

CECILIA R. VANIMAN
THE REVITALIZATION OF A
PORTION OF THE OLDER COMMER-
CIAL DISTRICT OF BOZEMAN,
MONTANA

LIBRARY
MONTANA STATE UNIVERSITY
BOZEMAN

THE REVITALIZATION OF
A PORTION OF THE
OLDER COMMERCIAL DISTRICT
IN
BOZEMAN, MONTANA

By

Cecilia Rene' Haught Vaniman

Submitted to the School of Architecture as Partial
Fulfillment of the Requirements for the Degree of
Bachelor of Architecture

At

Montana State University
Bozeman, Montana

5 June 1978

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ACKNOWLEDGMENTS

I wish to dedicate this thesis undertaking to my husband, Donald D. Vaniman. His dedication, inspiration, generosity, and sacrifice will be remembered and cherished always.

I also wish to thank my parents, Joseph and Betty Haught, who have been an encouragement throughout my life and have invariably supported my desire to obtain this goal.

Many individuals contributed to the synthesis of this thesis. I would like to thank Professor John DeHaas, my thesis advisor, and other members of the School of Architecture who served on my juries for their assistance, including Professors Elmira Smyrl, David Wessel, Joan Draper, and Francis Woods.

I would especially like to acknowledge the encouragement given me, not only on this thesis, but throughout the past several years by Dr. George McClure.

My employer, The Department of Earth Sciences (its staff and faculty) all have been a tremendous source of support and encouragement. To each and every one of you, I truly thank you.

Special recognition goes to Sharon Dusenberry for her excellent typing of this manuscript.

And lastly, I extend my sincere appreciation to Dr. John Alwin, Cultural Geographer, Department of Earth Sciences, for his invaluable critique of the original manuscript.

TABLE OF CONTENTS

TABLE OF CONTENTS

	Page Number
PRELIMINARY THESIS PROPOSAL.	1
THESIS PROPOSAL.	7
THEME.	15
PREAMBLE	17
THESIS STATEMENT	19
METHODOLOGY.	21
INTRODUCTION	23
THE PURPOSE OF THE STUDY	25
THE THESIS AREA.	27
Location.	28
History	28
Geography	29
THE REVITALIZATION OF AN OLDER COMMERCIAL DISTRICT . .	34
THE CAUSE OF DETERIORATION	37
Land Use.	38
Traffic Patterns.	41
Form and Quality of Buildings	43
Streets and Landscape	47
POLICIES FOR REVITALIZATION.	48
Land Use.	50
Traffic and Pedestrian Ways	51
Buildings	53
Streets and Landscape	56
THE THESIS SITE.	60
Natural Features.	61
The Commercial District	63
Adaptive Re-Use of Library.	71
Housing	72
Plaza - Park.	82
CONCLUSION	84
APPENDIX A	
GUIDELINES FOR PARKING STRUCTURES.	86
APPENDIX B	
GUIDELINES FOR APARTMENTS.	99
APPENDIX C	
GUIDELINES-HOUSING FOR THE AGED.	111

PRELIMINARY THESIS PROPOSAL

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PRELIM.

THESIS PROPOSAL

Cecilia Rene' Vaniman
Architecture 555 and 556
January 3-June 10, 1977
School of Architecture
Montana State University

November 21, 1977

TO: Professor Ilmar Reinvald, Director
Professor David Wessel, Thesis Coordinator
School of Architecture
Montana State University

RE: Undergraduate Thesis
Winter & Spring Quarters, 1976
Cecilia R. Vaniman

THESIS STATEMENT: Having tried to express my feelings
in my own words, I find it much more appropriate to use
the following quote directly as it says it all without
my "improvement."

"OLD BUILDINGS - LIKE OLD PEOPLE - ARE
ESSENTIAL TO A HEALTHY AND MATURE SOCIETY IN
THAT THEY GIVE A SENSE OF BALANCE AND CONTINUITY
WITH THE PAST, BUT THEY MUST BE VALUED AT THEIR
TRUE WORTH AND NOT MERELY ACCEPTED ON SUFFERANCE."

George Stephen
from Remodeling Old
Houses Without Losing
Their Character

THESIS PROJECT: Study one block (or more) of downtown
Bozeman and determine what can be done to restore (or
reconstruct) the buildings in this block, within their
original historical framework. When the proposed shop-
ping centers are built in Bozeman, the downtown area will
literally be fighting for its life. I feel the downtown
area can compete with the shopping centers through restora-
tion of the heart of the city and its historical signif-
icance.

THESIS ADVISOR: John DeHaas

Resources:

Professor Joan Draper, Architectural History
Professor Hugo Eck, Mechanical, Electrical Systems
Professor James Gough, History & Restoration
Dr. George McClure, Structures
Professor Ilmar Reinvald, Historical Restoration
Professor E.S. Smyrl, Construction Technology
Professor William Semple, Design Methodology
Professor F.S. Woods, Historical Restoration
(Above mentioned are from School of Architecture,
Montana State University.)

School of Business - Marketing, Montana State University

Psychology & Sociology Departments, Montana State University

Professor M. J. Edie, Geography
Professor R. L. Taylor, Geography
Dr. J. M. Ashley, Cultural Geography
(Above mentioned are from Department of Earth
Sciences, Montana State University.)

Department of History & Philosophy, Montana State University

Dr. M. G. Burlingame (emeritus) Historian, Montana State University

Montana State University Library and Archives

Montana State University Fine Arts Library

Montana Historical Library, Helena, Montana

Berg - Grabow - Schofield, Architects, Bozeman, Montana

CTA Architects, Billings, Montana

METHOD: Study past and present city core and neighborhood restoration - adaptive use projects (their success and failures). I hope to have extensive correspondence with the people who actually planned these areas and intend to visit as many as possible to study their historical, sociological, psychological, physical and economic impact.

Through comparison and analysis, this information can be put into a "pattern language" for my use in a feasible solution for downtown Bozeman.

PRELIMINARY SCHEDULE:

December 10, 1977-January 6, 1978 -- Thought, preparation, scheduling of thesis.

January 7-February 10 -- Meetings with resources, correspondence, gather information, synthesize.

February 10 -- Preliminary presentation.

February 11-February 25 -- Gather information, synthesize.

February 25-March 2 -- Visit Country Club Plaza
Kansas City, Missouri; Larimer Square, Denver,
Colorado.

March 3-March 13 -- Synthesize into a "pattern language."

March 13-March 17 -- Final week - progress report.

March 17-March 28 -- Visit San Francisco with John DeHaas.

March 29-April 28 -- Design.

Preliminary Schedule (continued)

April 28 -- Preliminary presentation.

April 29-May 12 -- Design.

May 12 -- Preliminary presentation.

May 13-May 26 -- Design.

May 26 -- Preliminary presentation.

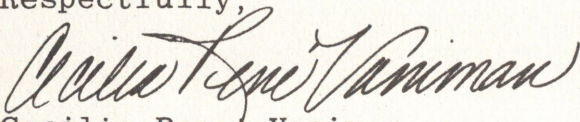
May 27-June 5 -- Finalize drawings, models.

June 5-10 -- Final Week - Final presentation.

FINAL PRESENTATION: multi-media
 slides
 drawings - sketches
 detailed models

This preliminary Thesis Proposal is submitted on
November 21, 1977 for approval of the Director and
Thesis Coordinator, School of Architecture, Montana
State University.

Respectfully,


Cecilia Rene Vaniman

THESIS PROPOSAL

THESIS PROPOSAL

Cecilia Rene' Vaniman
Architecture 555 and 556
January 3-June 10, 1977
School of Architecture
Montana State University

January 16, 1978

TO: Professor Ilmar Reinvald, Director
Professor David Wessel, Thesis Coordinator
School of Architecture
Montana State University

RE: Undergraduate Thesis
Winter & Spring Quarters, 1976
Cecilia R. Vaniman

THEME:

"What is Past is Prologue"
William Shakespeare, Tempest

PREAMBLE:

"OLD BUILDINGS - LIKE OLD PEOPLE - ARE
ESSENTIAL TO A HEALTHY AND MATURE SOCIETY IN
THAT THEY GIVE A SENSE OF BALANCE AND CONTINUITY
WITH THE PAST, BUT THEY MUST BE VALUED AT THEIR
TRUE WORTH AND NOT MERELY ACCEPTED ON SUFFERANCE."

George Stephen
from Remodeling Old
Houses Without Losing
Their Character

THESIS STATEMENT:

To achieve success in the rehabilitation of
old buildings, the design must not only coordinate
items as to their correct time in history but must
also coordinate their function, use and setting in
modern time.

THESIS PROJECT:

Study one block of downtown Bozeman and deter-
mine what can be done to rehabilitate this area to a

Thesis Project (continued)

live, viable area. The block I have picked is bounded by Main, Mendenhall, Black, and Bozeman Streets and contains J. M. McDonald Company, Phillips' Book Store, Evans' Jewelry, Pine's Cafe, McCracken's, Country West, Life of Montana Building and possibly most important, the Carnegie Library.

At this time I wish to leave all techniques - Restoration, Rehabilitation, and Redesign - open for discovery, exploration and possible use.

METHODOLOGY:

1. Research the development of the study area and determine the possible patterns of growth and/or decline.
2. Study past and present city core and neighborhood restorations or adaptive use projects (their success or failure).
3. I plan to have extensive contact with the people who will actually use and own this area. Some of the groups who will have input are: Friends of the Library, Downtown Development Corporation, City/County Planning Board, the individual building owners, and the general public.

Methodology (continued)

4. Through comparison and analysis this information will be synthesized into a "pattern language" for use in a solution.

THESIS ADVISOR:

John DeHaas

RESOURCES AND CONSULTANTS:

Professor Joan Draper, Architectural History
Professor James Gough, History & Restoration
Dr. George McClure, Structural Analysis
Professor William Semple, Design Methodology
Professor F. S. Woods, Historical Restoration
(Above mentioned are from School of
Architecture, Montana State University)

School of Business - Marketing, Montana State
University

Psychology & Sociology Departments, Montana State
University

Dr. John Alwin, Cultural Geography

Professor M. J. Edie, Geography

Dr. J. M. Ashley, Cultural Geography

(Above mentioned are from the Department of
Earth Sciences, Montana State University)

Department of History & Philosophy, Montana State
University

Dr. M. G. Burlingame (emeritus) Historian, Montana
State University)

Resources and Consultants (continued)

Montana State University Library and Archives

Montana State University Fine Arts Library

Montana Historical Library, Helena, Montana

Berg - Grabow - Schofield, Architects, Bozeman, Montana

PRELIMINARY SCHEDULE

January 4-16 --	Thesis proposal and scheduling.
January 12 --	Meet with Thesis Advisor.
January 16-February 3 --	Collect data on existing buildings - maps, elevations, plans, circulation patterns, etc.
January 19-26 --	Meet with Thesis Advisor.
February 2, 9, 16, 23 --	Meet with Thesis Advisor.
February 3-26 --	Begin prelim design, synthesize data.
February 27 --	Presentation with Thesis Advisor and Consultants.
February 28-March 12 --	Meet with community groups and synthesize data.
March 2, 9 --	Meet with Thesis Advisor.
March 13-17 --	First Quarter Thesis Progress Report.
March 18-27 --	Field Trip to San Francisco.
March 28-April 27 --	Synthesis and Design.
April 6, 13, 20 --	Meet with Thesis Advisor.
April 28 --	Preliminary Presentation.
April 29-May 11 --	Design.
May 12 --	Preliminary Presentation.
May 13-June 5 --	Finalize drawings, models.

Preliminary Schedule (continued)

May 4, 11, 18, 25 --	Meet with Thesis Advisor.
June 5-10 --	Finals Week, Final Presentation.

PRESENTATIONS:

Periodic presentations to advisor and architectural staff consultants relative to status of project.

Progress Report at the end of Winter Quarter 1978 to include verbal presentation with support from notes, sketches and drawings.

Final Thesis Presentation - verbal defense of thesis with support of drawings, sketches, models, and slides.

Emphasis of all presentations shall be directed to development and support of the thesis statement.

This Thesis Proposal is respectfully submitted for approval.

Cecilia Rene' Vaniman
Cecilia Rene' Vaniman, Student

John N. DeHaas, Jr.
John DeHaas, Thesis Advisor

David Wessel
David Wessel, Thesis Coordinator

George S. McClure, Jr.
~~George S. McClure, Jr.~~, Director
School of Architecture
Montana State University

THEME

"WHAT IS PAST IS PROLOGUE"

William Shakespeare, *The Tempest*

PREAMBLE

"OLD BUILDINGS - LIKE OLD PEOPLE - ARE ESSENTIAL TO A HEALTHY AND MATURE SOCIETY IN THAT THEY GIVE A SENSE OF BALANCE AND CONTINUITY WITH THE PAST, BUT THEY MUST BE VALUED AT THEIR TRUE WORTH AND NOT MERELY ACCEPTED ON SUFFERANCE."

George Stephen
from Remodeling Old
Houses Without Losing
Their Character

THESIS STATEMENT

TO ACHIEVE SUCCESS IN THE REHABILITATION OF OLD BUILDINGS AND THEIR SURROUNDING LANDSCAPE, THE DESIGN MUST NOT ONLY COORDINATE ITEMS AS TO THEIR CORRECT TIME IN HISTORY BUT MUST ALSO COORDINATE THEIR FUNCTION, USE AND SETTING IN MODERN TIME.

METHODOLOGY

METHODOLOGY

The built environment is not composed of single structures but of many elements working together. Appreciation depends on the understanding that the sum is infinitely greater than the simple addition of the parts. The viewing must be in its proper setting and totality.

However, to gain this understanding, the whole must be broken into (what seems like infinite) parts to be able to grasp the significance of each piece.

Because of this, the observations often have become generalities which can be focused in on the study area. Then the knowledge of the parts can be brought together for a solution of the problem.

I make no pretense of fully understanding all the problems in the study area, let alone the solutions to these problems. However, I now have some comprehension of the complexity and magnitude of such a study.

Successful commercial center revitalization requires careful thought and planning, architectural, historic and economic research and high quality of rehabilitation and new construction design.

INTRODUCTION

INTRODUCTION

There is a wistful myth that if only we had enough money to spend - the figure is usually put at a hundred billion dollars - we could wipe out all our slums in ten years, reverse decay in the great, dull, gray belts that were yesterday's and day-before-yesterday's suburbs, anchor the wandering middle class and its wandering tax money, and perhaps even solve the traffic problem.

But look what we have built with the first several billions: low-income projects that become worse centres of delinquency, vandalism and general social hopelessness than the slums they were supposed to replace; middle-income housing projects which are truly marvels of dullness and regimentation, sealed against buoyancy or vitality of city life; luxury housing projects that mitigate their inanity, or try to, with a vapid vulgarity; cultural centres that are unable to support a good bookstore; civic centres that are avoided by everyone but bums, who have fewer choices of loitering place than others; commercial centres that are lack-luster imitations of standardized suburban chain-store shopping; promenades that go from no place to nowhere and have no promenaders; expressways that eviscerate great cities. This is not the rebuilding of cities. This is the sacking of cities.

Jane Jacobs - "The Death and Life of Great American Cities."

THE PURPOSE OF THE STUDY

THE PURPOSE OF THE STUDY

Recent patterns of growth and development in Bozeman have tended to weaken the central business district. With the expansion of the urbanized area, the desirability of using downtown facilities has lessened and the development of new shopping centers at perephial locations has left the downtown with a diminished market.¹

The central business district (C.B.D.) is a vital element of Bozeman and the entire Gallatin Valley. The purpose of this study is to help gain some understanding of the quality of environment so needed if this town and others like it are to survive.

The purpose of this study is not to diagnose or provide cures for social or economic ills, but to give inspiration for improvement of a specific part of the physical environment.

THE THESIS AREA

THE THESIS AREA

Location

The location of the thesis area is in the middle of the central business district in Bozeman, Montana. It is one complete block bounded by Main, Mendenhall, Bozeman, and Black Streets, and contains J. M. McDonald Company, AMC Sullivan Photo, Phillips' Book Store, Bozeman Jewelry, The Pant Tree, Evans' Jewelry, The Crystal Bar, Pine's Cafe, McCracken's, Country West, Life of Montana, Carnegie Library, and various offices. (Figures 1 and 2)

History

Bozeman, located at the southern end of the Gallatin Valley, is thirty-five miles southeast of the point where the Gallatin, Madison, and Jefferson Rivers join to form the Missouri River. The great valleys formed by these rivers provided an early thoroughfare for Indians coming to hunt buffalo on the plains. Because of the migration of many Indians through the area and the prevention of tribes using the valleys as permanent residences due to heavy winter snow, the region was early declared "common hunting ground." (Figure 3)

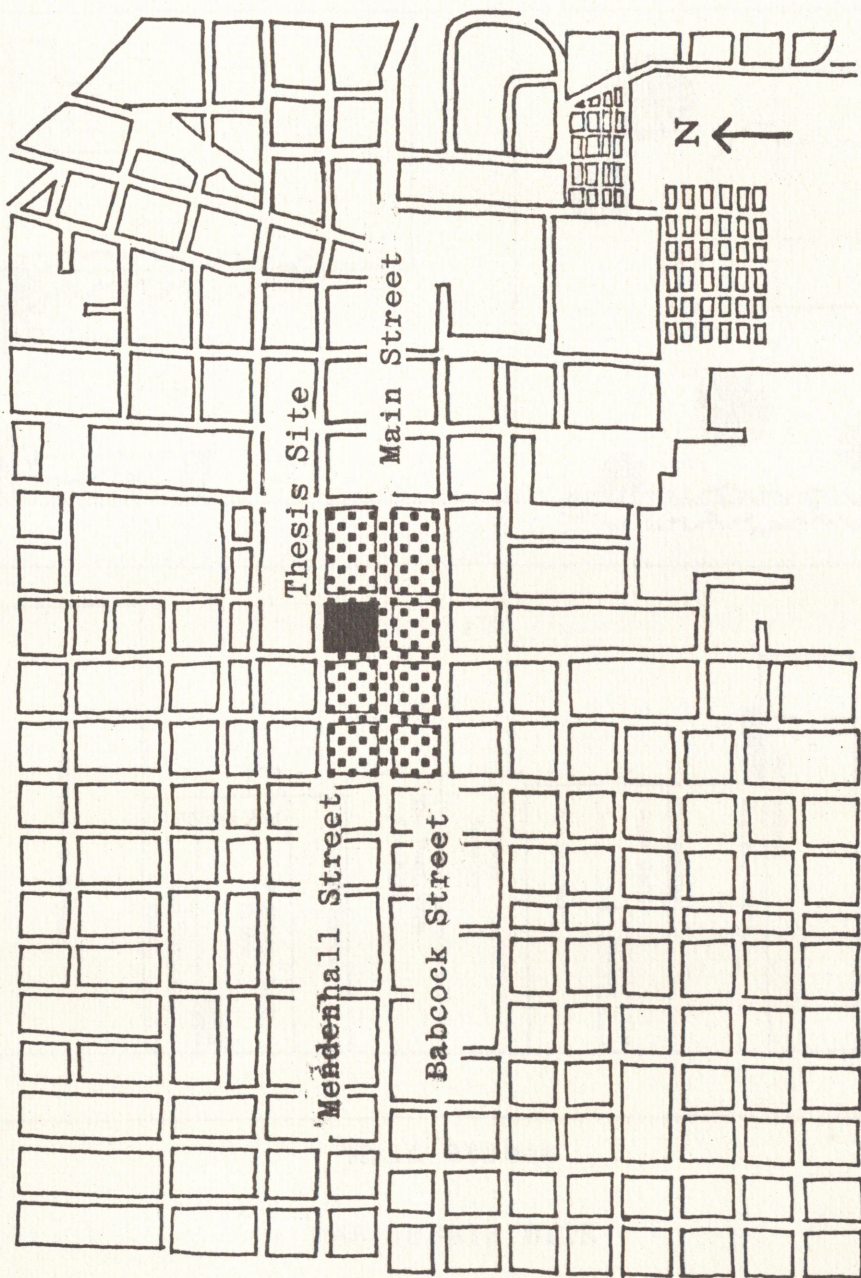
The first known visit in the area by white men was the Lewis and Clark Expedition in 1805.

