



WEST MEETS EAST

A study of Japanese Architecture and its Applications to  
Contemporary Residential Design

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TABLE OF CONTENTS

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illustrations . . . . .	3
acknowledgements . . . . .	4
introduction . . . . .	5
#                  #                  #	
<b>PART ONE</b>	
japan RETROSPECTION	8
#                  #                  #	
architectural history . . . . .	12
geography . . . . .	20
way of life . . . . .	24
#                  #                  #	
<b>PART TWO</b>	
japan DISSECTION	29
#                  #                  #	
climatic control . . . . .	34
standardization of construction . . . . .	37
use of materials . . . . .	40
space and function . . . . .	45
architectural feeling . . . . .	51
#                  #                  #	
<b>PART THREE</b>	
east-west INTERSECTION	56
#                  #                  #	
the program . . . . .	63
the site . . . . .	67
space organization . . . . .	71
the environment . . . . .	76
construction and materials . . . . .	78
aesthetics . . . . .	81
#                  #                  #	
<b>PART FOUR</b>	
east-west PROGRESSION	84
#                  #                  #	
the design . . . . .	87
#                  #                  #	
bibliography . . . . .	97
vita . . . . .	99

ILLUSTRATIONS

cover sheets - Japanese shoji paper  
frontespiece - photostat of wood-block print by M. Ishihara

P A R T O N E

japan RETROSPECTION

PLATE I	Ise Shrine . . . . .	9
PLATE II	Plan: Shinden-Zukuri . . . . .	18
PLATE III	Isometric: Shinden . . . . .	19
PLATE IV	Wood-Block Print - Hiroshige . . . . .	28

P A R T T W O

japan DISSECTION

PLATE V	Tōshōdaiji (759 A.D.) . . . . .	30
PLATE VI	Interior Elevations . . . . .	39
PLATE VII	Japanese Floor Construction . . . . .	43
PLATE VII	Japanese Roof Construction . . . . .	44
PLATE IX	The Japanese Bath . . . . .	49
PLATE X	Japanese House Interiors . . . . .	50
PLATE XI	Plan: Japanese House . . . . .	54
PLATE XII	Elevations: Japanese House . . . . .	55

P A R T T H R E E

east-west INTERSECTION

PLATE XIII	Tea House, Katsura . . . . .	57
PLATE XIV	Plan: Exhibit House . . . . .	66
PLATE XV	Garden: Exhibit House . . . . .	70
PLATE XVI	Interior: Exhibit House . . . . .	75
PLATE XVII	Exterior: Exhibit House . . . . .	80
PLATE XVIII	Katsura Detached Palace . . . . .	83

P A R T F O U R

east-west PROGRESSION

PLATE XIX	Entranceway, Tokyo . . . . .	85
PERSPECTIVE	. . . . .	91
FLOOR PLAN	. . . . .	92
ELEVATIONS	. . . . .	93
ELEVATIONS	. . . . .	94
SECTIONS	. . . . .	95
DETAILS	. . . . .	96

PLATES II, III, VI, XI, XII - Das Japanische Wohnhaus, Tetsuro Yoshida  
PLATES VII, VIII, IX, X - Dependents Housing, Engineer Section Far East Comd.  
PLATES XIV, XV, XVI, XVII - Museum of Modern Arts, New York  
PLATE XVIII - Photograph by A. N. Tuttle, Jr.



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This thesis on Japanese architecture would have been impossible without the kind help of my many Japanese friends.

Through the Far East Society of Architects, I have met many Japanese architects who have assisted me through their addresses to the Society, personal conferences and loans of literature.

I am indebted to the library of the International Society for Cultural Relations for the privileges granted to me in the use of their outstanding collection of material on Japan written in English.

Finally, I must acknowledge the indelible impression made upon me by the natural beauty and refined simplicity of the architecture of Japan.

## INTRODUCTION

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Until the advent of Western civilization and industrialization in Japan, in 1868, the architecture of the country consisted almost entirely of fortifications, religious buildings and residences. This is basically true of all architectural styles until the industrial revolution.

In a study of Western architecture the emphasis is almost exclusively directed to religious buildings. This is a valid criteria for these buildings demonstrate a continual development of style. This development was later available for application to the multiplicity of buildings required by the widening culture and industrialization of society. It is also in the religious buildings that we find the structural evolution man had to rely upon until he developed steel and concrete. The study of the European residence does not offer much to the student of architecture because these were, for the most part, mean structures that failed to show many refinements through the ages.

Conversely, the study of the Japanese residence, rather than the temples and shrines, offers the greatest rewards.

It is true, so aloof is it from Western ideals and methods of thought (Japanese temple architecture), it can never serve as a model for contemporary work as those styles of Europe with which we in America have such close kinship and sympathy. On the other hand it is possible to learn many lessons from it. . . . It is when we come to the domestic architecture of Japan however, that we find more in the way of salutary teaching. - Ralph Adams Cram, Impressions of Japanese Architecture and Allied Arts.

Japan, by its self-imposed isolation, retained an almost static civilization for hundreds of years. Hence, when it opened its gates to

## INTRODUCTION

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westernization and industrialization it had to call upon European architectural styles and building methods to house the increased functions of an industrial society. It was impossible to call upon national architectural styles for two reasons: 1) the structural system failed to go beyond the post and lintel system; and 2) the construction was almost exclusively of wood.

While Japanese architecture can be classified by period, it shows no such development as is evidenced from the Parthenon to Notre Dame de Paris. The temples of Buddhism and the shrines of Shintoism, while an interesting study in themselves, are of little value when they are studied in the light of their application to contemporary design, rational construction and function. The Japanese residence, however, embodies all the characteristics of the shrines and temples, as well as some of the rationalism being rediscovered by contemporary architecture.

A study of Japanese architecture would not be worthy of the undertaking unless some principles and applications could be evolved from it since the function of the architect of today is not that of an historian but rather that of a creator. This is also true of the architectural student as an architectural thesis is customarily a written study of a problem whose solution is the evolution of a design.

It would seem necessary then that an explanation be given of the form that this thesis has taken:

This thesis was started as a study of contemporary residential

## INTRODUCTION

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design when I was still a student in the United States, but service in the United States Army interrupted this study. However, assignment to Japan opened a new vista of study: Japanese architecture and the Japanese residence.

In order to pursue this study, a certain amount of RETROSPECTION into the characteristic features of Japan and her people was felt necessary to more clearly understand the country's architecture.

A DISSECTION of the Japanese residence was then made and its characteristics subjected to careful examination. These characteristics were then discussed in conjunction with their possible application to the American residence.

This INTERSECTION produced principles worthy of perpetuation.

The final step was the PROGRESSION of these principles--the design of a contemporary American residence.

An architect working in Japan has the advantage of seeing materialized before him in Japanese architecture and civilization, fundamental principals the rediscovery of which is the goal of modern architecture. - Antonin & Hopei P. Raymond, "On Japanese Residences," Architectural Japan Old New.

PART ONE

Japan RETROSPECTION



PLATE I

ISE SHRINE



As an architect my attitude toward the historic is necessarily conditioned by the artistic conception which I myself endeavor to realize. From this it follows that artists must speak and write subjectively about art. But is there any science of art which would be objective in the sense that it would present authentically not only historical data but also stylistic questions and qualities of old works thus giving a truly just criticism independent of time and space? - Bruno Taut, Fundamentals of Japanese Architecture.

japan RETROSPECTION

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The Orient, in the past, has been rather an esoteric field of study for the majority of Western scholars. Contemporary world problems have drawn the attention of the Western nations to this region of the globe. This attention has not been solely directed to political activities but has also resulted in much interest in the culture and civilization of the Eastern nations.

The architecture of any period or civilization is closely related to cultural and historical and geographical factors. In order to understand and appreciate Oriental architecture, a certain transplanation of point of view is necessary. The very fact that the culture is oriental rather than occidental requires more than the usual amount of open-mindedness and reorientation of views and values. This is especially true of Japan. In order that any facet of its culture be studied, and especially its architecture, a certain amount of background is necessary.

Therefore, the next section of this thesis will constitute a brief summary of the necessary background for a more sympathetic understanding of the written material, namely: architectural history, geography and way of life.

ARCHITECTURAL HISTORY

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Japan has been occupied by a civilized people for more than a millennium and a half. The racial stock is a mixture of several peoples: the Ainu, the Yamato, and the Chinese and Koreans. The Ainu, the aboriginal inhabitants of the islands, were slowly pushed north by invading groups and today form an insignificant part of the population leaving almost no cultural impact. The Yamato were bands of emigrants from the east and southeast fringes of Asia and other adjacent islands. This group forms the largest segment of the population and the most important culturally. There were also emigrations from Korea and Northern China.

Authentic Japanese history, as far as dates are concerned, begins with the Fifth Century. The history of the country is extremely interesting, but not necessary for a study of its architecture. The architectural history, as with all nations however, is closely tied to events of historical prominence.

There are several classifications of Japanese architecture by period. The classification set down by Jiro Hirada in his book, The Lessons of Japanese Architecture, is used as it is the simplest and is independent of Japanese names. It is as follows:

- |     |   |           |
|-----|---|-----------|
| I   | Pre-Buddhist Period - - - - -           | -552 AD   |
| II  | The First Period of Chinese Influence - | 553-885   |
| III | The First Nationalization - - - - -     | 886-1185  |
| IV  | The Second Period of Chinese Influence  | 1186-1572 |

ARCHITECTURAL HISTORY

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- V The Second Nationalization - - - - - 1573-1867
- VI The Period of European Influence - - - - 1868-1926
- VII The Present Period - - - - - 1927-
- I Pre-Buddhist Period ( -552)

In primitive ages the Japanese lived in caves, as did other peoples. As they became far enough advanced, they built simple rectilinear structures similar to those found on many islands of the Pacific. This is logical as the early settlers came from the South. The architecture has always been essentially a sub-tropical type, particularly the dwellings. These early type houses are preserved with slight deviation in the shrines of the Shinto religion. The shrine is the home of the Kami or Japanese dieties. The sacred regalia of the religion were moved from the Emperor's Palace to a residence at Ise in 29 BC. This shrine is rebuilt every twenty years after the original. From these buildings at Ise we can get an idea what the early dwellings were like.

(PLATE I)

II The First Period of Chinese Influence (553-885)

Previous buildings were of simple construction; and architecture properly speaking entered Japan with Buddhism in 552. The new religion came from Korea with many artisans to construct the temples of the new religion. During this period, the Temple at Hōryūji, near Nara, was built in 607 AD and still stands as the oldest wooden building in the world. During this period the capital of the country was Nara. Chinese



## ARCHITECTURAL HISTORY

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arts predominated in all walks of life. Buddhism spread rapidly and achieved a close alliance with the imperial family. The imported architecture was quite advanced. Entasis was used on the columns and an elaborate system of bracketing the roof existed (PLATE V). The roofs were of tile rather than the thatch that had been predominate.

### III The First Nationalization (885-1185)

In 784, the capital was moved to Kyoto, where it remained for four centuries. During this period, there existed a reaction against imported culture. The Chinese style was refined to meet national taste. The buildings became noticeably different from those first imported. The roof curves became less pronounced and the detailing was simplified and refined. The rigid symmetry of the building grouping was abandoned and the torii replaced the posted gate. The residence remained simple. The aristocratic mansions were a group of buildings connected by corridors and separated by landscape gardens. This way of building was called the Shinden-Zukuri (PLATES II & III).

### IV The Second Period of Chinese Influence (1186-1572)

The capital of the country was shifted from Kyoto to Kamakura, coincident with the shift of power from the nobility to the samurai or warrior class. The architecture shifted to the Indian and Chinese styles as commerce with the latter country increased. During the latter years of this period the country was ravaged with continual internal wars.

## ARCHITECTURAL HISTORY

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The Zen sect of Buddhism, based upon meditation was developed and had a strong influence upon the residence. A new style was developed called the Shoin-Zuhuri (PLATES XV, XVI, XVII, XVIII).

The tea ceremony was born and its rigid ceremonies found great favor with the military class. Tea house architecture was developed and exerted a strong influence on the residence.

During this period, most of the features we associate with the Japanese house were introduced. Previously, it did not differ greatly from the early European cottage.

The dwelling house used tatami on the floor, sliding paper screens, the tokonoma or alcove, shelves on the wall, fixed table by the window, coffered ceiling, narrow verandas and an entrance room.

Interior decoration (PLATE XIII) developed as an art and occupied the interest of the greatest painters. The exterior of the homes remained unadorned.

### V The Second Nationalization (1573-1867)

The country gradually became unified by a series of strong rulers; and a rigid feudal system was established resulting in a flourish of castle architecture.

The architectural attention shifted from shrines and temples to the buildings of men: palaces, dwellings, tea rooms and castles. The religious architecture of the times became stagnant. The tombs of the Tokugawa shoguns were built in Nikko in a style extremely ornate and



## ARCHITECTURAL HISTORY

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decorative—corresponding to the Renaissance and Roccoco periods of Europe.

Japan, free from foreign influence, developed the culture of the common people: painting, plays and poems.

During the latter period, Japan was isolated from the rest of the world and interest in construction and the arts gradually decreased.

### VI The Period of European Influence (1868-1926)

In 1853, Commodore Perry opened Japan to Western trade and influence. Previous to this time, very few European people lived in or traded with Japan. The country underwent extraordinary changes as it attempted to catch up with technology of the West. Western architecture was eagerly sought and copied; and many foreign architects practiced in Japan. The majority of the buildings were of the various revivals then sweeping the Western nations. Many of these buildings were ill suited to Japan and later were severely damaged during the earthquake of 1923. However, they filled the void in building styles left by the feudal ages. Much work was done in designing for earthquakes; and all large buildings recognized the special structural requirements during the later part of this period.

### VII The Present Period (1927- )

The present architecture of Japan reflects a nation still in a transitional stage and still full of the dilemmas of the old versus the new. The reliance upon Western styles, at least the classical forms,

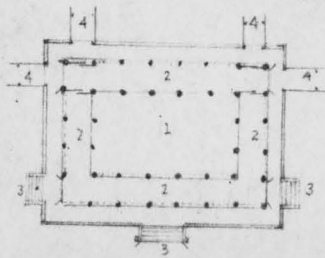
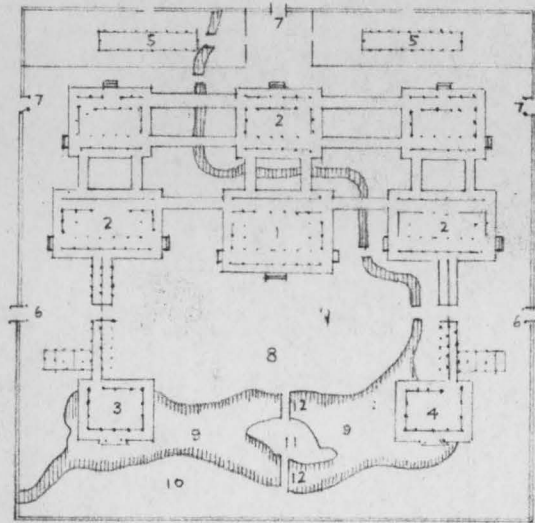
ARCHITECTURAL HISTORY

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has disappeared. The better buildings, though few in number, compare favorably with the contemporary architecture of the world. The architectural profession is just coming into its own. Many of the large buildings have been and continue to be born in the architectural factories of large contractors and municipalities. The average home can still be built and designed by a master carpenter due to the standardization of details.

