure relationships. Thus, until land is acquired or otherwise secured, most housing reconstruction programs normally begin by providing assistance to those people who have land or tenure.

A. Land Options for Reconstruction

Housing reconstruction programs for landless victims require that strategies for land acquisition be developed as the first step of reconstruction planning. Strategies available include:

1. Acquisition of large sites for multiple building construction.
2. Acquisition of smaller, scattered sites for multiple building construction.
3. Assisting individual families in acquiring individual sites.

B. Safe Housing Options

If the collapse of housing was a major contribution to the disaster, a primary objective of reconstruction should be to replace housing with buildings safer than those that failed in the disaster. An additional objective of U.S. AID is to maximize the resources that are available so that the greatest possible number of people can be served.

Generally, there are six options available to the program planner.

1. Conventional Housing Projects

In a conventional housing project, land is acquired, a site plan is prepared, utilities are installed, and housing is built, usually by a contractor, according to plans developed by the agency.

Conventional housing projects offer the best means of ensuring that the homeowner receives a safe, well-engineered disaster-resistant house. An architect and/or engineer designs the house, which is then produced by a construction team under the supervision of a trained building tradesman. Only when the structure is complete is the building turned over to the occupant.

Advantages of this scheme are:

- a. Complete control can be maintained over the quality of the building.
- b. As long as quality control is maintained, safety can be ensured.

Disadvantages, however, usually outweigh the advantages.

Disadvantages are:

- a. Cost - This type of program is the most expensive and thus, the number of people served is relatively minimal.
- b. Time - Conventional projects take a relatively long period of time to plan and execute.

c. Low Owner Involvement - Because of the nature of the design process, owner/occupant input is usually fairly low. Due to the cost of preparing a design, variations are relatively few.

d. Sites - This type of program does not lend itself easily to construction on scattered sites. Therefore, conventional housing projects are normally built in clusters. This adds the additional task of land acquisition.

A conventional housing project has an additional disadvantage. Because the program takes time to plan and execute, it offers nothing to the homeless during the emergency period. If the housing project option is chosen, it may be necessary to develop an emergency shelter program to provide temporary shelter until the housing project is completed.

2. Prefab Housing

During the 1960's and early 1970's, a number of reconstruction programs chose to develop and provide prefabricated housing units for disaster victims. In most cases, the prefab units were of panel construction with corrugated metal or cement roofing sheets. The success of the programs varied considerably, often depending on the sophistication of the design, size and its suitability to the particular community and its environment. In most cases, however, the housing units were not popular, and occupants considered the houses to be only a temporary or intermediate measure. Researchers have pointed out that the advantages, which included speed of construction, reduced costs,

and speed of delivery, were advantages seen from the viewpoint of the agency providing the houses and not the disaster victim. When surveyed, disaster victims noted the following disadvantages.¹

- a. Prefabricated houses represented only a small margin of economy compared to more desirable forms of houses.
- b. Prefabricated houses were more expensive than traditional houses.
- c. Prefabricated houses built in mass had the disadvantage of being uniform architecture.
- d. The resale market was very restricted. (This resulted in a high number of abandoned houses.)
- e. Prefabricated housing projects located in provinces outside (urban areas) turned out to have very high construction costs because of the difficulty and high cost of transportation.
- f. Because the units were designed for mass production, individual homeowners complained that they had no input into the overall design and, therefore, they were often unhappy with the configuration. For the most part, prefab housing programs cannot provide emergency shelter except in urban areas or in regions which are adequately served by roads. Thus, if a prefab scheme is contemplated, some form of emergency shelter may have to be developed for areas with limited access.

¹"Social Factors Which Influence the Advance of Housing Technology," Tarja Cranberg in Design, Siting and Construction of Low Cost Housing and Community Building to Better Withstand Earthquakes and Wind Storms, National Bureau of Standards, BSS 48, 1974.

3. Materials Distribution

Materials distribution programs can be a method by which a degree of safer construction can be effected. For example, in earthquake regions where heavy tile roofs contribute to the mode of failure in traditional housing, lightweight roof sheeting, such as corrugated metal or fiber-reinforced cement, can be provided as an alternative to tiles. In areas where roofing is particularly vulnerable to uplift during high winds, fasteners and anchors can be provided. Other disaster resistant components which could be considered include:

- . Concrete posts for disaster resistant frames
- . Braces or reinforcing material
- . Wood preservatives
- . Reinforcing bars for cement reconstruction
- . Stabilizing materials for earthen construction
- . Nails, screws, or other fasteners to improve joints in the buildings.

The advantages of materials distribution programs are:

- a. A large number of people can be affected at a relatively low cost.
- b. Distribution is relatively easier than distributing complete prefab units.
- c. Materials can be delivered faster than a prefab unit.
- d. The program places the burden of decision-making regarding design, size, etc. on the homeowner.

Disadvantages are:

- a. Without guidance or technical assistance, there is no assurance that the materials being distributed will be used in the manner intended or in a safe way.
- b. In those cases where the material being distributed is not indigenous nor available in normal periods, the introduction of the material may create a demand which cannot be satisfied after the reconstruction activities cease. Furthermore, the introduction of the material may require changes in the basic design of traditional housing which, unless proper technical assistance is provided, may prove to be an unsafe adaptation.

Many relief agencies are finding that materials distribution programs are an attractive program option following widespread disasters, as it enables a large number of people to receive at least some degree of benefit. An additional advantage is that materials distribution schemes can be initiated during the emergency period, and certain materials, such as roofing sheets and other components can be used first as an emergency shelter and later be reincorporated into a more permanent dwelling.

4. Housing Education Programs

The term "housing education" refers to the provision of technical assistance to homeowners and building tradesmen on ways to improve traditional housing to make it more disaster resistant. Housing education may be simply a teaching and education effort or may be a component of one of the other types of programs mentioned herein. Most often, housing education is offered in conjunction with materials distribution programs.

Housing education programs are difficult to initiate and conduct, as the training staff must be familiar with not only the technical aspects of construction, but with the means of conveying the information to different groups of people. Attention must be given to development of appropriate media for presenting the information and the structuring of appropriate sessions where people can receive "hands on" as well as theoretical training.

As difficult as housing education programs are, without some effort in this field, long-term acceptance of disaster resistant construction methods is not likely to occur.

The advantages of a housing education program are:

- a. Long-term change in construction techniques can be effected.
- b. If properly designed, large numbers of people can receive benefits at relatively low cost. (Initial costs may be rather high in terms of the development of the training aids, exploration of training methods, and the training of the initial staff. However, longer term operational costs are relatively minor.)
- c. Housing education programs place the burden of decision-making about the style, shape and materials of the house on the homebuilder and occupant, thus, ensuring a high degree of citizen participation and involvement in the program.

Disadvantages include:

- a. Housing education programs take considerable time to initiate.

- b. Impact may be negligible in areas where tradition or resistance to change is strong.
- c. The ability to change housing according to the techniques being taught often depends upon the availability of materials or components needed for the change.
- d. Housing education programs often require many years of program inputs before the methods being taught "catch on" and become incorporated into vernacular housing. Thus, an agency initiating a housing education program must plan to stay on-site for a number of years, or until reconstruction is well under way.

With proper advance planning, housing education programs can be initiated immediately following a disaster. When conducted in conjunction with materials distribution programs, they can provide a resource for emergency shelter while at the same time laying the groundwork for reconstruction activities.

5. Core Housing

An option for providing both emergency shelter and housing which is increasingly used by reconstruction agencies is known as the "Core Housing approach." During the emergency, or during the rehabilitation phase, a relief agency provides a simple, structural frame which can be used as an emergency shelter or temporary structure. The frame and roof are designed to be disaster-resistant and permanent. The plan is for the occupants to fill the walls with whatever materials are available and to progressively upgrade the structure. Initially, the walls may be filled in with material salvaged from the rubble, then

later replaced with more suitable or aesthetic materials as the structures evolve into more formal houses.

The advantages of core housing schemes are:

- a. The programs are relatively low cost and allow the agency to provide incremental assistance. The frame and roof can be provided during the emergency, for example, with materials for the wall and interior at a later date.
- b. Because the frame is designed to be disaster resistant, a degree of control over the end product is established.
- c. The provision of the components necessary to build the frame and roof can be provided rather quickly, and relatively faster than a complete housing unit.
- d. This approach can be used immediately following a disaster to provide emergency shelter, thus maximizing expenditures.
- e. The program can work on a scattered site basis.
- f. The homeowner makes a significant input into the final product and is given a degree of choice as to what materials will be used and how the final house will be finished.

Disadvantages are:

- a. Without continuing technical assistance or a housing education component, people may infill the walls in an unsafe manner.
- b. The program will only work where people own the land or have long term tenure.

Core housing schemes require a degree of sophistication in order to be successfully effected. It is especially important that traditional housing be thoroughly understood as well as disaster-resistant construction techniques. Also implicit is a high degree of pre-disaster decision making.

6. In-House Shelters

The establishment of an in-house shelter is a method used in industrialized nations which has great potential as a safety measure in developing countries where housing costs are relatively high. There are two approaches. The first is to install a disaster-resistant shelter in a house. This could be a closet, or a small area of the building which can be reinforced and made safe from collapse. During a disaster threat, the occupants would move into the shelter for safety.

The second approach is to design or strengthen one room of the house so that it is disaster resistant. Normally, this would be the room in which all the occupants or a large portion spend the majority of their time during the day or night, such as a bedroom or kitchen. Again, during a disaster threat, occupants would seek safety in this room.

Normally, in-house shelters are designed for use in windstorms because the occupants would have time to move into the shelter. The second alternative, i.e. the strengthening of one room, could be used in earthquake areas, though in all probability, the only room which would justify extensive modification would be a bedroom.

To date, there are no known examples of the use of in-house shelters reconstruction programs, though the method has been found in traditional housing in various disaster-prone areas. The projected advantages for a reconstruction program are:

- a. Costs of disaster-resistant construction would be reduced.
- b. Extensive modification of traditional designs would not be necessary.

The primary disadvantage is that in-house shelters have little overall effect on reducing the vulnerability of the houses.

C. Housing Programs

Each of the aforementioned safe housing options can be coupled with a particular land strategy to form the basis for a housing reconstruction program. In a widespread disaster, normally more than one approach will be taken. For example, a materials distribution scheme may be initiated as part of an emergency shelter strategy for all groups. Next, a core housing program could be started for people in urban areas; while in the rural areas, the materials distribution scheme could be expanded and followed with a housing education program. For landless victims in the urban areas, large sites would be acquired for conventional housing projects with a range of housing types and styles; while, in smaller outlying towns, smaller conventional housing projects of 30-40 houses would be developed on smaller sites.

D. Orientation of this Manual

This manual focuses on conventional housing projects. It describes the prerequisites for a project and discusses planning, initiation and implementation. Several points should be noted:

1. The conventional housing project is only one type of option that is available. Emphasis on these projects in this manual is not intended to suggest that this is the preferred type of project, nor that it should be given priority over the other options that are available.
2. Conventional housing projects, by their very nature, can only serve a very limited number of people and meet only a small portion of overall needs.
3. A decision to undertake a conventional housing project should not preclude consideration of other program options by the Mission.

This manual is intended to be one of a series of manuals on housing reconstruction for use by AID Missions. Because the topic of this manual is conventional housing projects, the manual does not cover many other aspects of post-disaster shelter and housing which are important in helping the Mission formulate reconstruction plans. This manual assumes that a basic understanding of post-disaster shelter/housing issues will be provided in a preceding volume and that a policy framework has been developed by the Mission to serve as a guide for the housing planner.

E. Users

This manual is designed to assist the AID Mission in developing and implementing a conventional housing project. It is designed as a guide for program and project decision-making. In the course of any program of this nature, a variety of technical decisions will arise. Where technical decisions or inputs are required, they are noted in the text. These technical questions must be answered by technicians. This manual should not be considered as a substitute for the input of trained professionals.

Both AID and many partner organizations have had extensive experience in conventional housing projects. The Mission should not hesitate to seek the advice of those who have experience and expertise in this type of program. Sources of expertise within the U.S. Government include:

1. AID Office of Housing
2. AID Office of Foreign Disaster Assistance
3. AID Office of Engineering
4. Office of International Affairs, U.S. Department of Housing & Urban Development

Other non-governmental resources are listed in Appendix ____.



CONVENTIONAL PROJECTS

A. Orientation

A conventional housing reconstruction project is defined as a complete program of land acquisition, site planning, site development and housing reconstruction. Conventional projects can be divided into two types according to the method by which housing is provided. They are:

1. Simple projects wherein the reconstruction agency uses only one approach to provide the housing (normally contractor built structures.)
2. Integrated projects wherein the reconstruction agency utilizes two or more approaches for providing housing.

To date, most AID conventional housing projects have utilized the first approach. Normally, the houses provided are eligible for financing or can qualify for the housing guarantee program. A post-disaster conventional housing project is simply a normal conventional housing project conducted at an accelerated rate, taking into account considerations imposed by the disaster and/or a disaster threat.

Operational Responsibility

Conventional housing programs are normally conducted under the activity of a governmental or semi-public body. Because land acquisition is an integral part of the program; because the degree of sophistication required is high, and because this type of project requires extensive financing and readily available cash, other types of relief agencies, such as volags are normally not project holders. (However, other types of agencies may become involved in project execution, especially in the integrated project model.)

Beneficiaries

The designated beneficiaries of a conventional housing project are usually people who are both homeless and landless as a result of the disaster, and the project should be planned to meet the needs of these people on a priority basis. Examples of eligible persons are families who were tenants prior to the disaster, persons who have been evacuated from vulnerable sites, and persons who have lost their land as a result of the disaster effects. (For example, landslides, erosion, flooding, or the diversion of streams.)

Locale of Conventional Projects

Conventional housing programs are normally conducted in urban fringe areas on lands adjacent to or nearby an existing settlement. In some cases, entire new towns have been developed in response to a persistent disaster threat, however, projects of this magnitude are beyond the scope of this manual.

Timing

Conventional housing projects may be initiated during any post-disaster phase, but because land acquisition is involved, project execution and the actual construction and occupation of housing will not take place until well into the reconstruction period. This is important to remember. Conventional housing projects are not a solution to emergency shelter and housing needs.

B. Key Issues

There are a number of issues which must be confronted when planning a conventional housing program. They are:

1. Preconditions for a program

Those factors which determine whether or not a conventional project should be undertaken are:

- a. When the number of victims who have lost land or access to land represents a significant portion of the total in one particular area.
- b. When it can be determined that delays in reconstruction will mean that a significant number of tenants will not have access to other housing resources.
- c. When alternative approaches for providing land, such as scattered site acquisition, are not feasible due to costs or political/administrative obstacles.

2. Urgency and speed

Conventional housing programs are often proposed as a means of rapidly providing housing to meet the needs of disaster victims. Experience has shown, however, that conventional housing programs are among the slowest type of reconstruction activities. This is due primarily to the problem of land acquisition, but also the fact that planning and installation of facilities and housing takes longer on undeveloped land. Furthermore, it is often difficult to obtain the resources necessary to conduct conventional projects in a post-disaster environment. Therefore, conventional projects should only be proposed when speed is not a prime consideration.

3. Land issues

Land acquisition and subsequent land sales or tenure arrangements always become central issues in the housing projects. As land is usually one of the more sensitive issues within the LDC's, AID program managers must proceed with caution in these actions.

Experience has shown that the three key post-disaster land issues are land ownership or long term tenure, safety, and location and access to replacement sites.

a. Land ownership

Land ownership or long term tenure affects reconstruction plans in two ways. First, without tenure, people will be hesitant to contribute time or money to reconstruction efforts and will expect the reconstruction agency to provide all sites, services, and a complete replacement house. Second, the provision of new land or opportunities for people to purchase land can be an effective stimulant to reconstruction, thereby reducing the time of recovery and providing leverage by which safer housing can be ensured.

b. Safety

The issue of safety is a prime consideration in reconstruction planning. Even if people own the land, they may be reluctant to rebuild if a continuing threat is perceived. It is therefore important that before land is acquired, the sites be analyzed to determine their vulnerability and suitability for habitation.

c. Location and access

The location of the site and its proximity to the occupants workplace is another important consideration. Many resettlement schemes have failed because people did not have easy access to their places of employment or because services to the sites could not be quickly and economically provided.

4. Balance of income groups

A common debate in planning conventional housing projects is the target population and income group to occupy the project. Usually, such projects are intended to provide housing to the poor and there is often resistance to allowing other income groups to acquire project housing or land. In practice, due to the resale provisions, requirements for loans, etc., the people qualifying as beneficiaries tend to be an upwardly mobile segment of the low income population, as well as portions of middle income groups. For large projects, this can prove to be an advantage, as it means that portions of the land can be sold at a higher price to subsidize other portions of the site, thereby lowering costs for lower income families.

C. Key Concepts

1. Parallels to normal housing projects

A key concept to remember is that a conventional housing project conducted after a disaster is essentially a normal housing project carried out on an accelerated basis. Many conventional projects have failed because the reconstruction agency neglected to conduct the project in the same manner, using the same techniques as it would do under normal conditions. A conventional housing project is complicated rather than simplified by the disaster, but acceleration is feasible due to the pressures created by the disaster.

The additional factors added by a disaster are:

- a. Pressures for rapid site acquisition and development caused by a need to house disaster victims quickly.
- b. An immediate and identifiable clientele.
- c. Concern over the relative safety of the site.

- d. Concern over the relative safety of the house.
- e. Concern over access to places of employment, amplified if the beneficiaries are evacuees.

Disasters often represent opportunity loss, in other words, persons who would normally be eligible for loans or those who would have excess capital to invest in new housing may no longer have these resources due to losses in the disaster. Therefore, reduced ability to participate financially must be taken into account.

2. Integrated land use

Conventional housing projects often fail because they are viewed simply as a housing scheme, rather than as a balanced community. It is especially important in larger projects that land be provided for commercial and semi-public use and that the site be developed as a community, not simply as a mass of housing.

3. Integrated income groups

In large projects, it is important that the community be planned for a variety of different income groups. From a social perspective, this balance is especially desirable because it reduces the impact of having one large, low-income subdivision, which would quickly deteriorate into a slum and blighted area, and by mixing the land uses in the initial plan, land prices can to some degree be stabilized during the early stages of the project.

4. Maximizing opportunity for the victims

A key objective of any reconstruction activity is to promote the full recovery of the disaster victims. Housing reconstruction programs provide many opportunities for involving disaster victims and stimulating both economic and emotional recovery. It is important that reconstruction

activities be planned to provide jobs and opportunities for disaster victims. It is especially important that contractors be encouraged to utilize disaster victims in site development activities and in housing construction.

