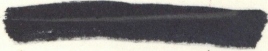


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A RETIREMENT COMMUNITY FOR
HAMILTON, MONTANA

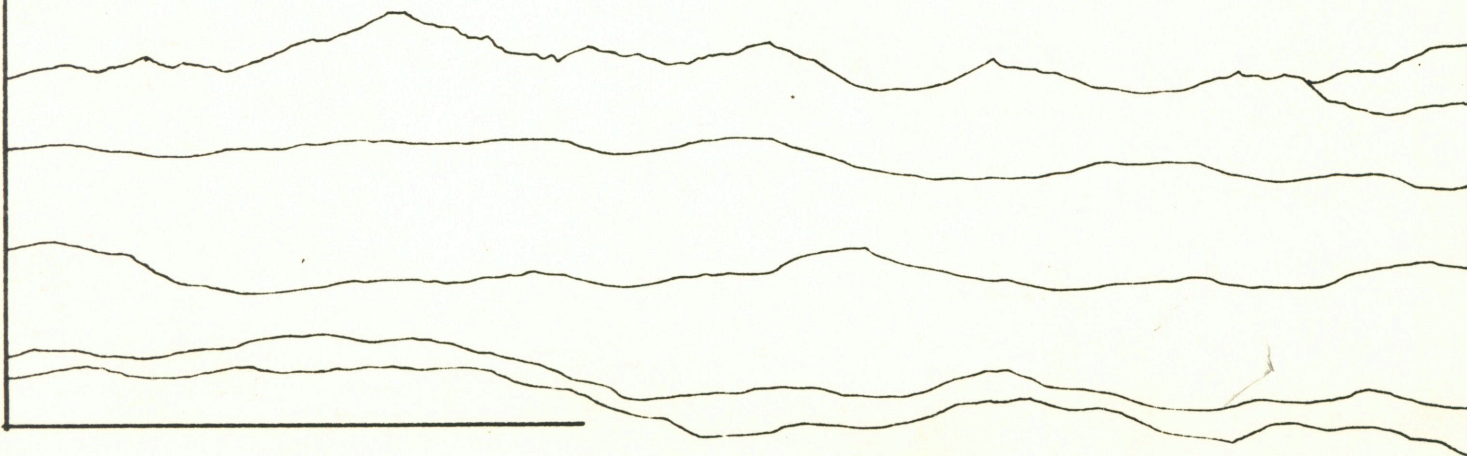
Stephen A. Hammer

Undergraduate Thesis in Architecture.

Montana State University.

Bozeman, Montana

June, 1984



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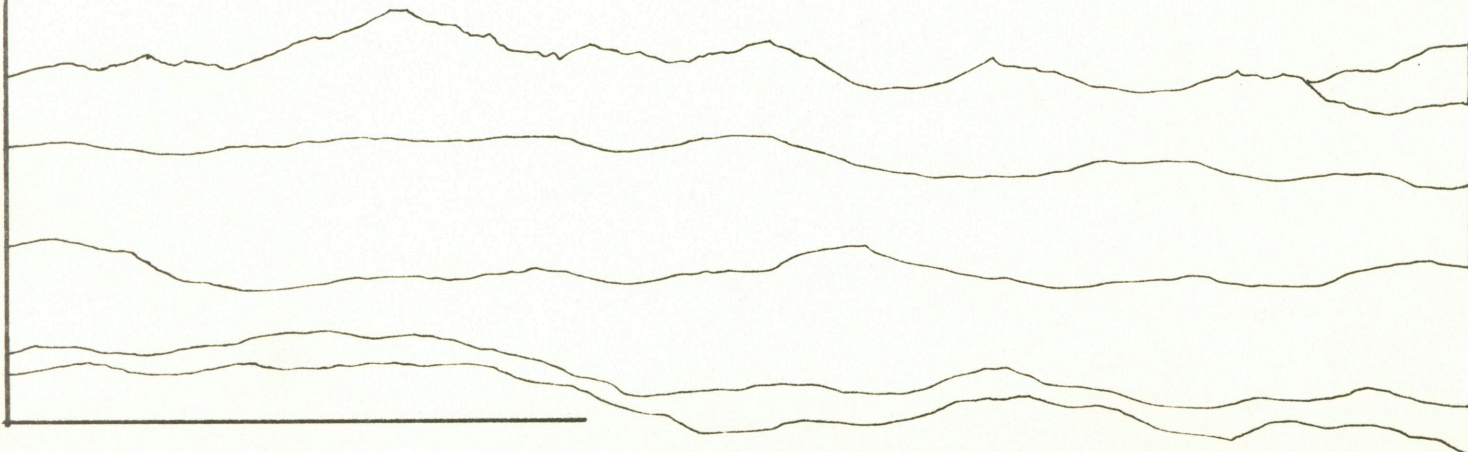
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June 28, 1984

Thesis Approval:

Advisor

Chairman, Thesis Committee

B. K. [Signature]

Director, School of Architecture

contents

Title Page	i
Contents	ii
Preface	iii
Hamilton	1
The Site	19
Site Analysis	28
Climate	34
Elderly Housing	45
Master Plan	55
Program	57
Concepts	61
Footnotes	63
Bibliography	65
Final Design	67

preface

After God had created the Earth and all it contained, He said it was good. The Hebrew word for good used in this telling of the creation in Genesis means three things; Beautiful, Functional, and having Form and Structure. Thousands of years later, Vitruvius used the exact same three elements to define what is good architecture; Firmness, ~~Commodity~~, and Delight.

The purpose of this Thesis is to attempt to create an architecture that is good. Architecture must first have form and structure. If a building is going to be built, the architect has to consider more than how the facade looks, he must consider how the building is going to go together.

Second, architecture must function. It must serve those who are going to be using it. Architecture should not be used as a method to perpetuate the ego of Avant-garde visionaries at the expense of the people using the buildings.

And finally, architecture must have delight. It must be beautiful to look at and experience. In general, a good piece of architecture should not put much more weight on one of these elements than the others.

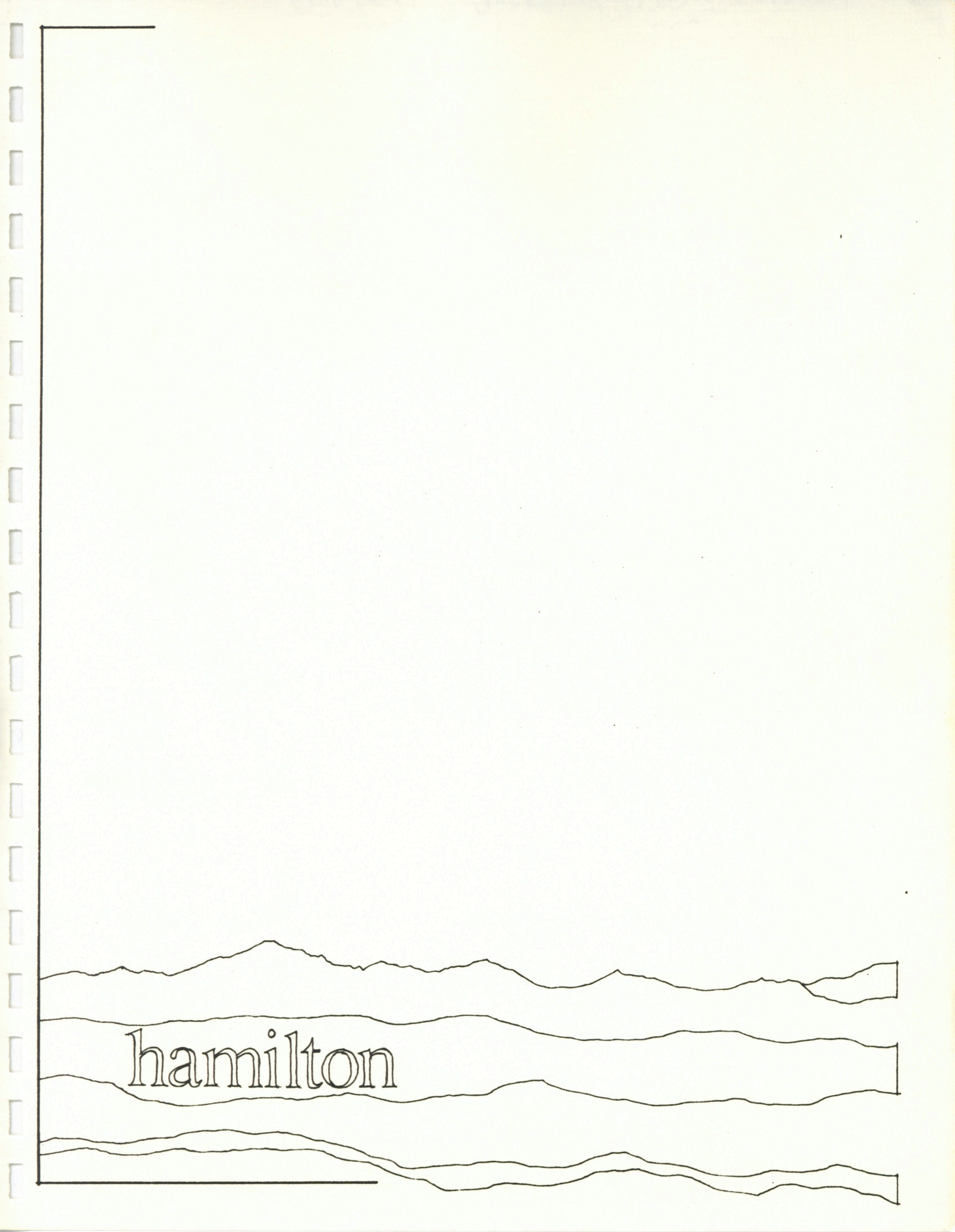
With these elements in mind, I have chosen to design a retirement community for Hamilton, Montana. In such a project, where there is a series of small buildings making a larger complex, it is sometimes easier to explore and express design ideas more readily, and I feel that I can get a better concept of designing buildings that actually could be built.

In designing for the elderly, I can really see the importance of serving the users of the architecture. Elderly people have more specialized design considerations to think of, and their home is a very important part of their lives in later years, as their focus turns more and more to their homelife.

Finally, I can study in greater depth what makes architecture beautiful. I will study the building form (especially the roof), and the use of materials and light in interesting ways. I will also study the importance of building/site relationships as a way to create delightful architecture (including context, connection, landscape, entry, etc.).

If I can successfully consider these design criteria, I think I will be able to say the architecture is indeed good.

Stephen Hammer



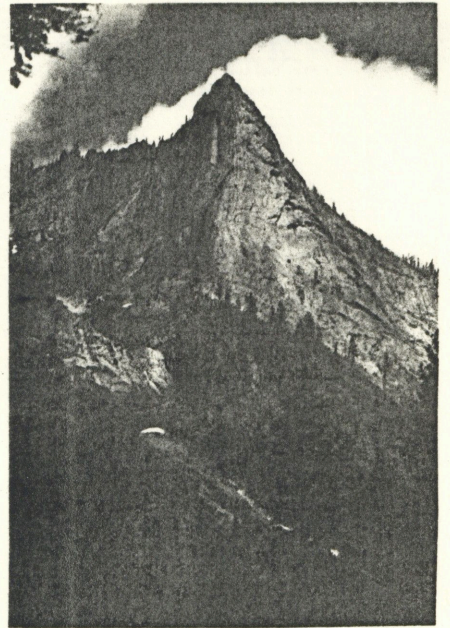
hamilton

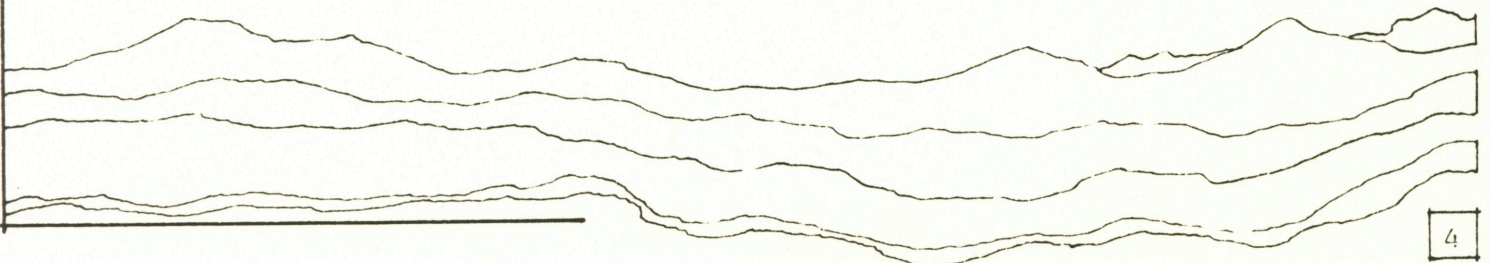
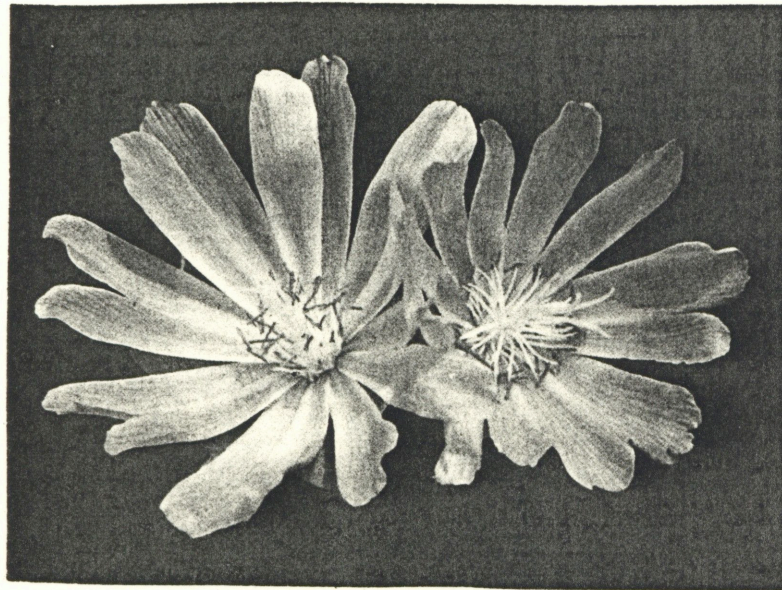
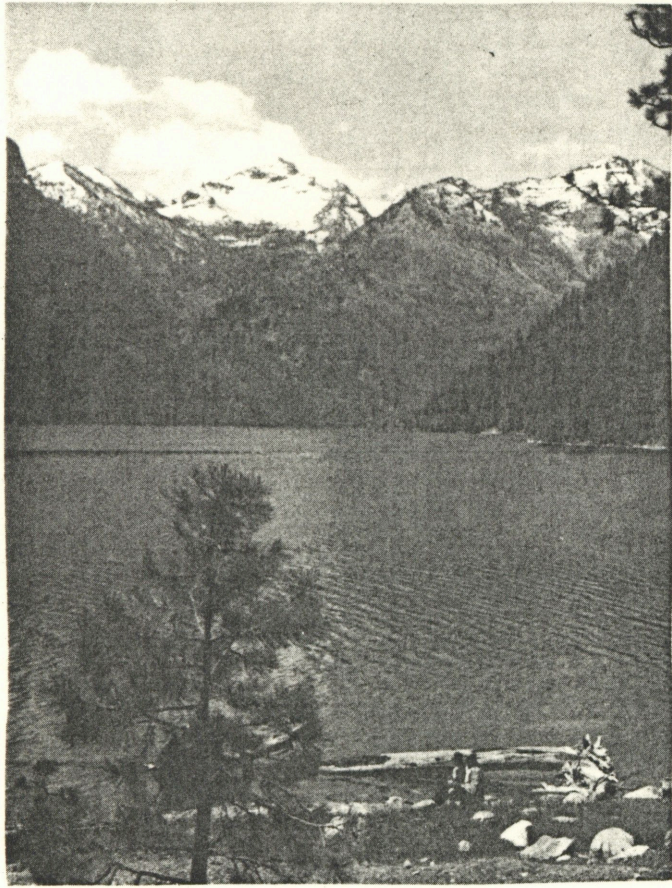


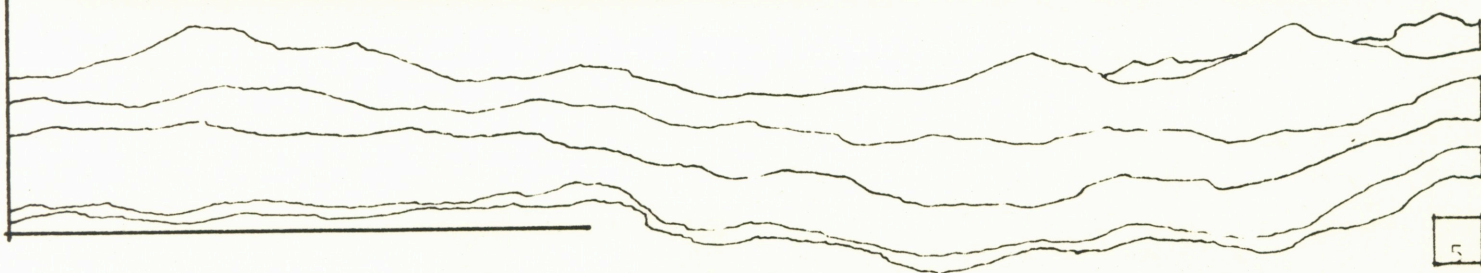
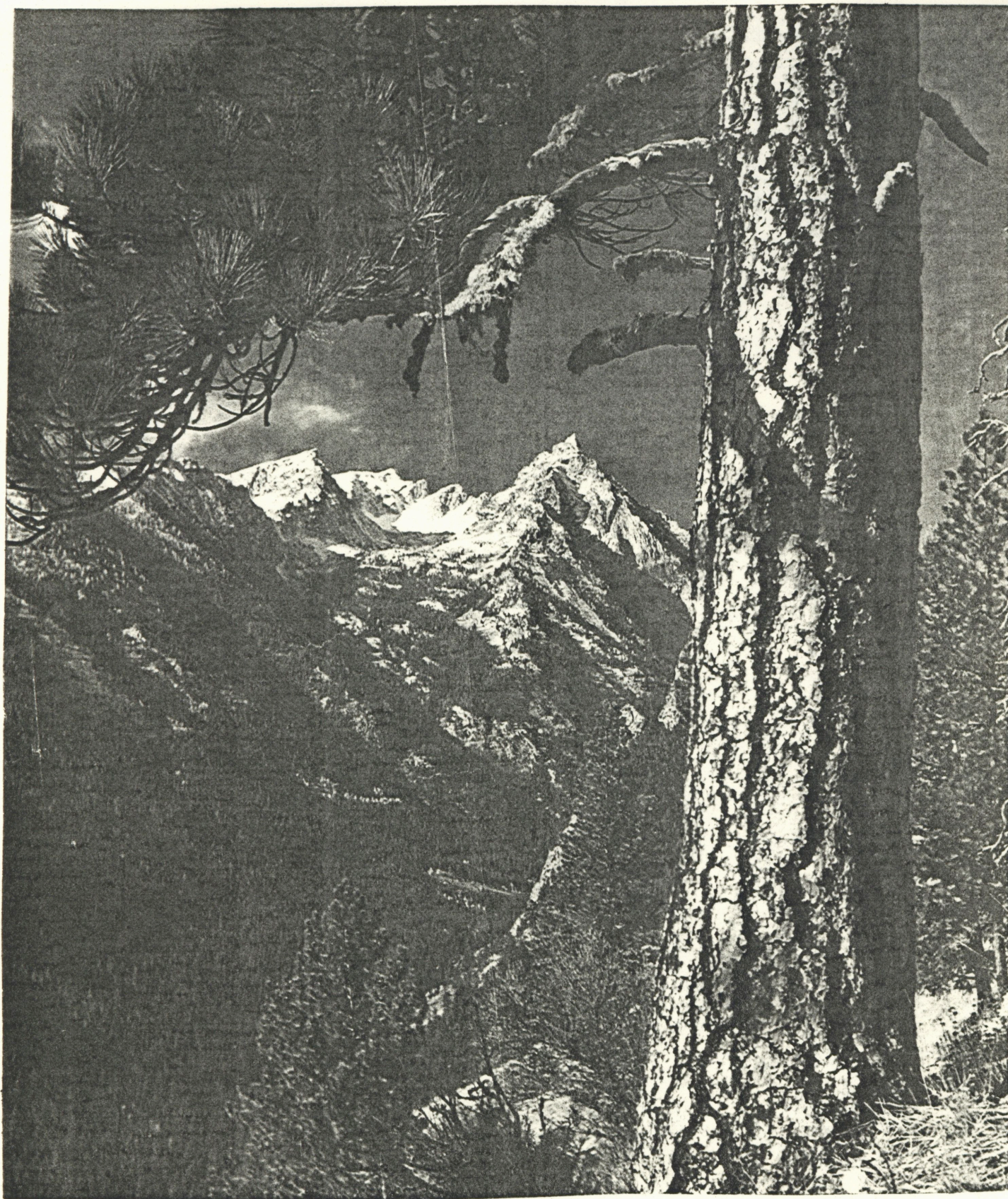
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BITTERROOT VALLEY²







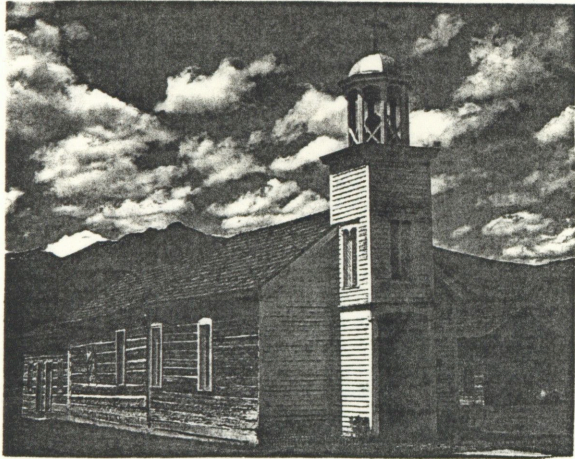


The history of the Bitterroot Valley is very rich and very diverse, much like the valley's character still is today. The area was very important for early explorers of Montana. Lewis and Clark had a very important stop-over point from east to west called Traveler's Rest near present-day Lolo. Also, Ross' Hole (near present-day Sula) was an important meeting place for the Flathead Indians with the Lewis and Clark expedition. In fact, this place was the subject of a famous painting by C.M. Russel that now hangs in the chamber in the House of Representatives in Helena.⁴ The Bitterroot valley was also an important place for the expedition that came a few years after Lewis and Clark for the Railroad. Contonement Stephens was an important resting place for this expedition before crossing the Rocky Mountains at Lost Trail pass.

The Bitterroot Valley is also the earliest center of continuous white settlement in Montana (probably because of its Pacific Northwest location). At the request of the Flathead, or Salish, Indians who then lived in the valley, St. Mary's Mission was established by Father Jean Pierre DeSmet in 1841. The mission became an outpost in the wilderness of early Montana. Here, several Montana firsts were claimed, including: the first oats, wheat, and garden crops, the first irrigation, the first cattle, and the first flower mill, saw mill, and even the first church and school in Montana.

The mission was closed in 1850 and sold to John Owen where he built the fort and trading post of Fort Owen (which was later moved to a more protected spot where it still stands near present-day Stevensville).

The Bitterroot Valley was an important center for agriculture in early Montana. Food produced in the valley was important for the miners participating in the mining booms of the 1860s. Thus, the valley began to be populated by large numbers of farmers. In 1866, the St. Mary's Mission was re-established by Father Anthony Ravalli (for whom the county was named) and this center for agriculture was operating once again. The church was rebuilt and a pharmacy was built next door (in the spot where they presently stand west of the present site of Stevensville).



1866 Church and Pharmacy of
St. Mary's Mission.

At one time the town of Stevensville was the capitol of the entire Washington Territory (named after the first Governor Isaac I. Stevens).⁶

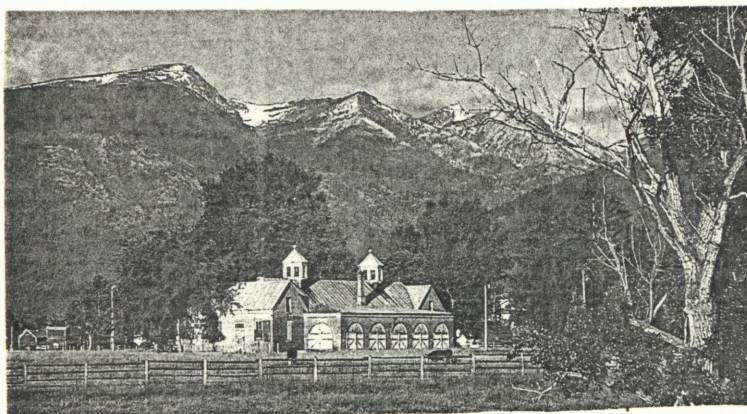
As the number of farmers in the valley increased, so did the pressure to remove the Indians from the area. In 1872, James Garfield (then a Senator) was sent to the valley to finalize the transfer of the Indians to the lower Flathead Valley. It wasn't until 1891, however, that proud Flathead chief Charlot finally gave up and led his people out of the Bitterroot.

By the 1880s, Marcus Daly, one of Montana's Copper Kings, was well on his way to establishing a huge country estate and a town. He built one of the finest stock farms in the world, modeled after the estates in his Irish homeland, choosing the valley mainly because of its scenic beauty.

Copper King
Marcus Daly.



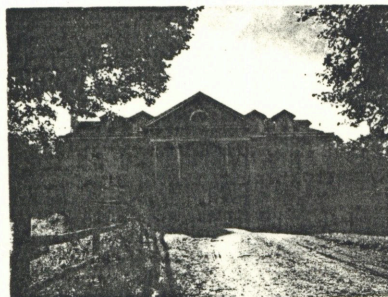
Daly bought out homesteaders allowing him to amass some 26,000 acres in a continuous block east of what is now Hamilton. World class thoroughbreds, trotters, and pacers were trained at the estate's race-tracks (which included a covered arena for winter). Tamany Hall, named for Daly's most famous and favorite race horse, still stands today.