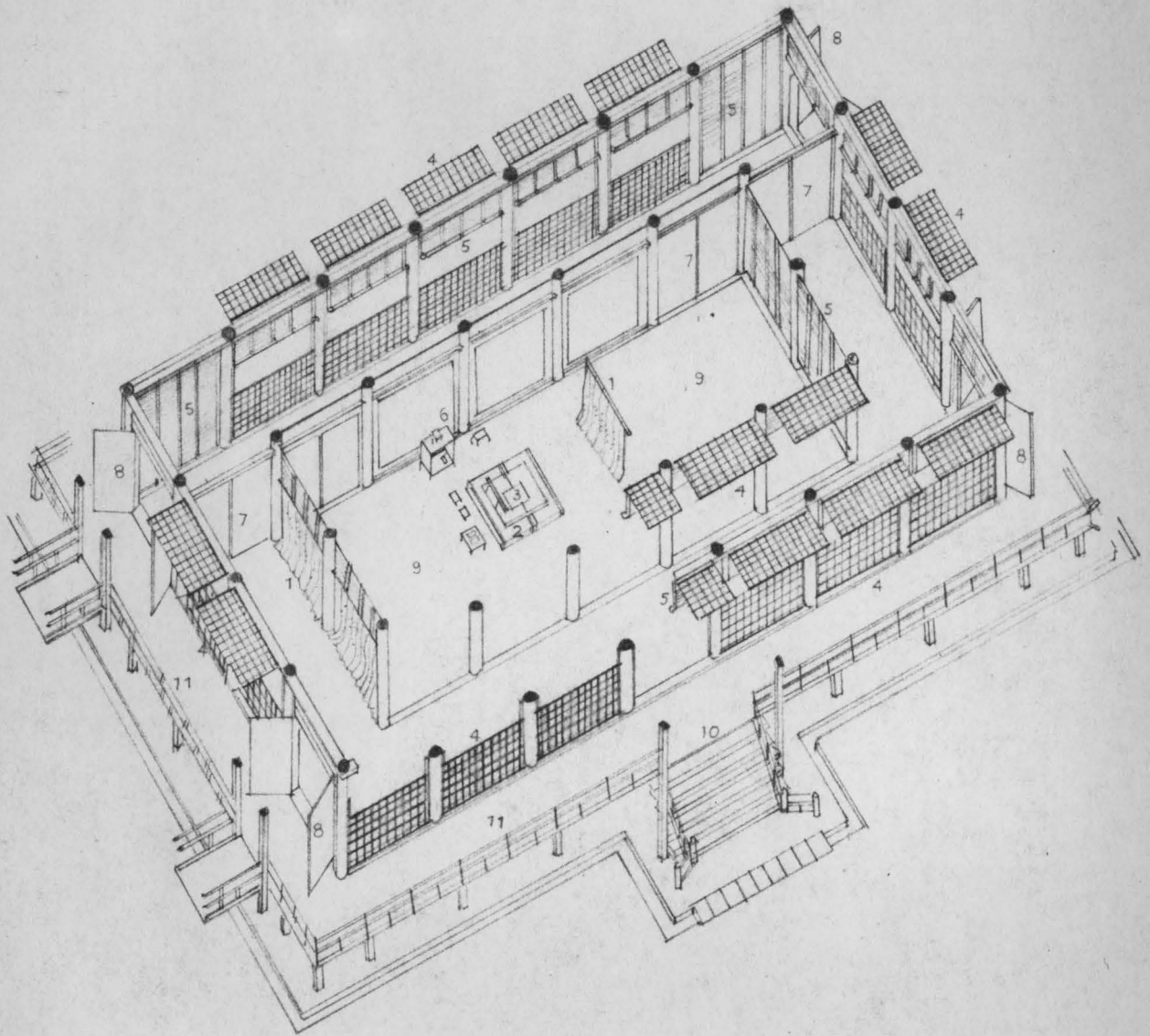
The design of the contemporary residence usually incorporates the facilities for both the traditional and Western style of living; most of the rooms are of traditional tatami mats while a sitting room will be provided with Western furniture.

The future would appear bright, however, as more and more of the buildings are capturing the simplicity and grace of a rich architectural heritage.



SHINDEN-ZUKURI LAY-OUT  
10<sup>TH</sup> CENTURY

1. SHINDEN 2. TAINOYA 3. TSURIDONO 4. IZUMIDONO 5. SIDE BUILDING 6. MAIN ENTRANCE 7. SIDE ENTRANCE 8. GARDEN 9. POND 10. HILL 11. ISLAND 12. BRIDGE



ISOMETRIC VIEW OF "SHINDEN"

1. KIKO, HANGING CURTAIN WITH MOVABLE FRAME. 2. TATAMI, MATS. 3. SHITONE, SITTING SEAT. 4. SHITOMI, WOODEN FRAME SHUTTER. 5. SUDARE, MARSH-REED SCREEN. 6. NIKAZUSHI, PORTABLE SHELVES. 7. SLIDING DOOR. 8. SWING DOOR. 9. WOODEN FLOOR. 10. WOODEN STEP. 11. EXTERIOR VERANDA.



## GEOGRAPHY

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Geographically, Japan, though a land small in area, encompasses a large variety of climatic experiences because of its extreme length.

Japan consists of four principal islands: Hokkaido, Honshu, Kyushu and Shikoku. The islands extend longitudinally from about  $30^{\circ}$  to  $45^{\circ}$ , which is equivalent to the longitudinal difference between Georgia and Maine.

The cities of Kyoto and Tokyo, located on Honshu, have been the cultural and historical centers of Japan. It is in these areas that Japanese architecture developed.

The northern island of Hokkaido has a more severe climate than the rest of Japan. This island was until recently sparsely populated and has made no important cultural impact on the nation.

Kyushu and Shikoku, the southern islands, are warmer than Honshu. They figured in the early history of the nation, but later lagged behind the development in Honshu. For these reasons most of the discussion will be specifically directed to Honshu and statistics from these areas will be used, although most of the statements will be true of the nation as a whole.

The total area of the islands is approximately equal to that of California. Much of the land is uninhabitable due to the numerous mountains and forestlands. Seventy-five percent of the land is rugged land whose average slopes exceed  $15^{\circ}$  and, hence, is unfit for normal cultivation. The country has always been densely populated. It has now

## GEOGRAPHY

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a population equal to half that of the United States. The saving factor is the warm climate and plentiful rainfall that affords long growing seasons.

The centers of population are the plains and river basins. Most of the towns are of the agglomerated or cluster type. The large cities, developed during the feudal period, were compact and rectilinear in form. Cities developed at sites of castles, temples and shrines, military posts and seaports. The most common and largest cities were developed around castles.

Japan, though short of natural resources, is blessed as being one of the most completely forested of civilized nations--approximately 54.5 per cent of the land area is forested. Most of the forests are on the lower mountain slopes. There is a fine variety of native trees, the most important being cryptomeria, cedar, cypress and cherry.

The majority of the people earn their living through farming and fishing. The society is agrarian in nature; and the basic food staple is rice. Industry, in recent years, has played an important part in the economy. This has been largely necessary as, in spite of soil conservation, fertilization and the use of every square inch of land, the nation is unable to grow enough food for the population.

Climatically, Japan is often classed as sub-tropical. It is a member of the monsoon realm of eastern and southeastern Asia and, as such, is subject to high humidity and heat, heavy rainfall and strong



GEOGRAPHY

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typhoon winds.

The climate has been compared to the Atlantic Seaboard and Mississippi valley states of similar latitudes. Tokyo, in mid-Japan, is located at about the same longitude as Winston-Salem, North Carolina. The climatic statistics for Tokyo are charted at the end of this section.

Japan is a humid land no section of which suffers from a seasonal or yearly deficiency in rain. In summer the combination of humidity and heat make the climate sultry and oppressive. The sky is generally overcast but bright. The major cities of Honshu experience heavy snowfalls, but these are infrequent and of short duration.

Japan is also one of the great earthquake centers of the world--subject to almost daily earthquake many of which are imperceptible except to instrument calculation. There have been many national disasters as a result of these demons of nature. The earthquake of 1923, perhaps the most famous of recent times, caused immense damage to life and property in the Tokyo area.

These geographical factors are of prime importance in understanding the culture and architecture of the people.

Climatic Statistics												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
*Percent Sunshine	69	65	55	42	52	43	24	47	20	32	51	43
*Percent Humidity	59	57	63	71	73	76	84	79	84	79	69	66
*Average Temperature F°	36.5	39.2	43.0	52.5	64.0	71.5	75.0	79.0	71.0	58.0	51.5	42.5
*Average Rainfall inch	.75	1.12	2.69	5.9	3.3	5.25	4.36	.92	8.1	7.73	5.57	3.6
*Wind Metres Per Sec	2.6 N	3.2 N	3.9 N	3.4 NNE	3.3 S	3.0 S	2.3 NE	2.6 S	2.7 N	2.8 N	2.3 N	2.4 N

\* Tokyo Ministry of Health - 1934

## WAY OF LIFE

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As an Asian nation, the customs, society and religion of Japan differ widely from those of the Western nations.

The country has been cultured for many centuries. The first civilization was transplanted from China, which at that time was greatly advanced above the other peoples of the world. The Japanese have developed this culture into a way of life that, while Asian in nature, has strong national characteristics.

In the early religion of Japan are embodied many of the principles that have had a strong effect on the life of the people. Although the country now practices both the Shinto and Buddhist religions, almost all of the people believe some of the tenets of or participate in some of the ceremonies of the Shinto religion. The religion is a combination of ancestor worship and nature worship. The former has made a meaningful thing of the family unit while the latter has had a strong influence on the architecture of the country.

The Shinto shrines, which are located throughout the country, are the places of worship of the religion. The religion is not congregational in nature since the priests do not preach to the people; and there is no strong doctrine or dogma. The Kami, or gods, are a combination of traditional beings with power and the spiritual forces that control the physical universe.

. . . . In my opinion the idea of man is the ability to live according to the great and basic principle of the Universe and be obedient to it. . . . While rationality is one of the merits of man, it often leads him to lose individuality and to transgress the laws



WAY OF LIFE

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of nature. It is natural that the trespassing of the law of nature is accompanied by punishment. . . . The kindness of the Universe may be shown by the regulation of mankind through natural instincts and aptitude and their accompanying pleasure and discomforts. . . . Now mankind all over the world is subject to various environmental conditions. . . , we must not only harmonize ourselves with the Universe, but also with the sun, the earth. . . .

Thus our Kami is born among us. It is the spiritual force that controls the various physical environments without which it is impossible for us to enjoy our existence. . . .

The unity of Kami and man is the pivotal doctrine of Shinto. - Sunami Takishi, "Architecture of Shinto Shrines," Architectural Japan Old New.

Thus, love of nature is one of the principal characteristics of the Japanese people.

The material things of life are second in importance to spiritual values. The average family has few possessions generally consisting of objects of art that are seasonally displayed in the tokonoma, of which later mention will be made. Due to the damaging effects of humidity and the real threat of fire, these objects are stored in places other than the home--usually a store house of sturdy construction outside the house. These buildings are of mud or stone and are solidly sealed against moisture and thievery.

The nation has developed a strong unity of custom and taste, largely due to its isolation and feudal system and centuries of development and civilization. This national taste embodies a strong aesthetic sensitivity. However, custom has not stood as a dogma to stifle individual creativeness. The country has quickly adopted foreign culture that harmonized with the nature of the people. The peaceful co-existence of

WAY OF LIFE

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Buddhism and Shintoism testified to this tolerance.

Mention has been made of the peculiarities of the Japanese mode of living. These shall be stated with their resultant impression on the residence so that they will not confuse or detract from later mention of the home.

The most noticeable and uncomfortable aspect of Japanese living to a foreigner is the fact that the Japanese live on the floor of their homes (PLATE IV).

The floor covering, made of several inches of rice straw matting covered by a finely woven mat of rushes, is resilient and soft to the weight of the body. These mats, called tatami, are made in six foot by three foot sizes.

Shoes are removed at the entrance to the house so that the delicate mats are not injured by them and because it is considered unsanitary to wear them indoors. Inside the home the occupants wear either slippers or go barefoot.

Upon these tatami the whole business of Japanese living is conducted. There is no furniture and the floor becomes the chair for meals, social gatherings, reading and recreation. At night the bedroll is taken from the closet and the floor becomes the mattress. For meals the table is either already in place or taken from the closet and the participants sit on the floor around it.

Another peculiarity of Japanese living is the apparent hardness

WAY OF LIFE

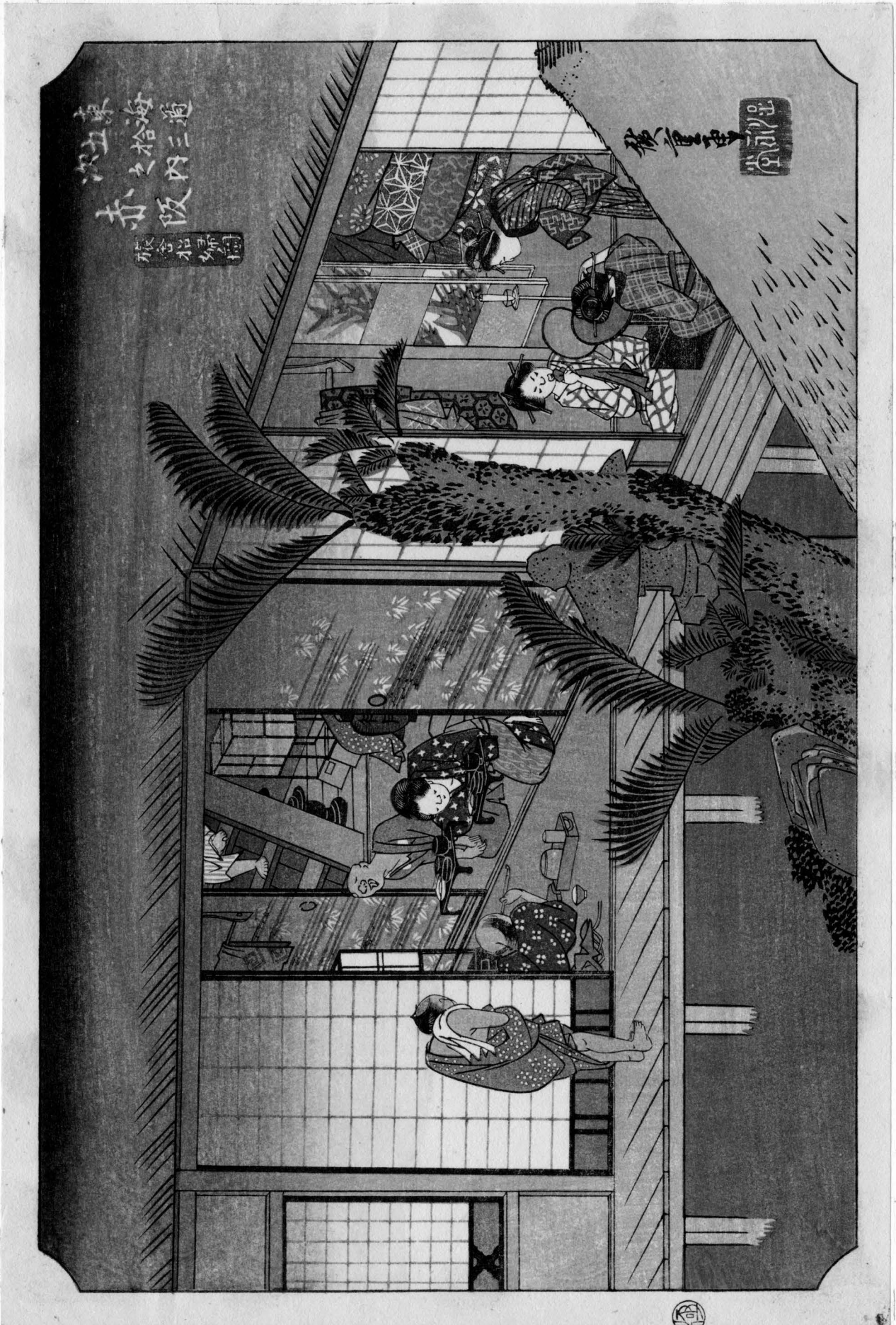
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of the people, insofar as the Japanese house is traditionally without a heating system. The main source of heat is a small charcoal burner, known as a hibachi, around which the occupants of the house warm their hands and feet.

It is true that Japan is not noted for the severity of its winters; however, a glance at the average temperatures in the section of climate control will convince the reader that the winters are far from warm. According to Professor Kobayashi of Nihon University in the old literature of Japan, many references are made to the discomforts of the people during the summer heat while scarce mention is made of discomfort in winter.

These facets of Japanese life do not erect an impenetrable barrier to its understanding nor do they make the architecture an esoteric subject without international applications.





PART TWO

japan DISSECTION



PLATE V

TŌSHŌDAIJI-759 AD.

The lesson of Japanese architecture for the western world may be summarized briefly as standardization, variety in unity, conformity to a mode of living, connection with nature, simplicity, and of course usefulness to purpose. - C. G. Holme, "Introduction," The Lessons of Japanese Architecture.



japan DISSECTION

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Although there is an increasing acceptance of Western style living among the Japanese people, their traditional architectural expression is still predominate. The better designed homes are essentially Japanese in taste and general characteristics. Therefore, this thesis will examine the Japanese residence as it was built before the advent of Admiral Perry and is still being built today.

Like any other country, the homes of Japan fall into three categories according to the location and economic status of the owner. They are: the farm homes, the city homes and the homes of the wealthy, which are found in both locals. These will not be treated separately. Basically, the same principles will be found in all to a greater or a lesser degree.

