

SPACE SAVING DESIGN FOR SMALL APARTMENTS
IN TAIWAN

By

LAN-LING CHENG
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Thesis Approved:

K. Kay Stewart

Thesis Adviser

Christine J. Salmon

James C. Jones

Norman D. Durhan

Dean of the Graduate College

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CHAPTER I

INTRODUCTION

If one has ever stood on a street in Taipei, he will find only people's heads and tall buildings in his vision. High density population problems have threatened Taiwan for many years. It is getting more and more serious. According to the census of the world population, Taiwan has had the highest population density in the world since 1974. Most of the people in Taiwan are aware that to increase their living space, it will be necessary for others to live in the street. People in Taiwan do not only ask for a shelter to live, but also want to make their small living space comfortable, homey, and pretty. A wave of westernized ideas brought people's living standard up to a higher level. At least, it heightened people's interests in their own living. So the new architects and interior designers in Taiwan spend a lot of time trying to improve the residential situation there. Finding ways to save space and use space efficiently have become most important assignments for the people in Taiwan.

The subtropical and oceanic climate in Taiwan is humid and hot. The average rainfall is 98.5 inches annually, which makes the weather full of moisture almost everyday.¹ In order to resist the destruction of typhoons which come often from the Pacific Ocean, people use heavy

¹C. M. Hsieh, Taiwan-illa Formosa: A Geography in Perspective (Washington, 1964), p. 48.

construction materials to build their houses. Multistory buildings also need to be structurally strong and built on stable foundations. Therefore, big reinforced concrete posts and beams frequently appear in the rooms. Design solutions may need to provide special treatments for those irregular walls.

Because of the shortage of land, multistory apartments are the best idea for gaining more living space in the overcrowded conditions. Therefore, tall residential units have been built on every inch of suitable land in Taiwan. Many single story houses were torn down to make way for new high-rise buildings. Only a few one-story houses have survived in the country. The standard square footage of the apartments, built by the National Housing Department of the Republic of China, varies from 432 square feet to 1,296 square feet. People get low-interest loans from the Taiwan government to buy their own homes. But because of the cost of land and building materials, only a few families could buy the right size homes for comfortable living within their financial resources. A Taiwan housing market report states that the most desirable houses vary from 576 square feet to 864 square feet and the average living space dimension for one person in Taiwan was 133.2 square feet.²

A large number of families in Taiwan have more than five members.³ It is crowded to put five persons in one small apartment for sure. So, the housing designers usually do not put closets in the plans in order to save space for personal arrangements. If there are some closets

²Facts and Figures About Taiwan, Republic of China (Taiwan, 1975), p. 5.

³"Cities and Urban Development," Free China (June, 1977), p. 68.

built in the rooms, they are always small or shallow "reach-in" closets. Obviously, these closets do not provide enough storage for the families' belongings. Unfortunately, there are not many people who know how to arrange space for storing things. Most of the families have not attached shelves to the walls but have bought a lot of cabinets, putting them here and there, making the rooms even more crowded. This is one of the problems that needs to be solved.

The traditional Chinese culture emphasized the virtue of being frugal and saving. So the custom of thrift drove Chinese to collect many small and unimportant things which also created storage problems within the homes. It is important to provide storage space for those collections.

High density living limits the possibility of private personal space. Many families in Taiwan have only one room for two, three, or more children. This room must serve as a bedroom, study, and activity room for those children. No doubt, it needs a good arrangement to make all of the children comfortable and give each child as much privacy as possible.

Another thing which is peculiar to Taiwan is the shape of furniture. Chinese like to use big, round dining tables. They take this shape, round, as a symbol of perfection and cooperation. The round table allows as many persons as possible to sit around it at some distance from the center. Besides, the way Chinese eat is not like western style where everyone gets his share into his own plate before beginning to eat. Chinese eat in the following way: Each member of the family has his own bowl of rice; then, in the center of the table are several dishes of vegetables, meat, fish, or a bowl of soup. If someone wants

meat or vegetables, he helps himself from the center dishes with chopsticks. Thus, it is necessary to seat everybody around the table at the same distance from the food so that everyone has the same opportunity to reach the food. But, round furniture is not easy to fit in the small, square or rectangular rooms because round shapes take up more space than others do. If we put round furniture in a square room, it could cause many dead angles in the corners of the room; especially when a big round table is placed in a small rectangular room. The young children are expected to squeeze in and out of the seats which are behind the tables. Although this is not a very serious problem, it does need to be considered in interior space planning.

There is another interesting aspect of Chinese living in Taiwan that affects the use of space inside the apartments. No matter how Chinese westernize their way of living, they could not neglect their philosophy about respecting ancestors. Not only the old houses in Taiwan have the special areas for ancestor halls, but also new houses provide the spaces for ancestor worship. The ancestor hall is a principal room to set up the family ancestor table, pictures of the ancestors, small statues of various gods or goddesses, and a place to receive offerings, food, and incense. It could also be a place to receive important guests with dignity and formality. Whenever the special days come, the ancestor hall is the place for ceremonies and banquets. But, in recent years, the new houses and apartments have not provided spaces for ancestor halls in order to save more room for living. So people set up their ancestor tables in part of the living room. Some Taiwan people are Christians or other religious groups who are not supposed to worship any statue, but they still keep their ancestor tables

in the most private area of their homes. Thus, finding the best place for the ancestors table in their homes will be a problem for nearly all families in Taiwan.

Since the National Housing Department of the Republic of China was established in July of 1955, tremendous improvements in housing have been made for the benefit and welfare of the Chinese community in Taiwan. The National Housing Department has built thousands of apartments and housing lots in the last few years. In order to contribute to the solution of the housing shortage, it made a plan to build about 144,000 units of housing in the period of 1977 to 1982. But, because of the high cost of the land and construction and the increasing housing demand, almost all of the new apartments are small in size. Therefore, the problems mentioned above remain difficult.

Purpose of the Study

In spite of some attention and research effort, the housing problems in Taiwan have not been greatly improved. The purpose of this study was to analyze the plan for a typical small apartment for government housing in Taiwan and develop ideas for efficient space use and furniture arrangement adapted to the Chinese living customs. The findings of this research may be beneficial to future plans for government housing in Taiwan and to the residents of present and future housing who want to use the space most efficiently. The findings could also be of benefit to homemakers in other countries who have space limitations similar to those in Taiwan.

Further, this study should offer helpful suggestions to housing

builders, interior designers, and people who want to get ideas for improving the living in small rooms.

Objectives

The objectives of this study were as follows:

1. To analyze the space planning of a typical small apartment in Taiwan.
2. To recommend suitable furniture, adapted to the habits and customs of the Chinese people, that best utilizes room space.
3. To suggest ideas for creating personal private spaces in rooms of minimum size.
4. To recommend plans for adequate storage in all rooms of the apartment.
5. To make recommendations for action that could improve space use for families in government housing in Taiwan.

Procedure

The procedure for this study was:

1. To review the literature related to planning for small living spaces.
2. To conduct informal discussion with Chinese students at Oklahoma State University and American homemakers in Stillwater, Oklahoma, about space utilization.
3. To discuss with builders in Taiwan the housing needs and the people's needs and conditions of Taiwan families and to get information about local housing from the National Housing Department of the Republic of China during a return visit to Taiwan in the summer of 1979.

4. Observe the space planning, storage, and use of color in the American homes in Stillwater, Oklahoma.

5. Select a typical small apartment floor plan from Central Public Functionary housing units built by the National Housing Department of the Republic of China in 1972 to 1975.

6. To analyze the plan and suggest the minimum changes that would increase the usability of the space.

7. To develop one or more design solutions for each room (except bathroom) that would maximize space use, provide privacy for the individuals in the household, and consider traditional Chinese living customs.

CHAPTER II

REVIEW OF LITERATURE

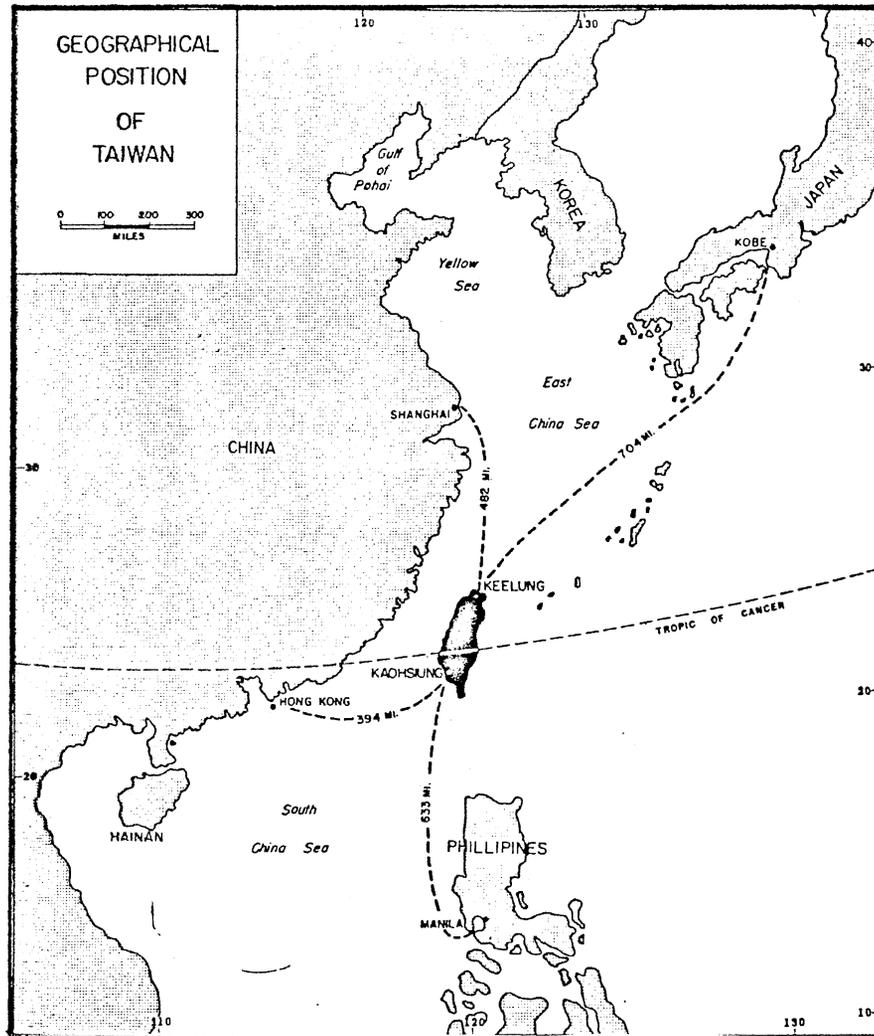
Taiwan, which is also known as Formosa, is an island situated off the southeastern coast of the Chinese mainland (Figure 1). It has an area of 13,884 square miles, which is about one-third the size of the American state of Virginia, and a population of 17,440,000 in 1979.¹ Taiwan is a mountainous island. About two-thirds of the area consists of rugged mountains (Figure 2). Approximately one-third of Taiwan is less than 328 feet in elevation, a little more than one-third is between 328 and 3,280 feet, and the rest is more than 3,280 feet.² Physiographically, Taiwan has three types of surface configuration: mountains, which occupy about 8,886 square miles in area, forming 64 percent of the whole island; plains and basins, 3,332 square miles with 24 percent of the island; and hills and tablelands, 1,666 square miles with 12 percent of the total area.³

As two-thirds of the island is mountainous, one-fourth of the land is arable, and five percent of the land is for urban, industrial, denuded and water areas, only an area which is less than five percent of the land

¹"Taiwan," National Basic Intelligence Factbook (July, 1979), p. 192.

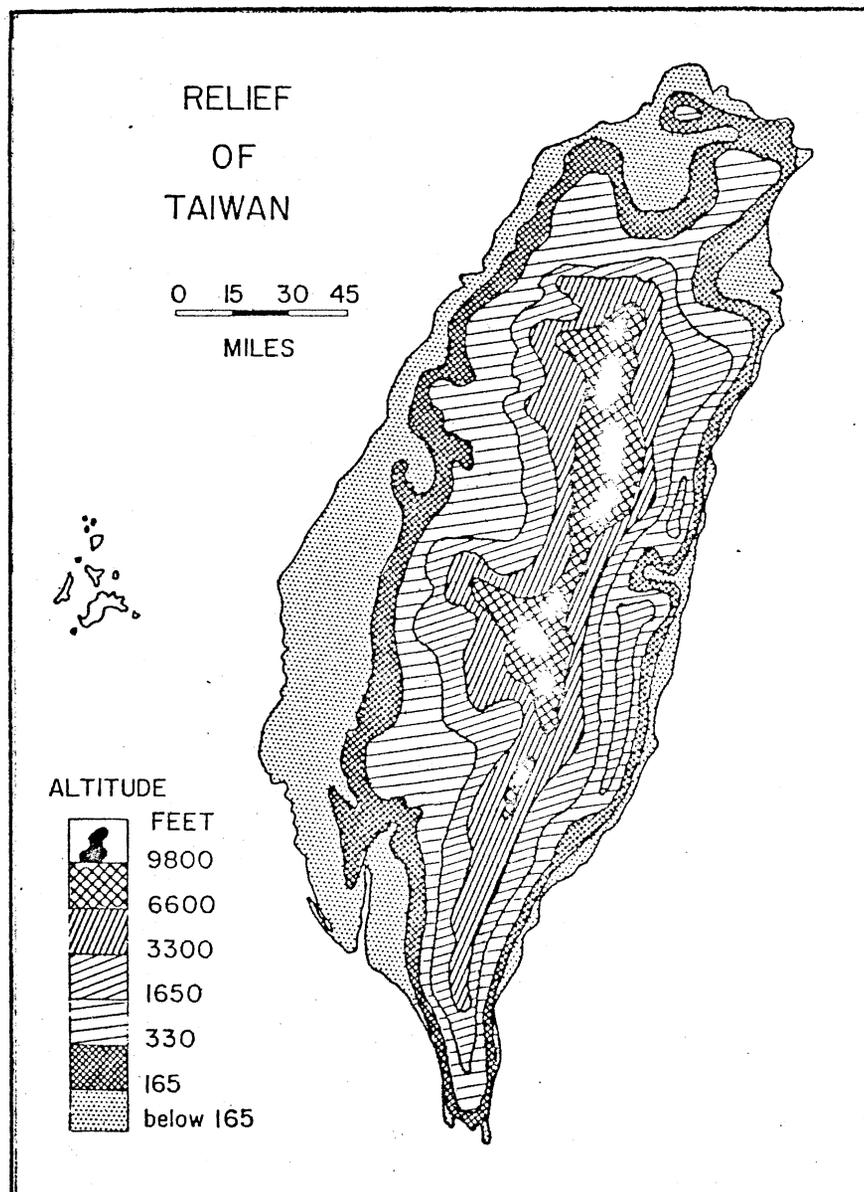
²C. M. Hsieh, Taiwan-illa Formosa: A Geography in Perspective (Washington, 1964), p. 29.

³Ibid., p. 30.



Source: C. M. Hsieh, Taiwan-illa Formosa: A Geography in Perspective (Washington, D. C., 1964), p. 4.

Figure 1. Geographical Position of Taiwan



Source: C. M. Hsieh, Taiwan-illa Formosa: A Geography in Perspective (Washington, D. C., 1964), p. 33.

Figure 2. Relief of Taiwan

can be used for dwellings.⁴ Recognizing that 17,440,000 people live in an area of less than 692 square miles, it is obvious that high population density and a shortage of land are the most serious problems in Taiwan.

The Chinese government tried to solve these problems through such things as teaching people to practice birth control, opening up mountains for cultivation, and developing dwelling areas for establishing housing units. For example, the policy of the National Housing Program is to promote the use of new materials, new manufacturing methods, and new building methods in order to reduce the building cost and speed the construction process. Stability and safety factors, and the maintenance and lifetime of the houses have also been considered since 1955.⁵ But there are still difficulties in high density living which urgently need to be conquered.

Taiwan's climate is characterized by high temperature, heavy rainfall, and strong winds. As Taiwan is an island facing the Pacific Ocean on the east, its climate is influenced considerably by the seasonal monsoon winds. Those seasonal monsoon winds bring abundant rainfall throughout the year. The average rainfall is 98.5 inches.

The occurrence of typhoons also affects the rainfall in Taiwan. The sudden heavy rainfall brought by typhoons makes many rivers flood, destroying houses, damaging crops, and even causing injury to persons. In Taiwan, hardly a year passes without the occurrence of a typhoon.

⁴"Taiwan," National Basic Intelligence Factbook (July, 1979), p. 192.

⁵Asia and the Far East Seminar on Housing Through Non-Profit Organizations (New York, 1958), p. 46.

On the average, two typhoons strike this island annually.⁶ So the air is full of dampness and the relative humidity averages between 75 and 80 percent annually in Taiwan.⁷

Except for the typhoons, earthquakes are the most destructive natural force. About twice a year an earthquake can be felt over the entire island. During the 50-year period from 1895 to 1945, Taiwan suffered nearly 8,000 shocks, averaging 160 a year.⁸ Most of them, however, were small and local.

In order to prevent the destruction from heavy rain, the old houses in Taiwan were built by double-deck materials. For instance, they used sun-dried mud bricks covered with rectangular tiles for walls (Figure 3) and stones for floors. Some old houses have mud walls with bamboo woven inside the walls to reinforce them. Presently, the new houses in Taiwan are built of concrete, bricks, steel bars, and some other strong materials for the same reason--to protect houses from the strikes of typhoons, heavy rainfall, and earthquakes.

Taiwan is the most densely populated country in the world. According to the report of the government of Taiwan, the annual birth rate was 23.4 per 1,000 population; the annual death rate was 4.3 per 1,000 population in 1977. The annual growth rate was 19.1 per 1,000 population; that means Taiwan gained 320,000 population in the year 1977.⁹ The growth rate of Taiwan has been very rapid. The total population of

⁶The data recorded by the Weather Bureau of Taiwan.

⁷Ibid.

⁸Fifty-One Years of Statistical Abstracts in Taiwan (Taipei, 1946).

⁹National Condition: A Brief Graphic Review (Taipei, 1977), p. 4.

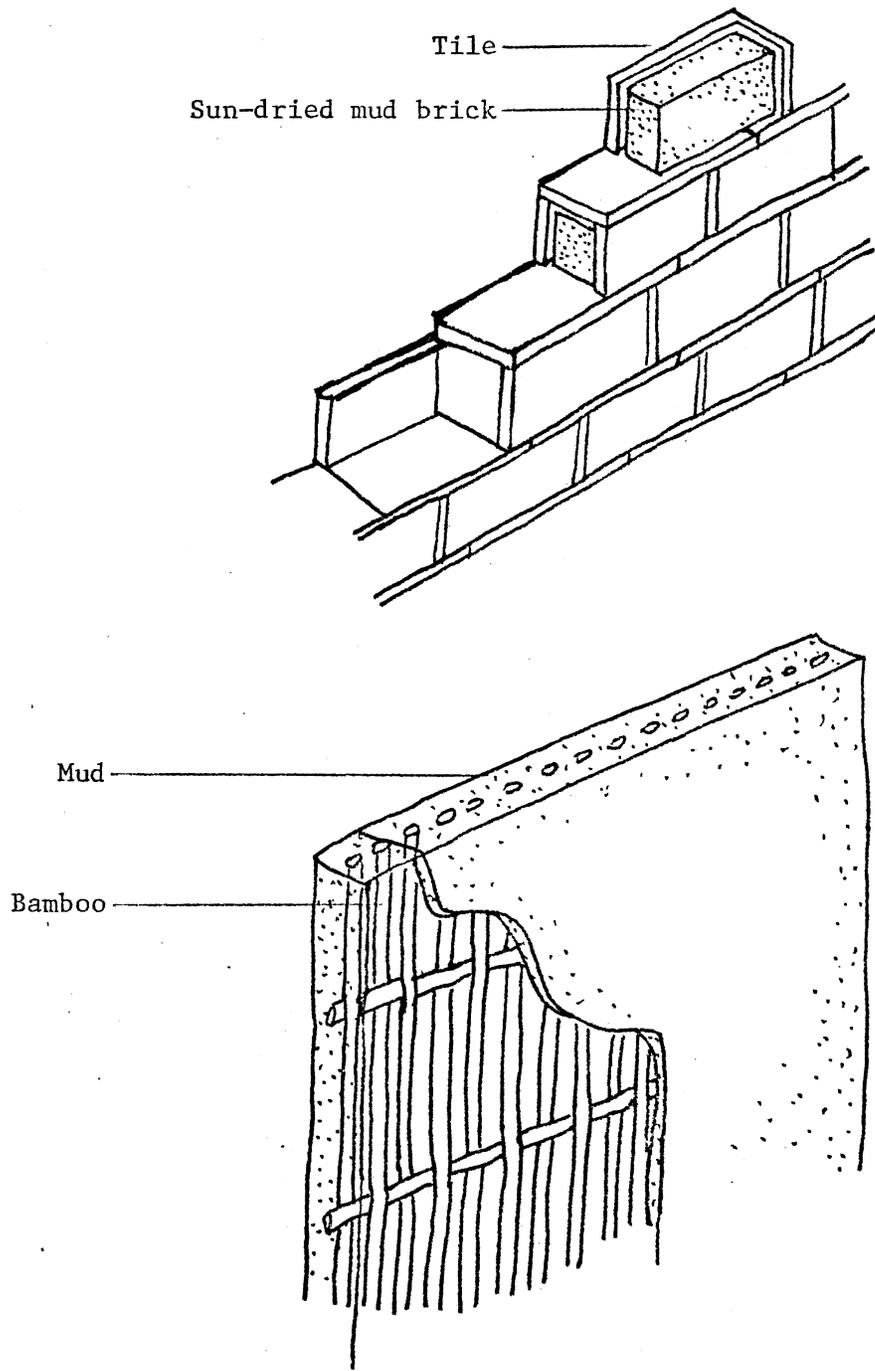


Figure 3. Double-Deck Wall and Mud Wall

Taiwan in 1950 was estimated as 8 million; in 1960, 11 million; in 1970, 14 million; and by 1980, more than 17 million.¹⁰ Chinese tradition places a high value on having many children. As a Chinese proverb says, among offenses against filial piety, to be without children is the most serious. Contraceptive practices are not popular and are hard to promote in Taiwan. Therefore, the large-family tradition and little use of contraceptives keep the fertility rate of Taiwan high.

In addition, the distribution of the population in Taiwan is uneven. This is related to the physical condition of the island. The heavy rainfall and the high mountainous regions in the central part of Taiwan are the most lightly populated areas. The area of western coastal plains occupies about 22 percent of the total area of Taiwan, about 3,000 square miles, but has about 66 percent of the total population of Taiwan.¹¹ In the Chinese capital city, Taipei, there is a population density of more than 260,000 persons per square mile in the northeast part and southeast part.¹² So, the population density problem is even more serious than is shown in the census of population data.

The houses in Taiwan can be categorized into many types (such as modern, traditional, Japanese, Dutch, Spanish, and some combinations). But the influence from other cultures over the settlements was slight. The present features of the houses show only the Chinese influence. So, only Chinese traditional houses could be seen except for newly

¹⁰ World Population (Washington, D. C., 1977), pp. 156-157.

