

COMMUNITY PLANNING FOR THE ACOMA TRIBE OF NEW MEXICO

by

Andrew Acoya

B.A. University of New Mexico
(1968)

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF ARCHITECTURE

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 1970

Signature of Author
Department of Architecture, June 8, 1970

Certified by
Thesis Supervisor

Accepted by
Chairman, Departmental Committee
on Graduate Students

Rotch



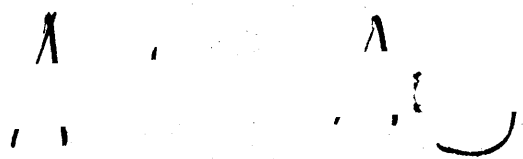
Dean Lawrence B. Anderson
School of Architecture and Planning
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

June 8, 1970.

Dear Dean Anderson,

In partial fulfillment of the requirements for the degree of
Master of Architecture, I hereby submit this thesis entitled:
"Community Planning for the Acoma Tribe of New Mexico".

Respectfully,


Andrew Acoya

COMMUNITY PLANNING FOR THE ACOMA TRIBE OF NEW MEXICO

by Andrew Acoya

Submitted to the Department of Architecture, June 8, 1970, in partial fulfillment of the requirements for the degree of Master of Architecture.

ABSTRACT

This study explores some of the problems and possible solutions when planning for new growth in relation to a preexisting ancient American Indian village.

The thesis will investigate important phases of Acoma Indian life, plan with their social and economic needs while being aware of existing newer needs -- i.e., automobiles, water supply, sewage, electricity, etc.

Important to this thesis is the background material which will give the reader some insight into the lives and life styles of the Acoma Indians themselves. This background is given initially, followed by some considerations given to the overall design, and lastly a discussion of my proposal is given.

Main emphasis has been given to the social implications on the physical design and also to the process of the design itself.

Initial studies for this thesis stemmed from recent policies adopted by most of the nineteen pueblos of New Mexico; namely, the policy of using federal financing to execute the building of homes on a large scale. The program of Mutual Help Housing is presently the most effective means of programming for needed home, yet is the least socially or culturally oriented. Whether ideas such as mine will be given consideration in planning future housing projects is quite dubious.

Thesis Supervisor: Horacio Caminos
Title: Professor of Architecture

ACKNOWLEDGEMENTS

I would like to thank M.I.T. itself, some of its professors, and also some of its students for providing a truly stimulating environment in which to study.

I am most grateful to Professor Horacio Caminos, my thesis advisor, for his extreme patience and beneficial guidance.

TABLE OF CONTENTS

	Page
ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
CHAPTER I: BACKGROUND INFORMATION	1
Part I: Location and Description of the Acoma Reservation	
Part II: Climate and Geography	
Part III: Land and Land Policies	
Part IV: Education	
Part V: Living Patterns	
Section 1: Kinship and Clan System	
Section 2: Relationships	
Section 3: Ceremonial Days	
Section 4: Recreation	
Section 5: Indigenous House Design: Some Form Determinents	
Section 6: Demography	
Section 7: Economics and Employment	
Section 8: Consumption Patterns	
Section 9: Acoma's Resources	
Section 10: The Present Housing Policy	
CHAPTER II: CONSIDERATIONS AND DESIGN DETERMINENTS	41
Part I: Considerations for Site Selection	
Part II: Four Sites considered	
Part III: Considerations for the Location of the New Community	
Part IV: Considerations for Dwelling Space	
Part V: Considerations for Designing the Community	
CHAPTER III: THE PROPOSAL	53
Part I: The Conceptual Framework	
Section 1: The Concept	
Part II: Organization of the Community	
Part III: Design of the Dwelling Space	

	Page
CHAPTER IV: CONCLUDING REMARKS	73
FOOTNOTES	77
BIBLIOGRAPHY	78

The earth is my mother
my home
and my keeper

Surround me with her goodness
with all her parts
and with all her gifts
for they exist as one
to my eyes

The earth is my mother
my home
and my keeper.

Acoya

CHAPTER I

BACKGROUND INFORMATION

CHAPTER I: BACKGROUND INFORMATION

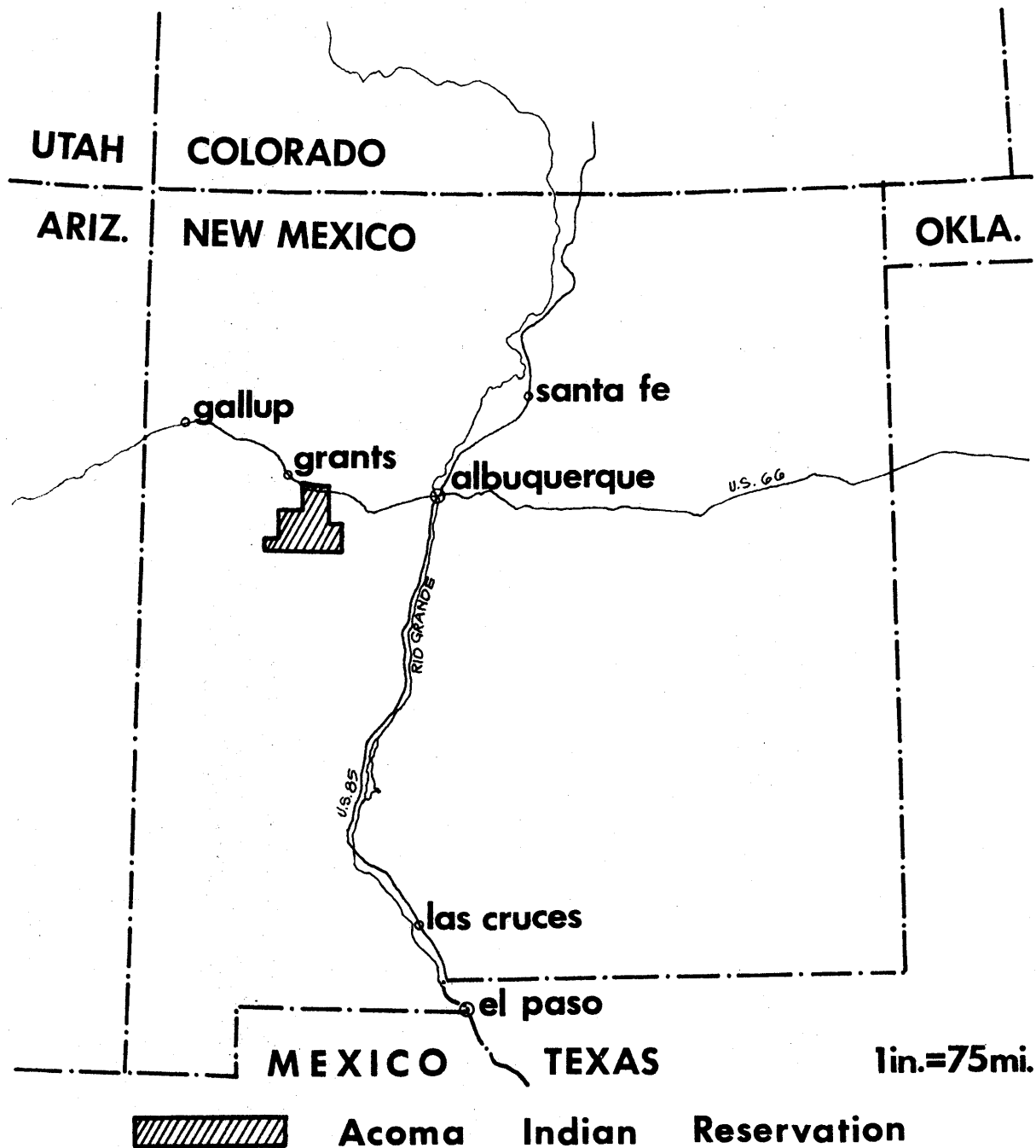
PART I: Location and Description of the Acoma Reservation

The Acoma Indian Reservation is located approximately sixty-five miles west of Albuquerque, New Mexico (see maps on the following two pages), on U.S. Highway 66. The reservation covers a total of 234,414 acres of mostly arid land.

Presently 1,800 acres are farm lands; 68,732 open grazing land; 6,540 commercial timber land; and 156,770 non-commercial timber land. In addition, 13,635 acres of grazing land are leased from the state. Of the 1,800 irrigated acres, 36 were farmed in 1961¹. A jigsaw pattern of use rights prevents efficient farming; and, in addition, there is frequent shortage of irrigation water.

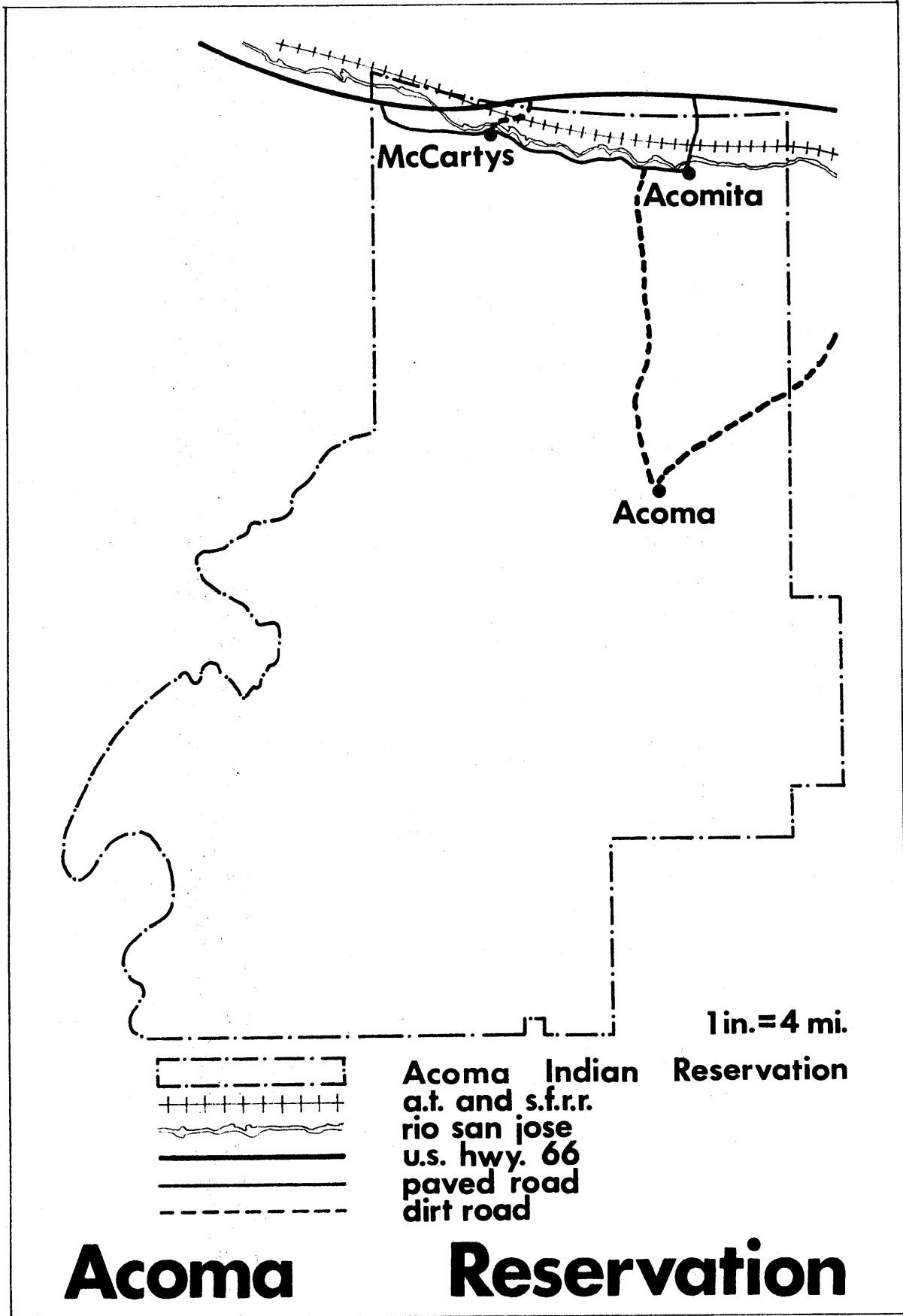
Although the Atinson Topeka and the Santa Fe Railroad passes directly through the reservation, no goods or products produced by the Acomas are transported on this railway system.

Main roads in and around McCartys and Acomita are well paved and maintained while the two main routes connecting these villages with Acoma (the old village) are dirt or gravel, and are in fair condition most of the time. Presently the State Highway Department plans indicate paving of major arterics to Old Acoma.



location

map



PART II: Climate and Geography

"Arid continental" characterizes the climate of the vicinity in a minimum number of words. With an average annual rainfall of just over eight inches, there is generally insufficient moisture to maintain the growth of any except the most hardy desert vegetation. The average monthly precipitation varies from about one-third inch during the winter months, November through March, to over an inch and a quarter during the summer months, July through September. With normally less than two inches of moisture, the winters are generally very dry. A considerable portion of this winter precipitation falls in the form of snow, but the average monthly snow fall rarely exceeds three inches and there are normally only four days a year when as much as one inch of snow occurs. Snow rarely remains on the ground for more than twenty-four hours. The July-September period furnishes almost half of the annual moisture with most of the rain falling in the form of brief but at times rather heavy thunder-showers. Prolonged rainy spells are practically unknown.

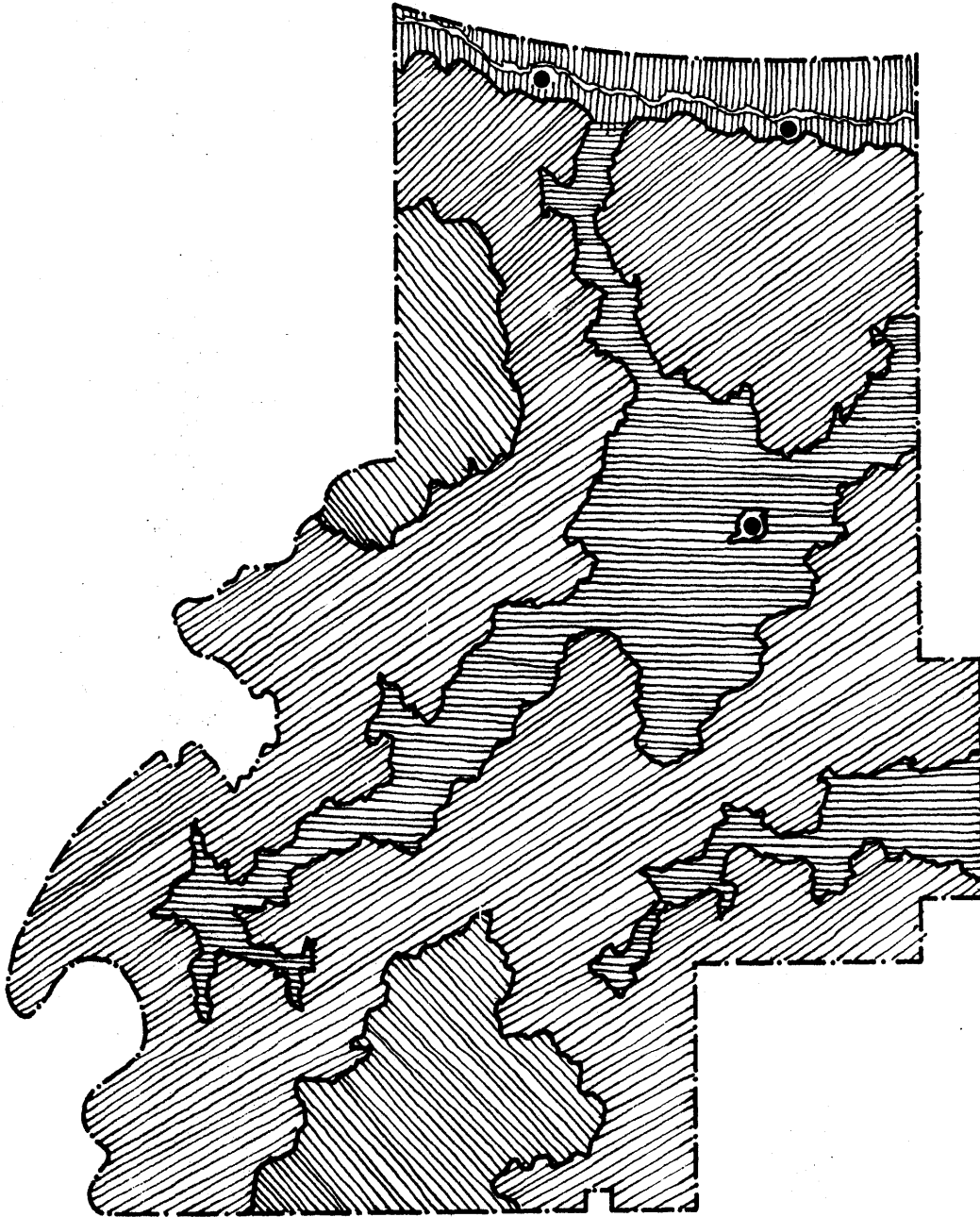
Temperatures are those characteristic of high altitude, dry, continental climates. The average daily range of temperature is relatively high but extreme temperatures are rare as testified by the fact that there is normally less than one day a year when the temperature reaches 100°F or drops to zero. Daytime temperatures during the winter average near 50°F with only two days on which the temperature does not raise above the freezing mark. In the summer, daytime maxima average less than 90°F except in July and with the large daily temperature range, the nights

normally are quite cool. The air is normally dry with an average annual relative humidity of approximately 43%. "Muggy" days are unknown and the usual humidity during the warmer part of the day is about 30%, dropping down to less than 20% in June, the least humid month of the year.

Another climatic feature is the large number of clear days and the high percentage of sunshine. Sunshine is recorded during more than three-fourths of the hours from sunrise to sunset and this high percentage carries through the winter months when clear, sunny weather predominates. Wind movement throughout the year averages around nine miles per hour, but during the late winter and spring months the average is somewhat higher when occasional windy and dusty days occur. However, an average of only 46 days during the year when the maximum velocity reaches 32 miles per hour. Tornadoes are unknown in this vicinity².

Physical geography (See map on the next page): The reservation of Acoma may be divided into four main categories: fertile farming valley, dry canyon, grassy mesa, and high plateau.