The establishment of Bozeman was planned in 1863-64. Settlers on the East Gallatin with John Bozeman as chairman formed an association to establish laws and record farming claims for mutual protection and thus founded the town of Bozeman.²

Geography

The Bozeman area encompasses eighty square miles in the eastern portion of the Gallatin Valley. This valley, surrounded by mountain ranges, has a highland climate with four distinct seasons and extremely high agricultural production. Traditionally, agriculture has been the basis for Bozeman's growth and today it still is a productive agriculture and stock-producing region.³ (Figure 4)

The buildings in downtown Bozeman speak of this agricultural prosperity translated into community pride. Today the buildings and C.B.D. do not reflect that original self-esteem. My goal has been to discover what could be done with one portion of the downtown area to bring back that special quality.



BOZEMAN C.B.D.

FIGURE 1

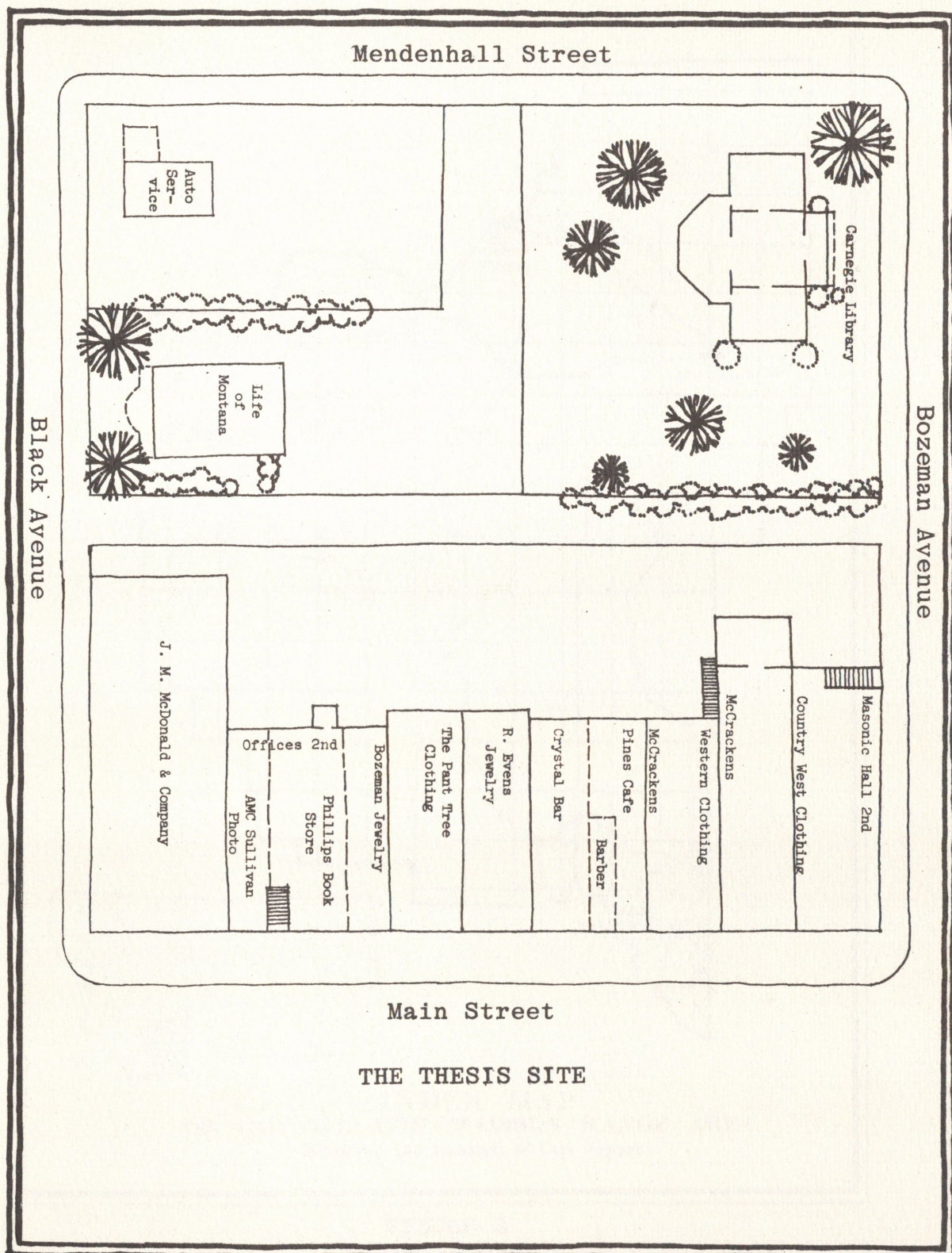
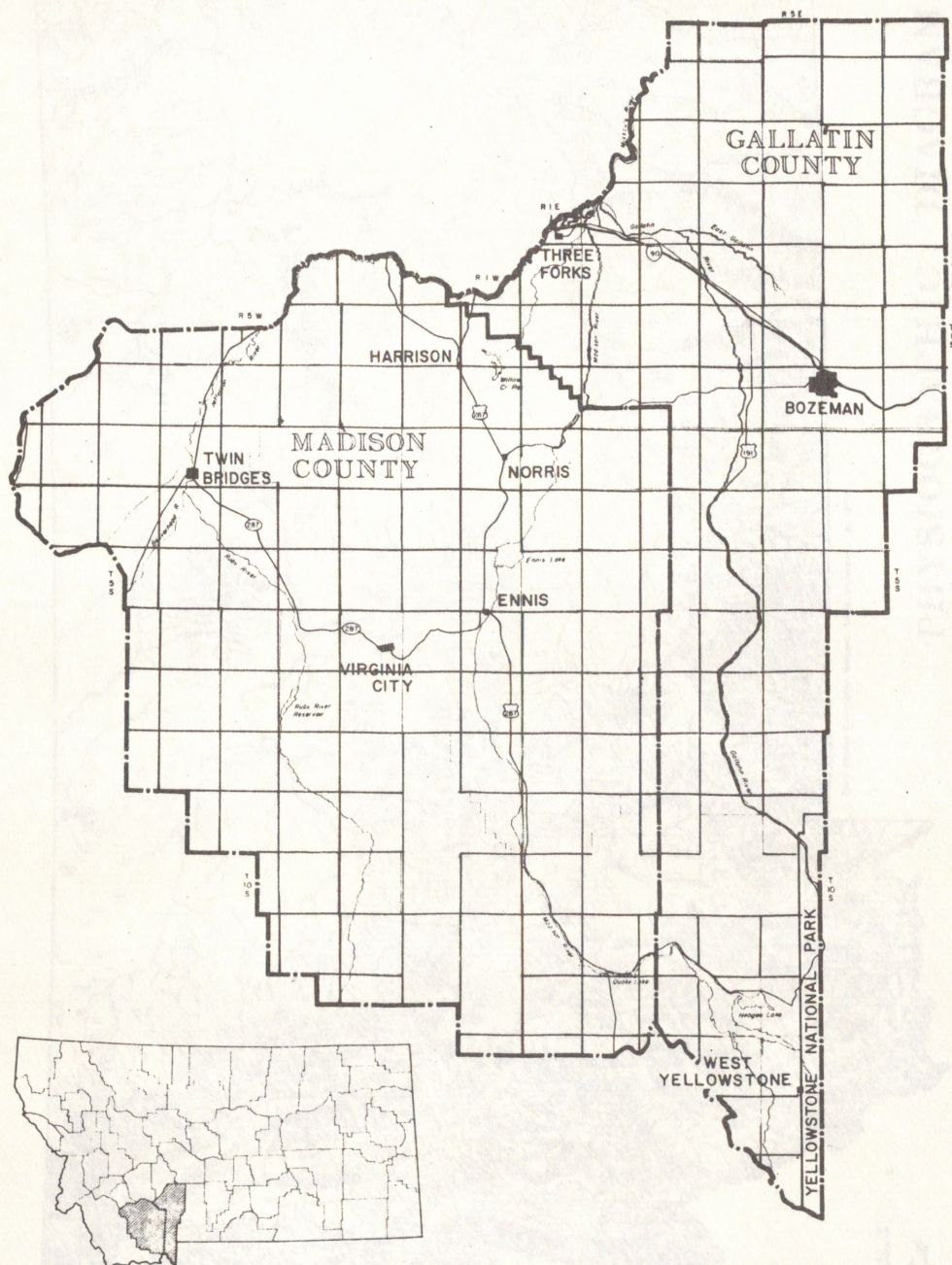


FIGURE 2



INDEX MAP
OF THE GALLATIN - MADISON RANGE AREA
 Showing the location of this report

FIGURE 3

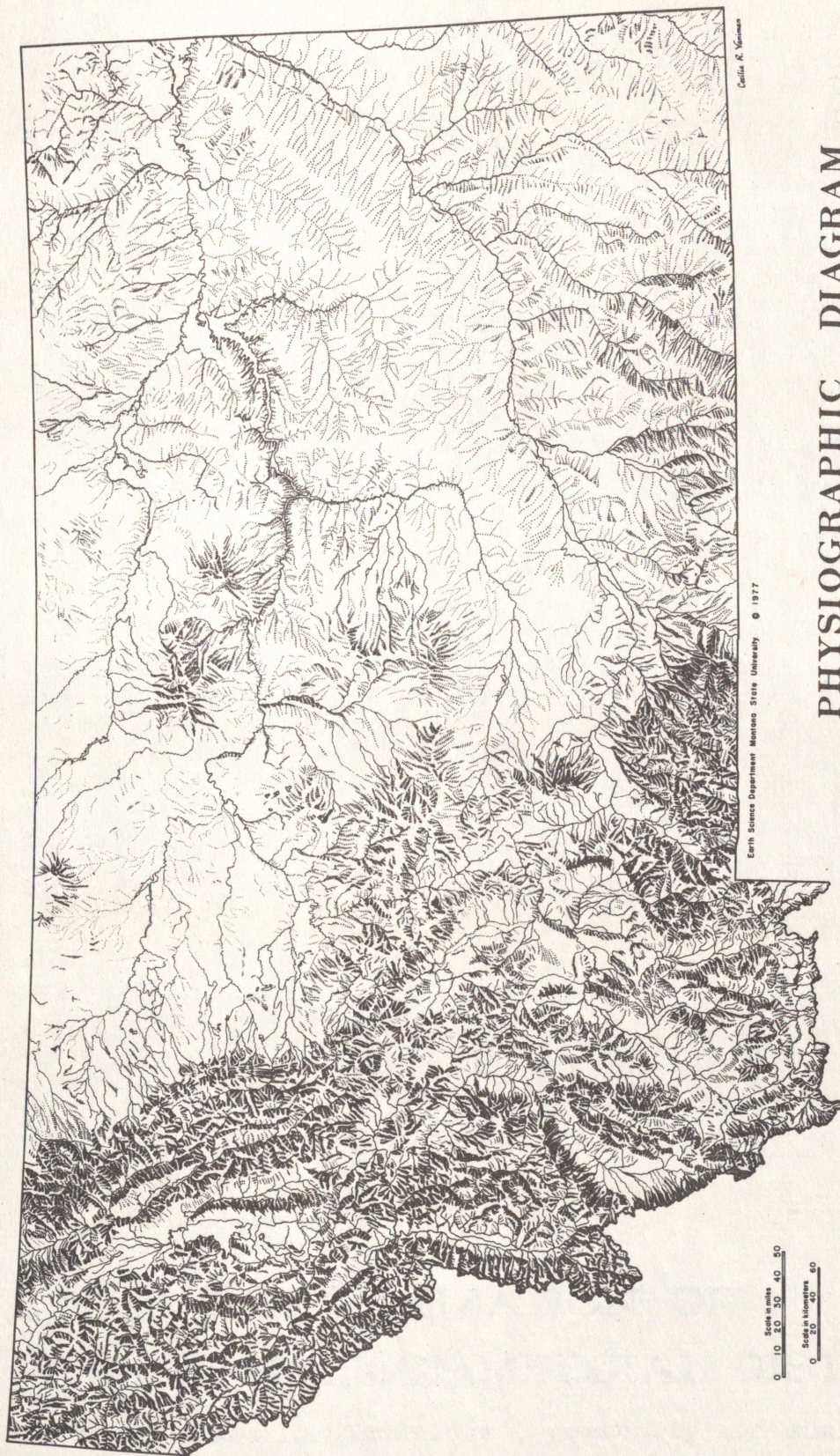


FIGURE 4

THE REVITALIZATION OF AN OLDER COMMERCIAL DISTRICT

Suggestions for individual, community and municipal
action based on a study of one block in the C.B.D.
of Bozeman, Montana.

THE REVITALIZATION OF AN OLDER COMMERCIAL DISTRICT

What can be done ?

We can let the area "die" of "natural causes" and abandon it at the tremendous cost of a great loss of opportunity.

Older buildings help give a community its character. They also help to provide residents with a historical perspective which helps them understand where they are going by seeing tangible evidence of where they have been.⁴ In a rapidly changing urban environment, such a depth of vision becomes increasingly more meaningful.

We can carefully restore the area to its original condition and forbid any change in the environment. This can be unjust, expensive, unrealistic, and in the long run self-defeating, since restoration alone does not guarantee economic viability. "Restoration for its own sake or sentiment is too inconsequential and too restricted in appeal."⁵

Instead, it is proposed that we take the built environment as is, repair the damage (mostly due to remodeling) where it is reasonably economical to do so, reinforce the existing commercial area, introduce new apartments and offices near their natural service area (the C.B.D.), route traffic around rather than through the area and, by sensitive design, improve the quality of the environment.

These recommendations basically deal with the environment as we presently find it—accent the best—eliminate the worst and build the new to fit the old.

THE CAUSE OF DETERIORATION

THE CAUSE OF DETERIORATION

Use of Land

The land use pattern which has developed over the years is primarily the result of "natural" growth set within a gridiron pattern of roadways and more recently restricted by laws which segregate commercial areas from residential, and multi-family housing from single family homes. The first roads became elongated commercial corridors lined with shops. This was the beginning of the development of lineal growth in Bozeman. (Figure 5)

As with many other embryonic towns, streets were laid out in a monotonous grid with:

little thought to the need for variety of streetscape, to the convenience of the residents or the future needs of the pedestrian and to vehicular traffic which would have to pass through the area. Commercial areas rather than possessing a rightful place and proper space have come to where they are by default, and are consequently regarded with suspicion by their nearby residential neighbors. Changes in the land use pattern and the zoning governing it have been established by precedent and privileged lobbies rather than by intent.⁶

The lack of a detailed comprehensive plan for land use is one cause for deterioration. This is especially noticeable in the buffer areas between the C.B.D. and the adjacent residential area.

Apartments and single-family housing are being built progressively further from the downtown shopping, while little or no redevelopment is taking place which will help maintain

adequate walk-in trade. It is hoped that rather than stopping new buildings in core areas, the people (private and governmental) will be able to encourage developers to revitalize the commercial core. A symbiotic relationship exists between both. The residential area guarantees the existence of the stores and the stores are a valuable convenience for the residents. Lack of cooperation between the commercial and residential sections of the population only serve to break up communities.

(However, when one examines the areas to the rear of the commercial artery-especially on Babcock and Mendenhall, it is no wonder residential property owners are on the defensive against their commercial neighbors.)

The tendency to develop peripheral commercial and apartment complexes or redevelop the C.B.D. and introduce large quantities of through traffic without providing parking will weaken a basically good town structure and hasten decay.



FIGURE 5

Traffic Patterns

Roadways have almost always dictated the forms of our communities. In Bozeman, Main Street originally was the spine of the town. Today Babcock Street and Mendenhall also can be included in this function. The avenues at right angles to this backbone became the ribs of the city skeleton. The gridiron pattern was a simple and direct way of dividing up land and served well when traffic was slow and volume small. There was seldom any distinction in width or form between streets carrying heavy traffic and those carrying little, as it remains today. On commercial streets sidewalks are directly against shop fronts, therefore these roads are wider. Houses and shops face directly on streets irrespective of whether the street is carrying 500 or 5 cars an hour. The purpose of the road and the purpose of the land adjacent to it are in direct conflict.

Access to and egress from the C.B.D. is relatively easy but once in the core, circulation is difficult.

Main Street, the major shopping street, is also the major east-west artery with residential streets crossing it every 320 feet. The shopping street is a dangerous parking lot due to the speed and density of traffic adjacent to the parking spaces. It is a poor arterial road because of the automobiles turning onto and off it for parking locations.

To alleviate this problem, the two adjacent parallel streets were designated one-way with traffic to flow from west to east on Babcock and east to west on Mendenhall. Because the one-way couplet is not complete, now the cross streets and alleys increasingly are being loaded with heavy traffic to

alleviate the problems created by the one-way system (it prohibits the natural clockwise flow of traffic). The residential streets, while not so much used for through traffic, increasingly are being used by motorists trying to avoid the jammed arterials. They also serve as uneconomical and inconvenient parking areas for workers and shoppers.

While an immediate walk-in trade is essential for a street side shopping center, generally more than half the trade is from outside the area by people arriving in cars.⁷

Anytime quantities of people or traffic are attracted to an area, the automobile must be accommodated. Without parking, the shop will fail, as people will prefer to shop elsewhere - even though they actually may walk further across a huge asphalt parking lot at a shopping center. They think this is less inconvenient, and that is all that is important.

Form and Quality of Buildings

The design of each building or individual piece of the landscape adds up to a pleasant or unpleasant total environment. A poorly designed group of buildings has a greater tendency to deteriorate than a well designed group because of its lack of intrinsic value.

The buildings within the study area are in good condition and the evident deterioration is due to poorly designed remodeling, not the general quality of the buildings.

The changes in these facades tell of a time of prosperity, followed by a time of decline and a scramble to keep up with their neighbors - but most of all a failure to appreciate the past. During the period of remodeling and "modernization" the general opinion was that anything old was a retardant to economic growth and anything new was a possible solution to the economic woes.⁸

Therefore, externally, the front facades of these buildings have over the years been stripped of cornices, towers and marquees, arches have been bricked in and signage has become plastic, neon and hokey.

Shorn of some ornament and elegance, and with once ornate panels filled with artificial materials, these buildings lost much of their charm.