Let us then examine the average Japanese house. Upon first discovery, it is seen only as a tile roof--a tantalizing view to the inquisitive. This is because the house is generally fenced in with walls or shrubbery. When we enter the grounds, we find that the house is invariably one-storied and set on stilts each bearing upon a stone. It is built of wood that has been left to the elements to age and mellow. The whole is surrounded by a series of gardens and green shrubbery.

With a closer look, we discover that in place of windows there are sliding doors which are covered with paper. Inside, separating the rooms, are more sliding doors. The ceilings are of wood and the floor covering is a series of woven mats. We note the absence of color

japan DISSECTION

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and decoration on the walls and of furniture on the floor. After seeing more houses, we decide they are all very similar in appearance. They are all unpainted, have the same sliding doors and tile roofs.

We become aware of the vast differences between the Japanese house and those of our own land. We try to understand this strange phenomenon--the Japanese house. An age long struggle of a people to shelter themselves from the elements provides comfort and creates a pleasant atmosphere in which to live.

CLIMATIC CONTROL

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The prevailing type of Japanese house was designed for the never ending summer of the tropics. This would appear to be one of the cultural features that the Japanese inherited from that branch of their stock which moved northward from the tropical islands and coastlands of Southeastern Asia. - Glenn Thomas Trewartha, Japan a Physical, Cultural, and Regional Geography.

The Japanese house does an excellent job of protecting its occupants from those elements it was designed to withstand. As has been previously mentioned, it would be unsuitable for most Westerners during winter. Traditionally, this defect has never bothered the Japanese.

The climatic statistics shown on page 23 prove Japan to be a country subject to heavy rainfall and hot humid summers. These conditions have been dealt with by several details of Japanese construction.

Basements are almost non-existent in the Japanese house; rather the floor is set off the ground from one to three feet. This keeps the house free from dampness, as much as possible, and allows the breeze to dry and cool it by circulating under the house.

The solution of the problem of summer heat and heavy rain are, by necessity, closely related. In order that the house be kept cool, it must be open during the summer rains that fall almost daily.

Almost all Japanese homes have sheltering eaves that extend several feet on all sides of the house. In some of the old large temple buildings the roofs extend as much as twelve feet beyond the walls. These eaves keep the walls dry and cool, allow the windows and doors to be kept open during rain and keep the hot summer sun from the interior of



CLIMATIC CONTROL

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of the house.

The roofs are steeply pitched so that their tile or thatch construction can shed the rains and snows effectively.

The rooms have a suspended ceiling of wood. The space under the rafters is vented to help cool the house.

The sliding window wall of the home is made up of several elements. The outer panels are of solid wood. These are stored in a box at the end of the verandah. They are used to seal the house during driving rains and winter nights. The inner panels are wood framed and covered with shoji paper (thesis cover sheet). These panels allow privacy, softly diffuse the light and afford a small measure of insulation. In place of shoji, bamboo or reed screens are sometimes hung from the eaves during the summer. These screens keep out the rain and sun and allow a freer passage of air than the shoji. Modern homes are usually additionally equipped with glazed sliding panels, lower lights of which are frequently of frosted glass. These panels keep out the cold more effectively. These glazed panels have not replaced the paper covered panels but are merely supplementary. All of these panels slide on tracks, are removable and can be used singly or in combination to produce a desired effect and meet a variety of conditions.

The normal procedure before building a house is to secure the services of a soothsayer who advises the owner in the orientating of his house on his lot.

CLIMATIC CONTROL

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Although the orientation is steeped in custom and superstition, it is based upon atmospheric conditions and hygienic principals. The house is opened on the south to secure the summer breeze and the winter sun. The north side is predominately solid wall to exclude winter wind.

The houses are topheavy in construction due to the heavy thatch or tile roofs. Actually, this helps the house to resist the strong winds and seasonal typhoons to which the country is subjected. The buildings rest on stones and are not tied to the ground. This allows them to withstand the force of earthquakes. In addition, they are built of wood, which has more strength and flexibility against seismic shocks than have stone or brick buildings.

Thus, the house withstands forces of nature extremely well and is adapted to the climatic conditions which the country experiences.

STANDARDIZATION OF CONSTRUCTION

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. . . . Since the technique of woodworking does not alter, the country has always retained a large population of these artisans living simply and inexpensively, yet able to do fine work, and owing to their long apprenticeship and hereditary craft, endowed with an eye naturally sensitive to harmony of form and balance. - A. L. Sadler, A Short History of Japanese Architecture.

One of the main reasons the Japanese architect of today finds his professional practice difficult is that he is considered unnecessary in the design of a residence. The master carpenter can complete a house after receiving instructions from the prospective owner. This is possible because of the standardization of sizes, details and component parts of the Japanese house. Centuries of development have resulted in the common acceptance of a system of construction, usage of materials, routine of living and an esthetical taste that have made the Japanese house the most nearly prefabricated and modularly coordinated building in the world.

The unifying factor of all residences is their scale. It is a scale based upon the human figure such as that preached by Corbusier and other outstanding architects of our time. Since the average Japanese is short in stature, six feet has become accepted as the unit of measure.

Lumberyard and craftsman stock readymade sliding doors and floor mats, measuring approximately six feet by three feet. These two items are the major components of walls and floors. Thus, the major part of the construction is immediately available leaving only the structural framing to complete the house. Experience has dictated the necessary size for these members until they have become standardized. The framing is precut

STANDARDIZATION OF CONSTRUCTION

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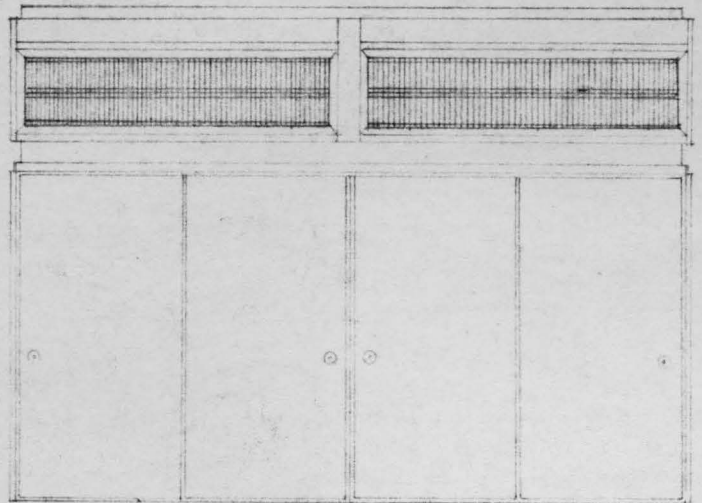
and assembled on the ground. This is facilitated by the method of joining. All wood is joined without nails by various methods of notching, mortise and tenon and wooden pegs. The structure is very often erected in one day, and is accompanied by a ceremony for the raising of the ridge pole.

In spite of this standardization of parts and unity of effect, there is a wide variety of solutions that can be obtained. The location of the house on the lot, the size of the rooms, and the number of rooms all allow for differences. The relationship of the rooms to each other and to the garden is not standardized and allows for further variety. There are also several different styles of roofs that are commonly used.

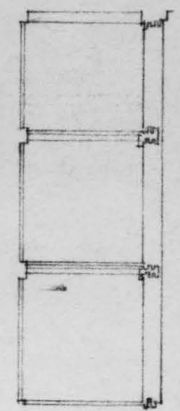
However small these differences might seem, the appearance of a group of these homes is never monotonous. This is true because of the architectural feeling of the people. Each house blends into a homogeneous group that, like the trees in the forest, offers variety in unity.



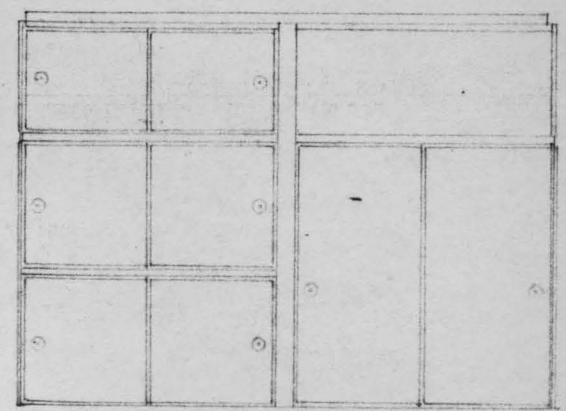
1. FUSUMA AND RAMMA  
BETWEEN TWO LIVING RMS



INTERIOR WALL

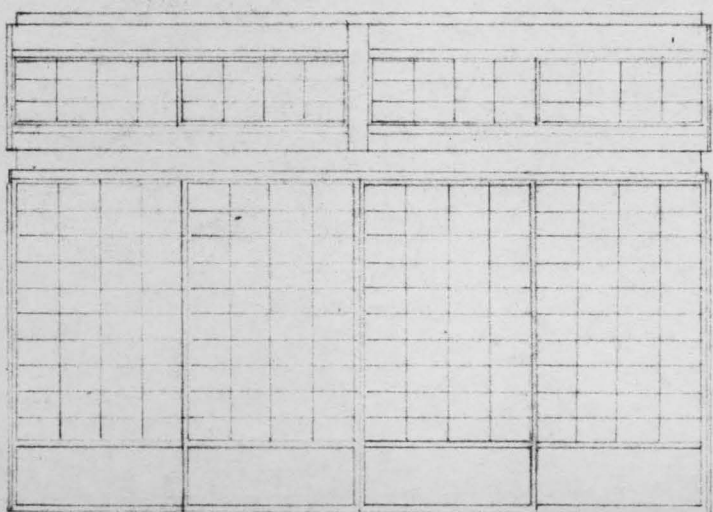


SECTION

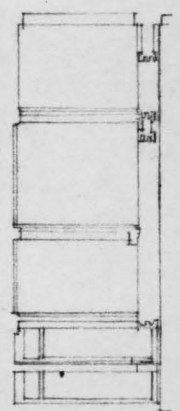


ELEVATION

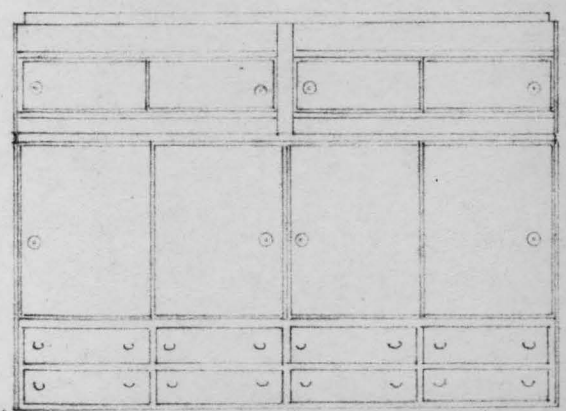
2. SHOJI AND RAMMA  
BETWEEN LIVING ROOM  
AND VERANDA



EXTERIOR WALL



SECTION



ELEVATION

BUILT-IN SHELVES + DRAWERS

## USE OF MATERIALS

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The most important and fundamental characteristic of Japanese architecture is that it is based on the skillful use of various woods, and it is therefore to wooden buildings that one has to look if one wishes to study and appreciate the peculiar features of constructional technique and artistic expression in truly representative Japanese Architecture. - Hideto Kishida, Japanese Architecture.

While European architecture is an architecture of masonry, one must always associate Japanese architecture with carpentry. Japanese achievements in wood are equal to those of the Gothic period in stone.

The land is naturally endowed with great forests and fine woods. Although there is no shortage of stone, it is seldom used except in the castles of the country where we find the lone examples of stone architecture.

Because the people have a strong affection for and affinity with nature, their architecture is one of natural materials which they treat with understanding.

There are dogmatic rules for turning a felled tree into structural members so that the resultant product will be as free as possible from defects and warping. While wood is considered to be a temporary material when exposed to the elements, the fact that the Temple at Hōryūji still stands after 1300 years is mute testimony of the correct usage of material.

The structural system is column and beam. Quite often round members are used in the construction. Seasoned lumber is difficult to obtain so the columns are generally split and wedged on the hidden side to keep the exposed portion from shrinking and racking. The wood members

## USE OF MATERIALS

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are not sealed with paint but are allowed to breath and hence attain long life. The early buildings which were built by imported Korean artisans were colored with read oxide of lead which was more a stain than a paint (PLATE V). This practise was discontinued by the Japanese artisans. The wood floors are finished by rubbing with wet rags until they are highly polished and smooth as silk.

When a solid wall is desired to close the bays between columns, the area is generally plastered. This plaster consists of mud with a straw binder applied to bamboo lath. The finish coat contains a fine sand and is left naturally colored. Recently a lime finish has been used and this is left white.

The shoji, or exterior sliding doors, are wood framed and covered with white translucent paper made from the paper-mulberry bush. This paper allows the light to be evenly diffused on the interior regardless of the angle of the light source. With the light source at an angle of  $35^{\circ}$  (measured between a perpendicular to the window and the line of the light rays), the shoji paper has a rate of diffusion of 42.2 as compared to only 2.2 for frosted glass.

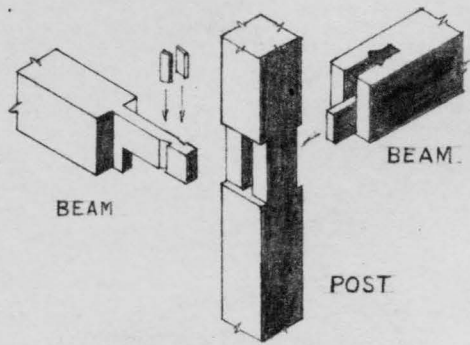
The roofs are either of tile or thatch. The heavy tiles are unglazed and steel gray in color. Special pieces are used in the valleys, on the ridges and hips and at the eaves. The thatch roofs are meticulously built up of straw to a thickness of about one foot and capped with special devices at the ridge.

USE OF MATERIALS

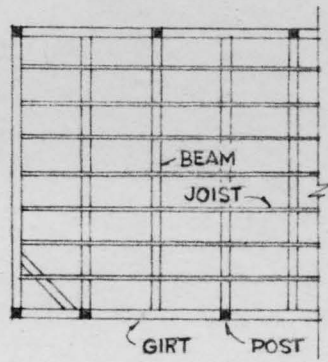
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Since natural materials are used without finish, the less durable parts grow unsightly. If the owner is financially able, he frequently replaces bamboo fences, shoji paper and tatami mats thus maintaining the beauty of his dwelling. The Japanese delight in the appearance of these new materials. Their philosophy is such that their existence on earth is only a part of the overall plan, thus their construction is in many respects temporary. The permanent parts of the house, the columns and beams, mellow and silver with age and their beauty is enhanced.

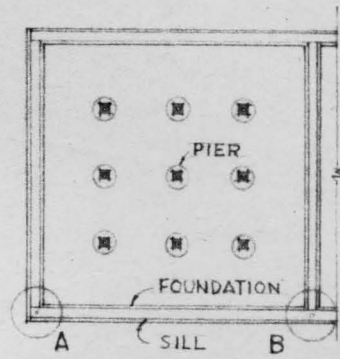




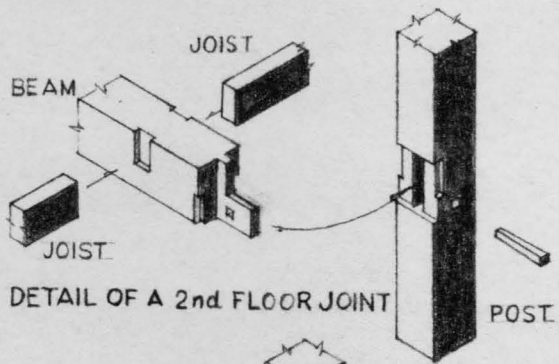
DETAIL OF A 2nd FLOOR JOINT.