Though the northern part of the reservation would seem to make farming a good means of livelihood, bad soil conditions due to high alkali content and lack of constant water flow make farming for a living quite difficult.



-  fertile valley
-  dry canyon
-  grassy mesa
-  high plateau

Physical

Geography

During Acoma's early history, dry farming in some of the canyons was employed to grow crops of corn, beans, and squash. Dry farming means that the people depended entirely upon rainfall to water their crops.

The grassy mesa plateaus have always been used for grazing of either sheep or cattle while timber exists at higher altitudes of the plateaus.

Basically, the mesas are composed of sandstone with some lava existent along the Rio San Juan on the western edge of the reservation.

PART III: Land and Land Policies

Size

The Acoma Indian Reservation covers a total of 234,414 acres of land of which 1,800 are farm lands: 68,732 open grazing land; 6,540 commercial timber land; and 156,770 non-commercial timber land. In addition, 13,635 acres of grazing land are leased from the state.

Policies

All reservation land is communally owned with persons acquiring rights of use through allocation given by the tribal council. Depending on use, the land allocation can vary in size and if unused after a certain period the land will be "repossessed" by the tribal council. However, once put to some use (building a home on it, farming, etc.) the land "belongs" to the family and is retained by the family through inheritance.

The grazing of sheep may be done in various areas of the reservation but land is never allocated to a single person for this purpose.

More of the community is organized in the grazing of cattle. Tribal land is set aside on high grassy plateaus for this purpose, also provided are windmills and water tanks furnished by the Bureau of Indian Affairs.

PART IV: Education

Grade school children on the Acoma reservation attend U.S. Government schools on the reservation. These schools are known as day-schools and are in Acomita and also in McCartys. There are approximately 272 grade school students at McCartys and 348 at Acomita. The high school students are bused to the Laguna-Acoma High School located on the Laguna Indian Reservation some four miles from the village of Acomita. This school though located on the reservation is public and is run by the City of Grants' Public Schools System. English and mathematics are the areas of greatest difficulty for most Acoma students. Since most families speak their native language in the home, the students must be extensively trained to use the second language of English.

Acquiring funds to attend college is most difficult for Acoma students. The Bureau of Indian Affairs is of some aid in such situations although there never seems to be enough funds to sponsor many students.

PART V: Living Patterns

SECTION 1: Kinship and Clan Systems

Kinship, the family household unit, and the clan system provide the Acoma Indians with an important means of tribal unification. These systems or cultural patterns are very ancient and were developed initially to give the tribal group great stability. Through these systems many members of the Acoma tribe have become closely related in bloodline and family relation.

Kinship

Generally, the kinship system seeks to relate members of a family through lineage while the purpose of the clan establishes a close relation between members of the whole tribe. With the Acoma kinship system being matrilineal and matrilocal, the normal pattern is for the married daughters to continue living at home since the house and its furnishings, plus the land, belong to the women of the household. The extended maternal family ordinarily occupied a cluster of contiguous rooms with additional rooms being added as needed. This has resulted in related families within the same clan occupying adjacent houses, though there is no clan localization as such. These related family units approximate to maternal lineages, so far as women are concerned. The Acoma household often consists of a group of related women (a segment of the lineage), their husbands who have come from other households, their children and grandchildren, and their brothers who have not yet married.

Clan

The clan is the most important social grouping on the Acoma reservation, being matrilineal, exogamous, and totemically named. Most of the nineteen original clans are now existent. There is no phratry grouping or moiety organization for exogamic purposes, though there is a dual organization of clans for ceremonial purposes³. An important function of the clans is their responsibility to perform important religious ceremonies for the entire tribe during certain times of the year. Different clans are entrusted with different religious practices and retain related paraphernalia for such events.

SECTION 2: Relationships

As stated earlier, families of the Acoma Tribe still organize by means of a matrilineal, matrilineal, extended family system. Thus, large households exist congregating various age groups which are assigned various duties to perform; for example, earning wages, going to school, or the teaching of younger family members.

This system initiates strong family ties which extend into the community of which the family is a part. Relatives of similar lineages and clans are united at the village scale and perform many community functions.

SECTION 3: Ceremonial Days

On ceremonial days, the main pueblo of Acoma increases in importance. All other villages, communities, and households assemble at the pueblo for festive purposes. These important days occur throughout the year and the ceremonies performed on these days serve to pray and dance for new plantings, good rains, good harvests, and also function as a social gatherer.

SECTION 4: Recreation

Recreation of any type is relatively new, since during earlier periods, time and money for such pastimes was often difficult to consider.

Baseball: Baseball in the form of village support is the most popular means of recreation. Much rivalry exists amongst the villages, as well as with other pueblos, and the enthusiasm expressed by the patrons depicts this sense. Little league baseball is also organized on the reservation with as many as four and five teams now existing. The season for baseball generally begins in late March and ends in September.

Football and Basketball: These two sporting events are more spectator and less popular than baseball. Both events are enjoyed by the people who support the Laguna-Acoma High School. Basketball teams are also formed amongst the persons of the communities during winter months, and these teams make use of the high school gym.

Hunting: Various types of game are still hunted, though hunting is not a means of subsistence. The early winter deer hunts are of the greatest significance since involved in this single hunt are many social and religious attachments -- recreation in this case is the last consideration.

Fishing: Still somewhat expensive trout fishing is enjoyed by a few who use the tribally owned reservoir just south of San Fidel, and also Bluewater Lake near Grants.

Shopping: Visits to Grants and Albuquerque on weekends may be considered a form of recreation -- for generally the chore of shopping (grocery and clothing) is overlooked. A dinner plus a movie may also be taken in.

Visiting: Socializing during evening periods (especially in the summer time) is enjoyed most by elderly persons. This form of "get-together" is not restricted to one's fellow clansmen or kinsmen.

Social Drinking: The worry of most elders, this form of socialization exists outside the reservation (no liquor is allowed on the reservation) at various taverns along U.S. Highway 66. Concern arises when alcohol is related to automobile accidents, family quarrels, expensiveness, and alcoholism itself.

SECTION 5: Indigenous House Design: Some Form Determinants

Introduction

The planning of Acoma (and most Pueblo Indian) homes has changed very little during the past few hundred years. Only very slight alterations from early times have been made in materials and methods.

The warm summer weather controls, to a great extent, the final character of a Pueblo Indian home. Important design considerations are: the roof shape, wall thicknesses, window sizes, and location for cross ventilation, exterior wall color and importantly, planning for outdoor living. With temperatures ranging from warm to hot during summer months, it is significant to note that from a scientific viewpoint the indigenous method of home construction works quite effectively: that is, staying cool during the day while distributing some heat during the cool nights. For example, flat roofs will absorb heat during the day and radiate this heat at night, thick walls serve as excellent insulation, white colored walls repel excessive sunlight, and with small window openings there is little loss of cool air.

Physically, the length of a viga, or structural beam whose medium span is approximately sixteen feet determines the room widths, while socially, the extended matrilineal family living pattern will dictate room lengths plus the addition of new rooms.

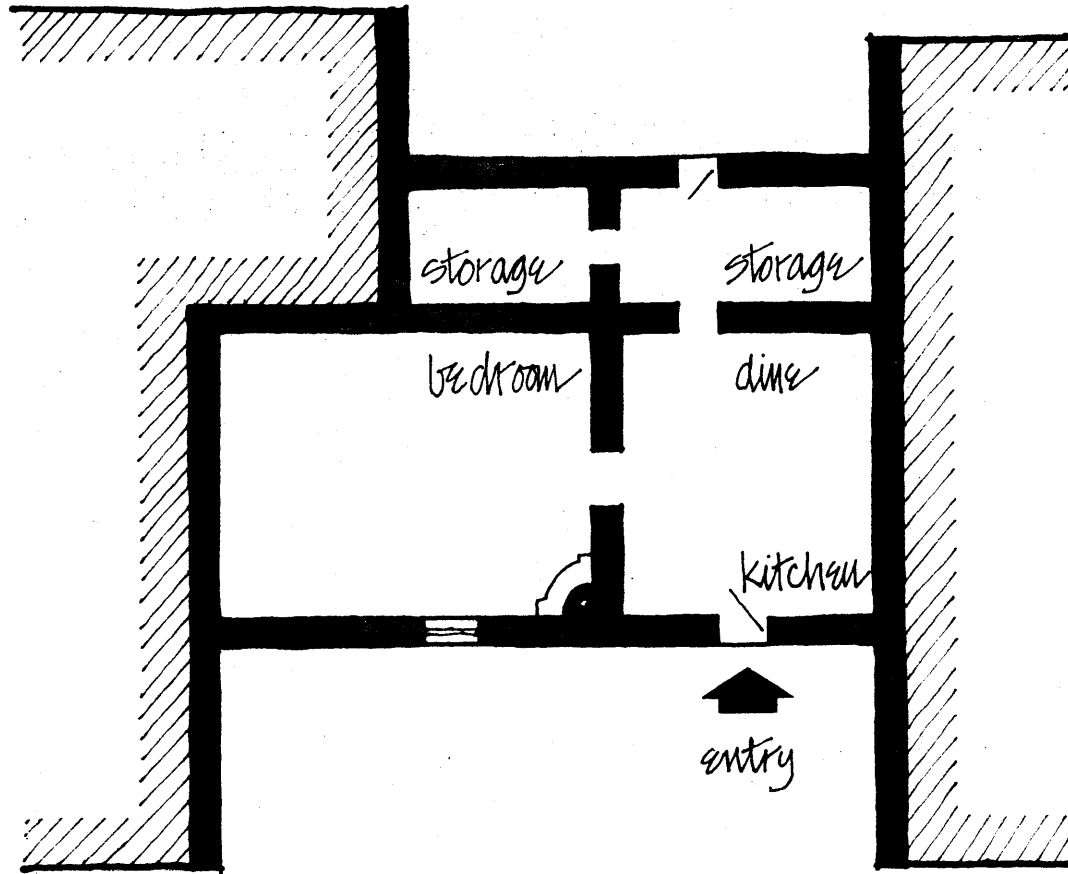
Outdoor living patterns must also be planned for and these patterns would include activities such as: the baking of bread in outdoor ovens; the drying of fruits, corn, chili, etc; and the social aspect of family or neighborhood visiting out of doors during the warm season.

Thus, if one examines existing house plans (see floor plans A, B, C, and D on the following pages), it can be concluded that the most important characteristics of Pueblo Indian homes to be: small scale; large and long partition free spaces; thick walls; small window openings; modular width construction; and a form (generally an "L" shape) which expresses the Indian's relationship to the out of doors plus family growth pattern.

The means of home construction, namely, work load distribution and construction techniques, have varied little in the last few hundred years. Of the two components organization has been altered the most. This change has been due mainly to economic reasons. At present, most small scale family home building employs the following materials and methods of construction and rely little on outside private aid -- electrical contracting being the main exception.

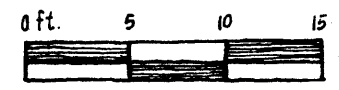
Building Materials

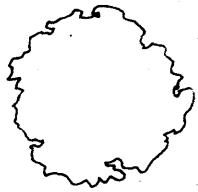
Adobe: This building block is generally made by mixing sand, straw, and water. This mix is then placed into a form and sun dried for several days. The block dimensions are approximately 8"x12"x16".



- 16 -

plan A

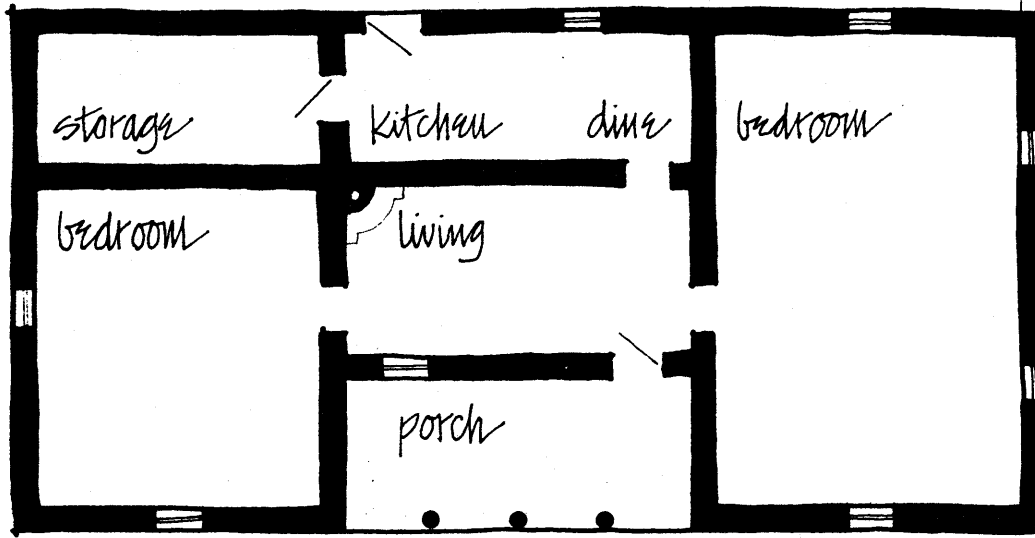
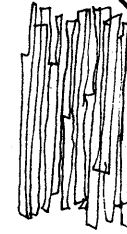