The most conspicuous features of a commercial street, especially when the fronting buildings are only two stories high are the shopfronts and the signs. It is unfortunate, however, that these features receive the least design attention even though they constitute the elements where good design can clearly be said to pay.⁹

Signs are seldom related in form, style or height. Each competes with the next for the attention of the shopper with the result of bad advertizing for the whole street. (Figure 6)

With a few exceptions the rear of the shops is an area traditionally forgotten by the owner. In some ways this is fortunate as the original facades have not been completely destroyed, and have little damage other than the bricking-in of openings. However, some of these store backs have become eyesores, used only for deliveries and the collection of debris. They are the cause of deterioration in adjacent areas and a loss of value for everyone as they are very visible from adjacent streets. (Figure 7)

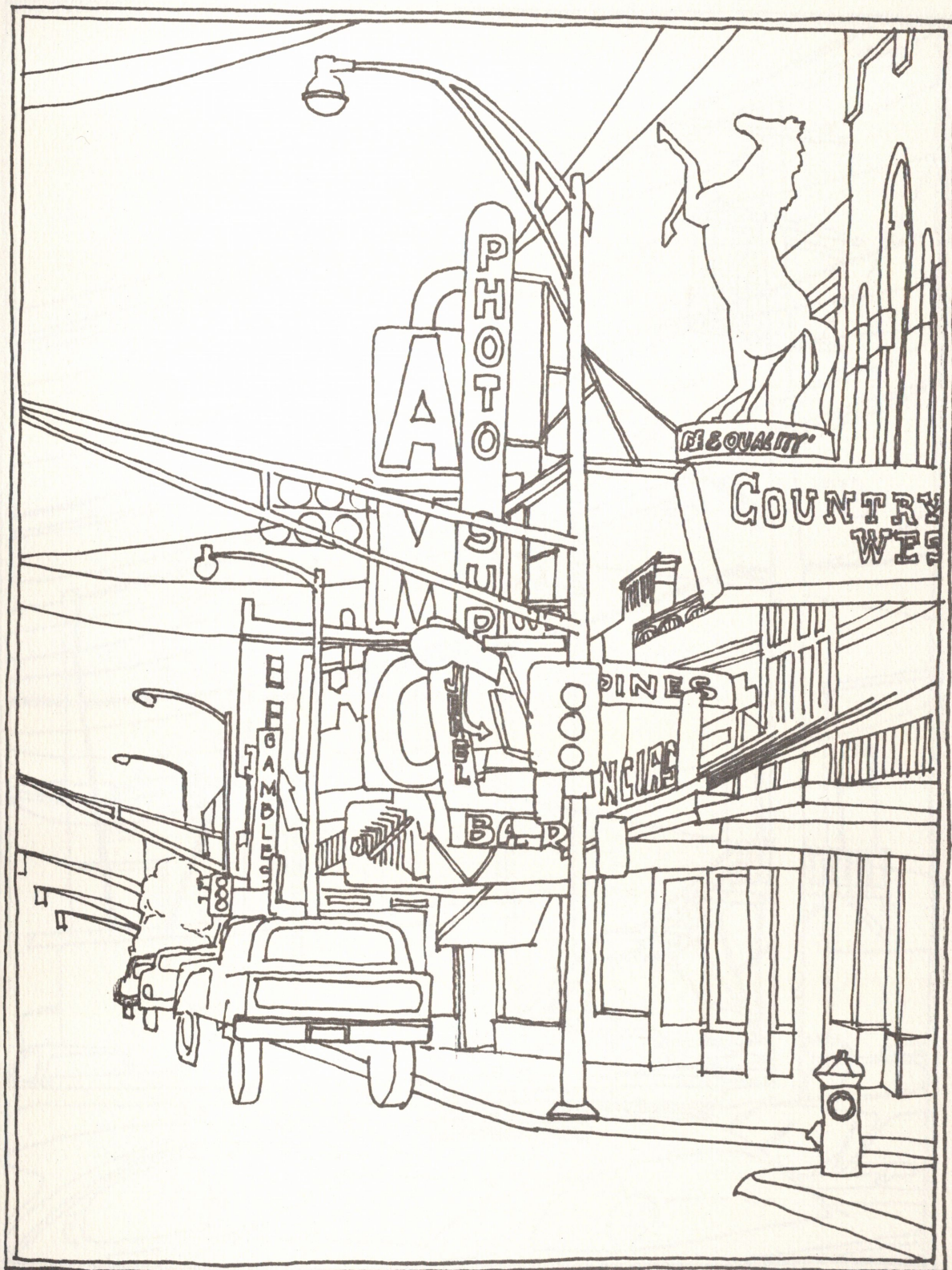


FIGURE 6

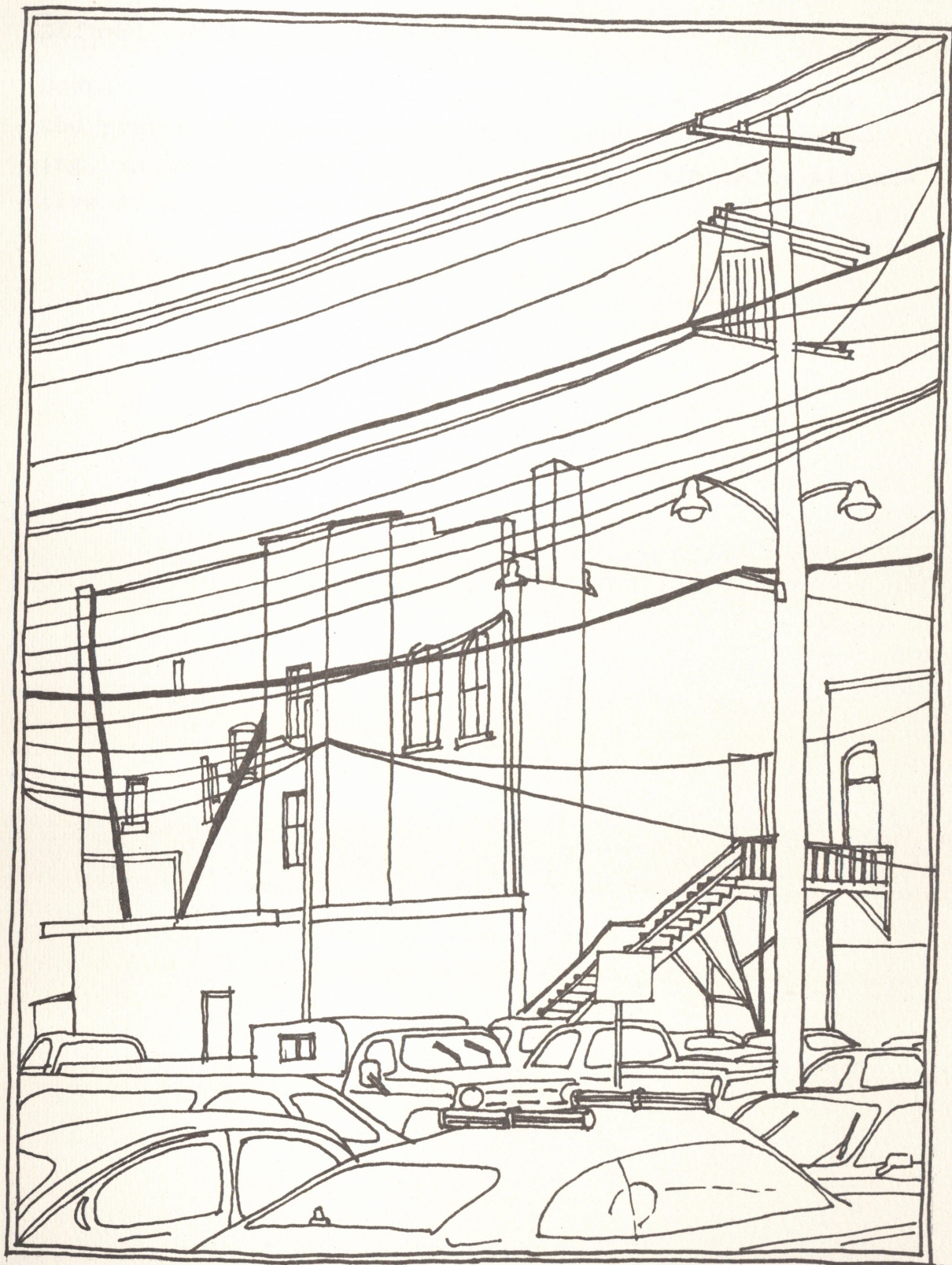


FIGURE 7

Streets and Landscape

Despite the abundance of surrounding natural amenities, the present downtown is devoid of plant life, landscaping, water sculpture and other elements especially attractive in a pedestrian environment.¹⁰

POLICIES FOR REVITALIZATION

POLICIES FOR REVITALIZATION

The following policies for revitalization first list the basic problems, give general solutions to the problems which would be applicable for the entire Bozeman C.B.D., and then focus in specifically on the application of the policies to the thesis area.

Land Use

PROBLEMS

1. Deterioration is taking place adjacent to the commercial area due to lack of incentive for redevelopment and to restrictive by-laws which encourage decentralization.

ALTERNATIVES

Rather than encourage apartment buildings on the periphery of the community, redevelopment of the commercial area and adjacent land should be encouraged. This must be carefully incorporated into the shopping and parking area as well as the existing adjacent residential area, to provide a proper transition between them. The provision of higher population density adjacent to shops is beneficial to both the shopkeepers and apartment residents and makes the provision of parking for the two mutually more acceptable.

APPLICATION TO THESIS AREA

1. Provide a parking structure north of the thesis site directly across Mendenhall.
2. Incorporate multi-use with the study area including housing, a restaurant, pedestrian pathways and a public plaza.

Traffic and Pedestrian Ways

PROBLEMS

1. One-way traffic couplet.
2. Heavy traffic through alleys.
3. Lack of adequate parking.
4. Lack of proper pedestrian system separate from roadways.

ALTERNATIVES

1. Due to political problems and ramifications, the correction of the one-way couplet is not suggested at this time.
2. Through traffic in the alleys should be either discouraged or made safe.
3. Parking for all shoppers, workers, and residents of the central business district must be provided.
4. Pedestrian paths separate from vehicular traffic systems should be provided to connect parking, commercial and residential areas. Pathways must have a definite origin and destination.

APPLICATION TO THESIS AREA

1. The accessibility to the site will have to be through the existing traffic flow patterns.
2. Through traffic in this alley should be prohibited and the space made more pedestrian oriented. Provisions shall be made for service and emergency vehicles.
3. Parking can be adequately provided in a parking structure located directly north across Mendenhall from the thesis site. There is also an existing street level parking lot west of and adjacent to the thesis site across Black Street. (Figure 8)

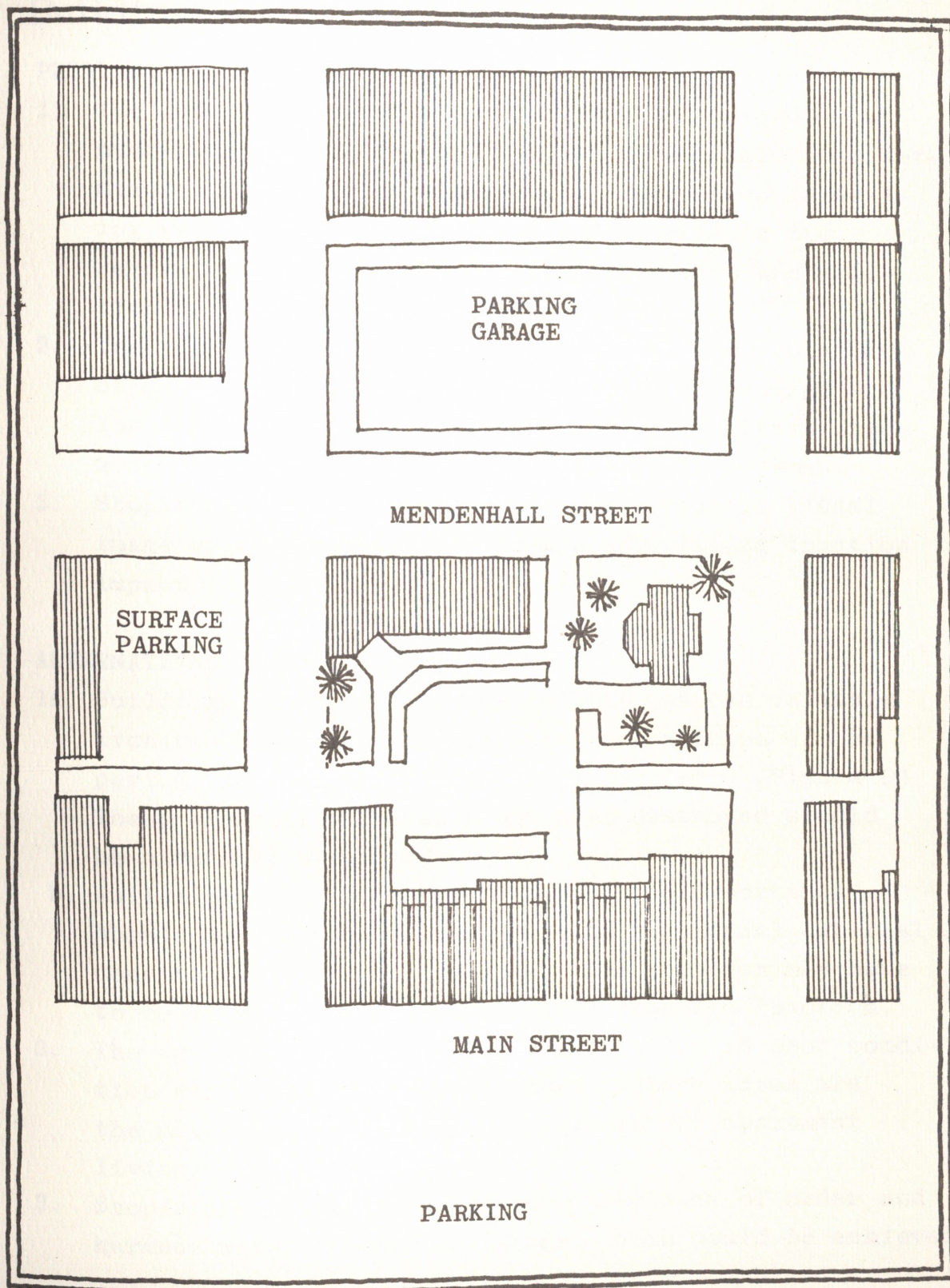


FIGURE 8

Buildings

PROBLEMS

1. The deterioration of older buildings may be due to a number of factors, including lack of economic considerations, necessary knowledge, and imagination in dealing with the older structures and results in the removal of valuable architectural elements and addition of poor design features.
2. The rear areas of shops pose a special problem. Lack of maintenance, inadequate provision for storage and loading, and absence of landscaping makes these areas some of the visually most undesirable in Bozeman.
3. Shopfronts and their signs present a chaotic visual image which damages their common advertising function impact.

ALTERNATIVES

- 1a. Buildings constructed prior to 1920 possess valuable architectural elements produced by craftsmen of the period, and now are rapidly disappearing. (Figure 9) These elements which have not been destroyed should be carefully preserved.
- b. Buildings of architectural or historic importance should be kept and restored to their original external condition, if at all possible. The interior may have to be adjusted to a more suitable economic function.
2. The areas behind the shopping street are in poor condition and prime for redevelopment. These areas are the most capable of providing convenient apartment living.
3. Shopfronts should maintain some semblance of order and harmony with adjacent buildings. This could be achieved

by restoration of traditional cornices in their original historical framework. The signs, including those overhanging the street, can be objects of beauty and the unifying element, if they are well designed.

APPLICATION TO THESIS AREA

1. Front architectural facades that have not already been destroyed should be preserved. Artificial materials which have been applied over the years should be removed to reveal the original materials where possible.
2. The back facades should be renovated by steam cleaning the brick and developing the original facade openings for display areas adjacent to pedestrian pathways. A solution for redevelopment is to provide a completely designed environment, front and back, making practical use of the entire property. The whole block then becomes a complex of many uses, including multi-family housings, commercial and public plaza.
3. All signage must be sensitively designed to fit the building and the total block environment.

Streets and Landscape

PROBLEMS

1. The C.B.D. is almost devoid of plant life.
2. Poles and wires clutter the landscape.
3. Lighting is usually either insufficient (side streets and alleys) or over provided (in the fashion of a free-way).

ALTERNATIVES

- 1a. In considering the kinds of trees that should be used in each location, it is important to choose trees that are suited to the particular environment. (Example: Evergreen bushes do not survive well near reflective hard surfaces.)
- b. Large trees to give shade should be used carefully so as not to completely cut out the sun from buildings or yards.
- c. Bushes and low-growing trees can be used to define space and create privacy.
- d. Trees and bushes can be used to create outdoor rooms partly formed by the buildings themselves.
- e. The following is a preliminary guide to suitable species and general placement.¹¹
 - 1) Trees near pavement traveled by vehicles:
 - *Seedless Green Ash (Summit)
 - Silver Maple
 - *Schwedler Maple
 - *Norway Maple
 - *Little Leaf or Redmond Linden (north exposure)
 - *Hackberry

- 2) Trees in areas away from vehicles:
 - *Cut Leaf Weeping Birch (north exposure)
 - Green Ash
 - Schwedler Maple
 - Norway Maple
 - *Thornless Honeylocust
 - Russian Olive
 - *Colorado Spruce
 - *Scotch Pine
 - Austrian Pine
- 3) Ornamental trees in sheltered locations:
 - *Mountain Ash
 - River or Paper Birch
 - Clump Paper Birch
 - Honeylocust
 - Concolor Fir (grows very large)
 - Schwedler Maple
- 4) Smaller flowering trees:
 - *Flowering Crabapple
 - Japanese Tree Lilac
 - *Mountain Ash
 - Mayday Tree
 - Newport Plum
- 5) Shrubs for screening:
 - *Catoneaster
 - Caragana
 - *Rose Tree of China (*Prunus triloba*)
 - Dogwood
 - Honeysuckle
 - *Alpine Currant
 - Highbush Cranberry
 - Russian Olive
 - *Amur Maple
 - Balleana Poplar (large)

Uchny Arbowitae

Evergreens could be used, though they are expensive and can be easily damaged by dogs.

6) Shrubs with interesting foliage:

*Variegated Dogwood (in shade)

Yellowtwig Dogwood (in shade)

Spireas

Golden Elder

*Purple Leaf Plum (prunus cistena)

*Euonymus (excellent fall colors)

Amur Maple

Sumac

7) Flowering Shrubs:

*Lilacs

Mockorange

*Snowball

Hydrangia (not very hardy)

Spireas

*Flowering Almond

*Potentilla

8) Ground Covers

*Potentilla

*Ajuga (in shady areas)

9) Grass:

*Kentucky blue-grass (best for heavy traffic)

All listed plants grow well in Bozeman. Those designated with * are extremely well suited to the thesis site.¹²

- f. Maintenance of appearances for the boundaries between landscape materials should be clear and sharp, and consistent with the dominant architectural lines set by the buildings.

2. Electric and telephone wires should be buried wherever feasible.
3. Lighting should be designed to match its purpose.
 - a. preventing accidents
 - b. dissuading vandalism
 - c. lighting buildings and landscape for scenic purposes
4. All items of street furniture (waste bins, mailboxes, planters, seating, etc.) should be well designed, simple in form, functional, durable and inconspicuous.
5. Water, if used, should be an integral part of the landscape.

APPLICATION TO THESIS AREA

1. Fortunately, the study block is blessed with several large trees and hedges. Landscaping in the new areas should be incorporated into the existing fabric as outlined under Alternatives.
2. All utilities are proposed to be buried.
3. Lighting and all street furniture should be incorporated in the design.

THE THESIS SITE

THE THESIS SITE

Natural Features

TOPOGRAPHY

The site gently slopes from south to north with an average drop in grade of six feet.

SOILS

The soils in this area are of the Bozeman and Bridger Series. They have a moderately thick loam surface and thick clayey subsoil. The subsoil is underlain by calcareous stoney gravels and loams to a depth of 60 inches.¹³

HYDROLOGY

The hydrology deals with the analysis of water based on groundwater, surface water, and the probability of flooding. The groundwater on the site is from 3-10 feet of the surface. There is no problem with surface water due to the slope of the land, nor is the site within the flood plain.¹⁴

LIMITATIONS

The limitations are present due to the combination of the water and soil conditions. A severe limitation is present in septic waste disposal use for reasons of potential groundwater pollution. Since central sewage treatment can serve the area, the factor of groundwater pollution is diminished and the severe limitation is upgraded to slight.¹⁵

A severe limitation is present in building foundations with basements due to the short distance to groundwater. However, after checking with the building owners on this block (some

with stone and concrete foundations and others with dirt)
I was informed that they have had no problems with water
even in years of severe flooding.

UTILITIES

The availability, adequacy, and location of site utilities pose no problems at this time.

The Commercial District

The bulk of the first development in Bozeman took place along Main Street in the form of fairly non-descript buildings. However, during the last of the nineteenth century most of these buildings were replaced by fine brick structures, many of which still stand today.

This thesis study began with documenting the existing buildings to discern what is worth keeping and what is not. All existing buildings on the study block shall remain except the gas station on the northwest corner and the Life of Montana building. Due to the many additions and changes over the years, but most of all to its location on the block, I have decided the benefits of the design concept out-weigh the loss of this building.

This northwest corner is currently one of the sites selected by the Bozeman Parking Commission for a parking structure. I feel the land immediately north, across Mendenhall would be more suited for this purpose. The tremendous opportunity for a residential, shopping, and public plaza would be lost on this block if it were used for a parking garage.

There are some potential future problems for the downtown area. Realizing that space requirements for retail sales activities will more than double by 1995, outlying shopping centers will eventually compete with the downtown for trade. It is also projected that the demand for commercial office space will grow at a greater rate than the general economy.¹⁶

This shows the need for commercial office space and that downtown shops must compete with suburban shopping centers. People in Bozeman have to be convinced to shop downtown; an effort that will take time and ingenuity.

The commercial core of my thesis area consists of the existing buildings facing Main Street. The functions and facades of these buildings shall basically remain as they are today, with adoption of the guidelines previously stated. "Main streets have a purpose that never go out of style."¹⁷ I have no intention of changing this traditional role, or closing it off as was previously proposed.¹⁸

Documenting these existing buildings was the beginning of understanding: to give a clear picture of each building's character and growth and to find a way of guiding the new development to be compatible with the old and enhance the existing historical qualities.