5. Importance of sites and services

In a post-disaster situation, housing is often seen as a primary need and the end result of a program. Planners should be careful not to develop a fixation on housing and should give equal attention to choice of sites and installation of adequate utility services in the project scheme. Experience has shown that while housing is a primary concern of disaster victims in the immediate aftermath of a disaster, over a long period of time, the development of the site and services provided is a far more long-term concern.

6. Disaster assessment

The key to successful project planning and execution is a thorough and accurate disaster assessment. For the planner of a conventional housing project, information which must be obtained prior to project planning includes:

- a. Data concerning the beneficiaries of the housing project including:
 1. Ability to participate in the program financially
 2. Numbers of people eligible for the program
 3. Demand for this type of project (i.e. the number of persons who are landless or permanent evacuees)
 4. The suitability and availability of safe sites

5. The availability of the resources necessary to carry out the project in the post-disaster environment. (i.e. will the materials be available? will the technicians necessary to plan and execute the programs be available when needed?, etc.)

D. Key People and Organizations

1. Project holders

The project holder of a conventional housing project must be an organization which can legally own or hold land and which has the administrative capability of conducting the project. The organization must be willing to undertake a long term commitment in the project area. Project holders are normally:

- a. Housing ministries of the national government
- b. Housing banks
- c. Municipalities
- d. Specially created disaster reconstruction agencies of the government
- e. Regional intergovernmental organizations (OAS, UNDP, etc.)

Voluntary agencies may also be project holders in certain circumstances, but foreign voluntary organizations without a permanent in-country staff should not be considered. Foreign volags, however, can be a useful technical resource and can be affiliated for the purposes of implementing portions of the project.

2. Technicians

The planning and execution of a conventional project requires inputs from a number of technical and professional people. Among those normally involved and their roles are:

- a. Planners - site layout and platting
- b. Architects - housing design, including disaster resistant construction details and technical assistance in housing education components.
- c. Engineers - earthquake or wind resistant structural engineering, sites and services planning and layout, soils analysis
- d. Geologists - hazard and risk analysis of the site
- e. Contractors - installation of sites and services, construction of housing, construction of community facilities

E. AID Roles

Appropriate roles for AID to play in a conventional housing program are:

1. Assistance in site selection

Activities relating to site selection include hazard and vulnerability analysis, analysis of access and suitability of the location, and soils testing.

2. Assistance in site acquisition

Activities include the provision of legal services to agencies contemplating purchase or acquisition of the land, financial aid to facilitate rapid land acquisition and providing technical assistance to find alternative ways in which land can be acquired or occupied under tenure relationships.

3. Assistance in project planning

As conventional housing projects require a great degree of sophistication, AID can often assist by providing technical assistance to project holders.

4. Assistance in project execution

Project execution often requires a high degree of sophistication. AID can provide technical assistance, administrative guidance, and help in sequencing activities. AID can often serve in a coordination role to help arrange input from other organizations and encourage partnerships in project execution.

5. Assistance in project financing

A problem delaying conventional projects can be immediate access to funds at critical times. AID can often use its own financial resources to stimulate rapid actions by providing funds, credit, loan guarantees, or direct loans to project holders.

6. Provision of assistance to disaster victims both before and after occupation of the site.

Because conventional projects take time to execute, the emergency housing and shelter needs of the victims cannot be met immediately. AID can assist the designated beneficiaries during the interim period by providing alternative shelter until the project site is ready for phased occupation.

7. Stimulating rapid action

Project holders often are not familiar with methods by which housing projects can be accelerated. The Mission can provide technical assistance to project holders and should encourage and stimulate administrative shortcuts wherever possible.

F. Lessons Learned

Considerable knowledge about conventional housing programs in both normal and post disaster situations has been gained by AID and other organizations.

Program planners should strive to incorporate the lessons learned into project plans and actions.

Among the lessons learned are:

1. Land acquisition is the key step. For the project planner, this means that adequate time and resources must be devoted to land acquisition at the earliest possible stage of the project.
2. Despite program intentions, the occupants of a conventional housing project are not always disaster victims. Generally, the longer the project takes to execute, the less likely that the disaster victims for which the project was intended will occupy the site. For the project planner, there are two implications. First, special attention must be given to ways of meeting the housing and shelter needs of the target population, and keeping them in the project "pipeline", and second, priorities should be given to activities which will allow the primary recipient group early access to the site.

The fact that many of the ultimate occupants of the site will not be the intended group should not be considered as a major problem, as long as adequate measures are taken to ensure participation by a significant portion of the designated beneficiaries. Planners may even allocate a portion of the site to be designated for non-primary group occupancy as a means of developing a balanced community.

3. Conventional housing projects have not proven successful in redevelopment areas. In many cases, the damage caused by the disaster is so severe that all the buildings on a site are demolished and large tracts of land are cleared. Some of these sites may be offered for use in a conventional housing project. Experience has shown, however, that these sites should be avoided due to problems of land ownership and other factors which serve to delay acquisition and increase the costs.

(Redevelopment of these sites should be accomplished through other housing reconstruction approaches.)

4. Because conventional projects take time to plan and execute, land costs will rise during the project. This has two implications:
 - a. First, unless rapid acquisition is possible, land acquisition costs will increase.
 - b. As land costs increase, it will be necessary to develop land cost write-down mechanisms so that occupants will be able to purchase the land at a reasonable price. This means that the agency must either be prepared to sell the land at a loss, or plan the project so that more expensive sites can be sold at a price which subsidizes the sale of the remaining land.
5. The provision of land can be used as an incentive for both safe construction and phased site development if suitable controls are used and it is understood by the beneficiaries that this will be a condition for receiving clear title to the land. Program planners often fail to use this incentive, and thereby lose an opportunity to effect safer and more appealing environments.
6. Adequate sanitation is both the most important utility to be provided, and a key to overall success of the project. Without an on-site sanitation system for each family, the desirability of the project and the overall environmental impact of the project will be substantially affected.
7. Without clear title to the land, people will be unlikely to participate in self-help activities or to upgrade their housing.

8. Many projects are over-designed. In other words, in an attempt to provide the highest possible quality of housing and the best site arrangement, programs enter into such detail that they inevitably cause delays and increased costs. Program planners should be especially careful to simplify plans and designs so that rapid implementation is facilitated.

9. The size and shape of individual sites can affect the ultimate safety of the evolving house. For example, sites are often too narrow to permit the necessary separation between buildings required in earthquake zones. Therefore, when the building is abutted next to the house on the adjoining lot, a vulnerable situation is created.

The shape and size of a lot often determine the evolution of a house. By providing an inadequate site, additions to the primary structure are likely to increase the vulnerability of the house.



PHASING OF ACTIVITIES (Program Planning)

A. Determining Project Feasibility

The first step in project planning is to determine the feasibility of the proposed project. In general, there are three steps by which project feasibility is determined.

1. Need Determination

The first step is to determine the relative needs of the disaster victims. This is carried out during disaster assessment. The disaster assessment should be structured to provide program planners with information about the different groups of disaster victims and their requirements for rehousing. Information to be gathered includes:

- a. The number of homeless and landless families and the relative percentage of this group as a total of the victims.
- b. Characteristics of the group, including income levels, percentage of loss, economic viability, estimated numbers and percent with post-disaster jobs, and an estimation of their financial ability to participate in the program.

Agencies should be careful not to become too overly involved in surveying, and should attempt to gather rough estimates rather than precise numbers.

Once needs have been identified, the mission should determine what actions other agencies are taking to meet those needs. It should be remembered that other relief organizations will also provide aid, and their plans should be taken into account before the mission decides which activities to undertake in a particular area.

2. Establishing that Conditions Exist for a Project

Once that the victims' needs have been ascertained, it is necessary to determine whether or not conditions exist for a particular type of project. In terms of conventional housing projects, the Mission must determine not only that the conditions exist, but also that mechanisms exist which will facilitate implementation.

Important determinants are:

- a. That land acquisition can be accomplished without undue restraint or delays.
- b. That financial mechanisms exist whereby funds can be transferred for the purpose of land acquisition.
- c. That organizations which can serve as project holders are available and qualified.
- d. That the economic environment in the post-disaster situation will permit loan programs.

B. Selecting a Project Holder

The third step is to identify a project holder. Normally, a project holder will be a branch of the host government, a semi-public organization, an intergovernmental organization or a private non-government organization located in the country. The Mission must determine the qualifications of the project holder and ascertain that the project holder is capable of conducting the project and seeing it through. Among the qualifications which should be considered are:

1. Previous experience in this type of program.
2. Previous experience in housing programs.
3. Previous experience with loan programs.
4. Technical capabilities.

5. Managerial capabilities.
6. Long term commitment to the project.

C. Initial Actions

Once an agency has decided on a certain course of action, the next step is to precisely define what the program hopes to attain, and to establish a framework for guiding the decisions that will be required in subsequent activities. To do this, an agency sets its policies, establishes goals and objectives, selects the strategy and approaches by which the objectives will be attained, and gathers the information necessary to conduct the program.

1. Policy Setting

Policies are the tool used to shape the response. They provide a standard by which choices are measured. Setting policies is one of the easiest program planning steps, yet it is often neglected. Ideally, the Mission will set its policies as part of its preparedness activities, and thus, when a disaster occurs, those involved in the initial program will have some guidance to structure their decision making. If policies are not set as part of preparedness, it should be the initial post-disaster program planning activity.

2. Objectives

Identification of objectives is the next step in program planning. Each objective should be put in a narrative form, and should describe what the Mission hopes to accomplish by each action or set of actions. The establishment of objectives is the time to discuss how programs in different sectors can be tied together to attain broader results. The Mission should strive for balance and examine various means of attaining a particular objective.

3. Goal Setting

Goal setting is the quantification of the objectives. The purpose of goal setting is to determine how much assistance is going to be provided and how many beneficiaries will receive aid. The establishment of realistic goals requires much forethought and discussion. It is at this point that the Mission must balance its desire to help the victims against a realistic assessment of the capabilities of the project holder.

4. Determination of Strategies and Approaches

Determination of strategies and approaches is the final step in program planning. A strategy is a plan for attaining a goal, while an approach is the method used. Among the strategies which must be considered and developed for a conventional housing project are:

- a. Rapid land acquisition mechanisms.
- b. Strategies by which the site can be occupied at an early date.
- c. Strategies for phasing the occupancy of the site.
- d. Strategies for counteracting increases in land prices.
- e. Strategies for holding the project open and available for intended beneficiaries.

5. Information Acquisition

Throughout the program planning process, certain types of information must be acquired. Generally, information needs may be divided into three categories.

- a. General Information about the society, the people, their customs, traditions, housing, etc.
- b. Technical Information about reconstruction and methods for rebuilding safe structures, and

c. Program Information, the information upon which program planning decisions can be made, including:

1. Identification of potential sites.
2. Procedural and legal data relating to land acquisition.
3. Economic information concerning the feasibility of proposed loan schemes.
4. Statistical information concerning the disaster victims and their capabilities in the post-disaster situation.

D. Program Organization

Once the mission has conceptualized the program, the process of putting it into operation begins. This entails allocating resources, developing the management component and initiating the project.

1. Resource Allocation

The allocation of resources, especially money, is one of the most complicated aspects of program planning. It is important to balance the program and to develop an appropriate mix of responses. It is impossible to describe all the choices that exist for a program, however, there are some concepts which describe ways in which funds can be stretched. They are:

a. Linkage to other programs

The methods usually considered are cost sharing, pooling of resources, or contributing matching funds.

b. Recoverable funding

In recoverable funding, all or a portion of the funds distributed are returned to the program, usually for reinvestment in the project activities. The most common examples are:

1. Revolving loans
2. Sales
3. Subsidy schemes

Recoverable funding increases the number of people who can be served, and extends the service of the cash originally committed.

c. Maximization of buying power

This refers to the practice of using the program money in such a way that either the programs or the beneficiaries financial power is extended. For example, if a loan program is going to be used in conjunction with the housing project, the agency may be able to find other institutions to make the loans and use its funds to guarantee the loans. In this manner, an amount of say \$100,000 could be used to guarantee up to \$1,000,000 or more in loans, thus increasing ten-fold the actual buying power of the money that the mission has on hand.

d. Multiple objective planning

In multiple objective planning, expenditures are targeted so that more than one objective is reached with each disbursement. A sample scenario: On the site for the conventional housing project, a work project is established to install utilities and build roads. The beneficiaries of the project are hired to help with construction. The people are paid in both cash and credits or coupons which are redeemable in nearby, adjacent markets. The specific objectives reached are improvement of the site, provision of capital to the victims, and stimulation of nearby markets. General objectives are progress on the project, economic recovery of victims, and stimulation of the markets.

2. Program Management Planning

The next step in organizing a program is to establish the management and administrative mechanisms. Activities include establishment of a table of organization (or organogram), developing a budget, establishing the program sequence, and hiring of staff and consultants.

a. Establishing a table of organization

Tables of organization have a subtle effect on the way in which programs are executed. The table of organization is the instrument for organizing a staff, establishing lines of authority, establishing a hierarchy of responsibility and establishing the lines of communication. Care must be taken to ensure that decision-making is not inadvertently restricted and that the flow of information is not inhibited.

Some helpful hints for establishing a table of organization are:

1. Form should follow function. This means that the structure of an organization should be built around the activities that are going to be conducted.
2. The organogram should encourage participatory management.
3. A reasonable span-of-control should be retained.

Span-of-control is a term used in management to describe the number of subordinates or activities that one person can control or supervise effectively. The absolute maximum is 7, though for most people the span-of-control limit is between 3 and 5. When establishing a table of organization, care should be taken that the number of subordinates or activities supervised does not exceed a reasonable limit.

4. Establish shortcuts. The table of organization should ensure that there are channels which allow those at lower echelons of a program to have access to the persons in authority. This may be handled by establishing committees of workers and program beneficiaries.

3. Staffing

The staffing of a post-disaster housing program is an activity which requires careful consideration. There are two common tendencies. One is to use volunteers to reduce costs. The second is to use contractors to increase the speed. Both have their advantages and drawbacks. Volunteers normally will only work for a short period of time and, therefore, cannot be relied on during later stages of project execution. Contractors can increase speed, but project recipients or other disaster victims may feel that they should be given the majority of work.

Staffing suggestions for program planners are:

- a. Do not hire an expatriate when a local person with the same skills is available.
- b. A proper balance between local and expatriate staff should be achieved. Local personnel must be included at all levels, not just the lower ranks.
- c. Only expatriates with technical skills should be placed in an advisory position. Expatriate advisors should be assigned counterparts, and see their roles in terms of training, delegation, and organization, rather than as individuals performing unassisted tasks.
- d. Equitable and equal salaries should be paid to both expatriates and local personnel.¹

¹From Relief Operations Guidebook, Chapt. 2, INTERTECT, 1973.

The use and choice of consultants is another staffing consideration. It is often difficult to find qualified housing experts familiar with post-disaster program requirements. This is especially true in the case of disaster resistant construction and in planning and implementation of large scale community reconstruction schemes. Thus, the Mission will most likely have to seek expatriate consultants for specific technical services. For the most part, a consultant's performance depends on his previous experience, and the Mission should ascertain not only technical qualifications, but the level and extent of previous field experience in post-disaster programs. Other considerations which should guide the selection of consultants are experience in the particular type of project, experience in the country, and experience with the local government.

4. Budgeting

Due to the nature of post-disaster funding, relief agencies rarely know precisely how much money they will have to operate with, and this, coupled with inflation and uncertainties in the post-disaster environment, make it difficult to allocate financial resources and to properly budget a program.

Whatever approach is used, a budget must be flexible and especially allow for inflation. If the budget is formulated immediately after a disaster, the initial document should be regarded only as a planning document, and not the final document or instrument of financial control. A large portion of the total budget should be left in uncommitted contingency reserve so that the project staff can adapt to changing situations and respond to unmet needs.

A suggested format for estimating initial budgets for a conventional housing project is shown in Table _____.

E. Project Management Systems

Because conventional housing projects are complex activities, a method for managing, sequencing and monitoring activities and progress is needed. Methods such as project management systems, flow charts or other management instruments should be selected. Flow charts can be used in two ways.

1. To plan and sequence a program where the resources and events and objectives are known in advance.
2. To illustrate a plan for responding to a situation which is not yet developed.

Another important factor is that through the flow charting process, the agency is forced to formulate a plan for the entire project. Thus, the flow chart can become an instrument for project management and control.

There are many techniques which can be adapted for disaster projects, and several agencies have developed their own approach or technique. (For example, the Log Frame used by U.S. AID.) Most systems utilize a simple bar chart, the CPM (Critical Path Method) or PERT (Project Evaluation and Review Technique). Whatever method is chosen, it is important that a visual chart be developed for monitoring program activities.

F. Monitoring

Throughout the course of a program, it is important to analyze actions and events. Incoming information is used to determine the performance and progress towards objectives. It is important to determine:

1. Whether or not the program is proceeding according to schedule.

2. The flow of cash.
3. Overall performance of staff.
4. The overall performance of the program.
5. Identification of bottlenecks and obstacles which cause delays or which require reassessing a certain activity.

Monitoring is a continuous process and provides a basis for making adjustments while the program is in progress.

G. Sequencing of Activities in Relation to Disaster Phases

The following chart outlines the activities related to a conventional housing project and the particular phase of a disaster in which it is appropriate that they be conducted.



LAND ACQUISITION

1. Background

Land acquisition is one of the most crucial aspects of a reconstruction program. Land issues are usually one of the more sensitive development issues in the LDC's, and AID program managers must proceed with caution in these actions.

Typically, disasters increase land problems and certain types of disasters and their related effects reduce the amount of developed land available for housing. In these cases, new, safer sites will need to be developed to resettle disaster victims.

A. Sites

In acquiring sites for a conventional housing project, there are two objectives; the selection of safe sites and selection of sites relatively close to places of employment. Sites that meet these criteria are:

- . Land around or adjacent to urban areas.
- . Urban sites which have been cleared as a result of demolition and clearance activities.

Each type of site presents special problems and opportunities for the planner. First, the establishment of new settlements for landless victims outside an existing urban area can create problems for the local government. If the site chosen is any distance from the original community, it may be difficult to provide services to the site. As the first priority of the government will be to restore and repair facilities for people inside the existing city boundaries, it is usually best to try and find sites which are within the service area of the city or immediately adjacent.