Bread
baking
oven

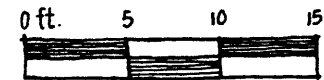


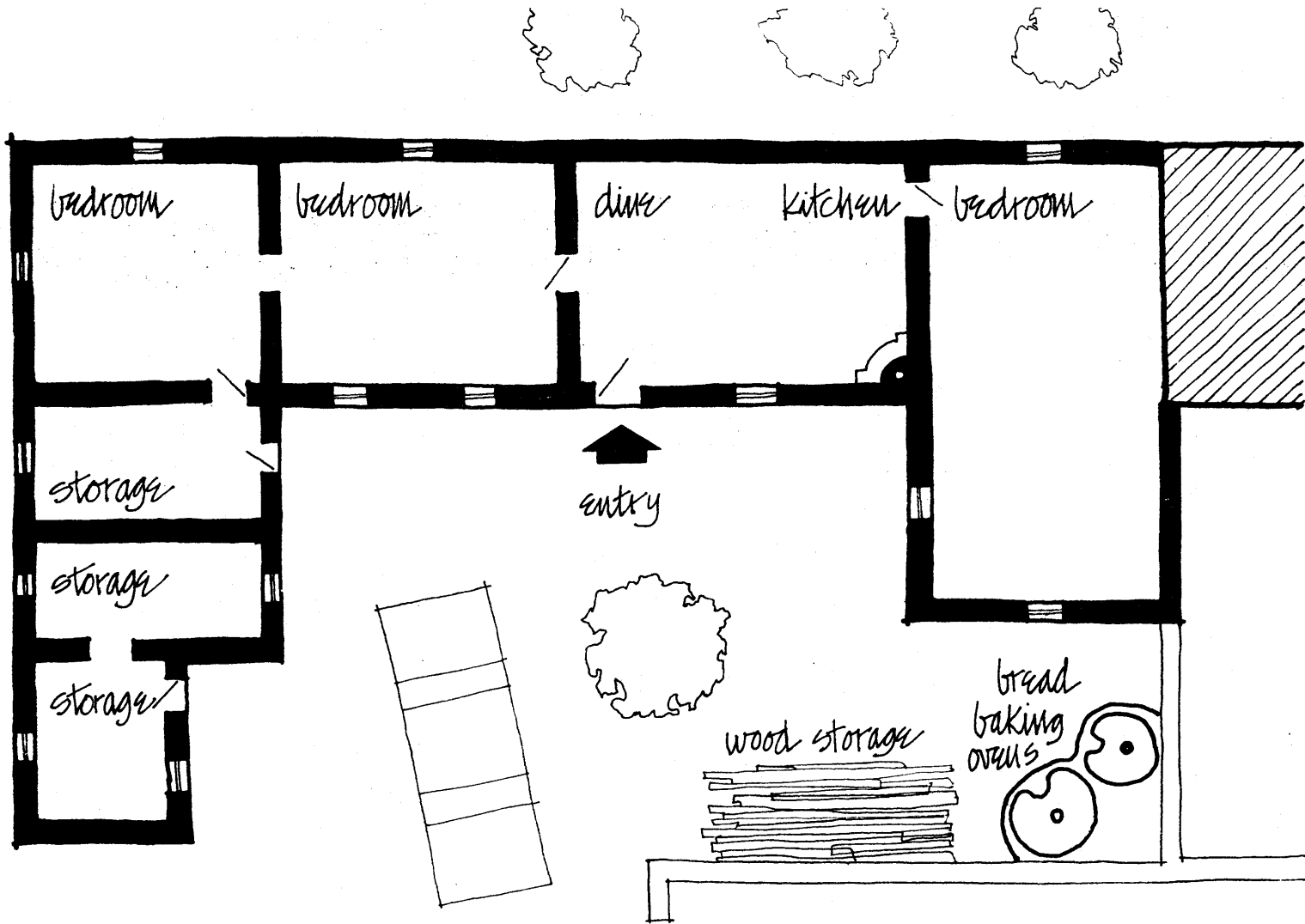
wood
storage



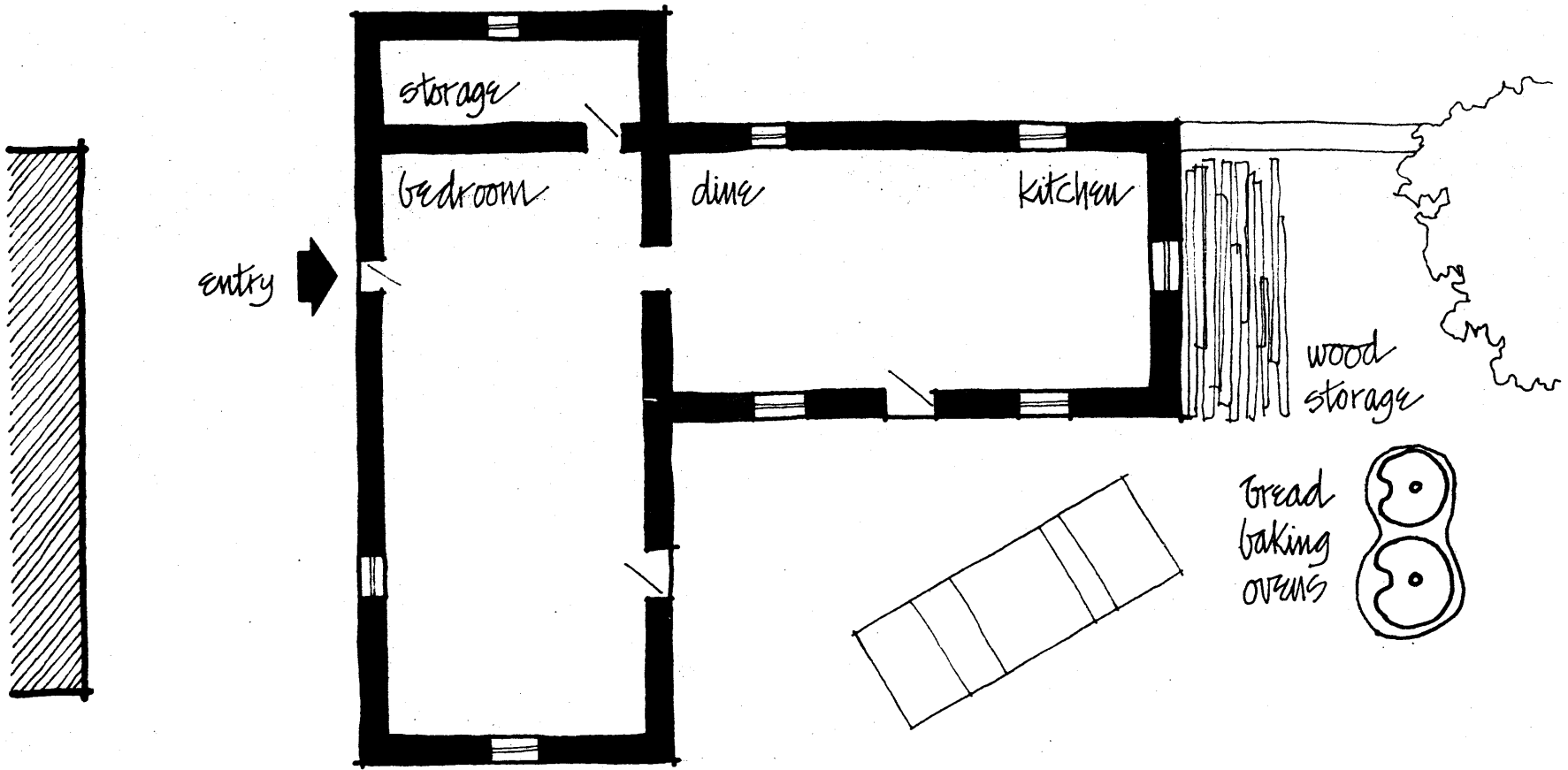
entry

plan B

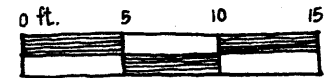




plan C



plan D



Sandstone (see photo on next page): This material is quite abundant and is used more often than adobe. The stone is easily broken with a hammer and various size stones may be used. Most important are the durability and the compressive qualities of the sandstone.

Mortar: Mortar to bind either of the above building materials consists of water, sand, and straw all very finely mixed and used in a slimy-like consistency. Cement as mortar is also being used, and with cement there is no need to plaster the exterior walls.

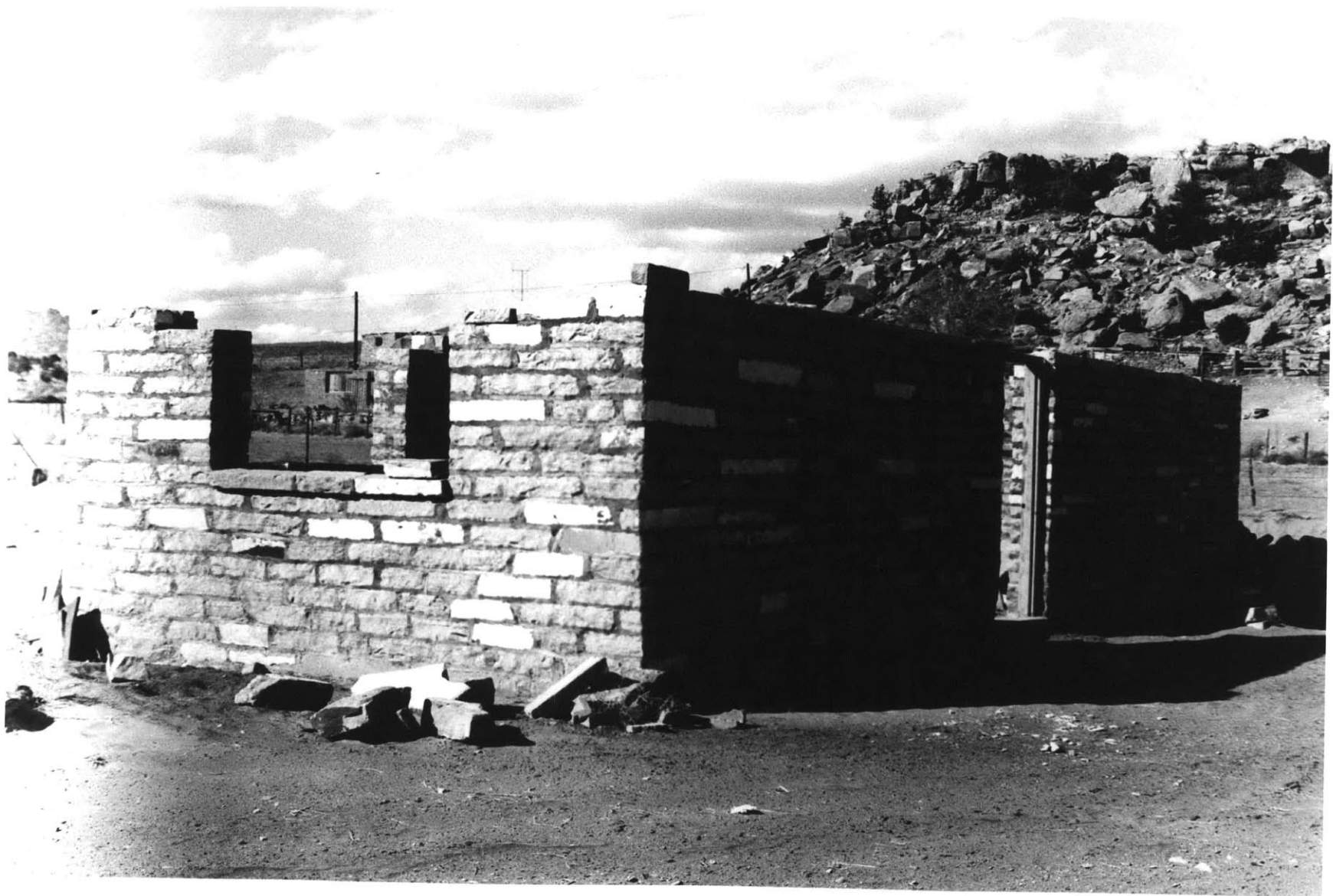
Plaster: Used as a finish on exterior and interior wall surfaces, this surface covering is made once again from sand (white specifically), straw, and water. If a plastered floor is desired, brown colored earth is generally used.

Wood beams: Formerly, trees cut in the nearby mountains were used for beams, hence a circular fashioned beam. Today one can buy roughly cut timber in both circular and rectangular shapes.

Other materials: Joists, window and door frames, nails, etc, must all be purchased at hardware stores in Grants or Albuquerque.

Labor Force

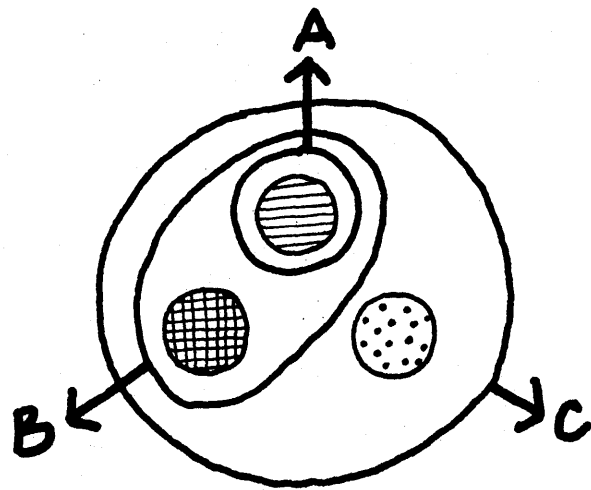
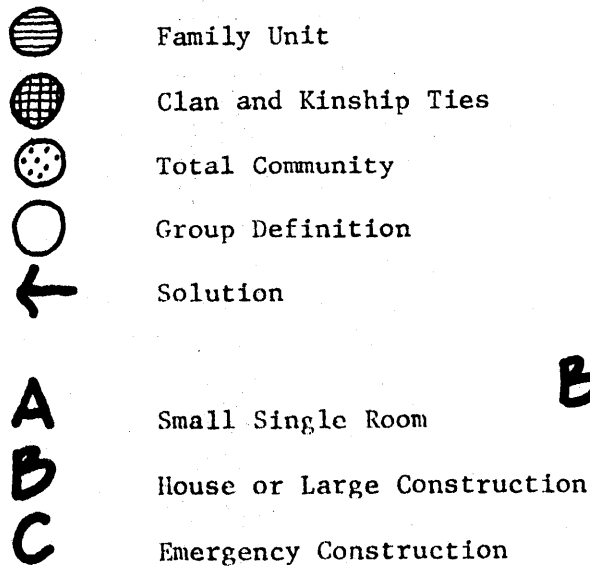
Generally, the construction of a room addition will be done by a single family with all members playing some important role (roles will be the





next topic of discussion). The size of the labor force increases when the scale of the structure increases and most importantly when an emergency arises. The labor force may only include the family and its close relations -- relations through kinship ties and clan organization. This will occur for instance when a marriage in the family is forecast and several rooms or a home must be constructed. The entire community becomes involved if a home has been destroyed by a flood or fire and the home must be entirely rebuilt.

Below is a model showing a generalized relationship between the labor force used and the scale of construction. The model should not be imagined as final or explicit rules, but only as a visual aid in comparing the material being discussed. In reality, there are several complex overlappings existent.

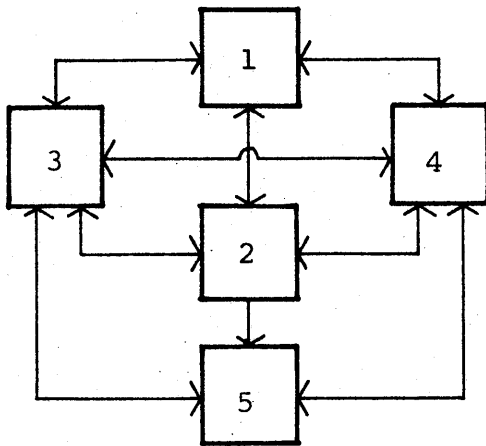


Roles: The Division of Labor

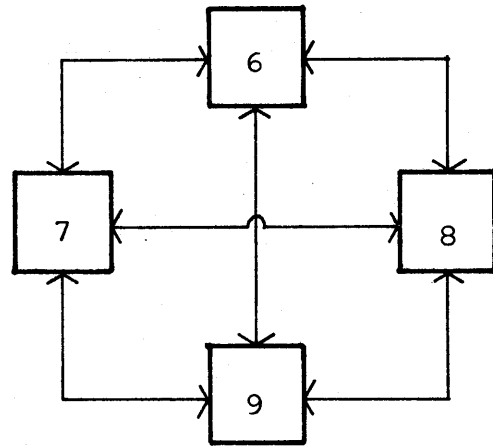
During building construction the labor force is divided into the following roles based on age, sex, and amount of skills. Listed next to each category is the type of work which the smaller grouping is supposed to perform.

1. - Male/Old Age: acquires role of supervisor and advisor.
2. - Male/Middle Age: given role of skilled mason, carpenter, etc.
3. - Male/21 yrs - Middle Age: this group is given several roles:
 - a) understudy group to the middle aged men,
 - b) in charge of hauling and the handling of construction materials,
 - c) along with group 4. do most of the heavy work.
4. - Male/13 yrs - 20 yrs: play role of mortar and plaster mixers. Also help in the handling of smaller building materials and work tools.
5. - Male/7 yrs - 12 yrs: given roles of water and errand boys.
6. - Female/Old Age: supervision of women.
7. - Female/Middle Age: given task of plastering walls and floors.
8. - Female/18 yrs - Middle Age: given important role of cook (food must be prepared for total labor force) plus aiding of group 7.
9. - Female/7 yrs - 17 yrs: given roles of babysitting and aids to above female groups.

Drawn below are two models explaining the relationships of roles played by the construction labor force. As explained previously, roles are determined using a criteria based on age, sex, and type of building skill.



MALE ROLES



FEMALE ROLES

After the house has been completed, a ceremony is performed to bless the home and this festivity brings together once again those who participated in the construction of the house plus many other related persons.

Thus when the labor force is organized (at any scale) its main goal is to construct a house, yet along with this united effort there are associated many important social and cultural institutions: contact with and awareness of one's own clansmen and kinsmen, a period to socialize, a time in which social roles are redefined, involvement of all ages in an important and educational task, plus the meaning attached to the fulfilling of a duty.

The owner of the newly built dwelling cannot help but relate a great deal of sentiment and attachment to the finished product and with such feelings no doubt the house will receive good care.

To summarize, I believe that the indigenous dwelling unit is not a house -- it is something much more.

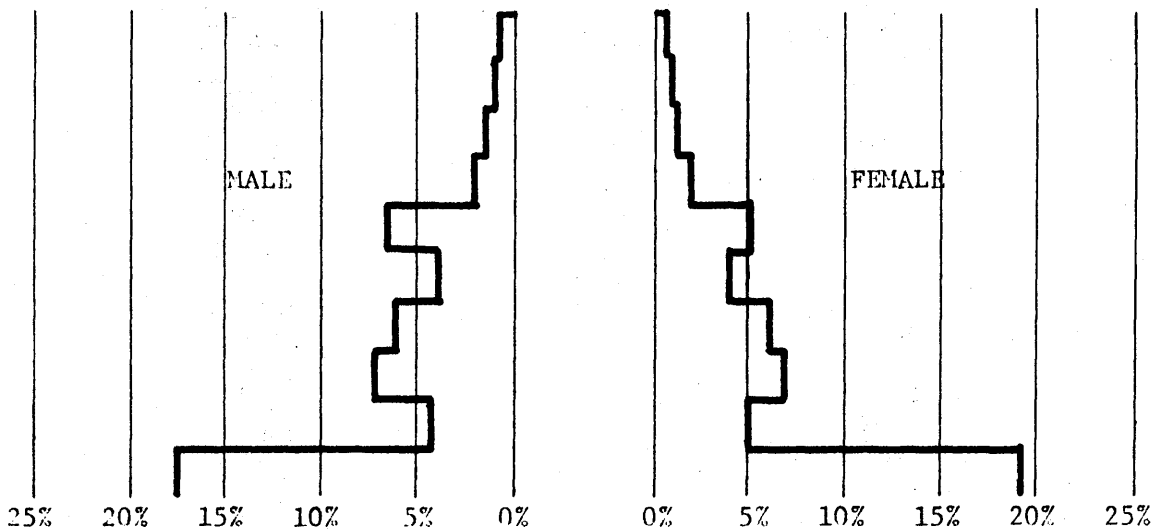
PART VI: DEMOGRAPHY

Introduction

Although there are few jobs found on the Acoma Reservation and it would seem ideal for a person to leave the reservation entirely; however, strong ties established by the Indians to the land and the people are most difficult to sever. It is these attachments which few outsiders understand and that most Indians consider before leaving or upon returning "home". For home has a precious meaning to the Indian and indicates a truly significant position in his life style. And while some persons leave the reservation for college or job hunting, most return immediately or after retirement.

Age/Sex

The Acoma tribal resident population as of April 1968 was approximately 1,654⁴. Below is a chart illustrating graphically the age and sex ratios of on reservation Acoma Indians.



DISTRIBUTION OF POPULATION⁵

The number of Acomas living off reservation amounts to approximately Most importantly, like other smaller ethnic groups, the growth rate of the Acoma people is presently quite high -- it is estimated to be about 3%.

Family Stability and Size

Most Acoma families are quite stable. An excellent indicator of this stability is shown by the following table which shows a high marriage rate with no divorce rate.

Table 1

MARITAL STATUS OF THE ACOMA INDIANS⁵

Marital Status	Percent
Married	58.4
Widowed	7.4
Divorced	0.0
Separated	1.3
Never-married	32.9
TOTAL	100.0

Also important here is to state the median number of children per family is six.

PART VII: ECONOMICS AND EMPLOYMENT

Introduction

For centuries the Acoma Indians have been agriculturally oriented with major emphasis on irrigation farming and sheep herding plus, until recently, the raising of cattle. Still cultivated are wheat, corn, beans, squash, apples, pears, peaches, alfalfa, and hay; also the raising of animals such as goats, horses, and donkeys. Agriculture and stock raising activities are still considered important; however, lack of good soil and interest in farming as a means of livelihood have resulted in abandoning agriculture as a primary activity for earning an income. Agriculture as a means of livelihood is generally accepted by older Acoma men and it is estimated that approximately three percent of the tribal members are farmers⁶.

The geographic isolation and social stability of the Acoma people over the years in their agrarian type of economy has contributed much to their attitude towards work. Due to years of experience in tending flocks and cultivating land, the Indians consider idleness or the receiving of welfare very undesirable. The majority of the Acoma Indians have now adopted a wage earning type of economy and presently sixty-three percent of the Acomas earn their wages off the reservation. Fifty-one percent of the Acoma Indians subsist on less than \$ 3,000 per year while the median family income lies between \$ 2,500 and \$ 3,000⁷. U.S. standards define poverty as a family of four whose income is less than \$ 3,130 annually.

From such a comparison one could generalize that the majority of Acoma Indians are "poverty stricken" yet with their extended family system, their cultural norms, and their ability to do more with less, it is unusual to find "poverty stricken" Acoma Indians on the reservation.