The conservation of these buildings is more than the conservation of the physical environment alone but also includes a lifestyle, cultural heritage, psychological, social and economic well-being. "A sense of well-being and of viability in space and time become essential factors in urban design, aimed at community coherence and self-awareness for the individual."¹⁹

Conservation accommodates change - it serves to direct change, not stop it. It can focus the attention on the values of the existing townscape.

The following are ways to approach conservation:²⁰

- The original design, materials, and details should be used whenever possible.
- A facade should not be made to look older than it actually is.
- The introduction of modern materials must be done with extreme care so as not to violate the original intent of the building.

This is to protect and conserve the elements of our community that are important and alleviate the fear that everything familiar is disappearing.

However, architectural facelifts and simple refurbishing of downtown districts have not been in the past and are not now enough to entice shoppers from suburban malls.²¹

Many shoppers are "addicted" to the enclosed, climate controlled mall where everything is under one roof, with skylights, indoor plants and fountains.

This complex can adopt some of the same marketing and managerial actions that make malls so effective. It must offer a good mix of retail, restaurant and service establishments.

With control of Main Street divided among many hands, there is no organizer to coordinate tenant mix to insure quality of merchandising or to enforce quality of design. Successful merchants are injured by their less aggressive or less diligent neighbors. Effective joint action on matters of security, maintenance, extended hours, and promotion of the area as a whole through special events and coordinated, well designed advertising is difficult to sustain.²²

However, it is possible to achieve success through these merchandising efforts with the cooperation of merchants, property owners, local bankers and citizens.

Therefore, the commercial viability on this block is achieved by melding some suburban marketing concepts within an urban location, enhanced by its historic structures.

This is obtained through the concept of an enclosed mall rather than an open-air pedestrian mall, which have not been successful. The pedestrian mall is a continuation of the main pedestrian axis through the commercial complex (at the present location of the Crystal Bar). The axis is accented by a skylight along its length - a skylight of extremely delicate and transparent architecture strongly contrasting the older massive buildings. Shops open off this axis in an area which is the present Pines Cafe. (Figure 10)

Laterally the pedestrian mall connects shops along the rear of the buildings. This is actually an arcade achieved through the use of the original openings. (Figure 10)

It is different from the suburban mall in that there are many existing windows - not the windowless box structure surrounded by parking lots. There is a minimum of corners and maximum open vistas to the outside.

The rear shop facades could appear drab from the outside because they are in the shade (Figures 11 and 12) and because the openings are quite small due to the nature of the old buildings. These shops could be expanded out onto the plaza

with white wood window frames and transparent windows flooding light from the interior through the displays to the exterior. This would emphasize the contrast between the opaqueness of the brick and the transparency of the glass.

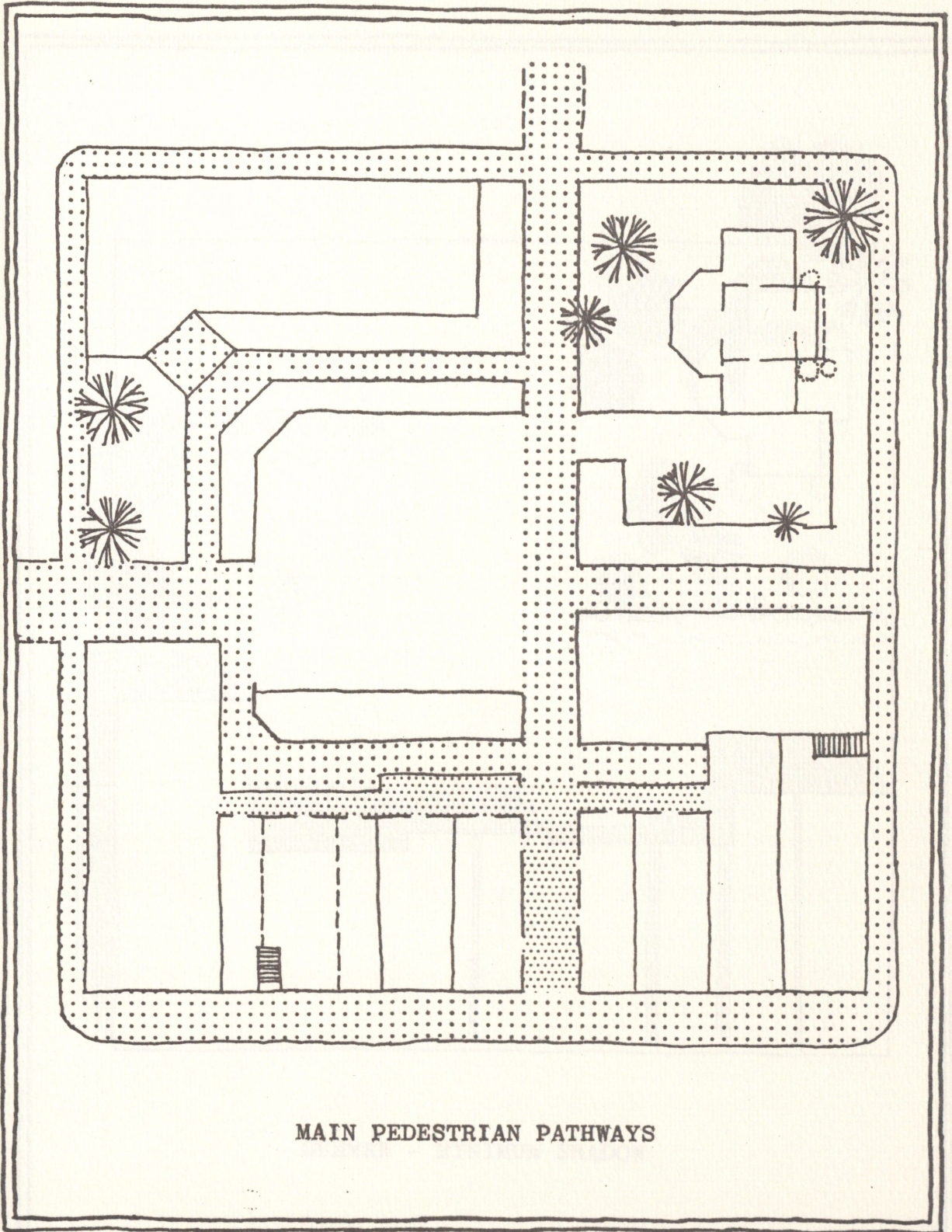
A complex such as this can literally change shopping patterns. It will draw from residents who now drive to the suburban malls and during the noon hour and late afternoon, becomes a focal point for people working downtown.

Commercially, visual improvements are directly related to economic indicators.

If rehabilitation does not increase sales volume, profits or the number of tourists visiting shops, it will not be attempted by other merchants.

Due to so many shopping mall failures across the country now, "'The theory is that the retail area will thrive from activity generated by other parts of a multi-use complex (i.e. offices, housing, etc.)' says Albert Susseman, Executive Vice-President of the International Council of Shopping Centers."²³

Without multi-use there is little evidence that a new downtown retail center could succeed.



MAIN PEDESTRIAN PATHWAYS

FIGURE 10

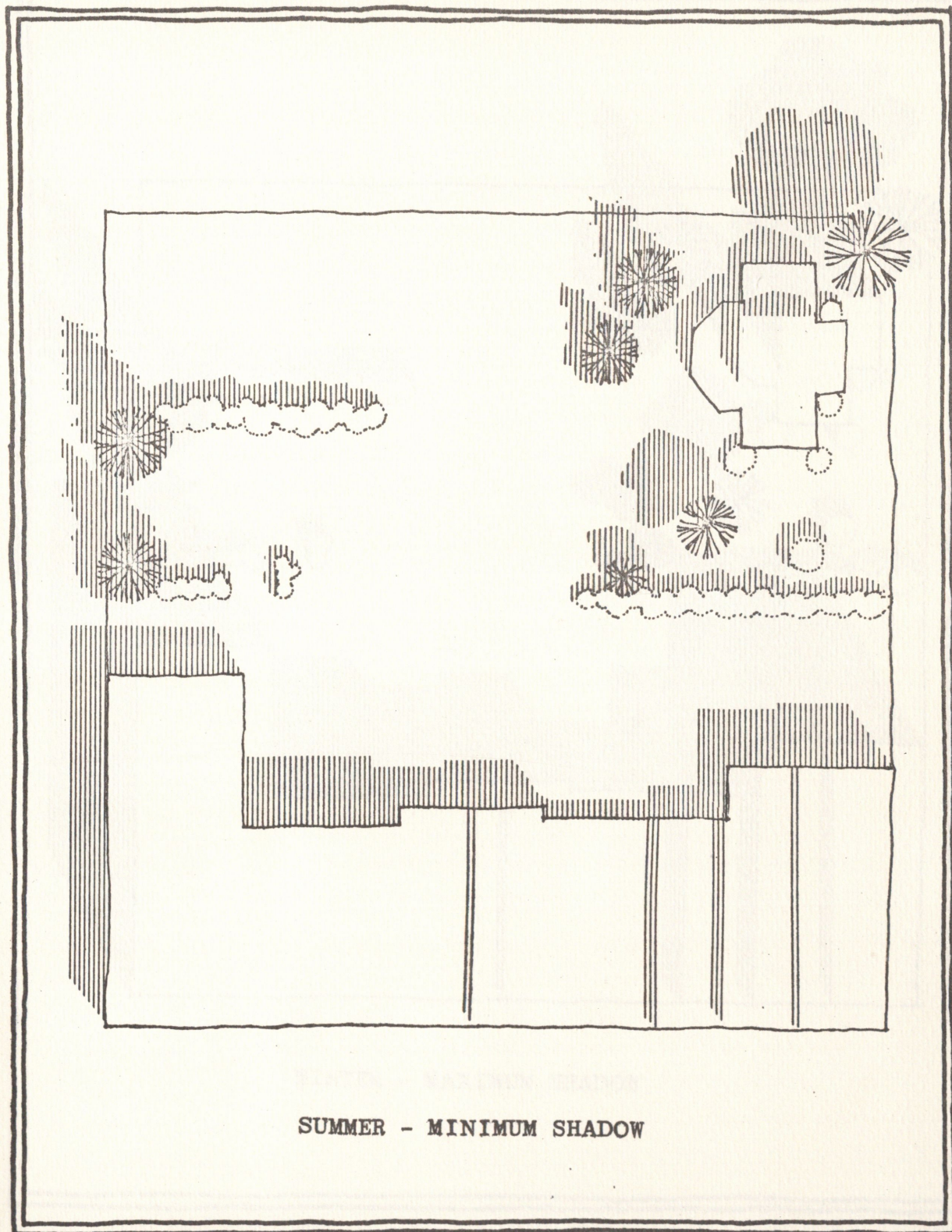
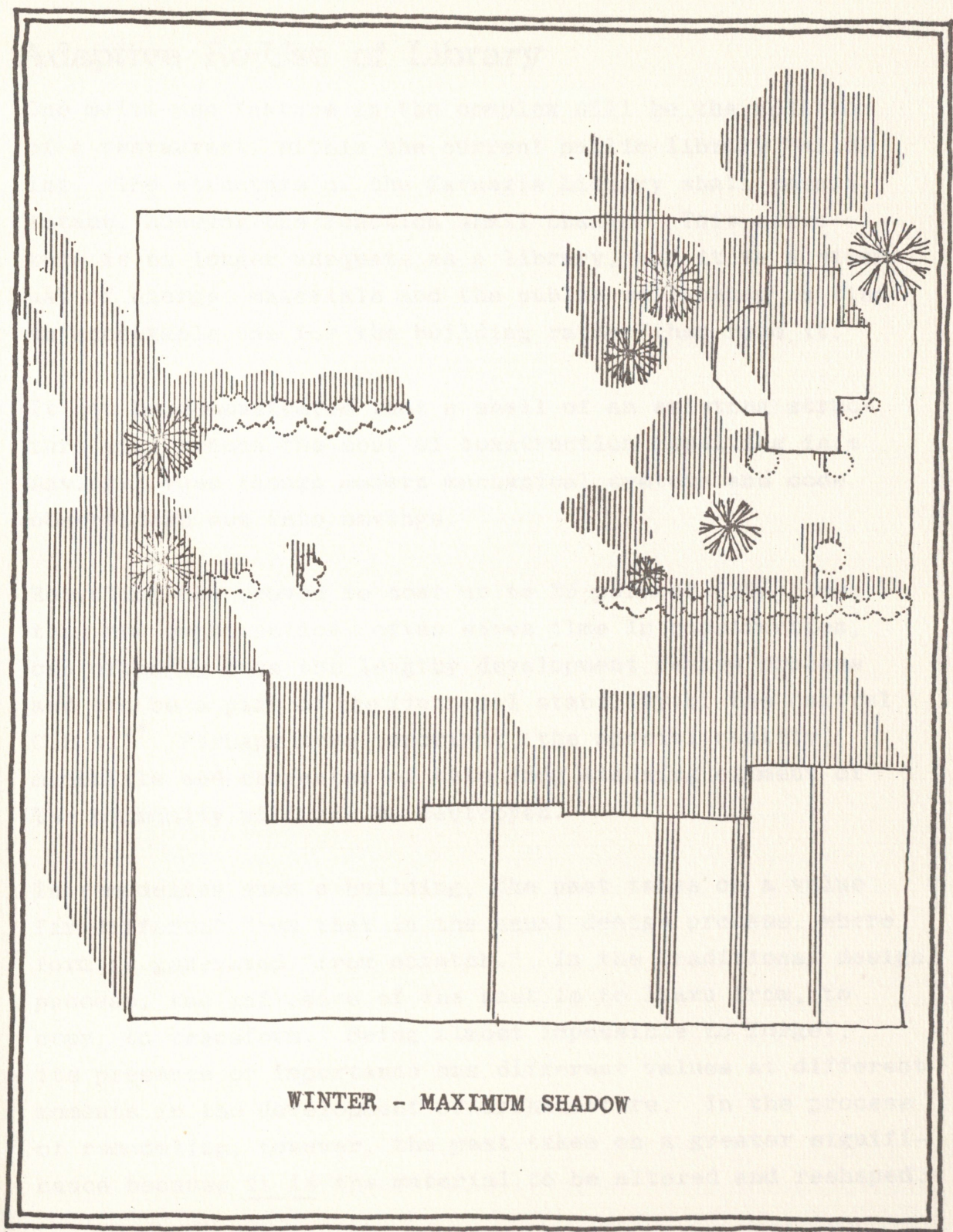


FIGURE 11



WINTER - MAXIMUM SHADOW

FIGURE 12

Adaptive Re-Use of Library

One multi-use feature in the complex will be the addition of a restaurant, within the current public library building. The structure of the Carnegie Library shall remain intact, however the function shall change. This structure is no longer adequate as a library, and it is a wiser use of energy, materials and the public well-being to find an acceptable use for the building rather than raze it.

It can be demonstrated that a shell of an existing structure will reduce the cost of construction resulting in a savings, even though modern mechanical systems and code observances cut into savings.

Recycling has proved to cost up to 25 percent (25%) less than new construction, often saves time in construction, can often by-pass the lengthy development review process and can be a part of the financial stability of the central C.B.D.²⁴ Perhaps more important, the special quality, materials and character of this long standing element of the community will not be destroyed.

In remodeling such a building, the past takes on a value far different from that in the usual design process, where form is generated "from scratch." In the traditional design process, the influence of the past is to learn from, to copy, to transform. Being almost impossible to forget, its presence or importance has different values at different moments in the development of architecture. In the process of remodeling, however, the past takes on a greater significance because it is the material to be altered and reshaped.

Housing

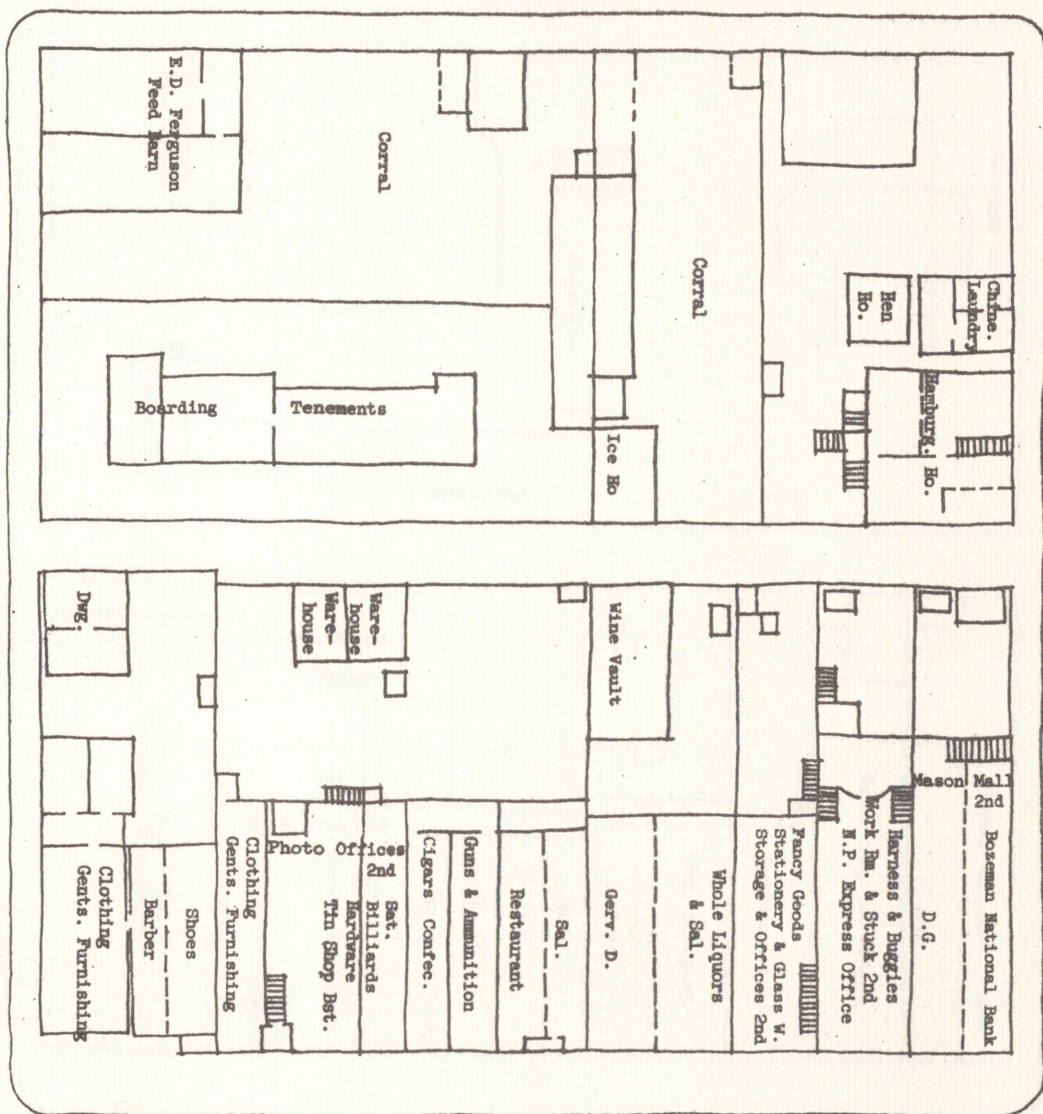
The success of redevelopment in downtown areas across this country can be explained by a number of factors, one important one being the introduction of housing. With people living in these restored areas, they become viable, alive places, not just shopping centers open from nine to six.

This concept is not new to Bozeman. Maps dating 1890, 1904, and 1912 show housing located behind the businesses on Main Street (Figures 13, 14, 15, 16 and 17). Over the years, the residential population in the downtown area has declined considerably. The need for new housing has been accommodated through the expansion of the suburbs. This has not only taken prime agricultural land out of production, encouraged urban sprawl, development, and escalated land prices, but also encouraged mass exodus. The urban limits of the city have extended to the point of lessening the desirability of using downtown.