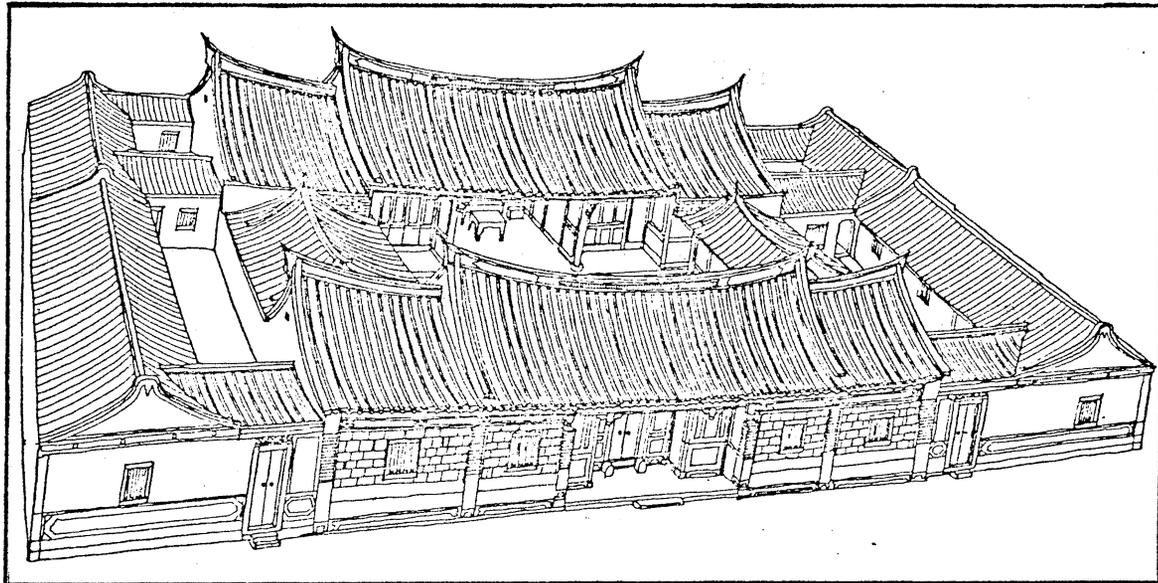
¹¹ Hsieh, p. 209.

¹² Ibid., p. 235.

constructed buildings. In order to understand the old houses in Taiwan, it is necessary to know the basic form of the typical Chinese house. The basic form of the Chinese house in Taiwan is a walled enclosure surrounding several smaller buildings which in turn surround one or more courtyards (Figure 4). Generally, a rural house consists of three units, a main building and two side buildings, arranged around a central courtyard (Figure 5). The windows are narrow and the doors are hinged. An urban house usually has two stories. It consists of a front building and one or two parallel additional buildings behind the front one, separated by a courtyard. Most buildings combine both residential and commercial functions; a shop occupies the front, and the family lives either in the back building or in the room over the shop (Figure 6).

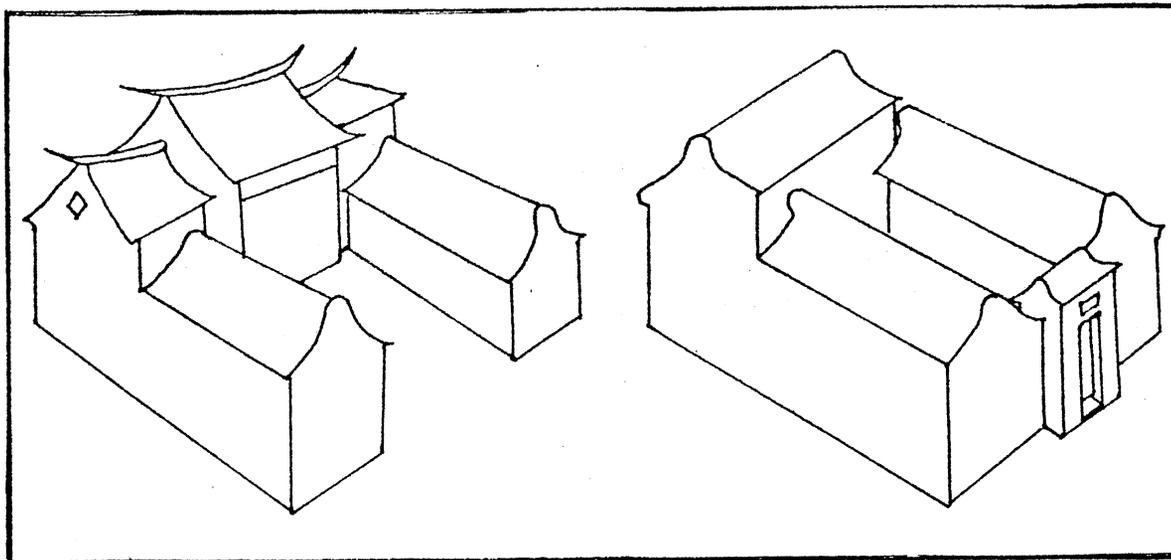
Although the whole house unit occupies a big area, the space of each room in it is small. Because the Chinese philosophy of living emphasizes the family and respect for brotherhood, the large house is probably most often conceived as a symbol of the family and its strength. Thus, the houses are usually built for four or five generations to live together. Each small family of the younger generations lives in one of the side buildings of the house. The central building, facing out into the court, contains an ancestor hall in the middle chamber. The elders live in the rooms at either side of the central building.

In the recent years, because of urbanization, households in the cities have become smaller and more independent. Many urban households are made up of only two generations--parents and children. The average size of the urban household is 5.4 persons compared with the general



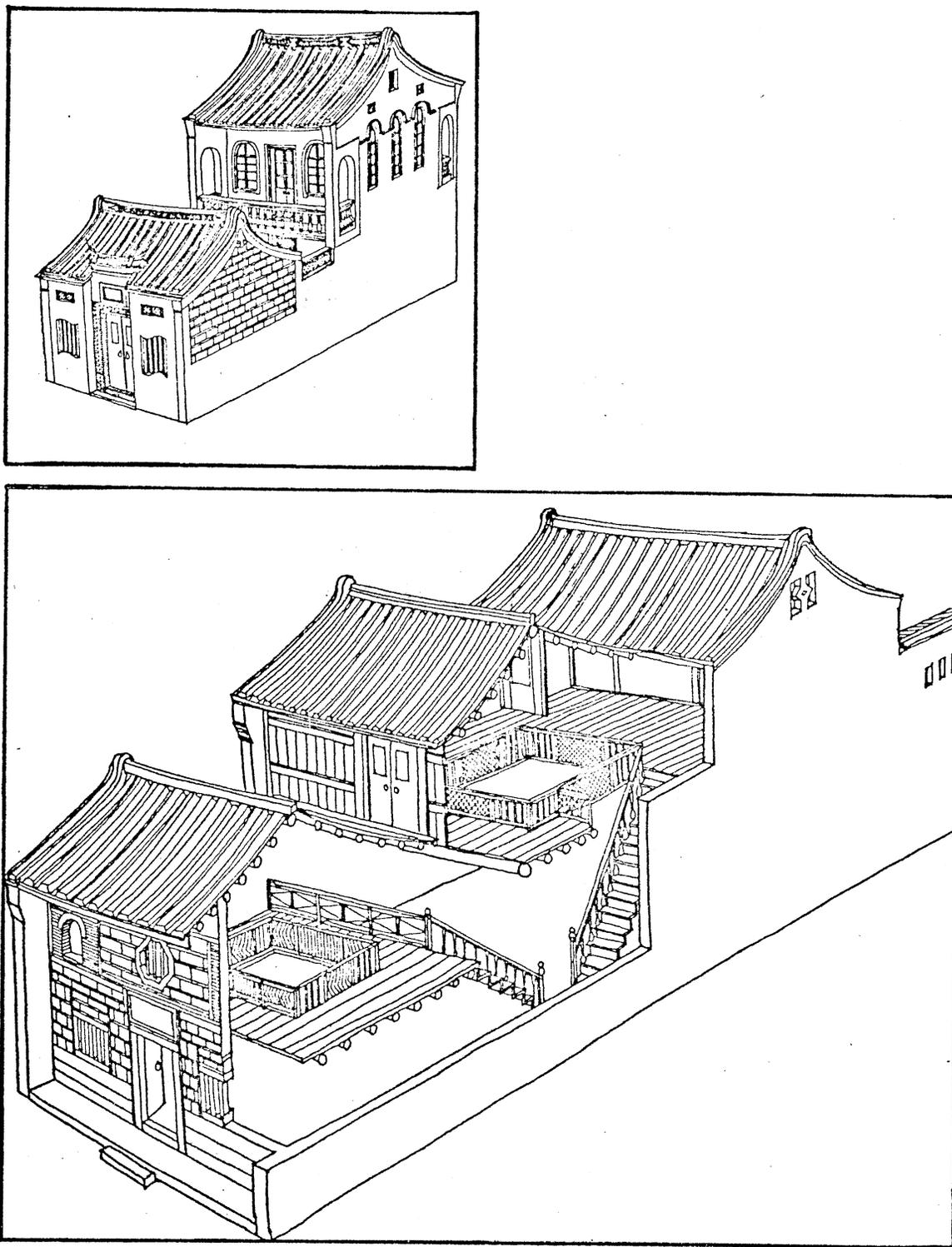
Source: R. Dillingham and C. L. Dillingham, A Survey of Traditional Architecture in Taiwan (Taiwan, 1971), p. 49.

Figure 4. A Large Farm House for Lin Family in Taipei



Source: "Way of Life," Questions and Answers About the Republic of China (July, 1977), p. 14.

Figure 5. Two Types of Chinese Rural Houses in Taiwan



Source: C. H. Lee, A History of Taiwan Architecture (Taipei, 1979), p. 190.

Figure 6. Two Types of Old Chinese Urban Houses in Taiwan

rural average of 6.9.¹³

In order to solve the housing shortage in either urban or rural areas, the National Housing Department of the Republic of China has built thousands of multi-story housing units and high-rise apartments for the people in Taiwan. In a housing market report of the Taipei Municipal Housing Department in 1975, there were 29,844 applicants for the new houses from the government; while in that area, the eastern part of Taipei, only 1,000 new houses were built. It showed a tremendous shortage of housing.

The growth of population is a very important factor affecting the number of families in need of housing. But the changing distribution of population, as represented in rates of urbanization, has perhaps a greater impact on the need for housing in Taiwan. The spatial distribution of the population within an individual community also has an extremely important influence on Taiwan's housing needs. The high density in urban communities is related to high densities within individual dwelling units as well.

The average living space dimension for one person in Taiwan was 133.2 square feet in 1975. Meanwhile, Taipei, the main commercial and political center of the Republic of China, had only 71.2 square feet of living space for each person. This condition has not improved much recently. The standard areas of the house and apartments built by the National Housing Department were in various sizes: 432, 576, 648, 720, 864, 1,000, and 1,296 square feet. Applicants for the houses should report how many persons are in their families. Then, the government

¹³Facts and Figures About Taiwan, Republic of China (Republic of China, 1978), p. 8.

sells them the right sizes of houses according to the sizes of their families. Each person in the family could get four "ping" of room space. One ping equals 36 square feet. That means one person could have 144 square feet of space to live in. But this rule is only the "ideal space" for the better living and it is also a way to prevent the rich people from buying too many living spaces while others have no chance to get even the minimum space for living. This is one of the improvements the Taiwan government has made in dealing with the housing problems. Taiwan families frequently buy much less than the "ideal space" of 144 square feet per person. The more space one family gets, the more bills they have to pay. People in Taiwan usually do not have a high income to cover this big expense. So the families often apply for smaller size houses to save money. The government of the Republic of China knows people's financial difficulties. Thus, they allow the applicants to apply for houses that are smaller than the size they need. But no applicant can apply for a house which is larger than the house he should get. According to a 1978 report, 89.93 percent of the people in Taiwan are living in the houses which have even less than four pings of space for each person in the family.¹⁴

The average size of the household in Taiwan is 6.1. In Taipei, the average size of the household is 5.14 while the average dimension of the house is 310.9 square feet. Actually, 24.97 percent of the people in Taiwan are living in the overcrowded spaces where the average living space dimension for one person is only 45.7 square feet.¹⁵

¹⁴The Annual Report of Taipei Municipal Housing Department (Republic of China, 1978), p. 44.

¹⁵Ibid.

It shows the urban population of Taiwan is in serious density living conditions. The density is reason for concern as Lou said in Asian Folklore and Social Life Monographs:

Although the various housing conditions have no apparent effect on patterns of husband-wife interaction, densities have a clear impact upon parent-child relationships. Parents in high-density housing evidently do not discourage their children from leaving the house, thereby temporarily relieving the high densities. But this solution to high densities tends to reduce the parents' knowledge of and control over their children. High density housing also discourages interaction and friendship practices among neighbors and friends. . . . High densities also affect two superficial manifestations of emotional strain: worry and unhappiness.¹⁶

There are also two strong moral feelings about high densities both within dwelling units and in the community at large. For example, Veiller, author of the first New York Tenement Housing Act, said:

Room overcrowding is bound up with another social problem; namely, the lodger evil. It is fraught with great danger to the social fabric of the country. It means the undermining of family life; often breaking down of domestic standards. It frequently leads to the downfall and subsequent degraded career of young women, to grave immoralities--in a word, to the profanation of the home.¹⁷

Therefore, it is very important to find some solutions for these high density housing problems. It is necessary not only to pay attention to efficient use of space through good arrangement, but also to keep an eye on creating individual privacy within the dense dwelling units. The land can be limited, but the ideas of freshness can never be ended.

¹⁶T. K. Lou, Asian Folklore and Social Life Monographs (Taiwan, 1971), p. 232.

¹⁷L. Veiller, Grad (New York, 1970), p. 43.

Actually, not just people in Taiwan are experiencing space pressure in their living. Almost all the countries in Far East Asia have this problem too. Table I shows evidence of space shortage problems in the big cities of the countries in Far East Asia.

TABLE I
DENSITIES WITHIN DWELLING UNITS IN CITIES OF ASIA

Cities	Median Square Feet	Median Square Feet per Person
Hong Kong	400	43
Bangkok	678	84
Taipei	720	96
Singapore	837	111
Malaysian cities	1,100	135

Source: T. K. Lou, Asian Folklore and Social Life Monographs (Taiwan, 1971), p. 54.

In western countries standard area for six persons is 900 to 950 square feet for living.¹⁸ In Taipei, it is very hard to meet this standard where an area of 720 square feet has to be shared with 7.5 persons. Hong Kong has the worst condition; a 400 square foot space has to house 9.3 persons.

¹⁸R. Jensen, High Density Living (New York, 1966), pp. 17-18.

But the facts here do not relate only to space shortage. Rather, the increasing costs of living are driving the world to reduce the living space in future years, too. As Baldrige said in Home:

As population expands and the cost of living escalates, more and more people are destined to make do with less and less space, regardless of their economic status. Also, the more affluent the middle class becomes, the more closet, drawer, and shelf space they will require. Increases possessions and leisure-time paraphernalia create a monstrous storage problem.¹⁹

Liman expressed a similar point of view:

Today the problems and solutions are similar. Building materials still determine the shape of space, double-decker living is a popular space stretcher, and areas of a home are allocated according to private and public needs. But the quality and quota of space available for a family are determined not so much by limitations of technology as by cost--and these costs will undoubtedly grow bigger even as rooms and closets grow smaller. . . . In these days of small rooms and high construction costs it is not only the closet but also the bedroom, dining room, living room, and kitchen (or lack of them) that pose problems for home and apartment dwellers alike.²⁰

So, saving space within individual dwelling units may become a world trend.

¹⁹L. Baldrige, Home (New York, 1972), p. 27.

²⁰E. Liman, The Spacemaker Book (New York, 1977), p. 8.

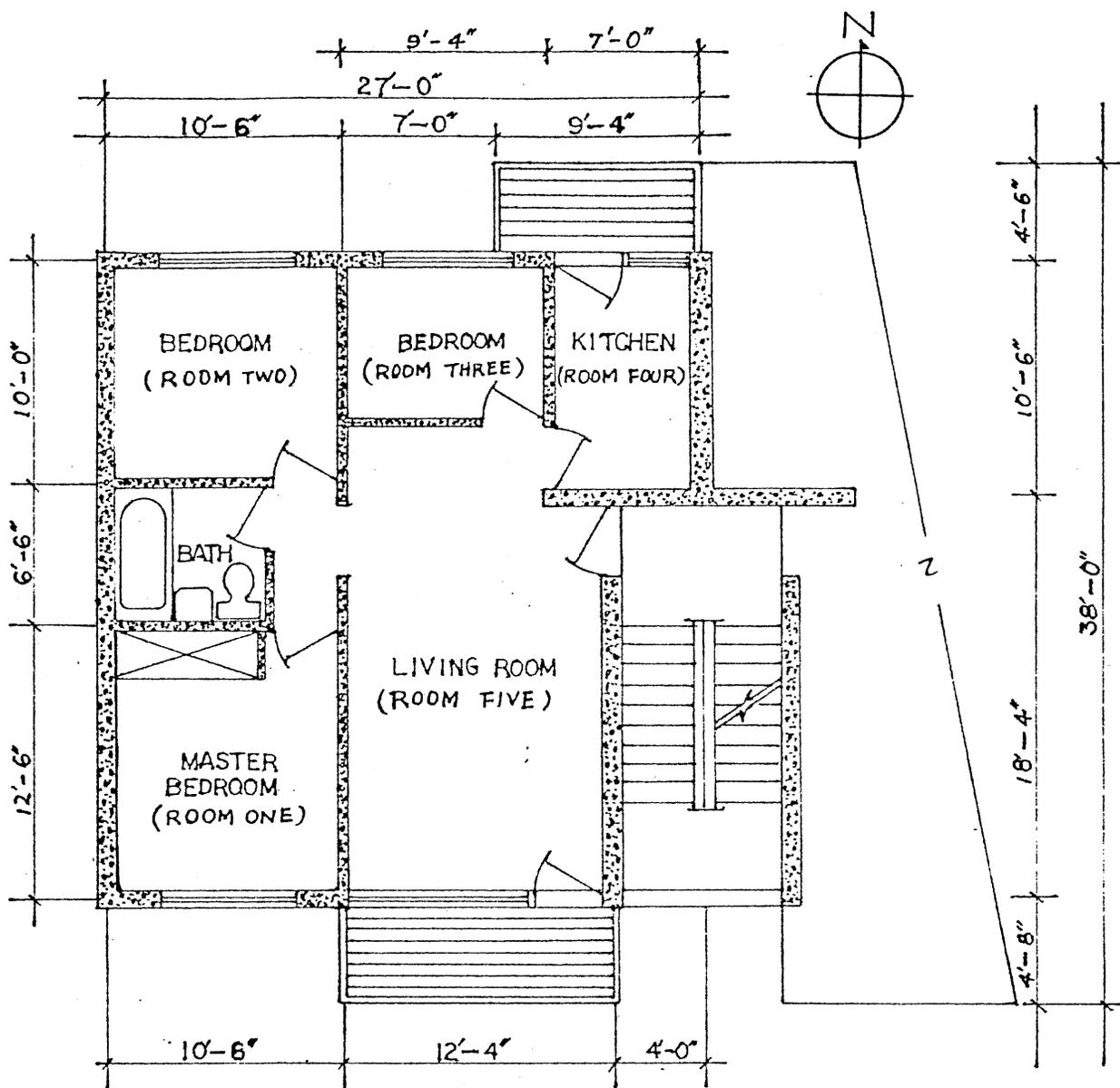
CHAPTER III

A SELECTED APARTMENT

Central Public Functional housing units, also called "Shuang-Shi" apartments, were built by the National Housing Department of the Republic of China in 1972 to 1975. There are 1,067 units which are supposed to house more than 5,000 people. These units were built only for the government employees. The government employees in Taiwan ususally do not receive very high incomes. If the government does not contribute to housing in some way, the employees may never be able to buy their own houses. So, the Taiwan government has built 5,000 housing units each year for the government employees since 1974. The government sells these housing units to its employees by making very low interest loans. The price of the apartments that the Taiwan government built for its employees is only one-fourth of the price for the same level housing unit in the commercial housing market. For instance, a 720 square foot dwelling in Shuang-Shi apartments costs only 5,897 United States dollars.¹ In fact, this low price housing supply is a kind of social welfare which Taiwan government offers to its employees.

The floor plan (Figure 7) of the Shuang-Shi apartments is a 720 foot dwelling unit. As far as Taiwan government was concerned, it

¹R. J. Sha, "Housing for Public Servants," Living in Taiwan (June, 1977), p. 22.



Scale: $1/8" = 1' 0"$

Figure 7. The Floor Plan of a 720 Square Foot Dwelling Unit in Shuang-Shi Apartments

should be a home for a five persons family. But through the survey in the Police office of this area, the detail records of the residents in these housing units showed the average number per unit in these apartments is 6.1 persons. That means there are at least five persons living in this apartment, maybe six or seven, too.

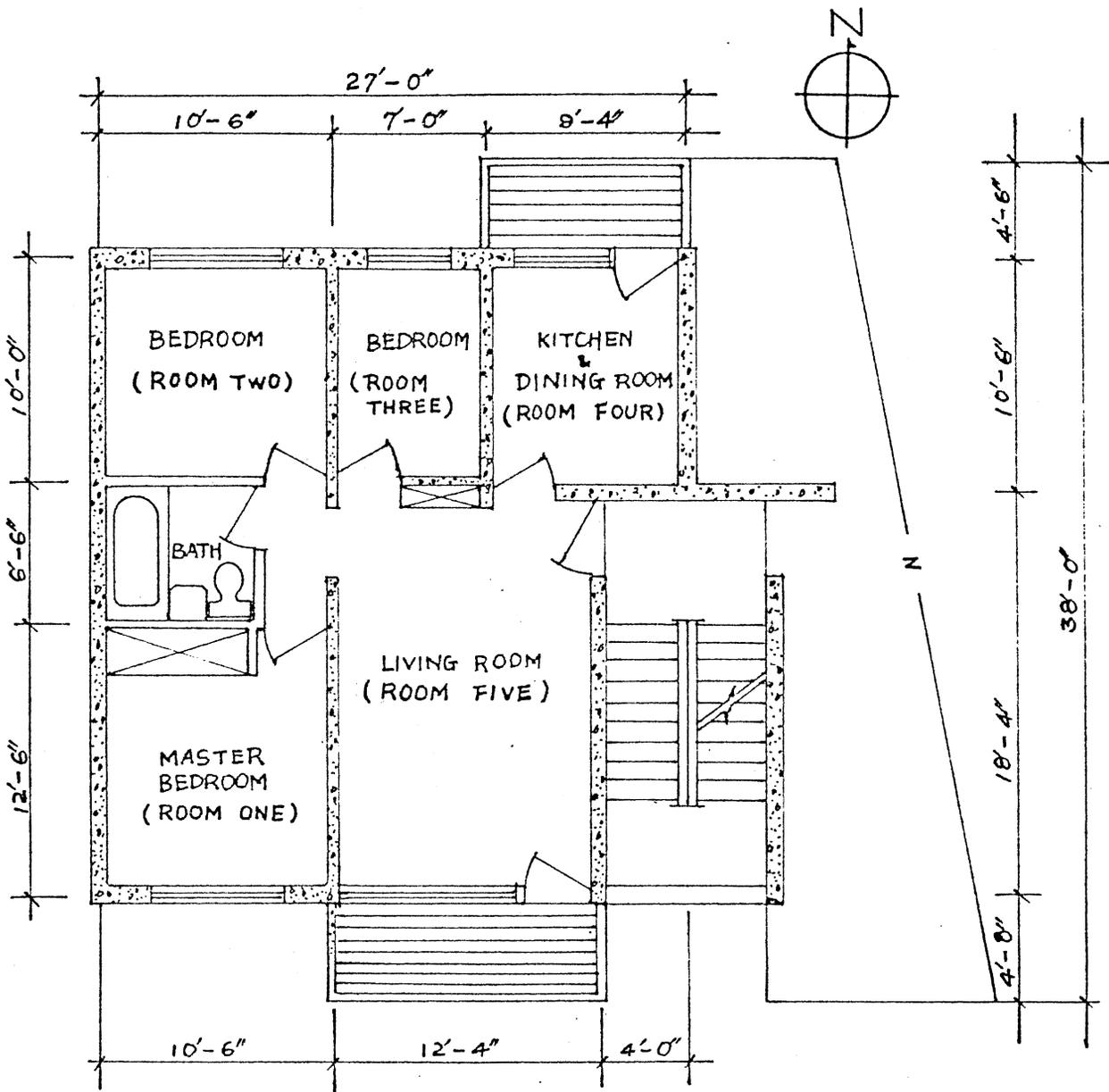
So this study will begin with the discussion of the floor plan and suggestions for minimal structural changes to improve space utilization. After the suggestions have been made on the floor plan of this apartment in the Shuang-Shi apartments, the further suggestions will be brought out to satisfy the purposes mentioned in the first chapter of this study.