Nonfarm on Reservation Employment

Shown below is a table categorizing nonfarm employment on the Acoma Indian Reservation. As can be seen, with only thirty-nine nonfarm jobs are available, work on the reservation is quite limited both in quantity and variety.

Table 2

ACOMA INDIAN RESERVATION NONFARM EMPLOYMENT⁸

Employer	Number Employed
Acoma Tribe	12
Community Action Program	17
Bureau of Indian Affairs Day School	7
Public Health Service Clinic	3
TOTAL	39

Primary Acoma Indian Job Types

When seeking employment off reservation, the Acoma Indians must enter an open competitive market where important skills are required for better paying jobs. Lack of training has hindered their chances of obtaining high paying jobs. The majority of jobs obtained by the reservation people are those found in Grants, San Fidel, Cubero, and other automobile oriented stops along U.S. Highway 66. With Albuquerque, sixty-five miles from Acomita, travel time to the city takes about an hour and here many private as well as civil service jobs may be found. On Table 3 are listed occupational types considered by the Acoma Indians.

Table 3

ACOMA EMPLOYMENT BY OCCUPATIONAL TITLE⁹

Description	Number	Percent of Total
PROFESSIONAL, TECHNICAL, AND MANAGERIAL OCCUPATIONS		
Architecture and Engineering	3	
Medicine and Health	2	
Education	1	
Managers and Officials, not elsewhere class.	2	
Miscellaneous Professional, Technical, and Managerial Occupations	2	
Subtotal	10	7.8
CLERICAL AND SALES OCCUPATIONS		
Stenography, Typing, Filing, and Related Occupations	2	
Computing and Account-Recording Occupations	1	
Material and Production Recording Occupations	1	

Table 3 (continued)

Description	Number	Percent of Total
Miscellaneous Clerical Occupations	1	
Merchandising Occupations, except Salesmen	5	
Subtotal	10	7.8
SERVICE OCCUPATIONS		
Domestic Service Occupations	15	
Food and Beverage Preparation and Service Occupations	15	
Lodging and Related Service Occupations	8	
Miscellaneous Personal Service Occupations	4	
Protective Service Occupations	3	
Building and Related Service Occupations	4	
Subtotal	49	38.0
FARMING, FISHERY, FORESTRY, AND RELATED OCCUPATIONS		
Animal Farming Occupations	8	
Miscellaneous Farming and Related Occupations	2	
Subtotal	10	7.8
PROCESSING OCCUPATIONS		
Processing of Metal	1	
Processing of Stone, Clay, Glass, and Related Products	1	
Subtotal	2	1.5
MACHINE TRADE OCCUPATIONS		
Metal Working Occupations not Elsewhere Classified	2	
Mechanics and Machinery Repairmen	6	
Wood Machining Occupations	2	
Subtotal	10	7.7
STRUCTURAL WORK OCCUPATIONS		
In Metal Fabricating not Elsewhere Classified	2	
Welders, Flame Cutters, and Related Occupat.	5	
Electrical Assembling, Installing, and Repairing	1	

Table 3 (continued)

Description	Number	Percent of Total
Excavating, Grading, Paving, and Related Occupations	3	
Construction Occupations not Elsewhere Classified	8	
Structural Work Occupations not Elsewhere Classified	3	
Subtotal	22	17.1
MISCELLANEOUS OCCUPATIONS		
Motor Freight	1	
Transportation not Elsewhere Classified	9	
Packaging and Materials Handling	1	
In Extraction of Minerals	2	
In Logging	1	
In Production and Distribution of Utilities	1	
Subtotal	15	11.5
TOTAL	129	100.0

As can be seen, thirty-eight percent of the labor force is employed by a service type job market while governmental occupations are less important. All the service experiences are concentrated largely in pursuits requiring little specific training, if any. The lack of training requirements for such occupations places most of the people in highly seasonal and vulnerable employment.

Attendance in school is highly important when one considers income and future earning power for the Acoma Indian. An important fact to consider

when examining school attendance with income is that: the median income range for all working Acoma men is \$ 1,000 - \$ 1,999, while for high school graduate it is in the \$ 5,000 - \$ 5,999 category. Hence, those that fare better in terms of annual income tend to be the ones that remained in school the longest or at least for the entire twelve years. Shown on Table 4 is the relationship between education and annual earnings for working males and females.

Table 4
INCOME BY EDUCATION AND SEX¹⁰
(Percent)

Years of Education	Sex	Income									
		\$ 0	1-499	500-999	1000-1999	2000-2999	3000-4999	5000-9999	10,000 +	Info. Not Avail.	TOTAL
None	M	0.0	0.0	0.9	0.9	0.9	0.0	0.0	0.0	0.0	2.7
	F	0.0	0.0	0.8	1.5	0.0	0.0	0.0	0.0	0.0	2.3
1	M	0.9	1.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0	3.7
	F	0.0	1.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	2.3
2	M	0.0	0.0	1.9	0.9	0.9	0.0	0.0	0.0	0.0	4.6
	F	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8
3	M	1.9	0.9	2.8	0.9	0.0	0.0	0.0	0.0	0.0	6.5
	F	0.8	0.0	0.8	0.8	0.0	0.0	0.0	0.0	0.0	2.4
4	M	1.9	0.9	0.0	0.9	0.0	0.0	0.0	0.0	0.0	3.7
	F	0.8	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	3.8
5	M	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.9
	F	1.5	2.3	0.8	0.8	0.0	0.0	0.0	0.0	0.0	5.4

Table 4 (continued)

Years of Education	Sex	Income									TOTAL
		\$ 0	1-499	500-999	1000-1999	2000-2999	3000-4999	5000-9999	10,000 +	Info. Not Avail.	
6	M	0.0	1.9	1.9	0.9	0.9	0.0	0.0	0.0	0.0	5.6
	F	0.8	0.0	1.5	0.8	0.0	0.0	0.0	0.0	0.0	3.1
7	M	0.0	0.9	0.0	0.9	0.0	1.9	0.0	0.0	0.0	3.7
	F	3.8	0.8	2.3	0.8	1.5	0.0	0.0	0.0	0.0	9.2
8	M	2.8	1.9	1.9	1.9	1.9	0.0	3.7	0.9	0.0	15.0
	F	3.8	0.8	1.5	0.0	0.0	0.0	0.0	0.0	0.0	6.1
9	M	3.7	0.0	0.9	0.0	0.9	0.9	0.9	0.0	0.0	7.3
	F	7.5	3.0	1.5	0.0	1.5	0.0	0.0	0.0	0.0	13.5
10	M	2.8	2.8	1.9	0.9	0.9	0.9	0.9	0.0	0.0	11.1
	F	9.0	3.8	3.8	0.8	0.8	0.0	0.0	0.0	0.0	18.2
11	M	1.9	1.9	0.0	2.8	0.9	0.9	0.9	0.0	0.0	9.3
	F	4.5	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	6.1
12	M	0.9	0.0	0.9	0.9	2.8	1.9	8.4	0.9	0.0	16.7
	F	9.8	6.8	3.0	0.8	1.5	2.3	0.8	0.0	0.0	25.0
13	M	0.0	0.0	0.0	1.9	0.0	0.0	0.9	0.0	0.0	2.8
	F	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
14+	M	0.0	0.0	0.9	0.0	0.0	0.0	0.9	0.0	0.0	1.8
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inf. Not Avail.	M	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	2.8	3.7
	F	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.3
TOTAL	M	16.8	13.1	14.9	13.8	11.0	8.3	16.6	1.8	2.8	99.1
	F	43.9	22.1	19.8	4.8	6.1	2.3	0.8	0.0	1.5	101.3

PART VIII: CONSUMPTION PATTERNS

Patterns of consumption are important and are dealt with here to provide insight into the following: availability of automobiles, use of credit for purchases, places and types of establishments for expenditures.

Briefly, spending off reservation is predominate as the following figures indicate: 99.6 percent of all groceries, 75.8 percent of all automobile repairs, and 100 percent of all clothing. To pay for these goods and services the Acoma Indians pay cash as follows (credit percent is shown in parentheses): groceries 64.8 percent (33.5); automobile repairs 64.3 percent (18.7); and clothing 73.5 percent (24.4)¹¹. Most grocery shopping (enough for a week), and clothing shopping is done on weekends in Grants or Albuquerque. There are two reservation stores at Acomita for the purchase of groceries. Stores at San Fidel, Cuberero, and Budvill generally charge at least fifteen cents more on goods than to Albuquerque stores.

An important consideration is that twenty-one percent of Acoma families are without automobiles. This means a great deal when one considers the need to commute to a job and need to purchase goods off of the reservation.

PART IX: ACOMA'S RESOURCES

There is a great deal of potential for recreation and tourism on the Acoma Reservation. However, there is need of capital and experienced to develop this potential.

The foremost tribal income resource could come from the development of ancient and historical Old Acoma Pueblo which sits atop a 357 foot high mesa. Said to be the oldest inhabited settlement in the United States, it is known as Sky City. According to one potential developmental report (see "Development of Tourist Potential, Acoma Indian Reservation, New Mexico", 1965 by Kirshner Associates) it is possible that 100,000 persons per year could visit Old Acoma.

Acoma pottery is amongst the finest in the United States and can be sold for very high prices. This and other handicrafts are given little consideration by tribal leaders as a source of livelihood and presently nothing is being done to develop a means for distributing these goods.

Two other important resources on the Acoma Indian Reservation are a trout fishing lake (Mesa Lake) which gains the tribe about \$ 3,000 annually; and also timber land.

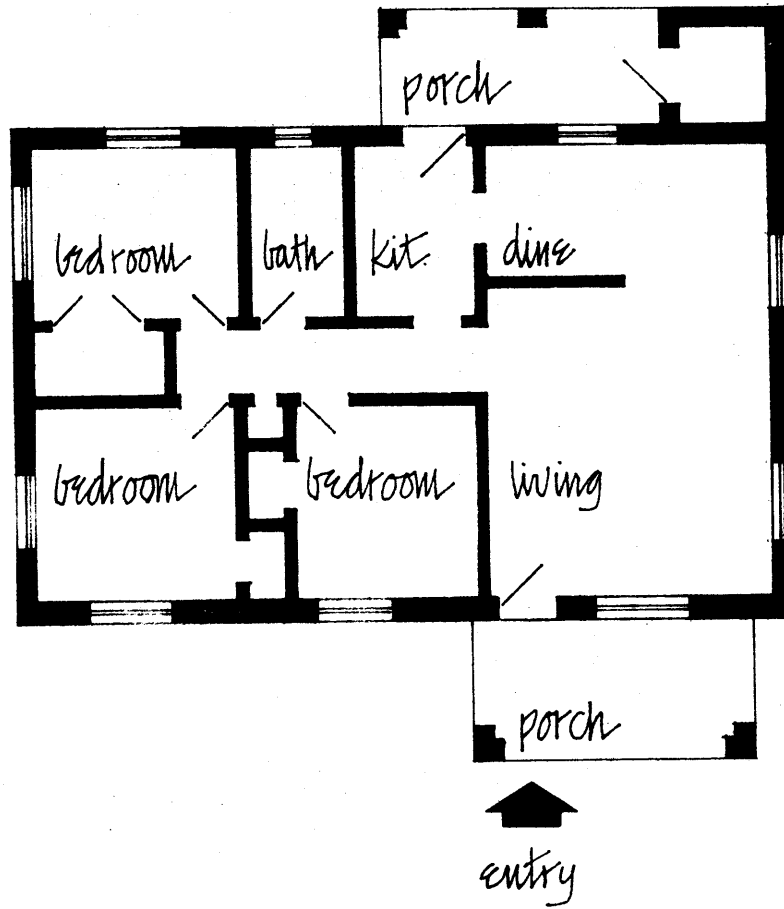
The Acoma people have been farmers until very recently, and their economy did not depend on formal academic training. But academic as well as vocational training now being emphasized are difficult to be made use of on the reservation -- which is where most of the people still wish to live.

PART X: THE PRESENT HOUSING POLICY

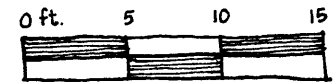
The Bureau of Indian Affairs is a branch of the Interior Department and has recently been given the task of evaluating, programming, and planning for Pueblo Indian housing needs. Their main vehicle for solving the housing needs on the reservation lies in a program entitled: "Mutual Self-Help Housing".

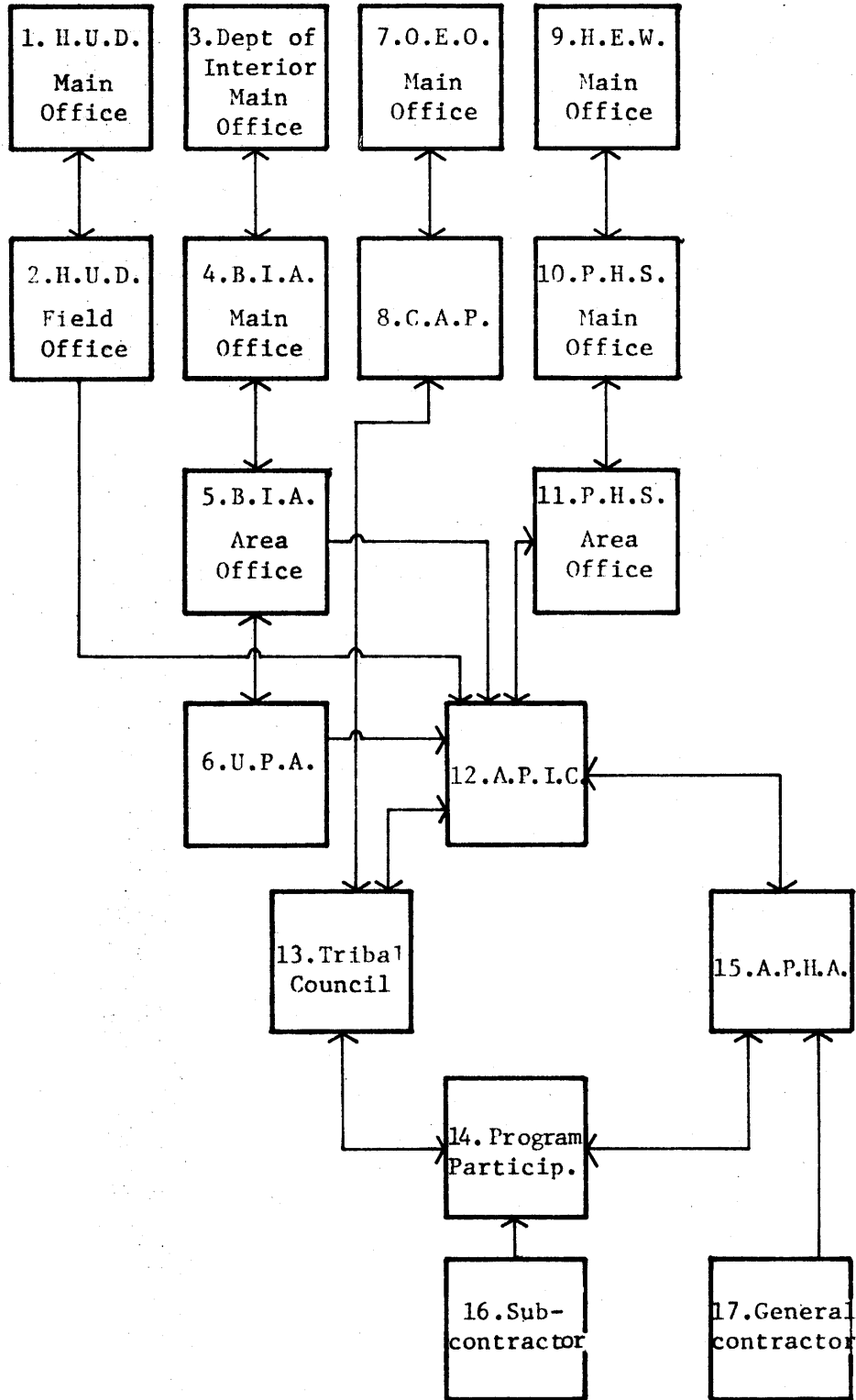
Basically, the self-help program brings together (on the same reservation) fifteen to thirty families who try and work together to aid in the construction of one another's homes. The participants must fulfill certain requirements among which are the following: be of a certain income bracket; be willing to work at nights and on weekends; be physically fit; and be able to pay on the home for at least twenty years.

All homes are constructed using one floor plan (see Plan E on next page) which is supposed to cover any variety of conditions. The basic construction materials for the Mutual Help Home are: concrete flooring, stud and stucco walls, timber hip roof with shingles, and aluminum door and window frames. Initial construction is done by a contractor who produces the shell (the structure), next an electrical contractor wires the structure, then the Public Health Service installs plumbing, and lastly the participants along with a supervisor finish the interior of the house. On the page following the next is sketched a model showing the formal organization required to execute the Mutual Help Housing Program on Pueblo Indian Reservations.



plan E





FORMAL ORGANIZATIONAL CHART

Mutual Self-Help Housing Program

Legend for preceding chart

1. Department of Housing and Urban Development: provides funding for projects.
2. H.U.D. Field Office: San Francisco, California.
3. Department of the Interior: Administration of governmental Indian Affairs.
4. Bureau of Indian Affairs: branch of the Interior Department.
5. Area Field Office of the B.I.A.
6. United Pueblos Agency: governmental agency dealing specifically with Pueblo Indians.
7. Office of Economic Opportunity: serve as advisors.
8. Community Action Program: advisors and program directors.
9. Department of Health, Education, and Welfare: administration of health facilities.
10. Public Health Service: installation of plumbing and sewage facilities.
11. Area Field Office of H.E.W.-P.H.S.
12. All Pueblo Council: United organization of the Pueblo Indians of New Mexico. There are nineteen pueblos.
13. Tribal council and governing body of individual tribe.
14. The program participants.
15. All Pueblo Housing Authority: programming and coordination of housing projects.
16. Sub-contractor of individual participant (optional). Dry-wall construction is generally sub-contracted.
17. General contractor who erects the shell.