Tamany Hall.

Daly planted hundreds of cottonwoods in long rows along his major roads (today standing as giant landmarks in the area) and he created the town of Hamilton. In about 1887, Daly brought two men to develop his dream town after he had established a lumber making industry on the banks of the Bitterroot River. They were James Hamilton and Robert O'Hara, both from Minnesota. The town was named after James Hamilton, and it was incorporated in 1894 with O'Hara appointed the first Mayor.

Daly ruled his empire from a hilltop Victorian Mansion which he built in 1890. After his death in 1900, his widow had the mansion totally re-done and enlarged into an imposing Southern Colonial home that is now hidden behind iron fences and a jungle of vegetation.

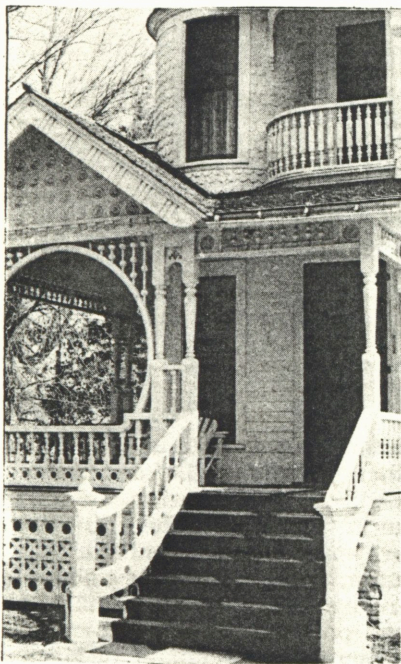


The Daly Mansion.

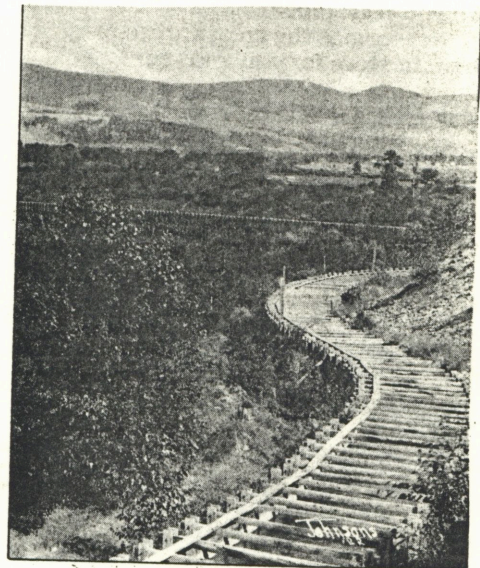
The mansion looks very much out of place in the Bitterroot Valley of Montana; it looks like something from Gone with the Wind with its 31 rooms including no less than 13 bathrooms.

Daly was a major force in shaping the history of Hamilton and the valley, especially by giving the valley a strong love of horses. Today the Bitterroot Valley is a very horse-conscious place with numerous ranches of green pastures and white picket fences comparable to Lexington Kentucky.

Another element of the Victorian era in the Bitterroot is the Brooks Hotel in Corvallis. Still standing, this building gives us a fine example of Queen Anne architecture of the period, and it has a rich history that rings loudly with the Victorian past.⁷



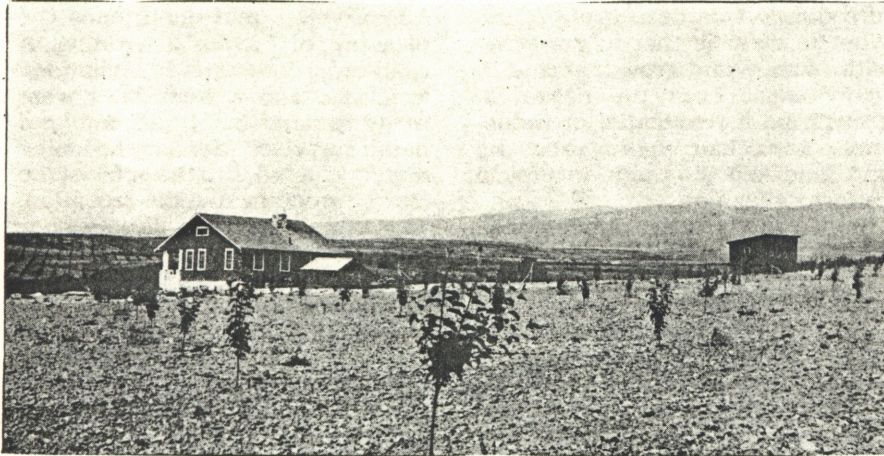
The Brooks Hotel.



The Big Ditch.⁸

A colorful yet brief era of the Bitterroot Valley past and another element of agriculture in the valley, was the apple boom of the early 20th Century. Things really picked up shortly after the construction of the Big Ditch, a 72 mile long irrigation canal. Still functional, this landmark was used to carry water from Lake Como, under the river, and north to Florence. Water from the canal was to be used exclusively for the some million apple trees planted in orchards near it.

These orchard complexes were the subject of railroad "boomer literature" designed to lure people into the valley, much like the homsteading in eastern Montana during the same period. (The railroad was a strong force in shaping the valley in these developing years.) Names like Sunny Side and Paradise Heights were typical of the huge orchards. In general, though, the subdivisions were generally 10-acre tracts, thus starting the valley's first subdivision boom (to be rivaled only by the current subdivision boom happening in the area).

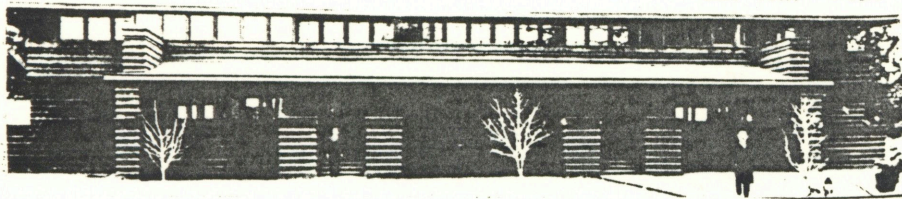


The apple boom orchards.⁹



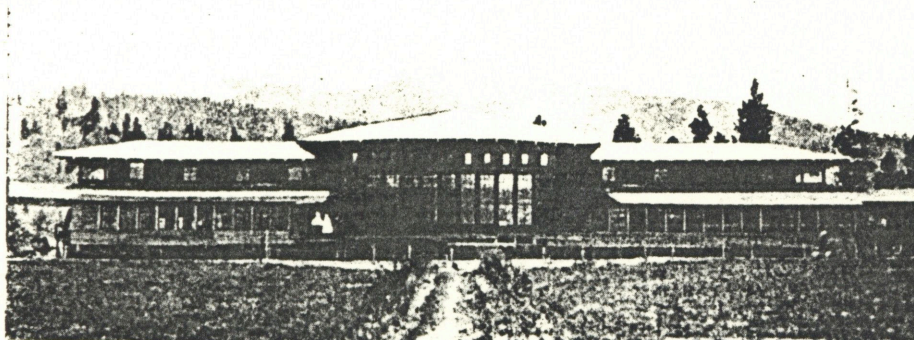
Two schemes were designed for the apple boom orchards in the valley by none other than Frank Lloyd Wright. Both were done in the typical Prairie School style he was working with at the time (the Oak Park Style, right before his trip to Europe and his change in style). One scheme was the town plan for the proposed town of Bitterroot Montana (near Stevensville) where only the Bitterroot Inn and a few other small buildings were completed. The Inn burned down in 1924.

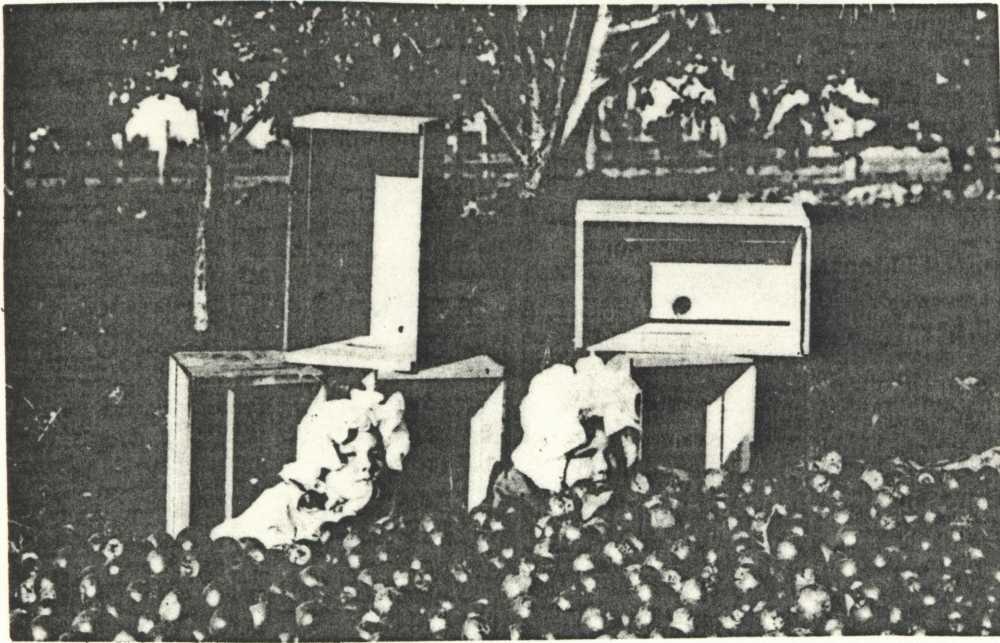
The Bitterroot
Inn.



The other scheme was the plan for University Heights (or Como Orchards) which was planned as a summer recreation and money-making facility for University of Chicago professors. The clubhouse and several cabins were built, but all but two of the cabins have been torn down.¹⁰

University Heights
Clubhouse.



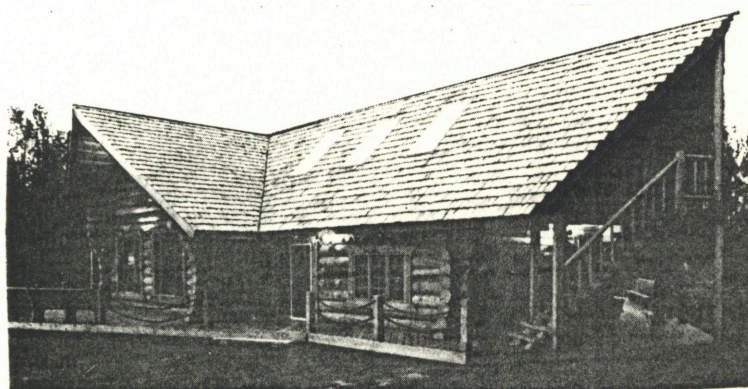
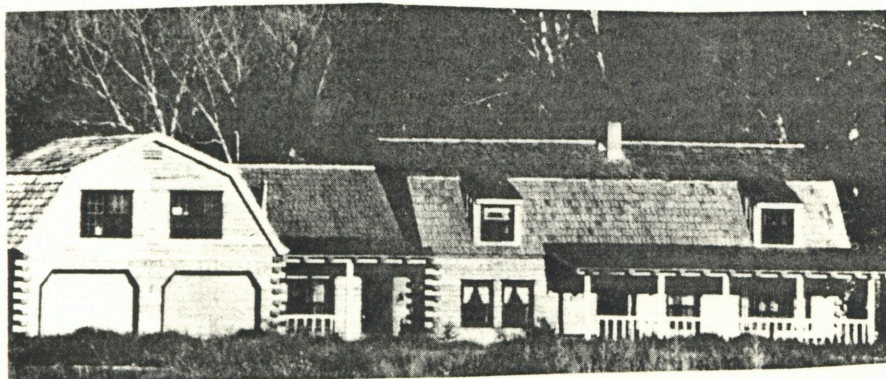
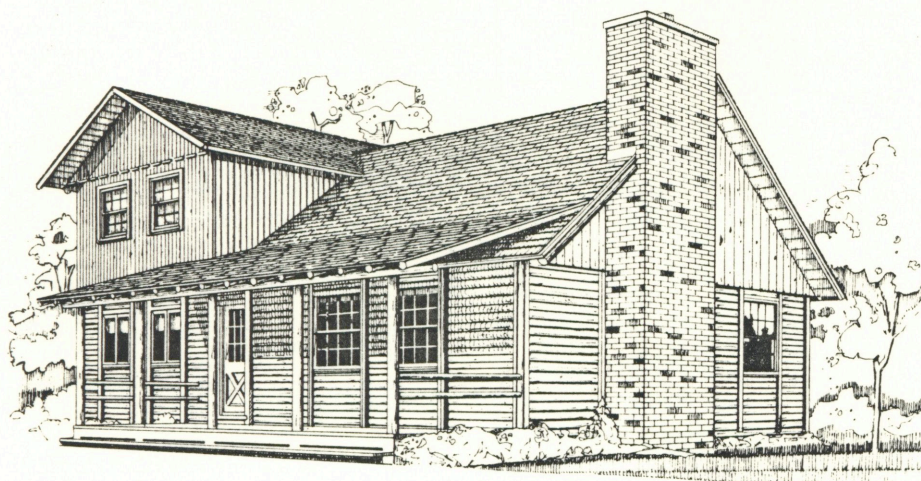


Although the apple boom was successful for a while (when annual production was as high as 400,000 bushels of apples annually), eventually the boom went bust, much to the dismay of investors like Frederic Nicholas and others who lost investments and sometimes life savings. Unfavorable weather, disease, poor land, and competition from better suppliers all contributed to the end of the apple boom.

Although apples no longer are a major crop in the valley, the Bitterroot Valley still has its heritage as an agricultural center. Crops, Livestock (including a large number of chickens), and Dairy products are all part of the valleys agricultural industry (third in employment to timber industries and government). The creamery in Hamilton carries on the tradition of fine cheeses and ice cream famous all over the country that was started by Howe during the Victorian past.

Another boom occurred in Ravalli County almost a half Century after the apple boom with the introduction of clearcutting in the area. In the 1960s, especially from 1966-69, there was bad over-cutting of Forest Service Lands and lack of multi-use. This created a great public outcry to stop the practice. (The valley is famous for its controvercial character over public issues.)¹¹

Today, timber is the major industry in the valley and involves 11 percent of the work force. There are some 10 mills, 13 post and pole plants, and a total of no less than 9 log home outfits. Some valley residents call the area the log home capitol of the world. Following are some examples of advertisements for these log homes.¹²

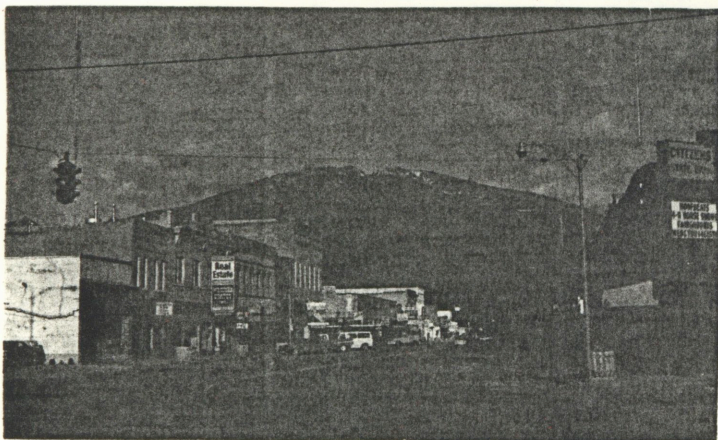


And now, there is a new boom crop in the Bitterroot Valley: housing subdivisions. Because of the secluded nature and scenic beauty of this valley, nestled between two north-south mountain ranges (the 6,500 foot Sapphires to the east and the 10,000 foot Bitterroot Range to the west) the area is very attractive to people seeking a little bit of paradise. There are also many opportunities for recreation in this historical mountain-valley setting, including: museums, hot springs, lake and river recreation, skiing, hiking, and biking to name just a few. Another advantage is the close proximity to a major Montana Urban center: Missoula (with its retail opportunities and the advantage of the university). The result of this is a huge rate of increase in population. From 1970 to 1980, the population of Ravalli County increased from 14,400 to 22,400 (a 56 percent increase)!

Because of this growth, there are more government services needed. This adds to the number of government employed people which is already the largest source of employment in the county.

And, along with this growth is a gentrification. Elderly folks and recently retired people are seeking a place for their dream retirement home, and the Bitterroot Valley is the perfect place to go. In fact, the National Association of Retired Persons has recently acknowledged Hamilton in the top 20 of desirable communities for retirement homes.

So there we have it; thus has ~~been~~ the history of the Montana valley called Bitterroot. It has had a diverse past, but more important, it is a place of diverse present. Diversity in the population is evident in the fact that the community thrives on controversy, and the decisions that will be made in the near future will do more to shape the valley than all the history up to now. As an architect, I would like to have a part in the direction of the valley's future, hopefully making it a better place than ~~worse.~~



Main Street
Downtown Hamilton.

Given our summarization of the history of the valley, what are some of the implications for designing housing in Hamilton Montana today? Since the people in the community will be elderly, they will more likely have a strong tie to, and love for the past, so it should not be forgotten.

First, the history we just looked at is very diverse, and does not give us one single impetus historically to draw from. Perhaps, then, a use of diverse building forms and styles would be appropriate. Also, there will likely be a diverse cross section of people living in the retirement community, implying a need for diversity in the buildings.

Another implication we can see comes from the valley's history of subdivisions. It is almost as if a lot of the agricultural heritage is being eaten up by ranchettes and housing developments, which seems bad. It would be nice if the valley could stay as it is and keep its secluded, unpopulated character, and designing a housing community for Hamilton would be adding to the problem. But, if the development of the land is inevitable, I would rather see good architect-designed buildings than K-Mart type establishments eating up the valley like cancer. In fact, the site itself is beautiful (pasture with a river running through it), and it is almost a shame to build something on it. But a housing community for the elderly seems to be the best type of use if the area is going to be developed anyway. What I can do is to perhaps leave as much of the remnant of the original site as possible, which may even mean reducing the size of the program. Basically, the site needs architecture that would enhance the site and not detract from it.

Another important element of the past that may inform us as to design implications is the agriculture in the valley. People have always had gardens by their homes, and there is no reason not to have them in an elderly housing project. It would even give the people something to do if they need it--something to care for and take pride in. In fact it would seem very appropriate in light of the apple boom to use fruit trees whenever possible. Again, it would be nice to leave as much of the agricultural land on the site as possible, and perhaps (because of the influence of Marcus Daly) a nearby horse pasture would help to continue the heritage of that bit of the past while giving elderly people something they can watch and enjoy, and even care for. Another element of the agriculture in the Bitterroot is the grain elevators. They are made of corrugated metal (which is also extensively used as a roofing material on many valley buildings including log cabins), and they are visually a combination of simple forms in an additive process. This may be two possible ideas to draw from.

Again looking at Daly's influence,¹³ the cottonwood-lined streets may be another idea to draw from. Especially since the site has an abundance of cottonwoods, this tree may be a major element in the design.

The strong Victorian past may be another informer of the design. The Victorian buildings were usually a series of disparate parts combined together in an additive process, often times with high elements such as turrets and bell towers (like on Tamany Hall and even on older buildings such as St. Mary's Mission).

The influence of Frank Lloyd Wright could be appropriately drawn from in the design of a housing community for the Bitterroot Valley; he designed two such projects in the same valley (in the Prairie School Style) and it almost is as if he has given historical architectural substantiation to such a project in the valley.

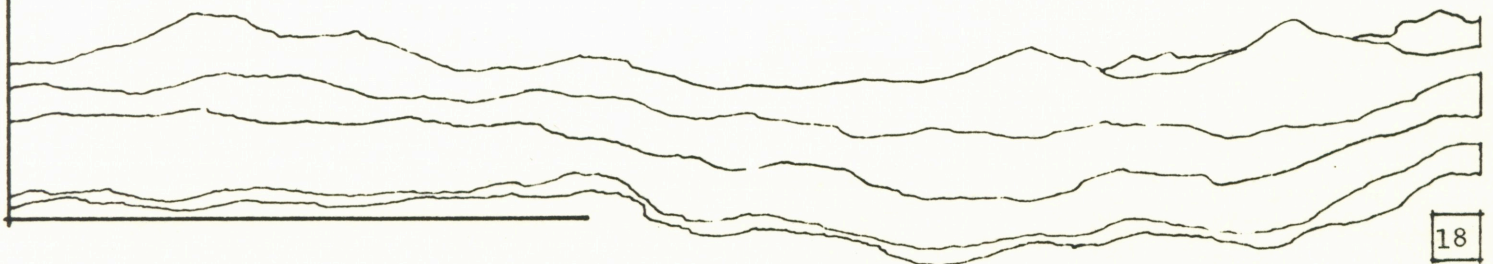
Because of the railroad's influence in the shaping of the Bitterroot, it would be appropriate to acknowledge its existence, especially since the town of Hamilton is layed out on the same angle as the tracks, and the tracks run by the site of the project.

The use of water is very important in the valey's history, and since the Bitterroot river runs through the site, running water could appropriately be used in the planning of the community (for example, using creeks running through the site, and the strong acknowledgement of the river's edge).

The importance of timber in the Bitterroot valley could have strong design implications. In fact, Frank Lloyd Wright was a firm believer in the use of local materials and labor. So, the use of logs as a design material would be appropriate in light of the several log home companies in the valley. Interestingly, the three architects in Hamilton all deal with designing log structures in the valley.

And finally, an important influence on the design (even in the selection of the project) is the element of housing, especially for the elderly, which is becoming the new force that is shaping the future of the bitterroot valley. In general, I think these historic clues will be very helpful in giving ideas and some criterion to look at in designing this project for the Bitterroot Valley.

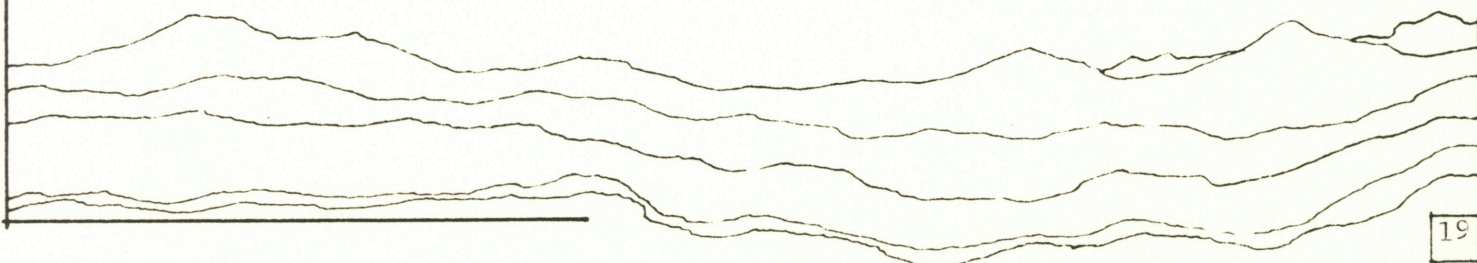
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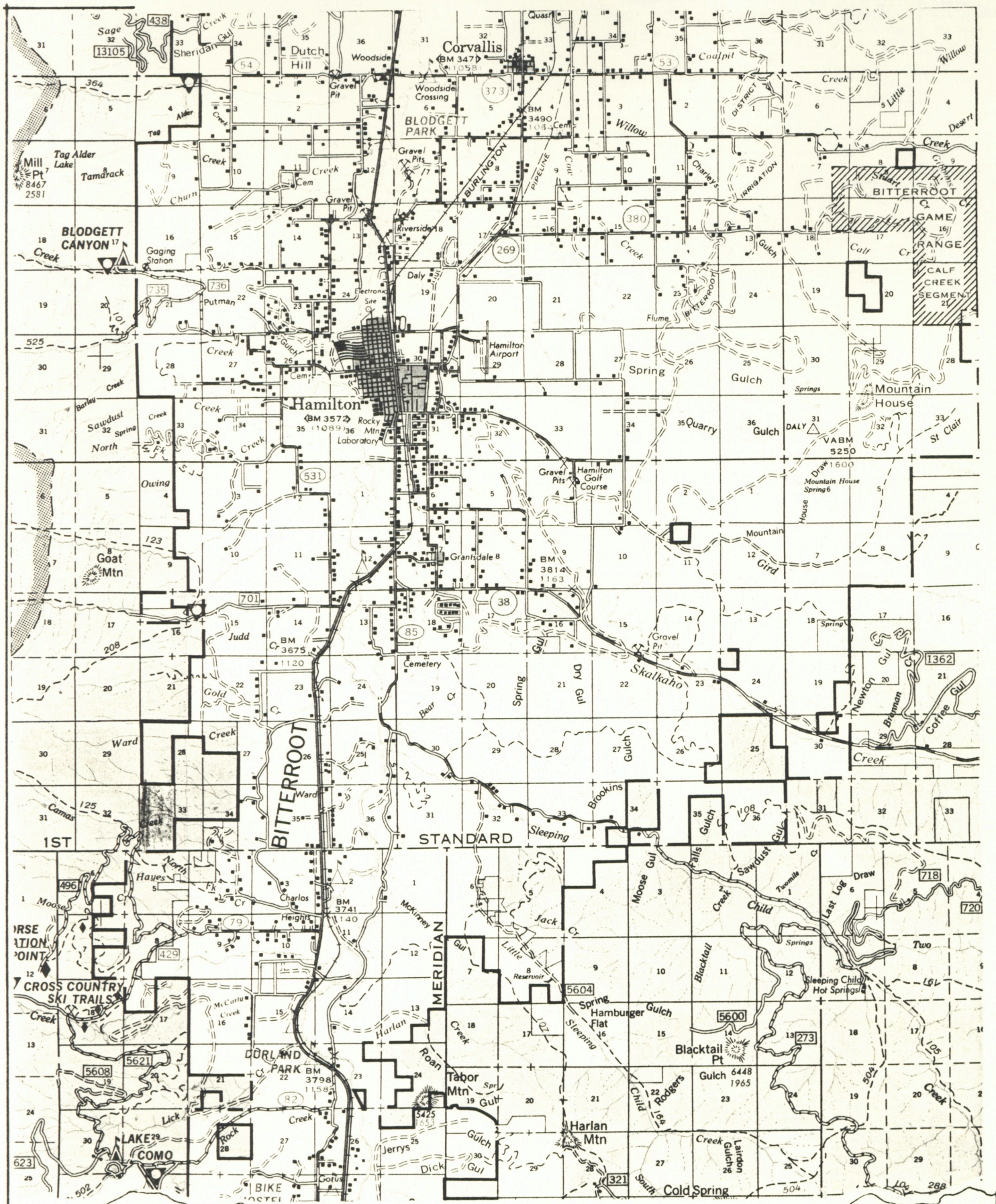