Discussion of the Floor Plan

This 720 square foot area does not include the two balconies at the front and the back of the units. The schematic diagram of this apartment (shown in Figure 7) is acceptable except that the space allowed for dining is located in the traffic pattern from the kitchen to the bedrooms and bath. Actually, this floor plan neglects the importance of the dining area. As shown in Figure 7, the plan could cause great inconvenience if the dining room were used for all meals. It is better to divide the space differently to create a new dining area within the kitchen. The back balcony spans from the kitchen to the third bedroom, so it may be better to move the partition wall between the third bedroom and kitchen. By moving the wall 2' 4" to the west it would be aligned with the edge of the back balcony. Then, the south wall of the third bedroom could be moved to the south by 2' 4". Thus, the kitchen dimension will be enlarged without altering the dimension of the third

bedroom (Figure 8). The family can have daily meals in the kitchen instead of dining in the center of traffic. If they have guests, they could set up a big folding table in the living room to serve the occasional big feasts. In order to save space in a crowded area, folding furniture is the most efficient furniture they could use. Also, the Chinese wooden stools are good for saving space, because these stools could be stored under the dining table after using.

There is a one foot by four feet space in front of the third bedroom facing the living room (Figure 9). This space can be used for the placement of the ancestor table. Chinese have a traditional custom: they feel that the ancestor table should be placed in the center of the house and should be the focus of the family. As mentioned in Chapter I, the ancestor table is the place to put their ancestors' pictures, offerings, and incense. It is always long, narrow, and high. Actually, the Chinese ancestor table looks like a single carved wooden shelf. On the important ceremony days, a narrow shelf is not enough for holding a large number of sacrificial articles, so they often set up a spare table in front of that ancestor table for additional space. This spare table could be a folding table so it can be stored under the ancestor table. In case it is needed, it could be taken out easily. Meanwhile, it could be the dining table for the feasts, too. For those Christians or other religious groups who need a confidential place to keep their ancestor tables, they can still use this four square foot space by putting a decorative screen or partition in front of it (Figure 10). Thus, this small space satisfies the demands of saving space and adapting Chinese living custom at the same time.



Scale: 1/8" = 1' 0"

Figure 8. The Redesigned Floor Plan of Figure 7

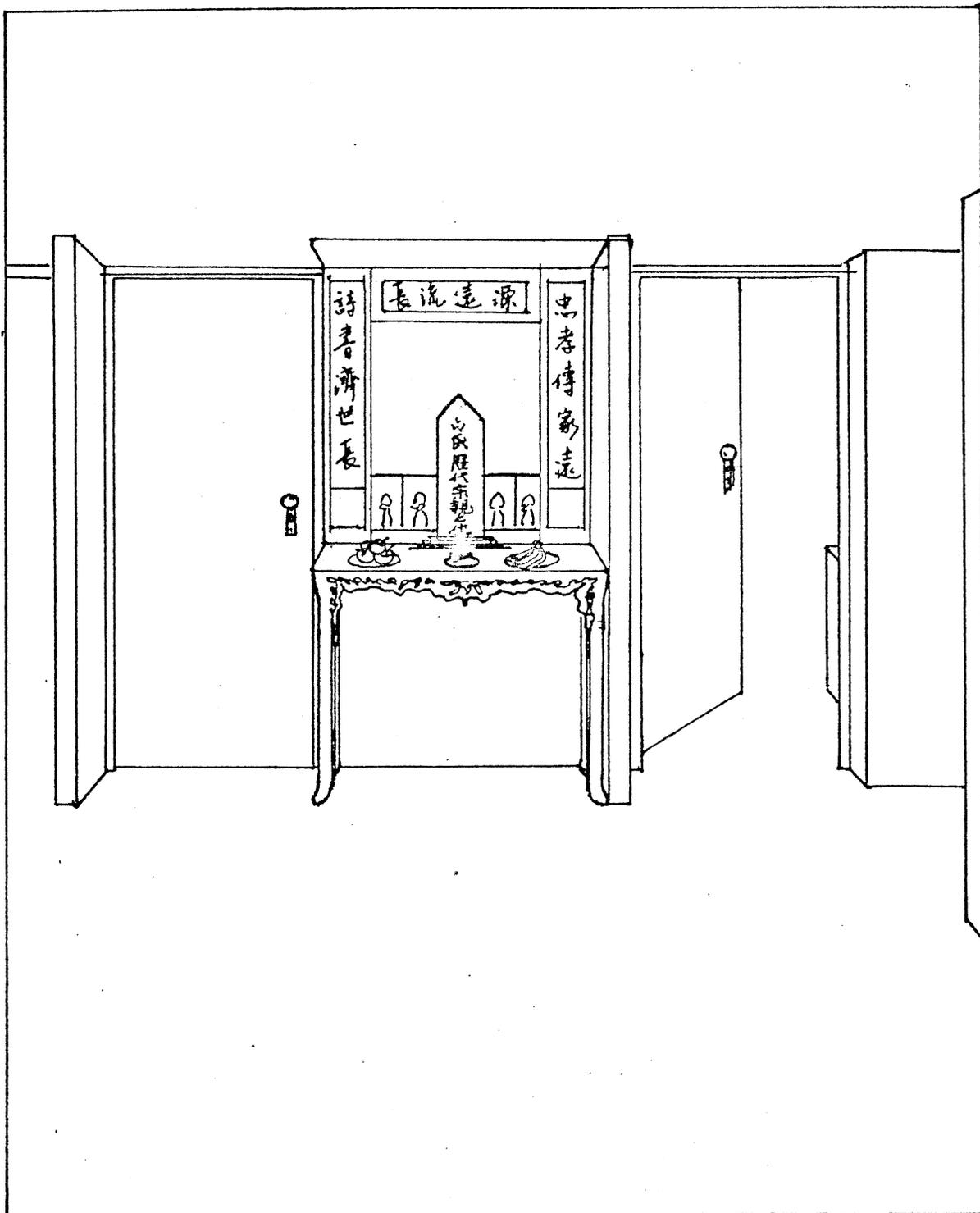


Figure 9. The Chinese Ancestor Table in a Living Room of Shuang-Shi Apartments

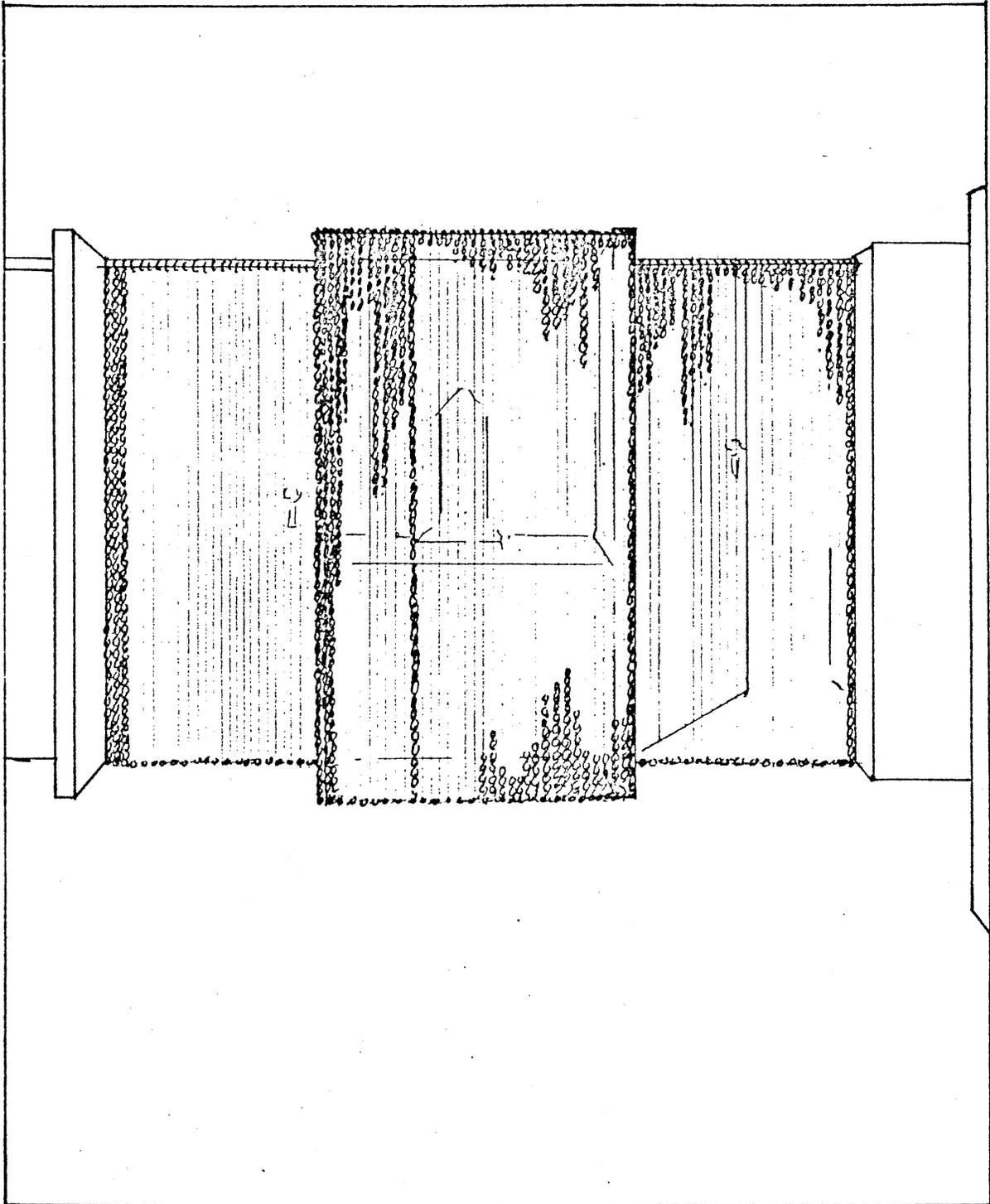


Figure 10. A View of the Screened-Off Ancestor Table from the Living Room

Taiwan has very good potential in the interior design field. Labor is plentiful and cheap and high quality craftsmanship is available in Taiwan. Furniture can be manufactured into the certain styles as customers direct. Fabrics can be woven to order; metal work for decorations is available everywhere. This enables the interior designers in Taiwan to feel free to put their own ideas in the design without worrying about the sources for the certain type furniture or extra expenses.

CHAPTER IV

PROPOSED SOLUTIONS

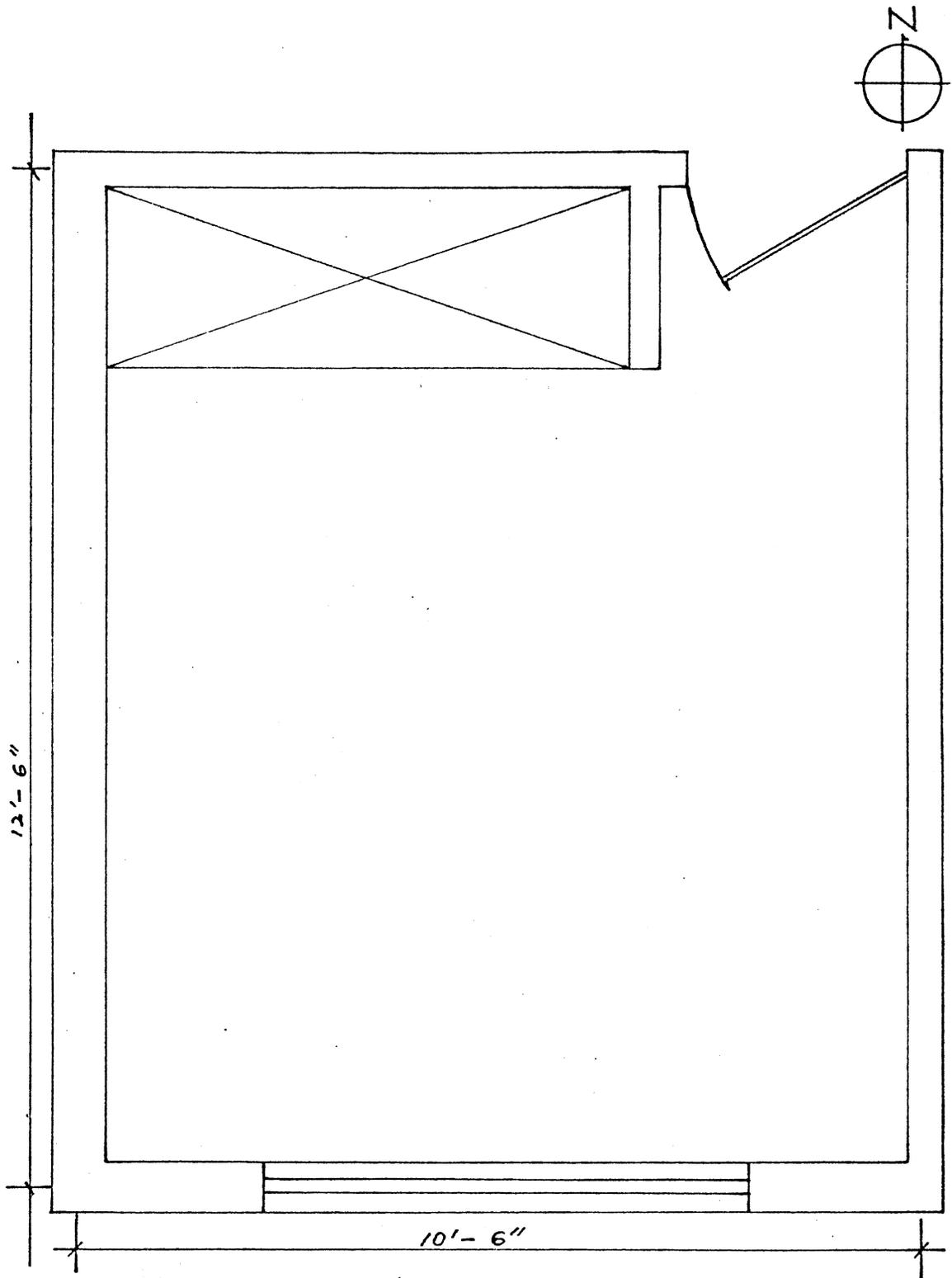
In this chapter, suggestions are submitted for alternative ways to furnish the rooms of Shuang-Shi apartments to make maximum use of the space. These suggestions contain consideration for individual privacy and adaptation to the circumstances in Taiwan.

In this dwelling unit from Shuang-Shi apartment, the use of specially designed furniture can save considerable space; one might also use built-in furniture which needs labor to install it. But these approaches to design are realistic alternatives as labor and craftsmanship are readily available in Taiwan.

The following sections present solutions for the different rooms in the apartment. At least two alternative plans are presented for each bedroom and one plan for kitchen and living room.

Room One: Master Bedroom

This is a 12' 6" x 10' 8" master bedroom of this apartment (Figure 11). In this room, a reach-in closet is built at the north side beside the door. The floor of the reach-in closet is 2" higher than the floor of the room so that dust will not seep in easily. This closet also has a full-front opening with sliding doors which allow more use of space in front of the closet. Basically, this reach-in closet is of good size. The closet space is arranged to include drawers, shelves, and



Scale: 1/2" = 1' 0"

Figure 11. Room One: Master Bedroom of Shuang-Shi Apartment

bars for hanging garments. This closet does not extend to the ceiling, so remodeling it to open the upper space would enlarge the closet and give more room for storage. Thus, the upper part of the closet could be used for storage, the middle part for clothes, and the bottom of the closet could have some drawers for bedding or other items.

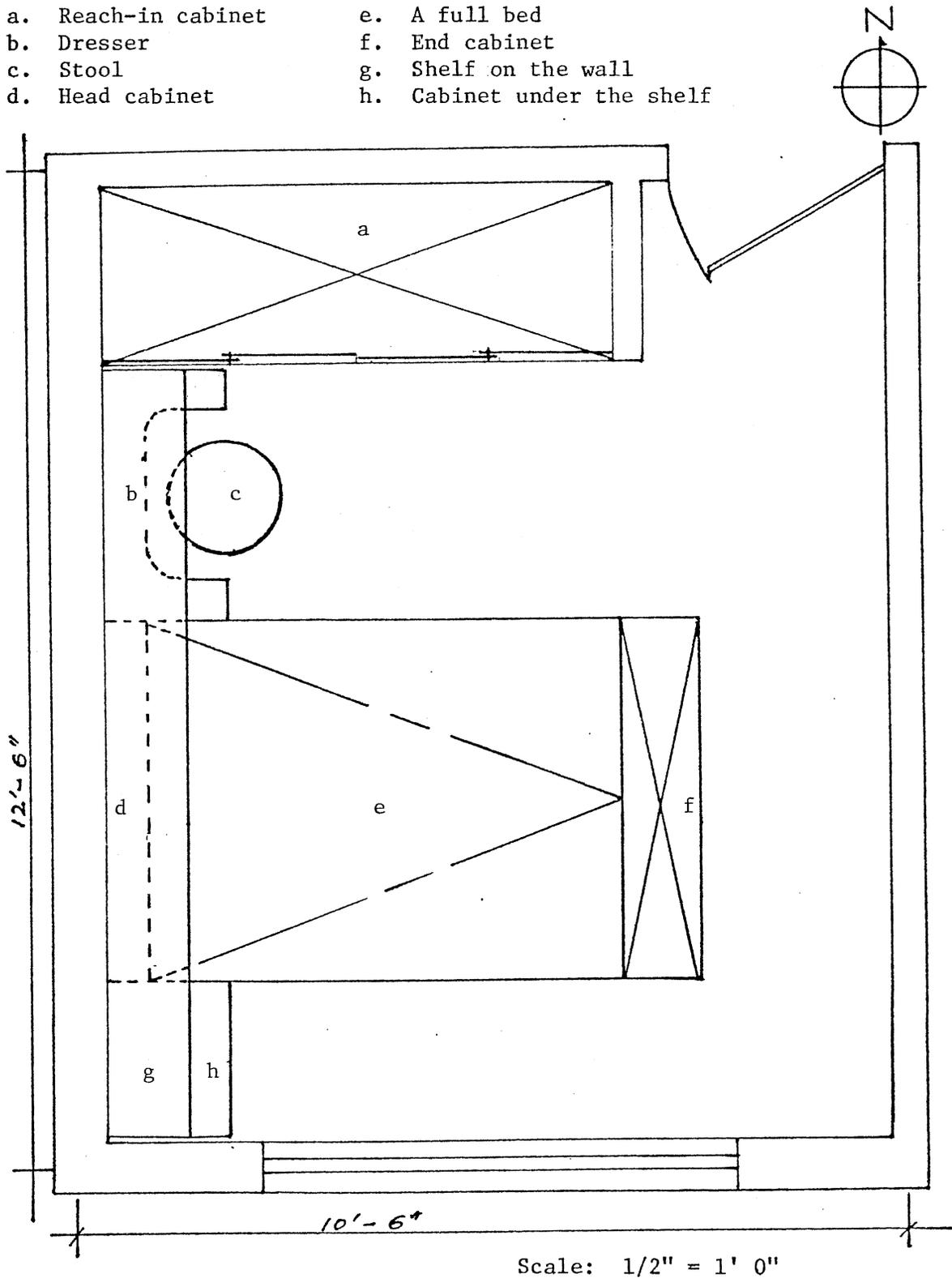
This bedroom needs to include sleeping and dressing areas. When a couple uses a room, separate closets for husband and wife are desirable. All the areas out of traffic lanes can be converted to some sort of storage; every wall is a potential storage space, either as a foundation for shelves, cabinets, or a sleeping area which can be built up along the wall. But, since this room is not big, it is not good to build too many things on the wall, which might cause pressure visually. Meanwhile, a soft and subtle color scheme should be good for creating the appearance of uninterrupted space in this bedroom. Actually, a room full of different colors and patterns looks crowded. It is better to avoid this visual pressure problem in a small area.