As is continually the case, the basic philosophy of the Interior Department in regards to Indian problems (housing policy included) is that the American Indians must "...join the mainstream of the great American society and become full participants in it."¹²

This most irrational dogma has now been carried forth by the Bureau of Indian Affairs into a highly bureaucratic housing program as well as into that program's mediocre development plans and house designs -- a credit no doubt to "mainstream" type thinking. Presently, with the initiation of the Mutual Help Housing Program, housing officials worry a great deal about the number of homes which are to be built and the amount of time that this will take. It seems that a large scale project accomplished in a short period of time is most impressive and is therefore evaluated as a very successful project. The project may be highly successful, but for whom the housing director or the inhabitants of the project?

CHAPTER II

CONSIDERATIONS AND

DESIGN DETERMINENTS

Introduction

This chapter gives an insight into the planning and design alternatives which were initially explored. The final proposal is based on the considerations explained here and is discussed more explicitly in Part 3. Much of what is stated here correlates with material already presented and I hope the reader will refer to the previous chapter if any questions arise.

PART I: CONSIDERATIONS FOR SITE SELECTION

The determinents controlling the selection of a site were thoughtout in relation to the future inhabitant's cultural, socio-economic, and health needs. Major considerations which determined the choice of the site were:

1. Location of site near an access of U.S. Highway 66 because:
 - a) 38% of the Acoma Indians earn their livelihood from occupations which relate in some manner to the highway;
 - b) 63% of the Acomas make use of the highway when commuting to work;
 - c) 99.6% of on reservation Acomas purchase their groceries off reservation;
 - d) 100% purchase clothes off reservation;
 - e) busing of high school students is one off reservation to Laguna;
 - f) many persons walk to the highway to wait for buses or rides to work;
 - g) when future businesses are established at the highway access, the employment source will within walking distance;

h) The four lane U.S. 66 reduces travel time considerably.

2. Location of site close to an existing village because:

- a) face to face communication and social interactions with the established villagers are important life patterns of the Acoma Indians which must be kept;
- b) existing facilities such as churches, schools, stores, utility lines, etc, could be used by the newer community;
- c) there is a need to establish contact with an older existing community to help define the role of the new community;
- d) by establishing adjacent or near an existing village, the newer community will aid in the physical and social reinforcement of that village.

3. Location of the site near existing electrical lines, water lines, paved roads, and if possible near natural gas lines.

PART II: FOUR SITES CONSIDERED

With the factors for site selection established, four sites (see map on following page) were examined -- the third site discussed here was suggested by an Indian housing official and the other three by myself. Each suggested site was studied for its social and locational implications and these studies are described in the following paragraphs.

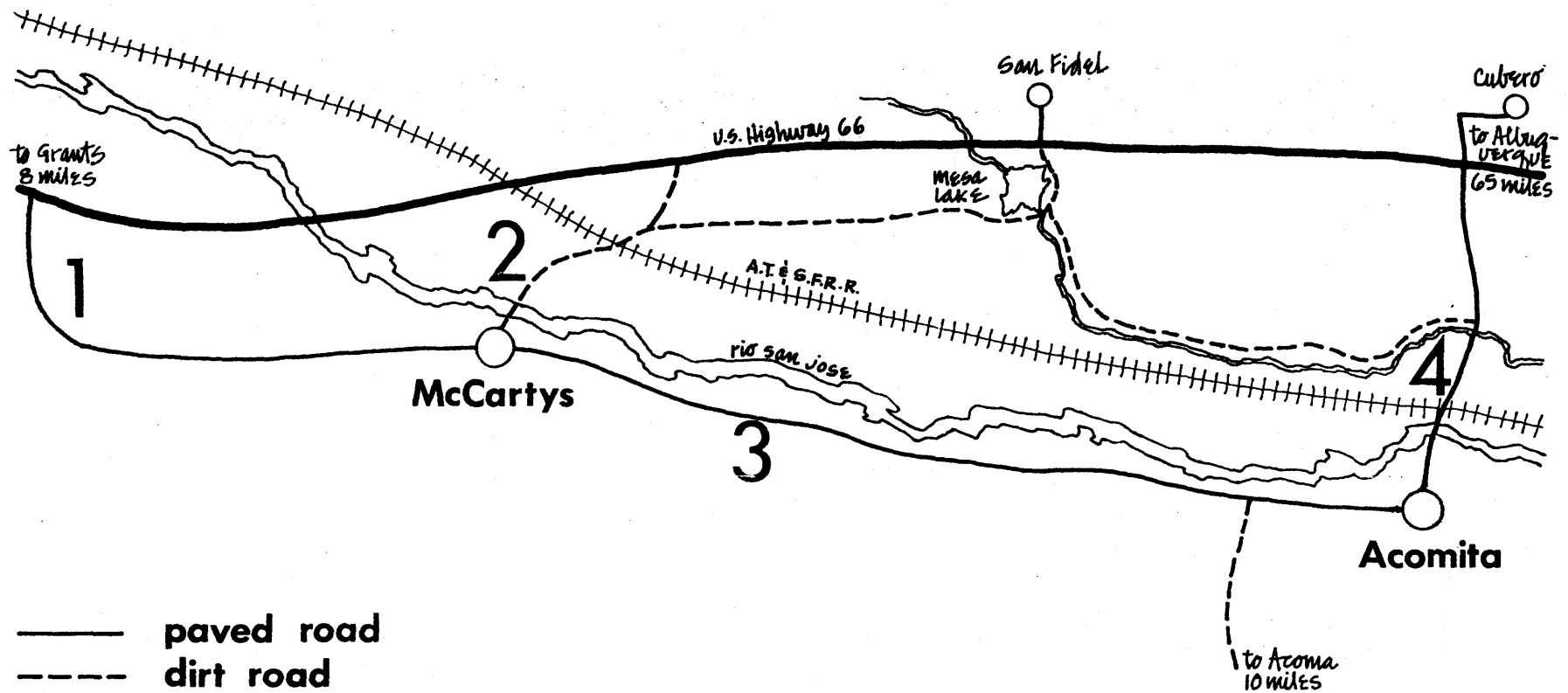
Site Study One:

This site at the far western edge of the reservation was suggested because of its excellent access point to U.S. Highway 66; the land is flat, and is adjacent to a small farming village; the town of Grants is a short ten minute drive away; and the terrain abounds with small cedar trees.

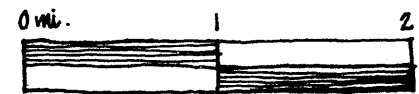
The main disadvantages of this site were: its great distance to the main center of activity (Acoma, Acomita, and McCartys), its problem of busing and lack of a nearby grade school plus lack of potential that the access point would be developed.

Site Study Two:

This area located near the village of McCartys is still a good possible site. The area is flat; located near the existing facilities of McCartys, and the access has some potential for future development. However, the



site locations considered



lose soil conditions of the site present erosion and dust problems, land acquisition may be a problem, and the road to the highway access is of dirt which makes driving quite difficult.

Site Study Three:

This site was considered mainly for its abundance of large areas of flat land to be used later for expansion and future development. Though this site did have the advantage just stated, the rest of the considerations for site selection seemed to be entirely neglected.

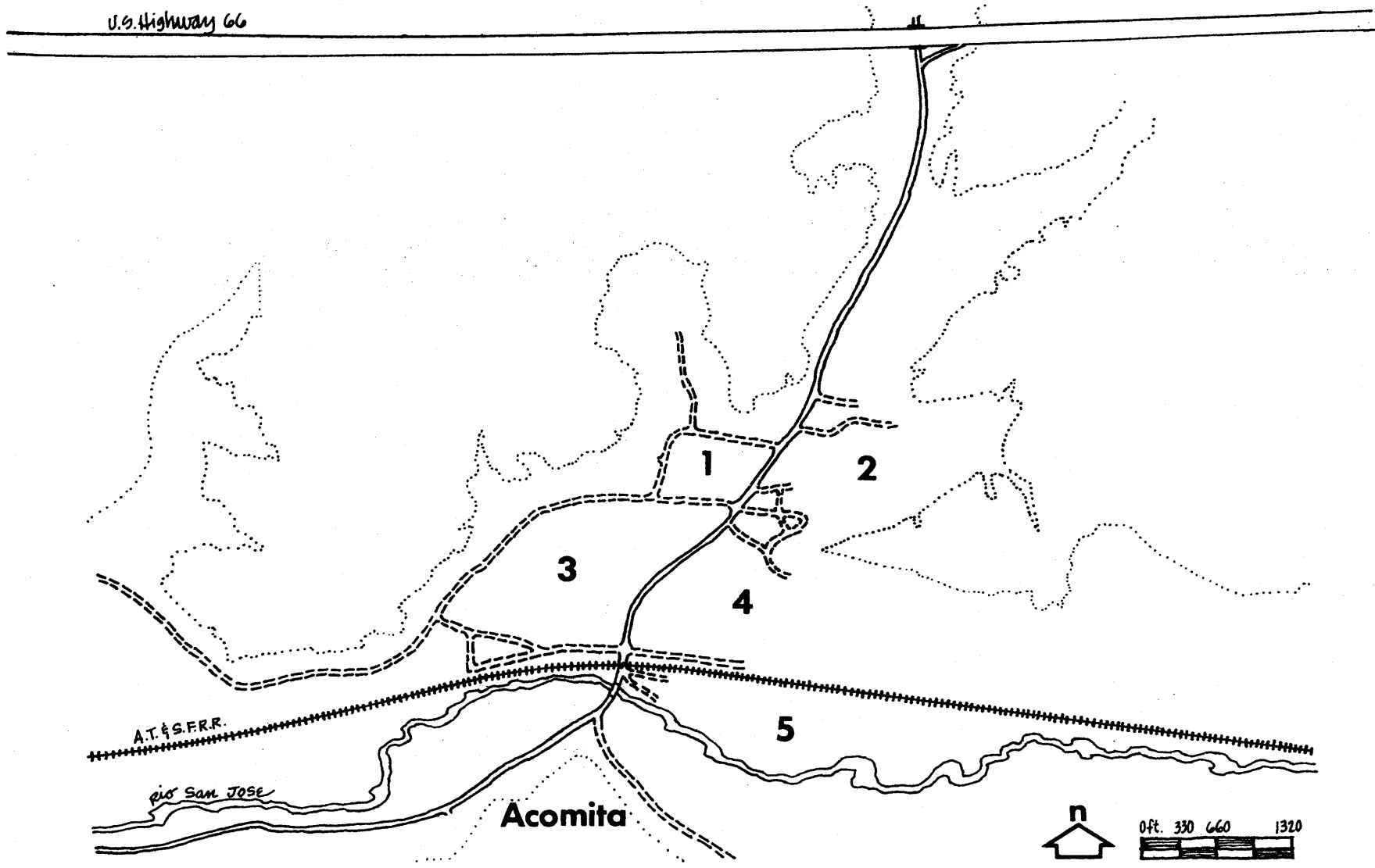
Site Study Four:

With only slight problems of slope conditions and perhaps land acquisition, this site fulfills all requirements proposed for the selection of a site. Briefly, the advantages here are, location: near an excellent highway access with much potential for development, adjacent to an existing village and its facilities, close to existing electrical and water supplies, near the paved reservation road, and within a fertile farming valley.

PART III: CONSIDERATIONS FOR THE LOCATION OF THE NEW COMMUNITY (refer to sketch on the following page)

Once the general area for site development near Acomita was chosen, several specific locations were investigated. These are numbered on the map. Important factors controlling the final location were:

1. The area's relationship to the U.S. Highway 66 access.
 - a) This access point should be quickly and easily reached by automobile.
 - b) Distance to access point within walking distance.
2. The area's relationship to the existing village of Acomita for social, psychological, and physical reasons.
3. The area's relationship to the existing paved reservation road:
 - a) to cut travel time;
 - b) to cut automobile repair expenses;
 - c) to cut dust problems.
4. The area's relationship to existing or planned fresh water supply sources, electrical lines, and gas lines.
5. The area's availability as a site.
 - a) Land ownership problems.
 - b) Present or future use.



possible locations for new community

6. The area's physical nature.

- a) Would there be costs for cut and fill or excavation?
- b) Would there be difficulties with loose soil?
- c) Would natural drainage be a problem?
- d) Would natural sandstone be easily accessible?
- e) Would erosion onto or from the new community be a problem later?

PART IV: CONSIDERATIONS FOR DWELLING SPACE

The problem of house design was approached from a point of view that the house would be occupied only by Indians and hence it was sought to follow their long established traditions of spatial distribution and methods of construction. Though the end result of such a design criteria may not conform in part with established F.H.A. or H.U.D. standards, it is hoped that if the designs produced by this study are to be implemented through federal sponsorship, these standards will either be altered or be less restrictive.

Stated next are parts of the design criteria which were evolved from studies done for Chapter One. Since this chapter deals mainly with the alternatives considered, and the design process, further explanations of the following statements are given in Chapter Three of this paper.

Basic design determinants controlling the form of the dwelling space were the following: the space should be

- a) approximately 1,000 square feet in area
- b) of modular construction with a module of between fourteen and eighteen feet (maximum) center to center
- c) constructed of natural indigeous materials
- d) small in scale
- e) a single story in height
- f) covered with a flat, five ply built up roof
- g) enclosed with walls at least one foot thick
- h) opened with windows of maximum dimensions 36" by 42" inches and aligned for purposes of cross ventilation
- i) "open" in visual perception and contain as few partitions as possible
- j) integrated with essential plumbing and electrical fixtures.

PART V: CONSIDERATIONS FOR DESIGNING THE COMMUNITY

Design of the new community involved a familiarity with the nineteen Indian Pueblos of New Mexico. These centuries old communities were studied to provide an insight into patterns of social and cultural norms, land use, circulation, physical planning and growth, plus the historical alterations which have taken place.

Having acknowledged many of the established community structural patterns from studies of the Pueblos, the following considerations for the design of the community were determined:

I) Organization of community

A) Population size and density

1. Number of persons to be housed
2. Net density of the community

B) Land Use

1. Establishment of central plaza
2. Dwelling lots
 - a) size
 - b) form
 - c) location

C) Social organization

1. Social grouping of families
2. Face to face contact

3. Interaction

a) orientation of lots

b) mixture of lots

c) mixture of circulation types and play

4. Family sizes and types

5. Personal relationship to community

D) Circulation

1. Speed conditions

2. No direct through traffic

3. Mixture of circulation types

4. Road patterns

5. Road dimensions

CHAPTER III

THE PROPOSAL

CHAPTER III: THE PROPOSAL

CHAPTER FORMAT

The following format is presented here to clarify the discussion to be presented on the next few pages.

The first topic to be considered in this chapter will be the development of the conceptual framework; next, the framework's application to the sites selected for initial development; and lastly, a short discussion with project summaries will be presented.

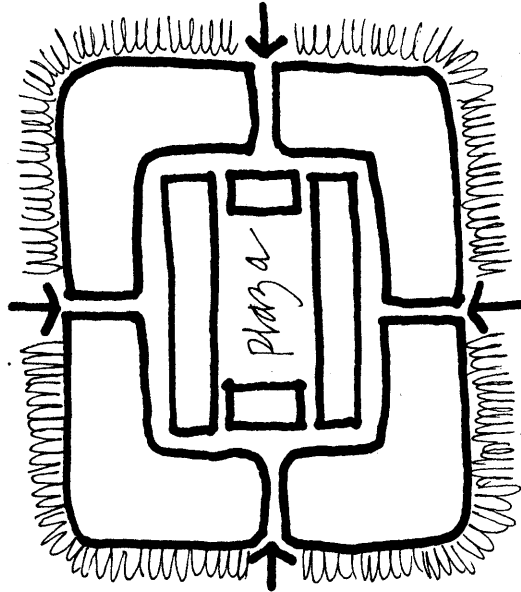
PART I: THE CONCEPTUAL FRAMEWORK

SECTION 1: The Concept

The main objective of this study was to investigate the social and physical organizations of the existing villages and then to plan a new community integrating these traditions with newer needs such as automobile circulation and utility networks.

Theoretically, the population of the new community would approximate existing Pueblo Indian populations of 1,000 to 1,200 persons, be closely knit (50 to 60 persons per acre), and if possible, grouping would be done by lineage.

Basically, the community would be organized around a rectangular central plaza which is free from automobile traffic. Traffic would be allowed only around the periphery of the plaza with no direct auto cross routes through the community itself. This concept is sketched below.

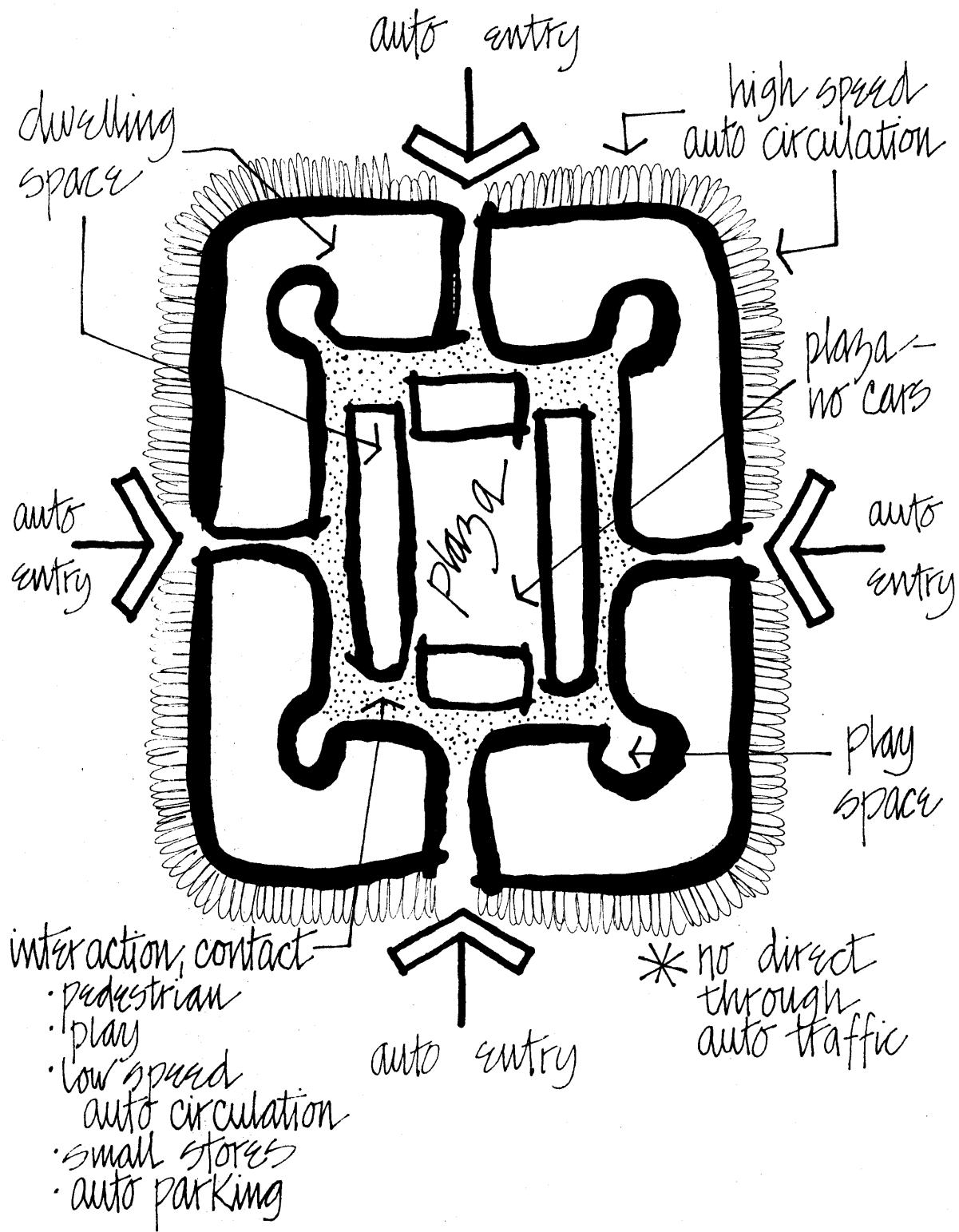


Persons requiring smaller areas for living would reside adjacent to the plaza while those with large families would live at the outer "ring" surrounding the plaza (allowing more room for expansion).