Post-disaster redevelopment of urban areas is a highly debated issue. Some cities have bulldozed large sections of a community and attempted to rebuild in a completely new fashion. While there have been some successes, such attempts have usually failed. Problems of land ownership make the condemnation necessary to acquire the land, usually delaying the program to a point where full implementation becomes almost impossible. Thus, in a post-disaster environment where rapid construction of replacement housing is desirable, planning to acquire and develop land obtained through clearance activities should be avoided.

B. Land Costs Following Disasters

Each type of natural disaster has its own particular effect on land values and this in turn affects acquisition timing and cost.

1. Earthquakes

Following an earthquake, land values normally increase; surprisingly, even in marginal areas and especially in urban areas. Since earthquakes have virtually no effect on agriculture, agricultural lands will also increase in price.

2. Volcanoes

Land values generally decline following the eruption of a volcano. Agricultural land will lose more value on average than urban land, especially if ash fallout is extensive.

3. Cyclonic Storms (hurricanes, cyclones and typhoons)

Cyclonic storms have two associated damage-causing phenomena - high winds and flooding. Both can destroy buildings and other manmade structures, as well as crops, but it is the flooding that alters the land and changes its value.

Land values following cyclones vary depending on the type and extent of damage. If a storm surge has struck, the value of the land inundated usually declines, more so if salt deposits remain. Beachfront property also declines in value in both urban and rural areas. Sites which proved safe, i.e. above the flood level or which were protected from high winds by hills or manmade structures will usually increase in value. Overall, however, land values generally decline.

4. Floods

Floods caused by heavy rainfall can destroy crops and damage human settlements and housing, but in most cases the effects are only temporary. Agricultural land subject to flooding is often the best for agriculture, as flooding is a means of replenishing the nutrients in the soil. Thus, in rural areas, the flooding may have little effect on land value.

In urban areas, flood plains are usually considered undesirable for housing and other types of development. Therefore, the land will have less value than other sites. If embankments or other flood control measures are taken, urban sites previously subject to flooding will increase in value. If the areas are situated near navigable streams, control of flooding will often alter development patterns along the banks as access would make areas more suitable for commercial or industrial development. Thus, land prices could rise beyond levels acceptable for housing projects.

C. Land Development Trends Following Disasters

Disasters can dramatically affect human settlement patterns. Typically, they increase land problems. Following a disaster, it is usually obvious

that the persons disproportionately affected are those living on poor sites and political action will soon mount to provide suitable sites for those made homeless and landless by the disasters, as well as for those still living in areas vulnerable to secondary disasters. Signs of the pressures for action are land invasions, political demonstrations, and increased land acquisition activities by humanitarian organizations.

In rural areas, economic hardships caused by a disaster often so adversely affect marginal farmers and small commercial enterprises that these activities are forced to cease. When this occurs, many families choose to move to urban areas to seek employment. This can add a sudden new wave of migration to already overcrowded and expanding urban centers.

If the disaster has affected the urban areas, commercial and industrial reconstruction demands may prompt a further increase in migration to the urban area. Increased salaries and job opportunities will attract many newcomers to the city from smaller, outlying towns, as well as from the rural areas.

For the planner of a conventional housing project, this trend in migration has implications for the land acquisition program in that the newcomers will compete for sites and services and land values will undoubtedly increase.

2. Site Strategies

Following a disaster, a site strategy must be developed by the program planner to ensure that the land acquired can be obtained rapidly and that disaster victims, the intended recipients, are sheltered until the project is ready for occupancy.

In general, there are three situations for which strategies should be developed.

1. Temporary Residence Off-Site

If sites are not immediately available, some actions must be taken to provide temporary shelter for those people who will be moving to the site. Normally, shelter can be provided by the immediate family, the extended family or friends. However, a small portion may have to be housed temporarily on public or semi-public sites. Examples of temporary locations are churches, schools, warehouses, and temporary camps.

As a general rule, temporary camps should not be set up except in the following situations:

- a. Volcanic eruptions
- b. During standing floods
- c. During other types of natural disasters where land cannot be reoccupied due to a continuing threat.

If it is decided that a temporary camp must be established, it is important to develop the temporary site in a manner which will not prevent its becoming permanent. Sites chosen may be land on or adjacent to governmental facilities, land which is clearly not suitable for development of housing, such as industrial sites, parks, or plots of land where the density created would make permanent settlement unattractive. (These criteria should not insinuate that a temporary camp should be designed and built as an unpleasant place to live, only that it should be designed to discourage permanence.)

2. Temporary On-Site Occupancy

Once a site has been selected, it may be desirable to begin relocation of disaster victims to the site or to portions of the site as quickly as possible, even if land acquisition is not complete. In a post-disaster situation, occupancy prior to complete land acquisition may be permitted or arranged under the following circumstances.

a. Provision of Legal Tenure to the Occupants

In many societies, land may be occupied under special tenure relationships pending the sale of land. For example, in certain Latin American societies, land tenure may be granted under a legal agreement which allows a homeowner to build on the land and occupy the site, but restrict the resale of the property to the original owner until such time as the land has been purchased from the owner by the occupant.

b. Lease Purchase Arrangements

In those countries where land sales may take an excessive amount of time, it may be possible to draw up an agreement allowing the site to be occupied on a lease purchase basis. The occupant would lease the land from the landowner until the land was sold. Payments made as part of the lease agreement would contribute towards the final purchase price.

c. Certificate of Occupancy

This arrangement may be used where the landowner has agreed to sell and a price has been arranged but the actual sale is delayed by legal procedures. Under this arrangement, a separate legal agreement is drawn up between the project holder and the landowner in which the terms of the sale are agreed upon and become binding. Under the agreement, the landowner agrees to allow immediate occupation of the site, and to issue a certificate of occupancy to each prospective landowner, which allows the family to occupy the site and begin construction.

d. Commitment to Binding Arbitration

In cases where a landowner has consented to sell the land to

the project holder, but there is a failure of all parties to agree on the purchase price, it may be possible to formalize an agreement that will allow occupation while negotiations are being concluded. To do this, all the parties enter into an agreement wherein the land will be sold at a price determined by binding third party arbitration. The agreement permits early occupation and separates occupancy from the actual land purchase.

3. Rapid Land Acquisition Strategies

The following strategies should be considered in order to acquire land rapidly for housing reconstruction programs.

a. Seek Public or Government Held Lands

Often, the fastest means of obtaining land is to have the government cede public lands to the project holder. Strategies such as land swaps between government agencies can also be useful.

b. Avoid Condemnation Proceedings

As a general strategy, project holders should be encouraged to purchase land outright rather than use land condemnation proceedings. Land sales are usually much quicker than condemnation, especially if more than one landowner is involved.

c. Early acquisition

Land acquisition proceedings should be initiated as soon as the sites have been identified. Following a disaster, urban land values can be expected to increase dramatically. The earlier that land acquisition proceedings are initiated and concluded, the cheaper the price, and the less time the proceedings will normally take.

d. Land Swaps

In many cases, landowners may be reluctant to dispose of their property for fear of losing a valuable asset or an opportunity. If the landowner wishes to continue to own an equivalent portion of land, land swaps may be arranged. In a land swap, the project holder will normally provide an equivalent amount or an increased amount of land in another location in return for the site desired.

e. Use of Bonds

In many cases, land acquisition is delayed due to inavailability of immediate funds. In these cases, it is often possible to provide the land holder with an alternative form of payment until such time that the money is appropriated. The usual manner chosen is by providing interest-bearing government bonds to the landowner to hold until such time as the final payment is effected. During the period he holds the bond, any interest accrued is given to the landowner.



Rapid Site Development Strategy

The reasons for rapid site development have been set forth. This chapter presents a methodology to implement two types of projects.

The first type is of large scale. The term "large" is relative to the size and character of the adjacent urban setting, but generally the size of the site and number of families will constitute a significant, identifiable new sector of the city. The **principals** of the project development range from perhaps 1,000 to 25,000 families.

The second type of project is small-scale. Again, size is relative, but the principles of this project development would be applicable from 50 to approximately 500 families.

The following process assumes certain actions have already been taken:

1. A needs assessment has identified the number of families that qualify for and would predictably occupy the project, and the income levels of those families.
2. The site selection and acquisition process has been completed. The size of the site or sites is a function of the standards for lot size per family plus areas for circulation, public and commercial spaces. (See Chapter 3)
3. The site development considerations and analysis have been completed and have determined the project's feasibility.

Implementation of the project needs to begin with estimating at what points in time the site will be ready for occupancy for each income level. With that known, a strategy for the temporary housing of victims and the staging of their movement to the new site can be developed.

For the purpose of identifying the distinction in the various income levels, the following definitions are used:

Income Level

1. Middle Class: Capable of purchasing a site with all service connections and completed house or a privately-built house financed by the project.
2. Moderate Income: Capable of purchasing site with all service connections, core or shell with one or two rooms.
3. Low Income: Capable of purchasing site, all service connections and core or shell.
4. Very Low Income: Capable of purchasing site with service connections. House to be built with self-help or traditional building process.

From the needs assessment data, determine the number of families eligible for the project, the percentage of these likely to move into the project, and the number of families within each income level.

Strategies for Temporary Accommodation of Victims

The intended users of the AID-supported post-disaster rapid site developed project are the landless or untenured victims. The provision of shelter to this segment of the disaster population is often the most difficult for:

1. Logistical questions of where to put them;
2. Political questions of how to support a population with an inherently weak power base;
3. Economic reasons that a solution for this group may be more costly per victim for donors.

The all-new project site program directly addresses the issues within 1 and 2 above. But the project planner will still need to devise a strategy on how to provide shelter for the victims until they move onto their new site.

The options available to the planner will vary widely, depending upon the circumstances of the disaster site.

1. The ideal solution is to house the victims in pre-existing permanent public structures such as schools, until they can move to their new site. This solution, however, may be only feasible for a limited time if the sanitary facilities are too over-extended or if the building's owner sets an early time limit for evacuation.
2. The victims may be housed in temporary structures that are located on temporary sites. As with option number 1, it will be necessary to make it obvious to all that the intended future residents of the project are living in clearly recognizable temporary conditions and that the conversion of them to permanent status would not be tolerable socially or politically.

The temporary structures could, of course, be tents. Preferable, though, would be a structure of materials that can be re-used at the permanent site, such as corrugated iron roofing and wood framing.

More crucial is the selection of the sites. They need to be carefully selected to be sites the public will not accept as being converted permanently to housing. Examples are public parks, within rights-of-way of streets, or land whose commercial value precludes housing.

3. If it is not possible to provide shelter off-site for the victims until the site is ready, it may be necessary to provide temporary shelter on-site. There may be two ways to do this:

a. Construct temporary shelters on the lots dedicated to commercial or public use. They should be built and sited so as not to interfere with the work on the residential sites.

The cost of the temporary shelters will be part of the total project cost. It is therefore very important that the shelters be built of entirely re-usable materials as a means of maximizing the impact of the funds available to the project.

b. In some cases there may be insufficient land to locate the victims on commercial or public sites. This may require the temporary location of shelters on a portion of the project site destined for housing during the time of the construction of the rest of the project. Upon the completion of construction of the permanent sites, the

victims would be relocated to them and the construction would proceed on the sites vacated by the victims. Of utmost importance, though, is that the total number of moves by a family be kept to a logistically feasible minimum.

The following diagram suggests one scenario for site development concurrent with temporary site occupancy. It makes the assumption, illustrated graphically, that the temporary shelter is three times as dense as the permanent density.

Phasing Development

This manual does not presuppose a specific or ultimate level of development for any of the income levels. Instead it suggests a strategy for its development by assuming the need to rapidly develop the site to prepare it for occupancy as quickly as possible.

1. Determine the initial scope of development of roads, water supply, drainage, sewage, and other urban services as per criteria and methodology of Chapter 4.
2. Develop an approach to evolutionary standards of site development and house completion, i.e., rapid site development and occupancy will require moving onto the site at the earliest possible time. The host country might have standards for "sites and services" projects during normal times. These standards would likely take more than a year to meet when they include such items as curb and gutter, water faucet on each site, lateral hook-up to sewer, street lighting, electricity to the site, and fences built on property lines.

The evolutionary standard for a very low-income site could start with a graded roadway, community water tank supplied by a truck, single- or multi-family latrines, and staked-out sites. At this point, low and very low-income victims could move onto the site. The incremental improvements in the services can be continued, albeit with some decrease in efficiency due to the presence of the families.

3. Identify standards for disaster resistant site selection and construction techniques. (See Chapter 3 and Appendix)

4. Project the follow-up sequence of development, such as upgrading or extending services. Plan the development to ensure that work accomplished during the initial stages does not conflict with later development; e.g. plan for laying of water and sewer lines in the road right-of-way before the road is paved, or do not build permanent fences at the back of a lot if it is later to be a utility right-of-way.
5. Determine policy on order of occupancy of the site by income level and the relative proportion of each income level. For example, it is probable that the largest number of victims are the poorest whose urgency to move out of temporary accommodations is the greatest. Furthermore, the very low-income sites are the most easily and quickly urbanized. Allow these victims to move onto their sites as soon as they are ready, while work continues on the development of the middle-through-low income sites.

The next largest and most in need of resettlement may be the low-income group. As soon as the core or shell is complete, they would occupy their sites.

The same procedure would follow for the moderate income group.

Site Planning with Module/Grid

Rapid site development requires an expedient method of site planning. While not overlooking any of the concerns of site analysis, a method of site planning must be used that achieves a finished plan within a very abbreviated time.

The following describes a specific technique that facilitates rapid analysis and rapid planning:

A grid system is delineated with the basic module being 100 meters by 100 meters. These modules are bounded by a part of the circulation system and further subdivided into individual lots. The size of the lots may vary and be selected as a function of cultural acceptability and cost effectiveness. Examples are shown in Figure ____.

These 100x100 modules are aggregated together ^{to form} ~~in~~ groupings of ^{8, 10, or 12} ~~2x6~~ modules, thereby forming sub-neighborhood sections.

To prepare the site plan:

1. Draw up a base map of the project site at a large scale such as _____. Locate boundaries and all physical features (see Chapter 4 for specific elements). The base map can be prepared from a survey, blown up from other maps already available, or taken from aerial photographs.
2. On translucent paper, draw up (at the same scale as the base map) a grid pattern of the 100x100 modules. The total size of this drawing should actually be larger in area than the project site.

3. Overlay the grid pattern over the base map. Reposition the grid overlay several times to seek out an optimum relationship between grid and site that would achieve the following objectives:
 - a. The most compatible relationship between road system and topography (roads not too steep);
 - b. The optimum circulation system and linkage to off-site system;
 - c. Minimizing the conflict with the site's natural features (e.g., a principal road should cross a drainage channel as few times as possible);
 - d. Review Chapter 4 for other site considerations that may be relevant to the site.
4. Select the optimum grid pattern and draw it on the base map.
5. Prepare a land use plan according to the following principles:
 - a. The project planner probably has the power to identify the intended income level of the project participants. It is the recommendation in this manual that the large sites be developed with a diverse mix of income groups. There are several distinct advantages for such a mix:
 - 1) Social Advantages: There exists the opportunity for an exchange at the community/public level of positive complementary qualities. The lower-income levels bring leadership and help define the agenda for community development. The middle-income groups bring technical skills and services.

2) Economic Advantages: The lower-income group may secure employment in the construction of the houses of the middle-income groups.

After completion of construction, the middle-income groups may offer employment to their lower-income neighbors for domestic or other work.

b. It is assumed that, for most societies where an AID project will be built that includes an income mix, the income levels will be separated physically from each other. The acceptability of the project may in fact require such separation.

Therefore, identify the sites with the highest market value as the middle-income level sites. The number of sites would, of course, agree with the planned number of middle-income project participants. These sites would likely be on a major street on the edge of the project, buffered from the rest of the project through landscaping or other physical means, and in general be as desirable as competitive housing normally available.

c. The moderate income sites would be those bearing the second highest market value and should be planned to define the spine or "main street" of the project. Their value derives from being on a major street, from their potential to house small shops, and perhaps from their larger area than the lower-income sites.

d. The low-income and very low-income sites comprise the remaining residential sites. An important social argument can be made

for bringing together and mixing modules of these two groups. However, the different degree and timing of the supply of services may necessitate that the two groupings are kept in distinct sectors.

- e. The remainder of the project site is devoted to open spaces, commercial and institutional uses. These functions are not simply assigned "left-over" sites, of course, but rather are carefully placed to maximize their utility, convenience to the population, and not incidentally their market value.

See Figure ____ for prototype site plan.

6. Stake out roads and lots at the project site.

The project should now be ready for the first stage of development as discussed in the following chapter.

SMALL SITE PROJECTS

The process of site selection, planning and development is essentially the same for either the large or small project. The small project differs from the large in the following ways.

1. It is likely limited to a single income group.
2. For small sites that are located within the basic fabric of a city, connecting to the existing urban infrastructure may be a relatively minor matter of extending this infrastructure. Consequently, it may be possible to bypass some of the temporary installation of services.
3. For small sites that are located substantially apart from an urbanized center it may never be feasible to connect the new sites' services to the existing services. Consequently, a longer range view of the initial temporary services may be necessary.
4. When the victims are living in temporary accommodations away from the site, it may be possible to develop the entire site in one stage.

STAGED CONSTRUCTION CONTRACTS

In the conventional housing project a civil contractor has the opportunity and flexibility to schedule the several aspects of construction in a manner to maximize his own efficiency, convenience, and profit. The limits on the construction process are essentially mechanical and those of manpower. When all of the various pieces of the construction project are completed and interfaced with each other, the site is opened up to the public for occupancy.

During the post-disaster crisis, the above scenario is a luxury. The objective of maximizing efficiency, convenience and profit is substituted for the objective of fastest possible occupancy of the site. In other words, as soon as the sites are developed to the point of the "crisis period" minimum standards, they will become occupied.

The phasing of the project's development was presented earlier in this chapter. It is important to note here that this program of rapid site development is actually at a cost. In total time, it will take the contractor longer and with many additional steps and complications. For example, once the project is partially occupied, all of the construction materials on site will have to be not only guarded 24 hours a day, but probably also enclosed in some sort of warehouse or fence. Another example would be the construction of a sanitation system. Normally, the construction would be the usual installation of sewer mains, laterals, man holes, and residential hookups. In a phased development, the construction

will not only include that of the traditional system, but be preceded with the installation of temporary latrines, the servicing of them, and the removal of them upon the eventual completion of the permanent system.

The project planner must accept the increased costs and complications as a trade-off for the benefits of relieving the crisis living conditions of the disaster victim.

PROJECT FINANCING CONCERNS

The large scale project with its multi-level income mixture is conceptualized as adhering to customary A.I.D. financing policies. The middle income portion would tend to serve the maximum income qualified for support while the low income portion would serve the minimum levels.