Solution A

This plan has a full bed in the middle of the master bedroom (Figure 12). A built-in cabinet which includes bed, dresser, end cabinet, and head cabinet is painted one color and extends along the entire west wall of the room (Figure 13). Also, the curtains extend from ceiling to floor, from wall to wall, covering the whole south wall to visually enlarge the room. A long, narrow cabinet works as a head board of the bed, too. The end cabinet which is located at the foot of the bed is draped to cover the shelves. The color and pattern of this cabinet drapery is the same as the window curtains to keep the room simple and

- a. Reach-in cabinet
- b. Dresser
- c. Stool
- d. Head cabinet

- e. A full bed
- f. End cabinet
- g. Shelf on the wall
- h. Cabinet under the shelf



Scale: 1/2" = 1' 0"

Figure 12. The Floor Plan of Room One for Solution A

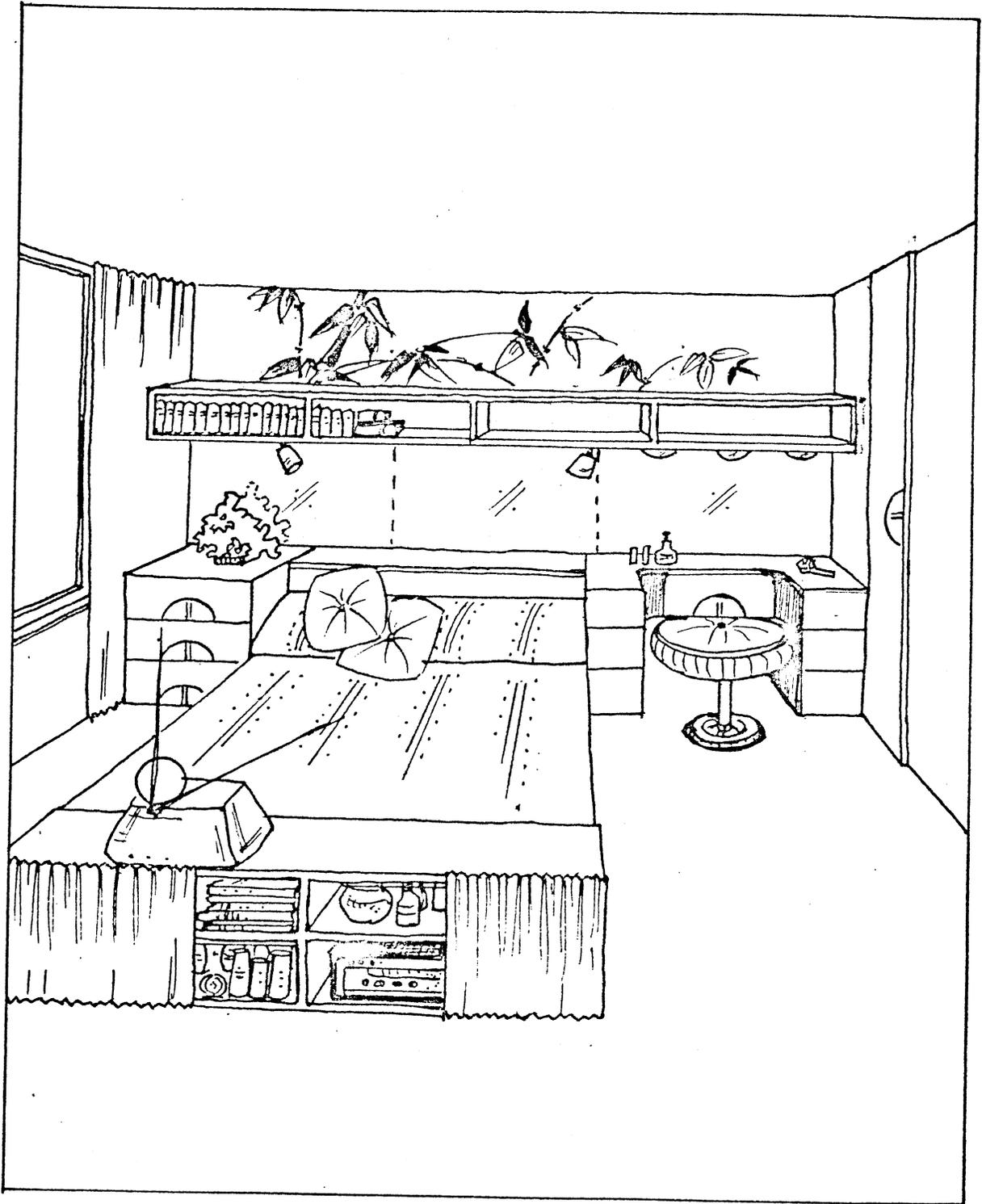


Figure 13. Solution A of Room One

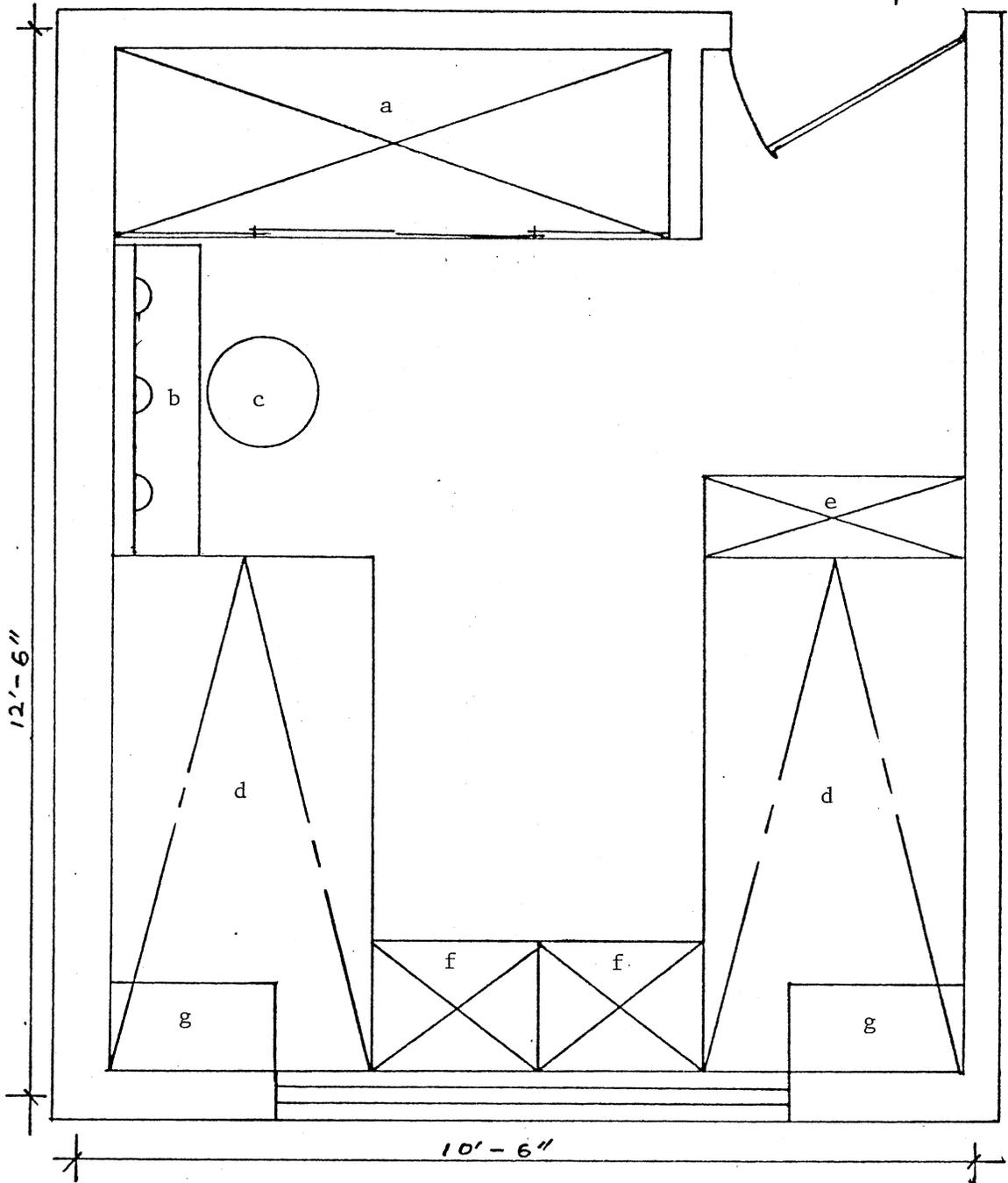
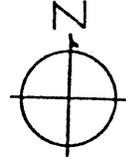
uncluttered. A built-in wall shelf over cabinets on the west wall are painted in the same color as other furniture. In order to brighten this small room, a big mirror along the wall could enlarge the appearance of room size without remodeling. In addition, an elegant, clean Chinese picture on the wall over the wall shelf brings mental freshness to this entire room. Using lamps installed on the shelf instead of table lamps could save table space for other uses.

Solution B

Some couples like to sleep in separate beds for certain personal reasons. So this plan is designed to meet the needs of those couples who want to sleep separately in two single beds. Since this room is not wide in either direction, these two single beds are better set beside two opposite walls (Figure 14). Two cabinets stand together between the heads of the beds so each one of the persons could have his or her own storage space. The shelves on the wall beside the window produce some room for books, plants or other personal belongings (Figure 15). Two well-designed fluorescent lamps installed beneath the shelves give bright light to this room and save more space on the surface on the cabinets beside the beds. A cabinet, four feet high, with shelves is set at the foot of one bed, facing the door. This cabinet could help to block the view into the room from the doorway. The bed would not be seen directly as soon as a person steps into the room, which gives some privacy to the person sleeping in this bed. All the furniture in this plan has some curved lines and patterns, so that the entire room could look smooth even with these many pieces of furniture in it. The simple pattern and

- a. Reach-in closet
- b. Dresser
- c. Stool
- d. Two single beds

- e. An end shelf case
- f. Two cabinets
- g. Two shelves



Scale: $1/2'' = 1' 0''$

Figure 14. The Floor Plan for Room One of Solution B

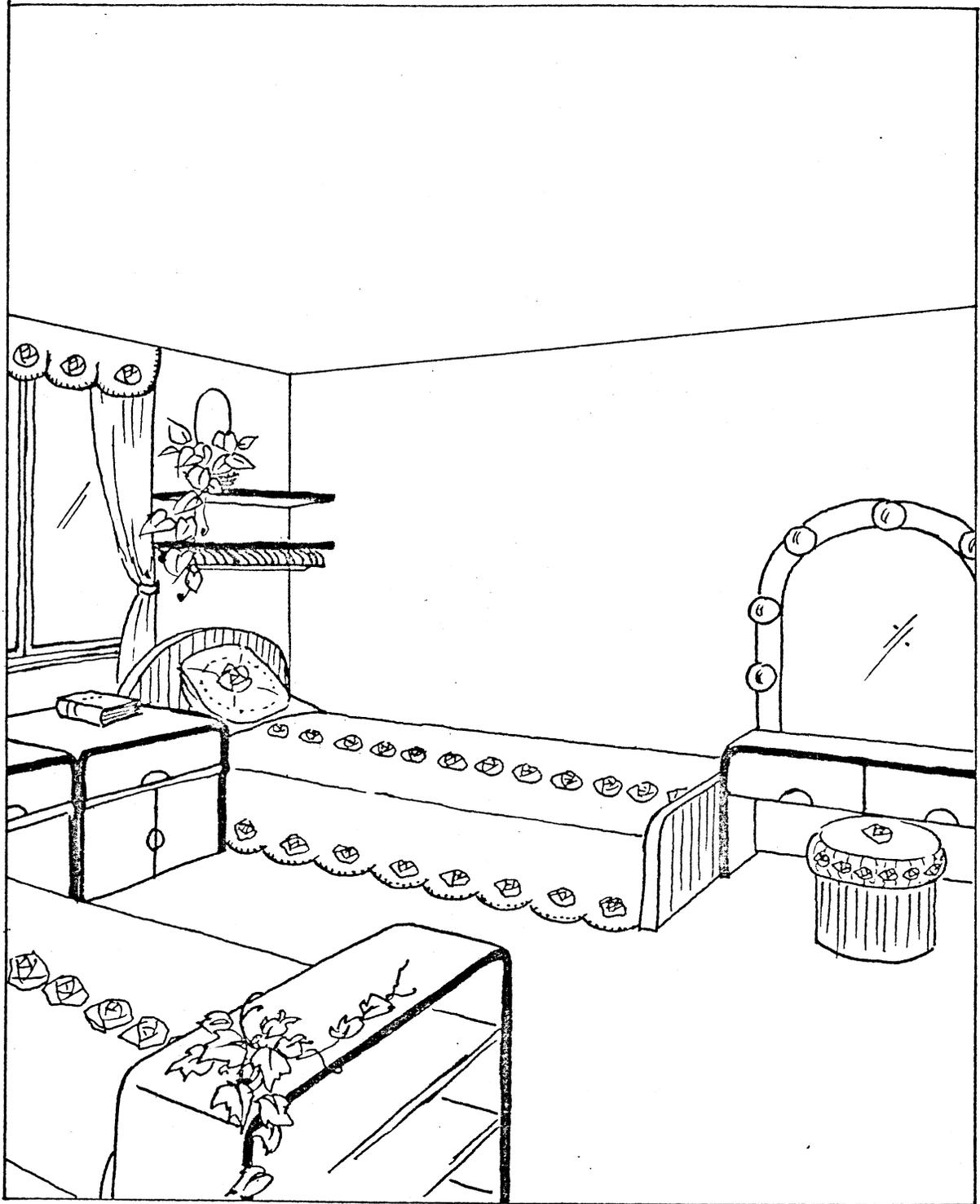


Figure 15. Solution B of Room One

curved edges of window curtains and bed covers create a clean effect and a comfortable feeling in this room.

However, the space allowance for convenient use of this room is adequate for two people so there are no serious space use problems. These two designs suggest maximum space arrangement for easy living.

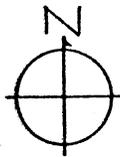
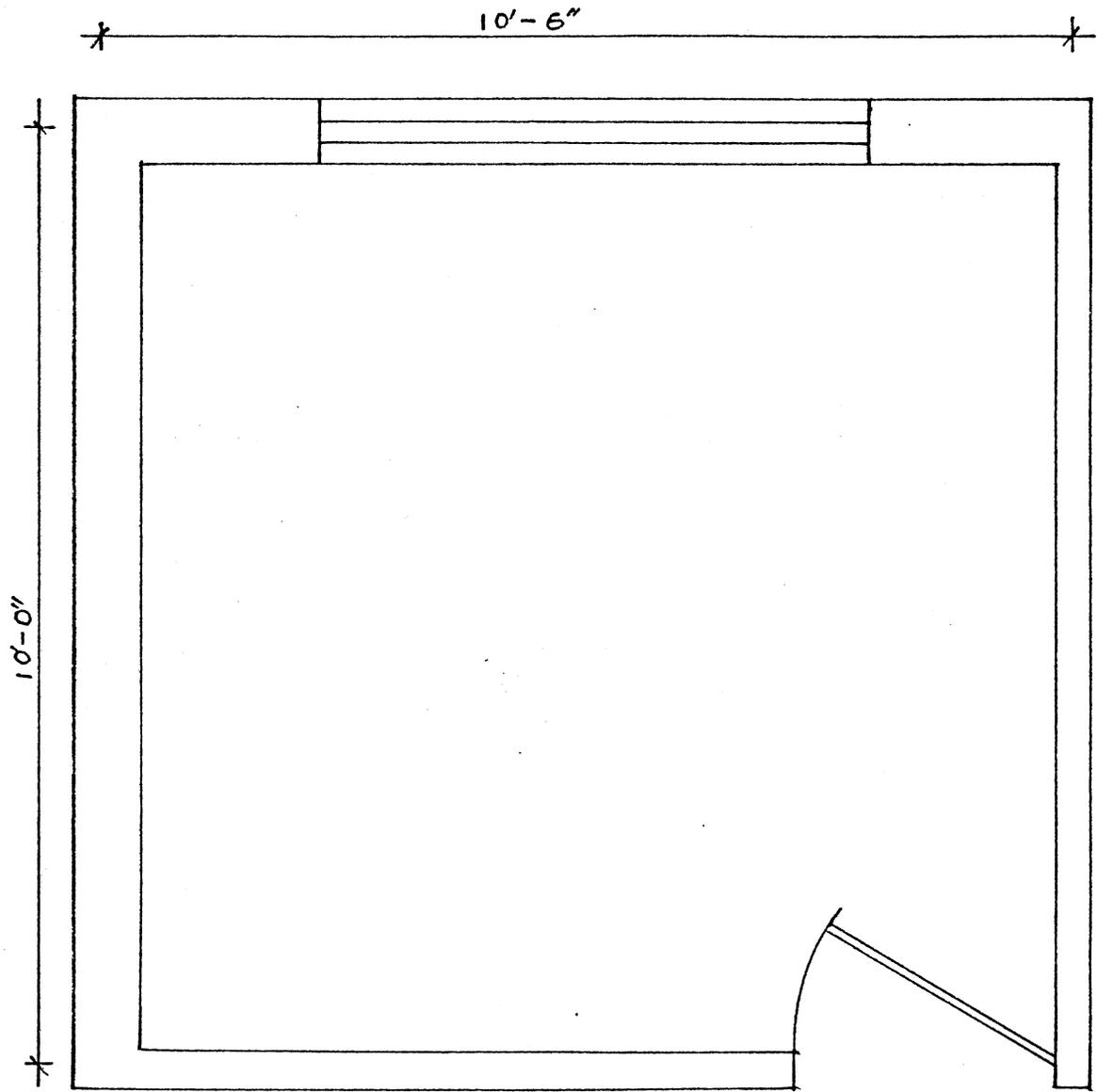
Room Two: Bedroom

The second bedroom is a 10' 0" x 10' 6" space which needs to be used by two or three persons (Figure 16). It is not hard to sleep many persons in this small room but it is difficult to create the private space for each one of the persons using this room. The following sections present three different design solutions for this second bedroom.

Solution A: For Two Persons

Because this bedroom is larger than the third bedroom, it could be used by two older children of the family. As usual, the older children need more privacy than the small children. If this room were divided from the middle to produce two individual spaces, each of these spaces would be too small for one person, especially when a bed is placed in either one of these spaces as there would be only two feet between wall and bed. A good circulation plan should allow at least two and a half feet between wall and bed if the other side of the bed is against the wall.

Therefore, there should be another way to give privacy to people in this room. One way of using space effectively is to put sleeping areas at different levels. Since the bed usually occupies a big space in the room, a lot of space could be saved by stacking the beds. A bunk-bed is



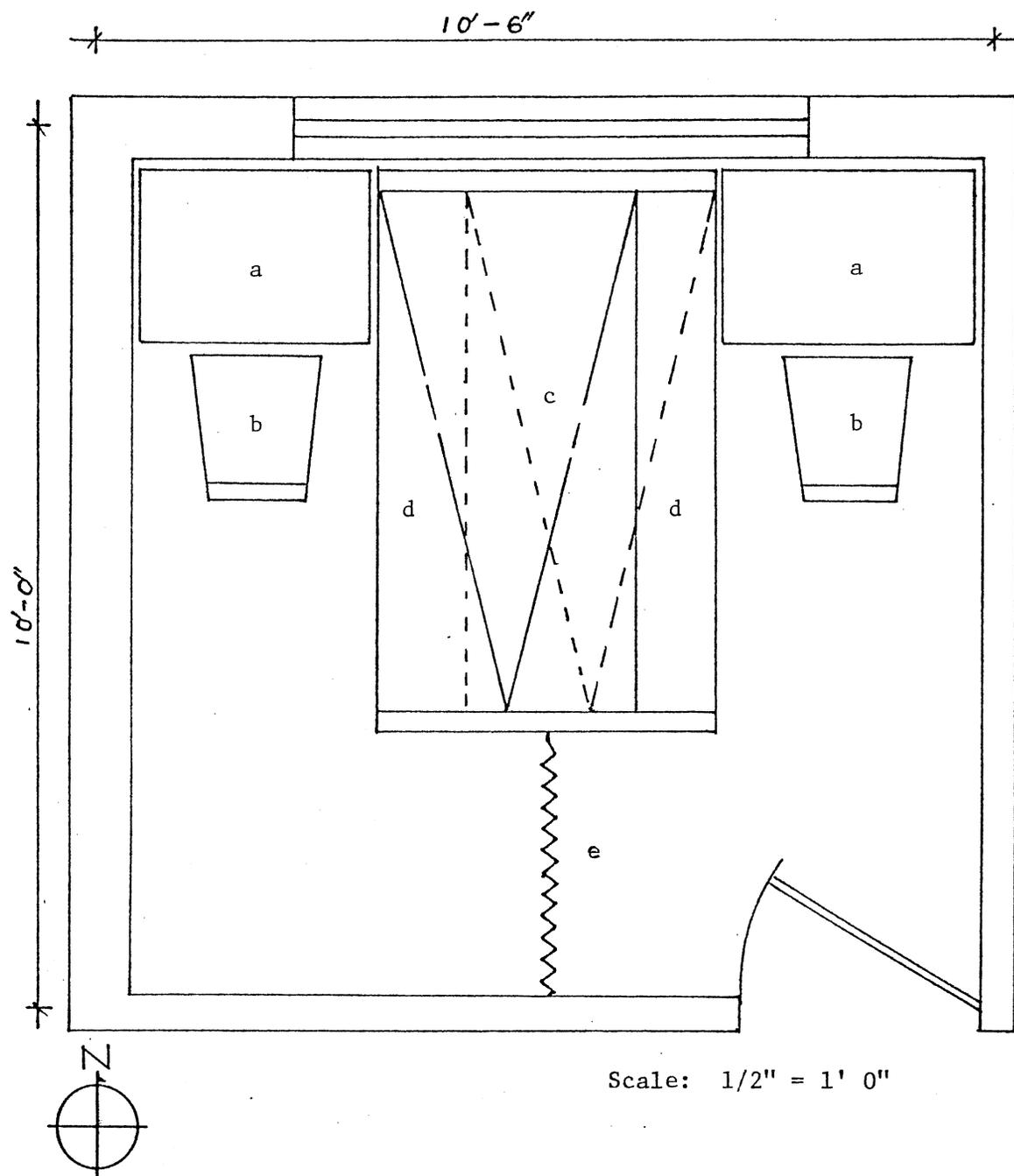
Scale: 1/2 " = 1' 0"

Figure 16. Room Two: Second Bedroom of Shuang-Shi Apartment

a good idea for saving space. It might be effective to put a bunk-bed in the middle of this room (Figure 17). Of course this is not a normal double-level bed because such a bed would not give enough privacy. A special bunk-bed was designed to serve the multiple purposes of sleeping, storage, and room divider.

Figure 17 shows a built-in bunk bed in the middle of this bedroom. It is four feet wide and seven feet long. Both backs of upper and lower bed are sealed by partition boards which are set in nine inches. In other words, there is a nine inch space on the back side of the beds at both the upper and lower levels. These nine inch spaces on the sides could be used for shelves and pegboards. Figure 18 is a view of the bookshelves on the lower level and the bed on the upper level while Figure 19 shows the opposite side. A ladder provides access to the bunk on the upper level. In addition, there are drawers on both sides at the bottom. Thus, this bunk-bed divides the room into two individual areas. Either one of the persons in this room could have enough privacy in his or her own area. Also, it allows more usable floor space on both sides of the bunk-bed where a desk and a chair can be put to create a study area. Actually, the addition of a folding door at the end of the bunk-bed to the wall could divide this bedroom into two individual rooms (Figure 17).