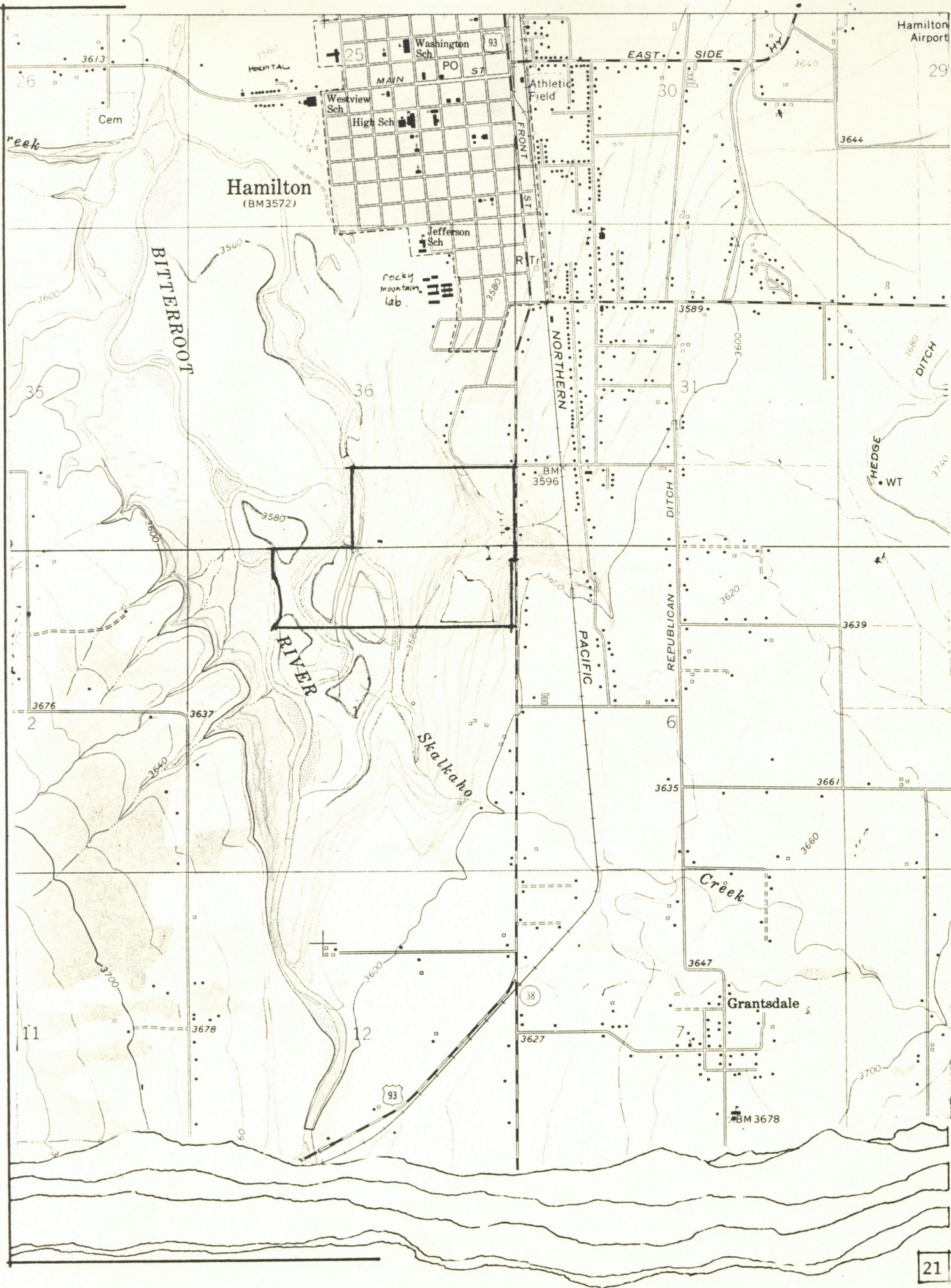
the site



Aerial Photograph of Hamilton. ¹⁴







Total Acreage:
5/16 of a Section
198.86 Acres
8,661,000 S.F.

Shady Lane



Scale: 1"=600'-0"

100 year
Flood Plane

Bitterroot River

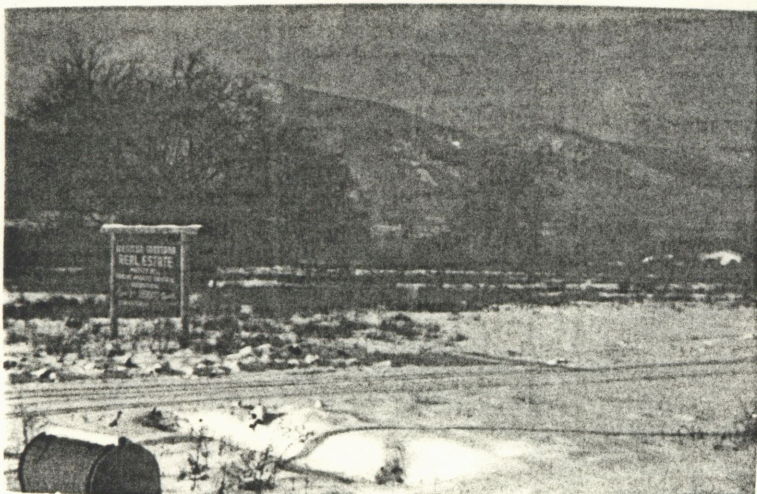
newly created
pond

just widened to
4 lanes

U.S. Highway 93

Skalkaho Creek

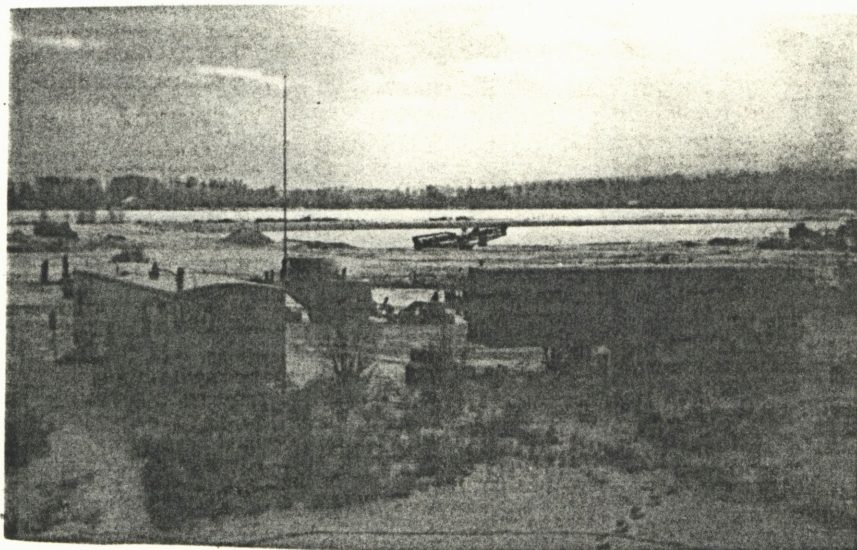




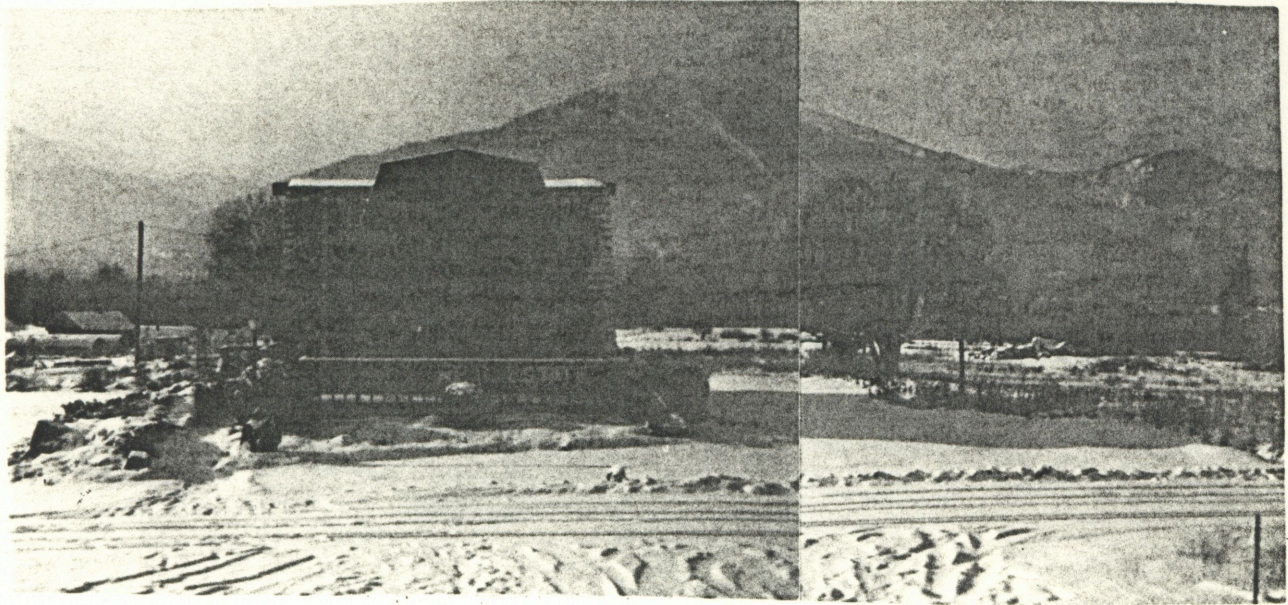
View looking North-
West to the Bitterroot
Range.



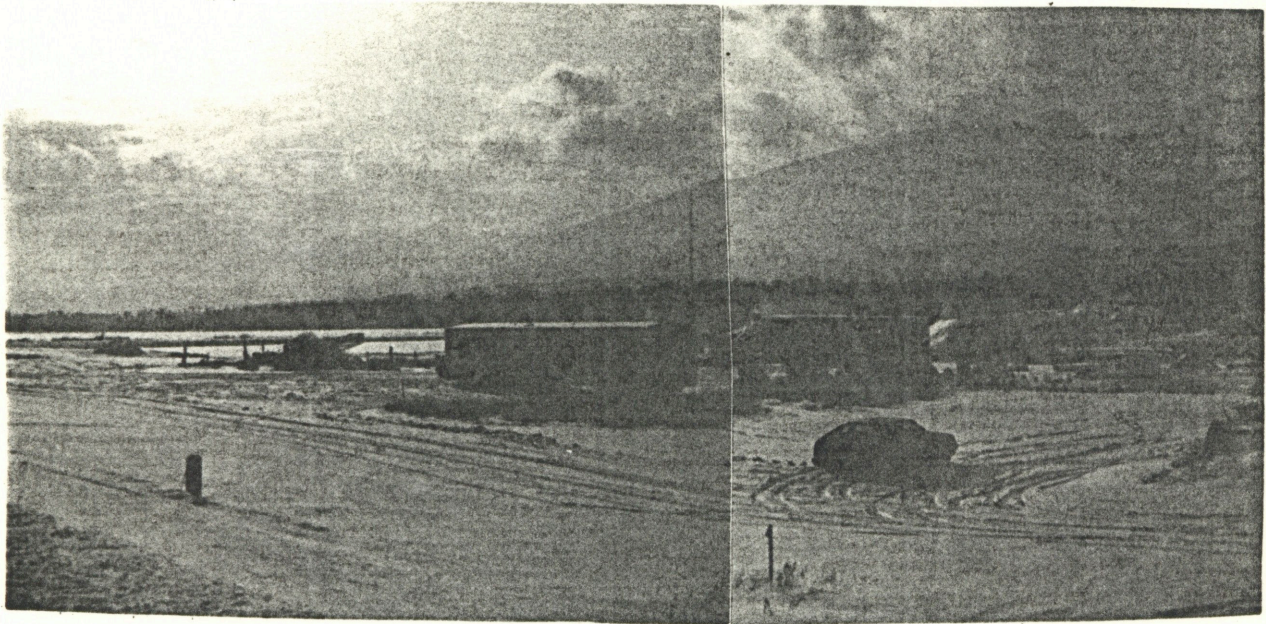
View looking
West to the
River and the
Slaughter House.



View looking South to
the newly created pond.



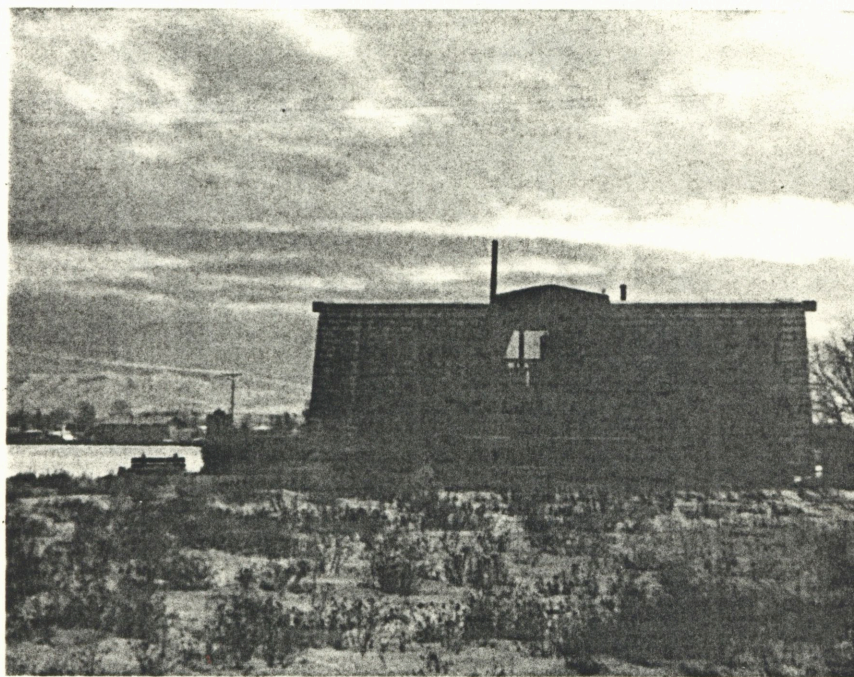
View looking West with existing Real Estate
Office Building in foreground and Downing
Mountain in the distance.



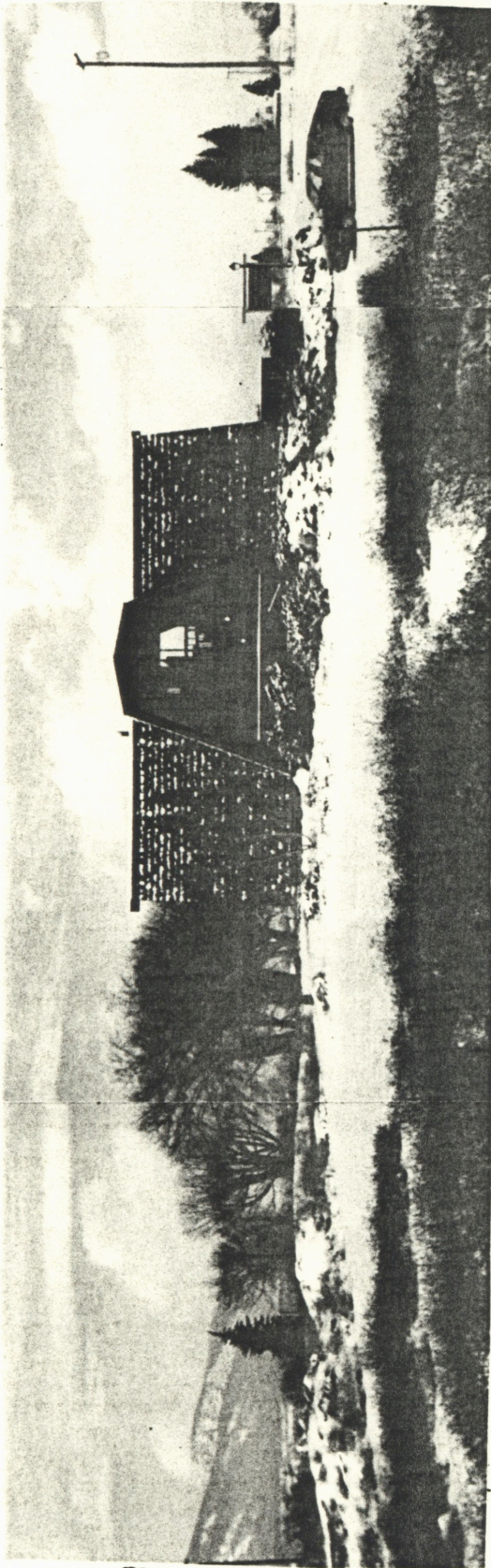
View looking South-West with pond in the
distance and Ward Mountain in the background.



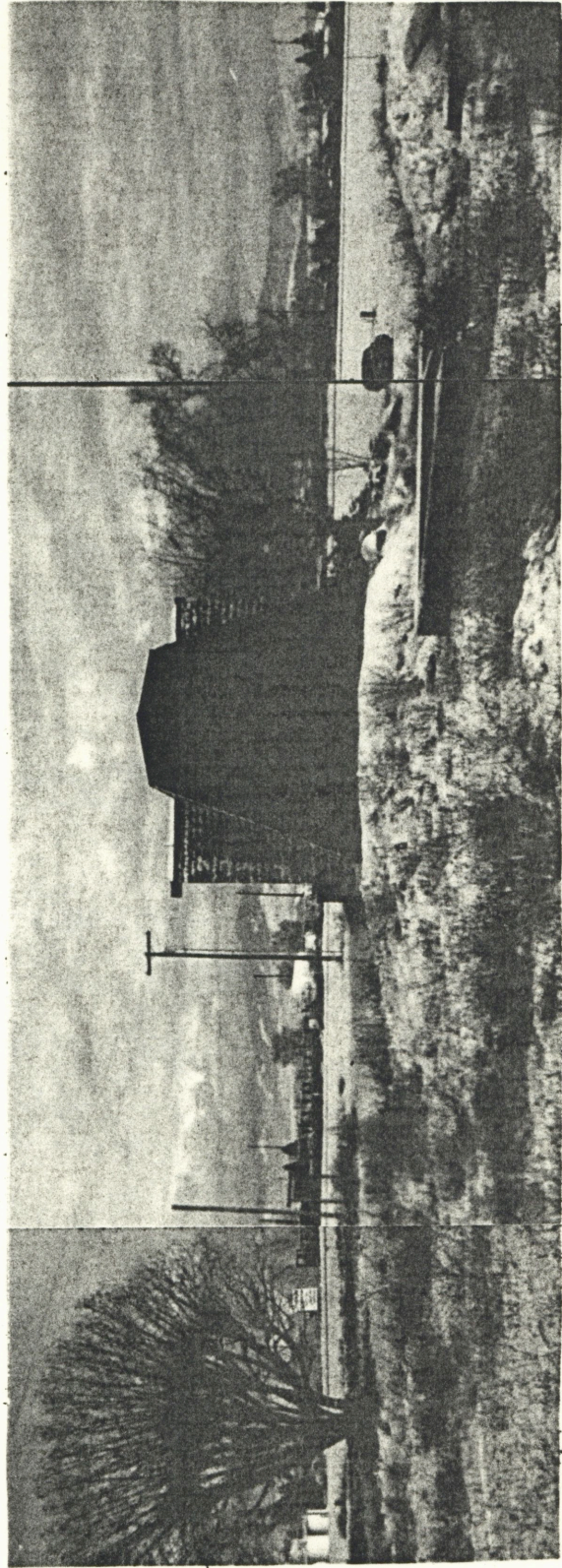
View across the highway looking East
from the interior of the real estate
office building.



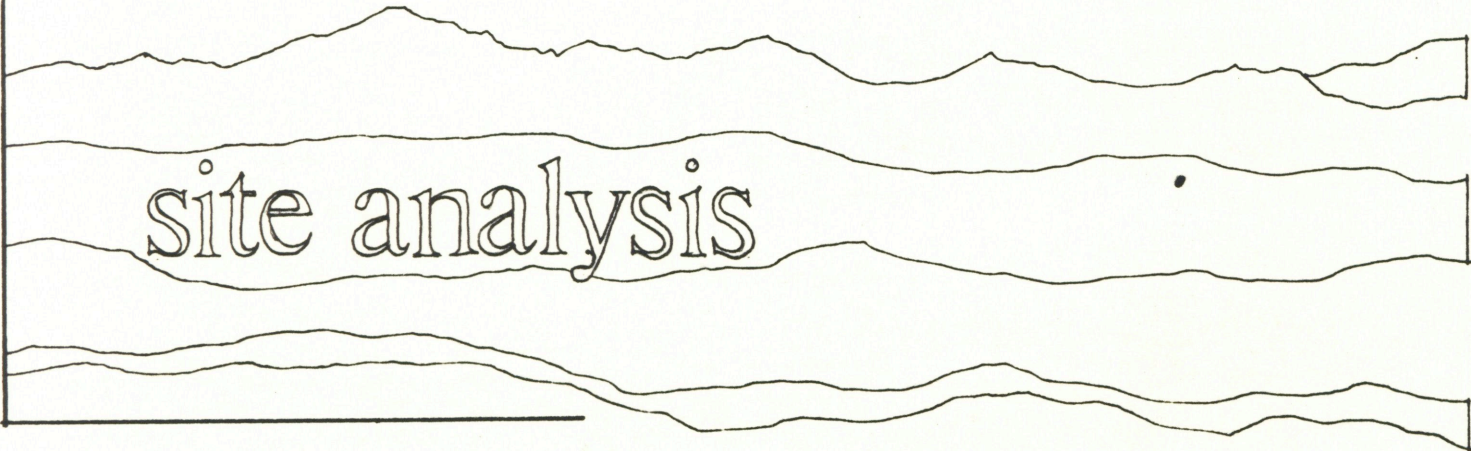
North elevation of real estate office
building looking south.



South elevation of the real estate office
looking north with the bench on the left.



West elevation of real estate office
looking east to stock yards on left.



site analysis

There are many substantial forces, both natural and man made, that are acting on the site and that make an impact on on the site. These forces are very important to consider as design implications and clues for design decisions.

The man made forced include such things as the angles of existing buildings on the site. The historic slaughter house on the western part of the site has potential for adding character to the project if kept, (it is about an hundred years old) and the real estate office is a prominant feature of the site because of its location on a high point near the highway. The option remains to remove either of these buildings from the site.

Another important design implication is the existance of an offset angle for the main grid layout of the streets of Hamilton. This angle is the same as the railroad tracks that run just east of the highway. There is also a shift in the angle of the main grid as you go south in the town. This is even closer to the site and thus could also be an important angle in the organization of the design on this site.

An obvious influence on this site (which has already been mentioned) is the existance of the newly widened four-lane highway. This feature is the entire eastern border of the site and offers the benefit of access to the site but poses the problem of dangerous traffic and the accompanying noise problem.

The other main man made force on the site is the newly created pond (used as a source of gravel when the highway was being constructed). It will be important for recreation both in summer and winter. The option is there for excavation in the pond to re-shape the shoreline if the cost is not too great.

Now we come to the natural forces acting on the design for this site. They include the following. First, sunshine is important to elderly folks, so it should be noted that there is an optimum angle to orient the buildings for the best solar radiation gain. Also, it is desirable to keep out some winds and use others. Thus the analysis shows what winds are desirable and what whinds are not.

In general the desirable winds are summer breezes and late afternoon winds in the Spring and Fall. The good winds, then, come from the west (where the undesirable sun comes from and the desirable views) and the bad winds come from the North. A more thorough breakdown of the directions of these winds is in the climatic analysis.

Another important consideration, especially for retired folks, is where the best views are. In general, the best views are of the Bitterroot Mountains to the west. In fact, most of the people moving into the Bitterroot Valley prefer living on the east side so they can have the best view of these mountains. Again, there is a contradiction here because the best views are on the west but the undesirable afternoon sun is also on the west. Thus good shading will be needed here.

One of the most important influences on the site is the river running through it. Needless to say, this is an important recreational element but it is also an important source of views for the elderly since their vision is usually shorter than younger people. This view could be more important than the view to the mountains (although still to the west). Also, the existence of tall trees growing along the river and beyond, cannot be overlooked. Right along the river bank are the Black Cottonwoods (*Populus Trichocarpa*) which grow up to 120 feet. They grow in moist soils such as along a river. As you get farther from the river and closer to the mountains, the Douglas Fir (*Pseudotsuga Menziesii*) dominates. In Montana, this tree gets as high as 130 feet, and it is used extensively for Christmas trees and lumber.¹⁵ The use of these two trees then, would be very appropriate in this project.

The river edge and the flood plane can have really important implications for the design. The layout of the community should respond to this force. Also, you can see in the aerial photographs the existence of traces of the former paths of the river. Perhaps it would be sensitive to respond to these paths, the most prominent of which is the geologic bench (with a 17 foot drop in elevation) on the east side of the site.