However, if the very low income victims fall below the minimum qualifications, the project should devise alternative means to serve them. For example, A.I.D. might require that the site actually acquired be large enough for the very low income and subsequently planned for them. Although A.I.D. may only be able to support the financing of middle, moderate, and low income, creative site planning can bring roads and minimal services to the sites for the very low income.



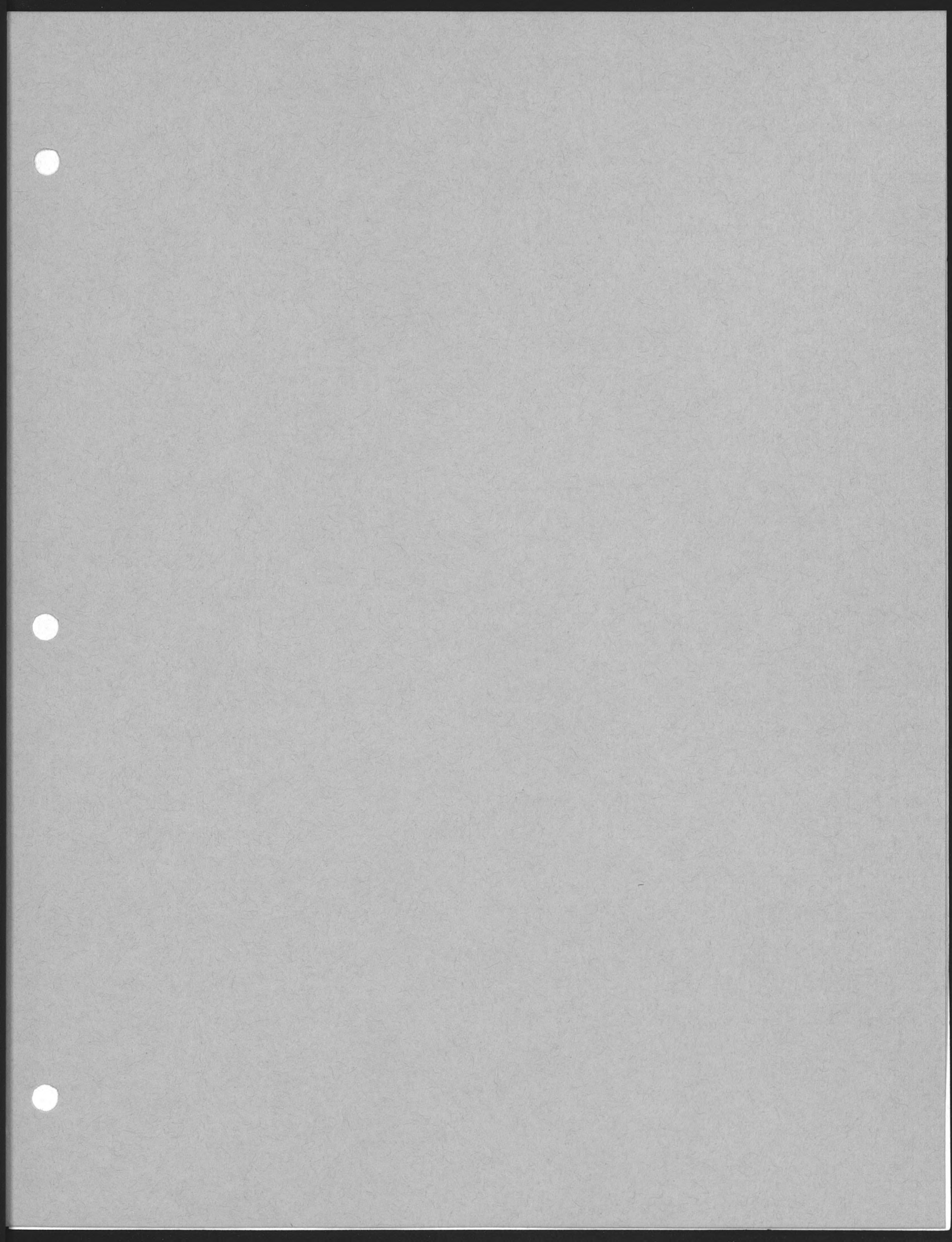
A site plan arranged in such a manner would find the roads and service extension to the very low income areas to be very cost effective.

A fundamental objective in post-disaster reconstruction is to utilize the very limited available financial resources in a way to maximize their impact. In the context of the recommended rapid site development, there are various ways to achieve this.

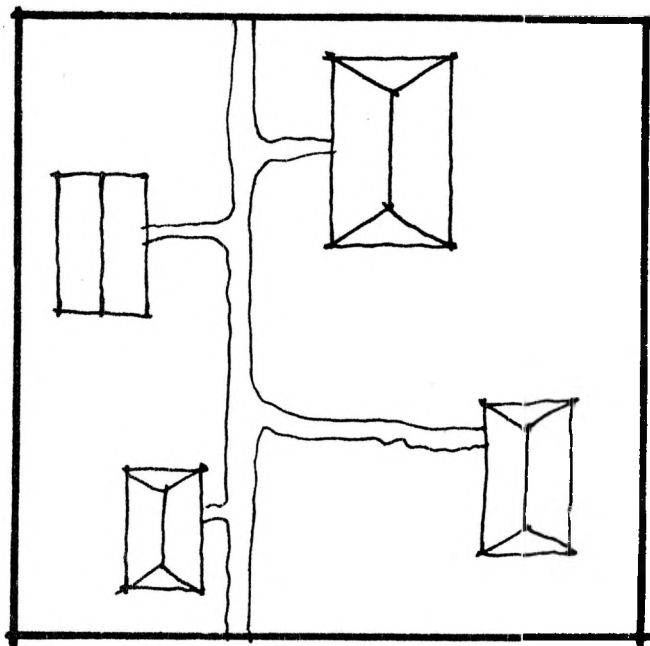
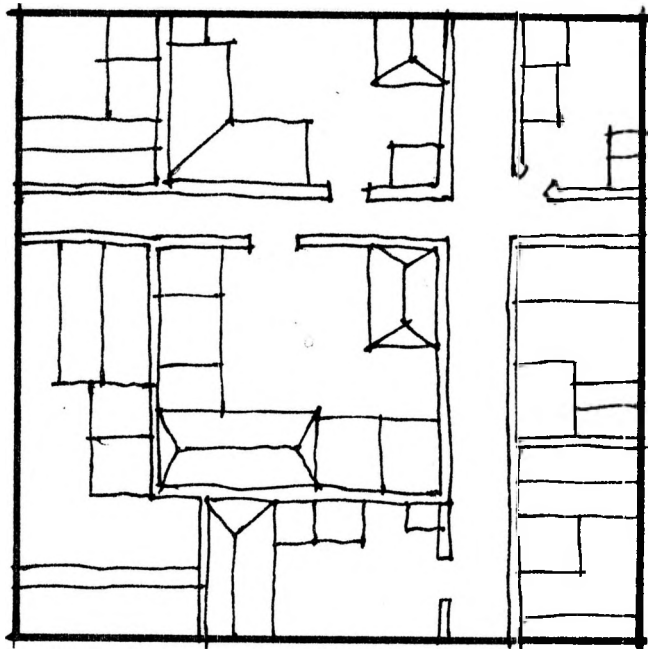
1. The sale of the middle income sites at an above cost price can be used to finance the second phase of the site development of the low income sites.

A.I.D. ROLE IN RAPID SITE DEVELOPMENT PROGRAM

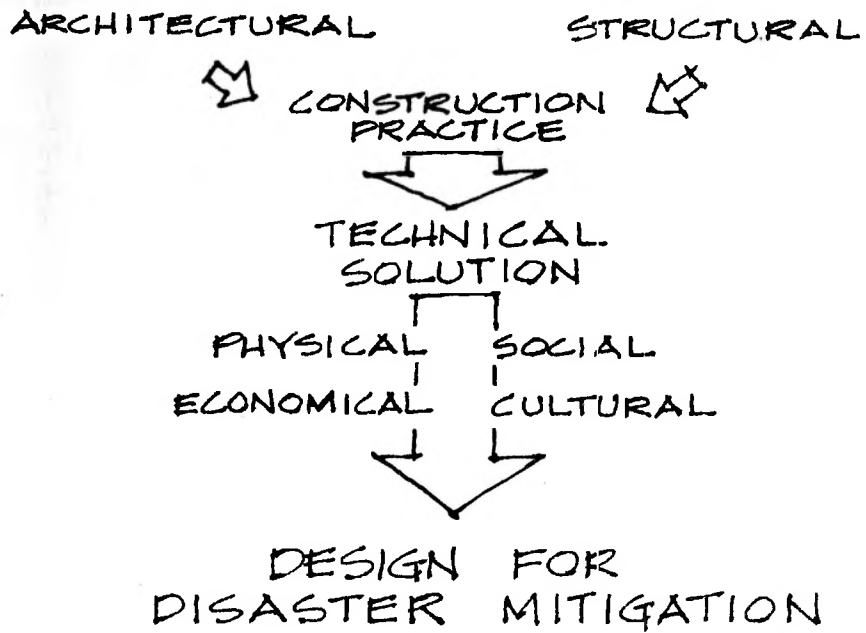
1. When the needs assessment reveals there is a significant number of victim families who have no land on which to rebuild, A.I.D. could advocate for the rapid site development approach to the national government.
2. Provide technical assistance to the implementing agency for:
 - a. Suggestions on rapid site acquisition
 - b. Site surveying
 - c. Site planning
 - d. Recommendations on financing systems
 - e. Recommendations on strategies for temporary victim shelter, phasing of site development to achieve as early site occupancy as possible, staging of movement of victims to their sites.



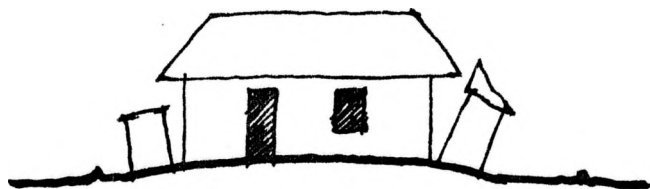
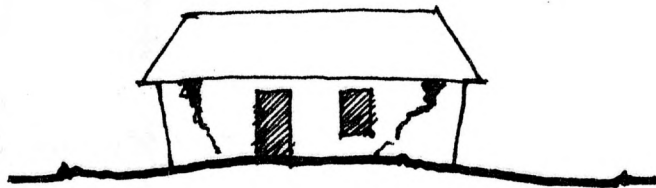
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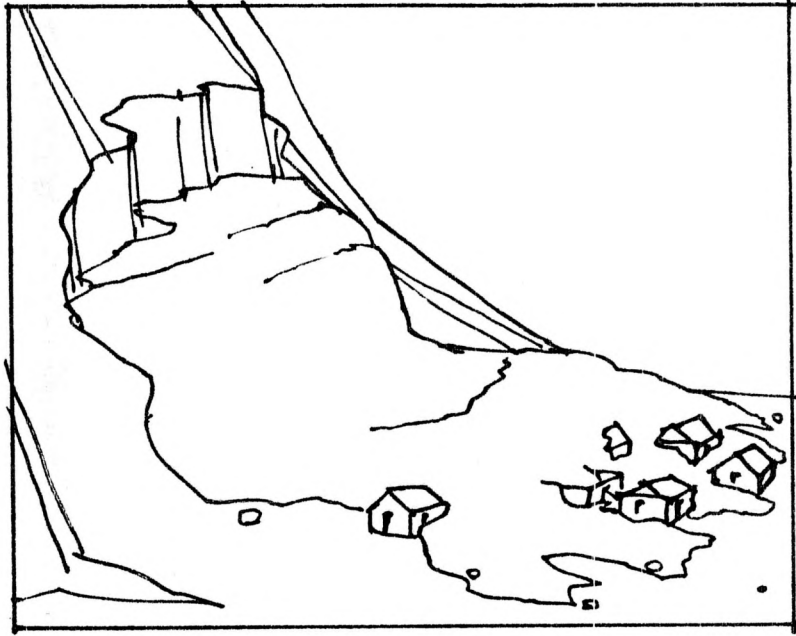
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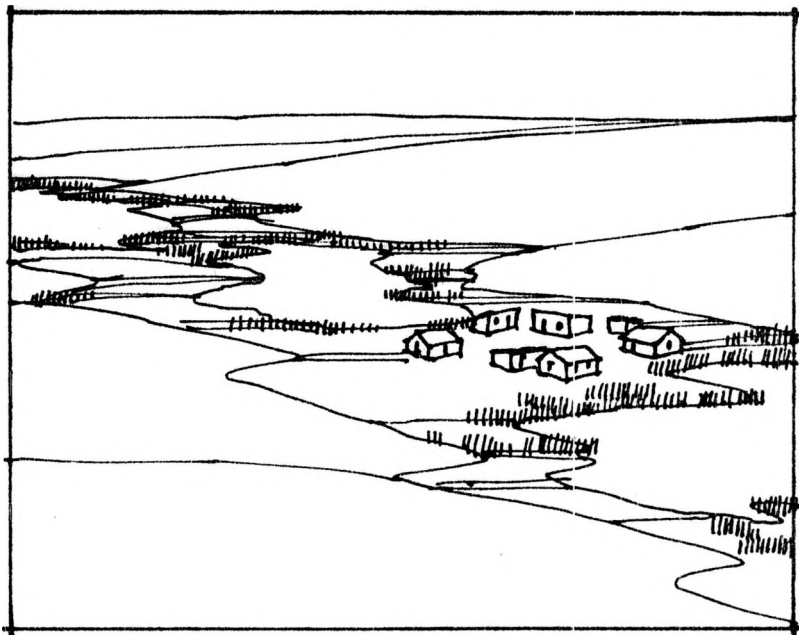
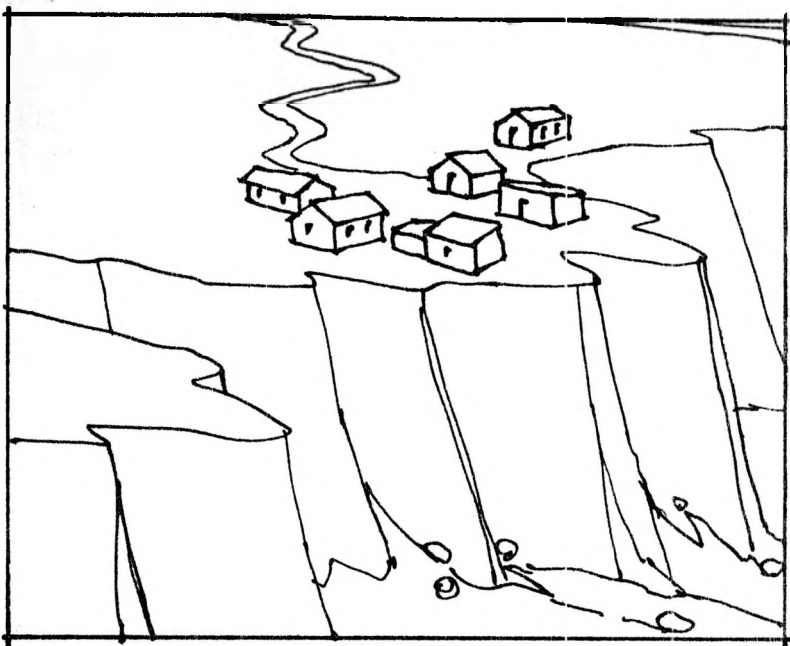
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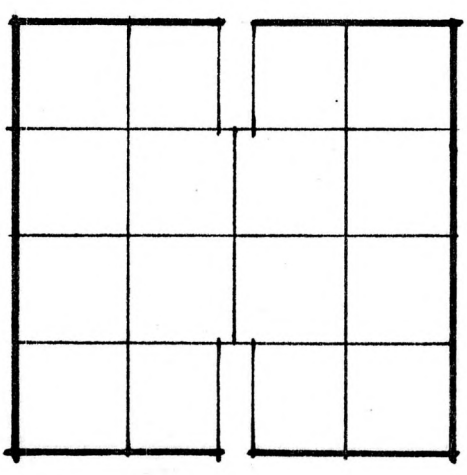
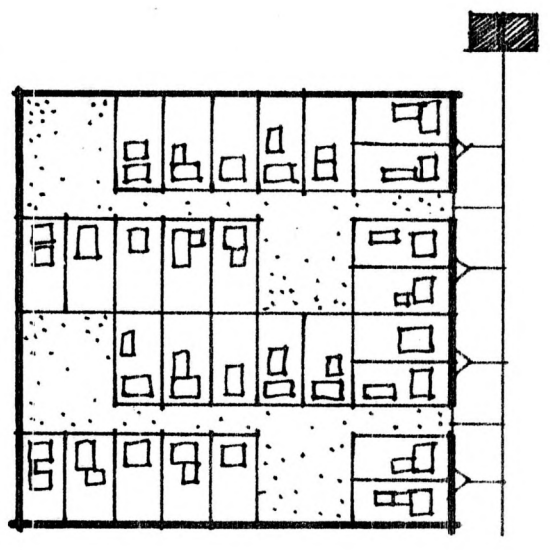
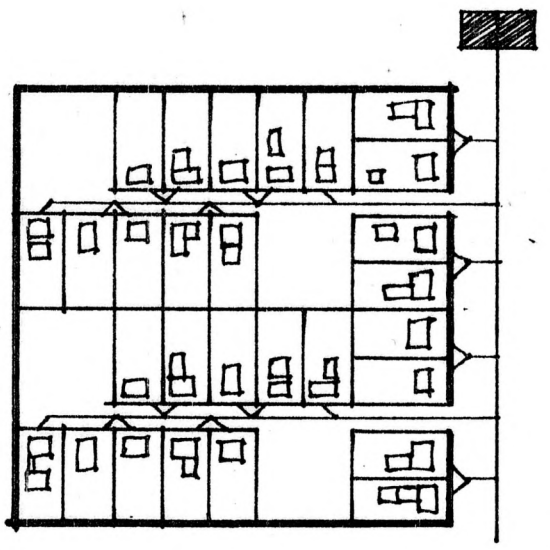
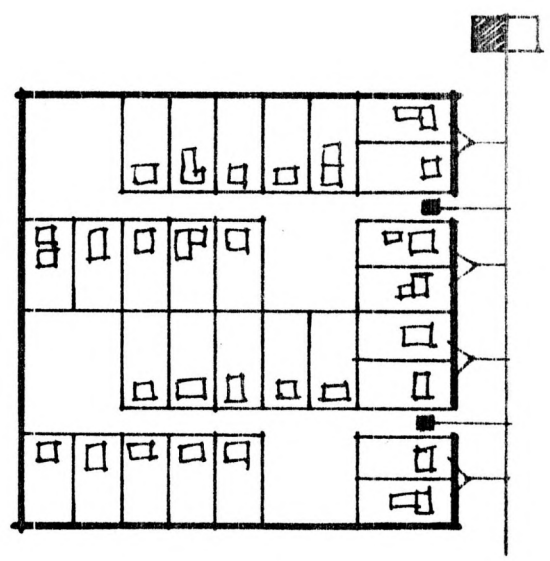
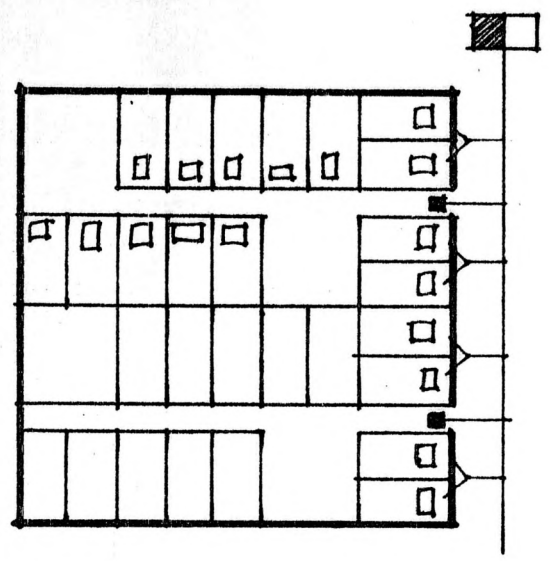
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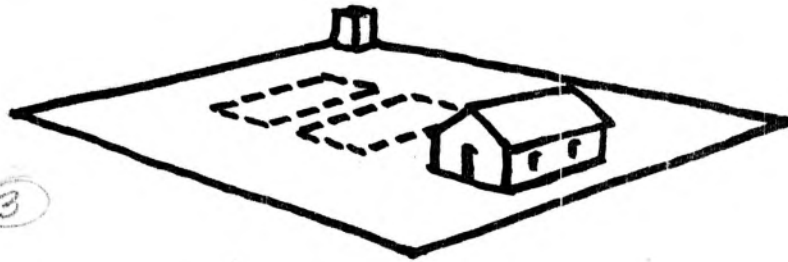
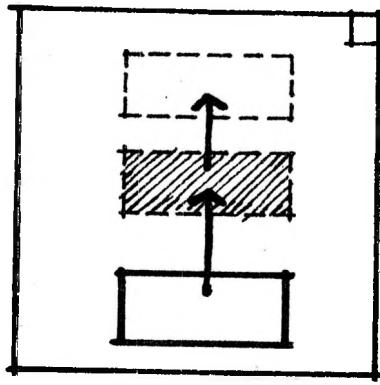