Face to face contact would be achieved by use of the main circulation spaces which would be used for play, pedestrian circulation, and automobile circulation. Play spaces will be provided for younger children away from the main circulation routes. (See drawing on the following page)

Auto circulation

There would exist a hierarchy of automobile traffic. Higher speed traffic from the main highway would circle the periphery of the community and



conceptual

sketch

would come to a slower pace once inside the community; and finally, there would be no auto traffic allowed within the central plaza itself.

Social Significance

To insure the important character of face to face interaction, auto and pedestrian traffic plus play have been mixed rather than separated, homes would face one another, organization of 25 to 30 families per "block" maximum have been sought and a maximum community population of 1152 persons will be planned for.

Dwelling Spaces

The dwelling spaces are to be designed using a module of 16'-0" c.c. This module is based on the existing medium span of a viga (wood beam) which is presently being used by the majority of Acoma builders. By using this modular construction design future dwelling space expansion is possible in various directions. Materials used for the construction of the dwelling spaces will be: indigenous sandstone with cement mortar and a five ply built up roof. Initial length of the bedroom space will be two module lengths (32'-0" c.c.), thus allowing the owner to partition this lengthy space as he desires and at any time he wishes.

Dwelling Lots

The module of 16'-0" c.c. will be used to plan lot sizes and also to plan the entire community. Thus, the module will be carried forth into determining the lengths and widths of lots, streets, the plaza, play areas, and open spaces.

PART II: ORGANIZATION OF THE COMMUNITY

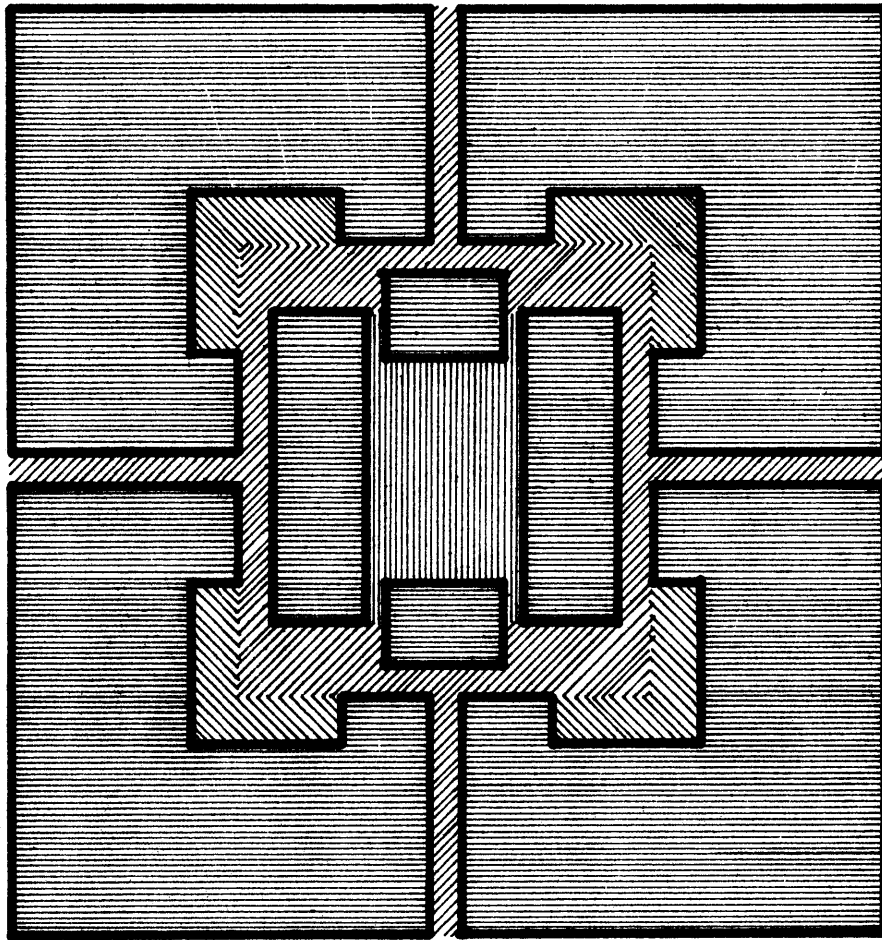
Population Size and Density

The population size and density of which the new community would be planned was determined by taking into consideration three main factors: existing New Mexico Pueblo Indian population sizes which range from 124 at Sandia to 3,860 at Zuni; the median family size of the Acoma Indians which is eight; and a density between fifty and seventy-five persons per net acre which approximates existing conditions at McCartys and Acomita.

Land Use and Circulation

The proposed land use scheme (see drawing on next page) follows quite closely the initial conceptual drawing. Although this scheme presupposes the site to be flat or free of any changes in topography; as will be seen, the conceptual framework stated here is adaptable to various topographic conditions.

Areas designated as dwelling spaces contain both dwelling lots (lots will be discussed in detail later) and family dwelling spaces, while areas shown as common space indicates a mixture of play space, pedestrian, and automobile traffic. The plaza has been designed not to allow auto traffic through or onto it and the play spaces have been positioned such that they are by-passed by the main automobile traffic.



DWELLING SPACE



PLAY SPACE



COMMON SPACE



PLAZA

land use scheme

Space for a grade school was not planned for because, firstly, existing schools will be used, and secondly, the population of the new community will not be large enough to support a grade school.

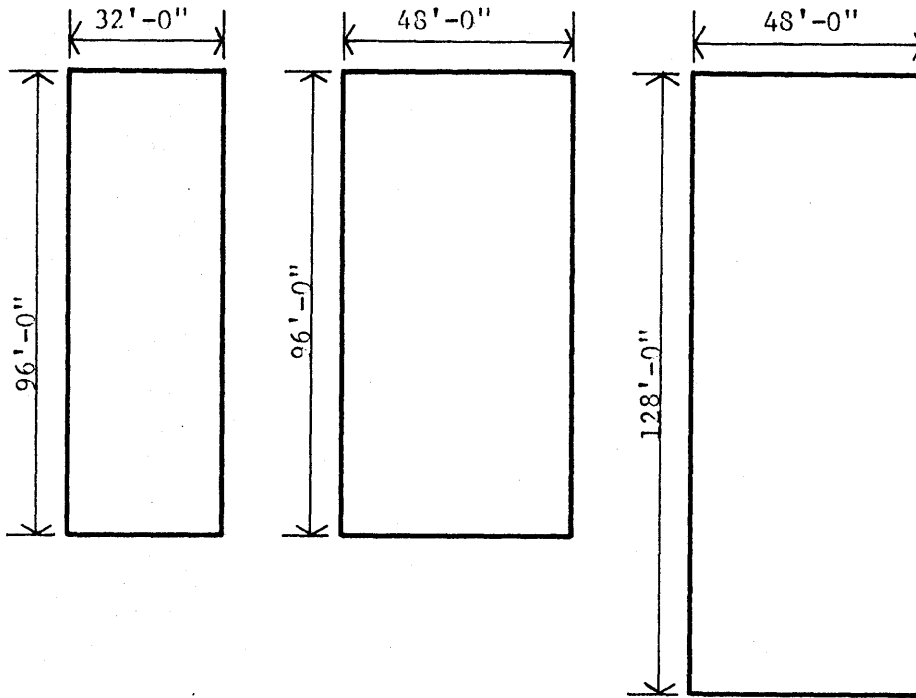
Commercial space was not reserved in this scheme since it is hoped that greater use will be made of existing stores or, perhaps, individual families in the new community may open a store. Presently, there does not seem to be a great need to designate special areas for commercial use only.

Spaces for a community center or playgrounds were not planned here since these facilities already exist and it is important socially that these facilities be used by persons from the new community.

Dwelling Lots

The dwelling lot types and sizes were determined after considering the following factors: various family sizes to be served; approximate enclosed and future growth spaces required by the families; needs of outside living space; an efficient lot form; and the planning module of sixteen feet.

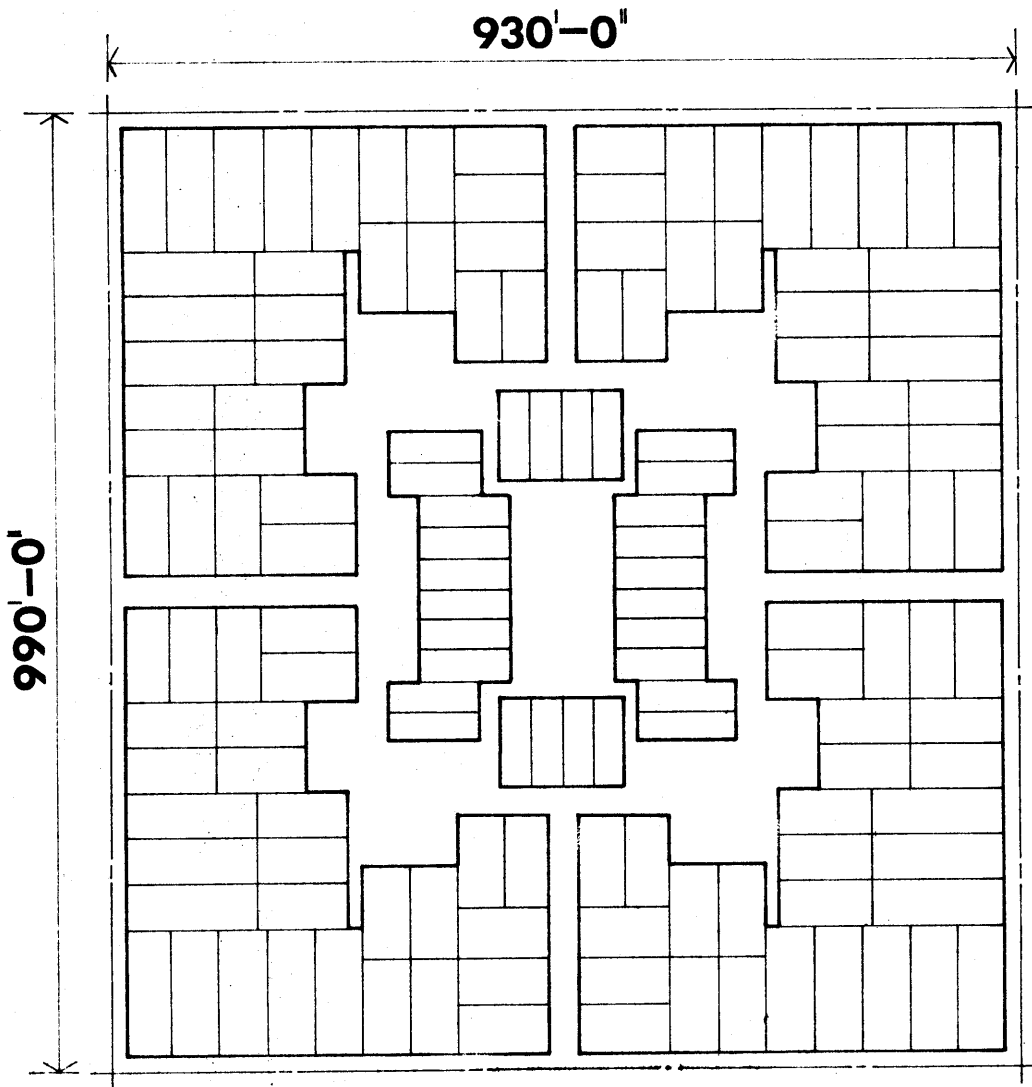
The three basic lot sizes incorporated into the new community are shown on the next page.



BASIC LOT TYPES

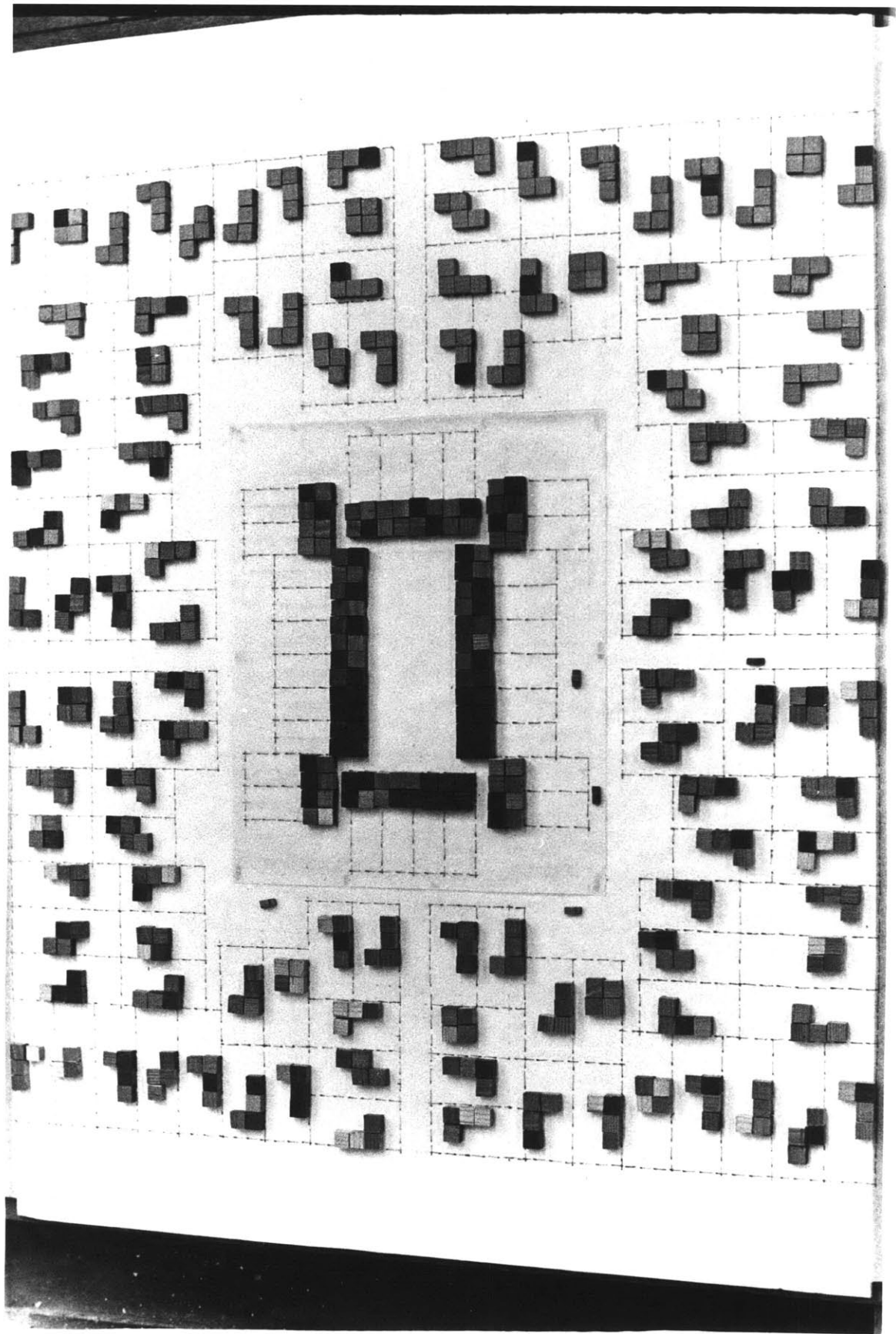
The final plan of the new community was derived by using these three basic lot types and taking into consideration Acoma Indian cultural patterns, the population and density figures and the conceptual framework previously established. This final plan is shown on the following page.