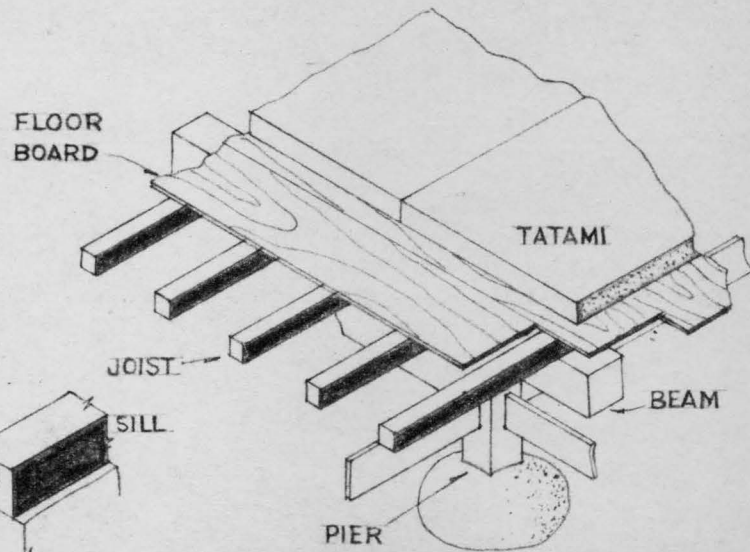
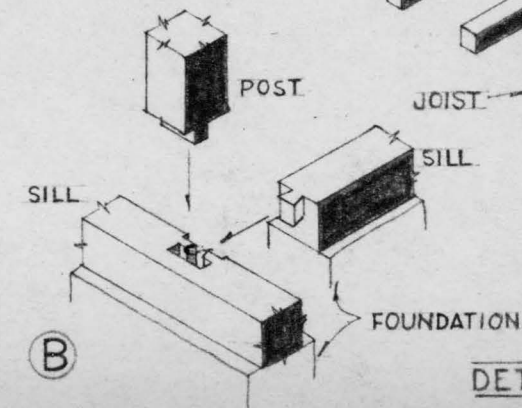
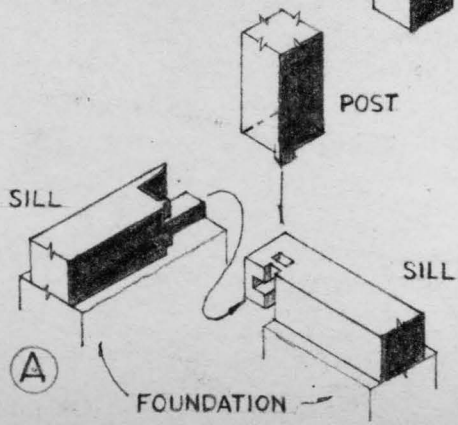
FLOOR PLAN



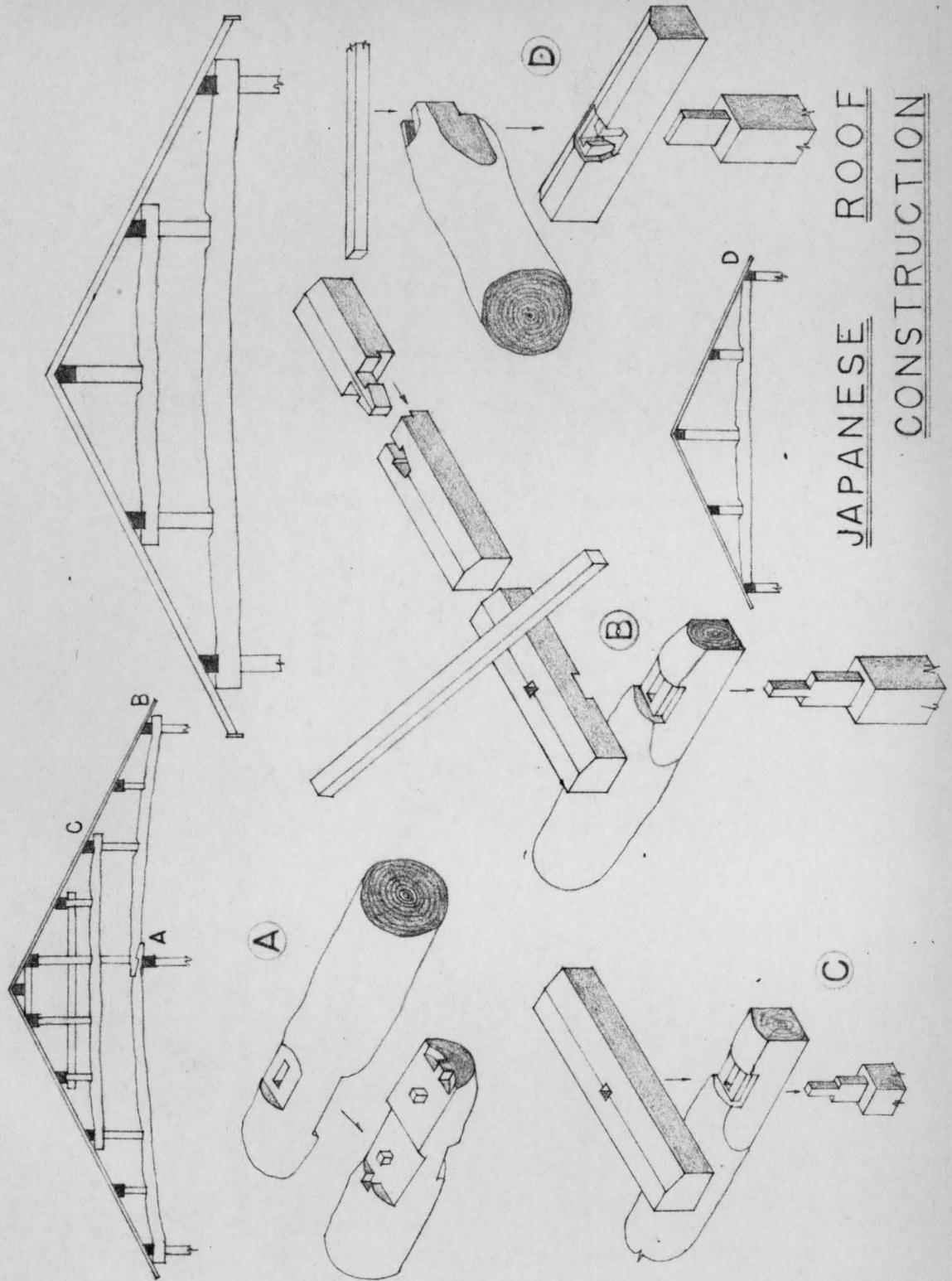
FOUNDATION PLAN



DETAIL OF A 2nd FLOOR JOINT



DETAIL OF FLOOR CONSTRUCTION



JAPANESE ROOF  
CONSTRUCTION

## SPACE AND FUNCTION

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The Japanese home possesses a wonderful flexibility. During the night and in winter it is a box hermetically closed to the exterior, divided into rooms inside. In summer away with the shutters, the paper windows, doors, and partitions. The house becomes nothing more than a pavillion open to all the winds. - Antonin & Hopei P. Raymond, "On Japanese Residences," Architectural Japan Old New.

The extreme flexibility of the Japanese house is due in large degree to the mode of life previously mentioned, wherein furniture is almost non-existent. With the absence of furniture, we also lose usage names of areas such as living room, bedroom and dining room. The end result is an opportunity for multiple use of space that the Japanese have taken advantage of to the maximum.

When we lose the identity of an area, we also lose the necessity of setting it apart from other areas. Thus, the interior of a Japanese home is divided by sliding panels and it becomes one area or several at will. The space consuming corridor is eliminated by the same device. The only thing resembling a corridor in the Japanese house is the verandah which runs along the outside of the house. This extreme flexibility extends to the exterior walls of the house, which may be thrown open completely making the inside and outside one. When this is done, the verandah is a viewing place from which to appreciate the garden.

The garden is an integral part of the Japanese house, which is designed around these gardens so they can be seen from the interior. If the owner is fortunate enough to have a site that overlooks one of nature's beauties, every effort is made to afford the maximum view of



SPACE AND FUNCTION

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feature.

The average Japanese lot is extremely small as the country is densely populated and land is at a premium. In spite of this fact, maximum privacy and seclusion is obtained from what would otherwise be intolerable crowding by the clever use of gardens and walls.

There is a tremendous variety of attractive fences of wood, bamboo, stone and vegetation. The lot is usually entered through a gate in the wall. The protection of family privacy from the community has received more attention than privacy within the family.

The Japanese residence being but a succession of rooms without walls and only divided by sliding doors does not admit of much privacy--a fact that must have had considerable influence on the manners of its inhabitants; for without suitable etiquette and uncommon neatness it would not be tolerable to live in. . . . - A. L. Sadler, A Short History of Japanese Architecture.

The Japanese people have adapted to this condition or else it is a result of their nature. Their voices are seldom raised in boisterous outbreaks but are rather calm and even.

It seems then that for the Japanese, privacy from sight is more important than privacy from the other senses. The noren, which is a decorative cloth panel hanging over the upper half of the doorway, is used in the entranceways of restaurants and shops to obtain visual privacy.

One of the most important and finest areas in the Japanese house is the genkan or entrance, which displays excellent workmanship and materials (PLATE XIX). The feeling is that the areas of the house serving



## SPACE AND FUNCTION

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the guests should be the finest.

It is in the entrance that the guests remove their shoes and don the slippers that are waiting for them. The entrance level is half the distance between the ground and the inside floor level and is set apart from the rest of the house by sliding doors that protect the interior from view. There is usually a secondary entrance to the house that is utilized as a family entrance.

In the main, and largest, room in the house meals are taken and guests are received. Along one wall are located certain standard details which form an important part of the room. These are the tokonoma, or alcove, and shelving. The tokonoma is the showcase of the house. The walls of all other rooms remain unadorned and undecorated except for the textures of the natural materials that compose them. The tokonoma usually contains seasonal scroll paintings and flower arrangements. The seat nearest the tokonoma is always reserved for guests as a place of honor. The shelving is an artistic form, decorative as well as functional, used to hold varied bric-a-brac that are highly regarded by the family.

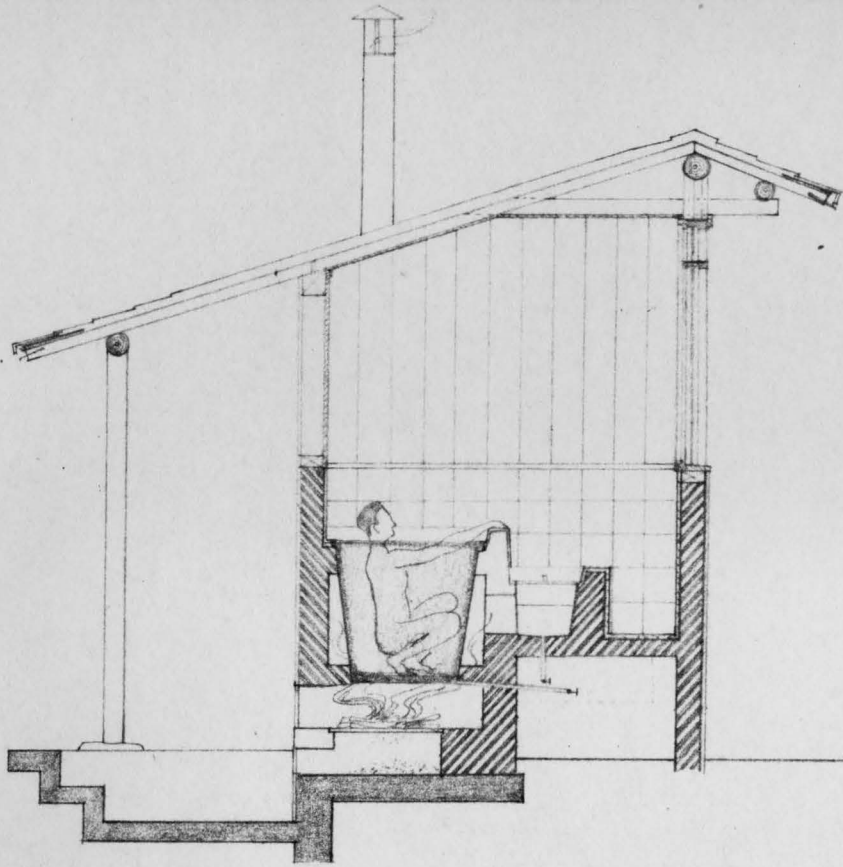
The closets are located along one wall with the contents hidden behind sliding doors of the same type used to separate the rooms.

The one area of the Japanese house that is set apart from the others and clearly defined is the bath. This is an important unit of the house as the Japanese are noted for cleanliness. The room is sunny,

SPACE AND FUNCTION

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cheerful and well ventilated. If possible, the bath is oriented so that the room has a pleasant view. When this is impossible, a small garden is the substitute.



BATH.

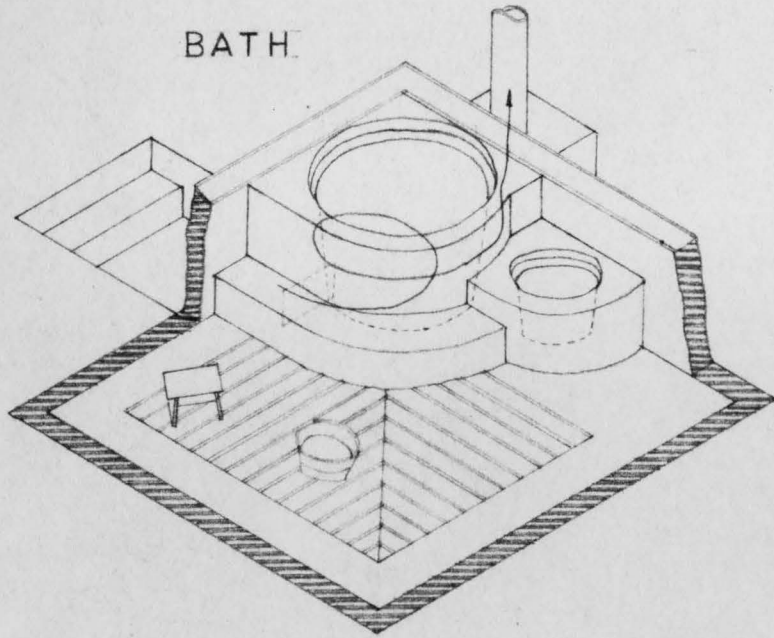
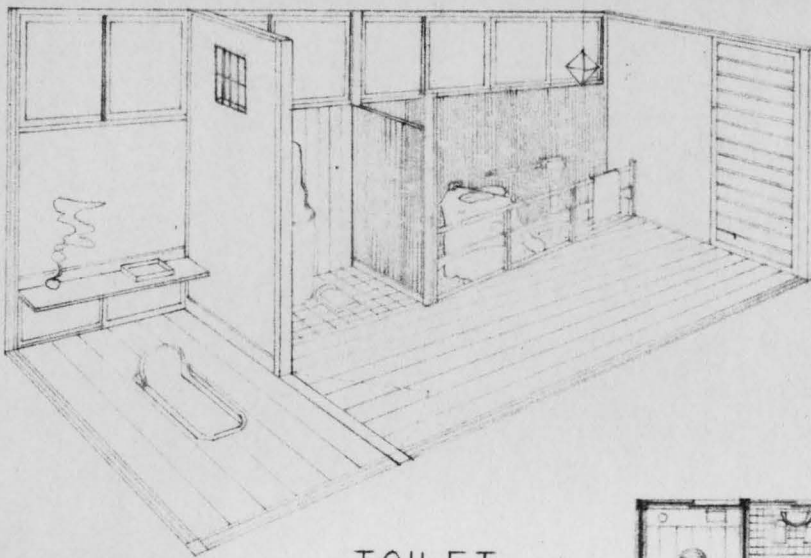
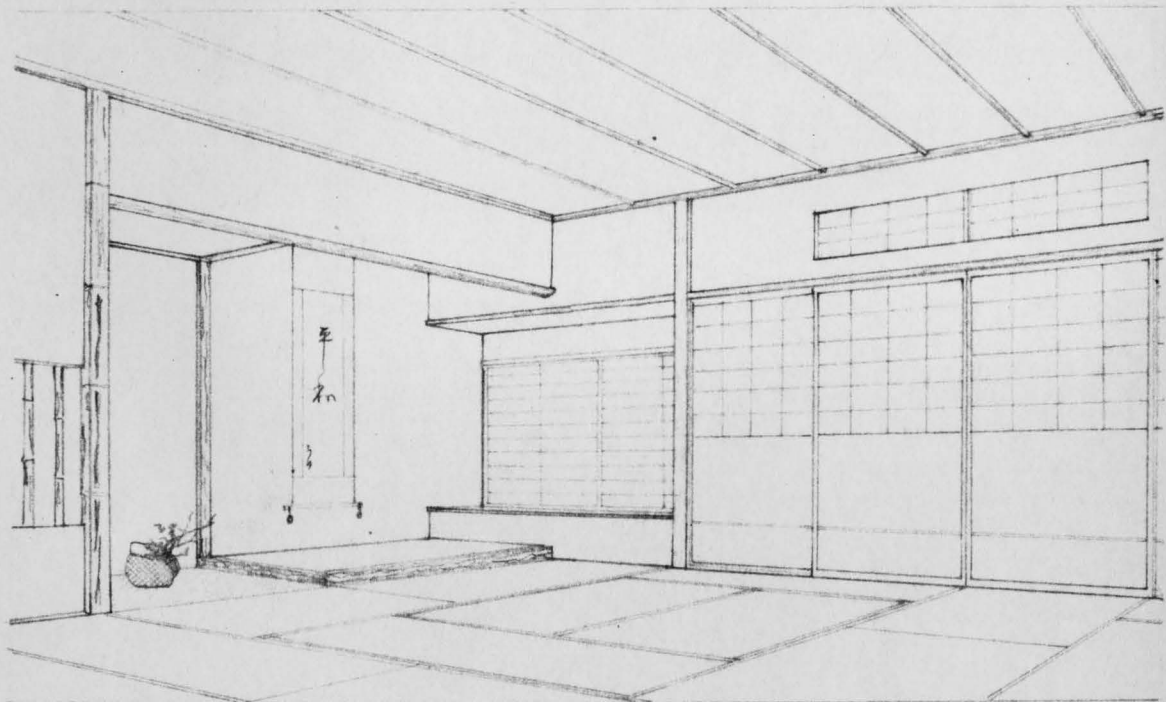
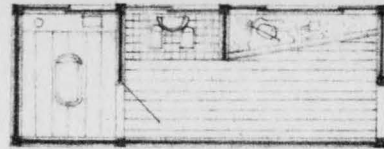


PLATE X

JAPANESE HOUSE INTERIORS



TOILET



LIVING ROOM



## ARCHITECTURAL FEELING

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Is there any other civilization for which beautifying means elimination? It is through increased simplicity and elimination that the man of taste finds elegance. - Antonin & Hopei P. Raymond, "On Japanese Residences," Architectural Japan Old New.