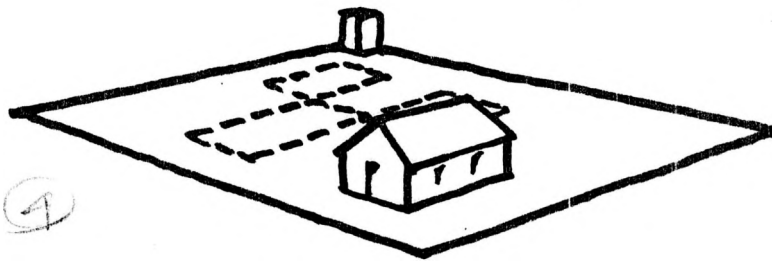
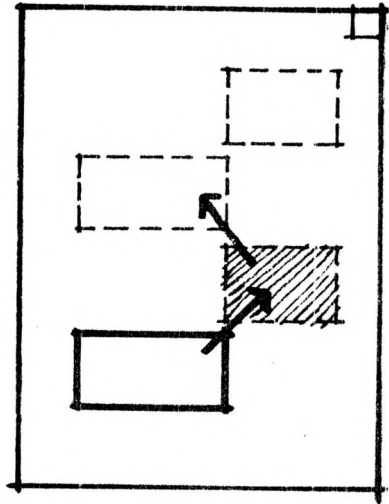
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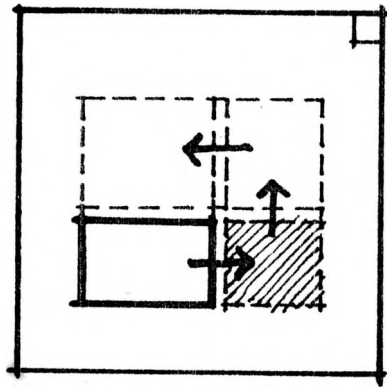


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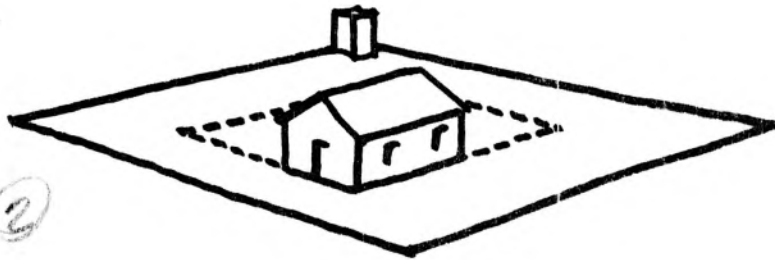




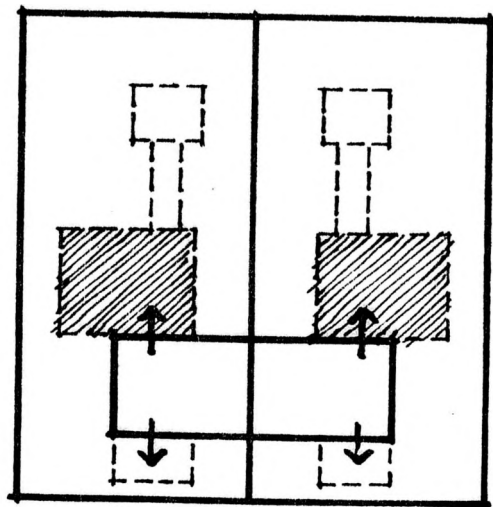




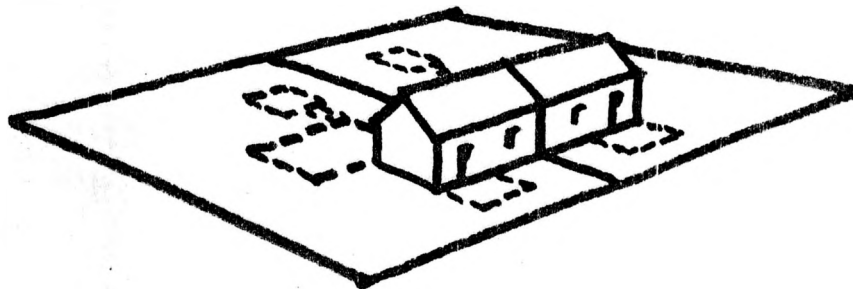
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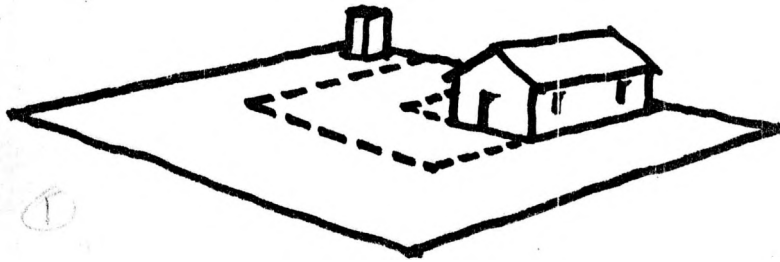
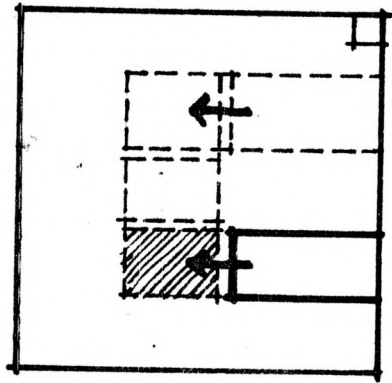
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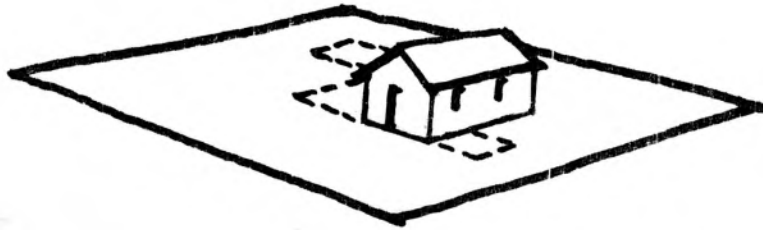
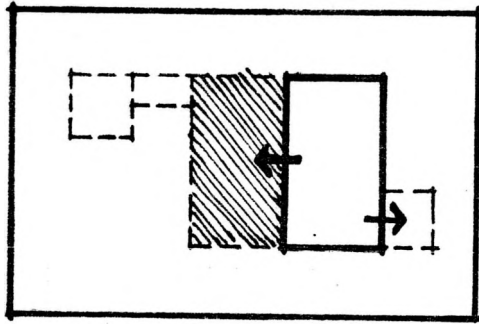


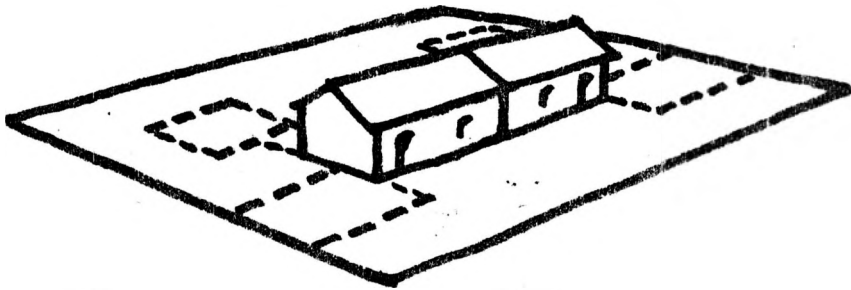
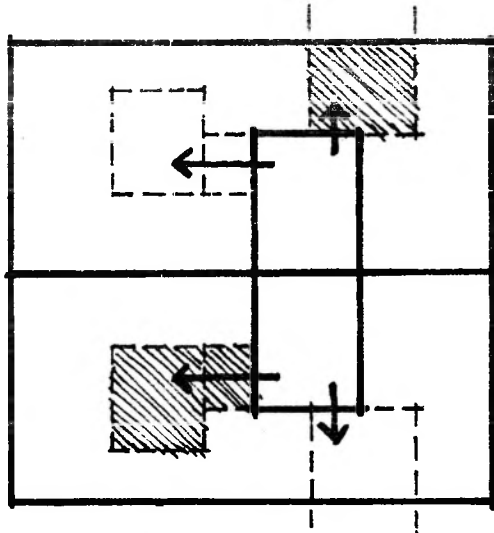
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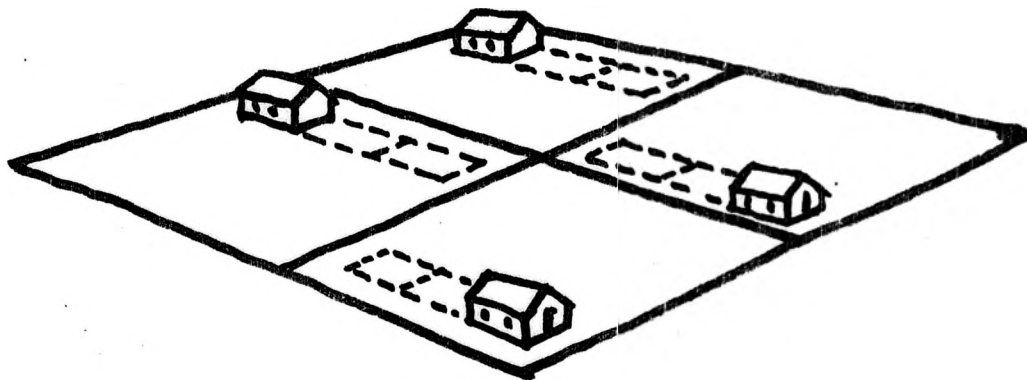
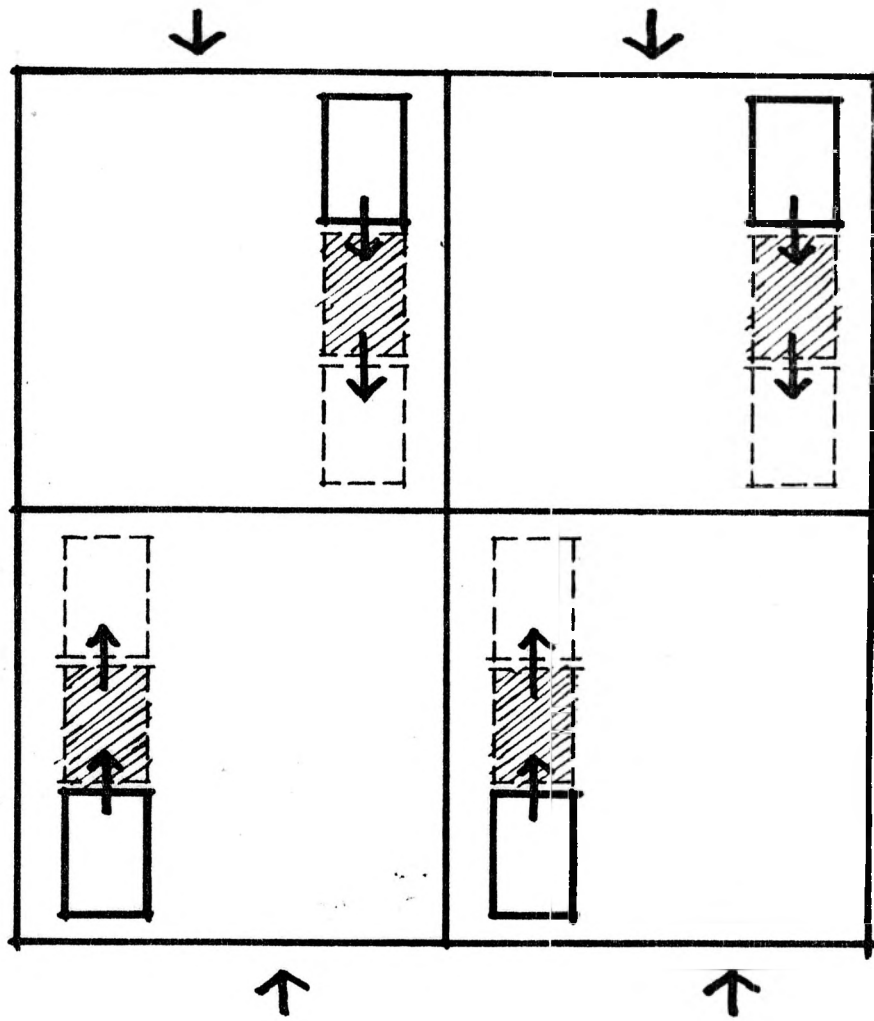




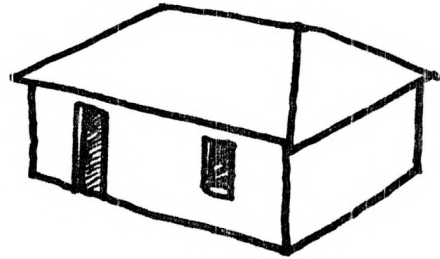
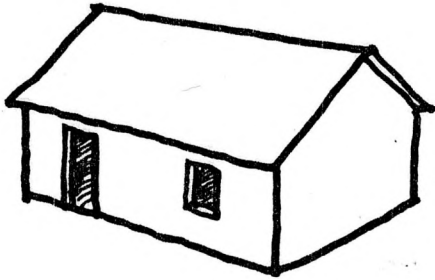
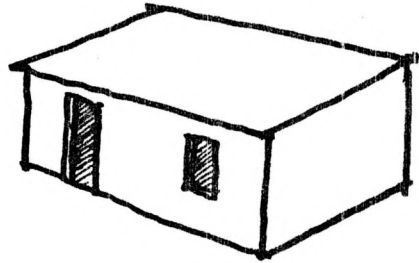
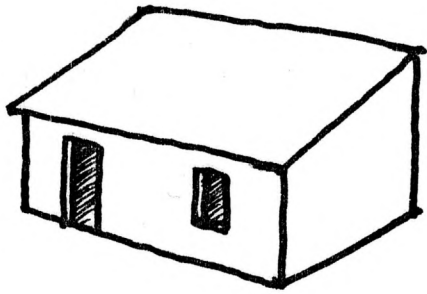