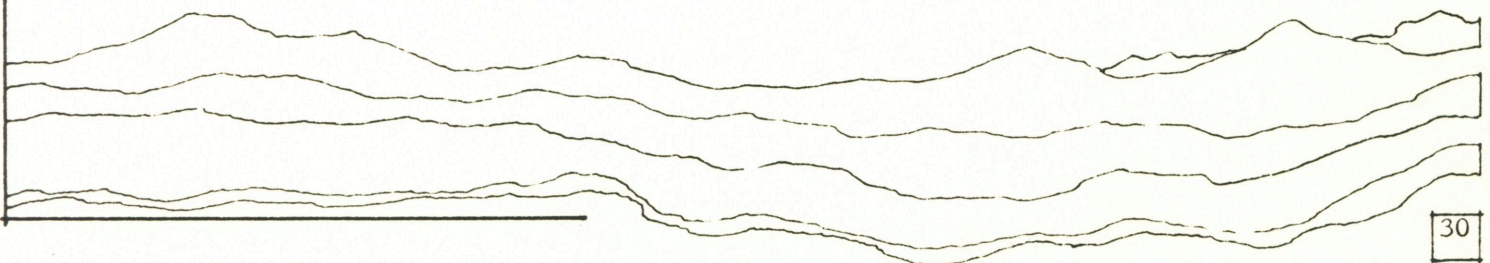
The final site force of importance would be the existance of the warm spring on the south east corner of the site. This could be used for recreational purposes (elderly people love hotsprings for recreation because of their medicinal qualities) which would be appropriate in the Bitterroot valley where hot spring recreation is a popular pastime. The spring could also be used for energy purposes, to heat buildings for example.

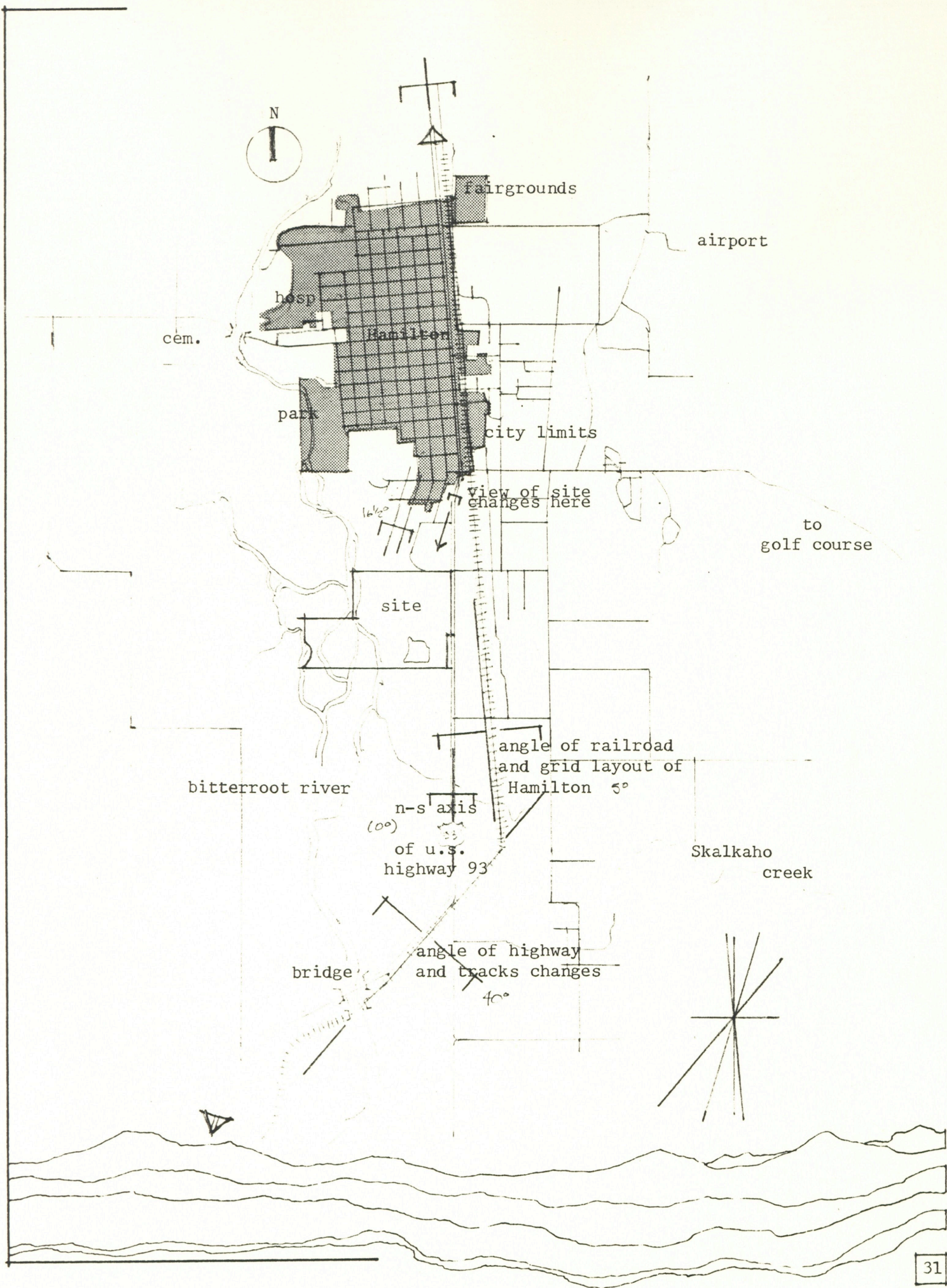


Black Cottonwood.



Douglas Fir.





angle of
streets in
south part of
the town.

16 1/2°

access

former paths of
river

geologic
bench

n-s axis of
highway (0°)

river
edge

existing real estate
office

existing slaughter
house

access

high
noise

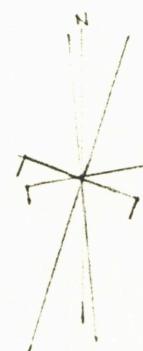
river
recreation

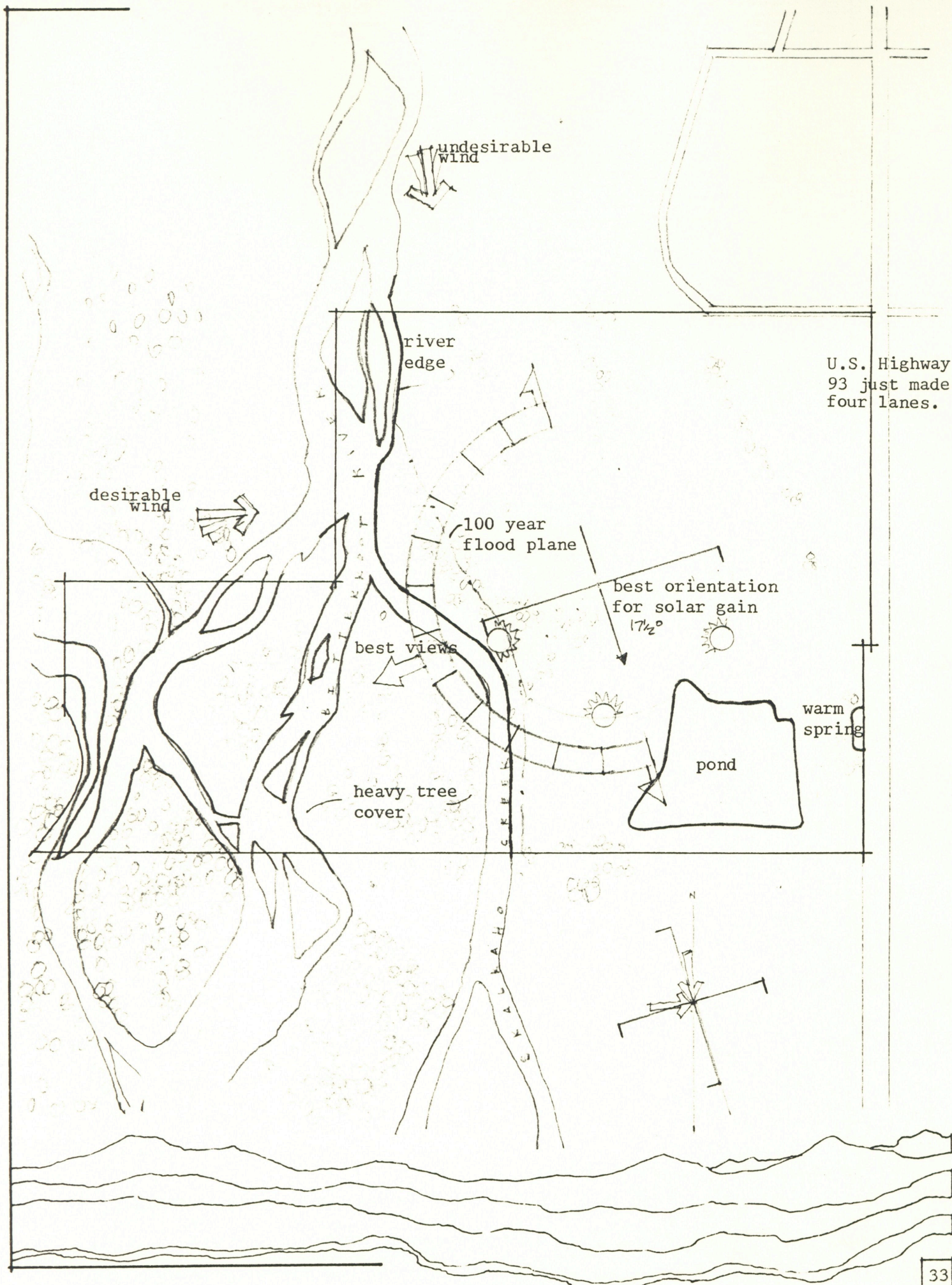
pond
recreation

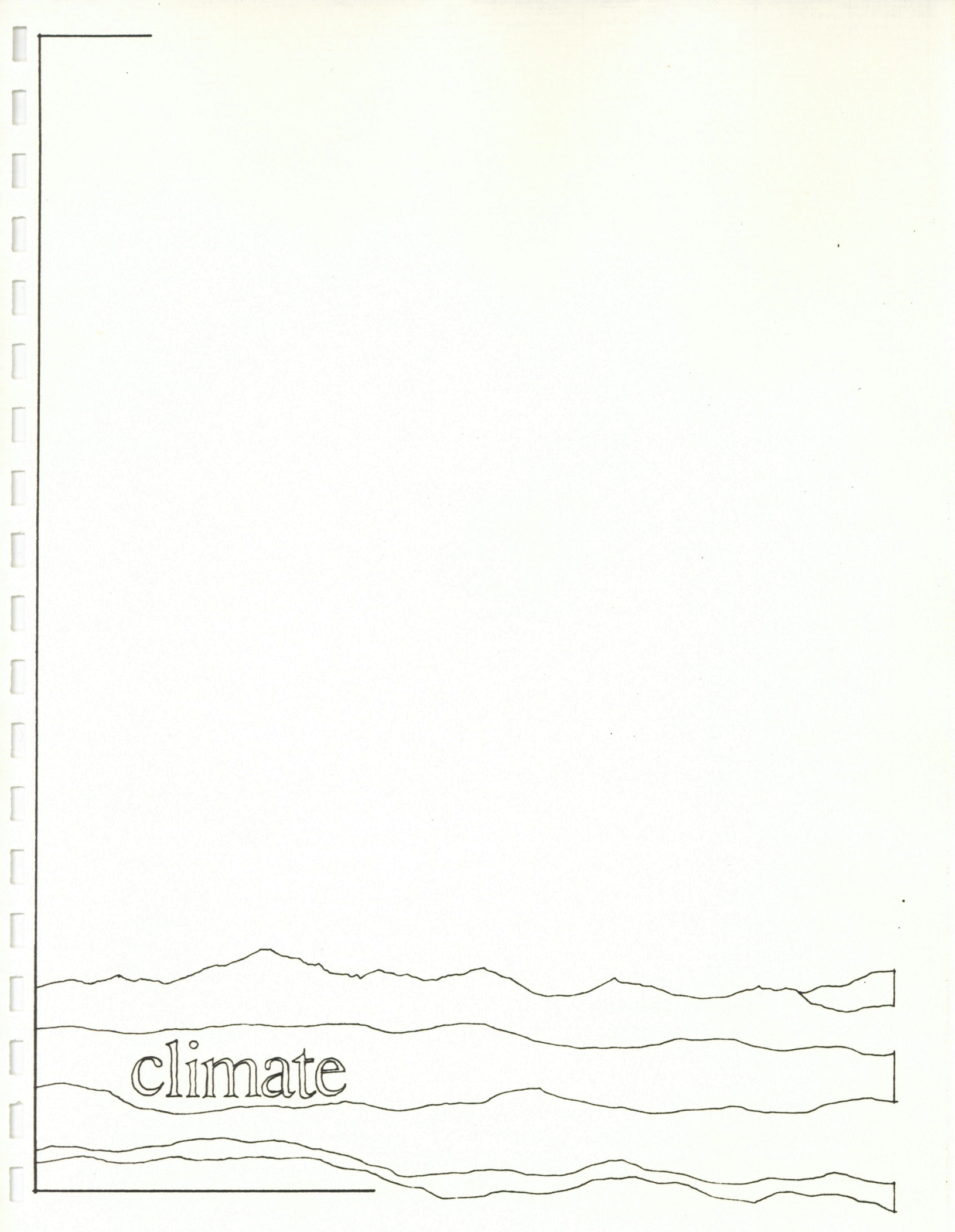
angle of
railroad

access

5°







climate

What is the purpose of doing a climatic analysis? If there is a thorough understanding of a practical application of climate data to the design, the building can be more efficient in terms of energy use. And, elderly people (on a fixed income generally) are not too excited about paying high energy bills, so the more efficient their house is, the more satisfied the elderly person is.

SUN¹⁶

The first four charts contain information needed to develop the fifth chart: the over-heated period (with the shading mask). This chart is based on the time table of climatic needs which is derived from the bio-climatic chart, which in turn is related directly to the temperature and relative humidity charts. (From these two charts, one can see that the temperatures in the Bitterroot Valley are very mild, thus giving Hamilton the distinction of being Montana's "Banana Belt". This is partly because of Hamilton's Pacific Northwest location, and sheltered nature, and also because of clear summer evening skies and cold air drainage from the mountains giving Hamilton comfortably dry & cool summer conditions. This is a major reason why this location is so desirable for elderly people.)

Once you have the over-heated period plotted over the sun chart, you can (with the use of the shading calculator superimposed over the over-heated period) calculate the angles from the center of the window that shading is needed. With this you can effectively calculate the size and format for any overhangs and shading devices on the house regardless of what direction the window faces.

Sunshine is important for the elderly (which, along with views, often times is the essential life needed for a person inside their house), so proper shade protection of windows is very important. Also, the optimum orientation for a house in this climate (for the best solar radiation gain) is an elongation $17\frac{1}{2}$ degrees east of south. Although this seems like an arbitrary angle, and although solar performance should not override other design considerations, it is an important notion to keep in mind, since we have seen the importance of sunshine for the elderly person.

Basically then, the house needs morning sun and not evening or late afternoon sun, and thus the south-eastward orientation. The sun also provides lighting, and with the sun charts, it is easy to see how much daylight there is and when sunrise and sunset are for a given day. (Note that sunset is earlier than in a place like Eastern Montana because of the close proximity of the Bitterroot Mountains, but daylight remains until well after the sun goes down.) This gives a good idea how much time there is for outdoor activity for a given day in Hamilton: an important consideration for the elderly.

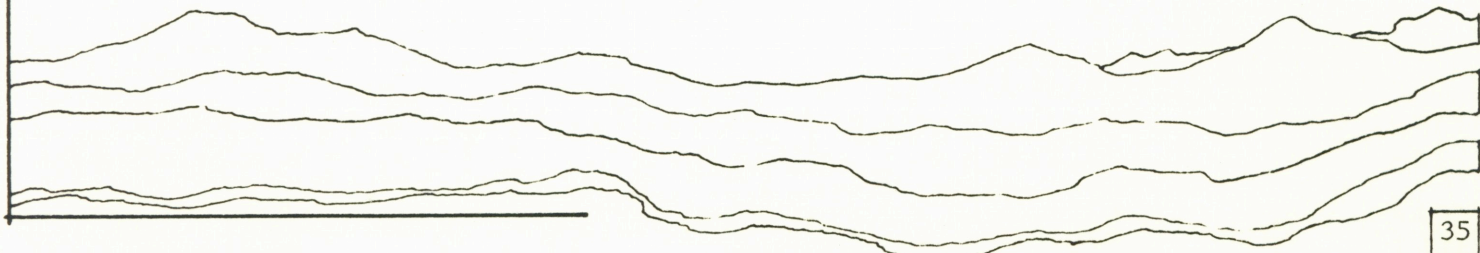
Finally, the clear versus cloudy day chart gives us a good idea what chance there is in a given month for outside activities, and how much an elderly person would likely be inside during a given period of time.

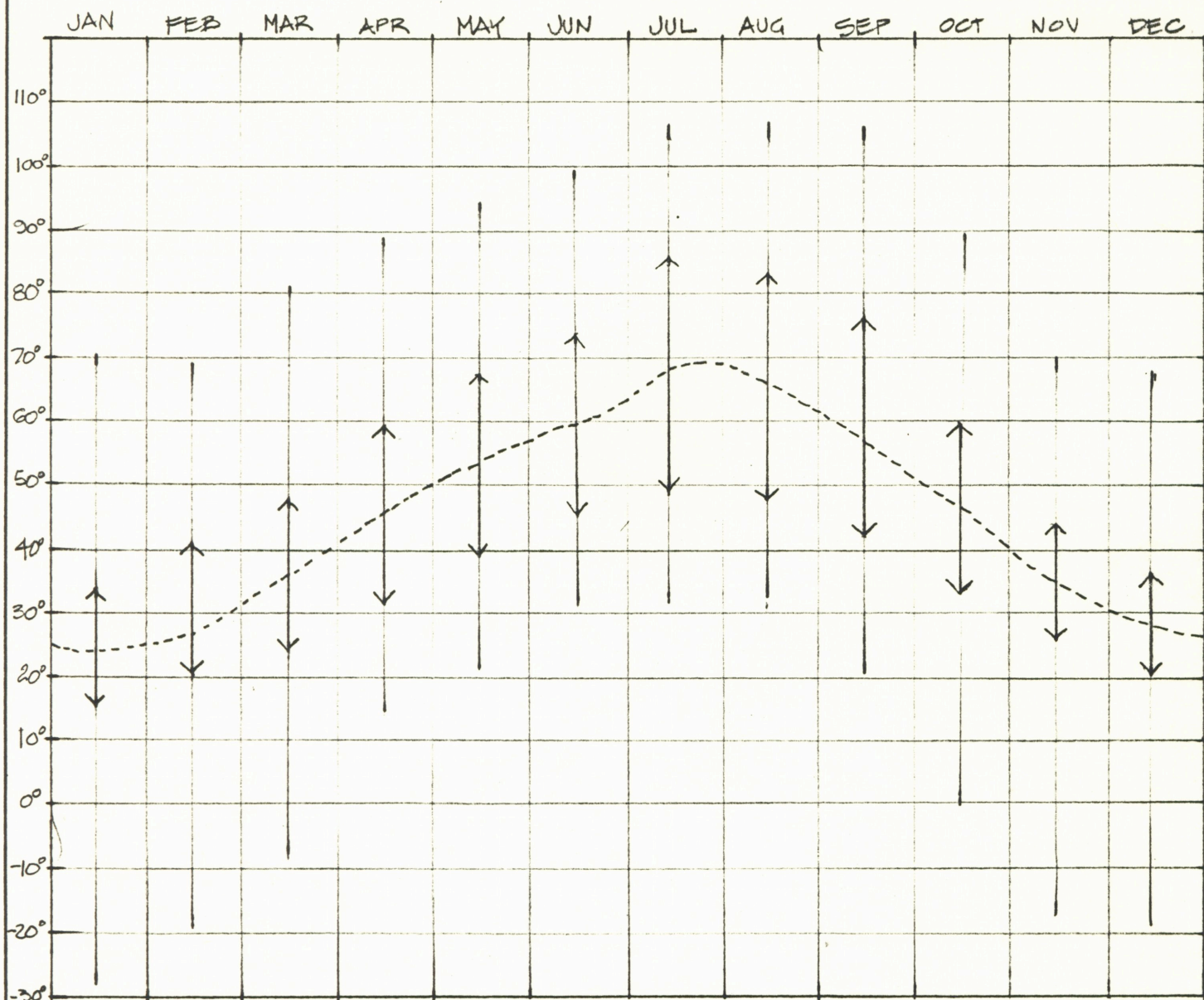
PRECIPITATION¹⁷

Hamilton is in the "rain shadow" of the Bitterroot Mountains, giving it a low average of 12.99" of precipitation annually. Most of this precipitation (as seen in the chart) is in the summer. This means that Hamilton generally doesn't have a lot of snow. This is good for the elderly because it means less hazzards from snow and ice will be on the ground in the winter. The dryness of the valley also implies a need for irrigation, especially for lawns and gardens.

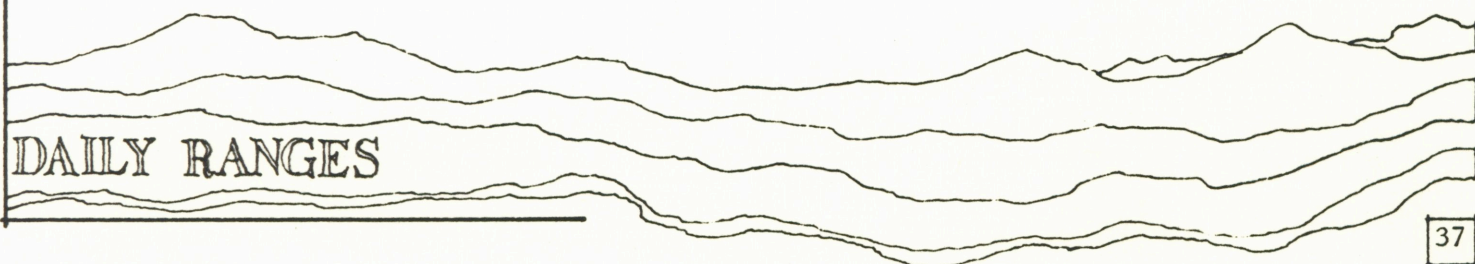
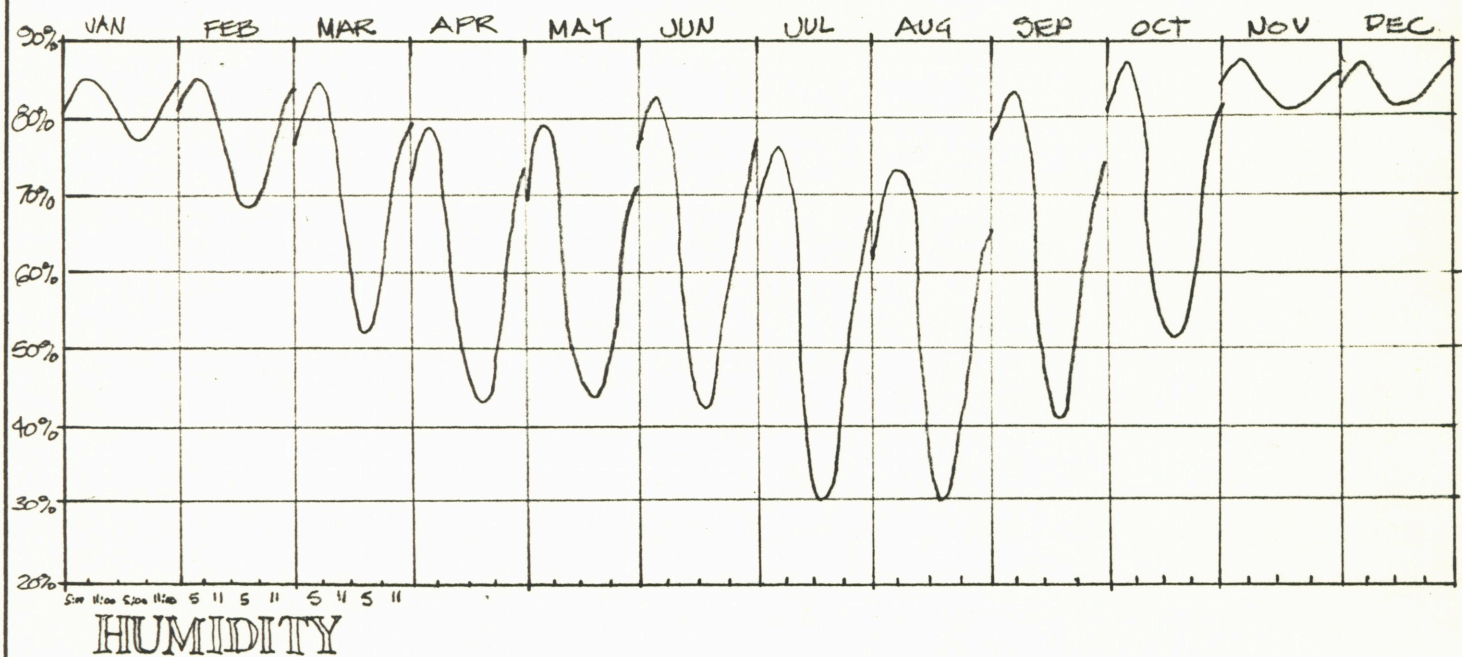
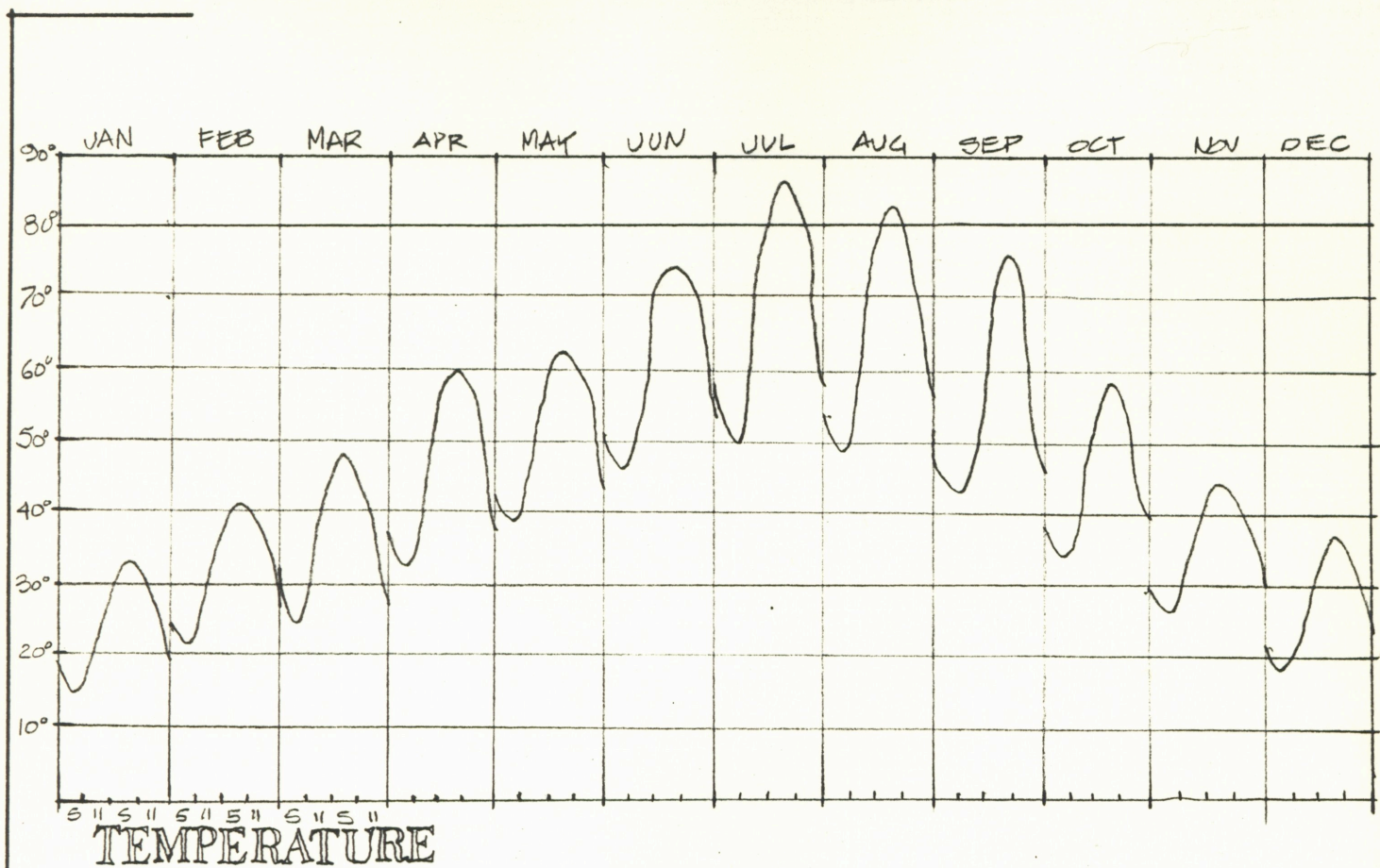
WIND¹⁸