The architecture of the Japanese house by nature does not try to dazzle or seduce the viewer upon first meeting; neither does it bore or weary him with constant usage but rather provides a pleasant restful atmosphere full of deep surprises and experience.

The pure simplicity of the Japanese home raises it into the realm of art. It stands as a symbol of the reality it contains. There is nothing that is not necessary and those things that are required have been blended into the whole with great finesse.

The architecture of the country, as it is most typified in the residence and temple, was imported, with Buddhism, from India and China. The Japanese were not long in making it a true national architecture. The nationalization was mostly a result of simplification and refinement.

One of the simplest and most beautiful portions of the Japanese house is the roof. Whether of tile or thatch, it is a simple functional unifying factor. The Chinese roof, first imported, was curvilinear in lines and tended toward the ornamental. By straightening and simplifying, the Japanese developed the most beautiful roof in the world.

The spirit of the architecture is a pure one that has no tricks of curve or of color.

Essentially it is an architecture of the straight line--the

## ARCHITECTURAL FEELING

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nature of wood. The line forms planes and these planes, always at right angles, form the interior space. The characteristic use of the straight line is most obvious in the plan composition and proceeds clearly into the elevations and interiors.

The elevation is a pure expression of structure. The structural columns are exposed and give the building its form and design quality. The uniformity of spacing of the structural members produces a unity that ties together the varied elements and materials of construction.

The elevation is a composition of lines and areas that resembles a Mondrian painting. The delicate tracery of window frames, white shoji paper and the solid plaster walls is broken by the strong lines of the columns.

The colors of the home are the colors of nature and as such are always in harmony. Love of nature in its pure forms is a real part of the life of every person. Yet in no way can their use of natural materials and colors be called rustic. The neutral and soft shades do not detract the eye from whatever it is viewing whether it be the garden, another human being or the scroll in the tokonoma. As a result, the home is very restful as it does not tax the individual by its prominence but gives peace through its simplicity.

All the senses are affected by the Japanese house. There are few sounds more pleasant than slippers on tatami mats, rain dropping from the eaves to the gravel below, or sliding doors and partitions gliding along

## ARCHITECTURAL FEELING

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their grooves. The wood, paper and tatami surfaces are smooth and pleasant to the touch. If cedar is used, there is a pleasant smell throughout the house; and tatami has a characteristic and pleasant odor.

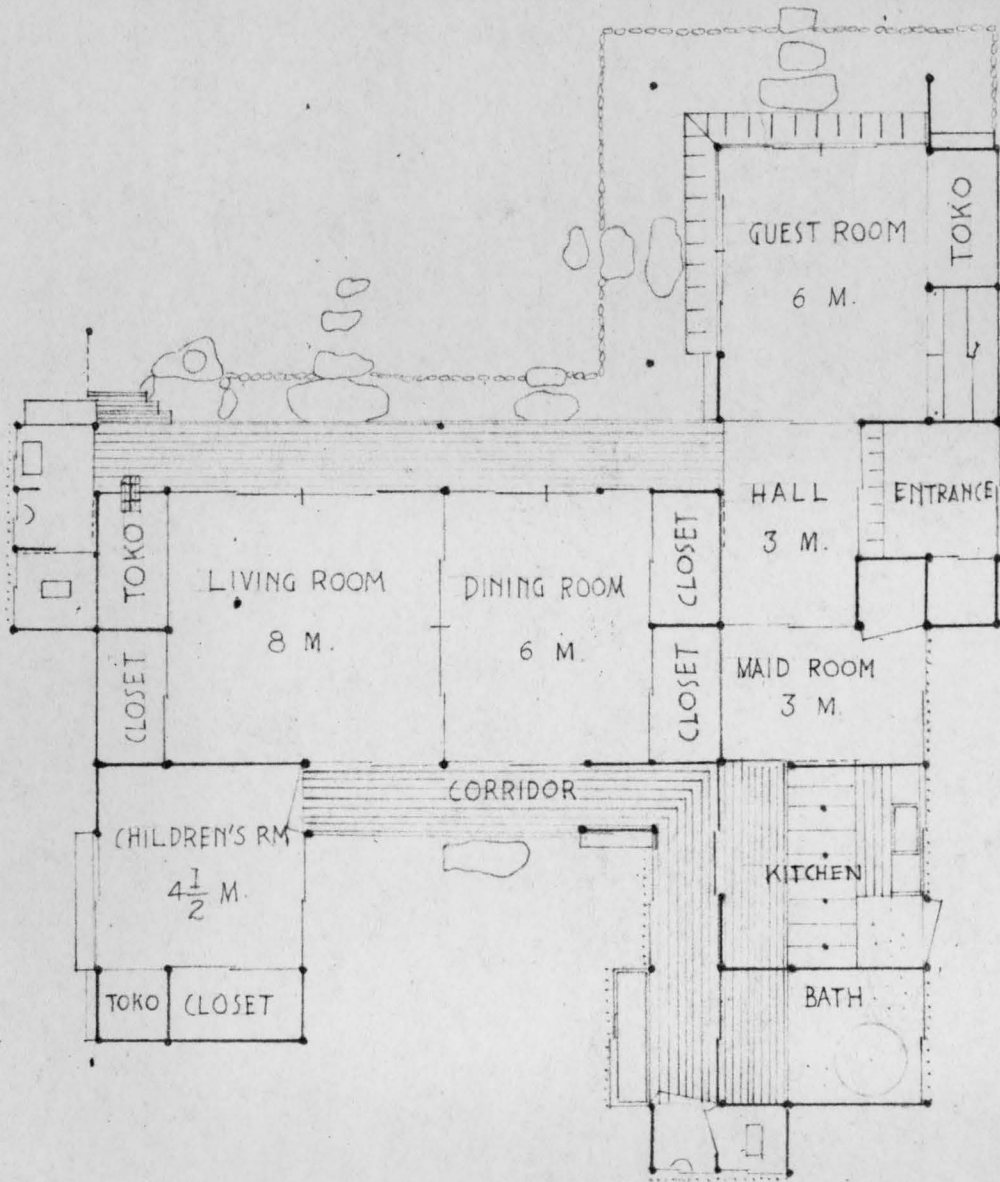
The Japanese garden is a study in itself and true justice cannot be given to it in this thesis. However, its mention is indispensable as the garden is not meant to stand by itself but to be an integral part of the planning of the house.

The garden takes many forms: Sometimes a miniature landscape containing dwarfed trees, hills, a pond and bridges; at other times no more than a lawn of white gravel and large rocks.

However, the important thing is that the house is integrally connected with nature. It is never meant to stand by itself as a symbol of ostentation.

A beauty that is not all on the surface, but is to be discovered by degrees, in simplicity with severity, in the avoidance of what is gaudy, crude, or ostentatious. - C. G. Holmes, "Introduction" The Lessons of Japanese Architecture.

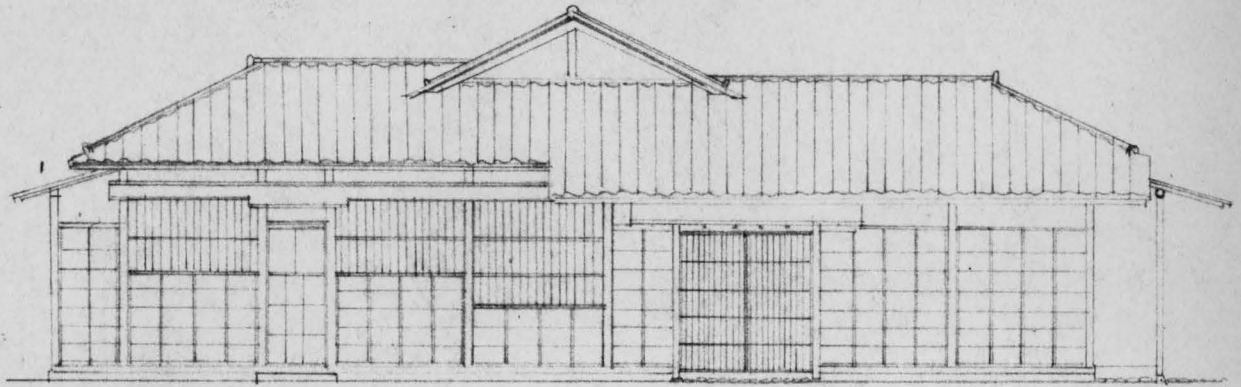




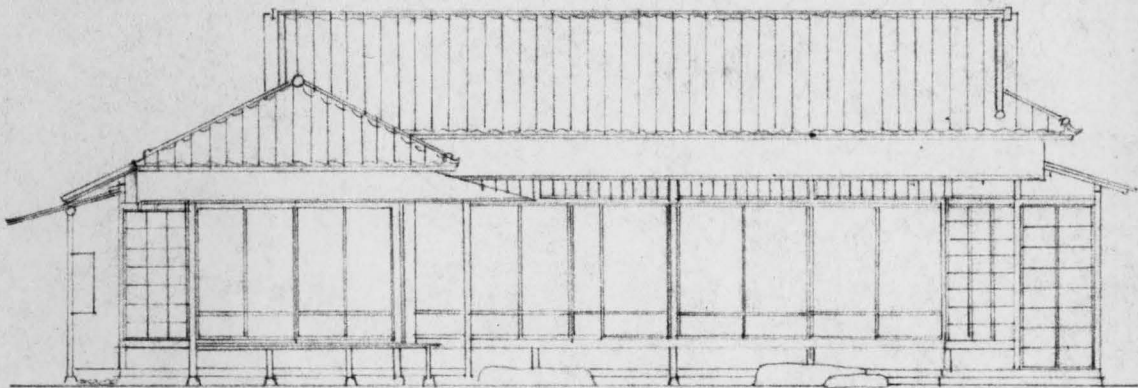
PLAN OF JAPANESE RESIDENCE



PLATE XII      ELEVATIONS: JAPANESE HOUSE



FRONT ELEVATION.



GARDEN ELEVATION

TWO ELEVATIONS OF JAPANESE RESIDENCE

PART THREE

east-west INTERSECTION

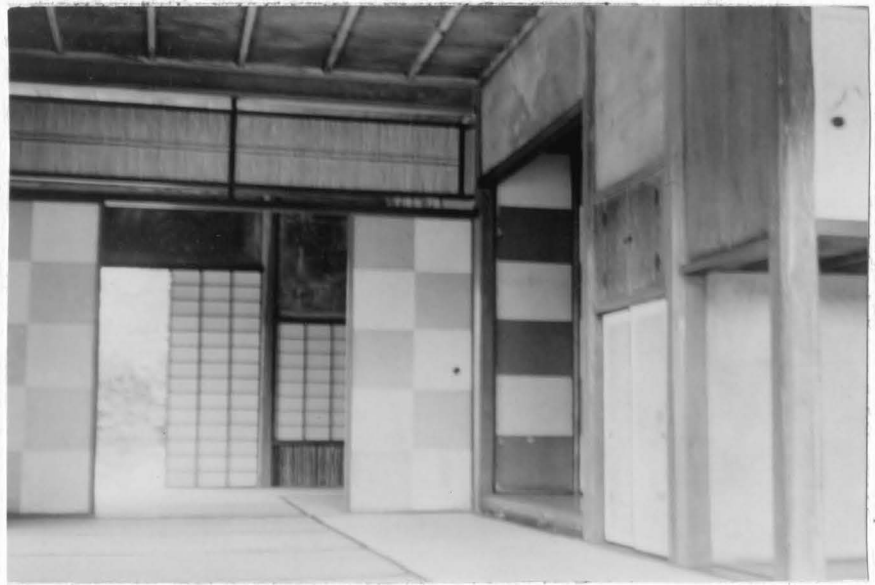


PLATE XIII

TEA HOUSE, KATSURA

It seems therefore that the exotic no longer exists in Europe for Japan or in Japan for Europe. International cultural relations, . . . may now be effectively cultivated, because logic, both rational and aesthetic is alike—though countries and their peoples be different. Progress and the correction of errors follow upon the recognition of this. - Bruno Taut, Fundamentals of Japanese Architecture.



east-west INTERSECTION

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It should be obvious to the reader that there are vast differences between the society, culture and traditions of American & Japan. Any house is the product of these factors. To transplant a Japanese home in American would be as foolish and disasterous as violating the natural laws of flora and fauna. There are, however, certain factors of civilization that are universal rather than regional: the laws of nature, the nature of man and the principles of the arts. That certain cultures have more fully recognized and adhered to these principles is evident. It was the intention of Part Two of this thesis to show that Japan in its past was such a nation and, as a result, produced an architecture worthy of recognition. It is an architecture that deserves the attention of the Western world not because of the solution of a regional problem--although this was well done--but because of the incorporation of the universal principles of all good architecture.

The characteristics of Japanese architecture have been categorically discussed in the preceding pages with an attempt to emphasize these universal principles. A certain amount of regionalism was necessary to do complete justice to the subject. Many of the curiosities of the architecture and way of life were excluded, as a preoccupation with them would have been following the way of the wanton dilettante. Similarly, in the following pages purely regional, technical, and utilitarian consideration must not be allowed to assume an importance beyond that which is theirs. The applicable principles are not new but are rather the universal

east-west INTERSECTION

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language of Architecture, which become more meaningful through example and application. In this section of the thesis, then, an attempt will be made to re-evaluate Japanese architecture and establish its application to contemporary residential design.

The following quotation states the facets of Architectural thinking which have developed the contemporary American residence and, by coincidence, parallel the categories used to discuss the Japanese residence.

If it is true that any good architecture recognizing the influences of its own times in history must be based on those influences as well as the differences between them and the influences of other times, what are the factors we should look into to explain our present day residential architecture? They seem to fall into the following categories: the program, the site, space organization, the environment, construction and materials, and aesthetics. - Thomas H. Creighton and Katherine Morrow Ford, American House Today.

If these are the factors that explain our present day architecture, is it not more than coincidence that they are also the factors that explain the ancient Japanese architecture? Even if we concede that these are the factors that explain the architecture of every period, we find a link between Japanese and Contemporary architecture that does not exist with other great architecture of the past: namely, they have common goals and common results.

The quotation used in the introduction is worth repeating here to reiterate this point:

An architect working in Japan has the advantage of seeing materialized before him in Japanese architecture and civilization, funda-

east-west INTERSECTION

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mental principles the rediscovery of which is the goal of modern architecture. - Antonin & Hopei P. Raymond, "On Japanese Residences," Architectural Japan Old New.

Since a praise of Japanese architecture is not usually encountered in the formal study of architecture, a search was made to see what the leading architects of today felt about the influence of Japan on Contemporary architecture.

The following architects were lavish with their praise and showed that there was possibly some influence, but they did not directly acknowledge any on their own work.