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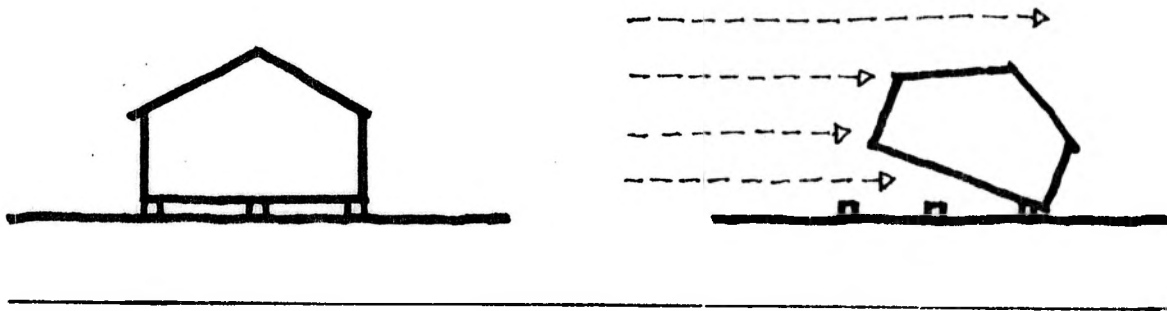
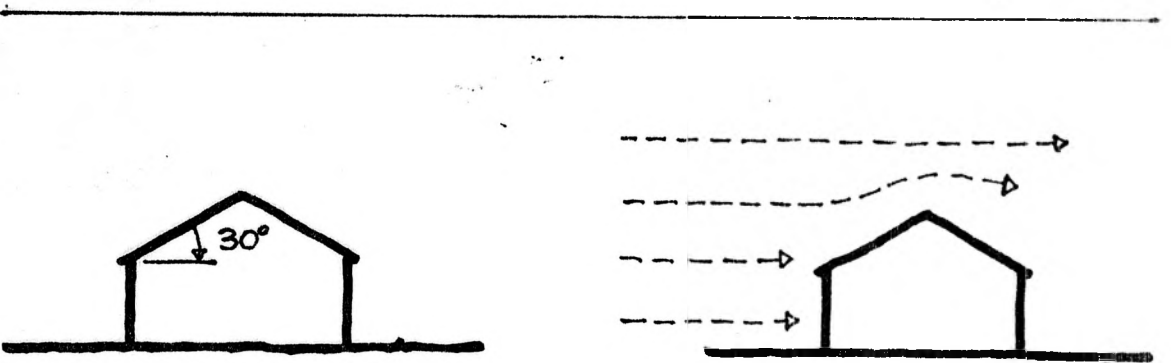
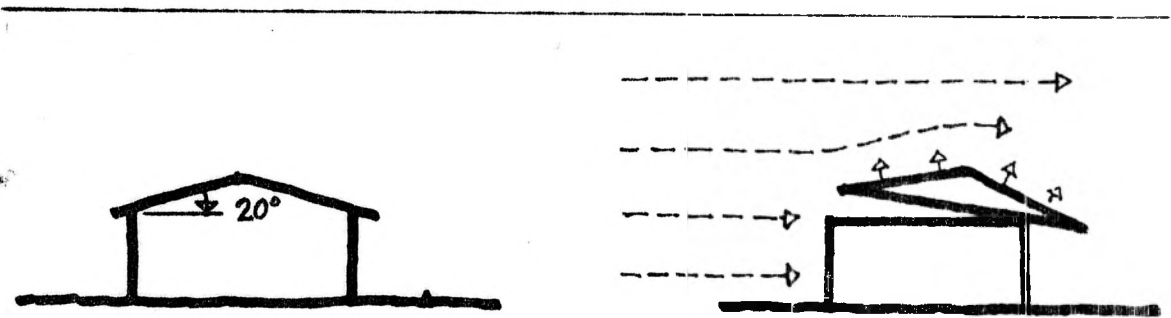
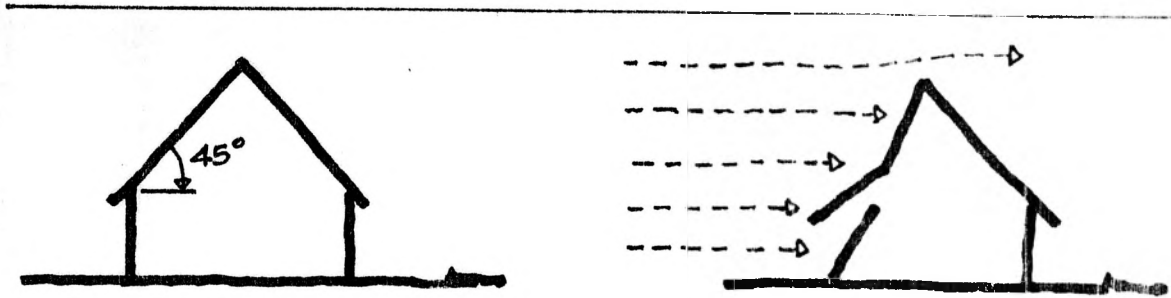
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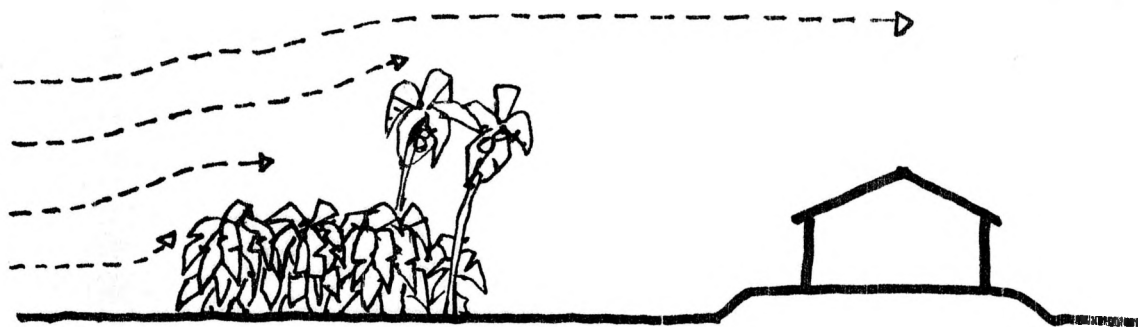
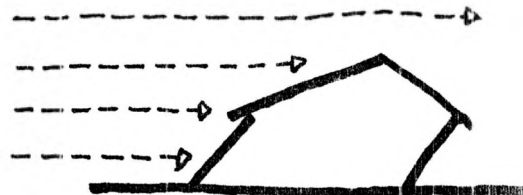
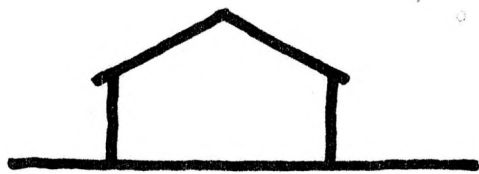


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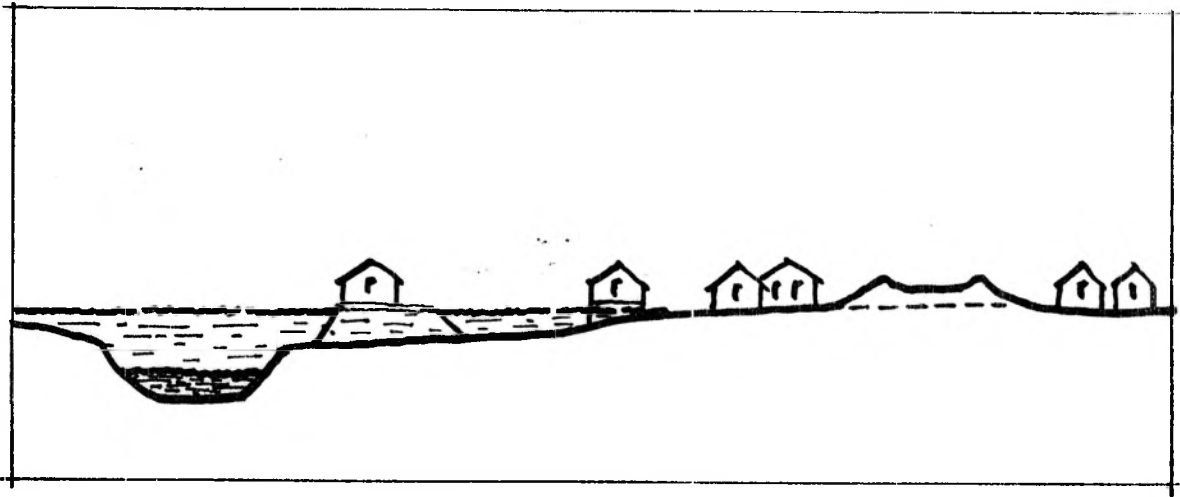
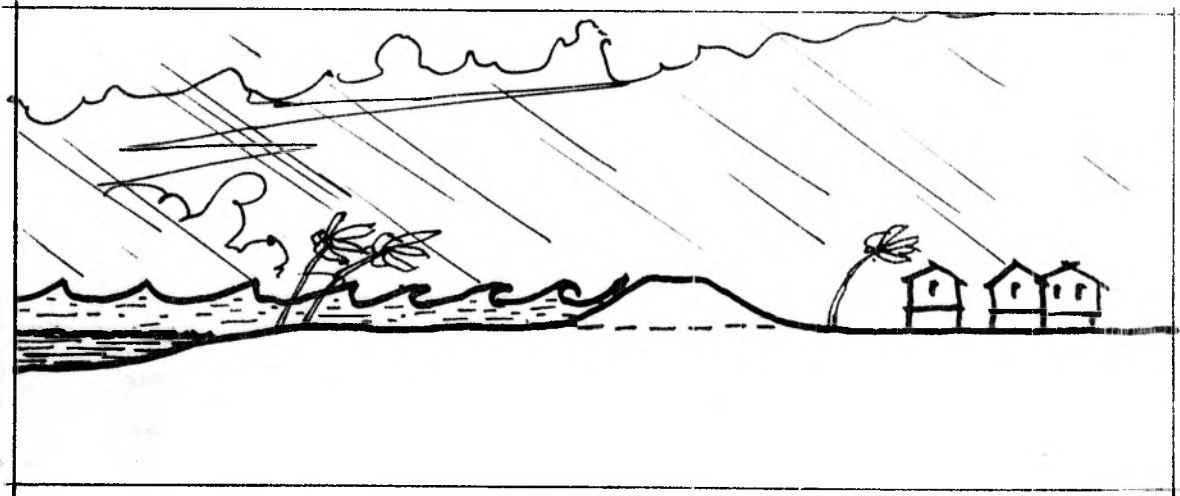


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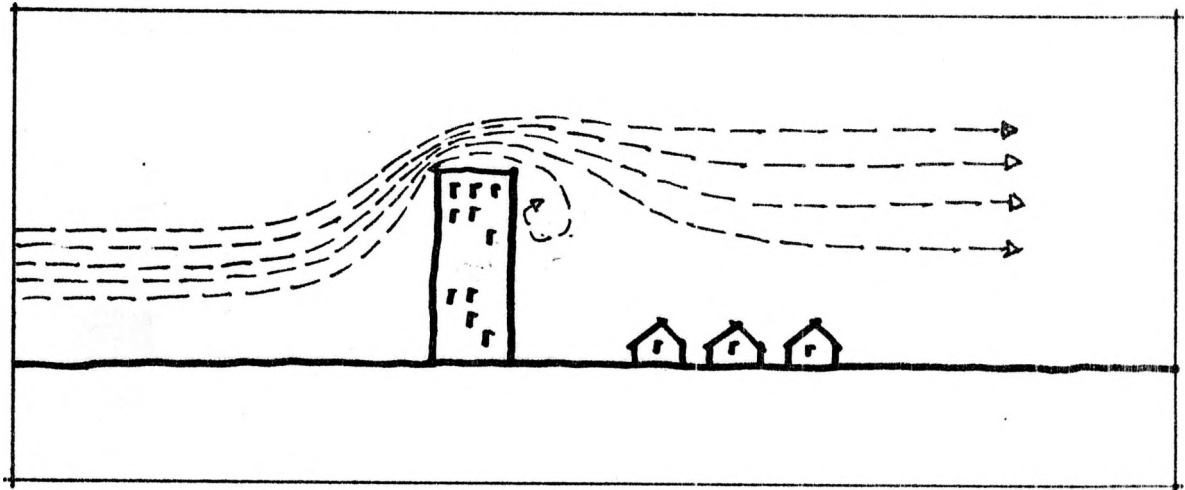
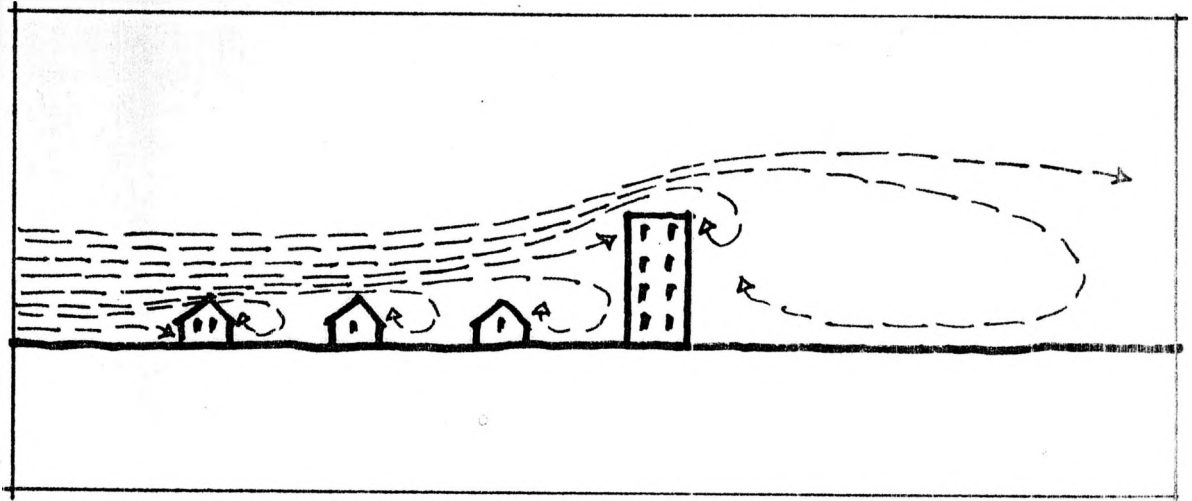