MARKET ANALYSIS

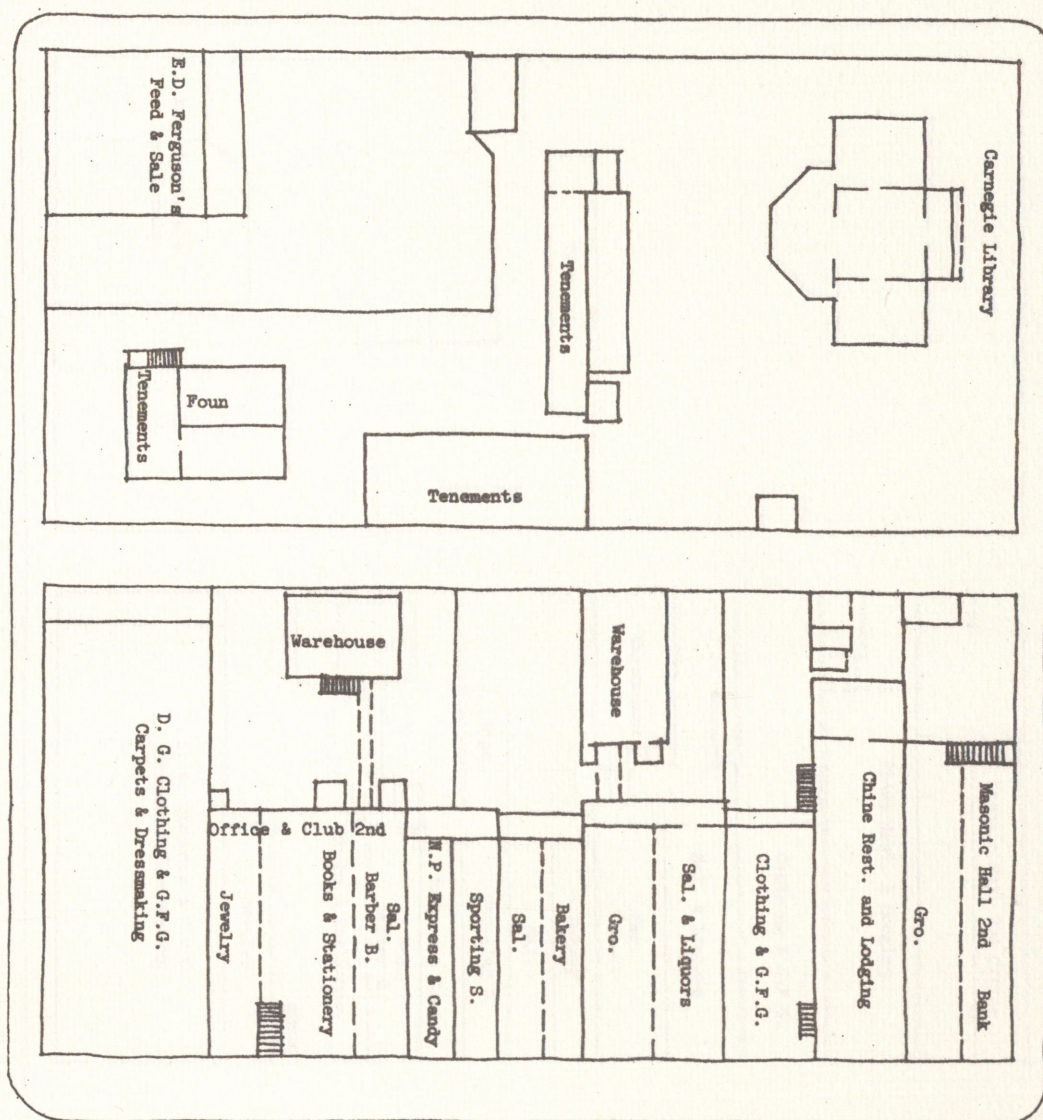
The city of Bozeman has a serious problem of providing adequate housing for low-income individuals - especially the elderly and handicapped. The 1972 Bozeman Area Master Plan outlines the problems and housing needs. A survey of dwelling units at that time revealed the north and northeast sections of the city (generally north of Main Street and east of Willson Avenue) required the most attention for housing assistance.

Due to the relative age of housing in this area [77 percent (77%) built before 1940], the majority of the housing units are either substandard or deficient. In fact, this area has



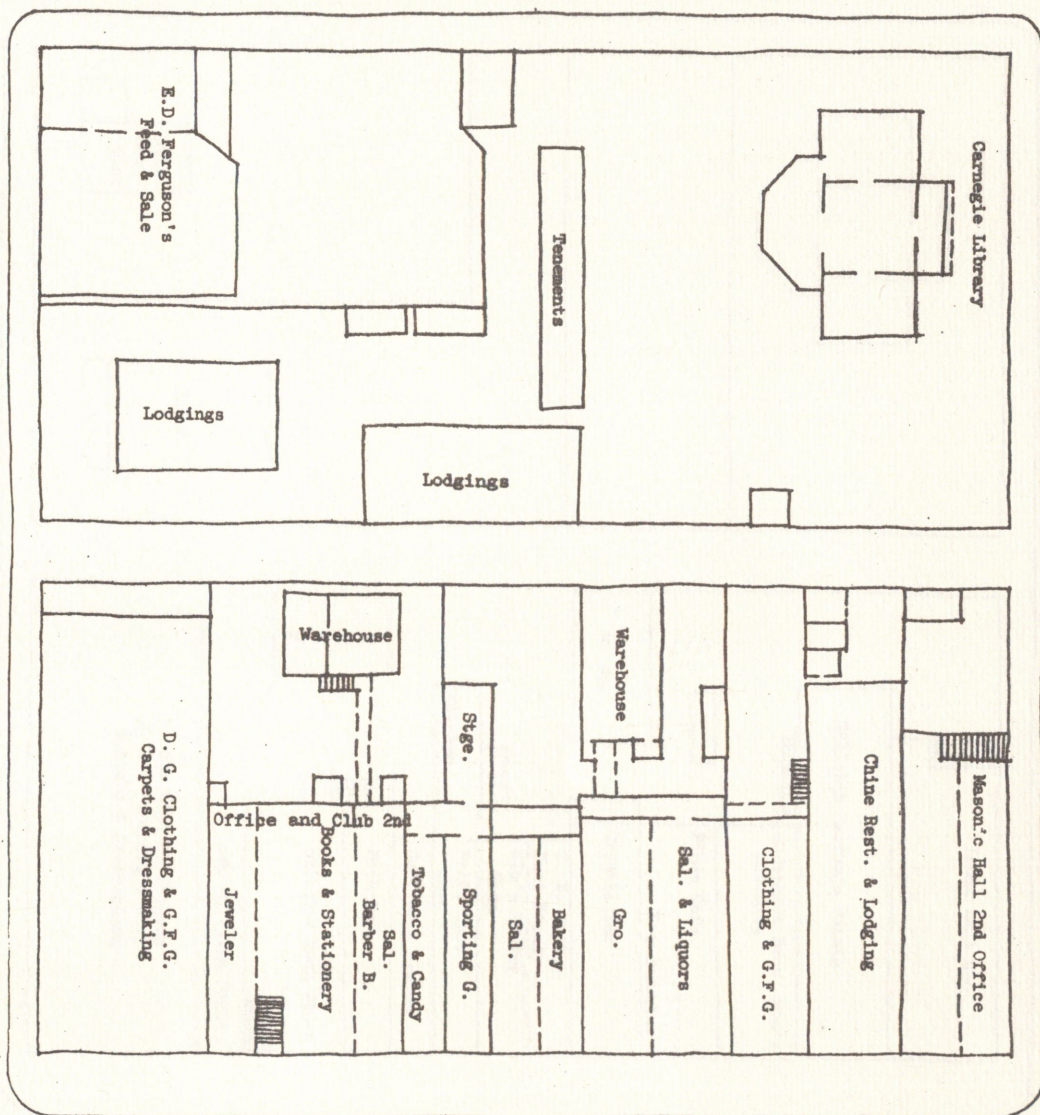
THE THESIS AREA 1890

FIGURE 13



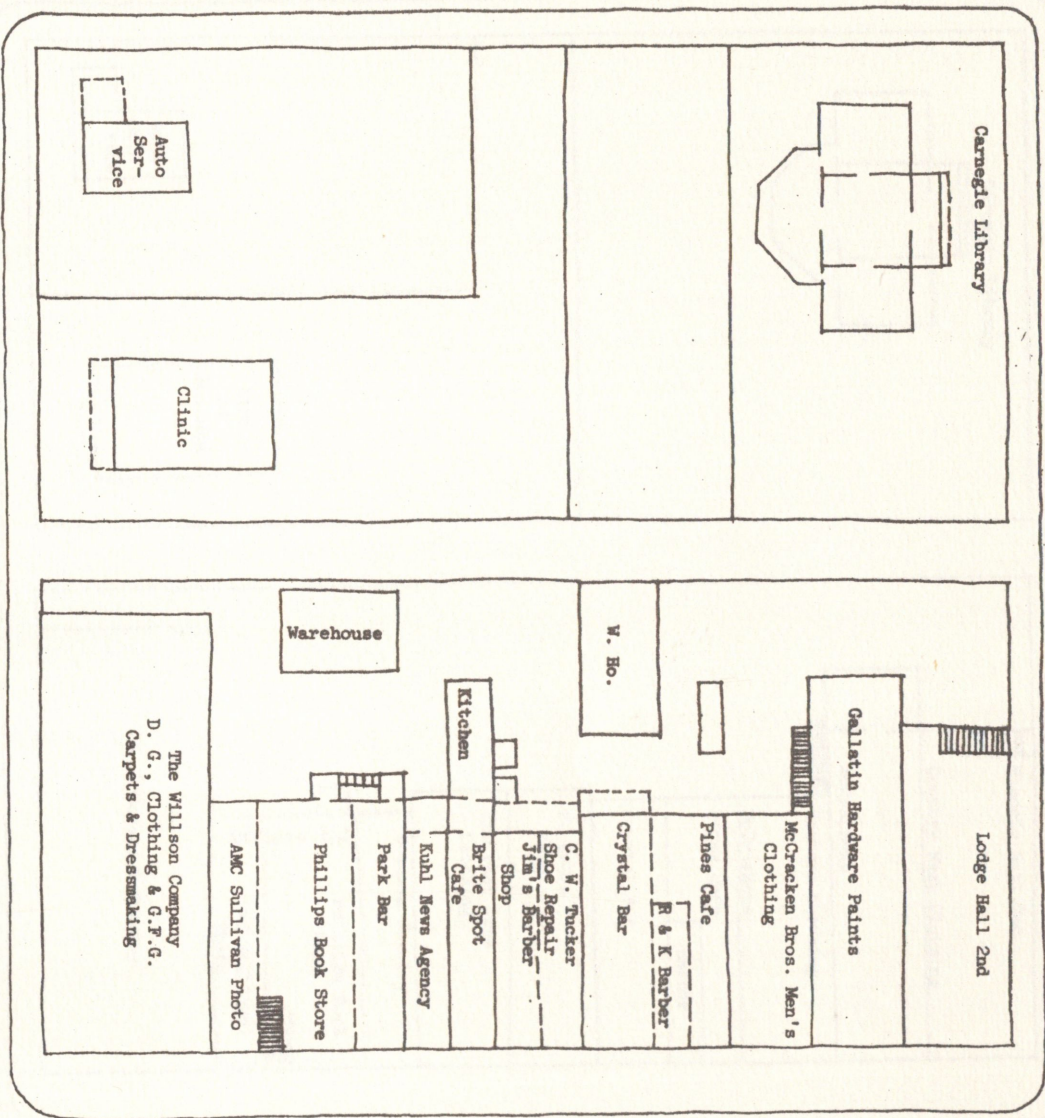
THE THESIS AREA 1904

FIGURE 14



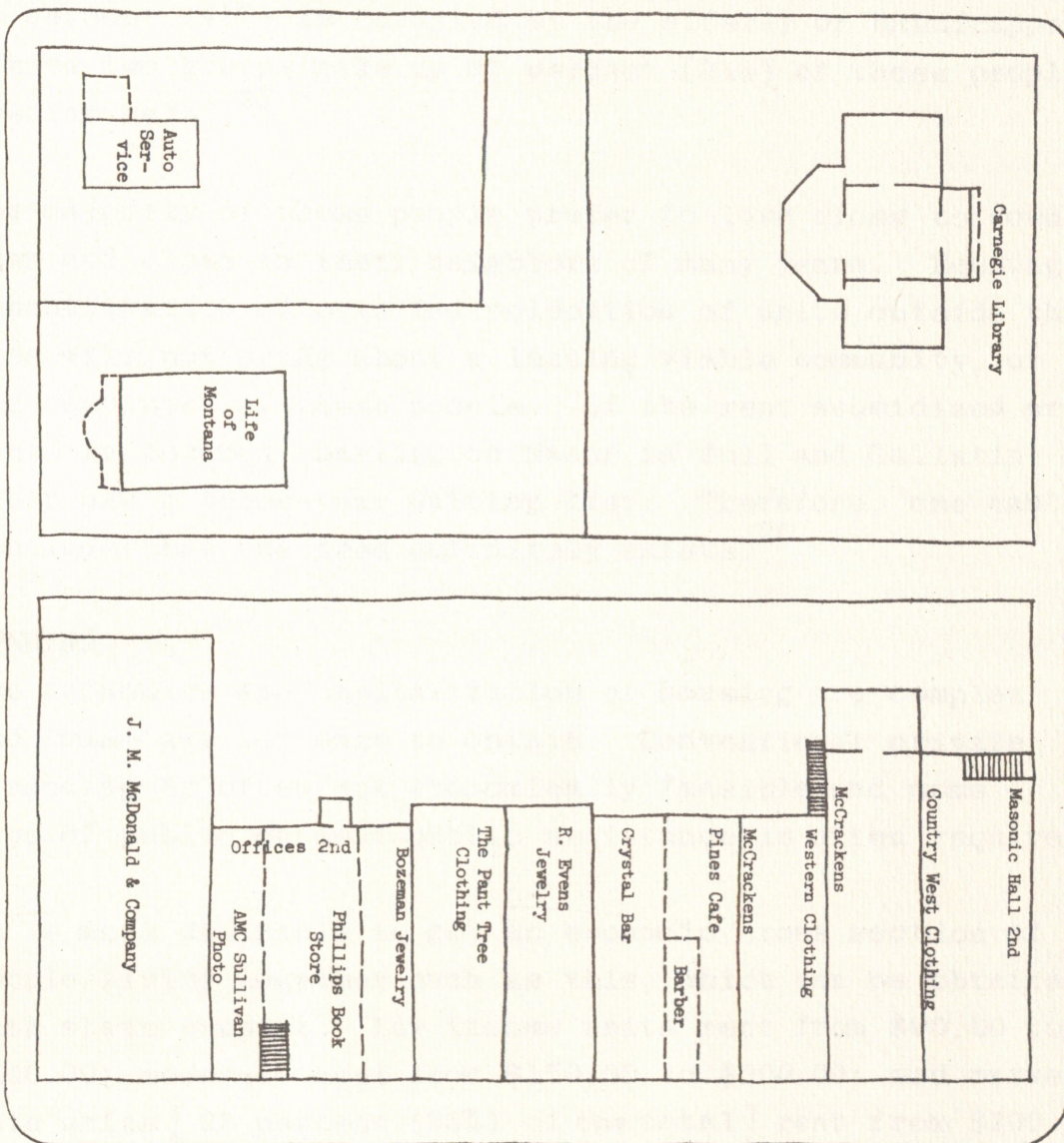
THE THESIS AREA 1912

FIGURE 15



THE THESIS AREA 1954

FIGURE 16



THE THESIS AREA 1978

FIGURE 17

75 percent (75%) of the substandard housing in Bozeman and 41 percent (41%) is occupied by the elderly or handicapped. [These two groups make up 91 percent (91%) of those people needing help].²⁵

The majority of these people prefer to live close to downtown and close to their neighbors of many years. Housing rehabilitation efforts and relocation of units outside the area will not bring about a lasting viable community, or the happiness of these people. Of the rent subsidized projects in Bozeman, Darlington Manor is full and Gallatin Manor has a three-year waiting list. Therefore, one can conclude that the need definitely exists.²⁶

FUNDING

The economics and capitalization of housing are complex and loans are not easy to obtain. Conventional private financing is often not economically feasible and some type of public or semi-public assistance is often required.

It is most desirable to get an economic cross section of people living together such as this, which can be obtained with state support. Low income units rent from \$90.00 to \$140.00; moderate rent from \$150.00 to \$200.00; and market rate units [25 percent (25%) of the total] rent from \$200.00 to \$300.00.²⁷ This would be determined by each tenant's income.

This should be a melting pot of ages: young singles, young married couples, middle aged, and older people, as well as an economic cross section.

DENSITY

Any substantial economic reasoning for the determination of the number of units in a housing development in Bozeman have been unobtainable. Most developments are governed by the amount of financing the developers can obtain rather than sound economic reasons for the number of units which will generate acceptable capital over a number of years. Most decisions are arrived at through a "gut feeling" rather than a detailed market analysis.

The City County Planning Board has just completed a housing study. However, it deals basically with the projected number of housing units needed in the future, not the economic facts needed for development. I do not have the expertise to compile such an investigation. However, after studying in detail the data from the American Legion Housing projects financed through H.U.D., I feel 40 units minimum in the proposed complex could be amortized over a reasonable length of time.

TYPE OF UNITS AND SIZE²⁸

Apartments

10 efficiency @ 320 sq. ft.	3,200
20 one bedroom @ 380 sq. ft.	7,600
10 two bedroom @ 420 sq. ft.	<u>4,200</u>
	15,000 sq. ft.
15 percent (15%) of total for corridors	<u>2,250</u>
TOTAL MINIMUM	17,250 sq. ft.

ZONING AND CODES

To an increasing degree, the philosophy of zoning is changing from one of restrictive limits and controls to an approach which attempts to lead and influence community growth.

The study area is in Zone B-3 which is limited to churches, fraternities, and sororities, single family dwellings, and multi-family dwellings of a maximum of 5 units.

Therefore, a variance of this type of redevelopment would have to be obtained.

BUILDING ACCESS

Figure 18 diagrams various means of circulation. The main access to the apartment building should be through the plaza with adequate entrances from the streets and parking.

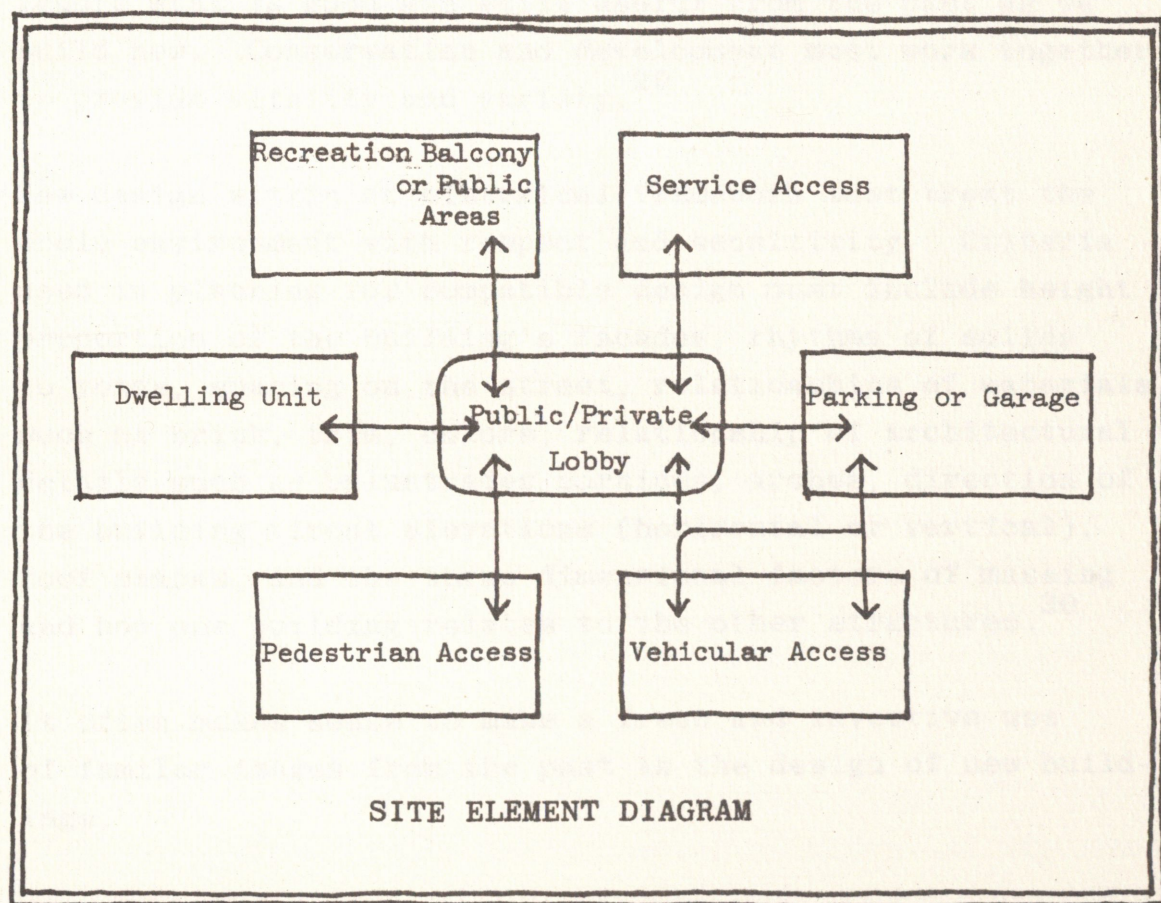


FIGURE 18

BUILDING ORIENTATION

The building orientation is influenced by a number of factors including location on the site, views, sun and prevailing wind. The priorities in this project are that as many apartments as possible have a view of the plaza and have a southern exposure. Therefore, the service core was placed in the northwest corner, and few apartments face the streets.