**FRANK LLOYD WRIGHT:**

During my later years at the Oak Park workshop, Japanese prints had intrigued me. . . . Ever since I discovered the print Japan had appealed to me as the most romantic, artistic, nature-inspired country on earth. Later I found that Japanese art and architecture really did have organic character. Their art was nearer to the earth and a more indigenous product of native conditions of life and work, therefore, more nearly modern as I saw it, than any European civilization alive or dead. An Autobiography.

**RICHARD NEUTRA:**

The standardized, lightweight, most simply furnished Japanese home, so neatly related to a well-balanced way of living, has been a deep moral inspiration to me for several decades, as well as the thorough, consistent technical propriety of its essentials and details. I feel warmly grateful to a people who have made this grand offering to the world. Architectural Forum, January 1953.

**WALTER GROPIUS:**

From my early beginnings as an architect, I was greatly intrigued and attracted by the Japanese house. Its lightness, its flexibility and pleasing lines impressed me deeply. The restrained order of its standardized building parts appealed to me as the hallmark of a deeply rooted culture adaptable to any new development. The elements for today's industrial prefabrication seem to be inherent in this ancient modular conception which simultaneously left freedom for a great variety of compositions, avoiding monotony. Architectural Forum, January 1953.



east-west INTERSECTION

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The following architects denied the possibility of Japanese influence on the modern movement.

MARCEL BREUER:

Traditional Japanese Architecture was not widely known in Europe at the beginning of the Twenties. . . . I don't know whether there was any influence from Japanese architecture on modern architecture while the basic development took place. Later on, of course, I was very much impressed by traditional Japanese architecture, and I found it at many points a confirmation of my own aims. Architectural Forum, January 1953.

HENRY HILL:

Many times the 'influence' of the Japanese architecture on the West Coast is mentioned--I cannot accept this. If there is a similarity of result, it is only because of a possible similarity of conditions. . . . The ways of life are very different and I believe the basic thinking and consequent results . . . must again be very different. Architectural Forum, January 1953.

Regardless of which view is accepted, the final brief quotation points out the complete unawareness of most Western architects about the Architecture of Japan.

I. M. PEI:

The Katsura Palace in Kyoto should be considered as seriously as the Acropolis, but I don't believe it was even mentioned in Bannister Fletcher. Architectural Forum, January 1953.



the program

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The purpose of any residence is to provide a shelter wherein a family carry on the varied processes of life, known as living.

Through the ages, man has developed knowledge of and control over his environment; his culture has been broadened through advances in education; and his leisure has been increased through social reforms. Although the processes of living have remained the same, the comforts and conveniences of performing these acts have been greatly increased: they have been softened by the great technology of the age in which we live.

In every country, the great differences between the program of the home of today and the home of yesteryear are the provisions made for comfort, ease of occupancy and sanitation. These differences are expressed in our kitchens, in our bathrooms, and in the increased space devoted to our storage and activities.

That present day American living habits differ greatly from those of past and present day Japan cannot be denied. The needs of the American family and the mechanical conveniences and building technology of our time have been discussed in many volumes and are very familiar to the student of architecture. Therefore, the real need lies in giving the home a character beyond the diagrammatic schemes and mechanical assemblies available to us.

Before accepting a program, let us examine the program of a Japanese home as we see it:

The program of the Japanese house is to provide a place to live,

the program

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within limited quarters, fashioned in simple elegance and built with beautiful materials. It must provide the following amenities of life: privacy from the outside world; a view of nature to be enjoyed; living areas to be used separately, or together, each flexible in use; the appendages necessary to provide for an orderly life; and one spot in the home for the display of the creations of man and nature.

Such a description may sound overly poetic and unrealistic, yet many Japanese think of their homes in this sense. In this description can also be found a clear-cut program. It is like a theorem in geometry, wherein the number of bedrooms and type of plumbing fixtures are relegated to the realm of given. The proposition is to prove that they can live in comfort and in the presence of beauty. Previous propositions that have been proven are that they can do this best when given homes generous in space, flexible in use, and suited to their culture.

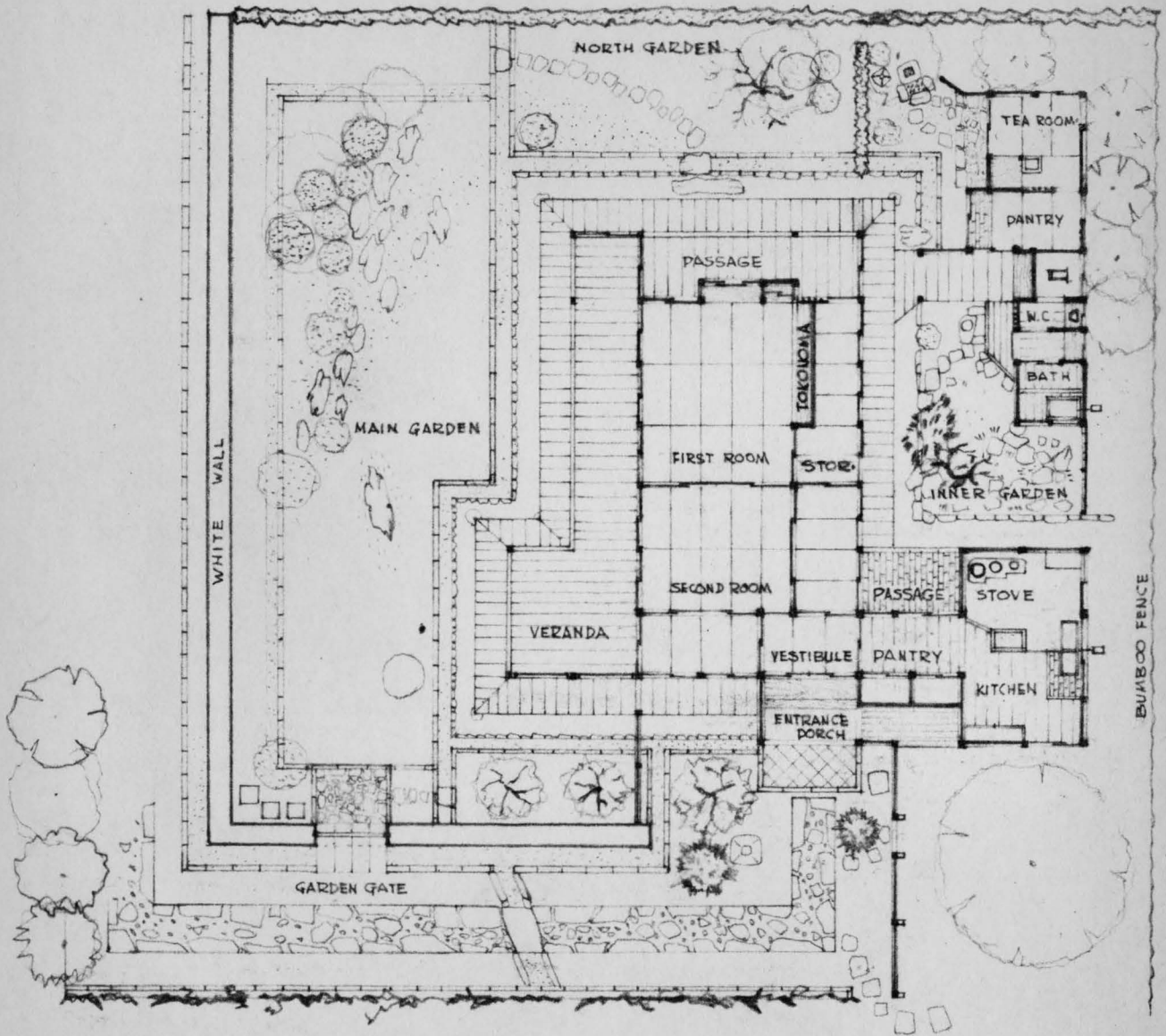
Here our simile with mathematics must end. For to the credit of architecture as an art, we can never, with such a proposition, end our theorem with a dogmatic Q. E. D. The proofs are infinite in variety. Japan has presented the proof many times. We shall attempt a proof in this thesis.

For the program of our design, we shall accept the program of the Japanese house. We shall attempt to prove the same proposition with regard to the average American family. If one would question the average family as the criteria and favor rather the solution for an individual,

the program

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we must point again to the Japanese home. Though similar to each other and in many cases identical, they form a shell in which activity can function in its infinite variety and not a form into which it is impressed. If such a program seems vague, it is because we must have a program of ideas and ideals.





the site

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Any building which is built should love the ground on which it stands. - Frank Lloyd Wright

We can learn the meaning of this quotation from Japanese architecture wherein the homes have a communion with their site. The American home, on the other hand, is often at odds with the ground on which it stands. This is because it is designed to be seen rather than to be seen out of. The Japanese home is the antithesis of this as the Japanese people would prefer that their home be screened from view by a wall or fence to provide them with privacy. Japanese gardens are much more widely known than Japanese architecture; and yet a garden is never found except in conjunction with a structure from which it can be seen.

It is a recognized fact that a house, to be a successful solution to the problem of housing its occupants, must be suited to its site. Likewise, the house that is blessed with a beautiful site encompassing the beauty of nature in a panoramic view has an automatic advantage over its companions on less glamorous sites. Entire designs have been determined from the peculiarities of a particular site. To avoid placing too much emphasis on this facet of planning, the design for this thesis will be placed on a level, interior, average-sized suburban lot. This will forcefully bring into focus one of the main tenets of Japanese thought: While the Japanese house takes advantage of view and glamorous sites wherever possible, the fact is that it never suffers when placed on a flat and uninteresting site because it lends to that site some of

the site

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itself and takes something from that site until the two have melted together into a feeling of belonging.

From this we learn that the house is but a part of an overall plan that encompasses the whole lot; and the two cannot be divorced. Landscaping and site planning are as much a part of the design of the house as is the structural detailing. The functions of living cannot be confined to the vacuum encompassed by four walls. One must also have the necessities which the land around offers: peace for the soul, food for the brain, and beauty for the eye. If we concede any portion of this ideal, we must have not only a house plan but a land plan.

In spite of the fact that the Japanese have a religion based upon a reverence of nature, they do not hesitate to use nature to their advantage by recreating the beauty of natural landscapes in their gardens. The Japanese garden is a painting in natural materials, based upon an interpretation of nature by the landscaper. Such a creation can only be accomplished with a knowledge of nature and its materials and aesthetic feeling.

The Japanese house divides the lot into several areas: the garden, the service, and the circulation areas. The gardens are meant for appreciation and not for use. In order to achieve this aim, the areas must be separated so that each attains the full value of its intended use.

These principles are of such importance that failure to recognize

the site

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them results in the uninteresting and unlivable assemblages we call homes. The correct starting point is, therefore, the design of an integrated lot plan rather than that of the structure. Let this concept be then added to our program.



PLATE XV

GARDEN: EXHIBIT HOUSE



space organization

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Clarity, simplicity and order in the planning, and a general generosity in the shaping of a house have always proved to be of lasting use. A house built in accordance with these principles will always have a value. It is more easily adaptable to varying needs than a house where complicated demands, valid at a certain period, have been the only guiding principle. - H. Carlheim-Gyllerskold, "Introduction," Swedish Cooperative Union and Wholesale Society Architects Office 1935-49. Stockholm, Sweden: Nordish Rotogravyr, 1949.

Here is a hint from a Western architect that a house too addicted to a program, or an individual, might have limited usefulness and that, rather, a Japanese concept of versatile space would be a better criteria.

The American house can never attain the versatility of the Japanese house because of the differences between the two modes of living. One of the main reasons for this is furniture, or rather the absence of it, in the Japanese house. Furniture gives to areas of the house their usages and names and, because of the character of most of the furniture, prevents multiple use of these areas. Furniture is, therefore, expensive not only in initial cost, but because of the great space it consumes.

Upon first glance, the Japanese home appears to be devoid of furniture; and this impression is generally a lasting one due to the clean lines of the interior. There are, however, several items of built-in furniture and these serve their purpose without marring the interior space of the room. These are the desk, or writing and reading surface, and shelves for the display of treasured objects. The storage areas are concealed behind sliding panels.

Thus, there is a possibility that by a selective use of built-in

space organization

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furniture we can make a room a more orderly and freer space and possibly liberate it from a single usage association.

By the usage of sliding partitions, the Japanese can make two areas into one at will. How often this is done and for what reasons is impossible to determine. The areas are usually small by themselves and are thrown together for special purpose. We can also be sure that the panels are removed during the summer to allow for a freer passage of air. But even when closed, the partitions give an idea of continuity of space by the open grillwork above them. The opaque windows, when closed, even give the sense of open space beyond them.

Further characteristics of the Japanese plan are the pleasant and secluded bath, the inviting and adequate entrances, and generous storage rooms. These, together with the flexibility of the space organization, are the lessons of the Japanese plan. In addition, we must not forget the concept of exterior-interior space relations discussed in the section on the site.

These concepts, with the exception of flexible space, are more tangible than those previously discussed in other sections of the thesis.

Thus the bath, entrance and storage areas of a house are readily acceptable as areas of needed improvement in our home that can be achieved with relative ease if they are given the attention they deserve.

The concept of unity of total space is one which requires considerable examination but is a concept we cannot overlook in an assimi-

space organization

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lation of the Japanese concept and, as such, it must be made our own.

Frank Lloyd Wright has devoted his career to freeing architecture from the box-like forms it usually assumes. Japanese architecture has done this in essence but not in fact. It has been done in the concept of vertical space that has often been used by Wright himself. The interior spaces have a relatively high ceiling for their size. The predominant feature of interior design is the horizontal wood beam element that is carried around the room at the height of the door head. Above this is several feet of wall before the ceiling. This horizontal element frees the upper wall and ceiling from the room and eliminates the feeling of being in a box. On the exterior, the house is again, by use of vertical space concepts, freed from the feeling of contained space. The roof is framed in such a manner that only light and airy supporting members are seen at the eaves. This, together with its height and wide overhangs, effectively free it from the walls which are its supports. The fact that the homes are set on stilts raising them several feet from the ground again makes them entities that are free from the confines of space that usually result when the walls rest on grade.

This concept of free vertical space, when added to that of flexible flowing horizontal space, makes the Japanese house one of complex spacial relations. These relations are not at first obvious to the viewer. This shows the subtlety with which they have been achieved.

Thus, to avoid boxlike forms, while utilizing the boxlike con-

space organization

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struction techniques that are the most logical for many materials, is an objective that contemporary architects have striven to achieve. It is a principle that is applicable to contemporary design.





PLATE XVI

INTERIOR: EXHIBIT HOUSE

the environment

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Although the word environment is usually used in an all inclusive sense, it will be used here only to discuss our physical surroundings.

Climate control has been a recognized aspect of contemporary architecture for some time and has received varying degrees of acceptance and usage in the homes of today.

In Japan, climate control has been one of the strongest influences in the shaping of the house. This is as it should be. When conformity to an architectural style makes proper environmental control impossible, the style loses its architectural value. Thus, proper climate control is a must in the design of any home, and as a result will, to a large degree, shape the home.

The average American home is built for winter and does an excellent job of keeping out the cold. In summer, the converse is quite often true as the house is extremely hot and uncomfortable. This situation is particularly true in the southeastern states which have really not developed a regional architecture to combat the climatic conditions, which are quite similar to those encountered in Japan. The houses of these areas are usually no different than those encountered in the northern states.

The climate of Tokyo has often been compared to that of Washington, D. C., while the climate of that section of Japan where their architecture developed is similar to the southeastern seaboard states of the United States. Therefore, the design will be assumed to be situated in

the environment

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these areas.

On the other hand, the Japanese house makes no provision for warmth in the winter. It has been pointed out that this fact has apparently not disturbed the hearty people. Perhaps the American house has been greatly overheated in the winter resulting in the great occurrence of the common cold. Be this as it may, there are very few areas in the United States where some form of heat is not necessary. The Japanese themselves are beginning to clamour for heat in their homes as many of them spend their days in heated office buildings. The fact is that the traditional Japanese home would be very difficult to heat as the emphasis has been so strongly on keeping it cool in the summer.

The methods used to keep their house cool in the summer have been previously discussed. These methods are quite effective. However, there is strong reason to believe that more effective methods are available due to our modern technology and scientific experimentation, although there are many applications available from the Japanese solution to the problem.

construction and materials

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Japanese architecture is based upon what would seem to be a rather dogmatic addiction to a limited variety of construction techniques and building materials. This, of course, is largely due to geographical factors. To some this would seem a handicap. If this is so, it was one that was experienced by all the ancients in the development of the great architecture of the past. Thus, architecture does not need bizarre materials and construction techniques to become great. These are in a sense a hindrance for they distract the mind from the essentials. Every material has its own vernacular of use and each is suited to certain conditions by the nature of the material, which also imposes limitations upon its use. The lesson of Japanese architecture is the skillful use of materials rather than the championing of wood and natural materials.