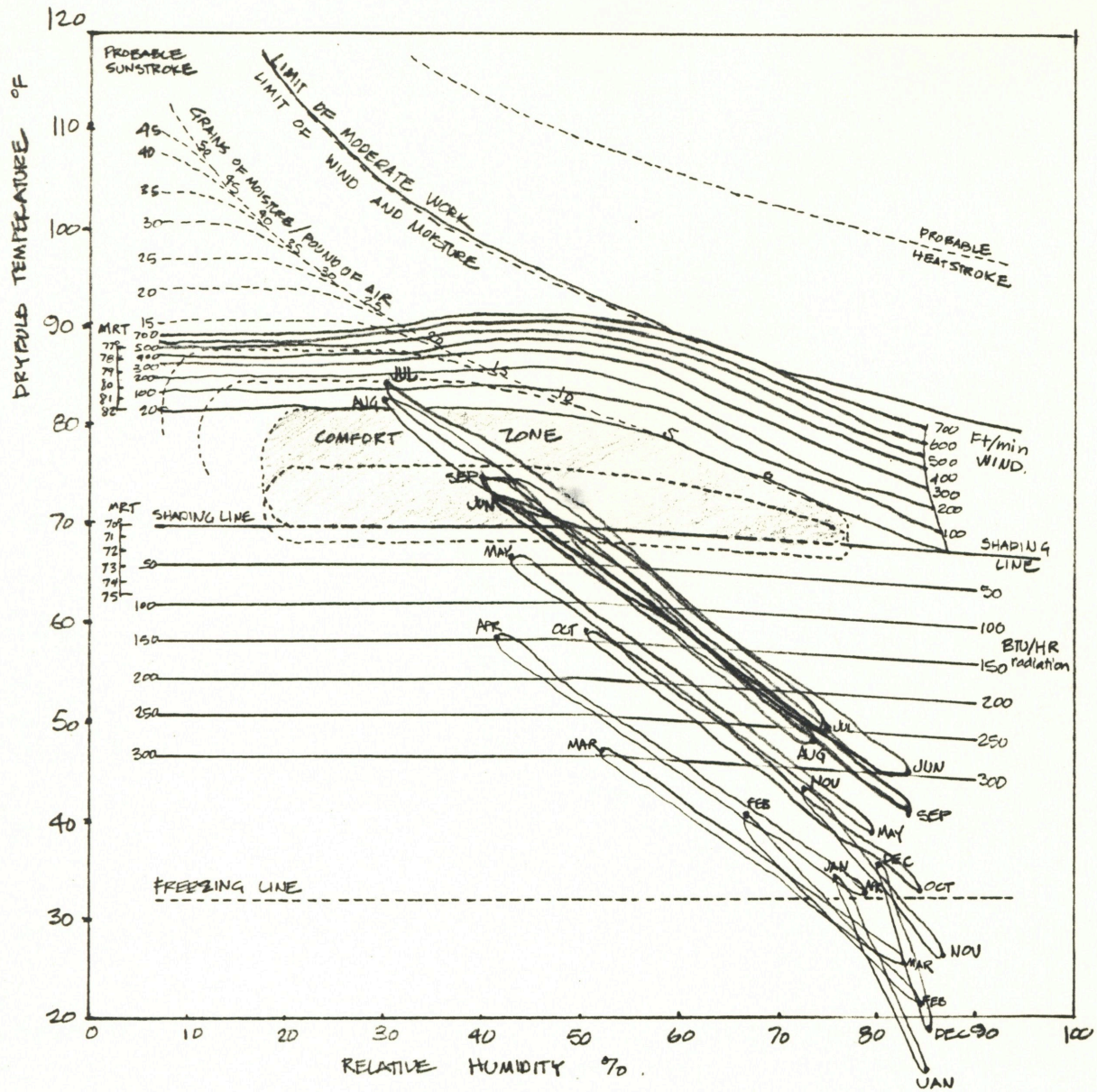
In general, the winds are mild in the Hamilton area because the prevailing "westerlies" are blocked by the north-south tending mountain ranges on either side. These mountains do, however, provide cooling breezes in the summer because of the cold air drainage that occurs in the evenings. Cool summer nights are also attributed to the effect of night time radiation into the clear summer skys. The cold arctic winter air that comes down from Canada in the winter, on the other hand, is blocked by the high mountains and thus the winter winds are less. The speed and direction of the winds in the Bitterroot valley can be seen in the final chart. In general the houses should be designed to keep out the winter winds and accept the summer breezes.



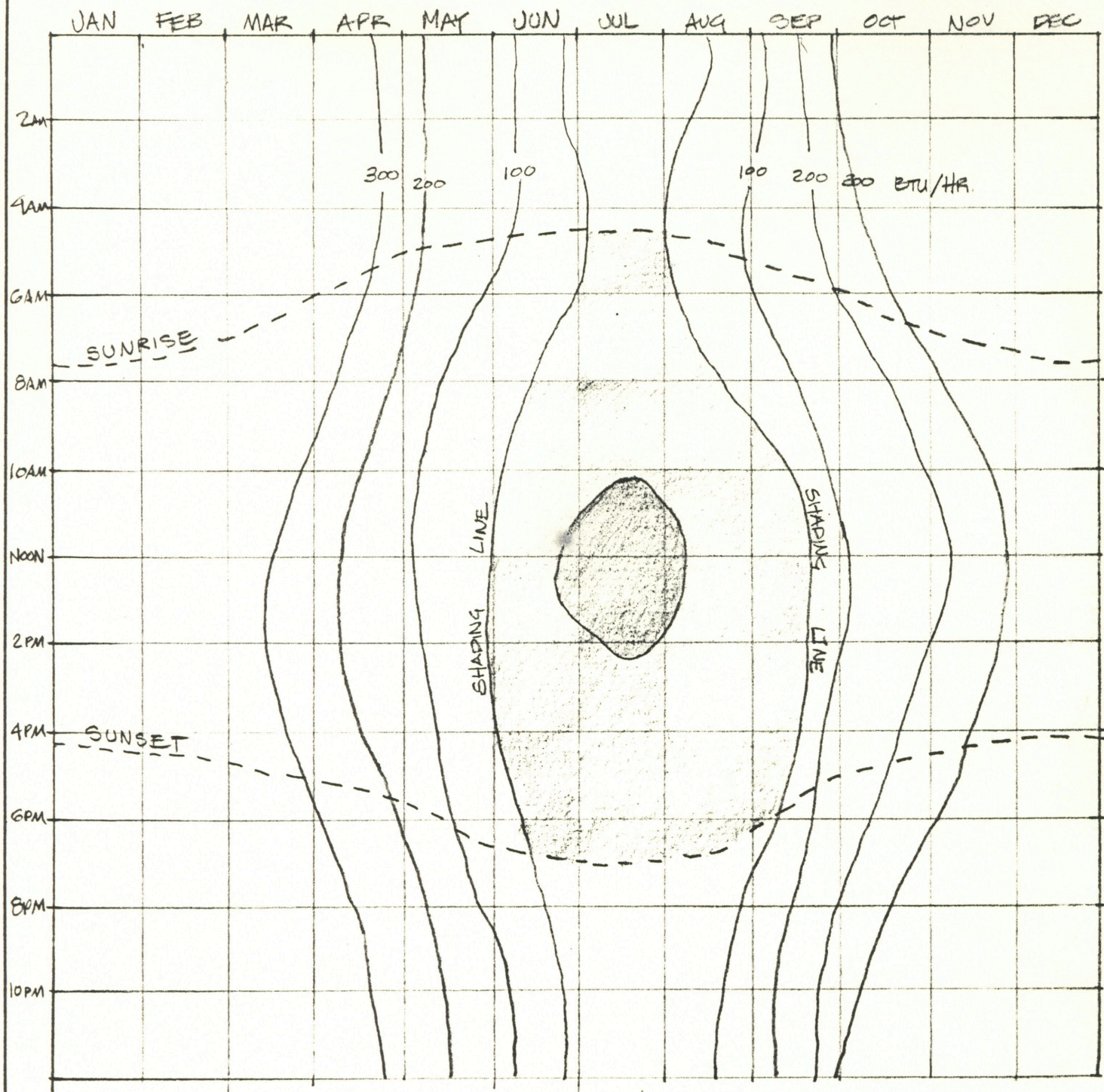


THERMAL ANALYSIS

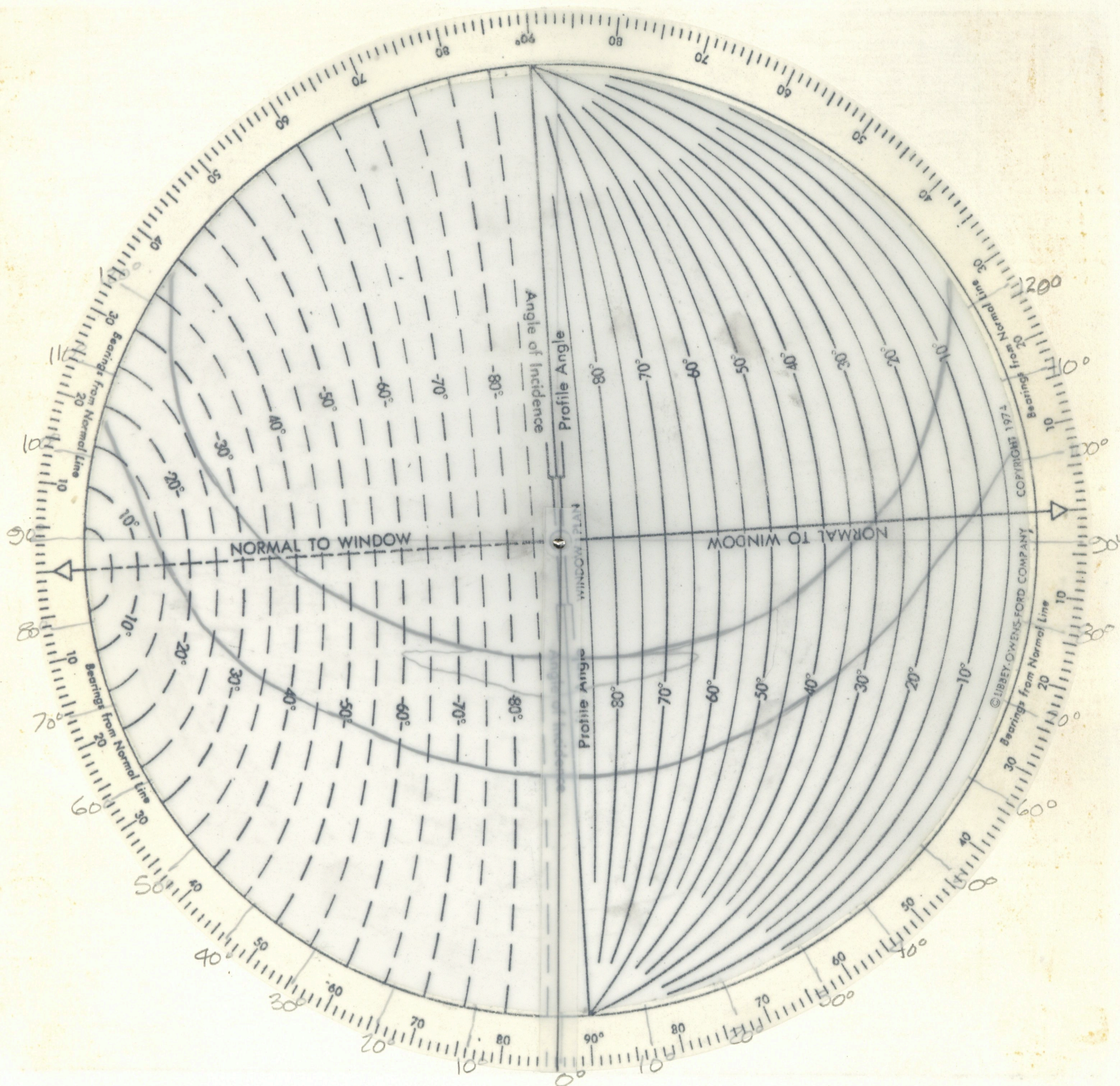




BIO-CLIMATIC CHART

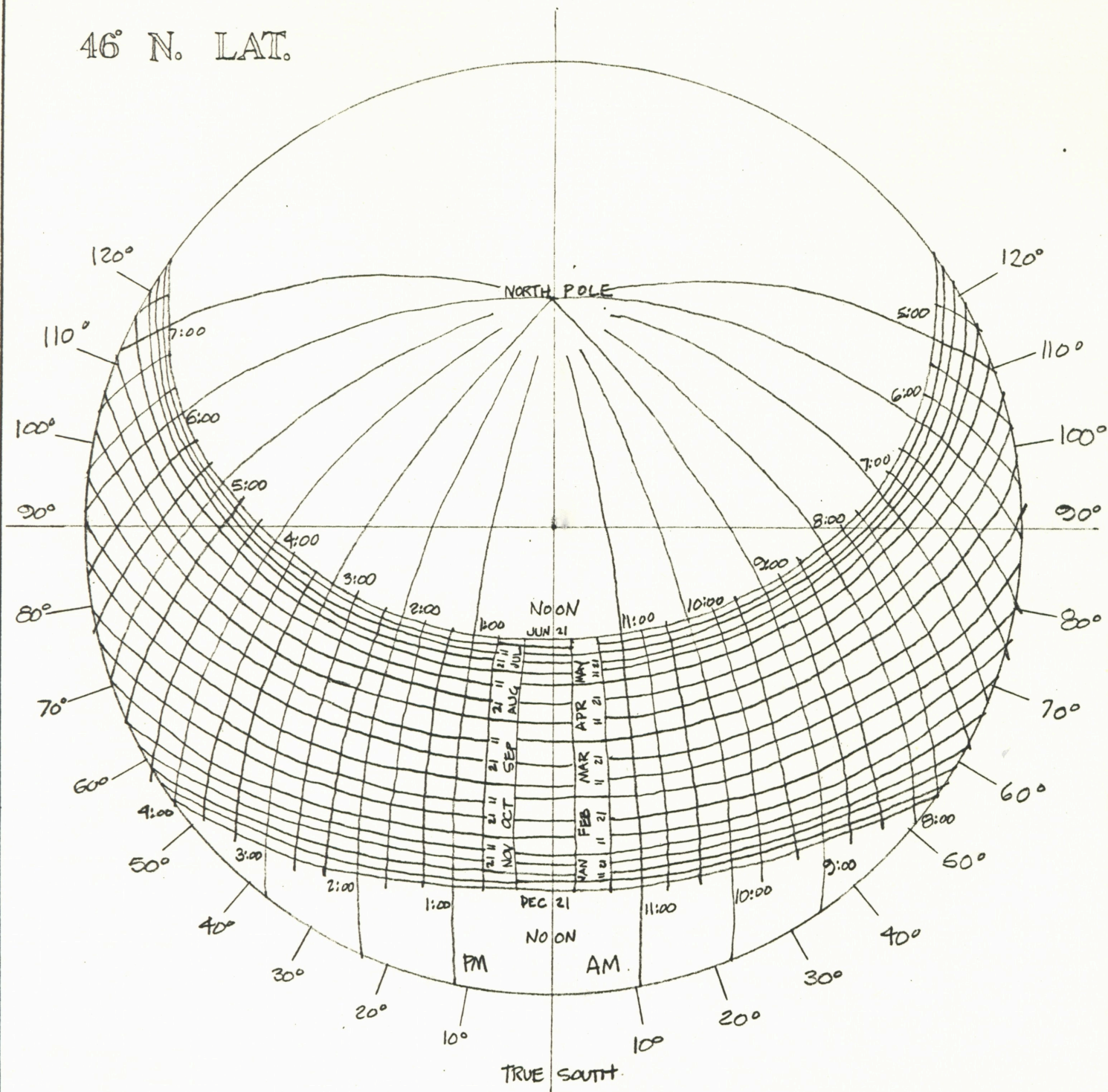


CLIMATIC NEEDS



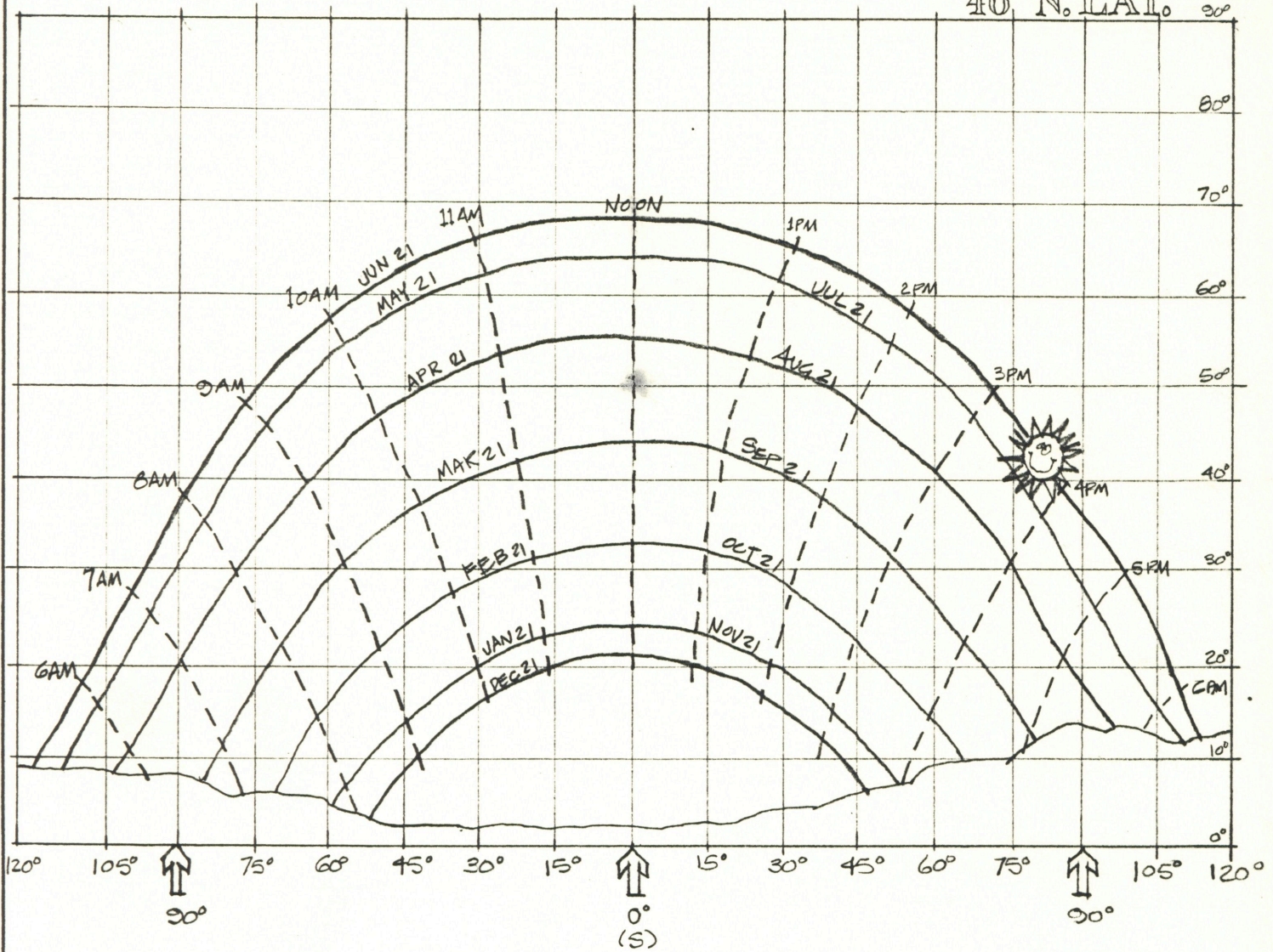
OVERHEATED PERIOD

46° N. LAT.

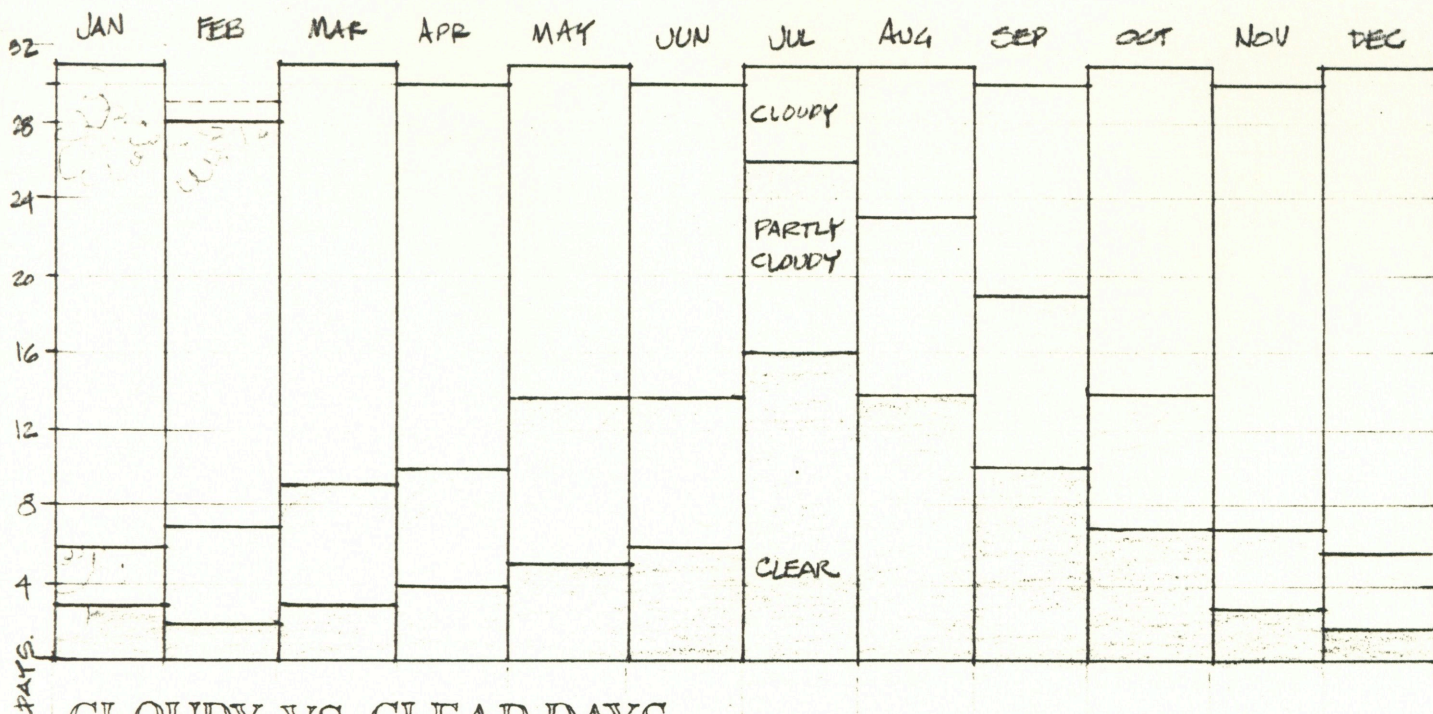


SUN CHART

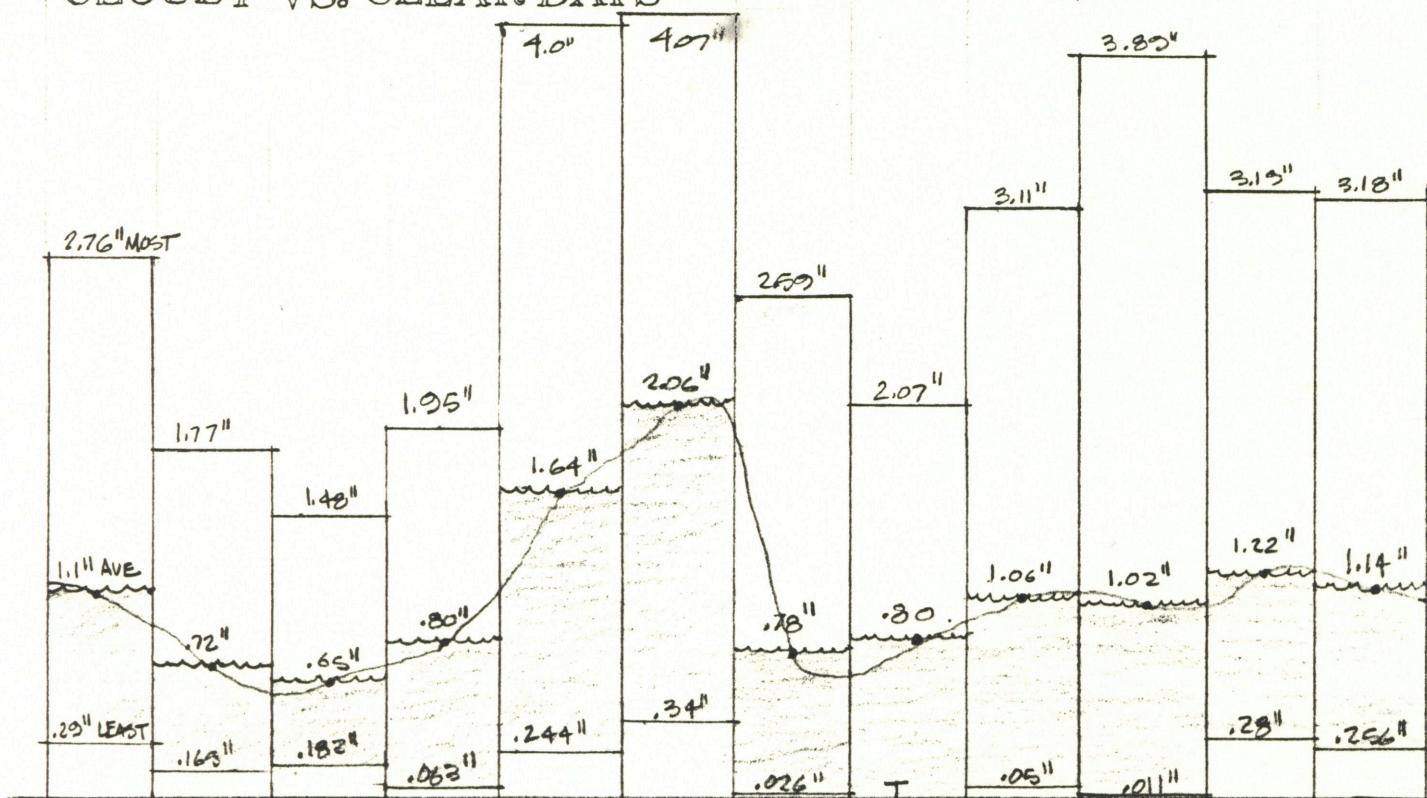
46° N. LAT.