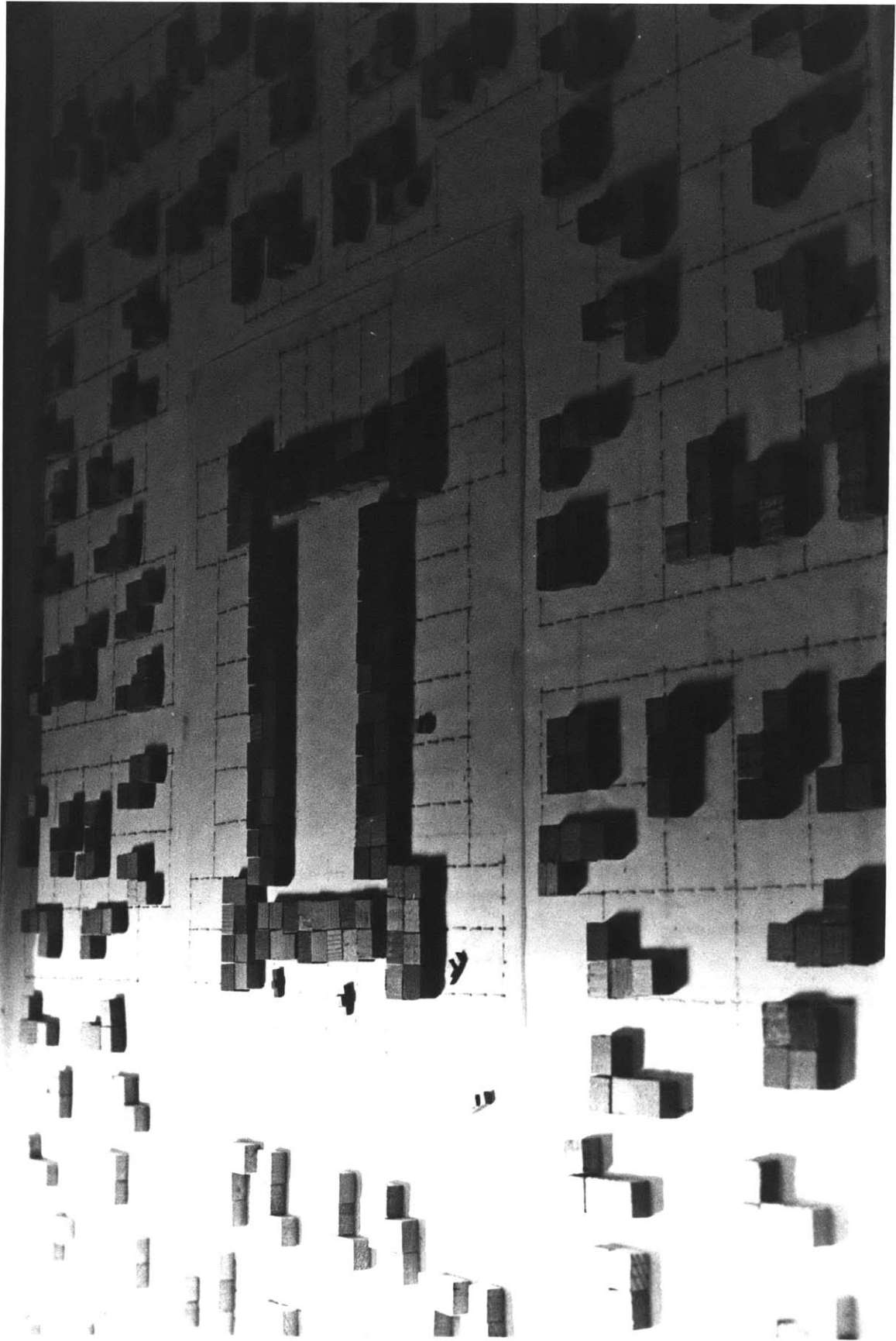
This plan for the new community assumes ideal topographic conditions yet does not depend entirely upon this criteria for its cohesiveness.



Layout of Dwelling Lots scale 1"=200'-0"

plan for a new community



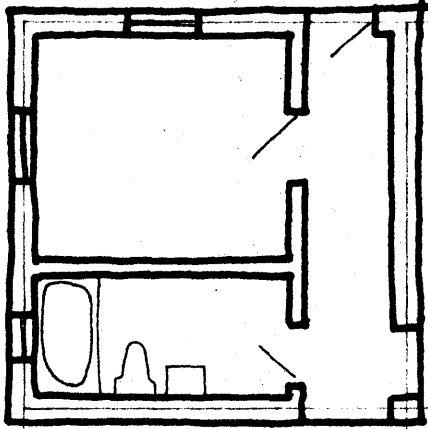


PART III: DESIGN OF THE DWELLING SPACE

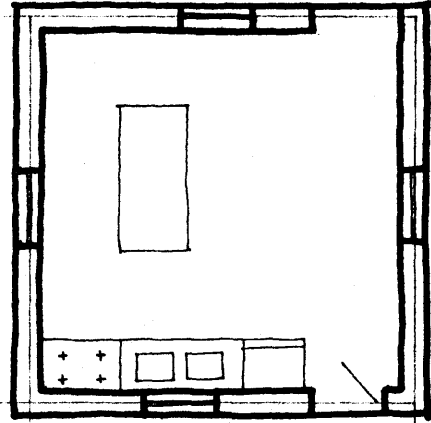
The dwelling space was designed entirely using the factors for design which were determined earlier in Chapter 2 of this paper.

Based on the basic planning module of 16'-0" c.c., three basic dwelling spaces were designed according to a function which they might serve. These basic dwelling blocks are drawn over a 16'-0" grid on the following page. Four possible combinations of these dwelling spaces are also drawn on the following pages and demonstrate the variety of spaces which can be achieved.

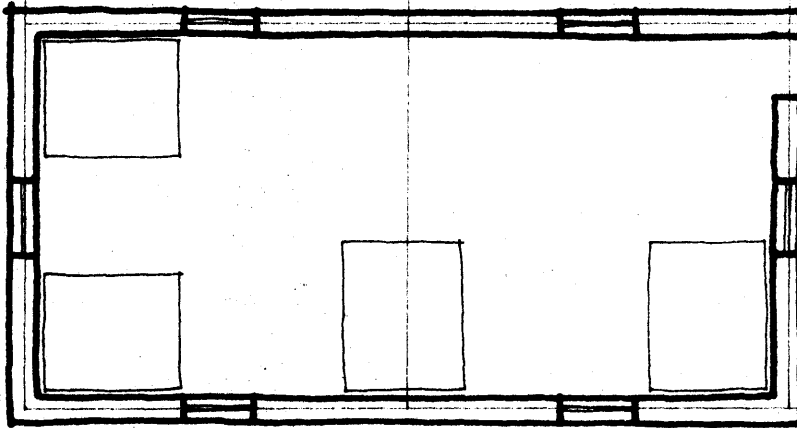
A dwelling area of 1,024 square feet (approximately equal to an F.H.A. standard three bedroom home) is acquired when the spaces are combined. If the utility-storage space is subtracted from this figure an area of 914.75 square feet of living space is left.



STORG./BATH



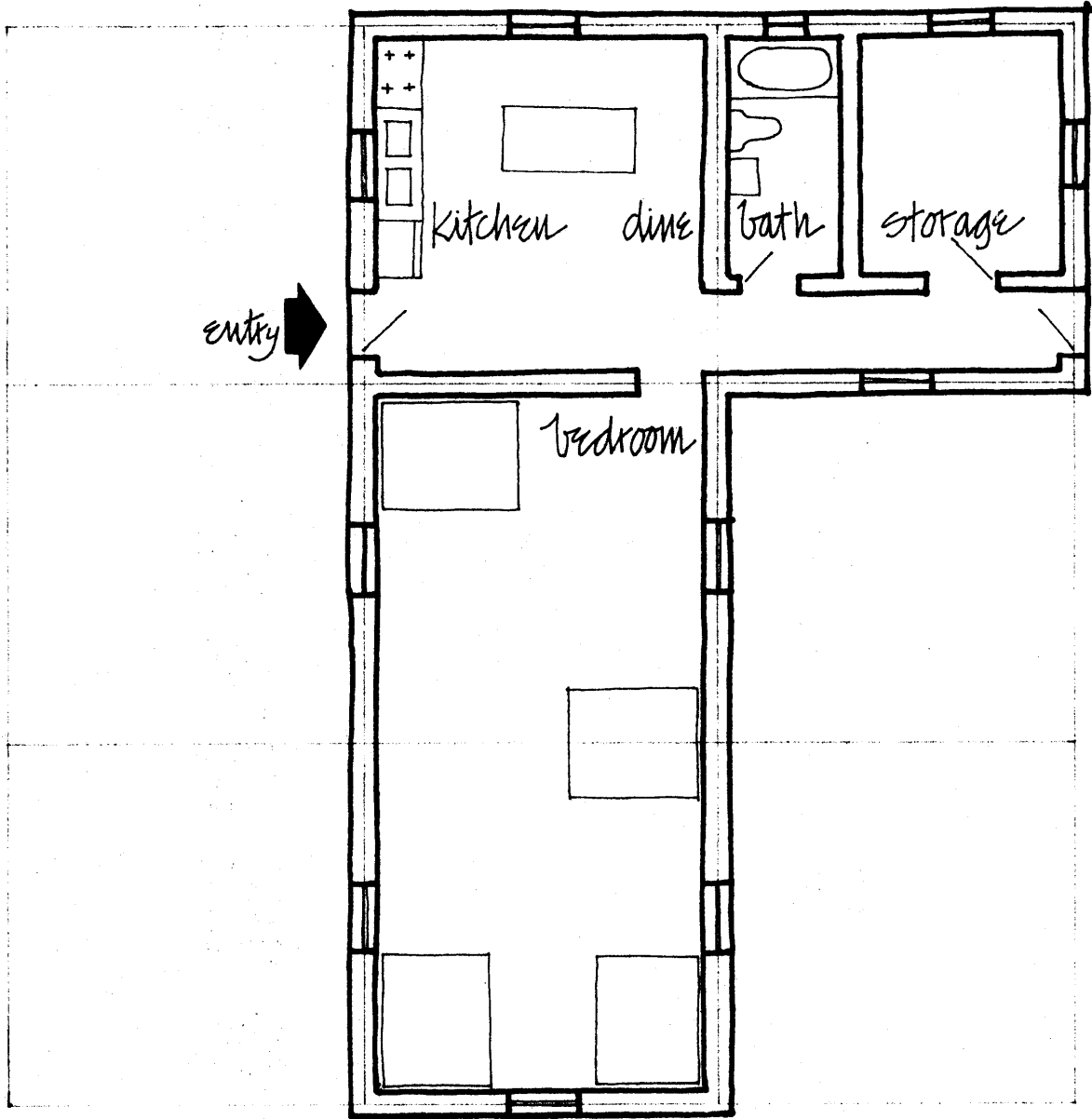
KIT./DINE



BEDROOM

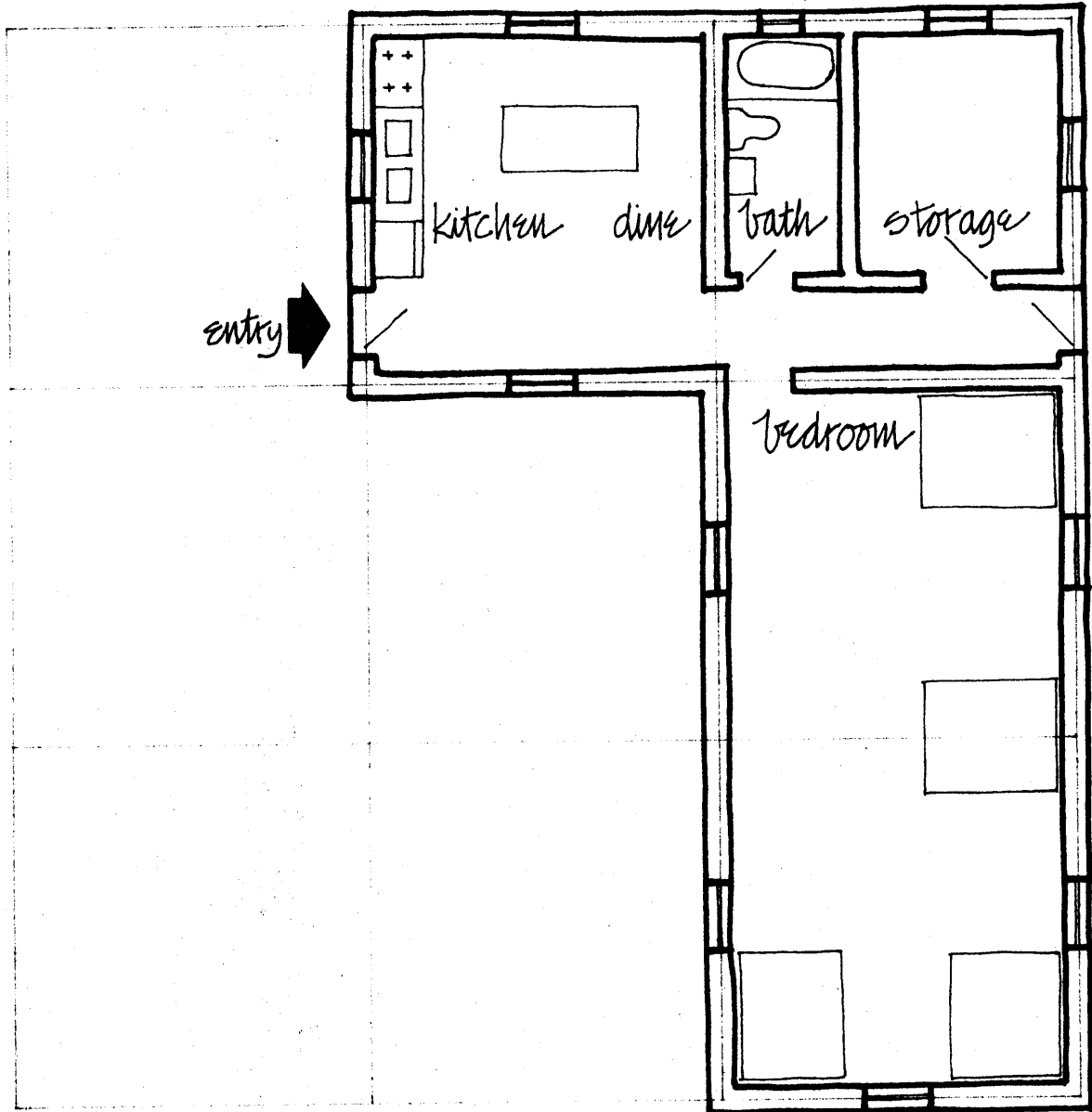
$1/8'' = 1'-0''$

three basic dwelling spaces



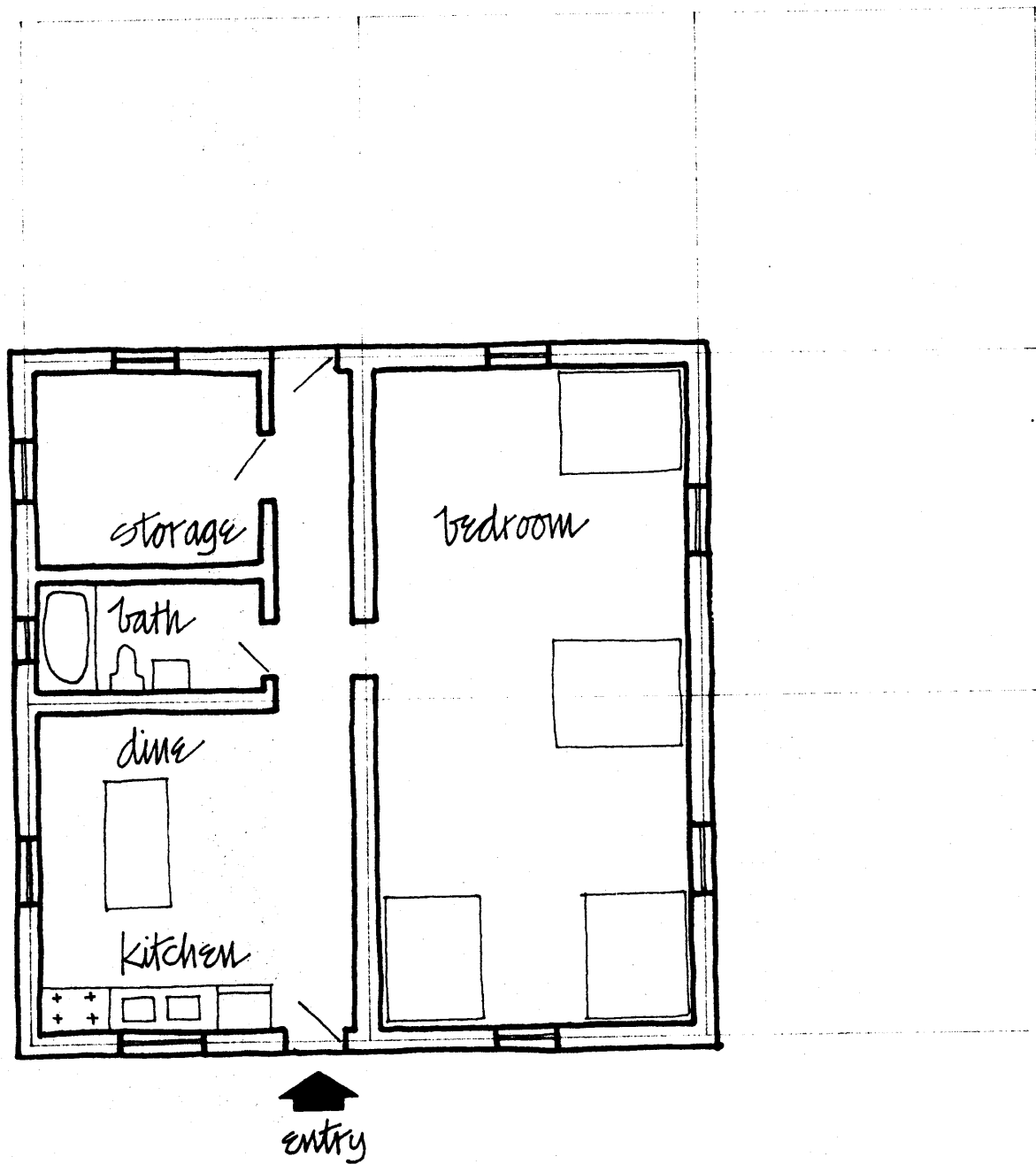
plan F

1/8"=1'-0"