The design for this thesis will be executed in wood. This imposes no hardships as the material is admirably suited to the residence and is often quite poorly used in this respect. The chief objection many homeowners have to wood is the high cost of maintenance. Hence we find the non-entity of architecture masonry-veneer construction. The Japanese show us that wood need not be smothered by paint. It can be exposed and thereby beautify the house. It need not be the hidden material in construction. This, of course, requires the use of woods that are resistant to decay and weather with a pleasing effect.

Most Japanese details depend upon skilled craftsmanship. Hence, the notched connections would be economically impractical in this country,



construction and materials

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if not virtually impossible, to the discredit of the trades and perhaps more the architects.

The beautiful tile roofs of Japan are expensive and heavy and, as such, could seldom be used. Actually, many of their methods are a far cry from modern technology and structural knowledge and have little use or application today. We find many of the details and materials are important not because of direct application but because of principles, many of which are linked closely with aesthetics.

One of these is the post and beam style of construction and the resultant use of prefabricated parts in the bays. The result is a simple economical construction with a flexibility which allows for a unity between interior and exterior spaces.

The system of prefabricated parts and unity of structural approach is a lesson in itself which carries far beyond our use of factory-made doors and windows. The success of such a system is achieved by the use of a structural module that carries throughout the building.

The use of such a system has had strong advocates for some time, but little has been done to fully exploit it in residential construction where it is most easily accomplished. The applications are limitless.

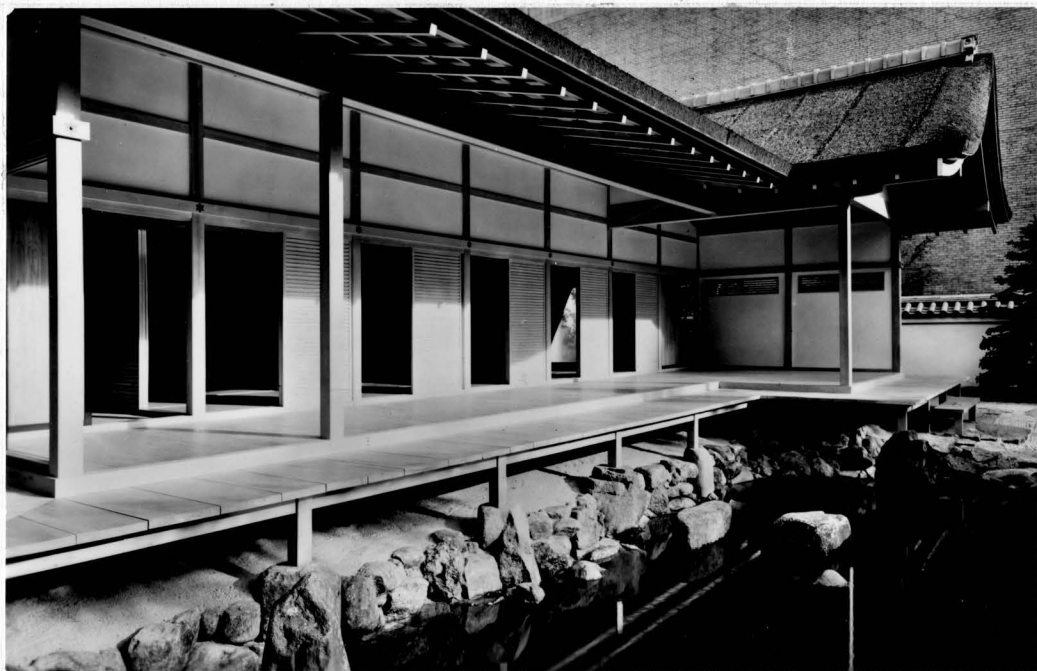


PLATE XVII

EXTERIOR: EXHIBIT HOUSE

aesthetics

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Aesthetics is the cornerstone of Architecture. If the concepts of site, form and construction are to have unity and direction, it is necessary to have an aesthetical approach to the theory of architectural design. Upon this approach rests the success or failure of joining the varied parts of a building into a successful solution.

That aesthetics should be divorced from the other sections of this thesis and discussed alone is misleading for it is more than a surface treatment of an architectural problem; rather it is a concept that permeates the entire thought processes. It is important that we think of aesthetics in this manner. By so doing we keep it from being a self-conscious entity that has no real meaning.

This is the great contribution of Japanese architecture--unity of approach, permeated by aesthetical sensitivity for the purpose of producing an entity of beauty and purpose.

In order to achieve such a result, the designer must have matured to the degree where he not only recognizes beauty and all its manifestations but possesses the unswerving conviction to pursue this beauty and has mastered the tools of expression to make it articulate. In Japan, there developed a group of such people skilled in the styling of buildings. Their services were eagerly sought after and they gained much respect. The style they developed gained national approval as it was a style based upon principles of universal appeal. Further, it was a style that was not so ornate that it was beyond the means of the people. The result is

aesthetics

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the residence of Japan. While different in the infinite variety of size and detail, they are so similar in principle they make the nation unique in the unity of its architecture.

The guiding principle of their aesthetics is simplicity and refinement. The chaff has been discarded leaving the essence. This is a difficult task as the essence must not be deprived of its strength and character. The result is that the structural members of the building became the ornamentation. The entire structure is exposed to view with the exception of the rafters. The resultant simple geometric designs are far removed from the egocentric designs of many Western designers and their resultant esoteric appeal.

Finally, the Japanese house is a fitting setting for the display of man rather than that of objects. The house is scaled to his proportions, fitted for his use and altruistically fashioned for his delight.





PLATE XVIII KATSURA, DETACHED PALACE

PART FOUR

east-west PROGRESSION



PLATE XIX

ENTRANCEWAY, TOKYO

Let us create a pure chaste and beautiful architecture by adapting the pristine spirit of our ancient architecture by utilizing the rich materials of our medieval architecture and by profiting from ever advancing modern learning and technique. - Dr. Chuta Ito, "Preface," Architectural Japan Old New.



the design

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The design presented on the following pages is an attempt to perpetuate the principles of Japanese architecture in a house for contemporary living. Any shortcomings in the result should not reflect upon the validity of the principles but rather upon the ability of the designer to give form to them.

A brief analysis will chart the reasoning that formulated the design with respect to site and plan, structure and materials.

Site and plan:

The site is a level interior lot measuring sixty feet wide and one hundred and twenty feet deep. The roadway frontage is on the west side of the lot. Zoning regulations require setbacks from the lot line of thirty feet from the front, fifteen feet from the rear and five feet from the side for a carport and ten feet for the house.

To obtain maximum lot utilization and the best orientation, the house was placed perpendicular to the road.

The plan was zoned into living, sleeping and utility areas to secure order and economy in the interior spaces and a unity with the exterior spaces.

The house has two separate entrances. The main, or guest entrance, opens into a foyer that is adjacent to the living area. The secondary, or family entrance, opens into the utility area. Covered walkways connect the carport with both the guest and family entrances.

The living zone contains the living room, dining room and study.

the design

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These areas are arranged so that they may either be used separately or as one room. Sliding doors and partitions give flexibility to the areas. The exterior walls are primarily glass on the north and south allowing views of the gardens that are adjacent to them. On the south, the living room faces a green garden that is enclosed to afford privacy. On the north, a stone garden and pool afford a view to the dining and study areas. The carport and walls shield the area from view. There is a generous storage area adjoining the living room for storing bulky items and a coat closet for guests.

The utility zone contains the bathroom, kitchen, laundry and heating plant. These are located together for economy and are placed at the center of the house for accessibility. The bathroom, located on the south side of the house, is generous in size and is compartmented so that it may be used by more than one person at one time. The bath and water closet compartments have a double glazed floor to ceiling window area that overlook a small enclosed garden.

The laundry is hidden behind a folding partition when not in use. The kitchen is on the north side of the house and overlooks the play and utility yard.

The sleeping zone contains the two children's bed rooms, the master bedroom and a connecting corridor. The two children's bedrooms are separated by a folding partition and can be made into one for use as a play room. The drawers and desk are built in to afford the maximum

the design

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freeness of space. Storage units are placed laterally across the room to allow a free passage of air. On the south side of the sleeping zone are the living yard and a covered patio that can be screened in. Openings in the roof allow sunlight to enter the bedrooms. The north side faces the play yard.

The house is provided with generous overhangs on all sides to keep out the summer sun and allow the windows to be opened when it is raining. The living and sleeping zones have direct cross ventilation to allow the breeze to pass through during the summer. The utility zone is mechanically ventilated.

Structure and materials:

The house is framed with wood columns, beams and structural roof deck. The columns are spaced twelve feet on center in both directions to allow maximum flexibility of interior space and exterior walls. The beams spanning laterally and the roof deck longitudinally span twelve feet. The laminated roof deck gives the building rigidity. Additional bracing is provided by the horizontal members that tie the columns together at the window and door heads.

The floor is a concrete slab on grade with vapor barrier and perimeter insulation. Floor covering is cork tile in sleeping zone, slate in the study, dining and utility zone and wood parkay in the living room. Foundations are concrete.

The interior walls are plasterboard. The exterior solid walls are

the design

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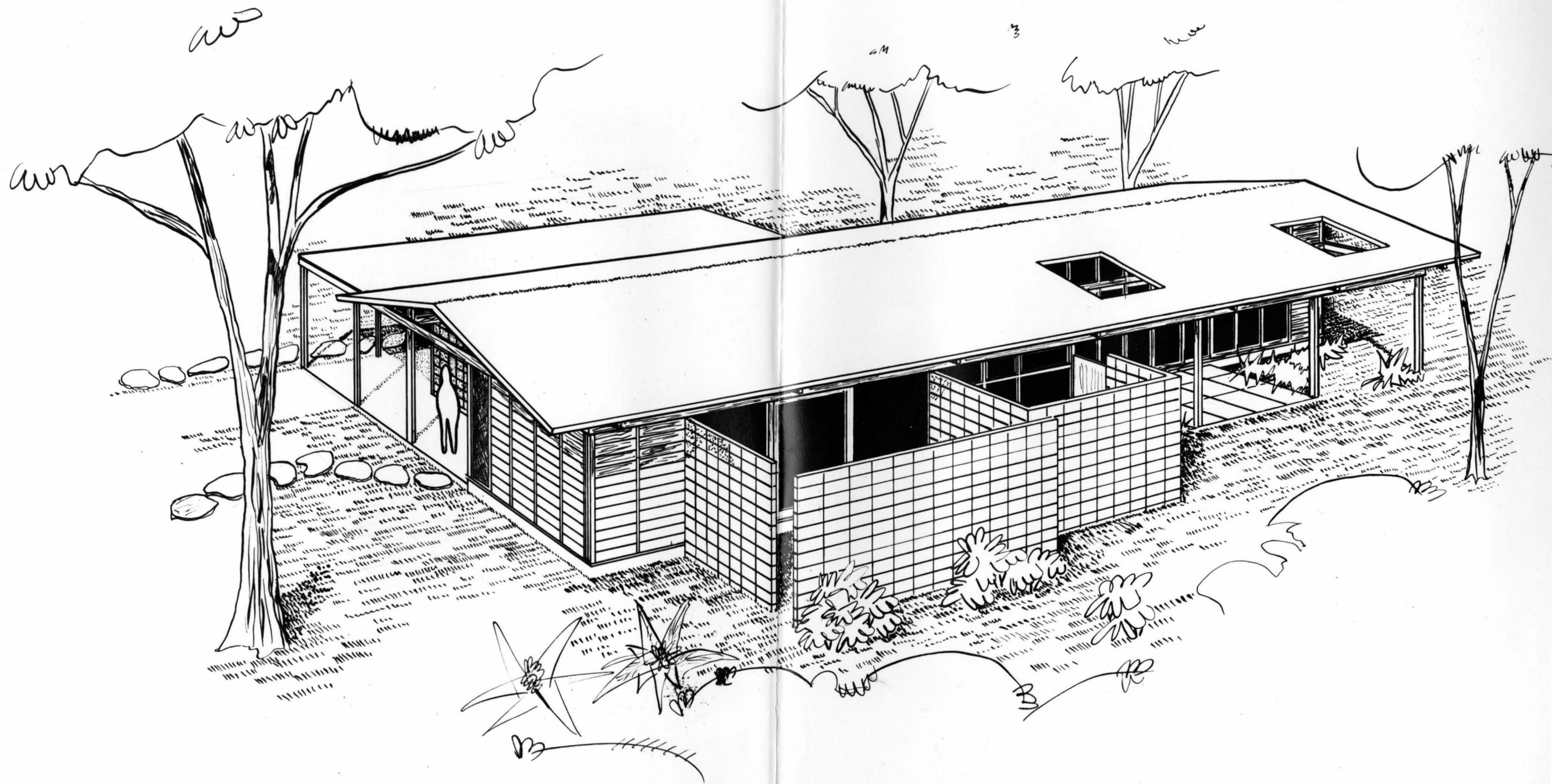
of horizontal cypress siding, sheathing and reflective insulation. Columns, beams, sill and trim are all cypress.

The roof deck is of western red cedar and is exposed on the underside to form the ceiling. The roof is covered with one inch of rigid insulation and a built-up roof topped with white gravel.

The heating system is a forced hot air system supplied through perimeter ducts in the slab and returned through a plenum over the heating unit.

The lighting cable is carried through conduits cut into the roof insulation.

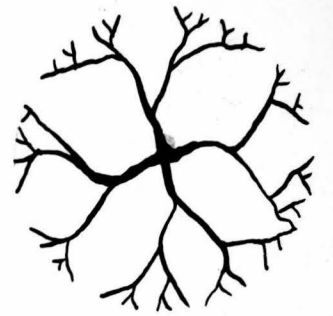




A HOUSE FOR CONTEMPORARY LIVING

by robert b. malcolm

PERSPECTIVE



STORAGE

PORCH + CARPORT

AREA:	
INTERIOR SPACE	1350 <sup>sq</sup>
CARPORT + WALKS	522 <sup>sq</sup>
COVERED PATIO	324 <sup>sq</sup>

UTILITY + PLAY YARD



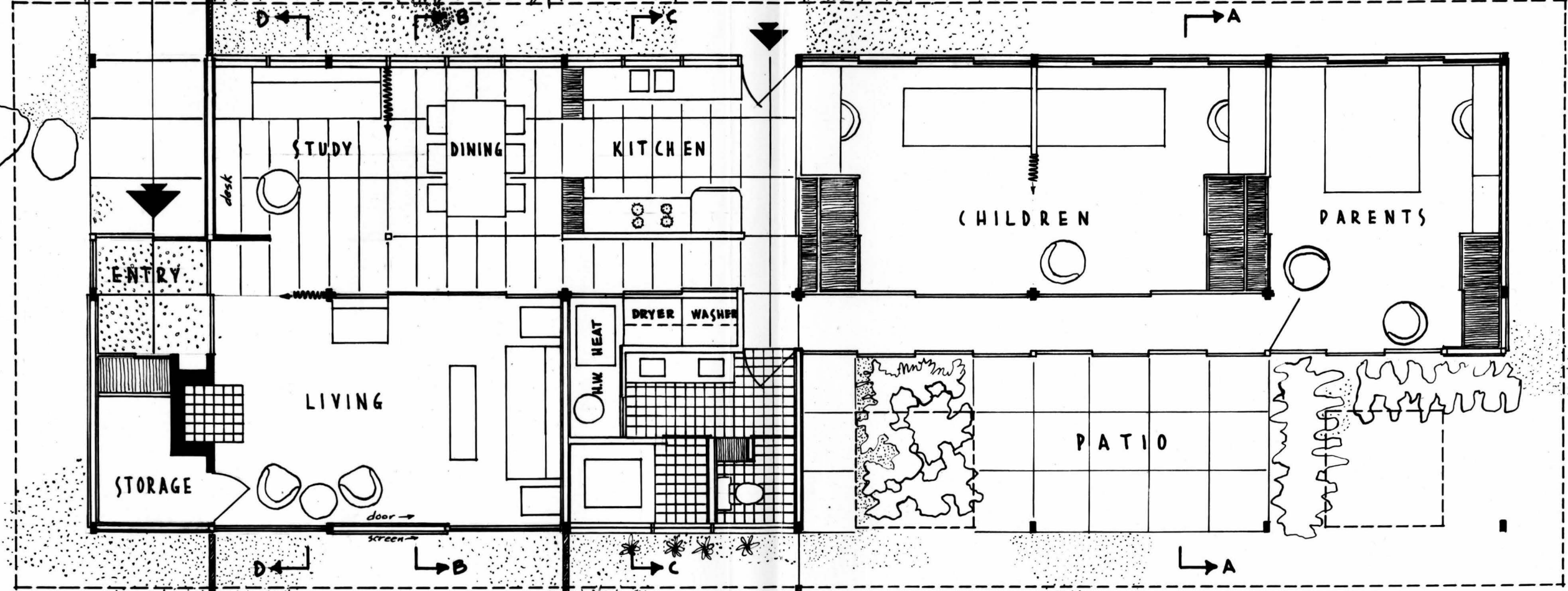
NORTH GARDEN

D ←

→ B

→ C

→ A



ENTRY

STUDY

DINING

KITCHEN

LIVING

STORAGE

HEAT

DRYER

WASHER

(CHILDREN)