Since the weather in Taiwan is humid and hot, good air circulation in any room is very much needed. So there should not be a partition board on the head of this special bunk-bed while the other end of the bed has one. Thus, the air and light from the window could go through the whole room. In order to gain more light for the hallway which is formed by the end of this bunk-bed and the south wall, mirroring the end



- a. Two desks
- b. Two chairs
- c. A special designed bunk-bed
- d. Two shelves on each side of the beds
- e. Folding door

Figure 17. The Floor Plan of Solution A for Second Bedroom

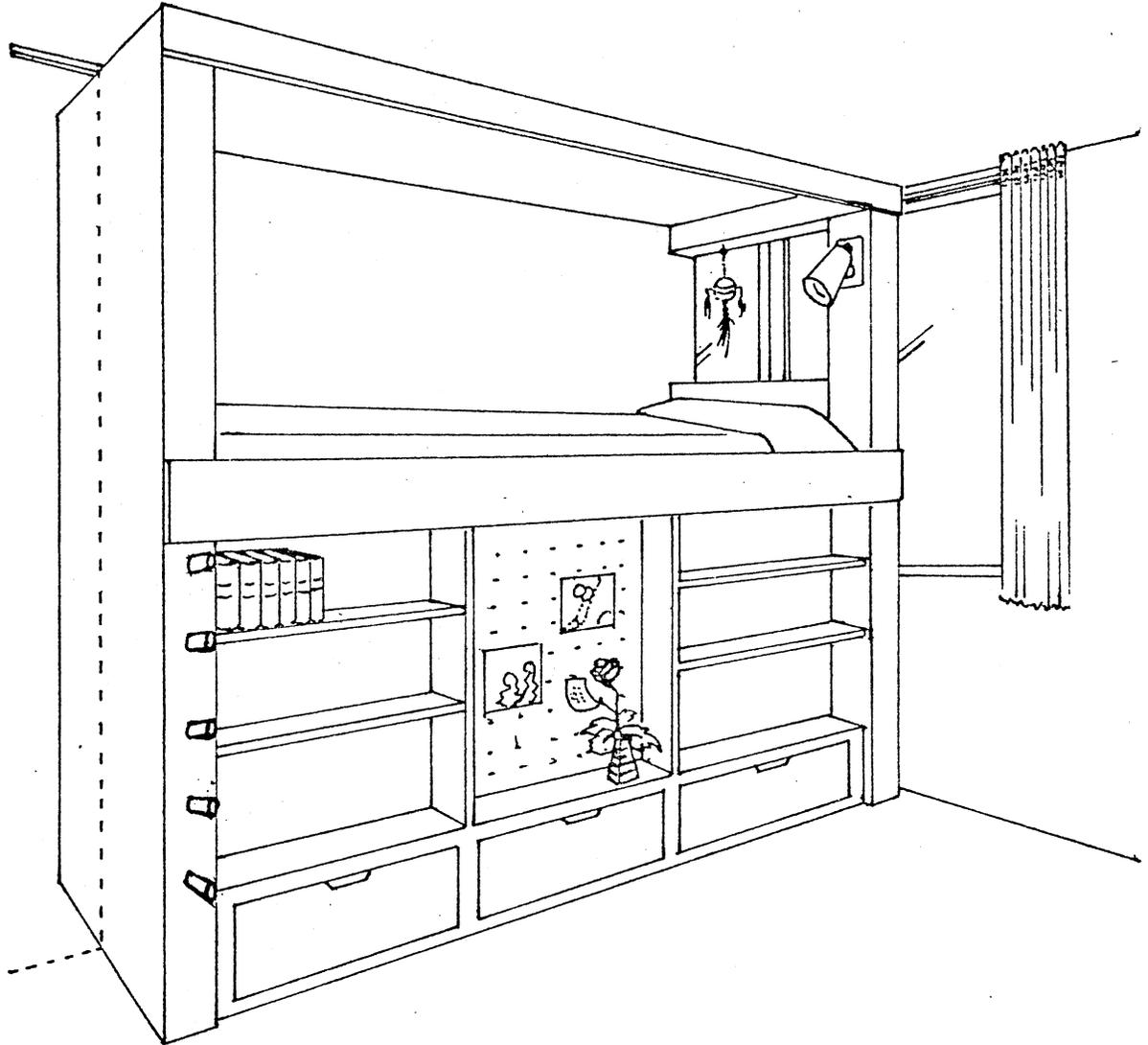


Figure 18. A View from East Side of the Bunk-Bed in Room Two

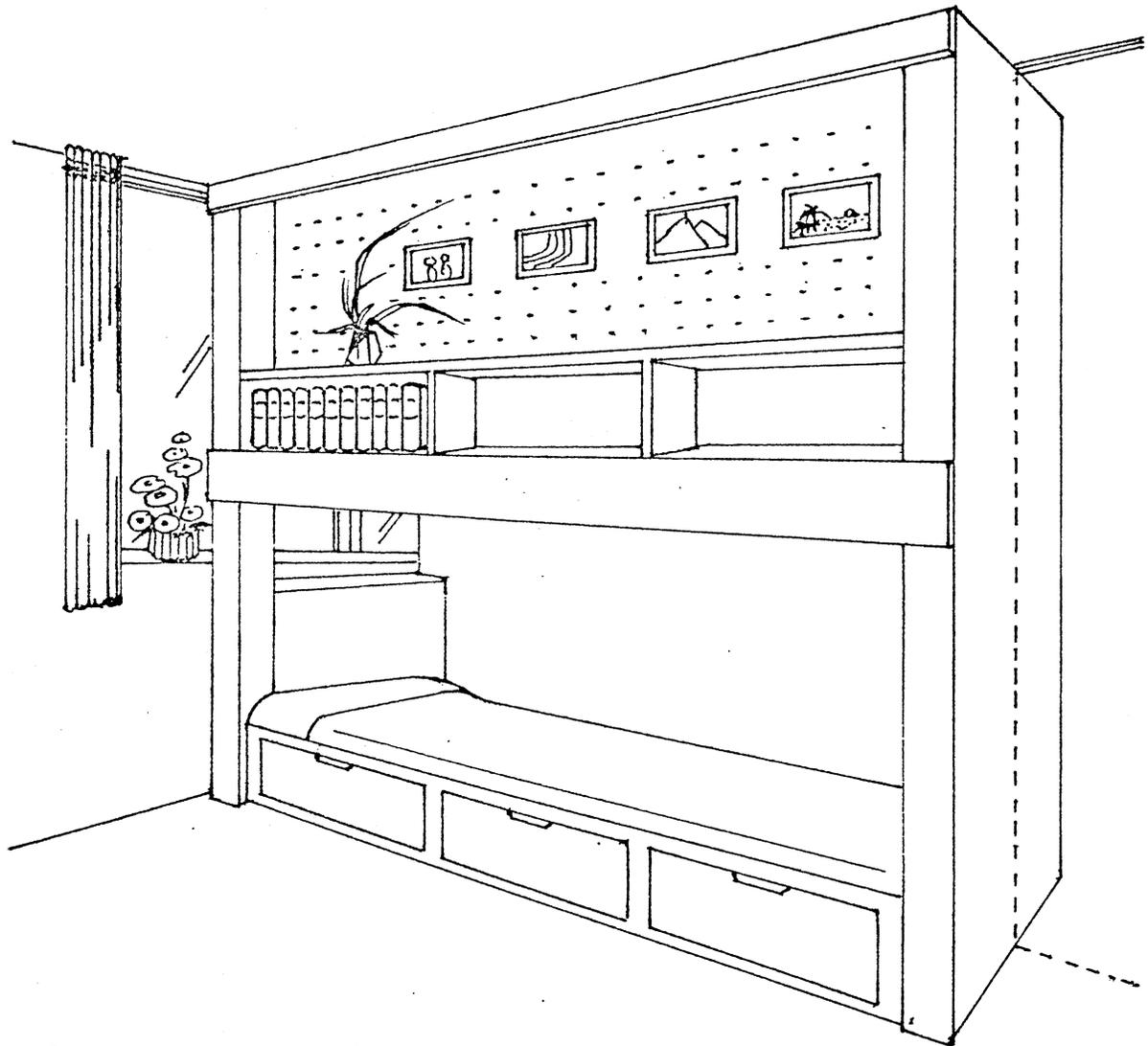


Figure 19. A View from West Side of the Bunk-Bed in Room Two

of the bed facing the wall would reflect light from the door and produce a wider-looking space.

If one wall paper, with minimal pattern (if any), were used on the walls and the back boards of the bunk-bed, it could make both sides of the bed more like two completely independent rooms.

The bunk-bed idea can be a good room divider, and would also work if it were a regular bunk-bed but with movable panels hanging on the sides (Figure 20). This way, it could also give better air circulation in that the panels could be removed when the weather is hot. Only 3.53 percent of the population in Taiwan have air conditioners in their homes, so good air circulation in the rooms must be considered.²

Solution B: For Two Persons

In this solution, the room is also designed for two persons but has different furniture arrangement. A bunk-bed has been placed in the corner (Figure 21). The whole bed could be screened off if desired. As the ceiling of this room is high (10 feet), the space over the door could be used for storage. Although this is a hard-to-reach area, the built-in closet up here could store some infrequently used items such as extra bedding, winter clothes in summer, etc.

On the other side of this room, there are two desks and chairs beside the window, facing each other. Two six feet high closets, back-to-back, are near those desks (Figure 22). The doors of the closets are mirrored all over, so the room in front of the mirrors looks brighter and wider. These two multipurpose closets are specially designed. Each

²The Annual Report of Taipei Municipal Housing Department (Republic of China, 1978), p. 44.

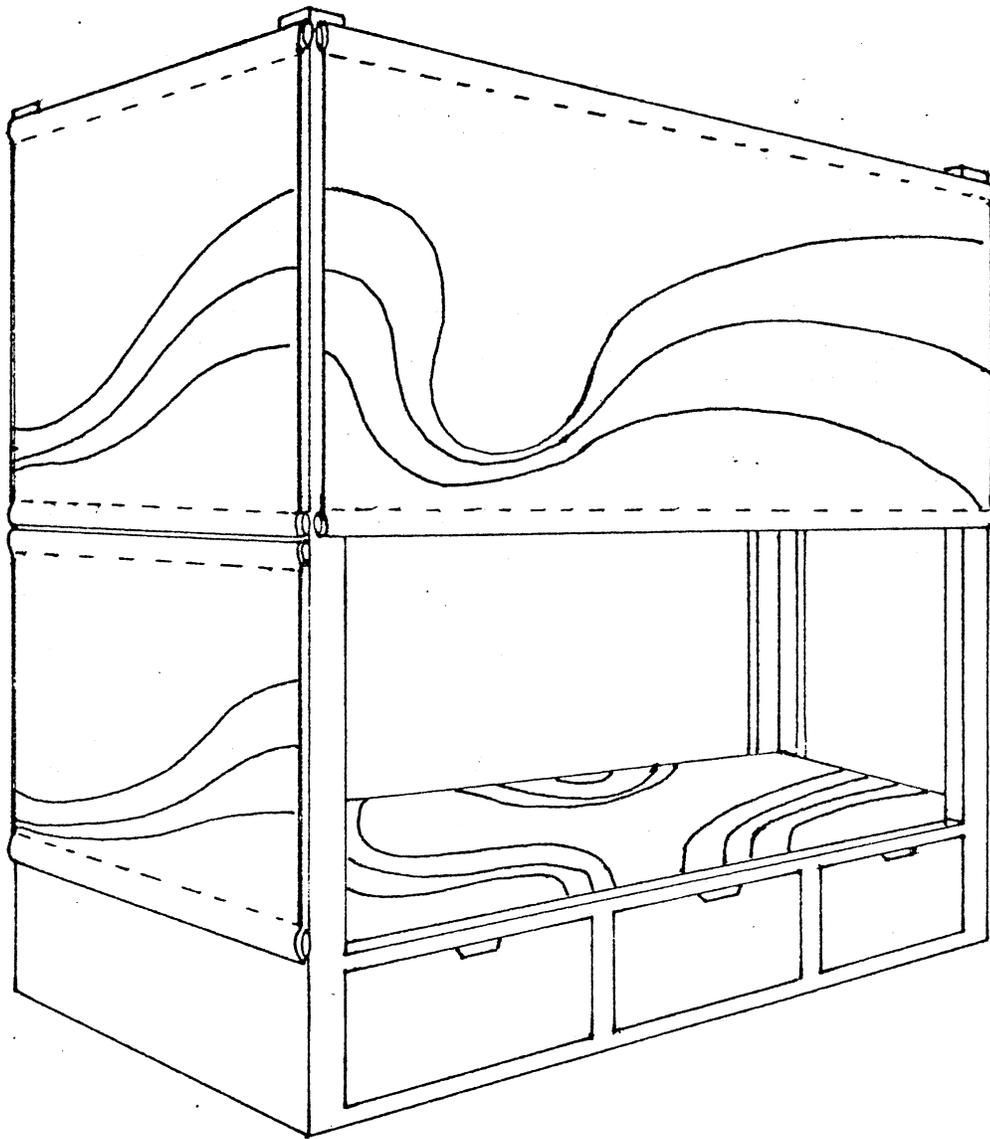
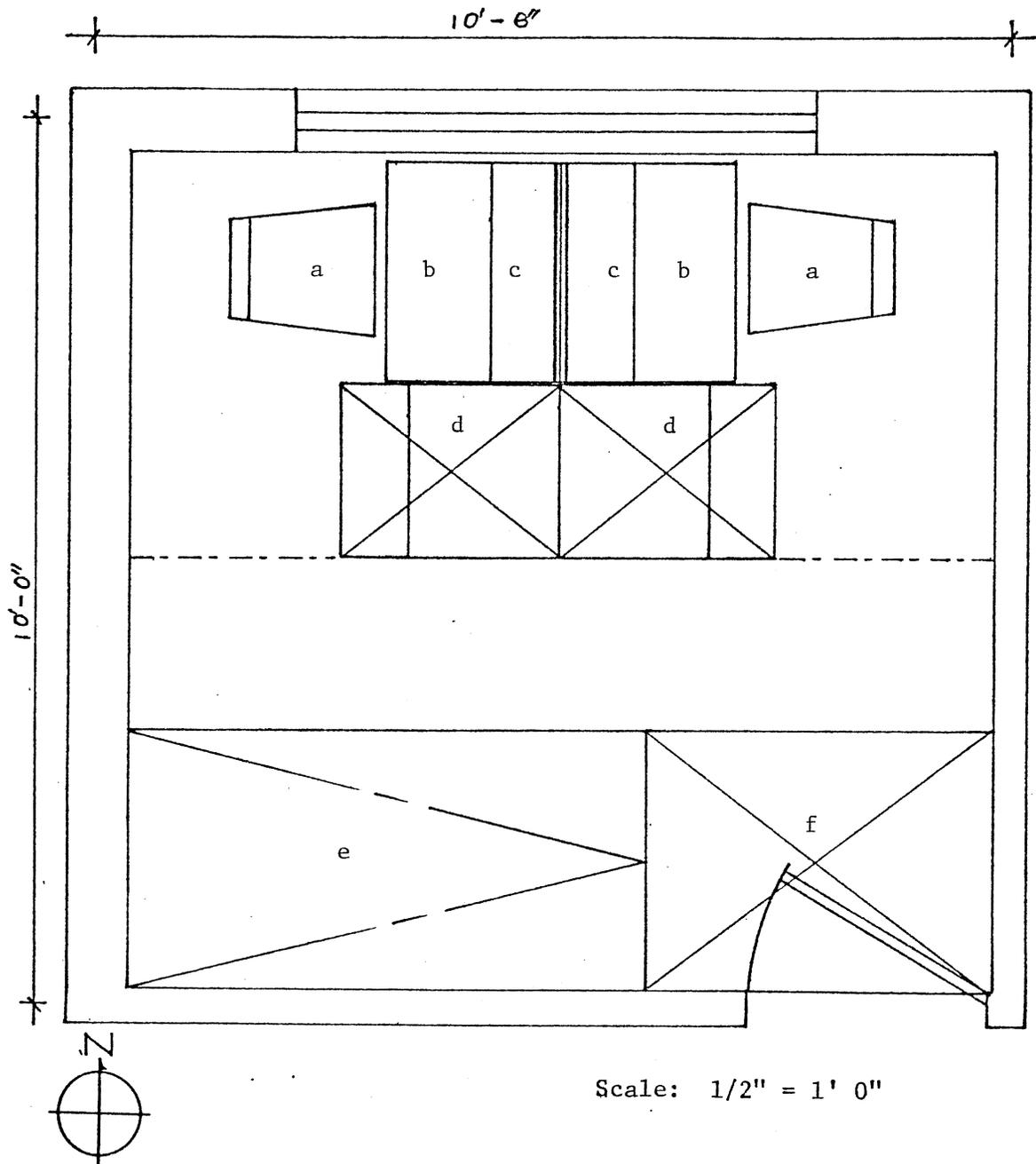


Figure 20. A Bunk-Bed with the Movable Panels Hanging on the Sides



- a. Two chairs
- b. Two desks
- c. Two shelves over the closets
- d. Two multipurpose closets
- e. A regular bunk-bed
- f. A closet over the door

Figure 21. The Floor Plan of Room Two for Solution B

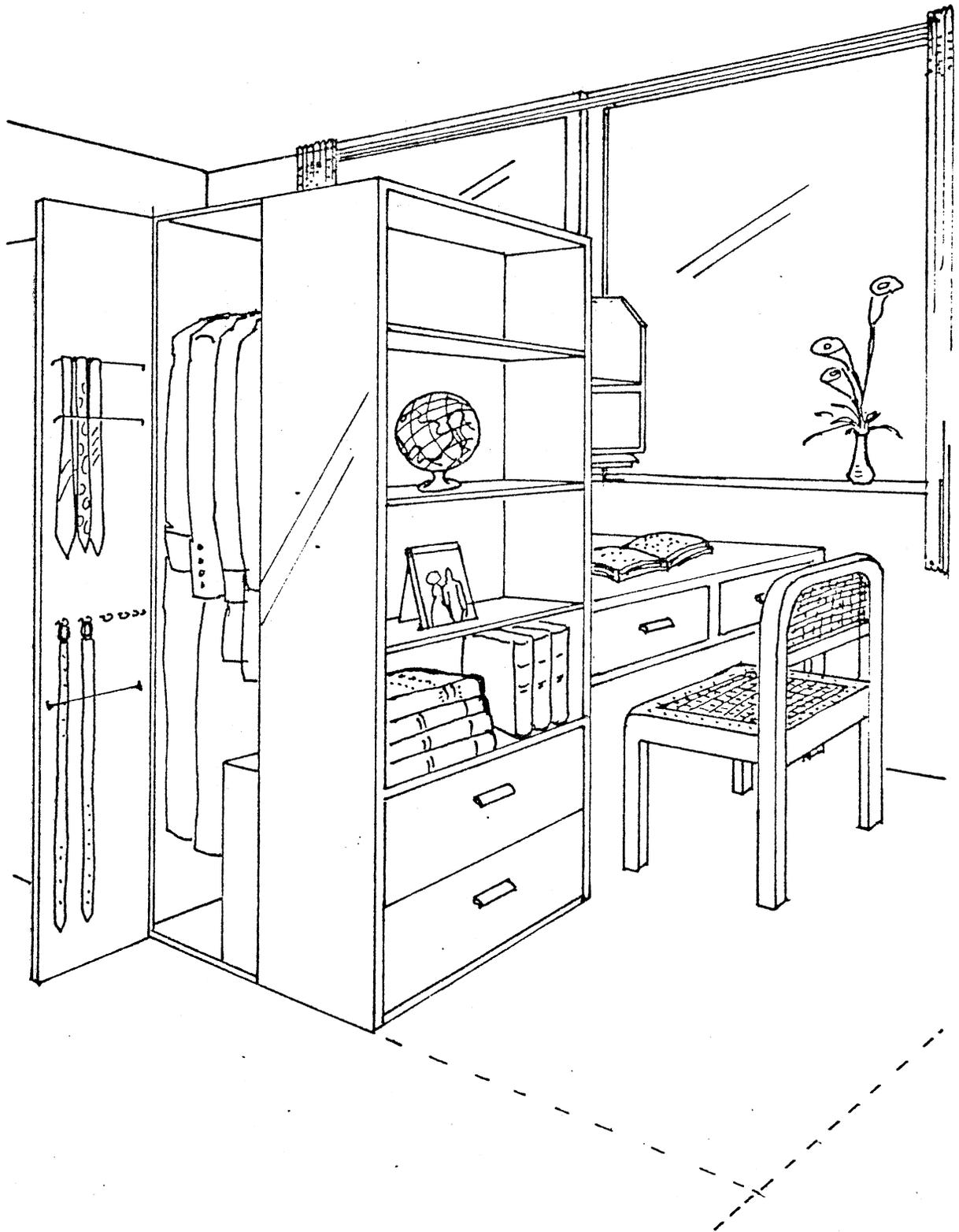
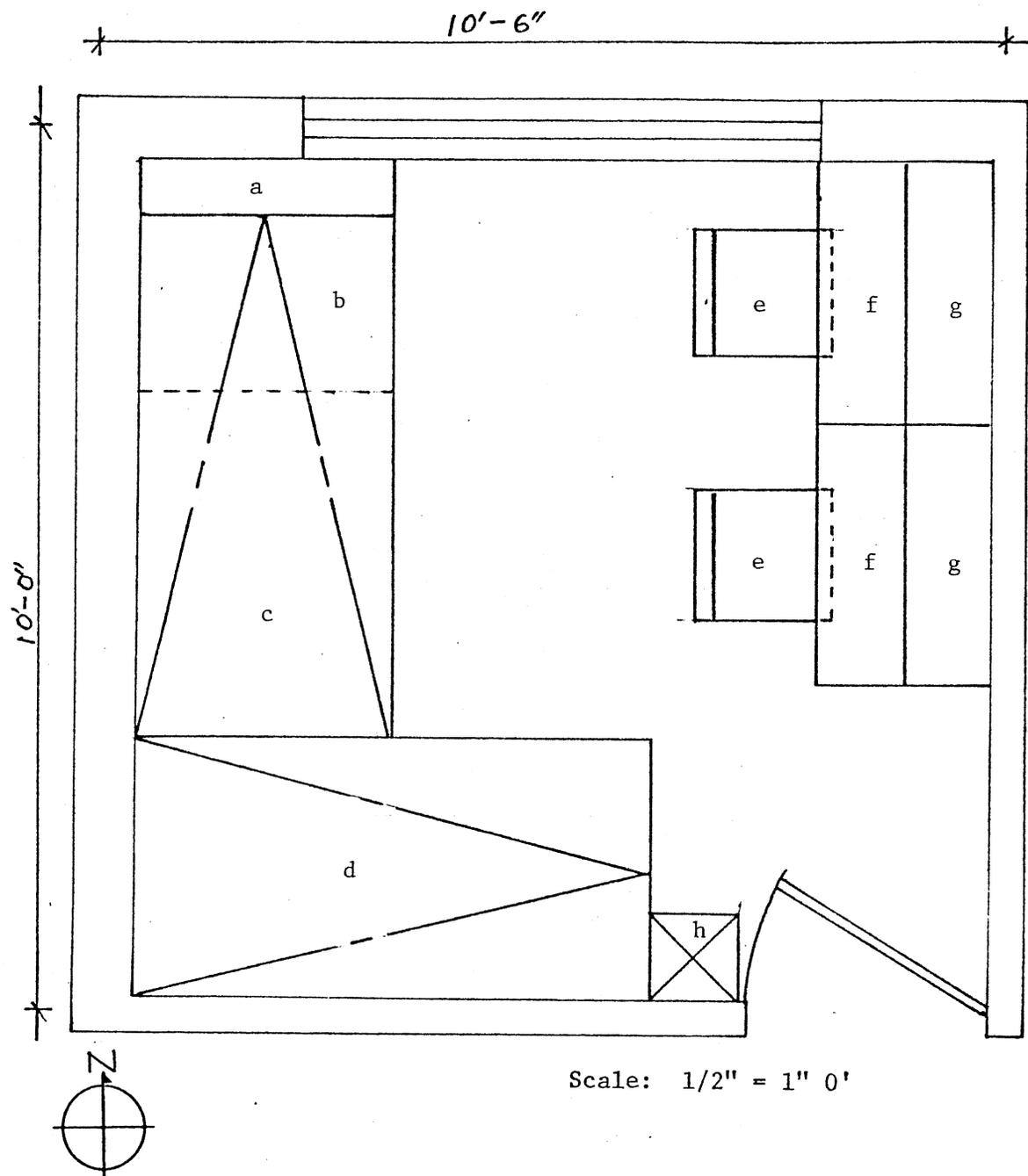


Figure 22. Solution B of Room Two

one of them has four shelves and two drawers on the side, which provide storage space for the user. There are spaces for hanging garments within these openings. Two desks are also specially made. There is a backboard as high as the closets on each one of the desks and shelves are attached to these backboards. Thus, this room gives private space for studying and a calm place for sleeping.