NEW GUIDELINES

New development can enhance older adjoining buildings. Too often in the past, we have ignored the context, scale, and character of existing buildings. We can no longer ignore what is good and still useful from the past as we build new. Conservation and development must work together to provide vitality and variety.²⁹

New design within an historical framework must treat the whole environment with respect and sensitivity. Criteria used in planning for compatible design must include height proportion of the building's facades, rhythms of solids to voids, spacing on the street, relationships of materials such as brick, trim, colors, relationship of architectural details such as balustrades, cornices, arches, direction of the building's front elevations (horizontal or vertical), roof shapes, and the three dimensional factors of massing and how one building relates to the other structures.³⁰

It often makes sense to make a fresh and inventive use of familiar images from the past in the design of new buildings.

Plaza - Park

Here is a single project composed of distinctly separate parts. It is the deliberate contrast between the parts, not some overall formal order which provides an essential character - one intended to encourage community participation.

This echoes the Renaissance Theory that any structure should stand as an entity, properly proportioned in all its parts, interior reflecting the outward theme and vice versa. Old landmarks must be preserved while new work can also be accommodated. The juxtaposition of old and new is an asset.

The buildings are important in themselves, but in the overall plan they are elements, not dominants. It is the three-dimensional park that becomes the unifying means of relating old and new, open and closed space, high and low building levels. It is also the park that supports much community participation - for arts and crafts shows, displays, etc. Open space can be used to enhance and even make possible a viable commercial development.

Within the detailed landscape of the plaza is a very simple fountain, conceived as an extension of the design of the plaza and buildings. As such it need not incorporate sculpture. The shape of the liquid abstraction is to enhance the architectural composition: a vertical accent to a horizontal facade.

The appeal of a fountain is not all visual. "Many an interior court has come alive by the splashing of water and its resounding echo."³¹

"Water
is the driver of nature
...So one might say
that it changes
into as many natures
as are the different places
through which it passes.
And as the mirror changes
with the color of its objects
so this changes
with the nature
of the place where it passes:
health-giving, harmful,
laxative, astringent
sulphurous, salt, sanguine,
depressed, raging,
yellow, green, black, blue,
oily, thick, thin.
Now it brings a conflagration,
then it extinguishes;
is warm and is cold;
now it carries away,
then it sets down,
now it hollows out,
then it raises up,
now it tears down,
then it establishes
now it fills up
and then it empties,
now it rises
and then it deepens,
now it speeds
and then lies still
...now it nourishes
and then does the contrary,
now it is salt
and then is without savor
...With time
everything changes."

Leonardo da Vinci

CONCLUSION

CONCLUSION

Contemporary architecture reflects the state of art everywhere. The Modern Movement has worked its way through its original vernacular sources. The stripped world of the International Style based as it was on plain buildings has largely run its course. It is no longer fashionable. Urbanization, inflation and resource shortages have coupled with new architectural tastes to radically modify the smooth, slick rambling structures.

Recent architectural examples make better use of the land and depend more on complexity of detail for formal interest. Brick is making a comeback, along with craftsmanship in carpentry. An architecture responsive to current regional conditions, with design elements and techniques reclaimed from the past can maintain its own kind of inventiveness and vitality.³²

The goal of the city planning should leave something which can endure in the midst of rapidly changing times and which can provide continuity to the growth of a community instead of contributing to the chaos which may eventually destroy it.³³

APPENDIX A
GUIDELINES FOR PARKING STRUCTURES

PARKING³⁴

Anytime quantities of people or traffic are attracted to an area the automobile must be accommodated. Adequate parking is provided in a proposed parking structure located adjacent to the thesis site, north across Mendenhall.

The criteria for parking should include ease of access and egress, identification of space, direct pedestrian access, economic feasibility and aesthetic appeal.

Even though the actual design of the parking structure is not within the scope of my thesis some very important guidelines are as follows:

Parking Garages

TYPICAL DESIGNS

In the following pages functional plans and design features of several self-parking facilities are presented. They are typical of the modern garage planning that has evolved during the past several years.

In Figure A-1, the plan for a twin-spiral garage is shown. The ramps, situated in opposite corners, are angled to facilitate the movement from the floors to the ramps. Entrances and exits have been provided on two streets on separate levels to take advantage of the different elevations.

The waiting area - two elevators, rest rooms, cashier's booths, and vending machines - is in the center of the garage. A retail area extends along the entire frontage

of one of the streets and has a depth of about 85 ft. The fourth level of the garage, or roof deck, extends over the retail area. Ninety-degree parking is employed throughout the facility.

A staggered-floor or split-level garage is shown in Figure A-2. The ramp systems feature separated one-way operation, and access is on only one street. The overall dimensions of the 352-space facility are 120 by 240 ft. Ninety-degree parking is utilized throughout the four floors. The cashier's booth is at the entrance, and the stairs and elevators are strategically located in the center of the facility to take advantage of the split-level and to afford minimum walking distances.

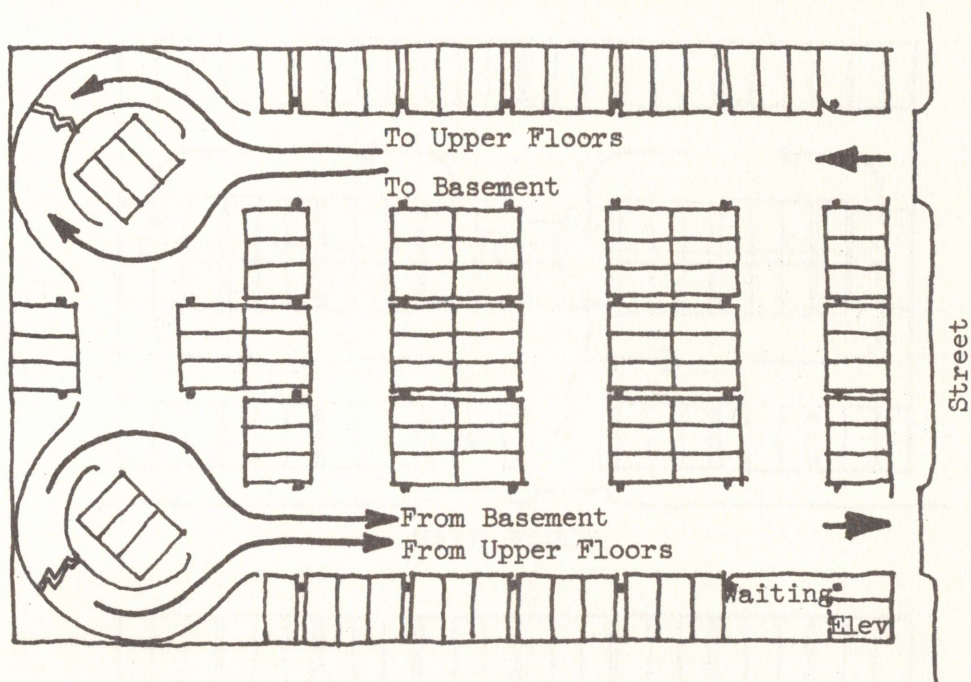
In Figure A-3 a functional plan is presented for a facility with straight ramps. The garage has one-way aisles and angle parking. Actually, a portion of the aisles is used in the floor-to-floor circulation. There are three pedestrian elevators and four stairways to serve the eight floors. Though the entrance and exit were on the same street, they are widely separated to reduce conflicts. The overall dimensions of the facility are 183 by 165 ft.

In a sloping-floor or continuous-ramp garage, the aisles serve two purposes: access to the parking stalls, and floor-to-floor circulation. In Figure A-4, a typical garage is shown which provides 90° parking. One pedestrian elevator and three stairways have been provided for the five-level facility. The entrance and exit are on one street. The direction of travel on the ramps has been reversed to reduce the conflict at the contact with the one-way street. Overall dimensions are 122 by 157 ft.

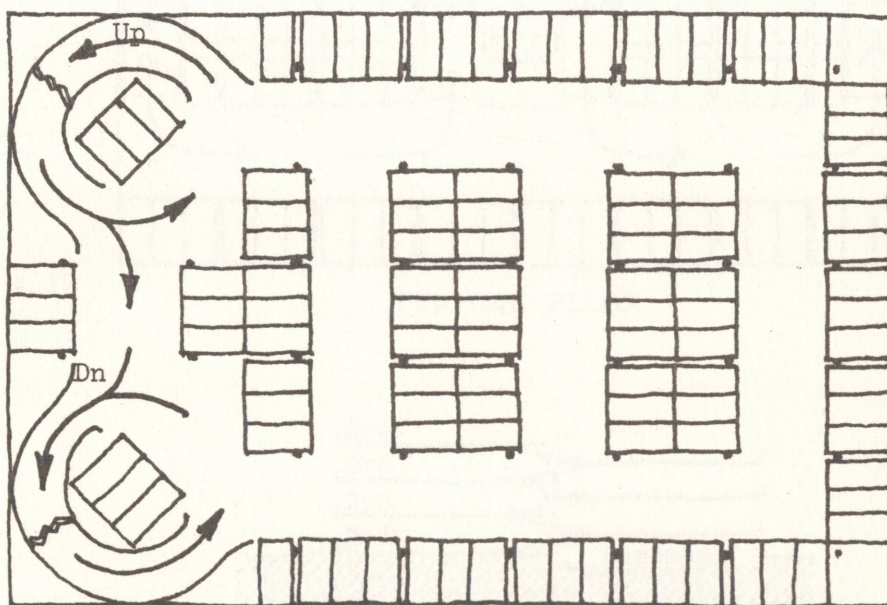
The preparation of a design for an irregular-shape site presents many problems, especially when self-parking is to be provided. An example of a good design is presented in Figure A-5, where a spiral ramp is in the center of the garage. The aisles are one-way and two-way, and 90° parking is used throughout the facility.

For the three-floor garage, there is one pedestrian elevator available at present. Plans and areas are provided for an additional elevator when warranted. There are four stairways. In the operation of the facility, an entrance has been provided on one street and two streets are used for exiting.

Many variations may be used in garage design. The previous examples are typical designs. The designs must be tailored to the available land.



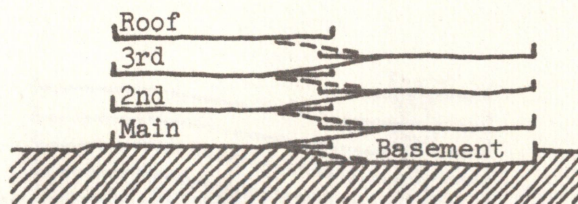
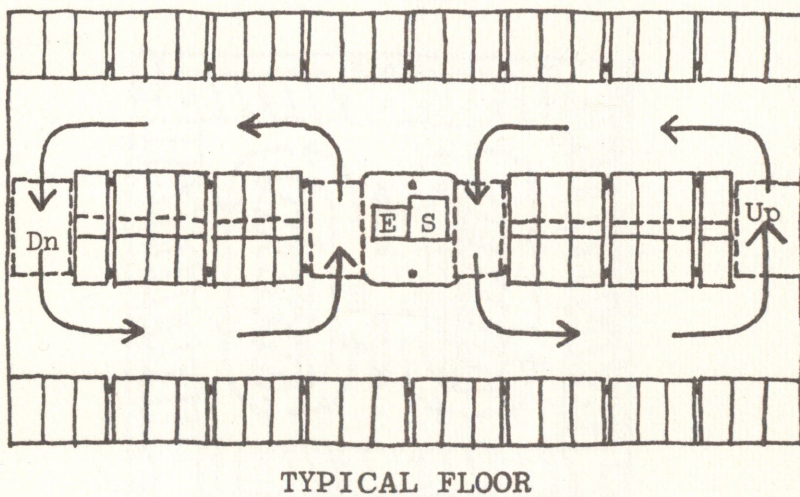
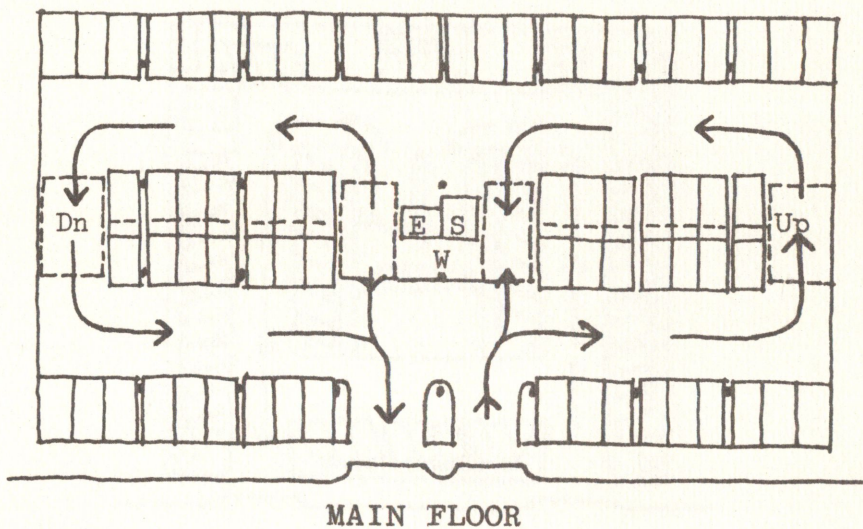
MAIN FLOOR



TYPICAL FLOOR

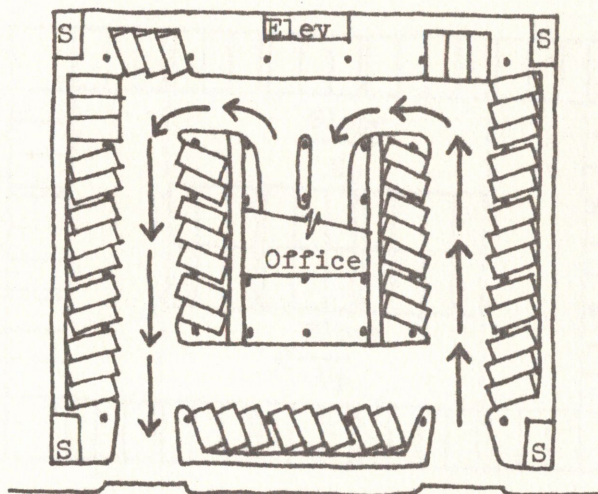
FUNCTIONAL PLAN FOR TWIN-SPIRAL GARAGE

FIGURE A-1

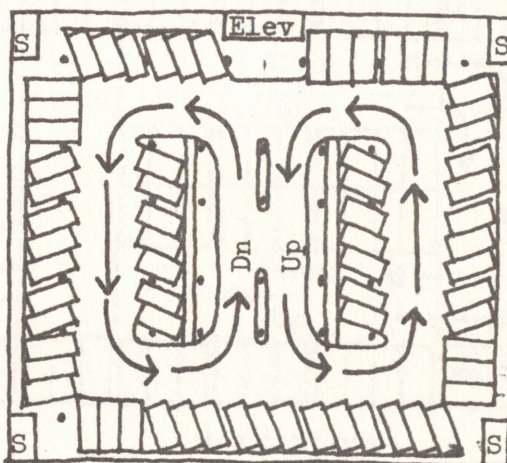


FUNCTIONAL PLAN FOR STAGGERED-FLOOR GARAGE

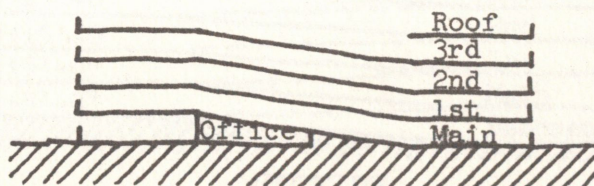
FIGURE A-2



MAIN FLOOR

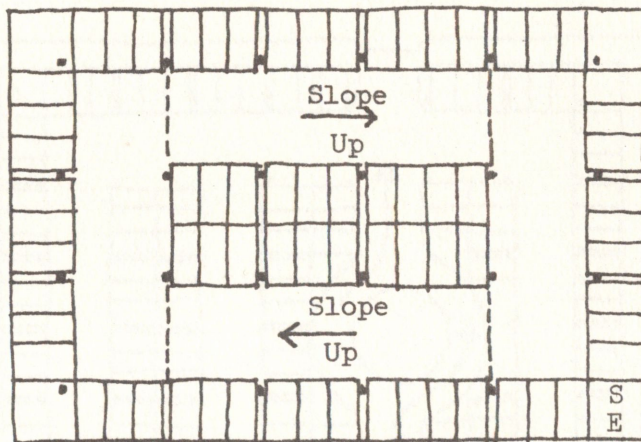


TYPICAL FLOOR

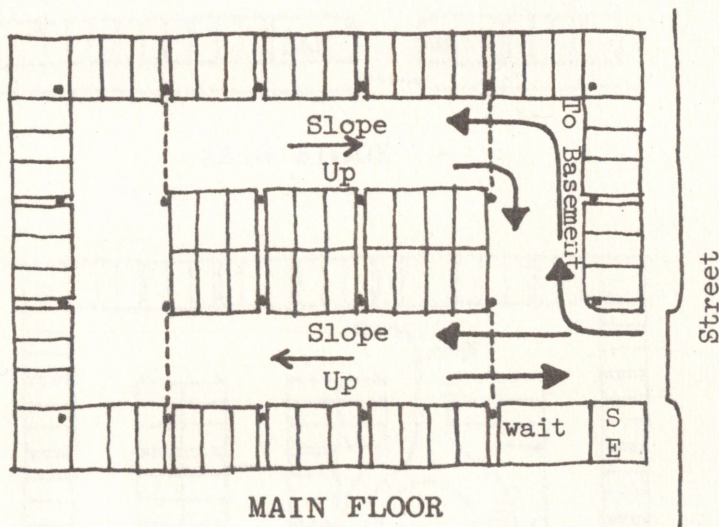


SECTION
FUNCTIONAL PLAN FOR STRAIGHT RAMP GARAGE

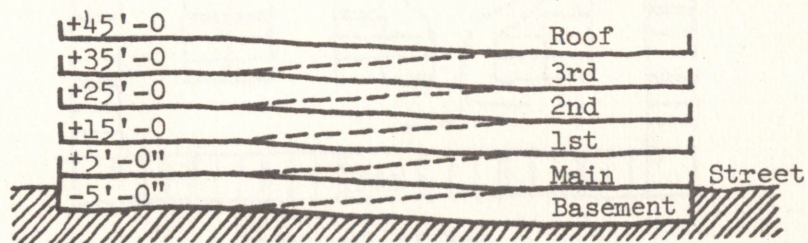
FIGURE A-3



TYPICAL PLAN



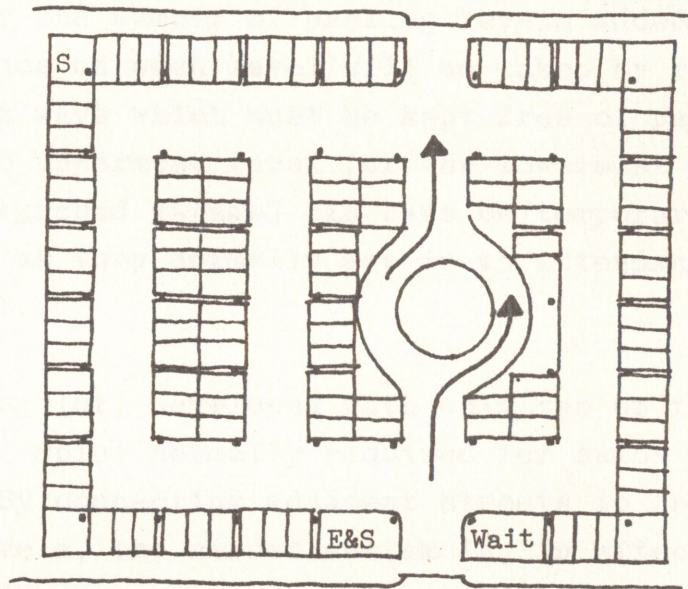
MAIN FLOOR



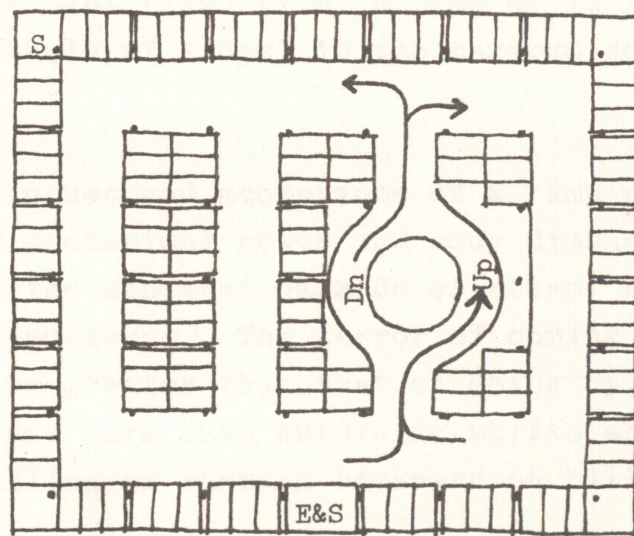
SECTION

FUNCTIONAL PLAN FOR SLOPING FLOOR GARAGE

FIGURE A-4



MAIN FLOOR



TYPICAL FLOOR

FUNCTIONAL PLAN FOR CONCENTRIC-SPIRAL GARAGE

FIGURE A-5

Ramp Garages

Ramp garages do not simply multiply the parking capacity of a lot by the number of parking levels added. Considerable space on each level will be taken by ramps and circulation ways which must be kept free of parked cars. Only on the uppermost level (or the lowermost in the case of an underground garage) can cars be temporarily stored in the aisles as they normally are in an attendant-operated parking lot.