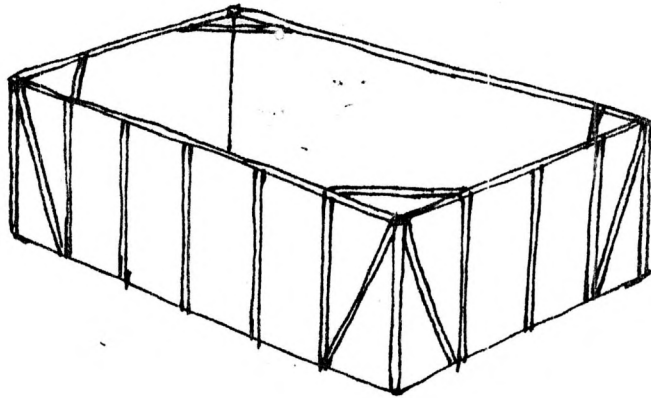
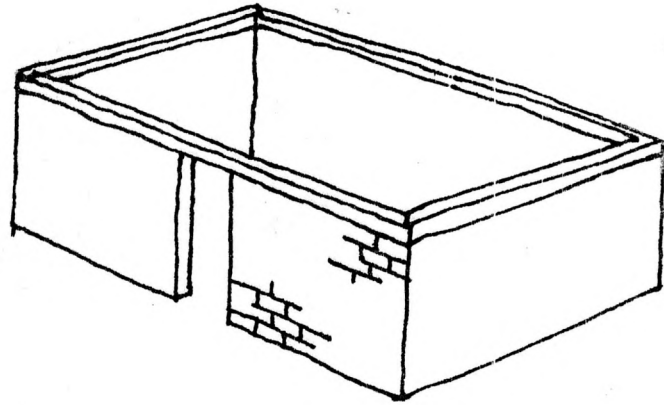
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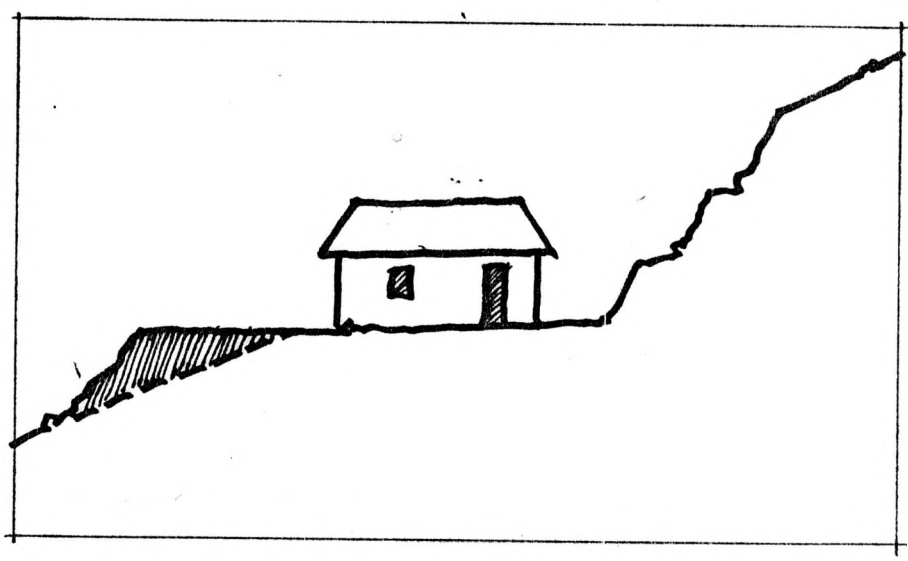
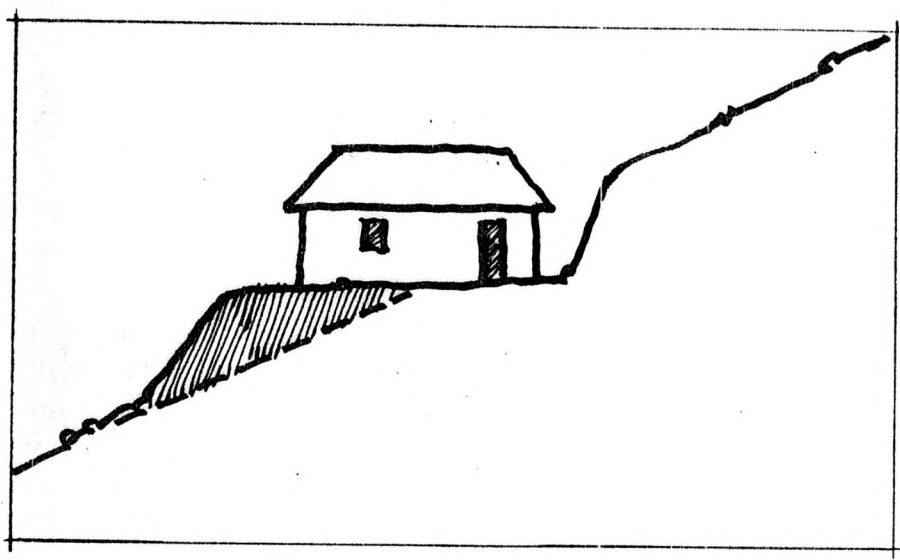
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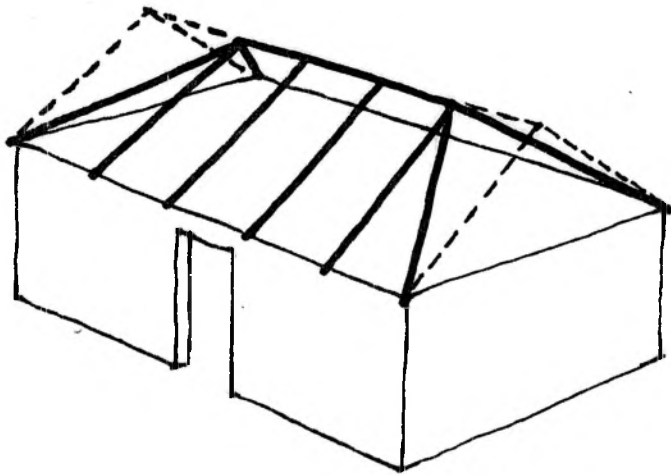
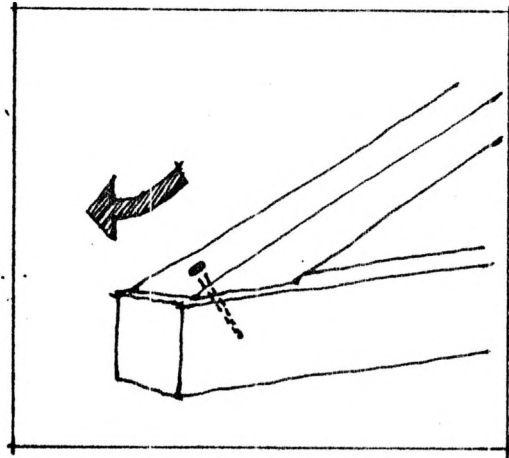
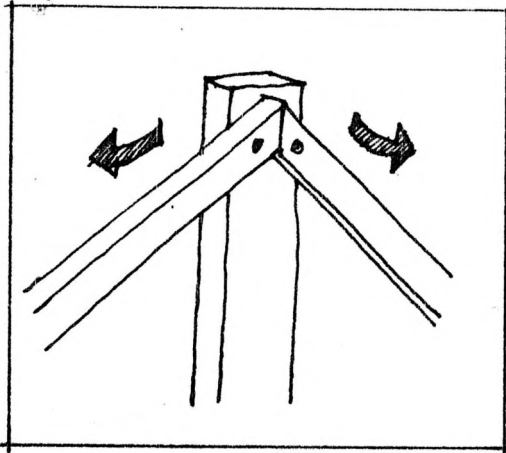
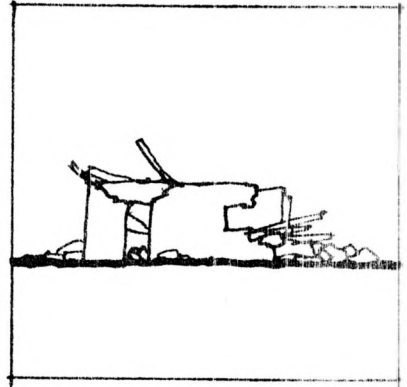
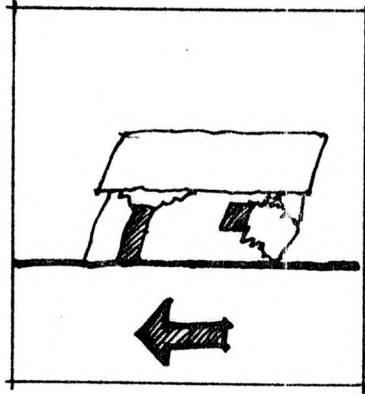
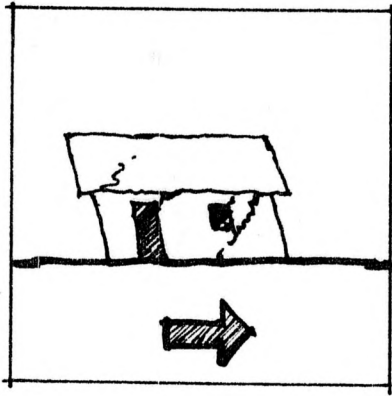
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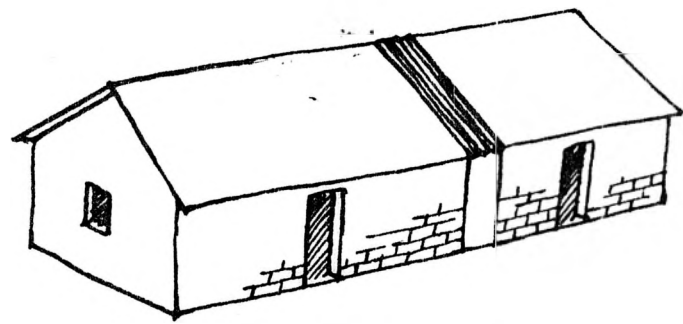
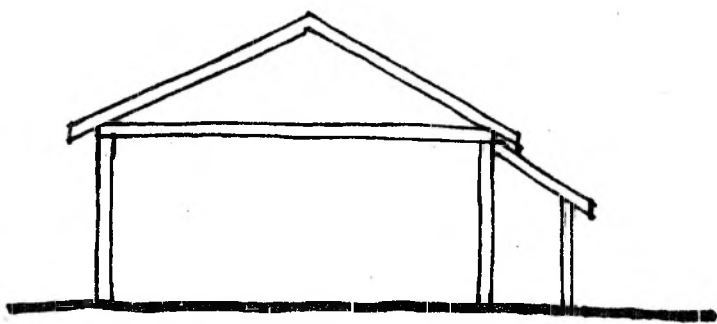
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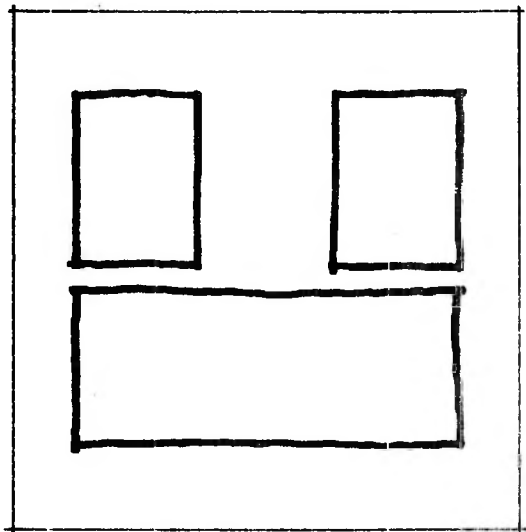
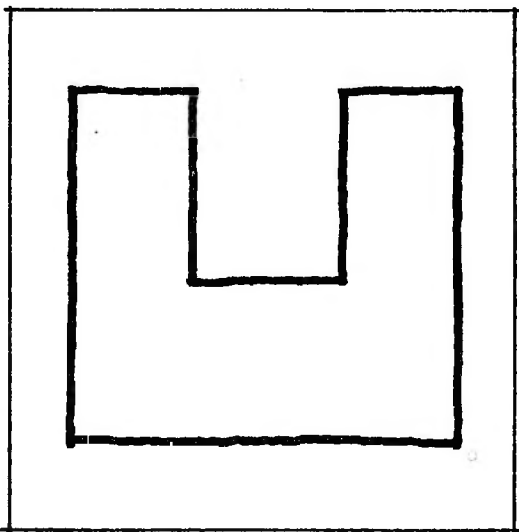
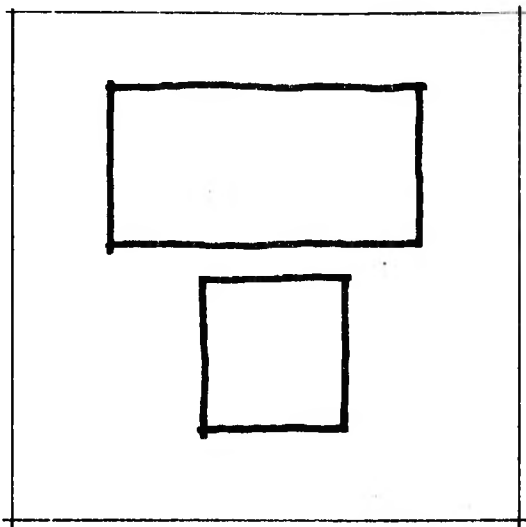
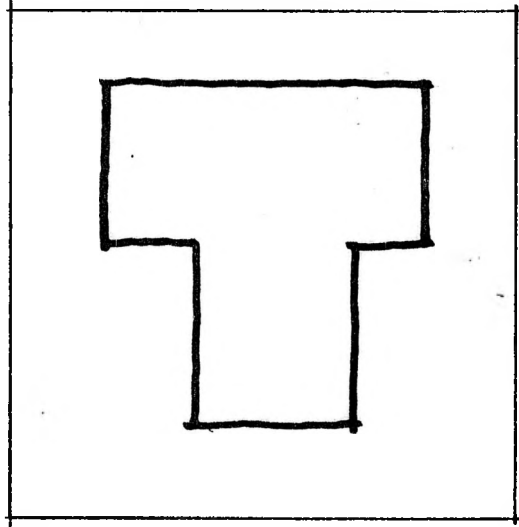
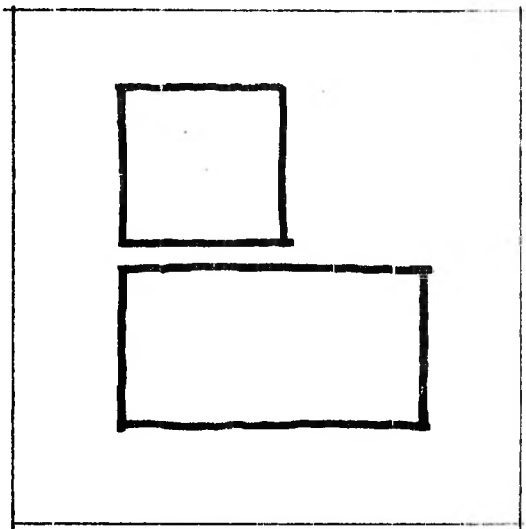
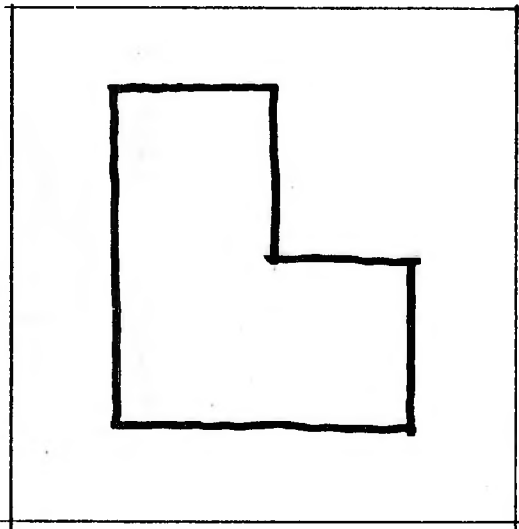
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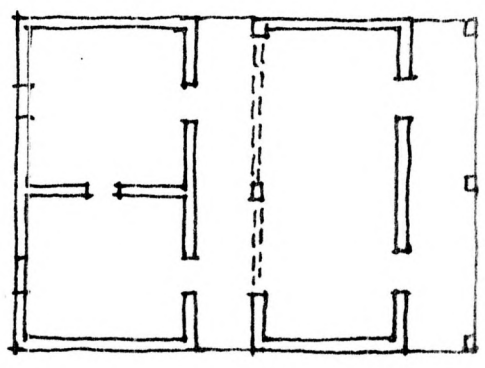
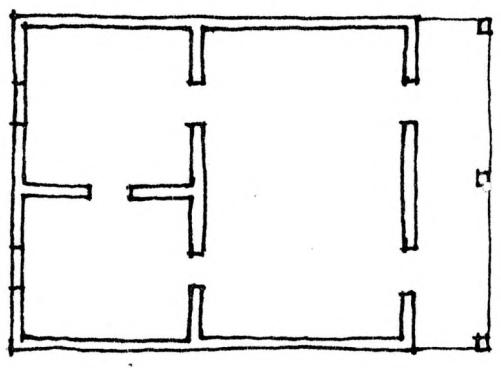
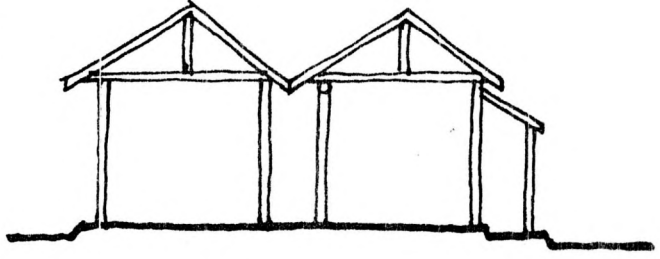
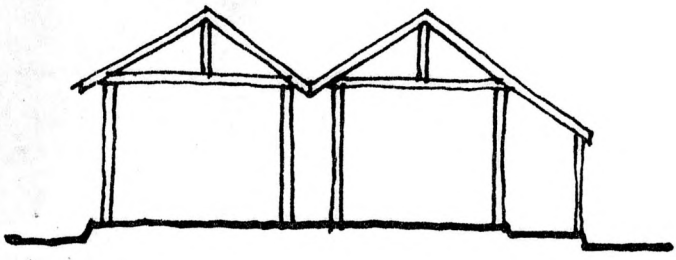
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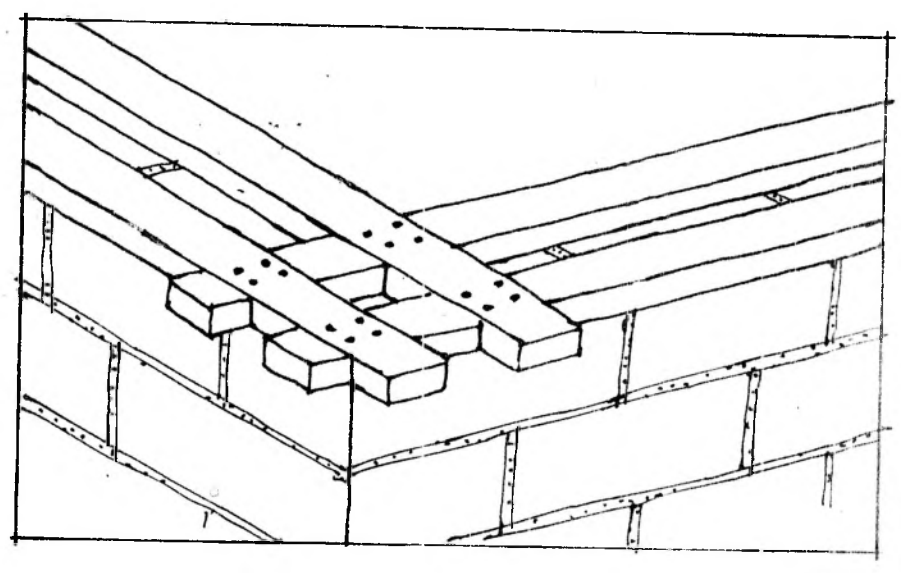
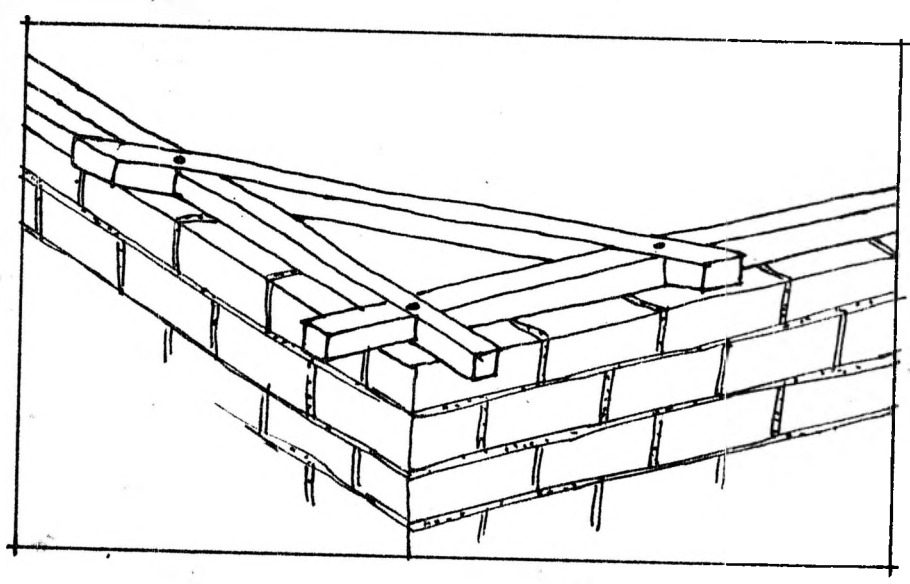
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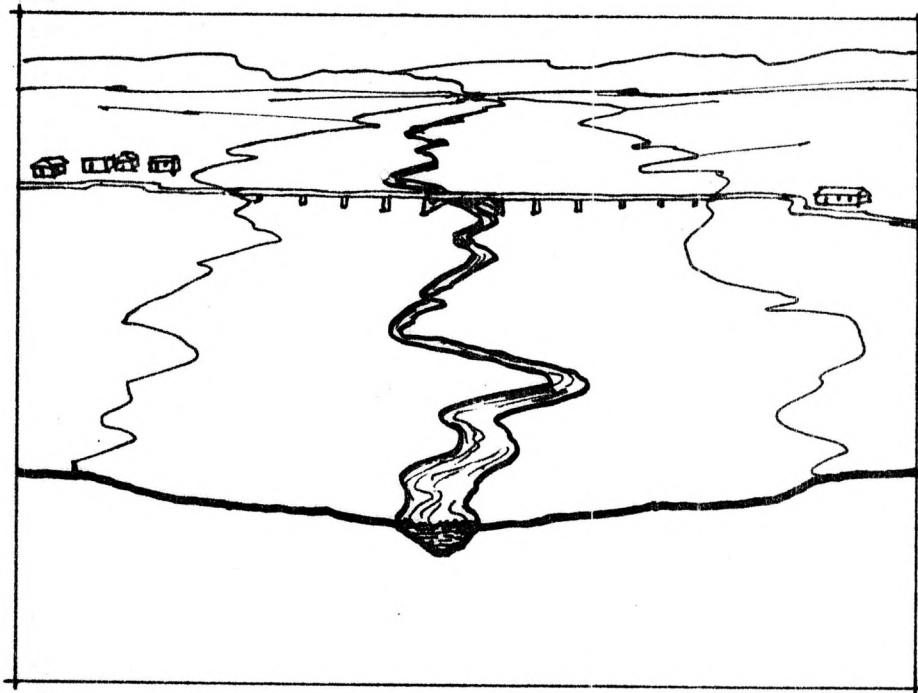