Solution C: For Three Persons

In case three persons have to be placed in this small room, it is better that they be three younger children. In order to gain more space, a double-level living arrangement is needed in this room. A bunk-bed is located beside the south wall to provide sleeping areas for two persons (Figure 23). Another person's bed is placed on the top of the closet which is near by the west wall and abuts one side of the bunk bed (Figure 24). There is a panel or a curtain hung at one end of each bed which might help the person have a little privacy. Since three younger children are living here, the youngest one is possibly under school age. Instead of a study area, a nine inch high play platform beside the closet is built for this preschool child. All of these three beds and one platform have drawers beneath them. Thus, each person could have his or her own storage space. Also a floor-to-ceiling thin bookcase near the door gives more space for storage. The other side of the room contains two chairs and two built-in desks with shelves above them on the wall. The light, single color painted walls are desirable in this room. Also, a white color (or a slightly lighter tone than the color used on the walls) is painted on the ceiling which helps add height and continue the unbroken feeling of flowing space. Mirrored doors of the closet open up



- a. A shelf between the bed and the wall
- b. A play area for the young child
- c. A single bed over the closet
- d. A bunk-bed
- e. Two chairs
- f. Two built-in desks
- g. Two shelves over the desks
- h. A floor-to-ceiling bookcase

Figure 23. The Floor Plan of Room Two for Solution C

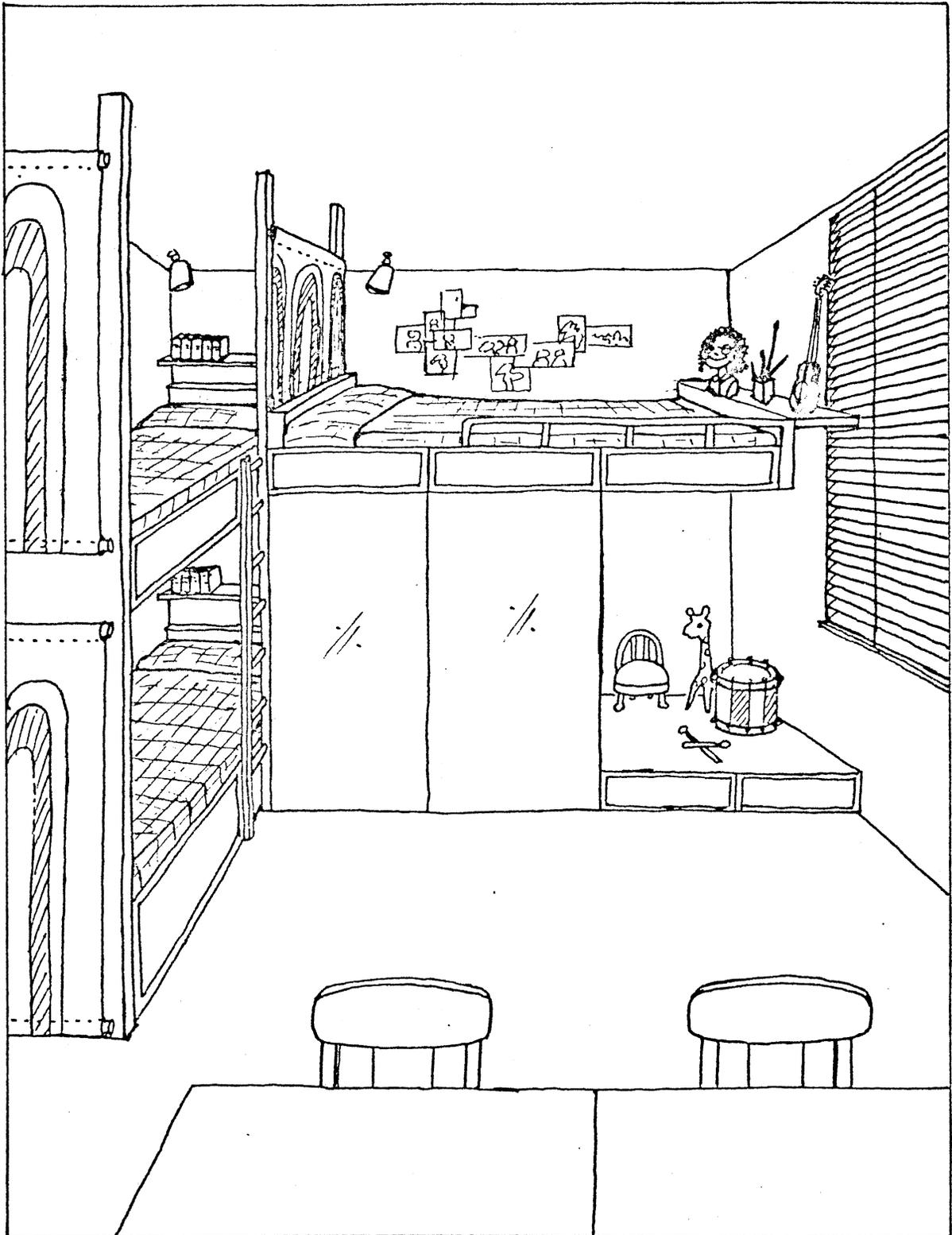


Figure 24. Solution C of Room Two

space in this small room and also bounce light back into the room for an airy feeling. A venetian blind on the window makes the room neater.

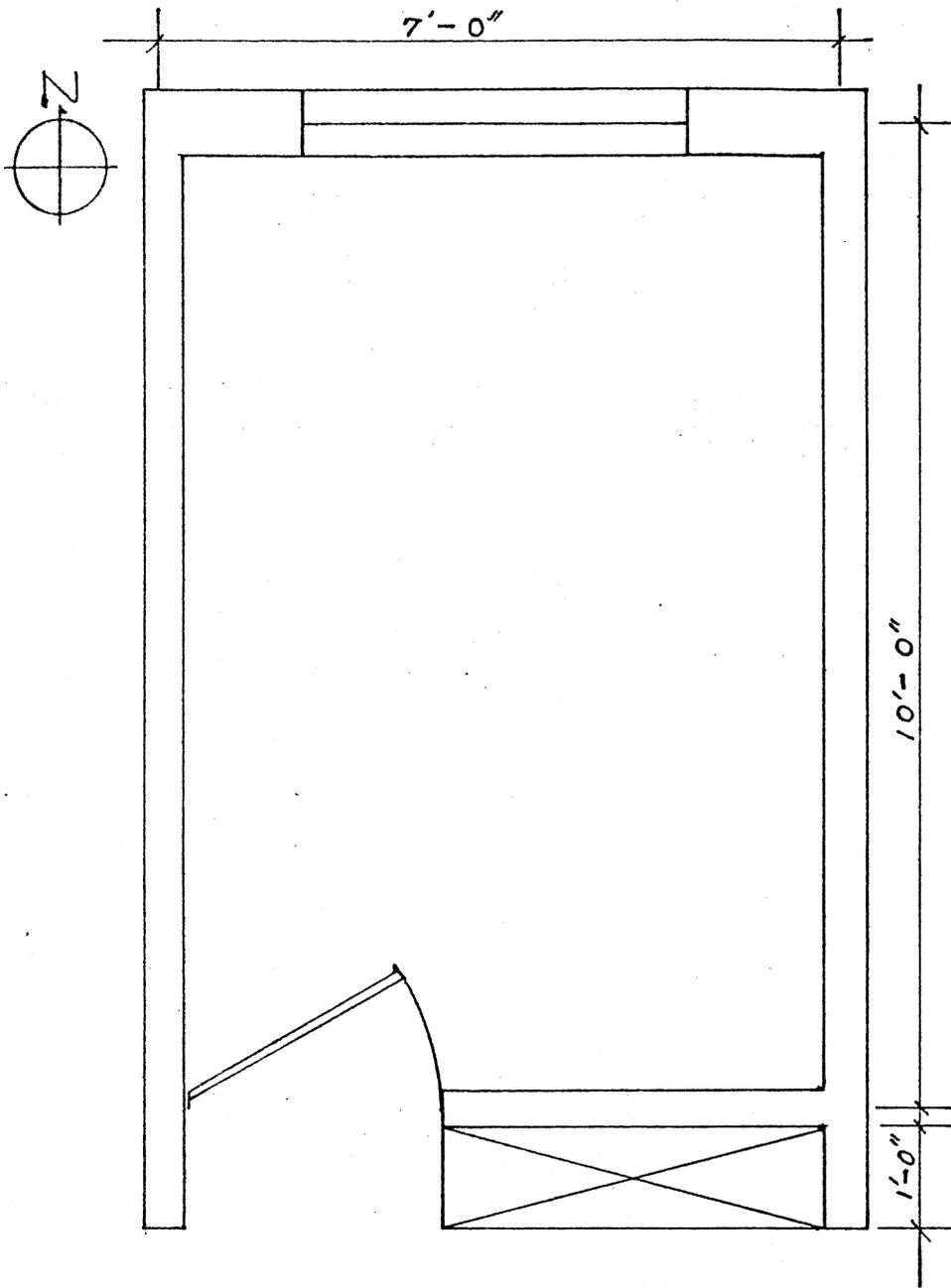
Room Three: Bedroom

The third room is a 7' x 10' bedroom for one or two persons (Figure 25). It could be the oldest child's room or the youngest one's. It could be a room for the only girl or only boy in the family. Some families in Taiwan have three or more generations living together, so this room could be a grandmother's or grandfather's room if needed.

Solution A: For One Adult

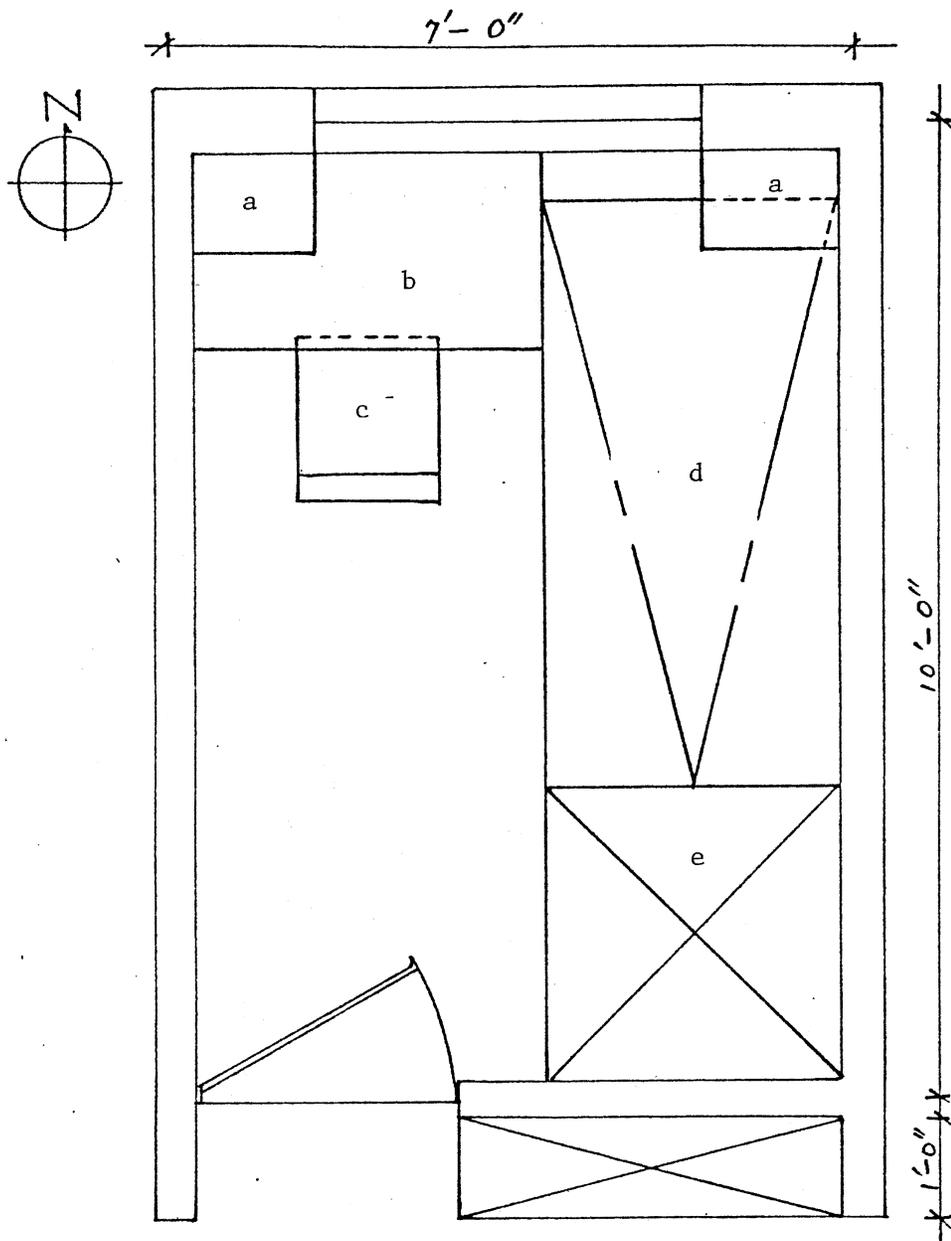
As mentioned in Chapter II, the elderly people in Taiwan often live with their children's families, especially the old widows or the old widowers. If this room is for an elderly person, the basic pieces of furniture should be put in it. A bed, storage place, and desk for personal writing always are necessary to cater to the living needs of an adult occupant of this room. The elderly people in Taiwan usually do not accept modern products easily. They prefer to use the old things to which they have been accustomed. So it is better to put some normal functional furniture in this room (Figure 26).

A floor-to-ceiling reach-in closet is built in the corner beside the door (Figure 27). This closet gives plenty of storage space for one person's clothing. Closets should be designed well for maximum storage. The bed has storage drawers under it. These two drawers are not for clothes but for some infrequently used items such as personal collections, antiques, etc., since these drawers are in a hard-to-reach position. Two book cases are hung on the wall beside the window. A built-in



Scale: $1/2'' = 1' 0''$

Figure 25. Room Three: The Third Bedroom of Shuang-Shi Apartment with a Space for Ancestor Table



Scale: $1/2'' = 1' 0''$

- a. Two built-in shelves on the wall
- b. A built-in desk
- c. A chair
- d. A bed
- e. A reach-in closet

Figure 26. The Floor Plan of Room Three for Solution A

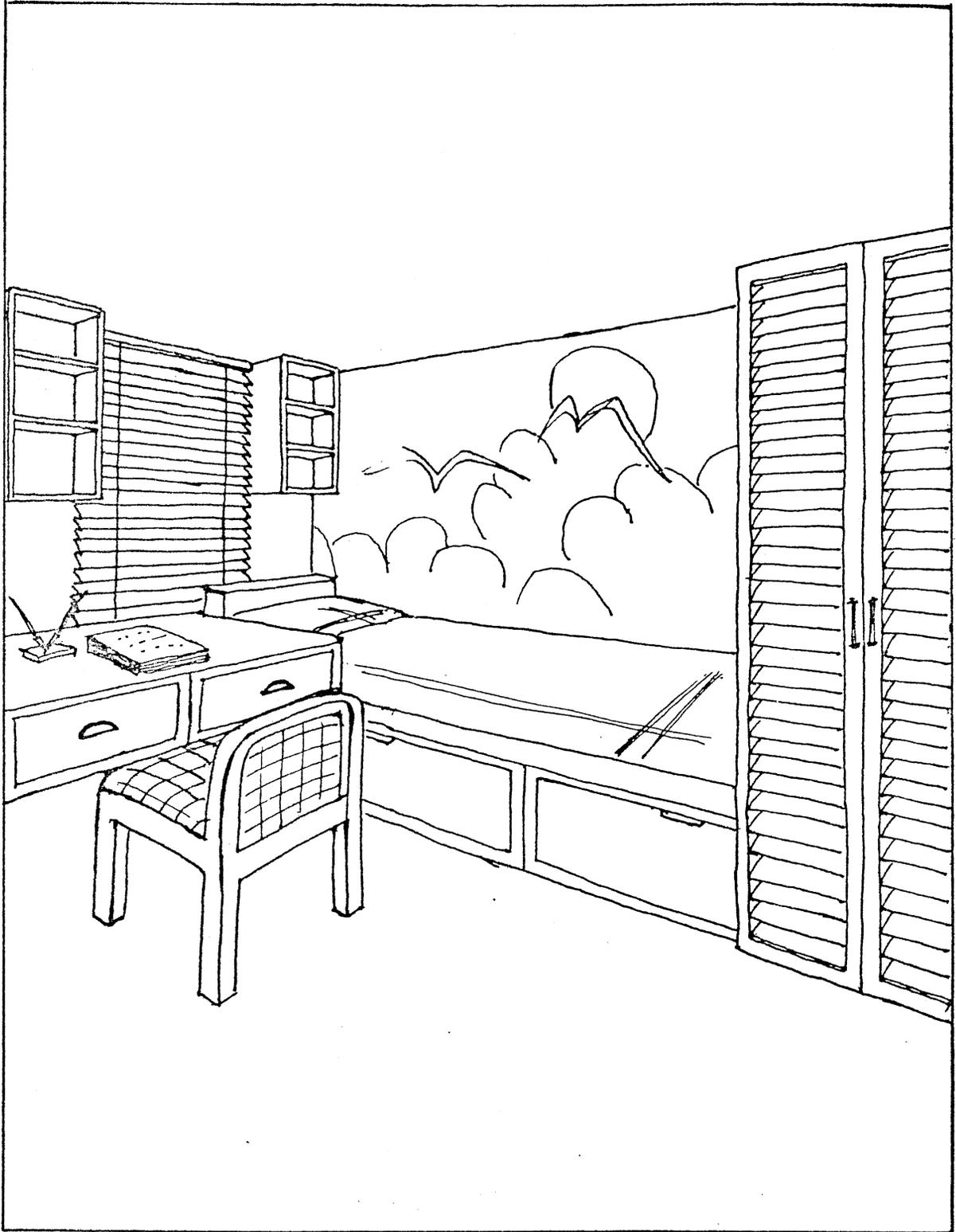


Figure 27. Solution A of Room Three

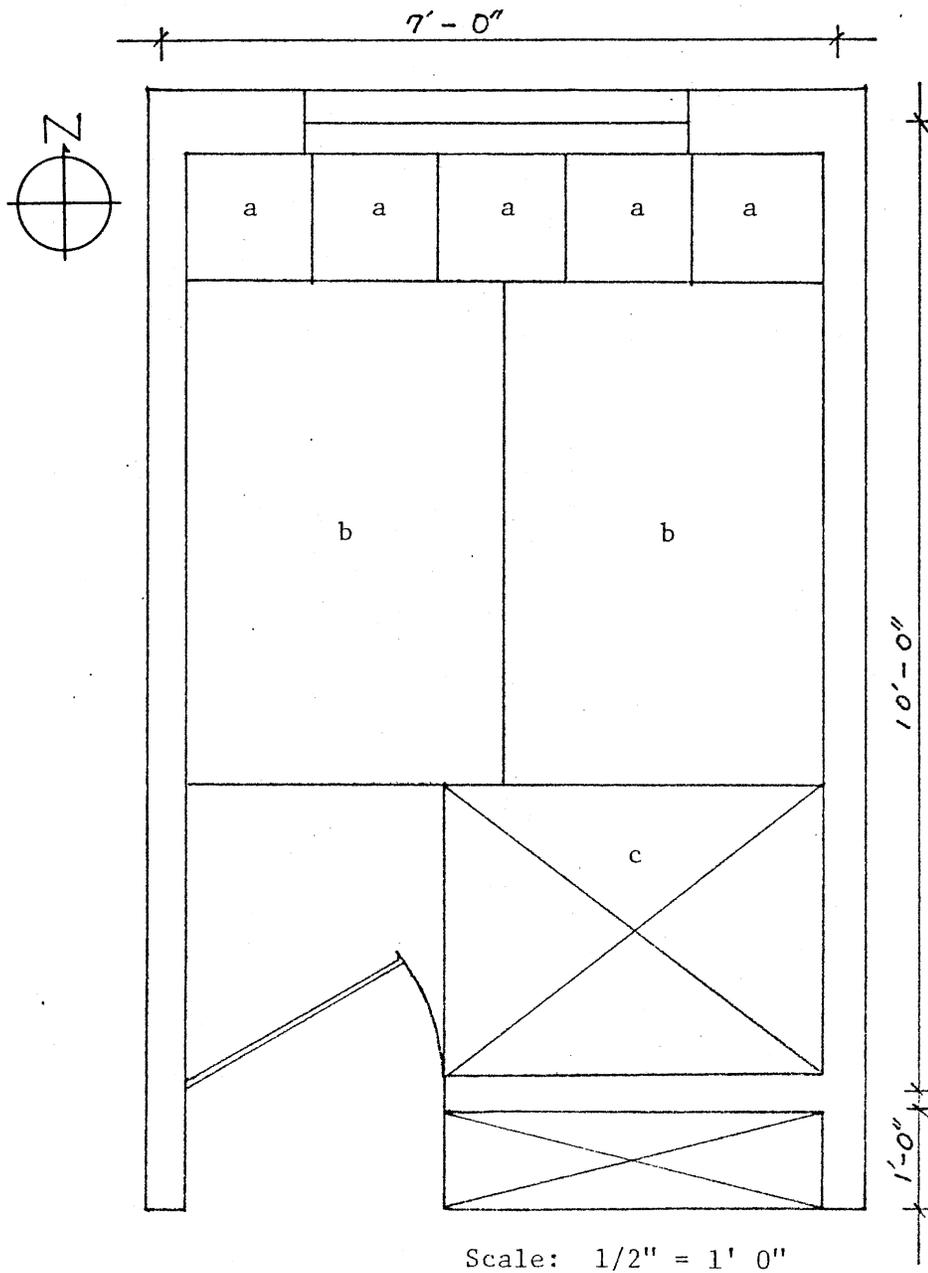
desk has no legs under it, which allows space for opening the drawer under the bed. A long mirrored west wall could enlarge the room so that the entire space would not look so narrow. In addition, the natural scenery picture on the east wall would be reflected into the mirror and create a feeling of an even wider space.

Solution B: For a Youngster

This plan is for a preschool child. In decorating a youngster's room, there is much to keep in mind: durability, ease of maintenance for hygiene, comfort, and safety. There is also a need for flexibility so that the room can grow with the child.

The floor is the child's playground. Sitting on the floor, a child could build buildings of blocks, paint, rest, and even sleep. This design features the Japanese straw mattresses ("Tatami") covering the entire floor except for the entrance. This covered floor area is a nine inch raised platform. This raised feature permits free passage of air beneath and prevents excessive dampness. Such an arrangement combines the play area with the sleeping space so that a child could use the space for activities in the daytime and for sleeping at night. Actually, it is a very big space for a child to sleep, so it would also allow space for two children to sleep whenever a little guest comes (Figures 28 and 29).