On a sloping lot, developed with only two or three parking levels, space normally required for ramps may be reduced. By connecting adjacent streets to the different parking levels, the street system is, in effect, incorporated into the garage ramp system.

As most garages will be designed for customer self-parking, 12 percent (12%) (i.e. a rise of 12 ft in every 100, or a 7° angle of slope) is the maximum convenient ramp grade.

Actually public use and acceptance of a ramp slope depends less upon the mechanical power and body dimensions of the car than upon the apparent hazards of steep, narrow slopes, and sharp, blind turns. The terror of coming down a ramp is likely to be greater than that of going up, especially now that so many cars have automatic shifts which prevent them from stalling or running backward on hills.

To make a ramp seem less confined and hazardous, it should be one-way, well-lighted but without distracting glare, and separated from opposing traffic with a wide divider strip.

Camouflage painting devices may be used to make the slope appear less steep. Horizontal lines of reference can be obscured with wall stripes parallel to, or at a steeper angle than, the roadway. A long sight line, particularly at the upper end of a ramp, will guard against drivers hesitating. This in turn will increase speeds (without decreasing safety), and so increase the ramp's traffic capacity.

The shallower and longer the ramp, the more space it requires on each parking level. The only exception to this is where the whole garage becomes in effect a shallow-angled ramp, a wide roadway with a line of 90° parking on each side. This spirals up and around in a continuous line of warped rectangles fitted into the rectangular shell of the building.

The second factor governing ramp length is floor-to-floor height. The smaller this dimension, the shorter can be the ramps. However, the floor-to-ceiling clear height should not be less than $7\frac{1}{2}$ ft., and even this will require many radio aerials to be retracted or tied down at the garage entrance. Thin-floor structural slabs are particularly worthwhile in garage construction.

Each end of the ramp, where it joins the parking level, must be blended into the floor grade over a minimum distance of 12 ft. The sections of a modern car most likely to scrape ground at top or bottom of a slope are the long overhangs in front and rear beyond the wheelbase.

The area required for a ramp system will be most important in determining whether a given piece of land can be profitably

developed with a multistory garage structure. A floor-to-floor height of $8\frac{1}{2}$ ft. requires a 12 percent (12%) ramp 71 ft. long. Another 45 ft. beyond this will be needed for a reasonably convenient turning radius in circulation lanes on each parking floor.

So the minimum length needed for the simplest form of parking deck, with a straight ramp and on more than two levels, is 90 ft. in addition to the ramp length, which will vary according to steepness (see plan, Figure A-3).

Minimum economical width totals 108 ft. And still, with these minimum dimensions, there is a quite uneconomical ratio of circulation space to storage space on each parking floor. Only by enlarging the floor areas, which usually means enlarging the available lot size, can more storage space be served by the same amount of circulation space.

Ramp length, of course, can only be reduced by steepening the ramp angle or reducing the floor-to-floor height between parking floors. The shape of a ramp can be changed and condensed by coiling it into a helix.

Location and shape of the ramp system is particularly important on the entrance floor of attendant-operated garages. The further away the ramp from the street entrances, the larger the reservoir space, and the better the cushion against delay and congestion at periods of peak arrival.

For customer-parking garages the same standards of walking distance should apply as in parking lots: a maximum

walk of 300 ft. from parked car to garage entrance. Most important here is allowance for peak periods of inter-floor travel by customers entering or leaving.

In a large garage, customer-operated elevators may be insufficient for these peak periods. Escalators will give much better service under these conditions; but they will probably be justified only in a very large garage.

In a parking garage of three floors or less, stairs are still accepted by the public. It will, however, generally be wiser to fill the top floor with long-term parkers, who (perhaps tempted by lower monthly rates) will be more willing to make the climb.

TYPES OF RAMP GARAGES

Type of ramp garages vary widely. No one plan is best for all sites or all types of garage. The shape of the lot, anticipated parking demand, whether the garage is to be designed for parking by customers or by attendants, limitations of cost and of structure (particularly if the garage is part of another building such as an office block or an auditorium)--all are important factors when deciding what is the most efficient type of ramp design for the job.

APPENDIX B
GUIDELINES FOR APARTMENTS

APARTMENTS³⁵

Structural Systems

CONCRETE

The most common structural system presently employed for medium- to high-rise apartment construction is flat-plate cast-in-place reinforced concrete with randomly placed columns. This structural approach has certain advantages which make it particularly adaptable to apartment construction. (See Figure B-1.)

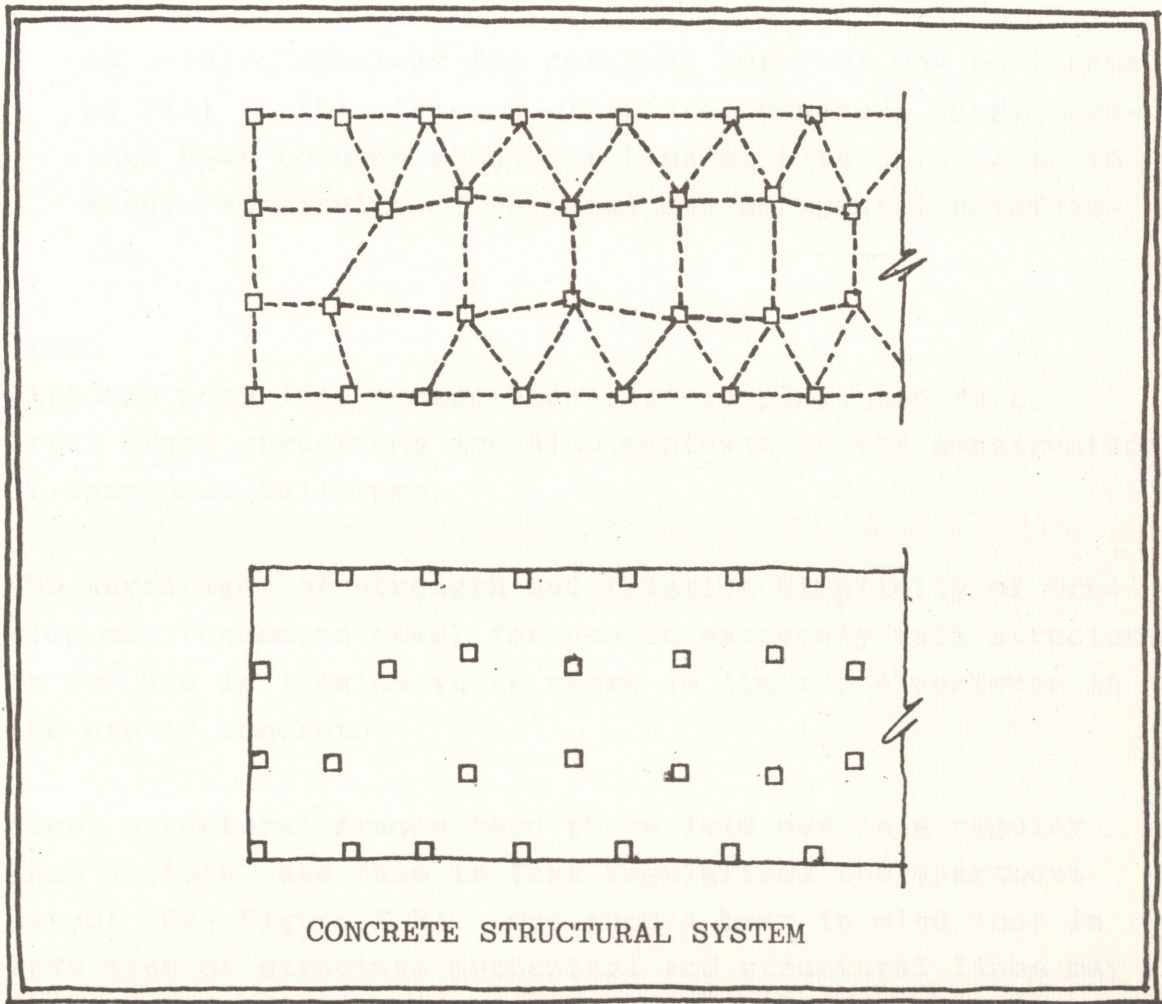


FIGURE B-1

1. The horizontal services normally required in apartment construction may be imbedded within the concrete slab, thereby eliminating the need for a hung ceiling and allowing the flat underside of the slab to serve as the finished ceiling of the space below. This reduces floor-to-floor and overall building height and eliminates the separate construction of a hung ceiling.
2. The possibility of placing columns randomly adapts well to the inherently irregular module generated by a typical apartment floor layout. Columns may thus be "buried" in convenient locations within an efficient layout.
3. As a rule, openings for vertical services may be located at will in this type of structure; however, large openings near columns should be handled with care so as to assure continuity of vertical and horizontal reinforcing.

STEEL

Although much less common than cast-in-place concrete, steel frame structures are also employed in the construction of apartment buildings.

The advantages of strength and relative simplicity of erection may recommend steel for use in extremely tall structures or for use in locales where there is limited experience in the use of concrete.

Steel structural frames tend to be laid out in a regular grid pattern, and this in turn regularizes the apartment layout (See Figure B-2). One should bear in mind that in this type of structure mechanical and structural lines may not coincide.

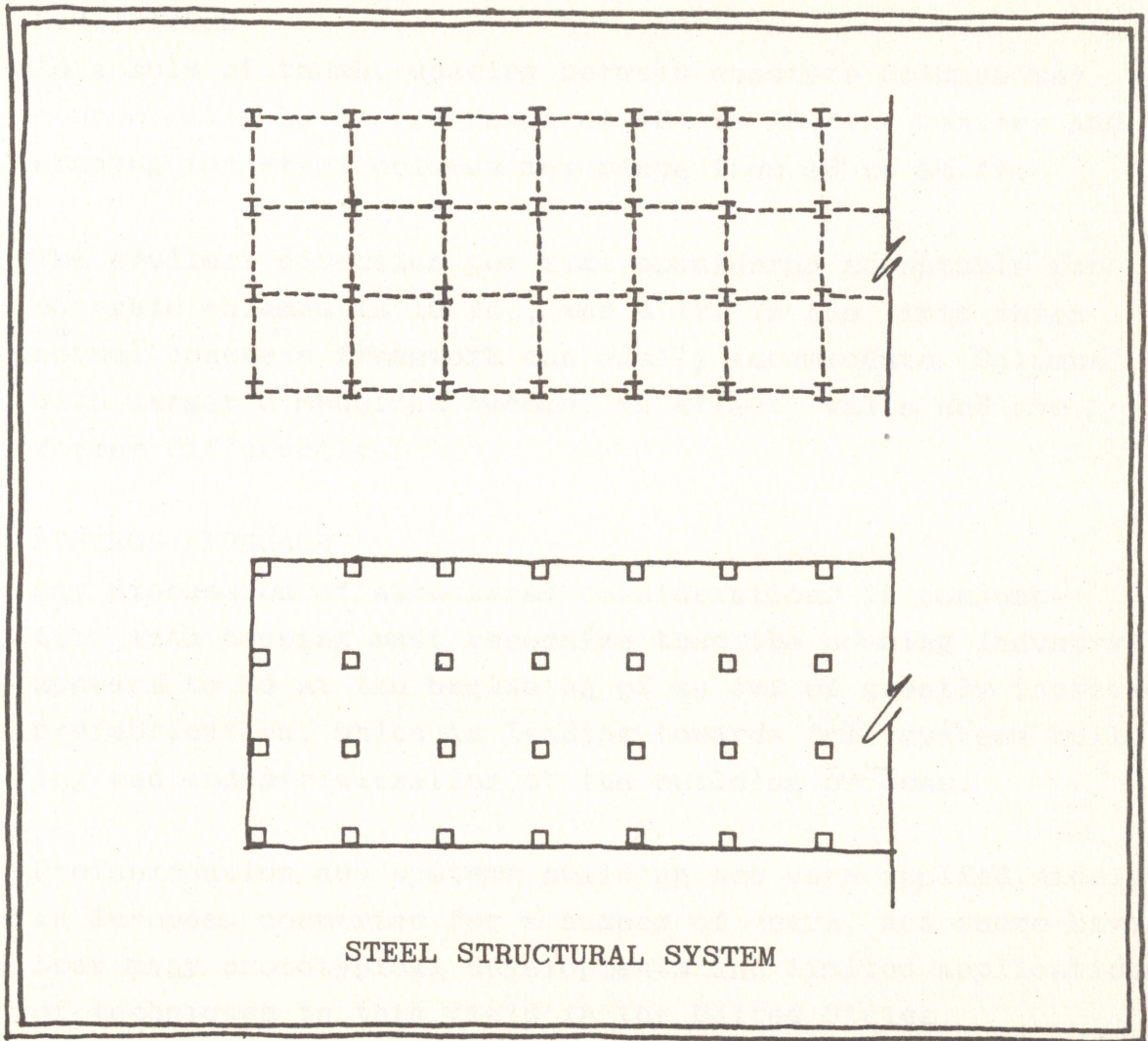


FIGURE B-2

LIMITATIONS

As a rule of thumb, spacing between concrete columns may economically be in the range of 12- to 18-ft. Centers and spacing for steel columns may range from 16 to 24 ft.

The smallest dimension per side considered acceptable for concrete columns is 10 in., and 4 ft. is the limit which normal concrete framework can easily accommodate. Columns with larger dimensions become, in effect, walls and are formed differently.

SYSTEMS APPROACH

Any discussion of structural considerations in conjunction with housing must recognize that the housing industry appears to be at the beginning of an era of greatly increased prefabrication, which is leading towards full systems building and industrialization of the building process.

Prefabrication and systems building has been applied widely in European countries for a number of years, and there have been many prototypical developments and limited applications of techniques in this field in the United States.

It is anticipated that, within the foreseeable future, virtually all European housing will be the product of some type of system. It would appear inevitable that progress toward industrialized construction will likewise continue in the United States.

At what precise point the utilization of systems building will become a major consideration in apartment design and what system or systems will survive to become a standard

of the future is uncertain; however, it is a significantly growing field.

Of the number of systems which are presently available, the following categories may be drawn:

1. Steel or concrete frame with precast planks, self-formed concrete deck or metal deck.
2. Poured-in-place concrete tiers utilizing special reusable forms for traverse walls or columns.
3. Long-span or short-span precast panel/plank and bearing wall.
4. Prefabricated floor-size truss or beam systems with clear span capabilities.
5. Preassembled modules, prepared off site or on site, for stacking or insertion in a structural frame.

Any proposal to use a building system should be preceded by a thorough investigation as to availability, code and market acceptability, union acceptability, adaptability to minor variations, and guarantees regarding erected costs.

Vertical Services

ELEVATORS

There are four variables involved in elevator selection:

1. Travel distance
2. Elevator speed
3. Elevator capacity
4. Building population

For the type of building proposed, one elevator is sufficient, with 144 ft. second waiting time limit allowed by FHA for single elevator systems.

EGRESS AND SAFETY

Except in rare circumstances, relatively little in the realm of egress and safety is left to the discretion of the architect. In general, the architect may choose only among accepted and approved procedures as set down in codes.

In most codes, two means of egress must be provided within specified distances from each dwelling unit except in the case of duplexes, which frequently require an additional means of egress off the corridors, usually by means of an escape balcony.

A scissor stair is an arrangement which allows for construction of two stairs in one fire enclosure. This is an efficient and cost-saving solution to the two egress requirements. Most codes, however, effectively preclude the use of scissor stairs, in many cases by limiting the allowable length of dead-end corridors. Fire escapes are usually required for construction that is not fire-proof; and sprinklers, smoke doors, fire detectors, and alarms are additionally required for various classifications of construction in some codes.

PLUMBING

Vertical plumbing risers and waste lines (or "plumbing stacks") are expensive due to both material and labor costs. Reduction in the number of stacks saves money and is, therefore, to a greater or lesser extent advantageous and advisable.

Reduction in the number of plumbing stacks is accomplished by doubling or even tripling up on each stack at each floor.

VENTILATION

Interior space such as bathrooms, interior kitchens, and public halls require mechanical exhausting.

HEATING AND COOLING

In most cases, planning and spatial layout are not significantly influenced by heating and/or cooling units and their lines of supply. The most common exception is the case in which ducts deliver conditioned air from either a central source or a unit in the apartment. In such a case, ducts may be of such size as to become a planning factor. Otherwise, heating or cooling units are served either by hot and/or chilled water pipes or electric conduit.

Determination of a Typical Floor

GENERAL

It is generally desirable to group vertical services such as the elevator, incinerator or refuse chute, flue, stand-pipe, and if possible, stairs so as to minimize above-roof construction. Stairs may be spaced to avoid corridors with lengthy dead ends. Efficiency apartments, probably with higher-than-average late-night traffic, may be best located near the elevator. Multi-bedroom apartments are best located at corners. Larger multi-bedroom units lay out more compactly with two exposures. Larger apartments at corners also can cut down on required public corridor.

An attempt should be made to back up similar units, such as bedrooms, as well as similar mechanical services. Community balcony, laundry, vending machines, pram storage, or tenant storage may be provided at each floor or only on certain floors. A janitor's closet is usually located on each floor at the refuse room. If the corridor has no window, mechanical ventilation is indicated. Delivery and exhaust ducts should be planned to be remote from one another.