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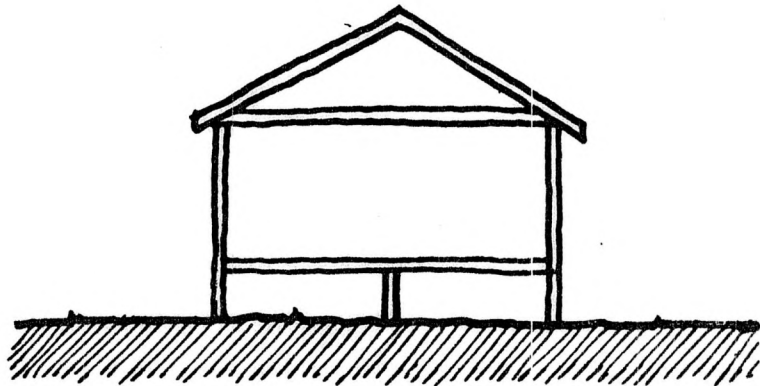
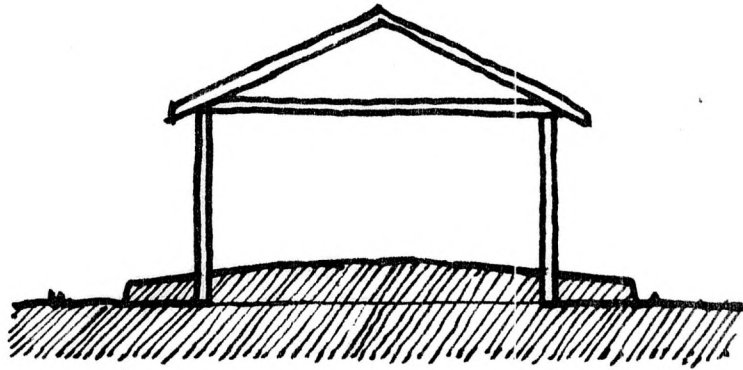
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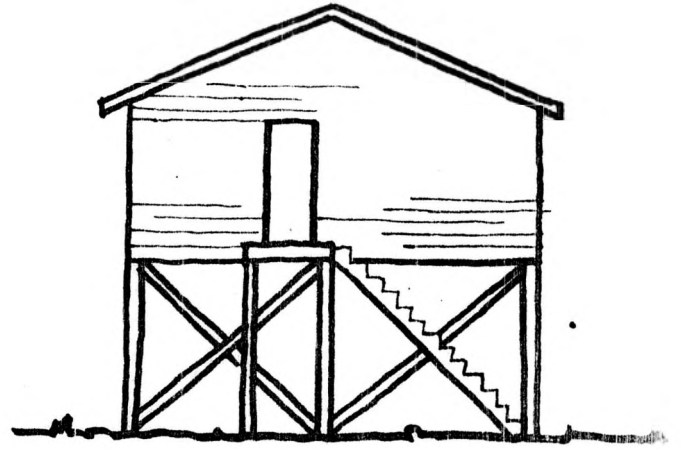
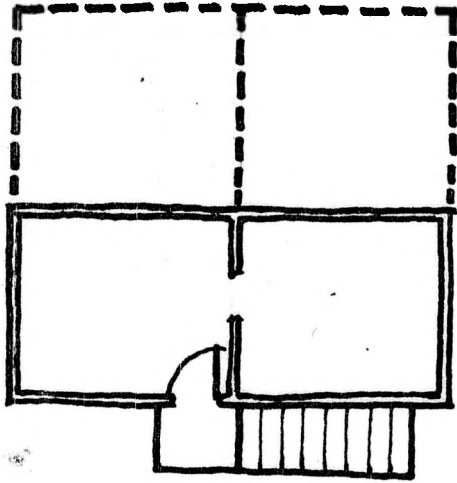
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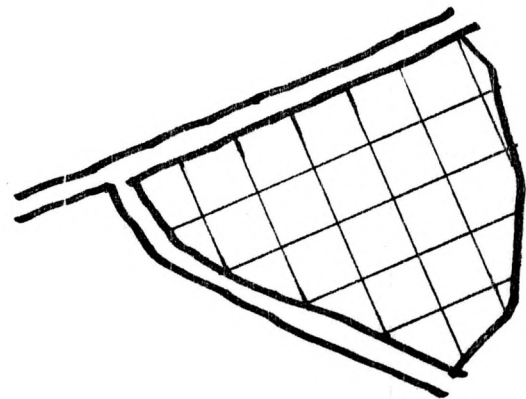
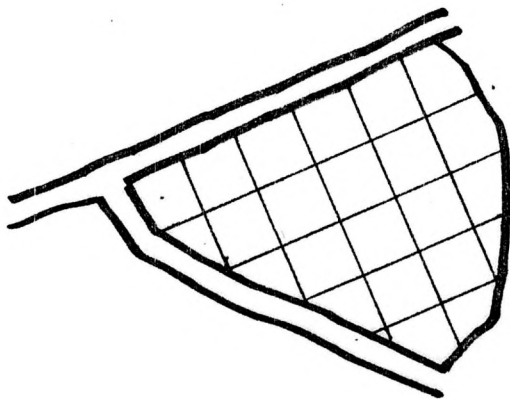
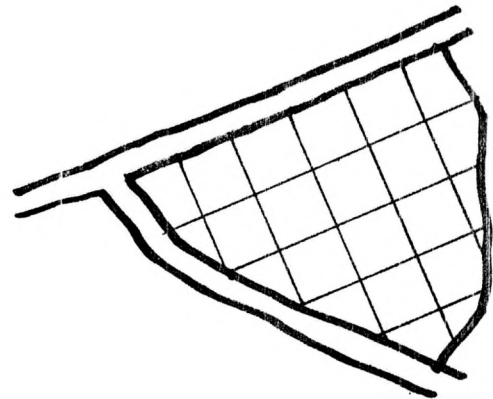
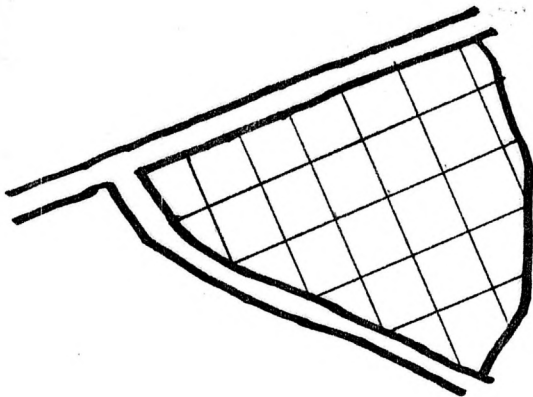
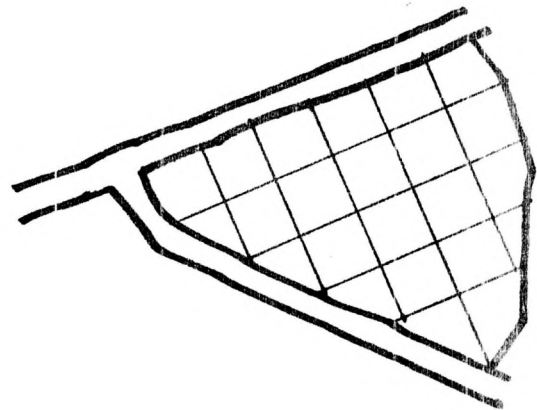
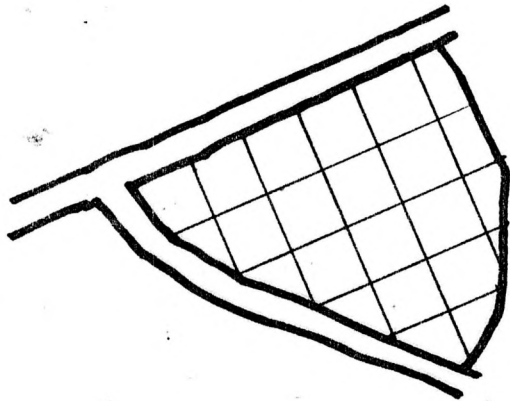
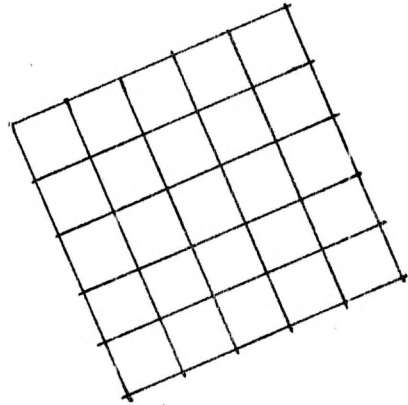
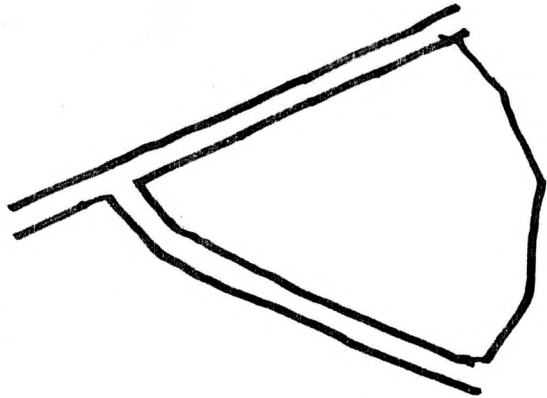
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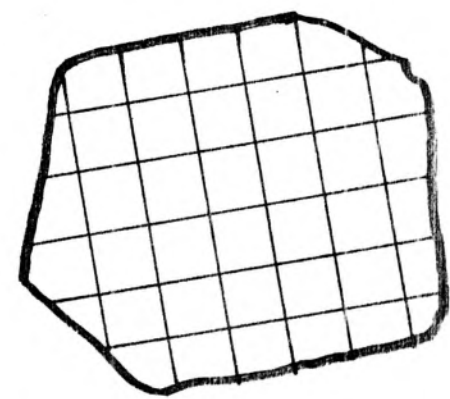
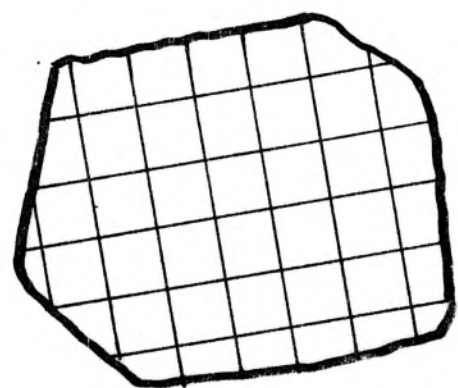
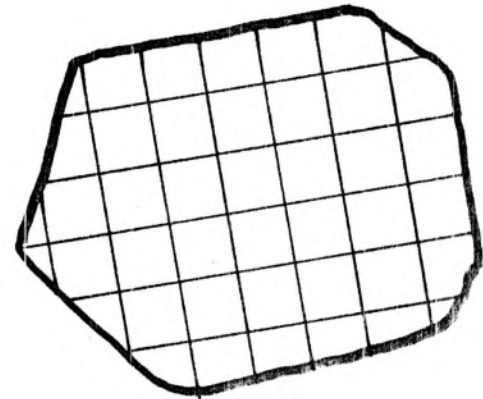
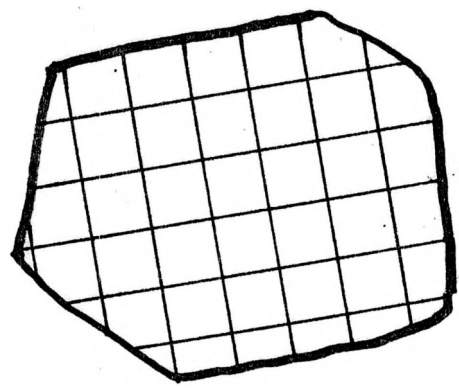
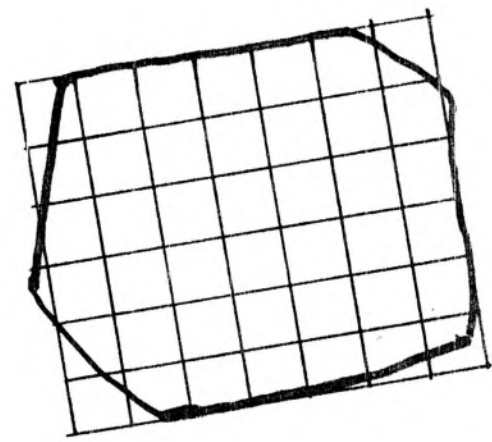
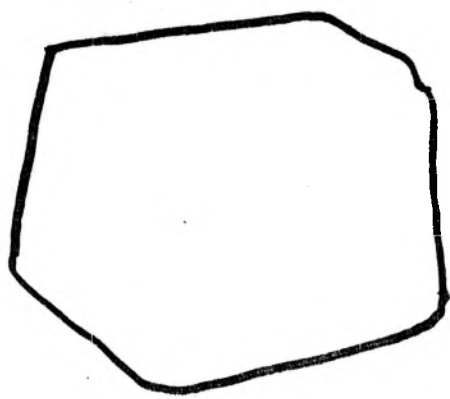
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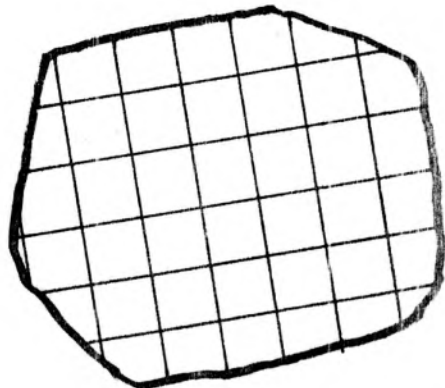
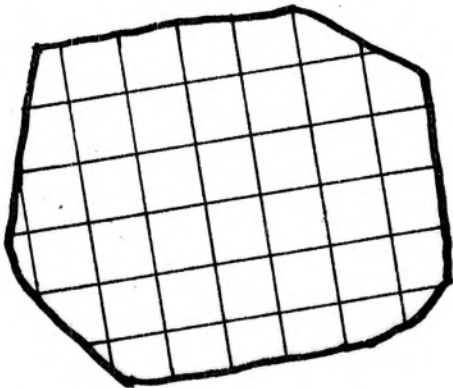
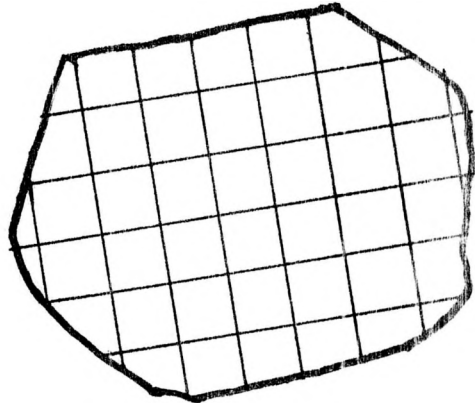
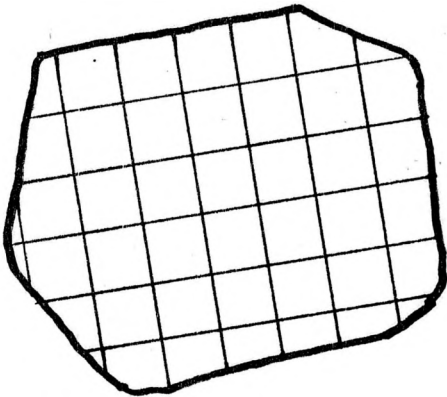
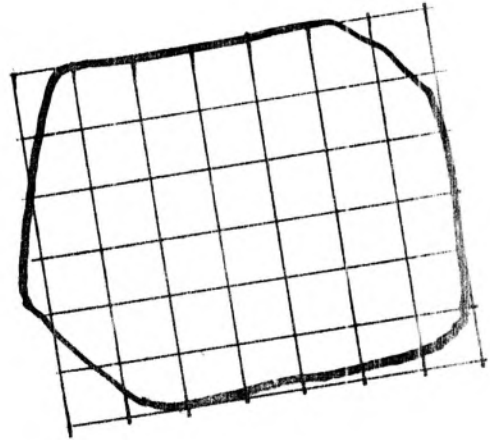
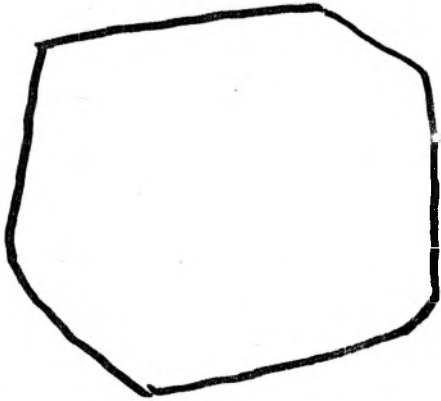
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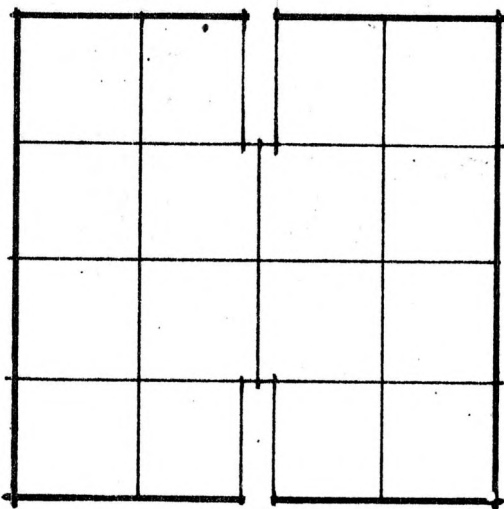
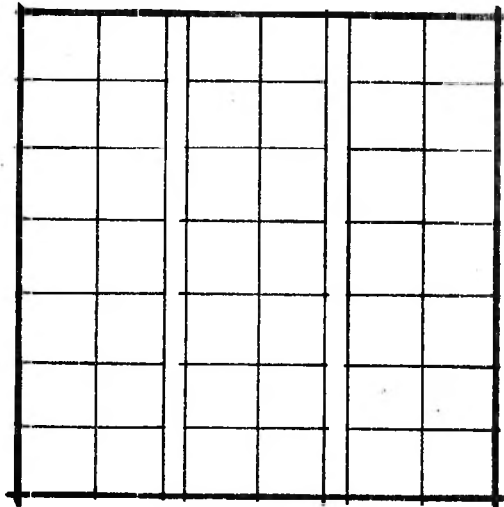
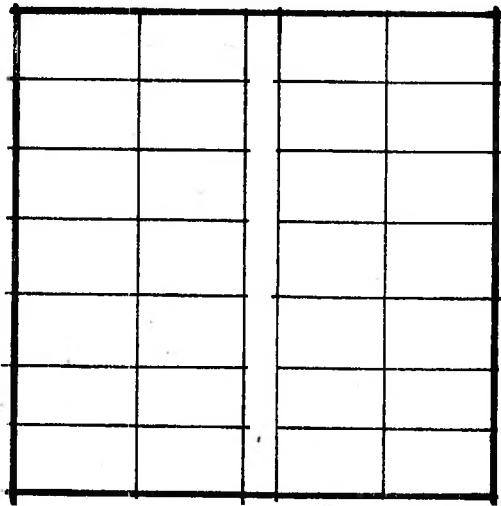
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