SUN PATH DIAGRAM

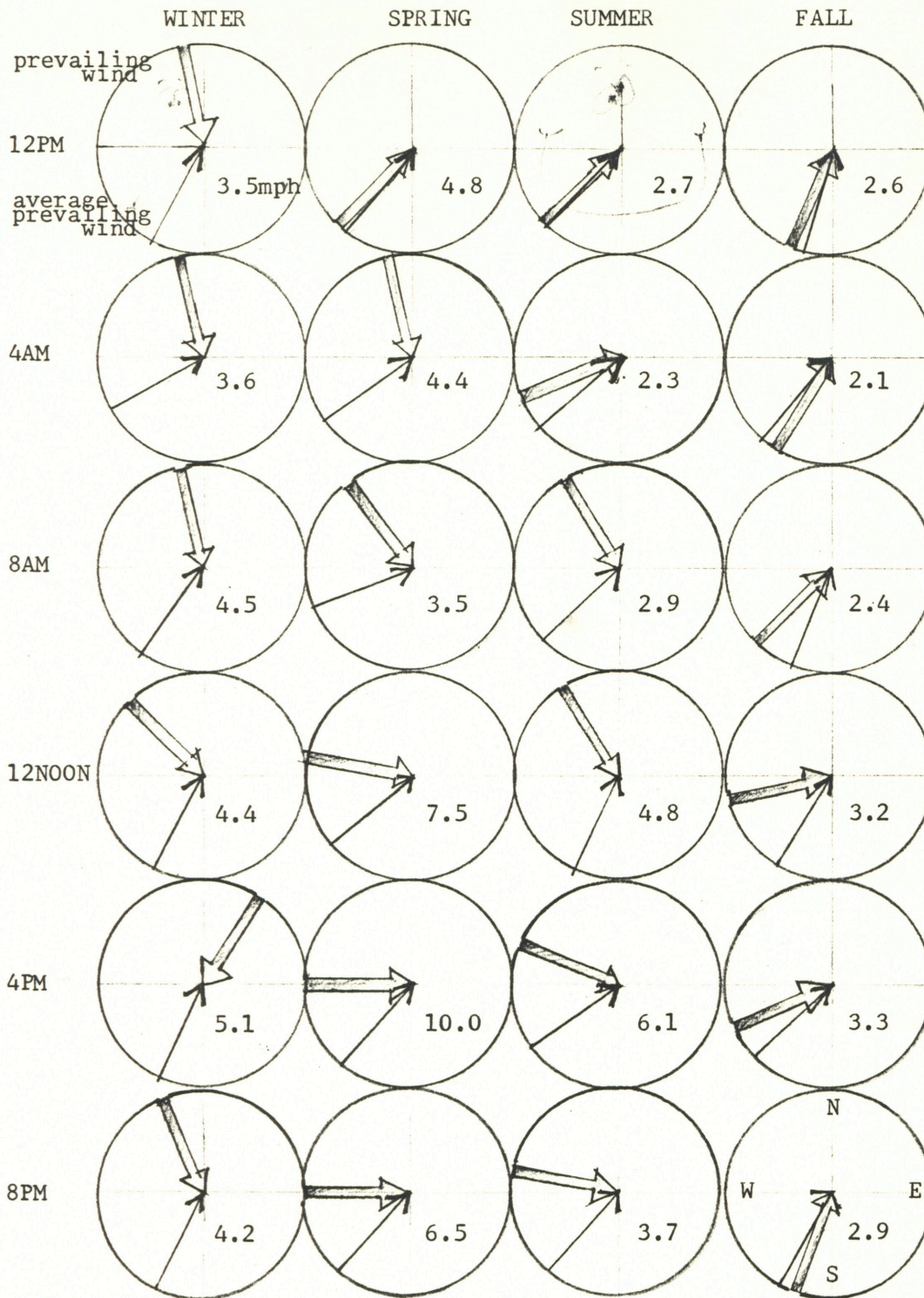


CLOUDY VS. CLEAR DAYS



PRECIPITATION (AVE. 12.99"/YR.)

SUNSHINE & PRECIP.



WIND DATA

elderly housing

The house is much more than just a shelter and a place to eat and sleep. The house is the place where the family lives: where the husband and wife start their life together, where they raise their children, and yes, where they grow old together. The house is a source of self-esteem and self-worth that becomes even more important as the owner grows older and retires and begins to spend more time in the home, and the focus of the daily life turns more to the home. And, housing for the elderly is a very specialized area of design because of the many special needs of the users. Following are some special considerations, and some design standards that will help design more effectively for this special group.

First of all, elderly people have expressed a desire for more than just housing for the handicapped. Not all retired people are handicapped, although the chances are that some elderly people will be, and the things that make life easier for the handicapped are not necessarily the things that make life easier for the elderly. So, handicapped should be considered, but they will not be the only people using the architecture.

In general then, the elderly have expressed a desire for small, affordable, single-family dwellings with low maintenance and low fuel bills that would be appropriate with people on a fixed income. The trailer house has been praised by the elderly for its efficient use of space, but they say there is usually not enough space. Elderly people tend to hang onto possessions longer than other people because of sentimental reasons, so there is a need for more space.¹⁹

Another consideration is that people want to have continuity in their lives. They don't want to be uprooted and moved if their needs change. Thus, there should be a community where a person can live in various levels of independence without having to move to a new location. This means that a person can keep the same relationships and the same location as they grow older and lose their mobility.²⁰

Also, the elderly want this sense of community (with the associated advantages of recreation and relationships) yet they want to live independently as long as possible. And they want the community while retaining their privacy and their ability to have personal possessions. And, they desire to have visitors often (such as family members and friends) so it would be good to plan for accommodations for visitors if they do come.

Elderly folks shy away from institutional buildings and desire a "homey atmosphere" (with earth tones, textures, colors, greenery, and the like) and a neighborhood atmosphere or cluster type arrangement where there are buildings together in clusters around outside green spaces, while still retaining a country living atmosphere (as opposed to city living).

As a person becomes older, and less mobile, their focus tends to be more on the inside of the house and not the outside (although in the warmer months, outdoor activity like gardening and yard work becomes important), thus the design should take great care on the interior spaces.

Another consideration is the loss of senses as a person grows older. Thus, the designer should reinforce the senses in the architecture as much as possible. It would be advantageous, then, to heighten the sense of passage of time (the seasons, day to night, etc.), the effects of lighting (elderly folks need up to twice as much light as younger people), the orientation of the building (entry, circulation), the sense of smell and touch (trees, breezes, textures of walls and ground surfaces), and the sense of sound (avoiding negative sounds such as traffic and other disturbing noises, and reinforcing such things as running water, rain, rustling trees and the like).

One final consideration for an elderly housing community is the need for flexibility, adaptability, expansability, and in general, growth and change. This goes along with the desire of the elderly to remain where they are even if their needs change, and allows for the aging of the society and increased population in the housing community.²¹

So then, these are some of the general considerations for designing elderly housing. Now we move to some more specific design criterion for the elderly and some specific requirements in designing for handicapped people.²²

PARKING

Covered carports and garages are nice because, in general, the elderly take great pride in and care of their autos, and garages are the best way to store cars. Also, they can be used for other purposes if the owner doesn't have a car (like a shop or storage area). If possible, access to the garage should be covered, protecting the elderly person from the hazards of snow and ice that they encounter when walking outside.

The code requires at least one parking place for handicapped for any public building not more than 100 feet from the entry. This space should be 12 feet wide allowing for access out of the car and onto the sidewalk.

SIDEWALKS

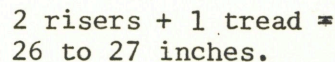
Access to the sidewalk should be possible for the handicapped through breaks in the curb with ramps of a slope no greater than 17 percent, and a maximum drop-off of $\frac{1}{2}$ ". The walks themselves should be four feet wide if one wheelchair will be using them, and five or six feet wide if two wheelchairs will be passing each other. The walks, of course, should not be located under downspouts or gutters.

Also, if possible, the organization of the community should be planned so the elderly folks won't have to dash across busy streets. It would be best if vehicular and pedestrian access could be separated.

LEVEL CHANGE

As we go from the sidewalk to the building entry, the best way to handle access is to keep the entry on the same level as the walk, but if that is not possible (because of terrain or desire for more than one level in the house) ramps can be used. In general, stairs should be avoided, but if they are used, they should only be short runs.

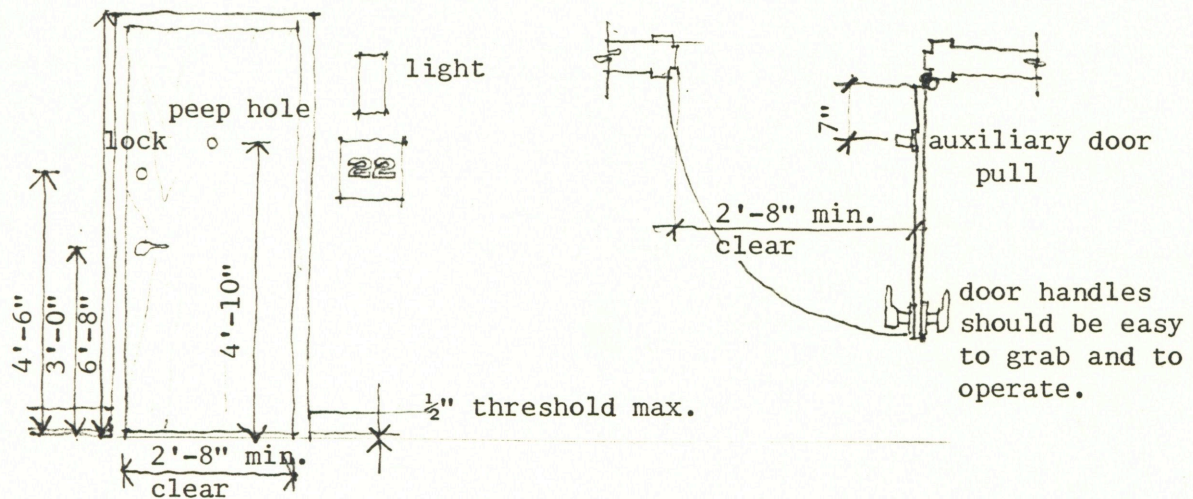
6" high
12" wide
curb



48

ENTRY

The entry of the building is very important. It should give a sense of identity to the building, and give easy access to the elderly by adhering to certain standards. With double doors, there should be 6'-0" clear width with 7'-0" length in a vestibule. A single door should be 2'-8" minimum clear with a 5'-0" square on either side of the entry. Following are some standard dimensions for entry doors.

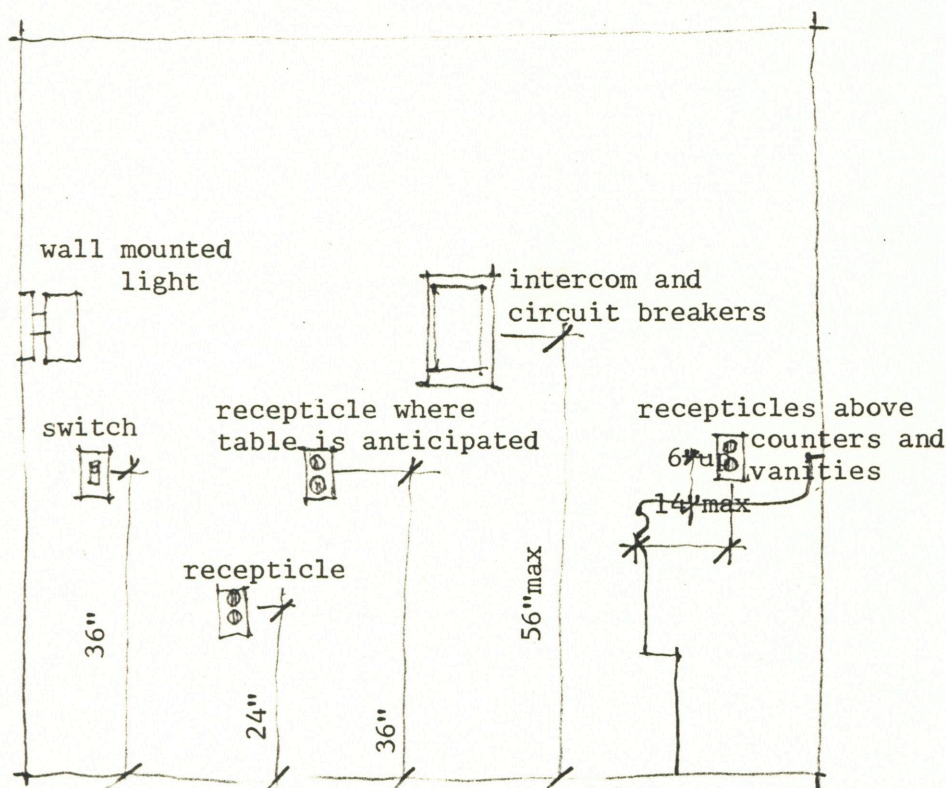


LIVING AREA

As we move inside the building, we see some further considerations for designing housing for the elderly. Corridors should be wide and well lit (5'-0" minimum) with handrails that return to the wall where ended, and doors opening in and not out into the corridor. In the living area, there is a need for lots of nooks and crannies (shelves, window sills, etc.) so that all the things collected over the years will have a place. There should be a clear passage through the living area, and it should be well lit with no obstructions or slight level changes on the floor, to avoid dangerous stumbles. Furniture should be light and easily moved or built in for ease of cleaning. The furniture should be comfortable (Grandpa's chair may easily be the most important spot in the house) with no sharp edges or corners to inflict injury.

Views to the outdoors and sunshine are essential for the living area. Thus, windows are of utmost importance and should not be high up out of reach for fire escape, views, and cleaning. In general, windows should be low (although skylights and clerestory windows are good to bring in light). Window overhangs can shade if anything, less than design criteria because an elderly person can tolerate a warm situation easier than a too cold situation.

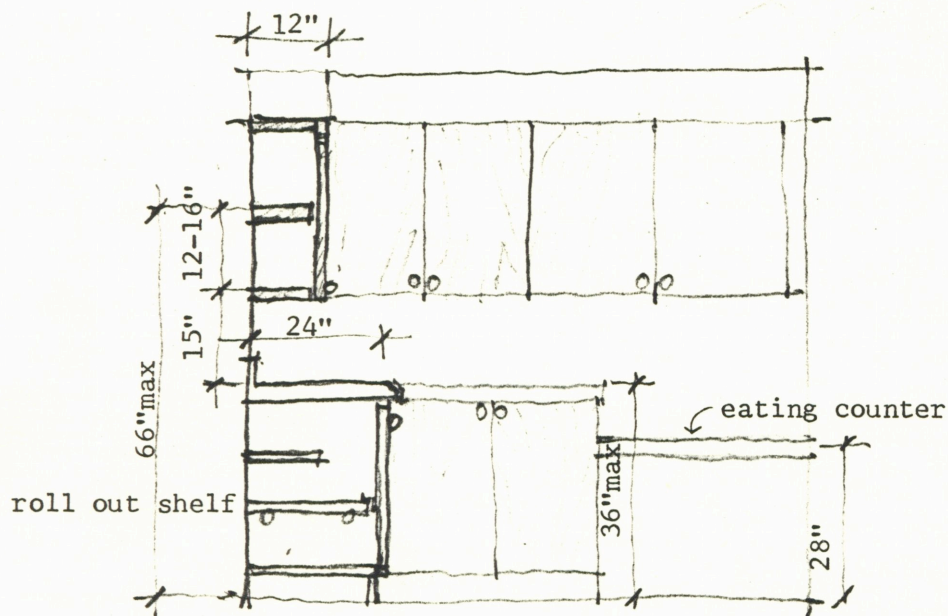
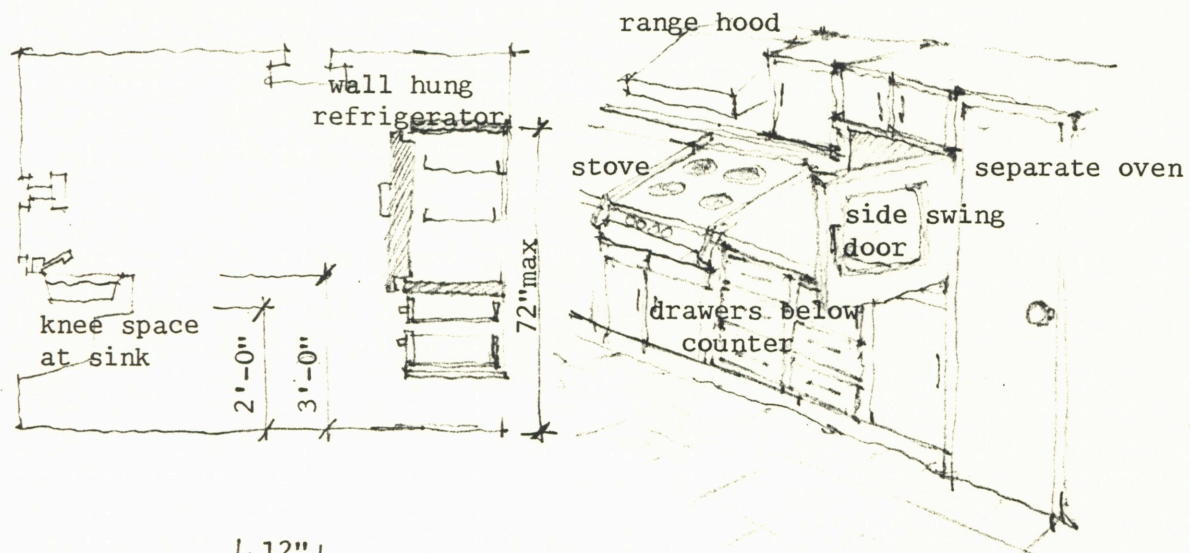
All controls (light switches, plug-ins, etc.) should be within easy reach for an elderly person. Following are some standards for the location of various controls.



Another important consideration is having adequate space for storage (remember these are the people who hang on to things) and for mechanical equipment (remember also there will be no basements). Storage spaces should not be high and hard to get at with the danger of falling objects and the possibilities of dangerous falls while climbing up high. The maximum height should not be more than 72".

KITCHEN

In the kitchen, storage should not be high either, but it should also not be too low causing lots of bending and lifting. If there is a space to put something, an elderly person will probably use it even if it is dangerous to reach (like above the stove). In general, there should be lots of cupboard space and storage space. Also, there should be adequate methods for disposing of trash (a compressor or a can near the kitchen door).



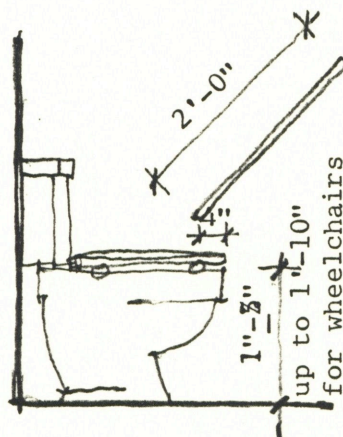
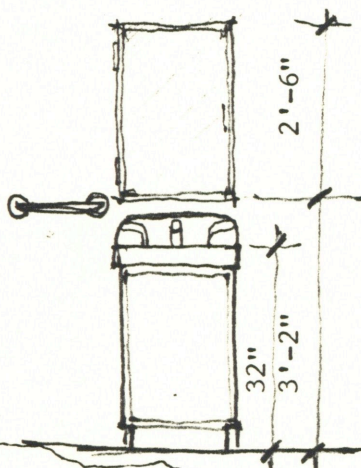
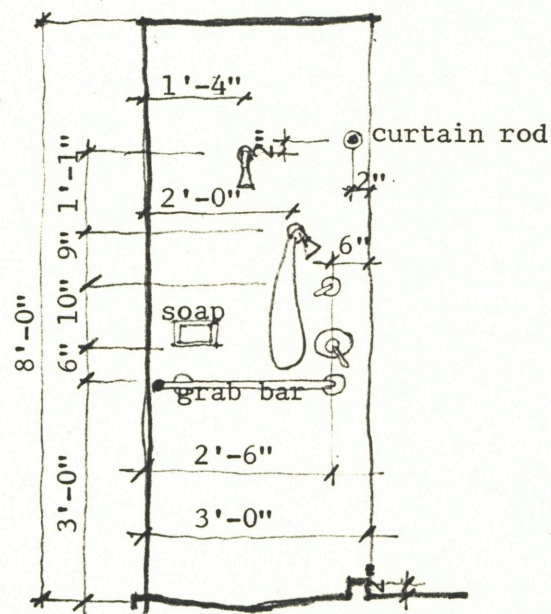
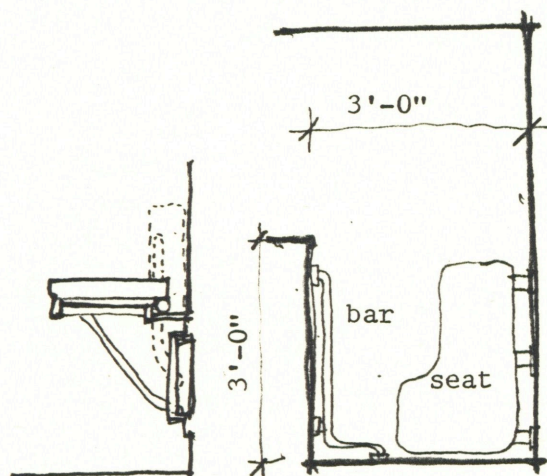
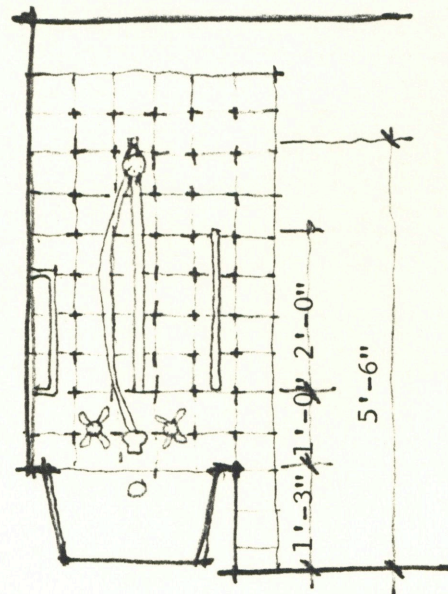
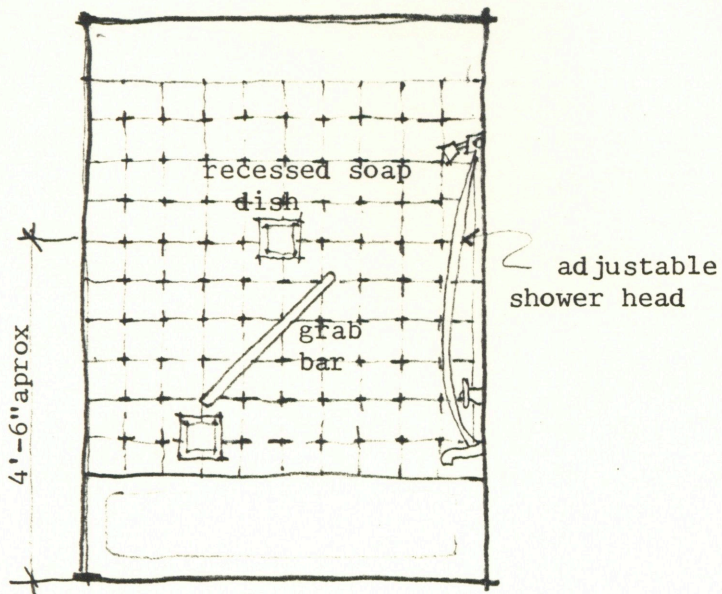
Somewhere along the counter (especially at the sink) there should be a place to sit down while working at the counter (high enough clearance for a wheel chair). Tables should be high enough for a wheel chair to fit under. Appliances should be electric (not gas) and again should be within easy reach. It is best to have a separate stove top and wall mounted oven with side-swinging door. A wall hung refrigerator is recommended because of easy reach. Although this allows for less room in the refrigerator, elderly generally eat less and consequently don't need as much space in the fridge.