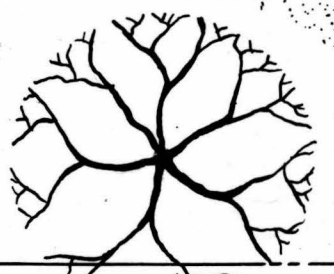
PARENTS

PATIO

BATH GARDEN

SOUTH GARDEN

LIVING YARD

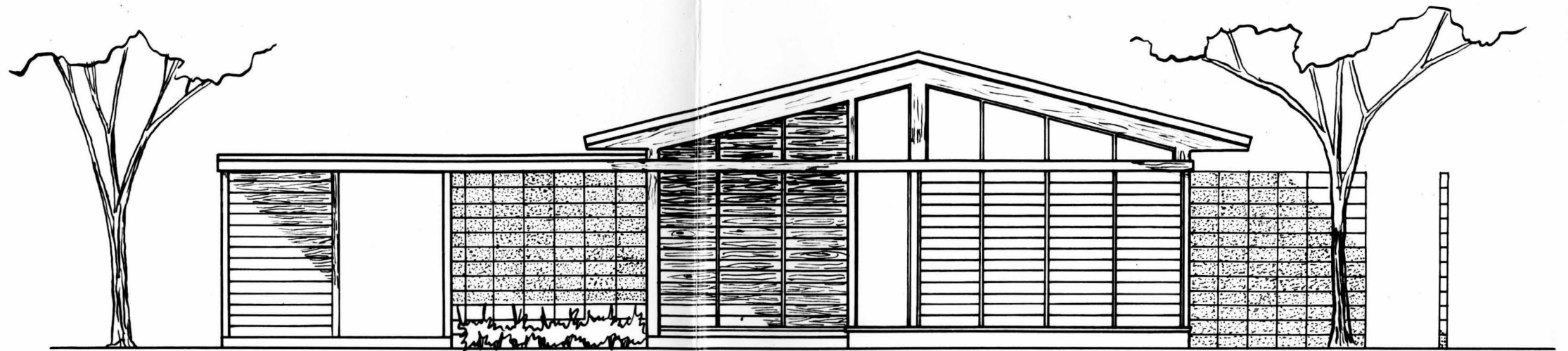


A HOUSE FOR CONTEMPORARY LIVING by robert malcolm

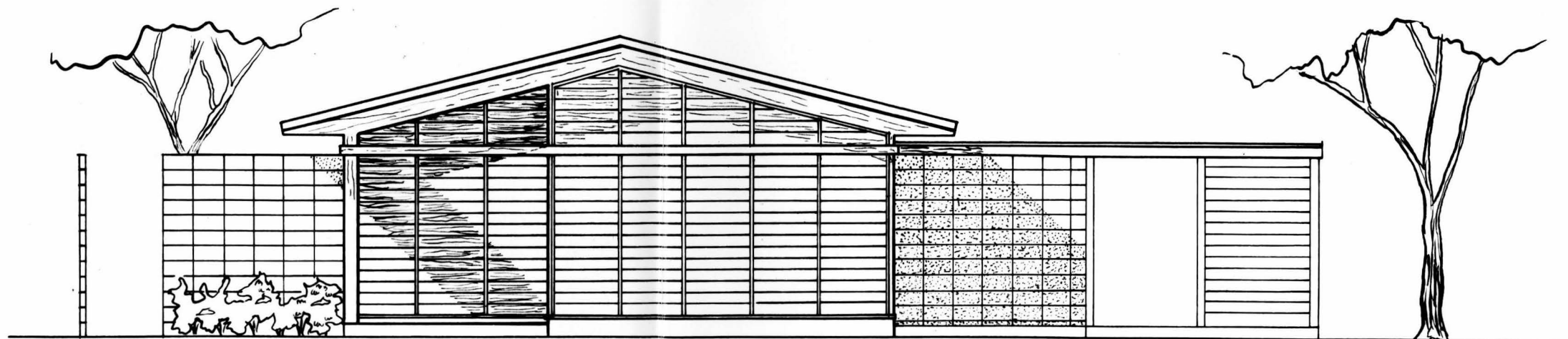
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FLOOR PLAN



WEST ELEVATION

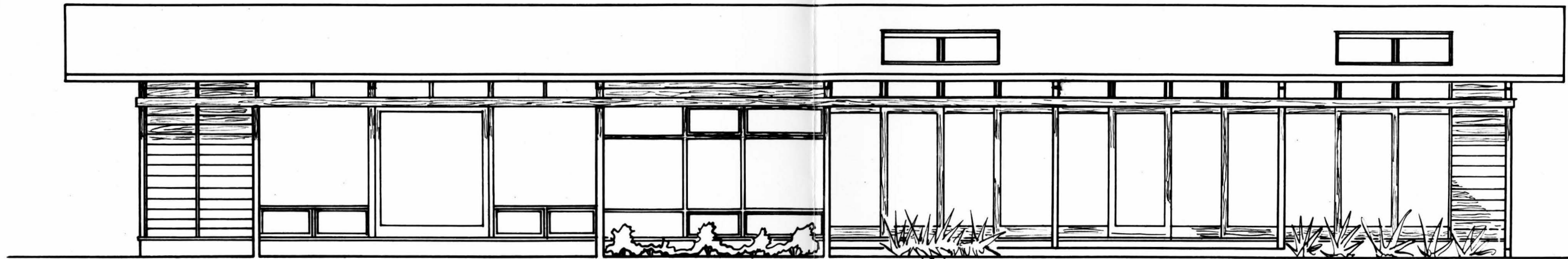


EAST ELEVATION

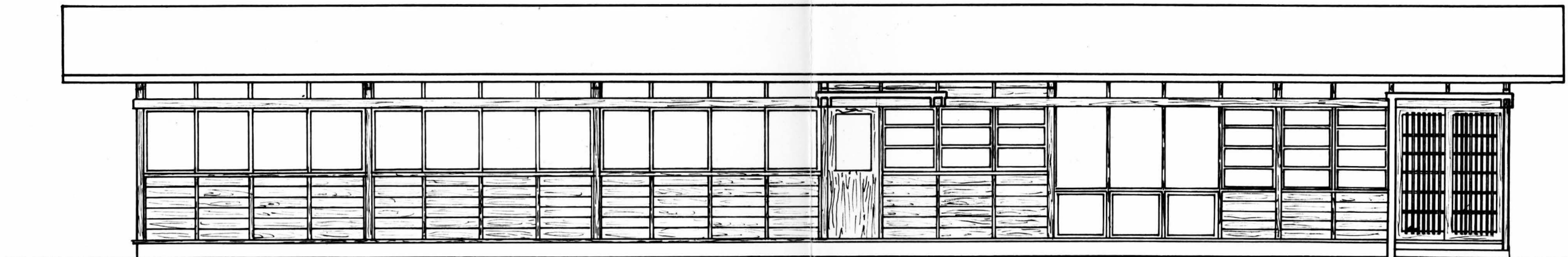
A HOUSE FOR CONTEMPORARY LIVING

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ELEVATIONS



SOUTH ELEVATION

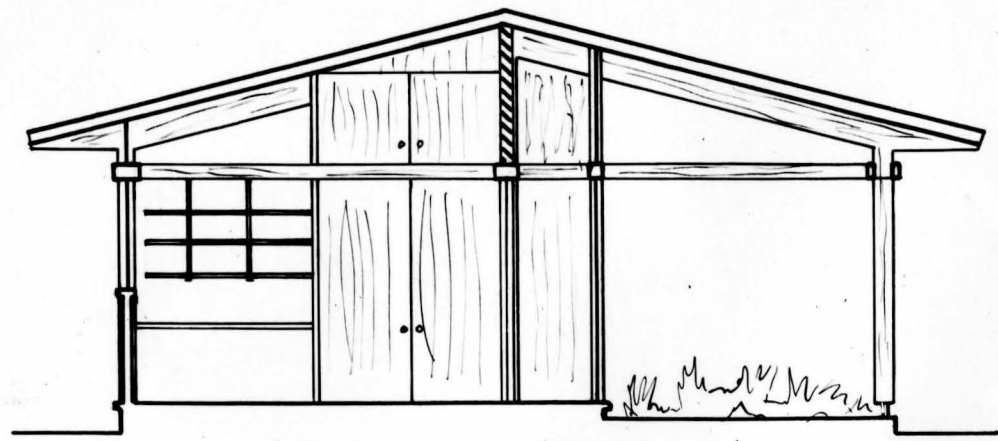


NORTH ELEVATION

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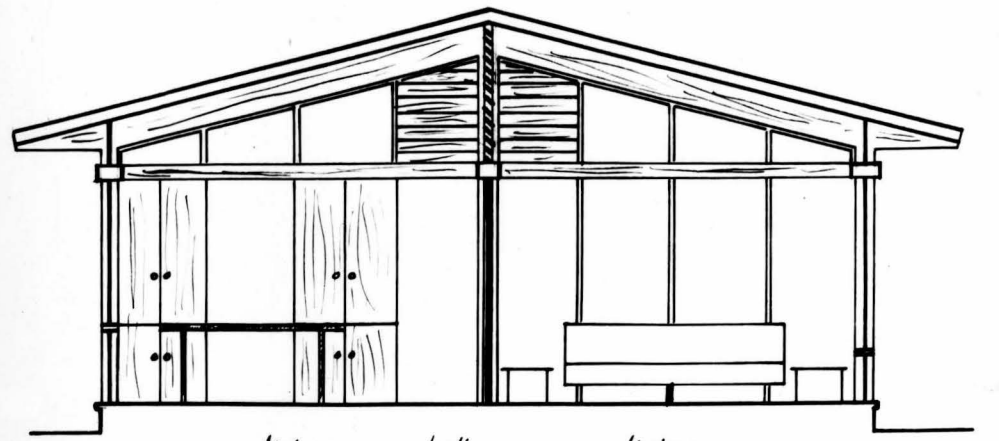
ELEVATIONS





bedroom hall patio

SECTION A-A



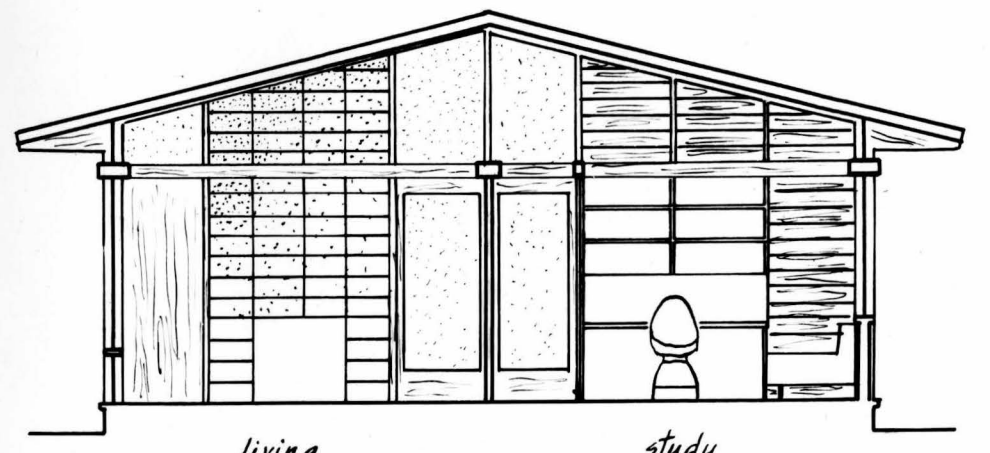
dining hall living

SECTION B-B



kitchen hall heat bath


SECTION C-C

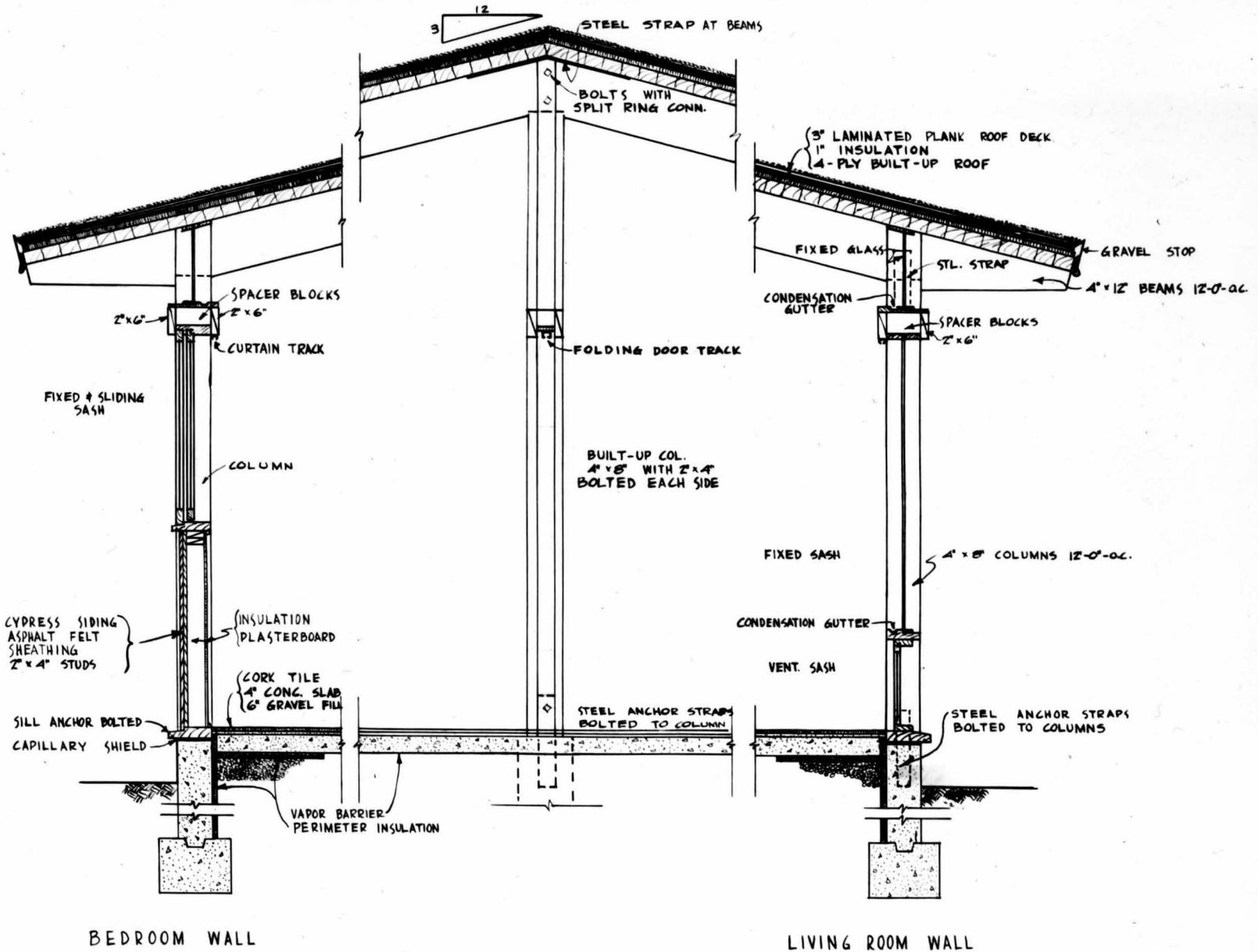


living study

SECTION D-D

A HOUSE FOR CONTEMPORARY LIVING by robert b. malcolm

SCALE: 1/4" = 1'-0"   
 SECTIONS



A HOUSE FOR CONTEMPORARY LIVING by robert b. malcolm

DETAILS

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