As Taiwan had been ruled under Japanese government for 50 years (from 1895 to 1945), some Japanese influence in the living customs of Taiwan have continued even to the present time. This "Tatami" bed is one of these influences which can be seen everywhere in Taiwan.



- a. Nine cube boxes
- b. Straw mattresses
- c. A reach-in closet

Figure 28. The Floor Plan of Room Three for Solution B

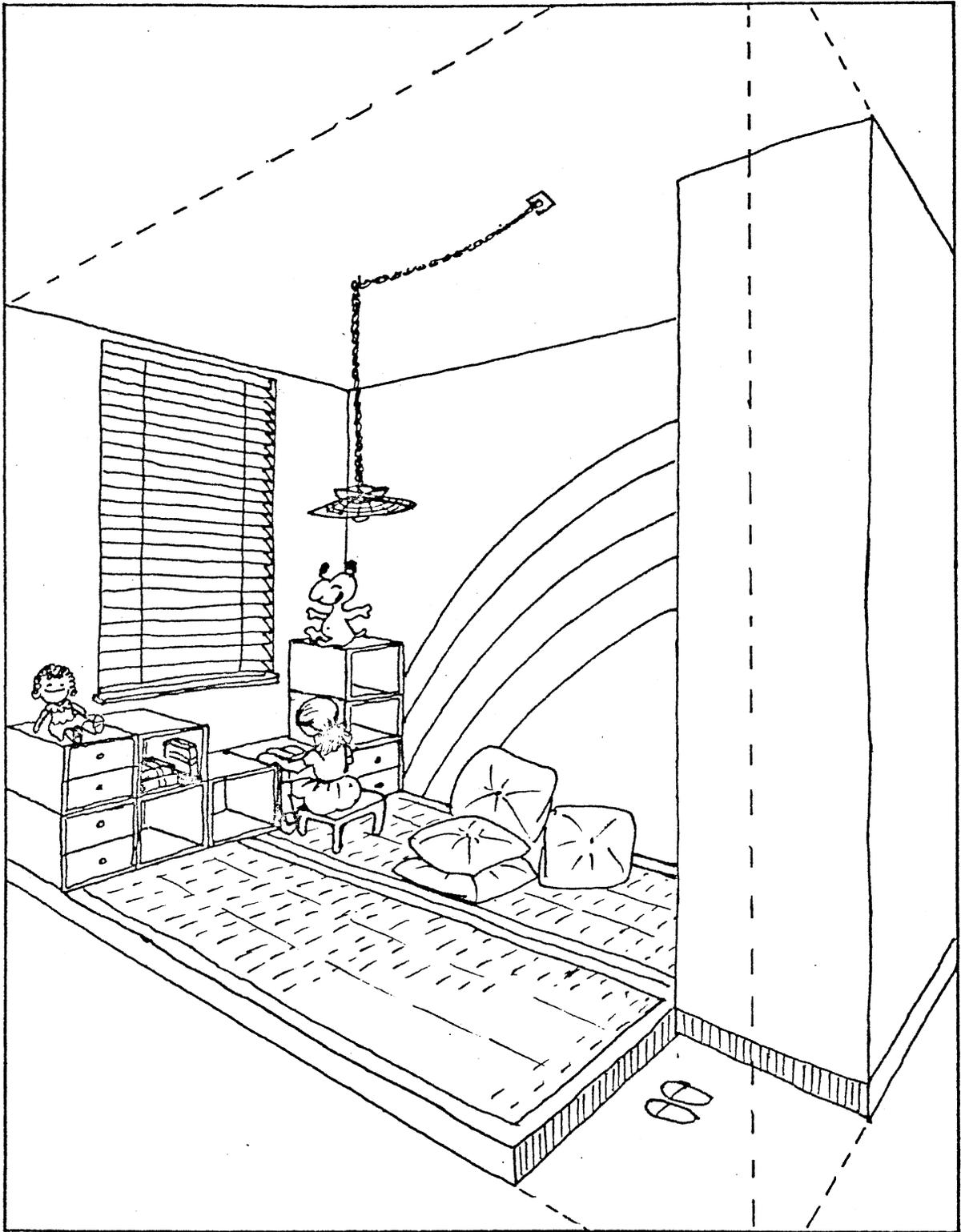
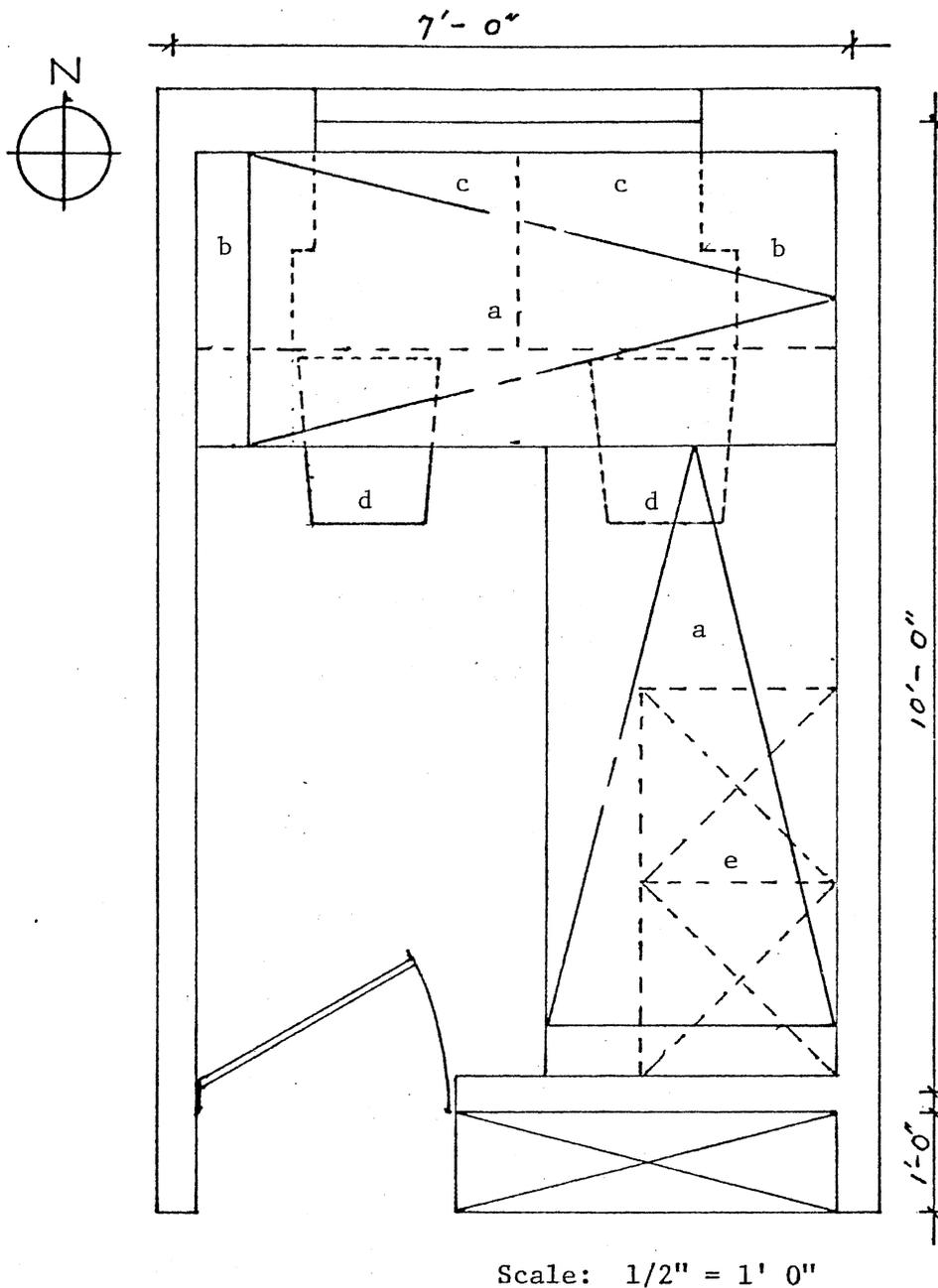


Figure 29. Solution B of Room Three

There is a built-in floor-to-ceiling closet beside the entrance. It is not only a storage space for the child living in this room but also a place to store some extra belongings of the family. The furniture in this room consists of a tiny chair, a large closet, several cushions and nine gaily painted wooden boxes. These modular boxes are 15 inch cubes which are easy to build, inexpensive, and very versatile. They stack together to form useful bookcases, shelves, storage cabinets, desks, and other practical things; and they go together to make dining tables, trains, castles, and other wondrous things that a child may create. Although the boxes are sturdy, they are lightweight so a child can lift one to play with it. An adjustable overhead hanging light is used in this room, so that the lighting position could be altered whenever position of the cubes is changed.

Solution C: For Two Children

A 10' x 7' room for two persons is rather crowded living. So, this room might function best for two school-age children. In order to save floor space for studying, two sleeping shelves are built-in on the walls. This allows 3' 6" between the ceiling and beds, and 6' between the floor and the beds. One 2' x 4' closet under the bed has drawers at the bottom. Two desks are built along the north wall under the window. There are also book shelves on the wall above the desks in the corner (Figure 30). A big pegboard covers half of the east wall, giving a place for hanging things. All the furniture is painted a light color, but the underside of the beds should be painted with the color used on the ceiling. Thus, the ceiling would not look so low. The mirrors on the closet bounce the light back into the room, which lights up the



- a. Two sleeping shelves on the walls
- b. Two book shelves in the corners
- c. Two built-in desks
- d. Two chairs
- e. One closet under the bed

Figure 30. The Floor Plan of Room Three for Solution C

space (Figure 31). The use of simple and cheerful decoration is the most important rule for this rather crowded room.

Room Four: Kitchen

The kitchen in this apartment is not only a room for fixing meals but also a space for dining. This is a 9' 4" x 10' 6" room with a 9' 4" x 4' 6" balcony outside of it (Figure 32). The balcony has a space for a clothes washer and drying rack. In order to save some money, the people in Taiwan dry their laundry in the sun instead of using dryers.

The equipment in this kitchen includes upper and lower storage cabinets, refrigerator, sink, cooking range, oven, and work surfaces located along the walls in an "L" shape (Figure 33). A piece of peg-board painted a bright color is on the wall between cabinets and work surfaces for hanging cooking utensils.

The other side of the kitchen is a dining area where the family eats the daily meals. A folding square table stands beside the wall with six stackable stools underneath. One half of this dining surface can be dropped down whenever it is not in use. Thus, this dining area would not occupy so much space all the time.

Chinese cooking requires a lot of frying and steaming which always produces a greasy surface in the kitchen. So the best wall covering to use in this kitchen is a specially finished wallpaper or a slick vinyl wall covering, because these are extremely durable, withstand steam, do not discolor and can be cleaned easily. A patterned wall covering helps to create the overall mood. As this room combines kitchen and dining area together, a fresh pattern with the bright colors

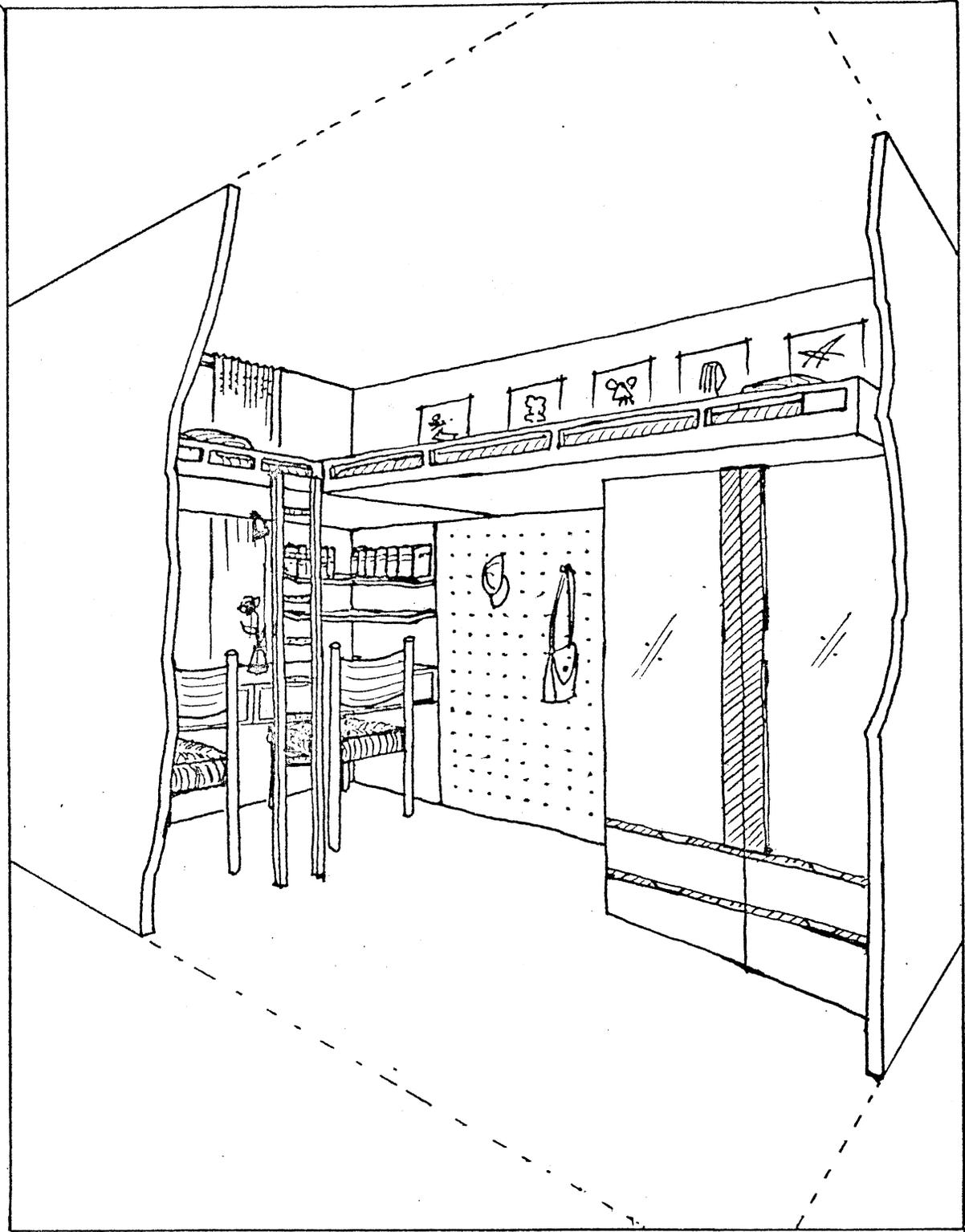


Figure 31. Solution C of Room Three

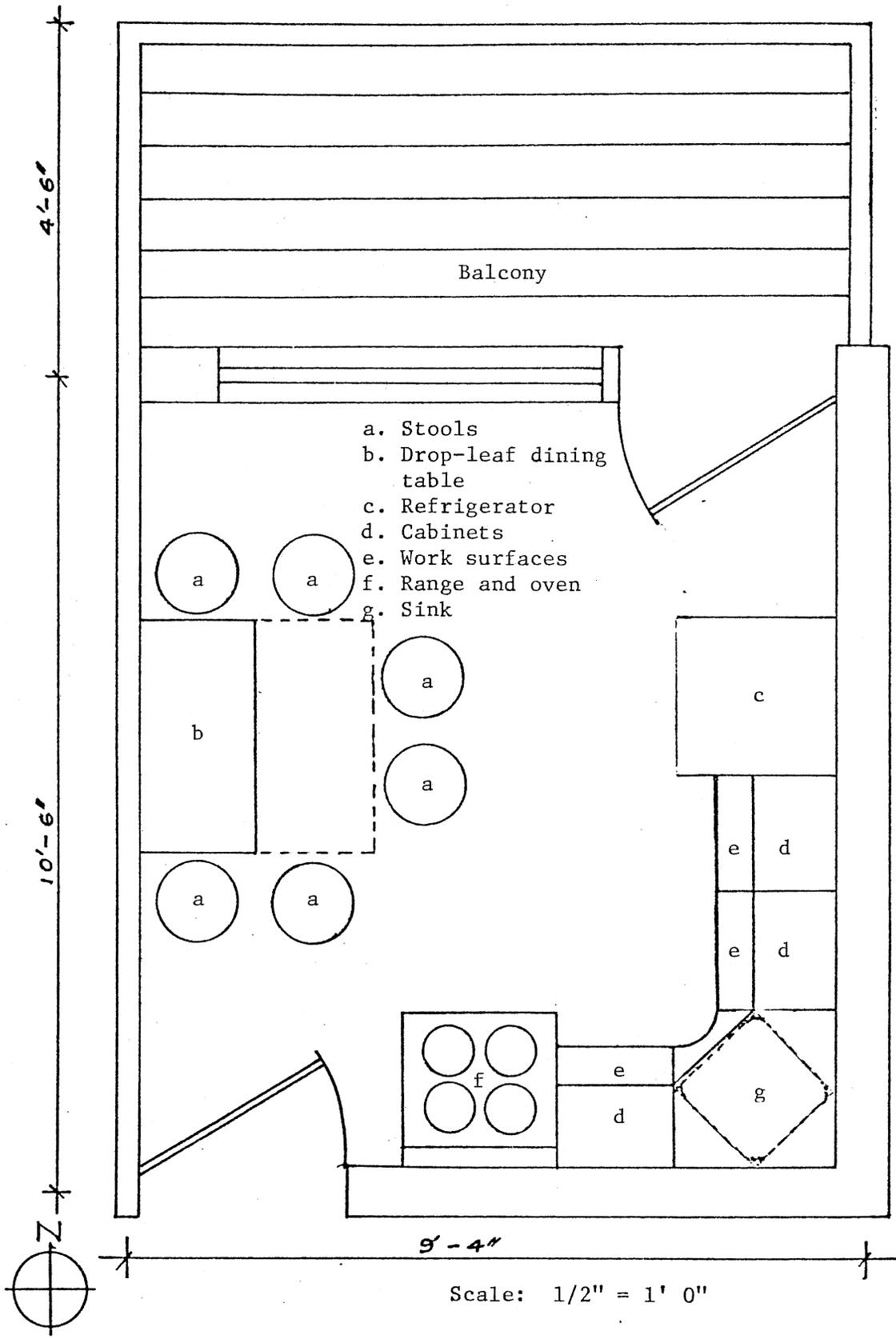


Figure 32. The Floor Plan for the Kitchen

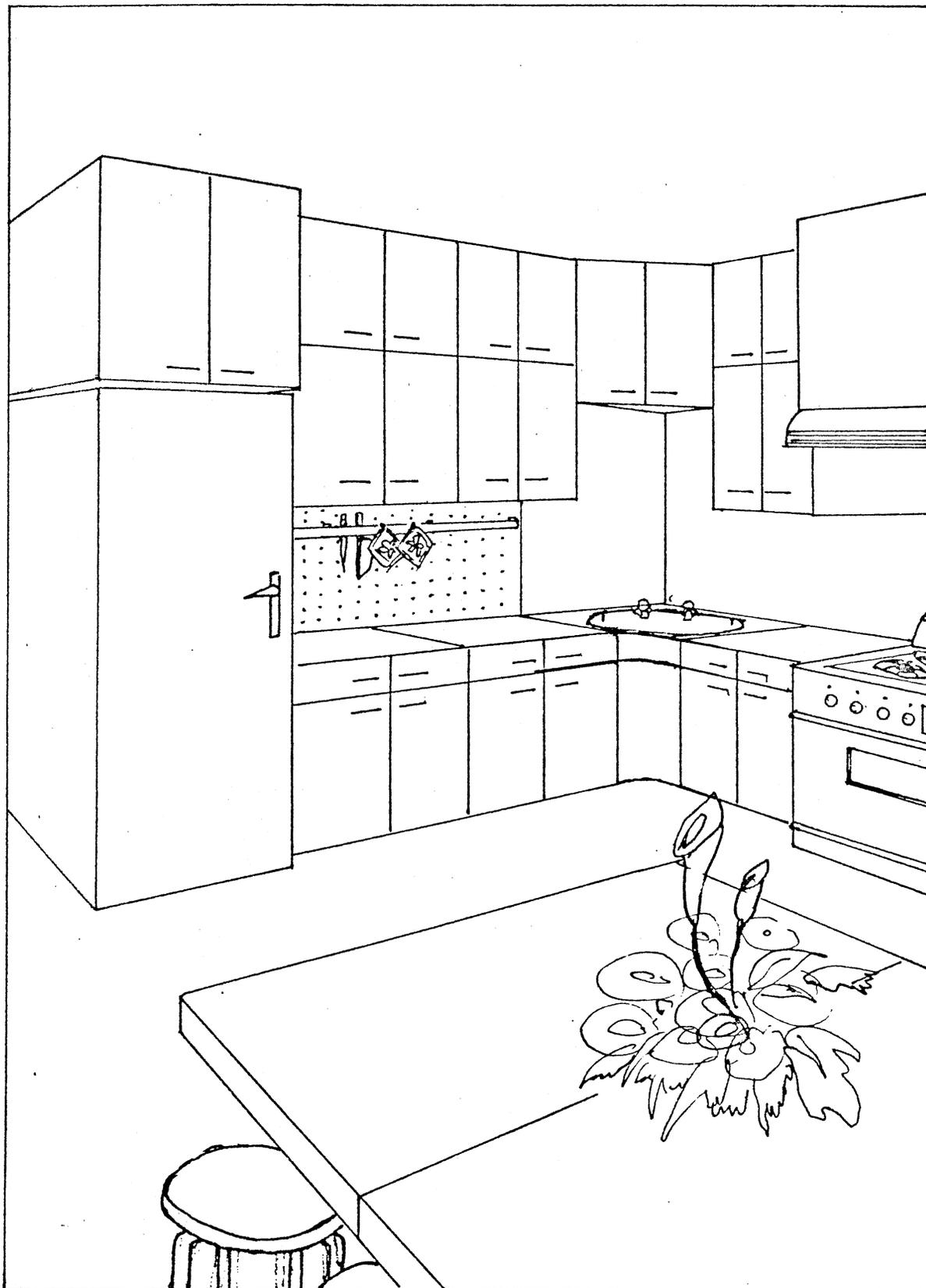


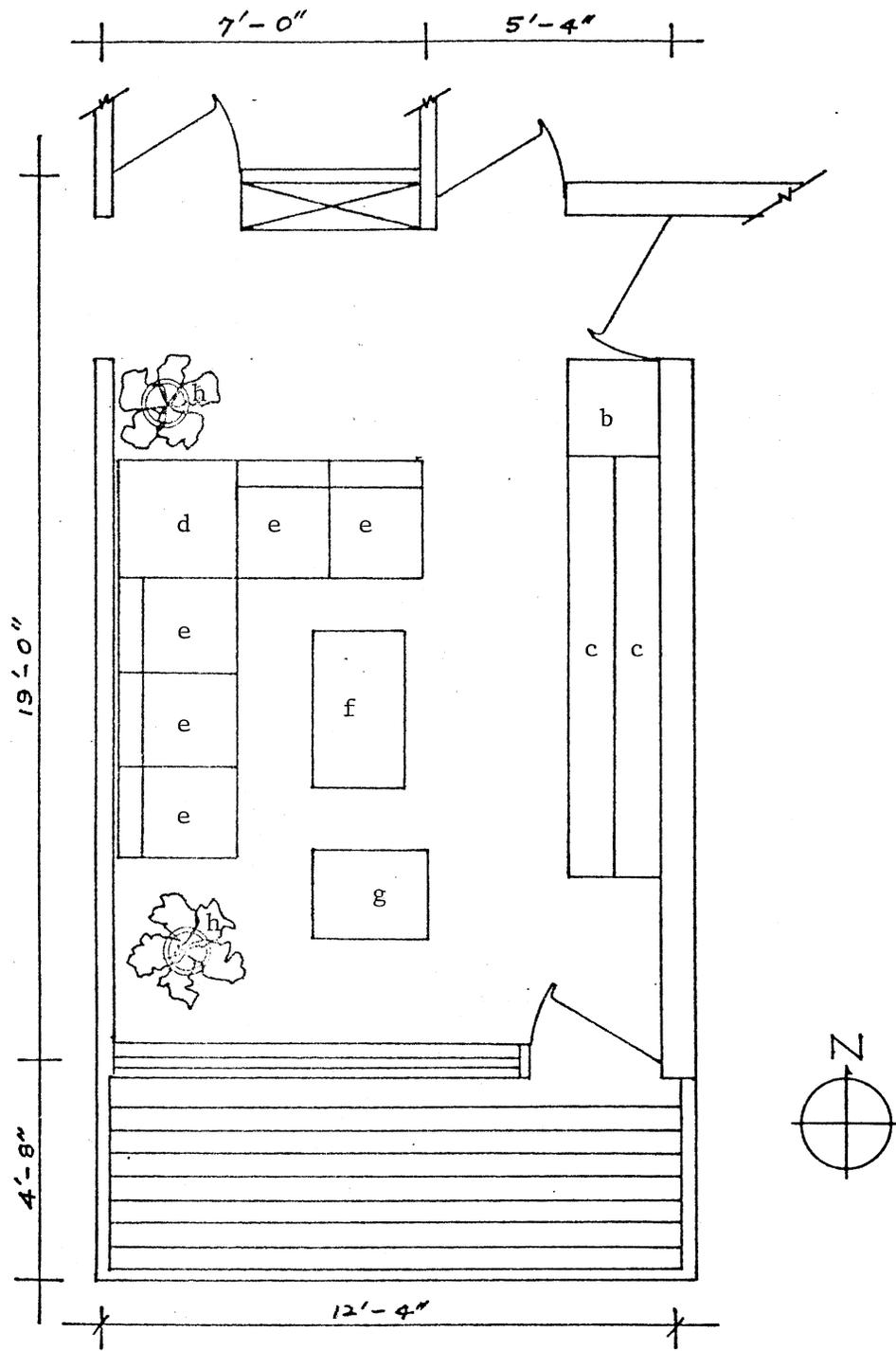
Figure 33. A View of the Kitchen

is suitable. A pattern of stylized modern florals, geometrics, or stripes could bring a cheerful mood. Also, a vinyl floor covering is good for the kitchen in this apartment since vinyl tiles and sheet vinyl are durable and washable.