BEDROOM

The bedroom should be a place where a person can withdraw and be alone if they want, and it should be a comfortable place that is conducive to sleep. The bedroom would be best on an eastern part of the house to bring in morning light, because elderly people usually like to wake early to the morning sunshine. A phone should be handy in the bedroom to avoid getting up for a call, and access to the bathroom should be very easy.

BATHROOM

The bathroom is one of the most important rooms to design for because this is the place where most dangerous accidents occur. First, the door should swing out so in case of an accident it can be opened from the outside. Also, this gives more room in the bathroom. Second, the bathroom shouldn't have hard-to-clean corners and crevices, yet there should be lots of room for adequate storage of medicens and hygienic items. A tub is desired by the elderly (especially women) because they are a generation that grew up with tubs, but a shower is generally safer. A tub or shower should have adequate safety grab bars, non-slip surfaces, and a seat to sit on (portable or fold-up). If a tub is used, a shower head should also be available. The bathroom should have no hooks or hangers at eye level that could cause injury (as well as in the rest of the home). And the toilet should be higher (for those bathrooms being used by handicapped) with grab bars, the sink and shower faucet controls should be easy to grab withour sharp edges, and the mirror should be at a level easily seen by an older person.



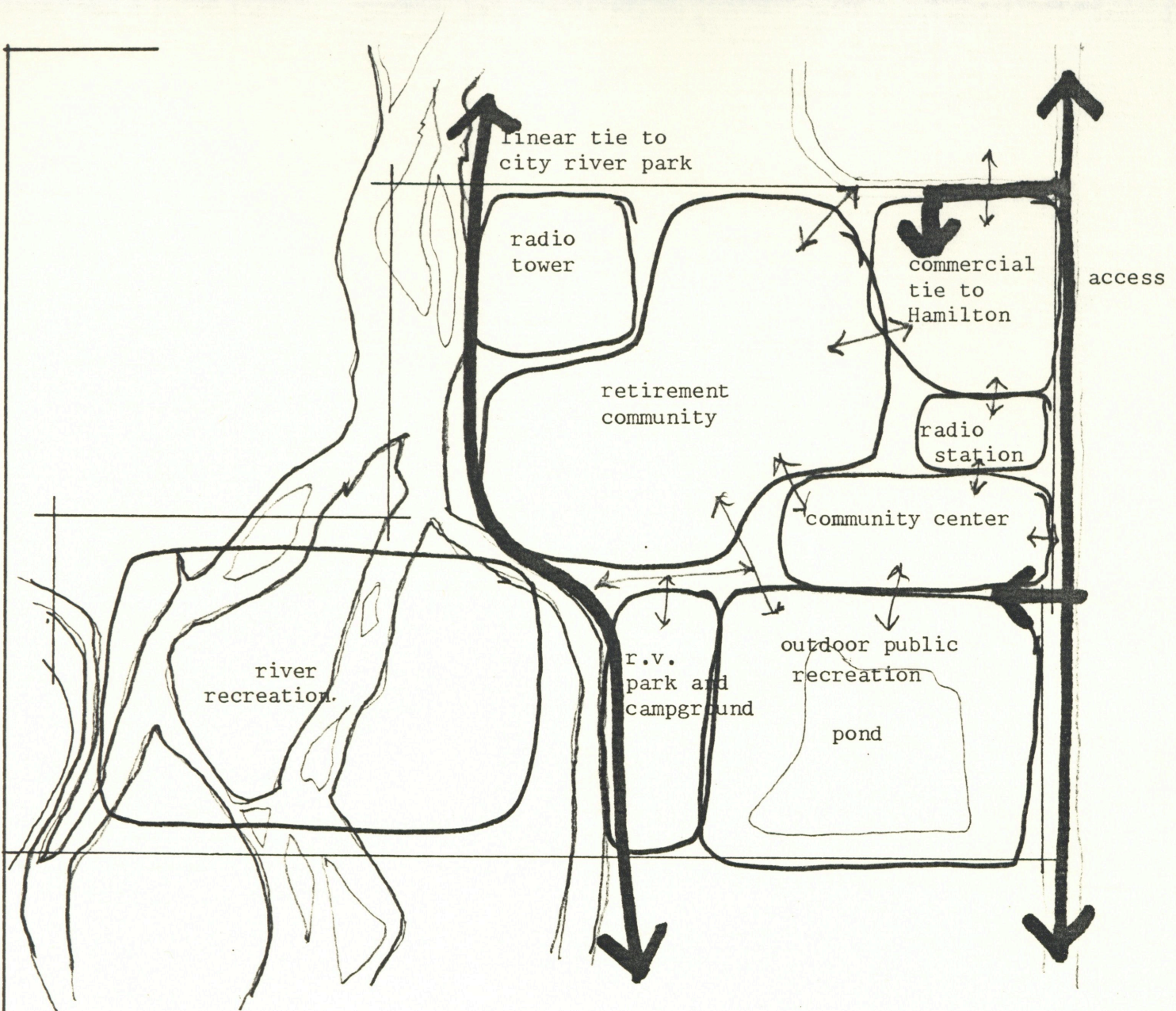
OUTSIDE SPACES

The final major area of design consideration is the design of the outside spaces. Exterior landscaping is an essential element in making the building a part of the site. The front porch can give the building a strong identity, but probably won't be used too much unless it is at least semi-private and has access to views and sunshine.

Patios and balconies are good ways to bring interior and exterior space together, providing safe access for the elderly to the outside. In general, the exterior spaces should be divided up into "mine and yours" but should still allow the opportunities for some conversation with friends and neighbors (clotheslines, hedge trimming, washing the car, gardening, yard work and the like can all be activities to bring people together outside as well as games and outdoor recreation). Outdoor activities are important to the elderly to give them things to do and things they can be responsible for. There should be adequate park areas for recreation (picnics, horseshoes, frisbee, etc.) and there should be good walking and biking paths, all allowing for maximum enjoyment of nice weather and maximum opportunities for exercise.

Well, these are some of the major special considerations for housing the elderly, and I hope the design will reflect these ideas in an effective way. The elderly are obviously the most important part of this design and their needs must be accounted for.

master plan

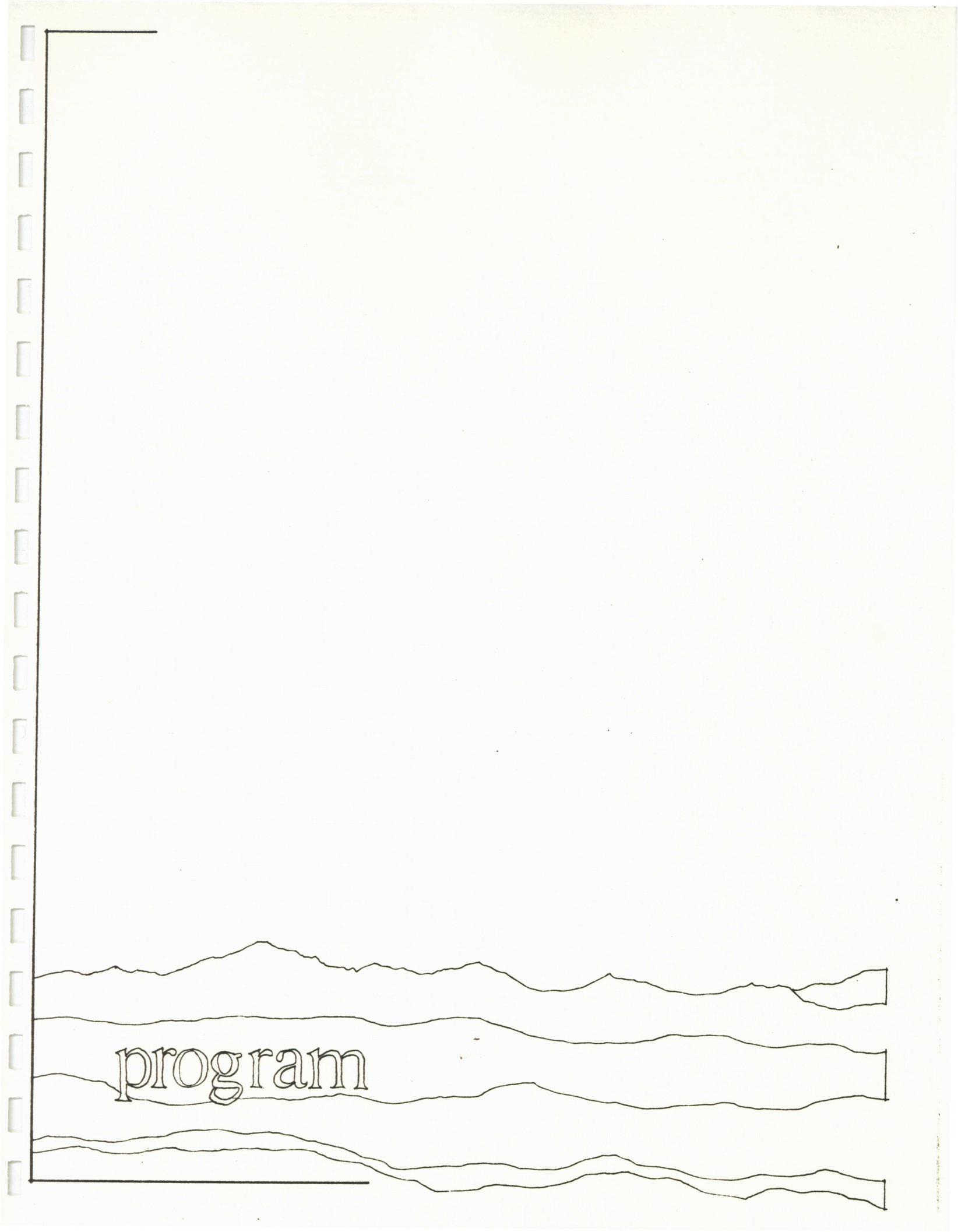


The original motivation for designing a retirement community for Hamilton came from a proposal by the owner of the radio station in Hamilton to put a new station in the A-frame house that existed on the site. When I found out that the owner of the building also owned the entire area around it, I saw the potential for a much more extensive project than just an adaptive re-use of an existing building.

The above master plan was developed to show the full potential of the site. The radio station would be the bridge between the commercial and public service activities, so to the north, there would be a small shopping center with offices, drug store, hardware store, grocery store, and the like. (This type of center was actually proposed.)

And, to the south would be a community center with a museum, library, theatre, health club, and similar activities. All of these facilities would be for the retirement community to use, but would also be used by the rest of the valley. This proposal was, needless to say, quite extensive, and probably too much for the town of Hamilton to need or even support, plus, it would be too large of a project to do for a thesis project.

For the purposes of the thesis, I decided to concentrate on the retirement community. The rest of the master plan could be done as the need arises. Basically, the outdoor activity areas would be the same, and the proposed radio tower would be dropped. The master planning of the retirement community itself will be included in the final design.



program

The size of the program for this elderly housing community should reflect the need present in the Bitterroot Valley and the density that the site will comfortably support while still leaving plenty of green space in between buildings. And, developments of this type are generally hard to justify economically if they are less than 100 units. And, if they are over 300 units, there is a tendency that the elderly become isolated from the rest of the community.

The population of Ravalli County increased 56 percent from 1970 to 1980 growing from 14,400 to 22,500 in ten years. And growth hasn't stopped; some businesses are planning for a 30 percent increase from 1980-1990. Of this population, not counting the seasonal residents that live in 346 seasonally occupied dwellings, 5,186 are over 55 years old. And the trend is that most of the new arrivals will be retired people, so we can almost count on a 25 percent increase in elderly population for the period between 1980 and 1990, or more than a doubling of the current number of elderly people in the county.

Right now, there are 183 people living in homes for the aged in the valley, probably mostly in the two nursing homes (one in Hamilton and the other in Stevensville). With these nursing homes, there is probably not a need for another full-fledged nursing home. In all, there are 333 people 65 and over with transportation disabilities. Of these, probably about 150 are not living in special homes for the elderly. Thus, there is a need for housing for (let us say for estimation purposes) one third of these or 50.

There are 1,761 rented dwellings (probably the majority of the retired folks are renters), and among these, 1,083 are apartments. And, there are 1,361 trailers (again probably owned by the elderly). This means that about half the elderly folks live in houses that they own. Again for estimating purposes, let us say that the renters and trailer owners will remain where they are and that 5 percent of the house owners will be interested in selling their house and getting a more affordable dwelling. This means a need for 80 new dwellings.

This means a need for 130 units needed in the valley and gives us a good rough number to base the building program on. This number is also good when looking at the density on the site, and the number falls within the parameters of 100 to 300 units. Future expansion will be important in light of the increasing elderly population, but in programming this community, with a wide range of ages (from 55 years and up), the biggest issue to remember is the importance of continuity of the person's living situation. Thus, within the community, there will be a layering of various levels of independence: from totally independent, to congregate or group home living, to finally an intermediate care facility (with a nurse on duty 8 hours a day). Along with this housing, there will be the necessary support facilities. All the housing will be designed with the elderly in mind, and the congregate living areas will be specially designed for handicapped people as well.

Here then, is the spatial program for this retirement community. The room sizes are rough and may vary during the design phase.

I. INDEPENDENT LIVING

A. Houses (unattached or duplex)

1. 20-2 bedroom units	SF
master bedroom	180
bedroom (studio)	120
living area	200
kitchen/dining	230
1½ bathrooms	160
laundry/storage	80
mechanical/circulation	150
	<u>1120</u> total
2. 25-1 bedroom units	
bedroom	150
living area	100
bathroom	120
kitchen/dining	230
storage (laundry)	60
circ./mech.	100
	<u>760</u> total

3. 1 garage per unit for parking.

B. Apartments (3 or more attached)

1. 15-2 bedroom units	SF
master bedroom	150
bedroom (studio)	100
living area	200
kitchen/dining	220
bathroom	120
storage	60
circ./mech.	130
	<u>980</u> total

2. 20-1 bedroom units	
bedroom	140
living area	180
kitchen/dining	220
bathroom	120
storage	60
mech./circ.	110
	<u>830</u> total

3. 1 parking space under a carport per unit

C. Common Facilities

1. Fitness Facility	800
2. Library	300
3. Lounge	300
4. Meeting room	300
5. Shop	800
6. Storage	500
7. Laundry	700
8. Mech./Circ.	500
	<u>4200</u> total

II. CONGREGATE LIVING

A. Apartments

1. 20-1 bedroom units	
bedroom	150
kitchenette	100
living area	50
bathroom	120
storage	50
	<u>470</u> total

B. Intermediate medical care facility (nurse on duty 8 hrs./day)

1. 15-permanent units

bedroom	150
kitchenette	100
bathroom	100
storage	50
	<u>400</u> total

2. 15-short term units

bedroom	150
bathroom	100
storage	50
	<u>300</u>

3. Support Facilities

lounge	500
medical facility	
reception	100
examination	300
therapy	300
nurse station	600
linen/utility	500
	<u>2300</u> total

C. Support Facilities for Congregate Living

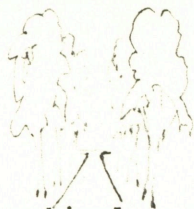
1. Administration	600
2. Dining Room	1000
3. Kitchen	900
4. Lounges	500
5. Meeting room	500
6. Laundry	500
7. Maintenance/Housekeeping	300
8. Fitness Center	750
9. Storage	500
10. Library	300
11. Shop	700
12. Apartments for overnight guests	
3 @ 150	750
13. Mech. and Circ.	4400
	<u>7300</u> total

concepts

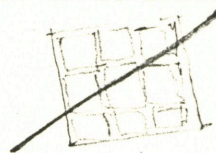
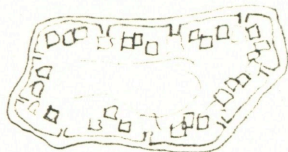
Following are some verbal and graphic images that have developed based on the research done on the project. These are all ideas or concepts that have strong potential to become integral parts of the thesis design.

ORGANIZATION

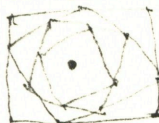
- * Strong sense of entry...gives a strong identity to place
example: cottonwood lined streets.



- * Separate vehicular and pedestrian access. Although the grid is pure in its orientation and easy to find your way around in, and although it is a historically standard way to organize homes, it doesn't respond to this site too sensitively and it creates the problem of having to cross streets to get somewhere.



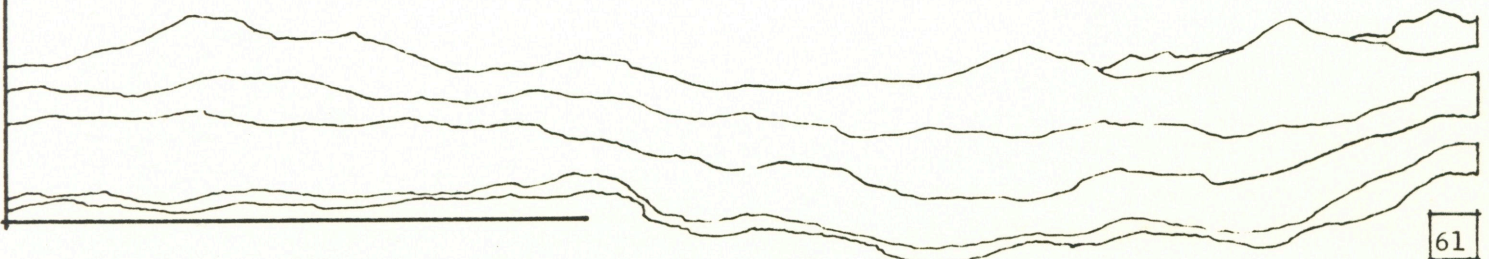
- * Central park area (as well as lots of park space around the outside as well) would give a strong sense of identity for the area.



- * Cluster arrangement with lots of green space in between giving a neighborhood identity.



- * Respond to the river's edge and the organic nature of the site. Higher density of buildings as you get closer to the highway. Taller elements as you get closer to the river with its tall trees. Independent living closer to the river, dependent living closer to the areas of activity as they like to watch things like cars.
- * Respond to winds (by using buildings like garages to block undesirable winds), sunshine (shading when needed and orienting the building for the best sun), and views (have windows and outdoor activity areas where they have the best views).



OUTSIDE SPACES

As much of the original site left as possible (green spaces).

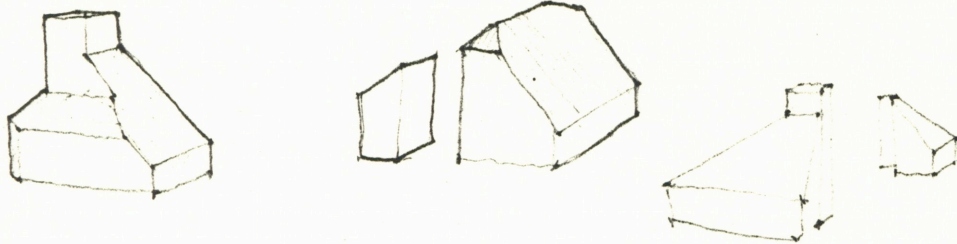
Horse pastures nearby.

Gardens and fruit trees, and the use of cottonwoods and doug fir.

Use of water (pond, river, creeks running through the site).

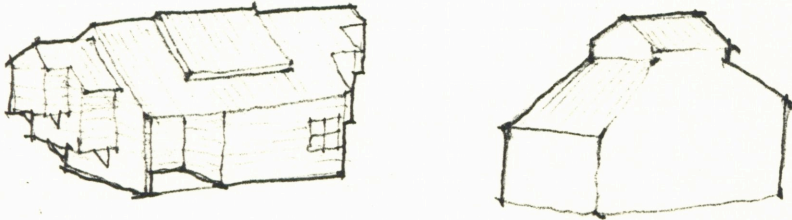
FORMS

Buildings are "parts" of other buildings in a subtractive process creating a tension between forms and thus giving a cohesion to the project.



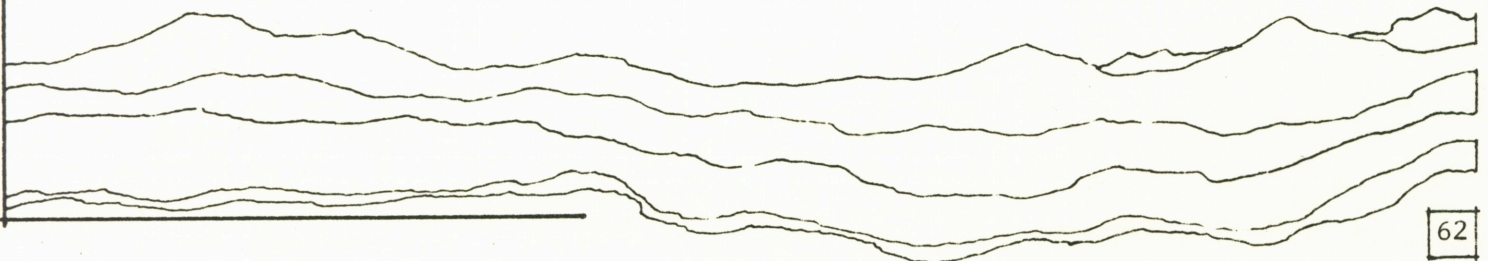
Diversity of forms (and plans) giving a lot of different choices.

Combination of simple forms in an additive process.



MATERIALS

The use of common materials, especially corrugated metal and logs.
Also the use of copper as a beautiful enhancement.



footnotes

¹John Alwin, Western Montana: A Portrait of the Land and Its People (Helena, Montana: Montana Magazine Inc., 1983): Montana map from back cover.

²Official Montana Map (Helena, Montana: Department of Commerce, 1983).

³Photographs of the Bitterroot Valley are taken from Alwin, the pamphlet on Bitterroot Valley History (Chamber of Commerce), and from various issues of Montana Magazine (Montana Magazine Inc.).

⁴Dale A. Burk, "The Bitterroot Valley: Montana's Oldest Settled Area Hasn't Settled Down," Montana Magazine 11 (March-April, 1982): 9.

⁵Alwin. Except where noted otherwise, the history of the valley, with photographs, is reprinted with the author's permission.

⁶Burk, p. 10.

⁷Ibid., p. 12.

⁸Ibid., p. 14.

⁹Ibid., p. 15.

¹⁰William Allin Storrer, The Architecture of Frank Lloyd Wright: A Complete Catalog 2nd ed (Cambridge, Massachusetts: The MIT Press, 1978): 144-145.

¹¹Burk, p. 12.

¹²Advertisements for log homes taken from various issues of Montana Magazine.

¹³It should be noted that Daly was one of the Copper Kings, which would be a possible hint justifying the use of copper as a material, as this is a beautiful material that has been used by some designers in the valley.

¹⁴Photograph is the view from the north, courtesy of Bernie's Studio, Hamilton, Montana (now out of business).

¹⁵Trees from Trees and Shrubs for Montana (Bozeman, Montana: Cooperative Extension Service, 1977.)

¹⁶Victor Olgyay, Design With Climate (Princeton, New Jersey: Princeton University Press, 1963). Charts are modified for the Hamilton area. The last chart is from Edward Mazria, The Passive Solar Energy Book (Emmaus, Pa.: Rodale Press, 1979): 279. This is also modified for Hamilton.

¹⁷ Precipitation as well as the other climatic data (humidity, temperature, clear/cloudy days) is data for Hamilton from Climates of the States 11 (Detroit, Michigan: Gale Research Company, 1978): 578-606, and U.S. Weather Bureau, Climatological Data: Montana (Ascville, N.C.: NOAA): various volumes.

¹⁸ Harold Robbins, Missoula Valley Dispersion Study (Helena, Montana: Air Quality Bureau, 1980). Wind data is for the north end of the Bitterroot Valley.

¹⁹ "The Age for the Aging," Progressive Architecture (August, 1981): 59.

²⁰ MSHDA, Housing the Elderly (Lansing, Michigan: MSHDA, 1974)

²¹ Chris Bergum, A Model Facility for the Elderly (Bozeman, Montana: Montana State University, 1982): various pages.

²² The design standards are all taken from a number of sources. Many of the standards are repeated in these sources several times. Sources include Bergum, Butler, Hessler, Housing the Elderly, MSHDA, consult bibliography for more complete source information.