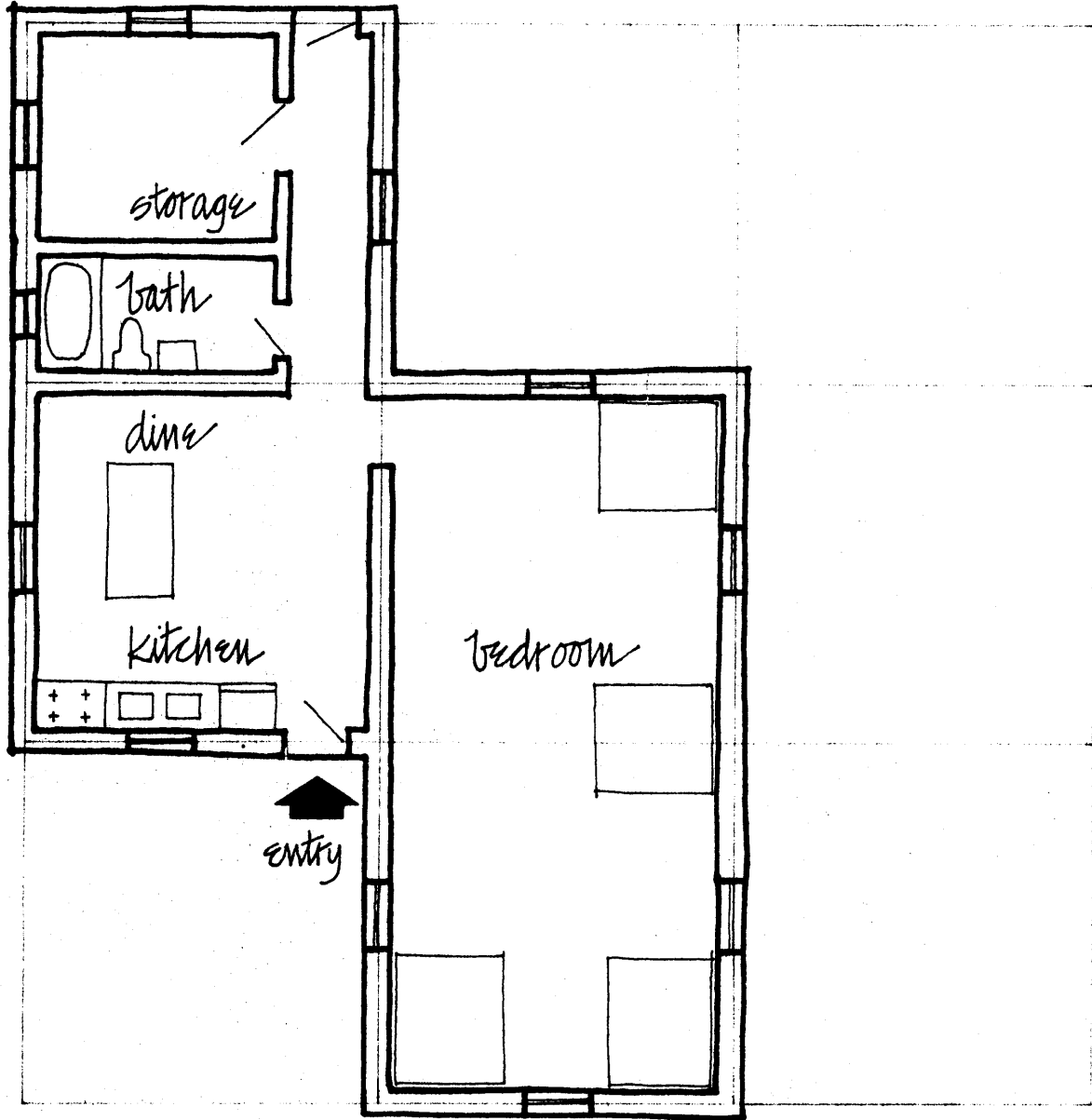
plan G

1/8"=1'-0"



plan H

1/8"=1'-0"



plan 1

1/8"=1'-0"

PART IV: SITE SELECTION

Two sites (refer to maps on the following pages) were chosen for initial development. These two sites satisfied the locational requirements determined earlier in Chapter Two. Both sites are bounded by steep mesas on two sides and occupied farmlands on another.

The sites are located one half mile south of the U.S. Highway 66 -- Acomita access, approximately a quarter of a mile from the existing village of Acomita, and near all existing paved roads and utility lines.

The problem of erosion can be controlled with proper drainage planning but dust may be a problem if roads are not paved or graveled.

Statistical Data of the Two Communities

Site One

Net Acres: 14.8

Number of Dwelling Units: 100

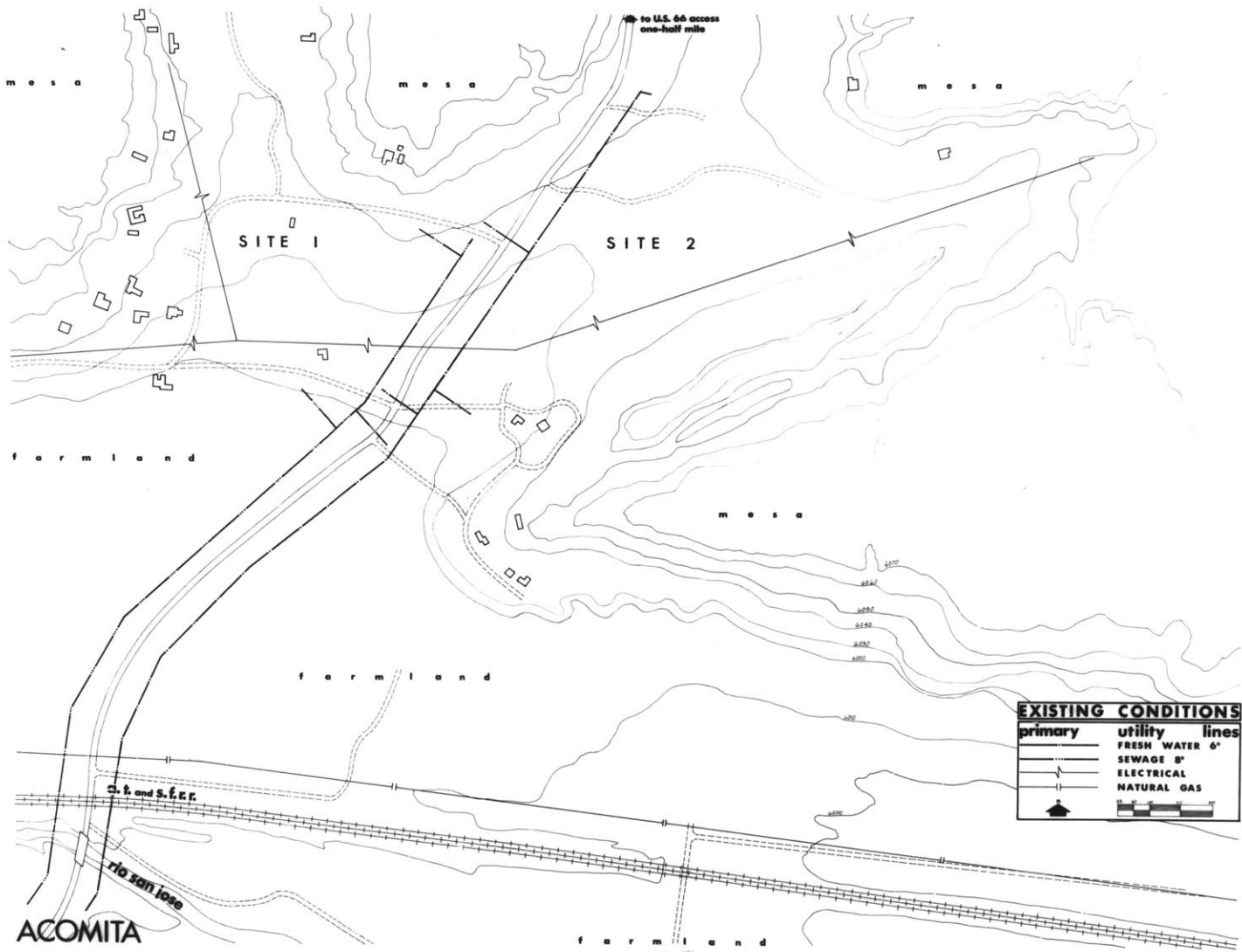
Number of Persons: 800

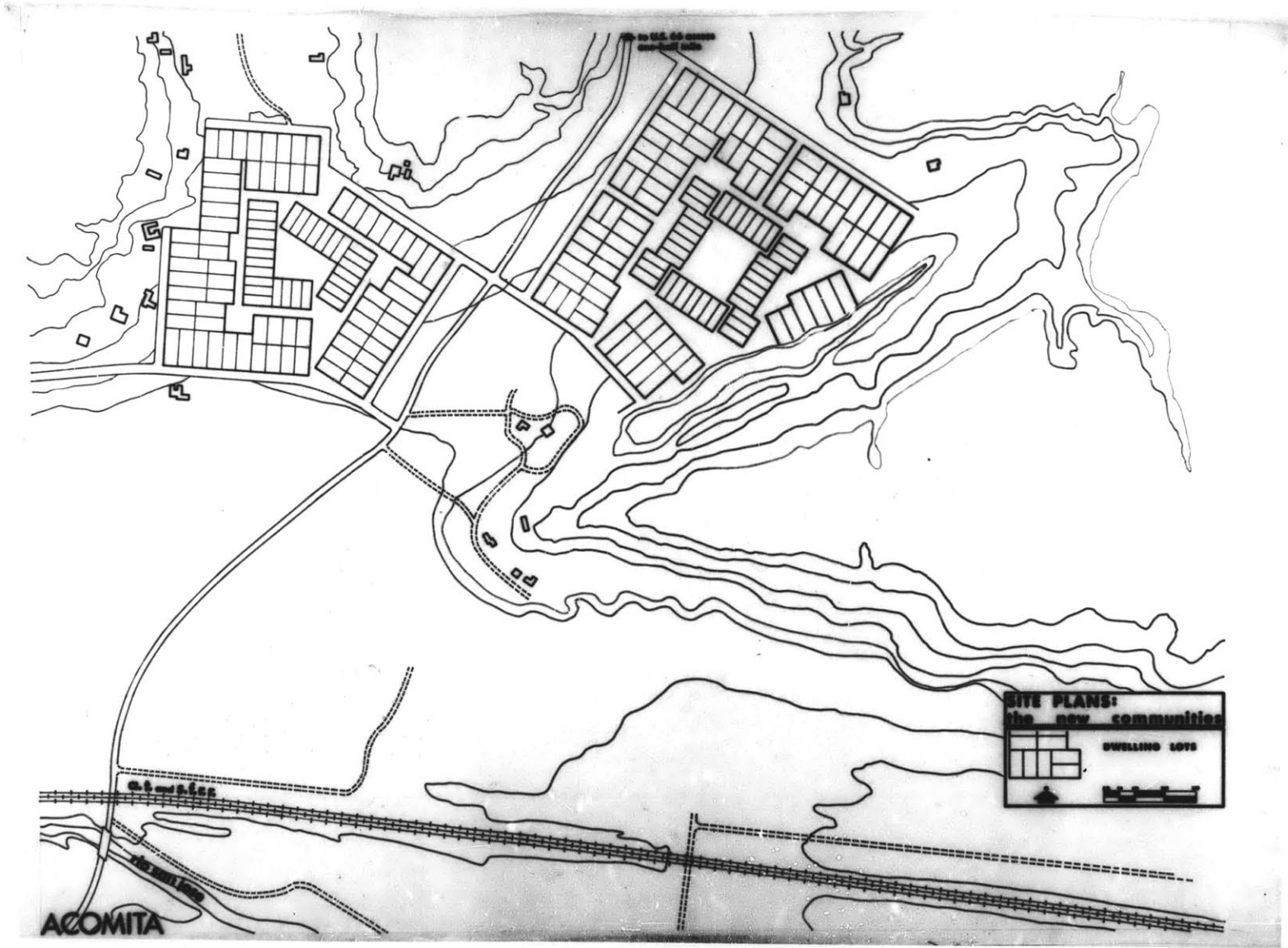
Number of Dwelling Units

Per Net Acre: 6.75

Number of Persons

Per Net Acre: 54





Site Two

Net Acres: 18.4

Number of Dwelling Units: 102

Number of Persons: 816

Number of Dwelling Units

Per Net Acre: 5.5

Number of Persons

Per Net Acre: 44

Both sites

Net Acres: 33.2

Number of Dwelling Units: 202

Number of Persons: 1,616

Number of Dwelling Units

Per Net Acre: 6.07

Number of Persons

Per Net Acre: 48.56

CHAPTER IV

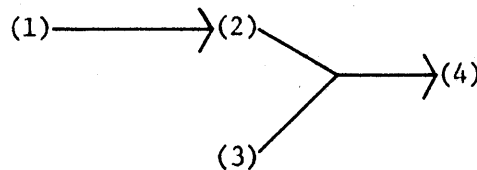
CONCLUDING REMARKS

CHAPTER IV: CONCLUDING REMARKS

In this summary and conclusion I will discuss briefly my thoughts on the following subjects: the study itself, the formulation of the initial concept and conceptual framework, the study's significance to the Acoma people, the possible application of the conceptual framework to other Pueblo Indian communities, the possible application of this study to the Mutual-Help Housing Program, and finally, some problematic areas which I have discovered and require further study.

Although the initial problem seemed small in physical scale, there were many areas which required deep investigation and evaluation. This study has acquainted me not only with regional planning but with the political and social aspects which govern many of the Pueblo Tribes of New Mexico. By performing this exercise a great deal of insight has been gained into all phases of community planning and much of what I have studied here at M.I.T. has become clearly unified.

Essentially the process of planning and design presented in this paper can be characterized by the following sketch:



In this case (1) represented background information required to formulate the conceptual framework (2). This conceptual framework was initially drawn up separate from (3) which was a site. By combining (2) and (3) the possible solution (4) evolved, thus various site conditions may produce a wide range of community designs all based on a single conceptual framework.

The true meaning which may be given to this study will come only when opinions from the Acoma Indians themselves are shared in relation to what has been proposed. What has been proposed in this paper is a bases from which a community may be constructed -- socially and physically. This basic framework requires enlargement and this will come only when the persons for whom it was planned express their thoughts and views about what has been designed for them.

Generally speaking, most of the Pueblo Indian communities are much like the Acoma villages. Although the social and political organizations may vary slightly, the use of the basic framework developed by this study would seem to be applicable to the rest of the Pueblo Indian communities. Planning considerations pertinent to other Pueblo Indian communities and which have already been discussed would be: community organization, clan and kinship relationships, religious organization, and the need to plan for automobile traffic plus utility networks.

Many basic phases of planning and house design are totally ignored by the planners and administrators of the Mutual Help Housing Program. With large scale planning as their main goal, important to their program would be the details of planning and design which have been formulated in this paper.

There exist many more areas of study to be investigated when planning for Pueblo Indian communities. These areas of study will be highly valuable when planning for future communities and dwelling spaces. A few of the subjects in need of further study are: a means for socially organizing the groups who will live in the new community, a means of determining public space types and their use, an investigation into the size of various social gatherings and their space requirements, a means for determining the social impact of a new community upon its inhabitants and also upon a preexisting village, the possibilities of using indigenous house designs and materials in a Mutual Help Housing Program, and a means by which participants in a Mutual Help Housing Program may be given a greater choice in the planning of their homes and communities.

FOOTNOTES

CHAPTER I

¹Anne M. Smith. New Mexico Indians: Economic, Educational, and Social Problems (Santa Fe: Museum of New Mexico, 1966), p. 93.

²U.S. Department of Commerce, Weather Bureau, Local Climatological Data, 1968.

³Fred Eggan. Social Organization of the Western Pueblos. (Chicago: The University of Chicago Press, 1950), pp. 240-247.

⁴Benjamin J. Taylor and Dennis J. O'Connor. "Indian Manpower Resources in the Southwest" (Tempe: Board of Regents of Arizona State University; Tempe, Arizona, 1969), p. 2.

⁵Ibid., 5.

⁶Ibid., 39.

⁷Ibid., 38.

⁸Ibid., 2.

⁹Ibid., 30.

¹⁰Ibid., 50.

¹¹Ibid., 53.

¹²U.S. Department of the Interior, Bureau of Indian Affairs. The Indian Record (November 1967).

BIBLIOGRAPHY

Books

- Abrams, Charles. Man's Struggle for Shelter In An Urbanizing World. Cambridge, Massachusetts: The M.I.T. Press, 1964.
- Brophy, W. A., and Aberle, Sophie D. The Indian, America's Unfinished Business. Norman, Oklahoma: University of Oklahoma Press, 1966.
- Camino, H., Turner, J. C., and Steffian, J. The Urban Dwelling Environments. Cambridge, Massachusetts: The M.I.T. Press, 1969.
- Chermayeff, Serge, and Alexander, Christopher. Community and Privacy. Garden City, New York: Doubleday and Company, Inc., 1963.
- Doxiadis, Constantinos A., Architecture In Transition. New York: The Oxford University Press, 1963.
- Eggan, Fred. Social Organization of the Western Pueblos. Chicago, Illinois: The University of Chicago Press, 1950.
- Hough, H. W. Development of Indian Resources. Denver, Colorado: World Press Inc., 1967.
- McNickle, D'Arcy. The Indian Tribes of the United States: Ethnic and Cultural Survival. London, England: The Oxford University Press, 1962.
- Mead, Margaret. Cultural Patterns and Technical Change. New York, New York: The New American Library, Inc., 1955.
- Sanford, Trent Elwood. The Architecture of the Southwest. New York, New York: W. W. Norton and Company, Inc., 1950.
- Smith, Anne M. New Mexico Indians: Economic, Educational, and Social Problems. Santa Fe, New Mexico: Museum of New Mexico, 1966.

Other References

Acoya, Andrew. "A Design for a High Density Sector at the Pueblo of Laguna; Laguna, New Mexico". Unpublished Bachelor's Thesis, Department of Architecture, University of New Mexico, June 1968.

Kirshner Associates. "Development of Tourist Potential, Acoma Indian Reservation, New Mexico". Published report to the U.S. Department of the Interior.
Published by Kirschner Associates, Management and Economic Consultants, 530 Jefferson Street, N.E., Albuquerque, New Mexico. November 1965.

Organization for Social and Technical Innovation. "Self-Help Housing in the U.S.A.". Published report to the U.S. Department of Housing and Urban Development.
Published by the Organization for Social and Technical Innovation, Inc., 264 Third Street, Cambridge, Massachusetts. June 1969.

Taylor, Benjamin J., and O'Connor, Dennis J. "Indian Manpower Resources in the Southwest". Published report to the U.S. Department of Labor.
Published by the Board of Regents of Arizona State University, Tempe, Arizona. October 1969.