Room Five: Living Room

This is a 12' 4" x 18' 4" living room (Figure 34). One of the problems in this apartment is the lack of a separate dining room. The family which lives in this apartment could have their daily meals in the kitchen but must use their living room for dining with other guests or special occasions. This room actually combines space for living and dining. Since this room is much longer than it is wide, the dining area could be put at the end of the room nearest the kitchen. This does not mean that a formal dining area is set at the end of the living room but that the area could be used for occasional dining. A temporary dining room could be formed whenever a big folding dining table is brought out for a party in the living room.

Good planning of the color scheme is very important for a cheerful living room because color alters the basic size and shape of the room through visual illusion. For this crowded living space, a monochromatic color scheme, which is based on one color used in various degrees of value or intensity, is most suitable. The smooth flow of one color throughout gives the effect of pushing the walls out, sending the ceiling up and widening the floor space considerably. A monochromatic scheme is not the only appropriate color scheme for this living room. Some other color combinations would also have good effects for this room if the colors were light, pale, or pastel tones and blend smoothly.



- a. Ancestor table
- b. Closet
- c. Wall storage unit
- d. End table
- e. Seating
- f. Coffee table
- g. Ottoman
- h. Plants

Figure 34. The Floor Plan of the Living Room

Figure 34 is a floor plan for the use of the room on normal days and the perspective of this plan is shown in Figure 35. By using the same furniture as shown in Figure 34 but adding a dining table and chairs, a different furniture arrangement forms as shown in Figures 36 and 37. Seating pieces made of rattan and wicker provide a cool feeling in hot weather. The people in Taiwan like to use rattan and wicker as the seating materials because those seats work two different ways, with cushions or without cushions. In summer, by removing the cushions on the seats, the woven wicker seats do not get sticky when occupied by people who are perspiring. In winter or whenever these seats need to be turned into beds, putting cushions back on the seats would make very comfortable winter seating or temporary beds for guests. A second bed could be obtained by connecting the ottoman and two single seats. So, the seating could actually be altered into two beds. The bedding for these beds could be stored in the end table.

A storage wall unit at the west end of this room holds many items: books, receiver, speakers, stereo, a slide-out writing surface, television, and some accessories. As this storage unit collects all small things in it, it keeps the entire living room neat. The light tone wood for this storage unit is desirable. The natural color of wood and wicker match each other well. The dining chairs made of transparent material could be folded and stored when they are not in use. The dining table is also a folding table which can be stored under the ancestor table at the south end of the living room. Too many doors in the north wall of the room break up the normal flow of wall space (Figure 10). A treatment of hanging beads across the openings for these two doors and the space

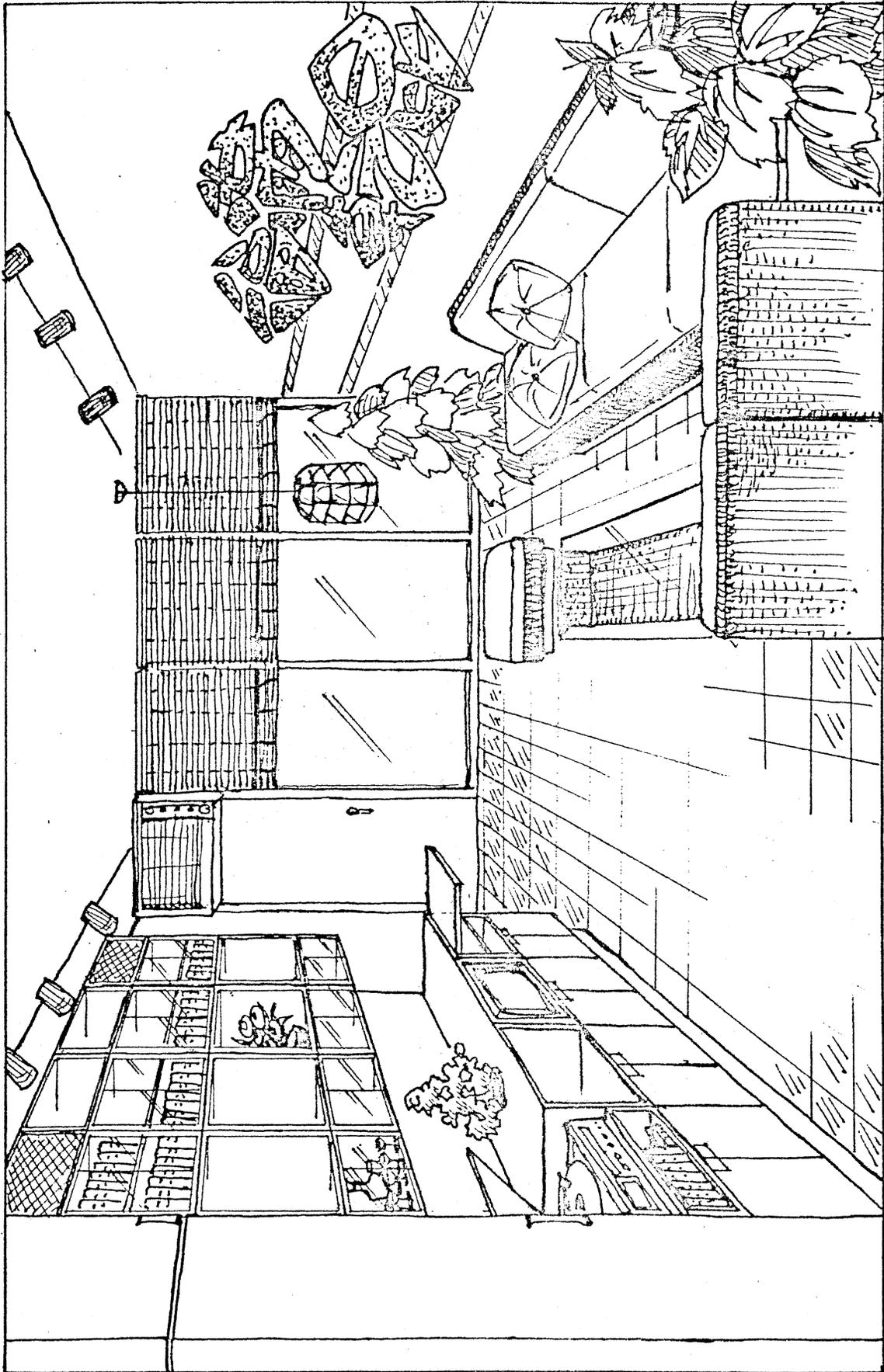
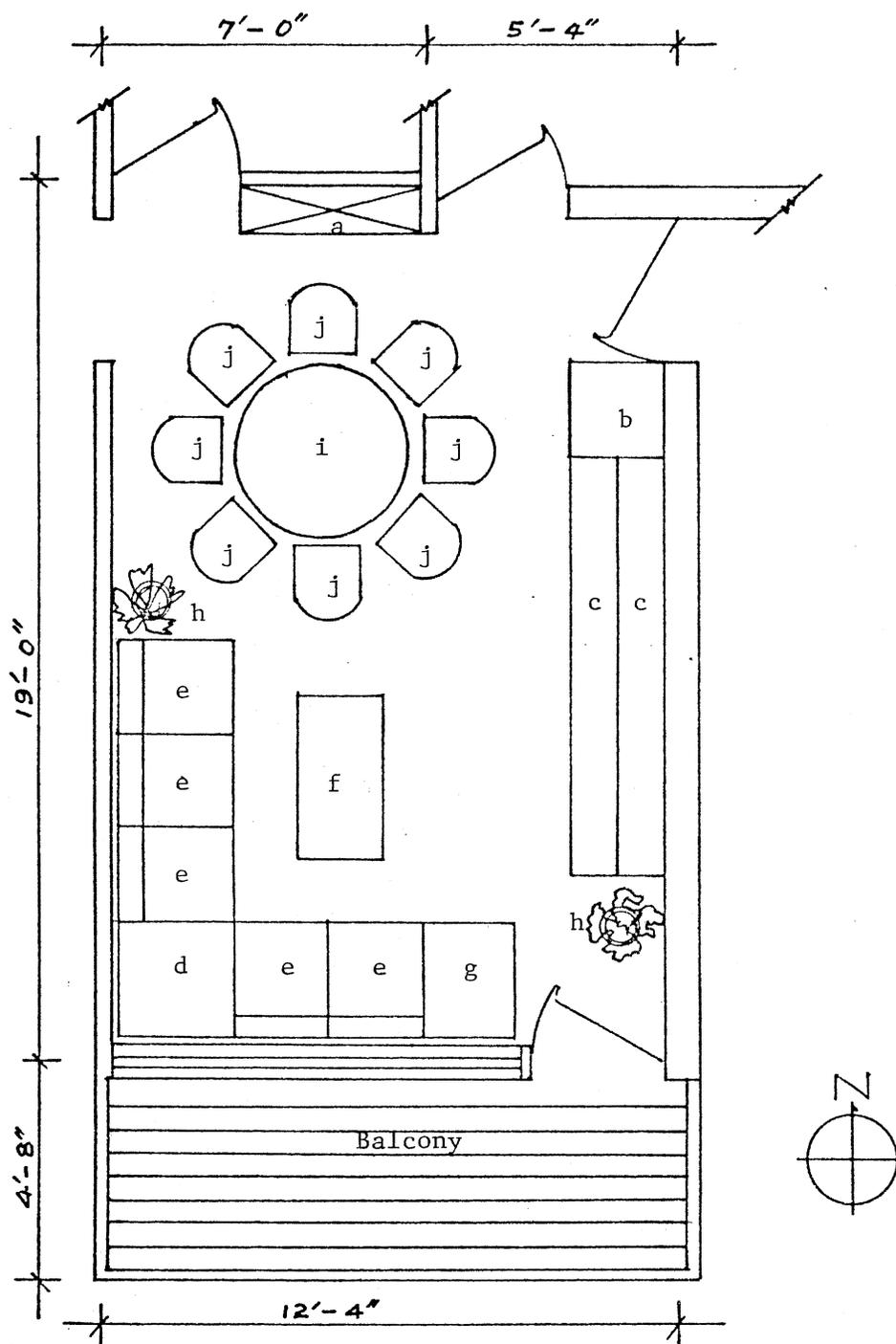


Figure 35. A View of the Living Room



Scale: $1/4'' = 1' 0''$

- | | |
|----------------------|-----------------|
| a. Ancestor table | b. Closet |
| c. Wall storage unit | d. End table |
| e. Seating | f. Coffee table |
| g. Ottoman | h. Plants |
| i. Dining chairs | j. Dining table |

Figure 36. The Floor Plan of the Living Room Including Dining Area

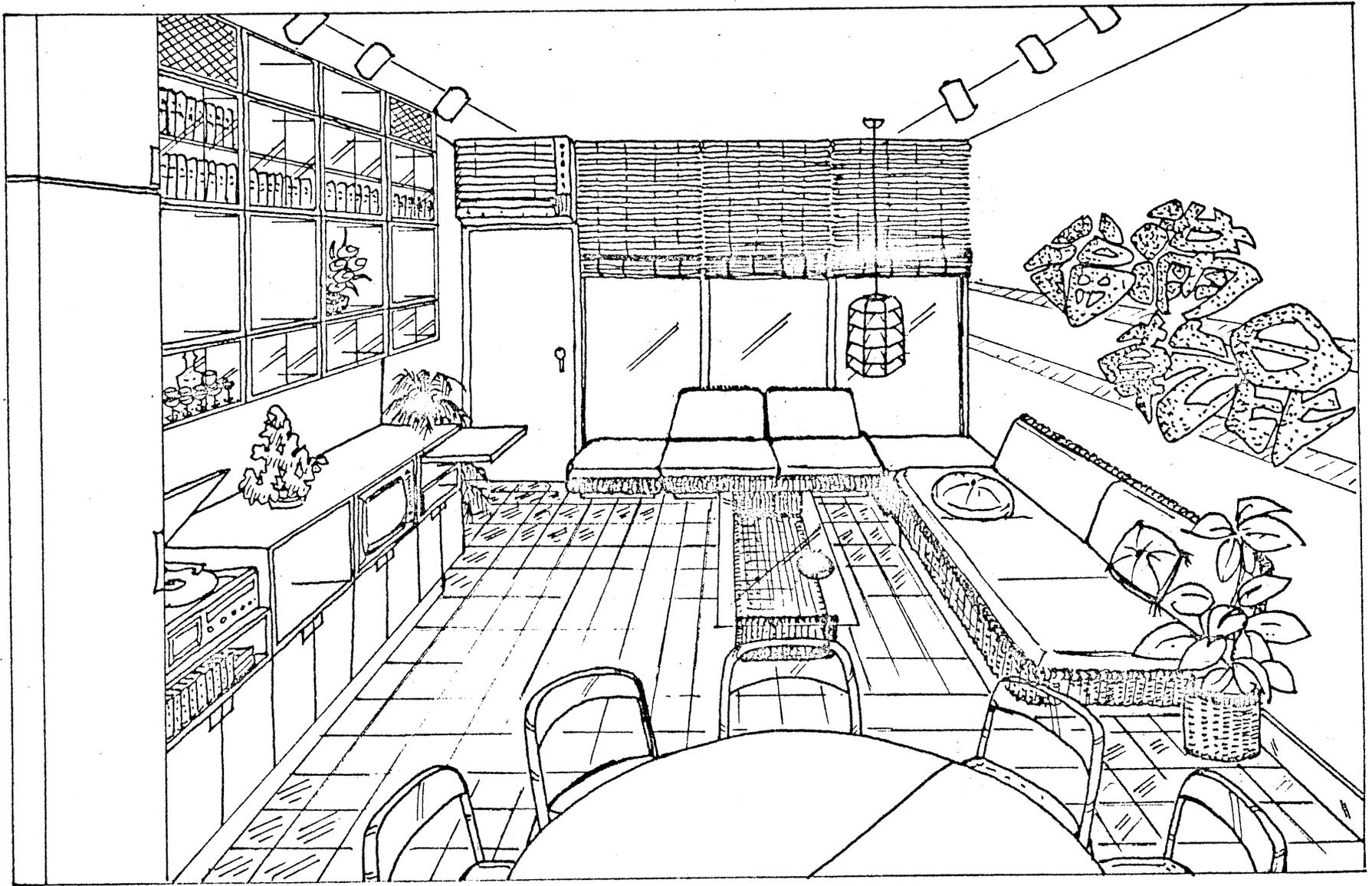


Figure 37. The Living Room with a Temporary Dining Area

for the ancestor table could connect the doors as a whole piece of wall again (Figure 12).

The bamboo roller blinds are used for the window treatment in this room. The bamboo brings the traditional Chinese mood to the home and coordinates with the hanging beads on the opposite wall. A floor-to-ceiling closet beside the entrance could store the folding dining chairs and serve as the guest closet.

Wooden floor covering has been built into the entire apartment except for the kitchen and bathroom. The addition of a wooden baseboard around the living room could create the effect of a lower ceiling, make the room appear larger, and enlarge the feeling of floor space.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This study is based on designing for space arrangement within a typical small apartment in Taiwan as well as creating personal privacy for crowded living. The rapidly accelerating shortage of housing and low income of the people in Taiwan indicate that space saving problems are becoming more and more serious. Interior space planning has not received high priority from the government of the Republic of China. With the increasing population in large cities and the attendant housing need, it is time for the policy-makers of the Republic of China to take a look at current housing development and the interior space distribution for housing units in the national housing programs.

A selected floor plan from the Central Public Functionary housing units built by the National Housing Department of the Republic of China has been studied in this thesis as a sample of the space shortage conditions in Taiwan. Through an analysis of this selected apartment in Taiwan, some proposed solutions for space pressure problems have been suggested for each room in the apartment. Specific dimensions and furniture arrangements show how the space saving designs can be accommodated in the small dwelling units for efficient space utilization and easier living.

Solutions for each room in the selected apartment consider the correct dimensions, suitable furniture, right color scheme, effective

lighting, and adequate ventilation for gaining more space in certain ways (such as enlarging space by visual illusion and saving space by the use of built-in or foldable furniture.

The floor-to-ceiling storage walls are compact and make maximum use of floor space. Also, the built-in furniture has certain advantages in avoiding wasted spaces in the rooms.

Certain materials can be used to produce better effects on enlarging spaces visually while still maintaining traditional moods in design. For example, the rattan and wicker furniture creates a cool feeling in crowded space and is appropriate for the climate of Taiwan.

Care must be taken to allow for sufficient space to prevent one use from interfering with another when a room is designed for multiple use. The designer needs to have a clear understanding of spatial allowances for each specific piece of furniture and each activity to be conducted in the space.

However, the minimal space in the apartment of the Taiwan housing project can be designed to provide for the social and cultural needs as well as individual privacy of family members. By designing double-level space use and partitions between the beds, personal privacy can be created in the bedroom.

In order to satisfy the Chinese elderly people's yearning for the traditional, the normal old-style furniture is selected for their use and to maintain the Chinese living custom. The square and round shape dining tables, which can be folded away when they are not in use, satisfy the traditional Chinese eating custom and space saving purpose too.

Although the space-saving designs occupy a central role of this study, this does not mean that spatial planning is the only or most important tool that planners of national housing programs or private construction industries should have at their disposal. The planning of residential environments, economic growth, physical development, and optimum functioning of the urban area are also necessary for improving people's living conditions in Taiwan. The endeavor in this study to improve the living level of Taiwan residents by giving space planning suggestions to the Taiwan government should not be separated from the planning of the social life, civic development, and the total residential environment in Taiwan.

This study has been planned to suggest ideas to the interior design field in Taiwan, but there is a very important point to be made: no matter what kind of designs that Taiwan interior designers could work out, they had better hold steadfastly to historic values and the uniqueness of Chinese design and heritage. Learning other's cultures may help people to further develop their own style. This depends on their attitude toward learning. Only one's unique culture could contribute to world civilization. So, the Chinese interior designers in Taiwan must examine their heritage and develop their own civilization with the methods they learned from others. Every nation should be proud of its own values, even if it is just a value for the single field of interior design.

Recommendations

In order to help the people in Taiwan to solve their space shortage problems by saving space within the dwelling units, the following

recommendations are made with the hope that the government of the Republic of China and the interested agencies can give attention to foster and promote the adoption of them:

1. A suggested floor plan of a Shuang-Shi apartment in this study can be a reference of future interior space dividing design for public housing in Taiwan.

2. Short-term courses or seminars about how to use space efficiently could be offered for the people who are ready to move into the new apartments so that the people in Taiwan could learn the space arrangement for their own homes from the beginning.

3. A national organization sponsored by various construction industries, educators, and interested agencies needs to be organized so that people in Taiwan could efficiently and economically obtain information about space saving design solutions.

4. Educators in the fields of home economics and applied art could be encouraged to emphasize better designs for small space and help homemakers to overcome the space pressure problems within the homes.

Recommendations for future studies concerning space pressure problems are suggested as follows:

1. Space design for crowded living in Taiwan.
2. Furniture arrangement for multipurpose rooms.
3. Multipurpose furniture for limited space living in Taiwan.
4. Suggestions for double-level living in a small space.
5. Built-in storage units for housing in Taiwan.
6. Gaining more storage space from an unused overhead portion of a door area, a window, or other wasted spaces.

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VITA

Lan-Ling Cheng

Candidate for the Degree of

Master of Science

Thesis: SPACE SAVING DESIGN FOR SMALL APARTMENTS IN TAIWAN

Major Field: Housing, Design and Consumer Resources

Biographical:

Personal Data: Born in Taipei, Taiwan, Republic of China, December 3, 1953, the daughter of Chung-Ting Cheng and Jee-Rou Liou.

Education: Attended Fung-Yang High School in Taichung, Taiwan, Republic of China; graduated from Fung-Yang High School in 1972; attended Providence College in Taichung, Taiwan, 1972-1976; received the Bachelor of Arts degree from Providence College in June, 1976; completed requirements for the Master of Science degree at Oklahoma State University in December, 1980.

Professional Experience: Secretary, Yeon-Ling Trading Company, Taipei, Taiwan, 1976-1977.