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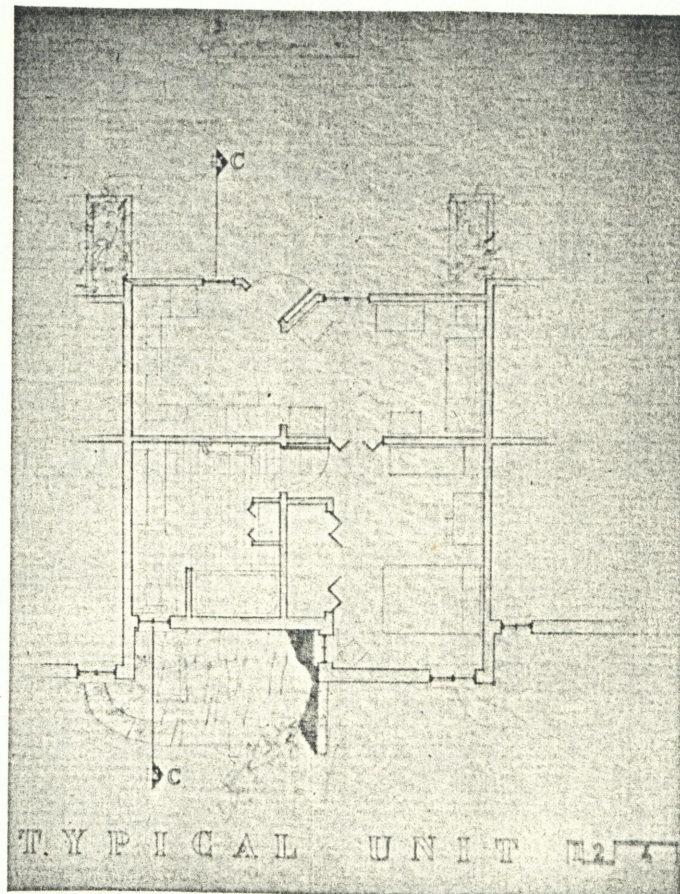
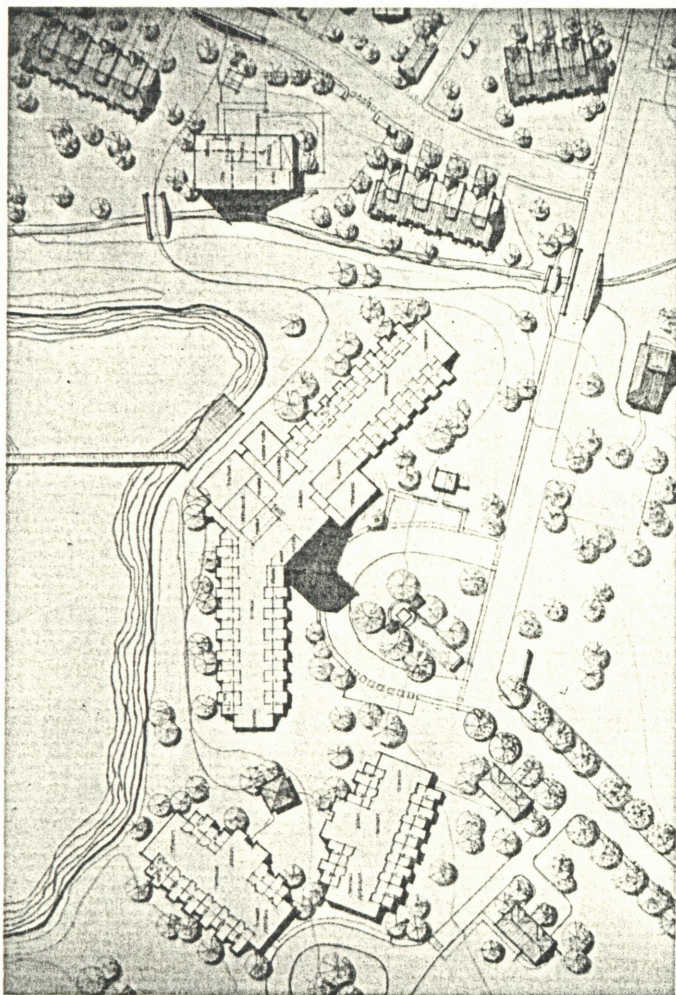
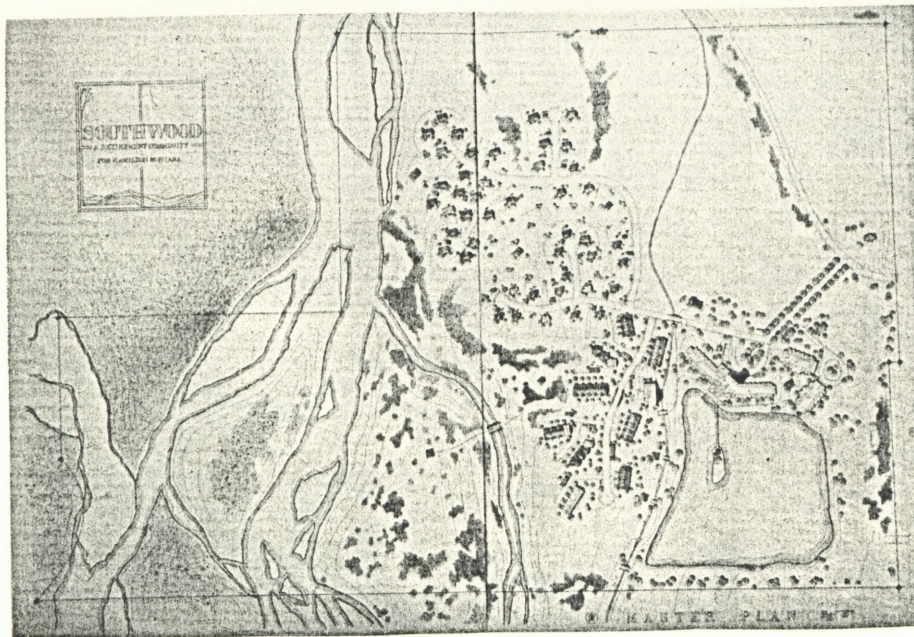
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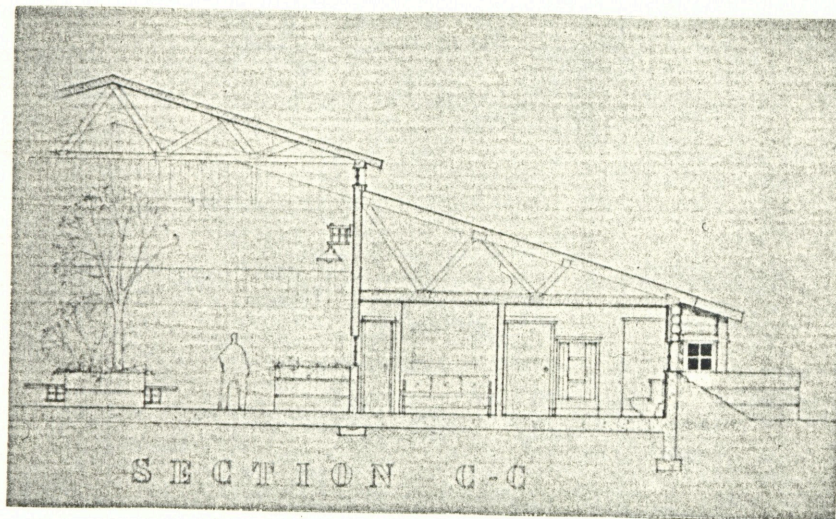
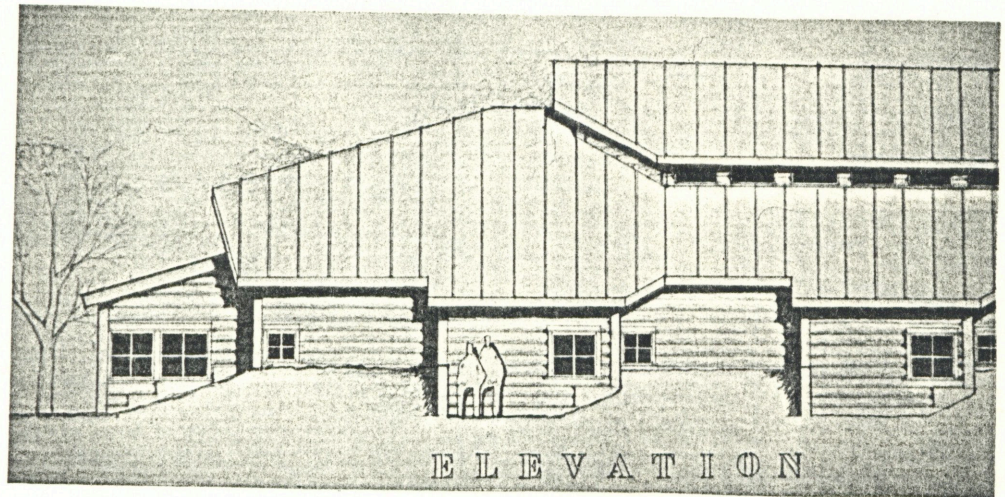
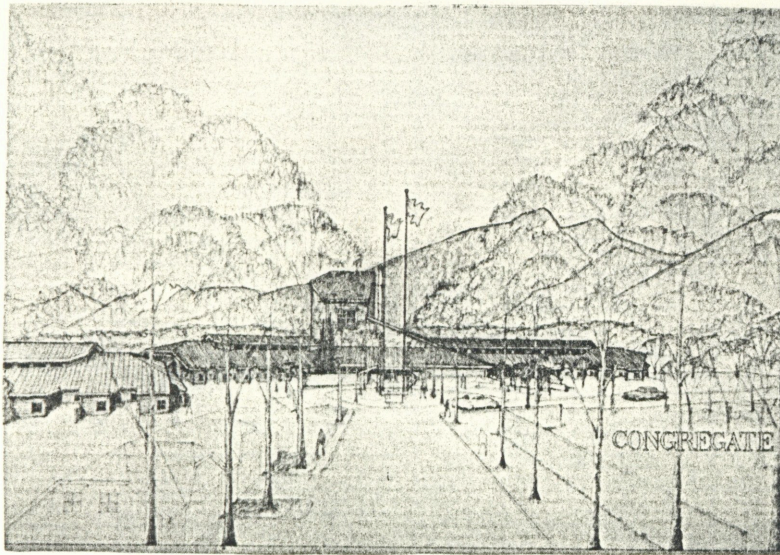
U.S. Geologic Survey. Topographic map and Bitterroot National Forest Map. Denver, Colorado: U.S. Geologic Survey.

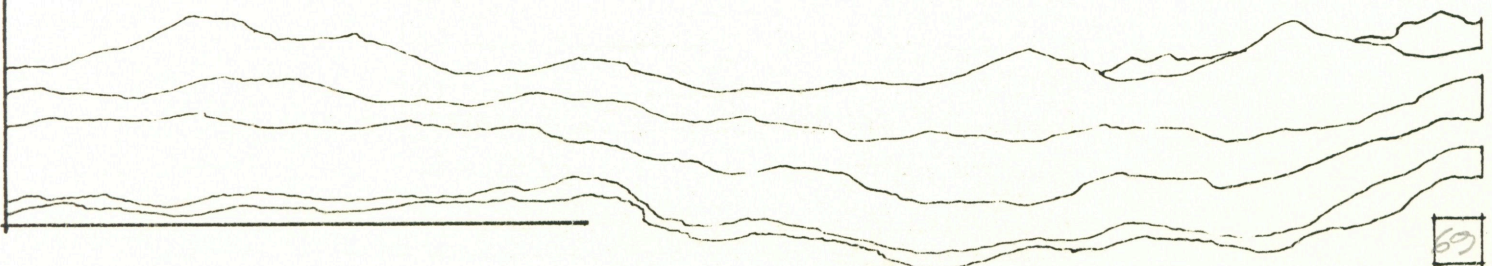
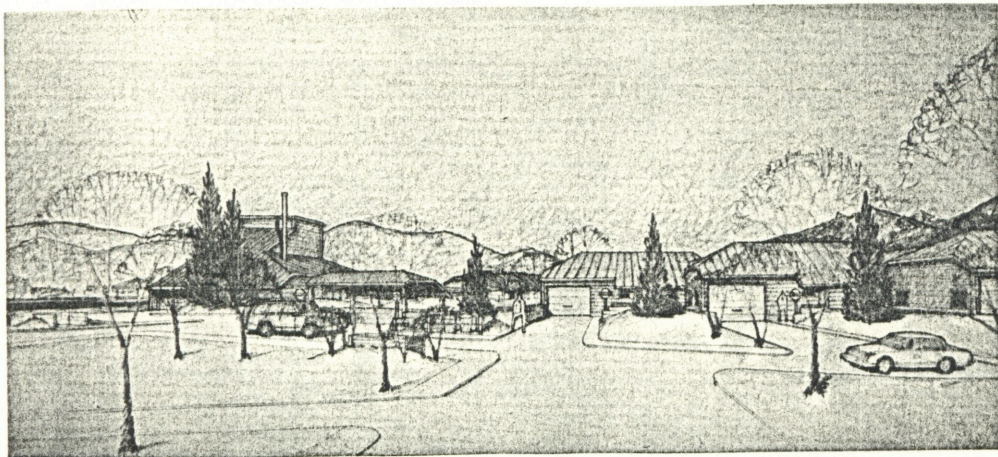
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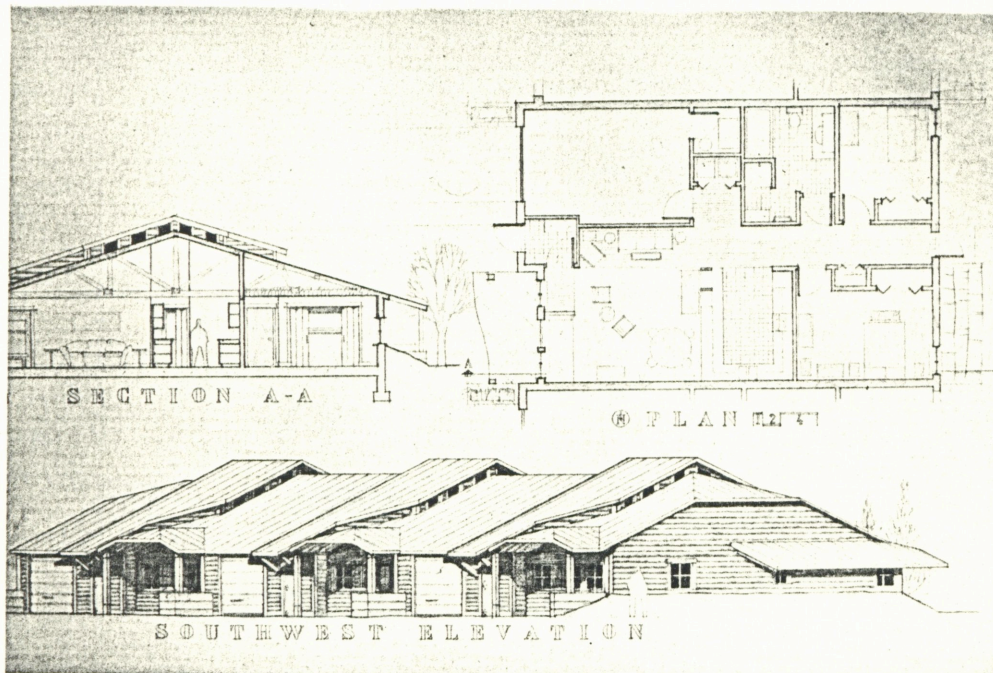
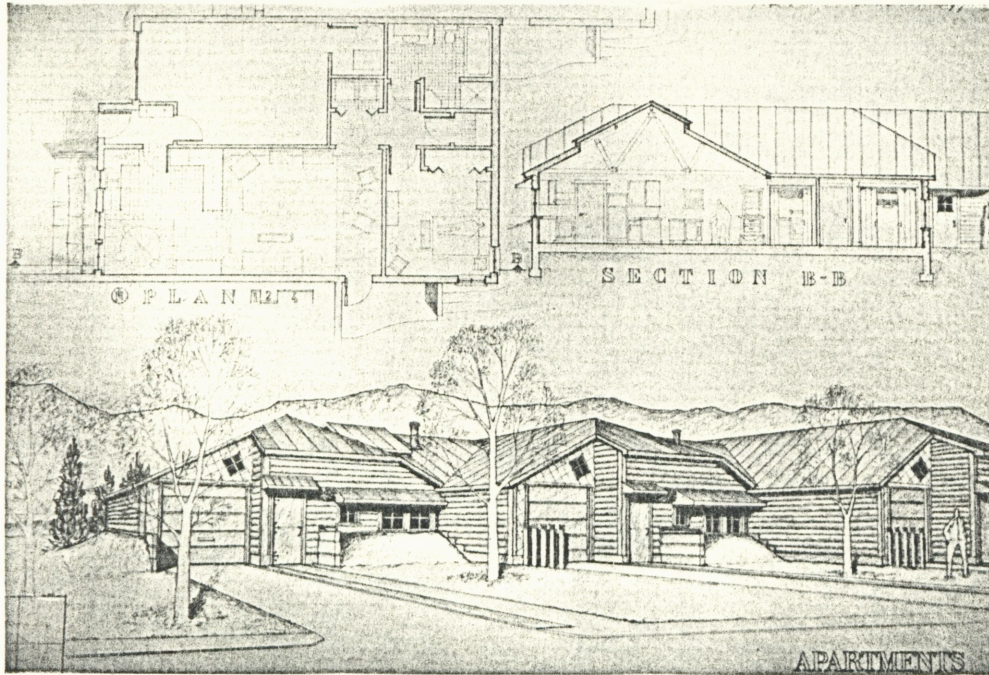
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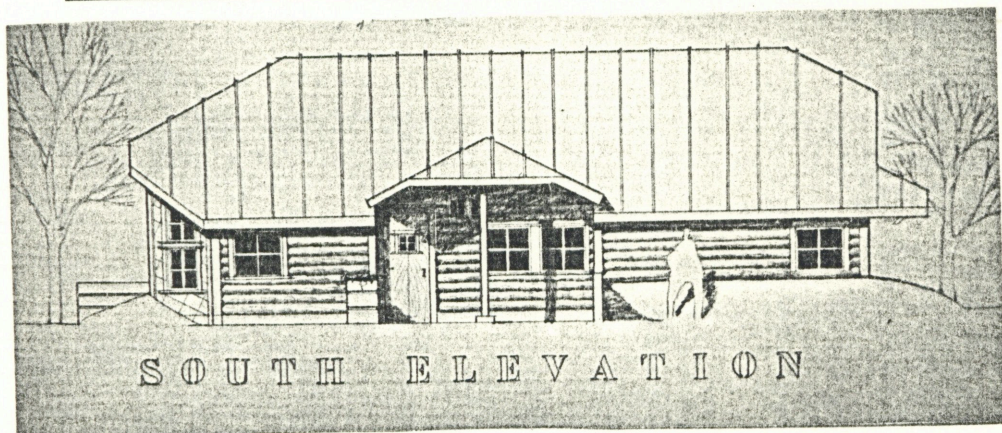
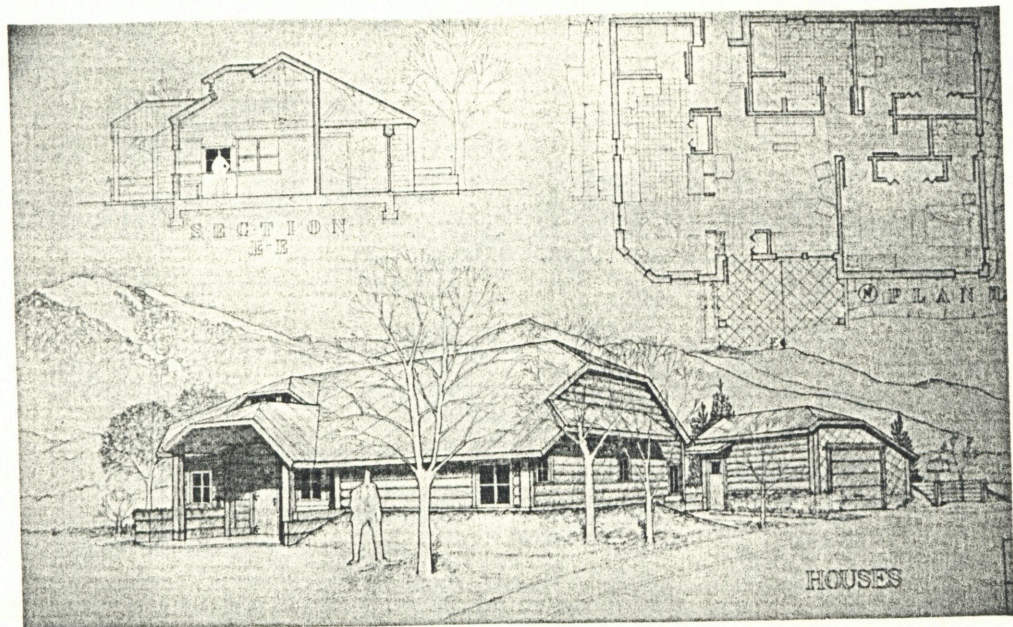
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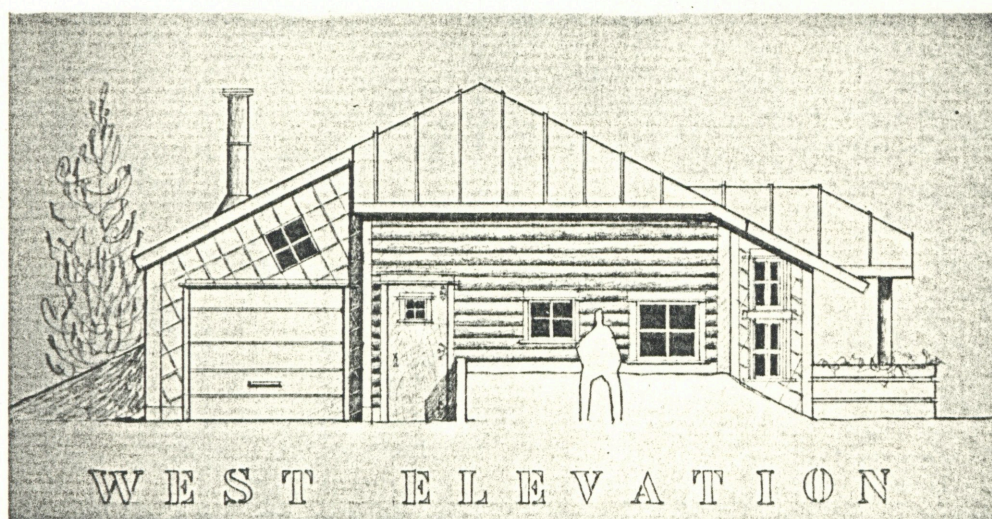
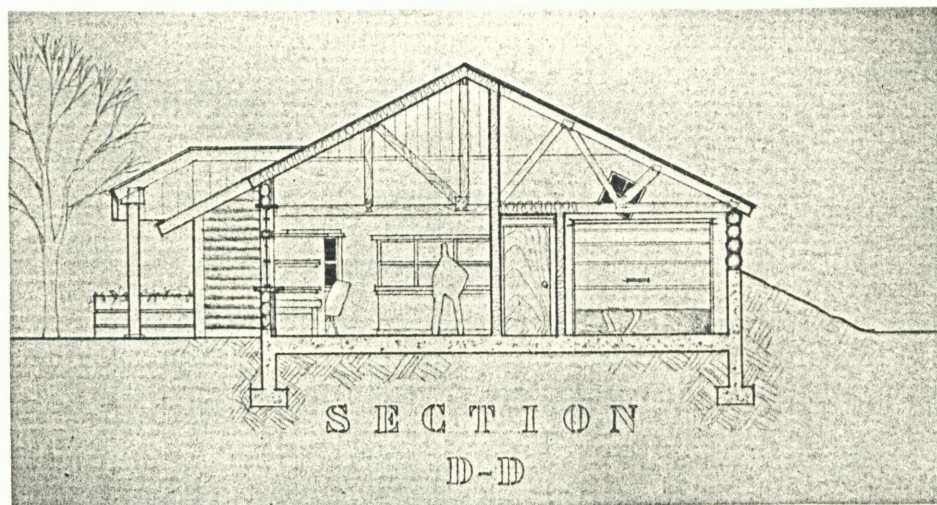
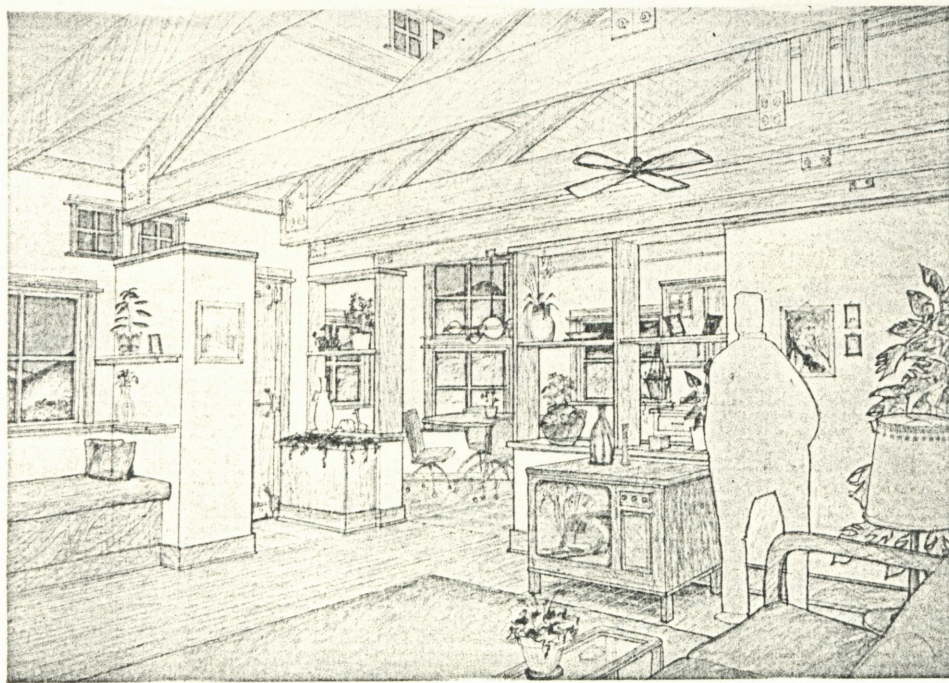












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