First-Floor Organization

GENERAL

The first floor of an apartment building fulfills a number of different program requirements. It serves as a connection between the dwelling portion of a building and the outdoors; it relates and interacts with both the outdoor functions and the dwelling units; and, further, it accommodates the physical transition between the dwelling units and the first floor.

Figure B-3 illustrates possible interrelationships of floor functions with both the outdoors and the dwelling units.

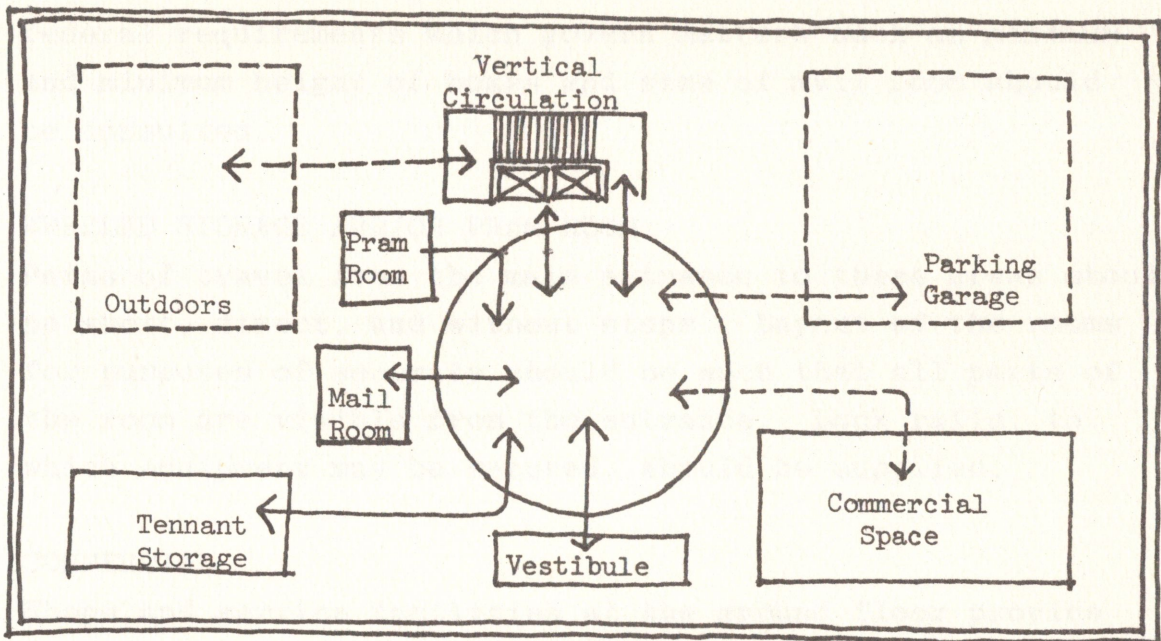


FIGURE B-3

VERTICAL CIRCULATION CORE

For purposes of security and convenience, elevators should be well illuminated and visible from the lobby area. At least one exit stair should empty directly to the outside (but not necessarily at the lobby level).

It should be borne in mind that the stair layout in the lobby will frequently differ from a typical floor due to a greater first-floor ceiling height.

MAIL ROOM

Mailboxes should be highly visible. If boxes are rear-loading, a locked room behind the boxes should be provided for the mailman's use. Front-loading boxes require no such room. However, in either case, an additional secure area for packages and deliveries may be advised. Current

federal requirements which govern matters such as maximum and minimum height of boxes and size of mail room should be consulted.

WHEELED STORAGE AND/OR PRAM ROOM

Paths of travel from the main entrance to these areas should be short, direct, and without steps. Layout of the rooms for purposes of security should be such that all parts of the room are visible from the entrance. Lock rails, to which equipment may be secured, should be supplied.

COMMERCIAL

Shops and service facilities at the ground floor provide many advantages in terms of activity and convenience. However, much of the advantage to the building may be diminished if the shops face away from the lobby and provide either no access or poor back-door access from the apartment building itself. On the other hand, easy circulation between a commercial establishment and the lobby may cause security problems which must be considered.

LAUNDRY AND COMMUNITY ROOM

Laundries and community rooms are frequently found at the first floor for convenient servicing and public access and in order to utilize the additional story height. These facilities should be on a short, direct path from elevators, with as little cross circulation with other activities as possible.

Laundries may be located either on typical floors or in a penthouse in conjunction with the community room.

Location of laundry rooms on typical floors has the advantage of convenience which, however, is offset by difficulties of multiple maintenance and problems of odor and noise.

APPENDIX C
GUIDELINES - HOUSING FOR THE AGED

HOUSING FOR THE AGED³⁶

Since the research indicated the need for housing for the aged, these guidelines have been incorporated.

In the coming years, a greater proportion of houses, apartments, and institutional accommodations will be built for elderly persons than at any previous time in our history. There are several reasons for this. First is the well-known fact that the life-span of mankind has increased through advances in medical science; thus the proportion of older people in the population has increased. Second, with the passing of the three-generation household, more elderly persons are living by themselves and therefore require separate housing accommodations. Third, increased social security benefits and private pension payments have enabled more aged people to pay for suitable accommodations. Finally, many nonprofit groups such as church, labor, and fraternal organizations, charitably supported groups, and tax-supported bodies are, and will continue to be engaged in the provision of housing specifically for the elderly.

Certain basic psychological and sociological principles should be observed in planning for the elderly. People in this age group usually do not want to break their ties with family and neighborhood and be placed in a new and foreign environment. They need activities, not merely hobbies, and they want to participate in community functions. The objectives, programs, and physical facilities for the housing of the aged should encourage and support the continuance of earlier patterns of living, daily routines, personal care habits, social contacts, and recreational activities. An important objective is to maintain independent living as long as possible.

Neighborhood and Site

A desirable neighborhood for the elderly should have many of the characteristics of any good neighborhood. It should possess the normal range of community facilities, have convenient public transportation, and be removed from particularly objectionable land uses. In terms of the individual aged person, the ideal neighborhood is often the one in which he has lived most of his life. The development of a broad program and the selection of a particular site should give consideration to old established neighborhoods where many of the aged are likely to be living and to have their roots.

From the point of view of the community itself, there are also many advantages in housing the aged in well-established neighborhoods, where there are more existing facilities and generally better public transportation. Another advantage which is frequently overlooked, is the sympathy and help that are extended to the aged by friends and neighbors, young and old alike.

The selection of an actual site involves the following considerations:

1. The topography should be as level as possible to minimize the need for steep walks, ramps, or stairs. Relatively level sites encourage walking—a highly desirable exercise.
2. The site should not be bounded on all sides by major traffic arteries. It should be possible to go shopping or to the park without having to cross a major street.
3. Essential commercial facilities should be close at hand and easily accessible—supermarkets, cleaners, laundries, shoe repair shops, drug stores, and the like.

4. Basic community facilities such as churches, libraries, health services, and recreation facilities should also be close at hand. In this connection it should be noted that a half-mile is the maximum walking radius of many aged persons.
5. Public transportation should be immediately available at the site, since many of the services that the aged require, such as specialized medical attention, will in all likelihood be located elsewhere. Transportation is also important for obtaining part-time work, for visiting distant relatives or friends, and generally for maintaining a spirit of self-sufficiency.
6. The site should not be immediately adjacent to a school building or a children's playground.
7. The site should be large enough to permit the development of adequate outdoor areas for both active and passive recreation. Ideally, these areas would be in addition to, and out of the way of, those areas used by other residents, particularly children.
8. Consideration should also be given to possible changes in the overall land use pattern, in terms of probable trends and projected plans.

These considerations must be taken into account whether the site is to accommodate solely aged persons or whether the aged represent only a portion of a larger "project" population.

Design and Planning

In very general terms the criteria for planning housing accommodations for the aged are:

1. Small size and compactness for convenience and economy.
2. Fireproof construction planned for maximum safety.
3. Minimizing of the problems and effort of housekeeping and daily activities.
4. "Livability," pleasantness, and the effect of spaciousness.
5. A high degree of privacy.
6. Careful avoidance of an institutional look.

LEISURE AREAS

Because the aged are generally retired, a comfortable and pleasant living area is highly important. Particular pains should be taken in the design of these spaces because they are not only intensively used but also tend to be quite small. Some suggested state standards, for example, call for living areas of 80 to 90 sq. ft. for single-person occupancy. Interesting views and southern exposure should be provided if possible. Extra-wide window stools for plants and built-in shelves and storage spaces are desirable. Privacy from the front door should be provided. If a dining area is included as a part of the living area, it should permit location of the table by a window. A light and/or a convenience outlet should be easily accessible to the table.

SLEEPING AREAS

A separate bedroom is necessary for two-person occupancy, but a sleeping alcove or a combined living-sleeping arrangement is often satisfactory for single persons. The separate

bedroom should always be large enough to accommodate twin beds, and it is often desirable to be able to divide the room in two with a screen.

A combined living-sleeping arrangement is the most economical in terms of space but has the disadvantages of lack of privacy and a tendency to be untidy. The sleeping alcove is a generally satisfactory compromise, since it offers almost the same economy as the combined arrangement but without its drawbacks. The alcove should be large enough to accommodate all the essential items of any sleeping area—bed, night table, storage chest, closet, and chair—and it should be possible to close off this area from the living area if desired. There should always be an operable window in the alcove for light and ventilation.

Regardless of which arrangement is used, certain details should receive attention: adequate space should be provided in bedrooms for getting into bed from either side, making the bed, using the dresser or chest of drawers, cleaning the room, using the closet, and dressing.

To provide for this degree of comfort and convenience, the bedroom must be about 11 ft. 2 in. wide and 9 ft. 10 in. or 19 ft. 4 in. long, depending on whether space is provided at the foot of the bed for dressing or just for opening the closet door. If twin beds are to be used, the width of the room would need to be increased to 15 ft. This could give space for two twin beds, each 39 in. wide, with 22 in. between them.

In the case of two-person occupancy, whenever more space is available, 3 ft. is often recommended as the clear distance between beds, and some agencies recommend an allowance of at least 5 ft. at one side of the bed for a wheelchair.

Whenever possible, there should also be space for an over-size table to hold medicines, water, tissues, and the like in large quantities.

The plan should permit placement of the bed so that a bedridden person can see out the window.

It is often desirable to provide a bell or buzzer near the bed so that a person can summon assistance.

In close proximity to the bed there should be a convenience outlet which is hooked up with a switch at the door or the entrance to the space. Thus a bed lamp could serve as the essential nightlight. Because of the two-way switching possible, this arrangement is preferable to the use of a single-switch ceiling or wall fixture.

There must be a short and direct access from the bed to the bathroom.

BATHROOMS

Bathrooms for older people should be ample in size and planned for safety. Many of the elderly need assistance in the bathroom, so the room should be large enough to permit one person to help another. For a person in a wheelchair, the bathroom should be large enough that he can maneuver the chair, and the doorway must be 3 ft. wide.

The location of the bathroom in relation to the bedroom, as well as other rooms of the house, must be given special consideration. If possible, one should be able to get into the bathroom without having to go around furniture or through other rooms.

A minimum area of 35 to 40 sq. ft. is acceptable but, because of the possibility that crutches or wheelchairs may need to be accommodated, 50 to 60 sq. ft. is often recommended.

Bathrooms without windows are acceptable and have some advantages for the older person. Ventilation is easily controlled by a switch. In a bathroom with an outside wall and window, avoid—if possible—placing the bathtub under the window, because it is difficult to open the window and to clean and curtain it. But if that is the only possible location, then select a crack-type window.

A lavatory installed at a height of 33 in. is more comfortable to use than one installed at the customary 31-in. height. For a person in a wheelchair, however, the 31-in. height is better. Lavatories should be well-supported, to hold a person's weight.

The shower and tub faucets should be placed so that a person can reach them easily both before and after stepping into the tub. Showers should have mixing controls, preferably thermostatic, and it would be well to have a testing spout where the mixture of hot and cold water could be tested for showers and tub baths. Design shower stalls without curbs, using a sliding door or other firmly installed and safe closure, and a seat, either built-in or

removable, is desirable for both tub and shower. The tub should have a low side and flat, non-slip bottom.

The toilet should be placed next to the tub (if a tub is used) so it can be used as a seat when filling the tub or simply for resting, and grab bars should be provided at the toilet and tub or shower.

All grab bars and hand holds should be of noncorrosive material, 3/4 to 1 in. in diameter, and mounted to withstand a pull of at least 500 lbs.

Towel racks and rods should also be strong and securely mounted because older people sometimes use them as grab bars to steady themselves. Glass towel rods should not be used.

Medicine cabinets should be extra large and preferably recessed. Projecting accessories should be avoided whenever possible. It should be possible to unlock the door from the outside in an emergency.

KITCHEN

Because kitchens are potentially as dangerous as bathrooms, equal care should be given to their layout and design. In locating the kitchen in the plan, provide easy access to the outside and direct access to the dining space, which could be a portion of the living room. In some plans, space can be provided in the kitchens for dining. In these cases, however, an additional 20 to 40 sq. ft. are necessary. Interior locations are acceptable if mechanical ventilation is provided.

Do not plan extremely compact kitchens for older people; they desire and need ample work space. If the kitchen is too compact, storage space is limited and much of it is either too high or too low to be reached comfortably. Shelves should be no higher than 68 in. from the floor, and no lower than 12 in. Too little counter space leads to crowded work surfaces, which in turn can create hazardous working conditions.

Clearance between facing equipment and counters should be a minimum of 3 ft. for one person. To permit two people to work and pass each other, the between-counter clearance should be $4\frac{1}{2}$ ft.

Equipment should be electric for greatest safety and should be arranged for maximum efficiency. Ranges should be provided with front rather than back controls. Heating elements should visibly glow when hot. In placing the range, consider allowing extra space for ease in making minor repairs and cleaning. A wall oven set at waist height is desirable. Although refrigerators need not be larger than a 6 or 7 cu. ft. capacity, they should have a large freezing compartment and should be self-defrosting. Do not place the refrigerator too low—as under a counter. In choosing the conventional type of refrigerator, consider the amount of stooping and reaching that will be necessary.

Double sinks or sink-and-tray combinations should be provided to facilitate hand laundering. Consideration should be given to the provision of complete laundry facilities, particularly in projects. If full laundry facilities are not possible, at least drying racks should be provided.

Storage spaces should be arranged as nearly as possible so that the bulk of the regular-use items can be stored between 27 and 63 in. from the floor. Ideally, stored items should be visible as well as physically accessible. Storage spaces over ranges and refrigerators should be avoided. Sliding cabinet doors are preferable to swinging doors.

Provide adequate lighting over all work surfaces; provide an exhaust fan to assure adequate ventilation and to carry out cooking odors; select floors or floor coverings that will not absorb grease and become slippery; and provide a fire extinguisher for grease and electric fires.

CLEARANCES AND COUNTER WIDTHS

Allow at least 4 ft. between facing equipment; 4 ft. 6 in. would be better.

Storage of materials, utensils, etc. should be near the area where they are usually used—that is, the mix center, sink, range, or serve center.

DINING AREAS

The size of the dining space needed is determined by the number of people to be served; furniture including table, chairs, buffet, cabinet, and serving table; and the amount of clearance required for passage and serving.

Allow 21 to 24 in. of table space for each person. The minimum-size table at which eight adults can sit comfortably, three on each side and one at each end, is 40 in. by 72 in. The minimum size for six adults with two on each side and one at each end is 36 in. by 60 in. A round table 42 in. in diameter is minimum for four people, and 48 in. for six people.

Regardless of the size or shape of the dining table, certain minimum clearances around it should be provided. Allow 36 in. between the wall or a piece of furniture and the table in order to edge past a seated person. Serving requires 44 in. from table to wall; 32 in. is needed for rising from a chair at the table.

GENERAL STORAGE

Ample, lighted closets should be provided for clothes, linens, and miscellaneous household items. Closets should either have sliding doors or be arranged for the use of curtains or screens. Provision must also be made for general storage of bulky items, such as trunks and furniture.

Materials - Furnishings

In designing housing for the aged, special consideration must also be given to the selection of materials, hardware, and equipment. Just as a particular space arrangement can contribute materially to the comfort and safety of an elderly person, so can a particular material or item of equipment. Some criteria that should govern the selection of these items are presented below.

FLOORS

All floor surfaces should be nonslip, outside as well as inside the basic dwelling unit. In this connection, apparent slipperiness is as important, because of the psychological danger, as actual slipperiness. This is particularly pertinent to the design of lobbies and other public spaces which often have large expanses of glossy, although perhaps non-slip, surface. Suitable flooring materials include unglazed tile, cork, vinyl or vinyl-asbestos tile, unwaxed wood, and

wall-to-wall carpeting. Throw rugs or deep-pile rugs are generally unsatisfactory because of the danger of tripping. Unwaxed wood floors are particularly satisfactory for the wheelchair user. Floors should be smooth and level, and particular care should be taken with highly jointed materials such as ceramic tile or brick or stone. Door thresholds and minor changes in floor level should be avoided whenever possible.

DOORS AND HARDWARE

Door openings should be 3 ft. wide to permit easy passage of wheelchairs, stretchers, and persons using crutches. Precautions should be taken to see that doors fit properly and do not stick, and thresholds should be eliminated. Bathroom doors should not have locks; provide easy latches instead. Large, easy-to-grasp doorknobs or lever-type handles should be used. Revolving and double-acting doors and automatic door closers are particularly dangerous and should be avoided. In projects, outside doors should be master-keyed and all devices which cannot be operated from the outside should be prohibited. It is also desirable to provide peepholes or vision panels. Sliding doors conserve valuable space in small units and eliminate the danger of walking into half-open doors.

WINDOWS

Whenever possible, windows should look out on an interesting view. In housing for older people, the height of the window is important, particularly in the living room, dining area, and bedroom. Sitting and looking out of the window is a daily activity for many of the elderly.

The living room windows should be low so that a person sitting in a lounge chair can see out. The bottom of the window should be no higher than 3 ft. 2 in. from the floor and can be as low as 1 ft. For window walls, it is desirable to include a guard rail at a height that will not interfere with viewing but that will give a feeling of security. To permit viewing from a standing position, the window should extend to a height of 6 ft. 8 in.

For dining areas, the eye-level zone is determined by the sitting height. The sill of the window can be 2 ft. 6 in. from the floor. For the bathroom and kitchen, the eye-level zone is set by the standing height. The opening of the window should be between 3 ft. 6 in. and 6 ft. 8 in. from the floor.

For bedrooms, one window should be low enough to permit a person in bed to look out. In addition to making the room more pleasant, a low window provides an emergency exit. The eye-level zone suggested for the dining area could also apply to bedrooms. Window arrangements that produce a uniform distribution of light are preferable to a spotty placement of openings.

Choose windows that are easily operated. Except for over the bathtub and similar locations, double-hung windows are satisfactory. But in hard-to-reach places, windows that are opened and closed by turning a crank are easier to operate. Many windows have been designed to reverse so that the exterior side of the glass can be turned to be washed from the inside. This is an important safety factor for those who find it difficult to reach or climb. Insect screens, weather stripping, and storm sash should be provided for all windows depending upon the location and climate.

A southerly orientation is most desirable, but provision should be made for shading devices. Roller shades should be avoided because of the danger involved in retrieving a released shade. Venetian blinds or draw-type draperies are preferable.

LIGHTING

Illumination levels should be approximately double those generally used in residential practice. Light sources should always be shielded. Ceiling-mounted fixtures are not recommended because of the dangers inherent in cleaning the fixtures and changing bulbs. As indicated earlier, it is highly desirable to plan lighting layouts so that lights can always be switched on from a doorway. Wall switches should control all light fixtures. Switched outlets are particularly important in bedrooms or sleeping alcoves so that the elderly person need not stumble around in the dark when looking for the switch or after turning off the light.

Place a convenience outlet for use of a night-light between bed and bath. A night-light in a central location is often useful, as are luminous switch plates. Convenience outlets should never be located less than 18 in. above the floor (30 to 40 in. above the floor is preferable).

Have the entrance well-lighted so that steps (if any) can be clearly seen and keyholes can be located.

HEATING

The aged generally require a higher temperature level than the standard; approximately 80°F. The heating system should be quick-acting and arranged to provide a uniform distribution of heat. If the aged are to be housed in

structures with younger occupants, consideration should be given to the provision of separate temperature controls or supplementary heat sources. If steam or hot water systems are used, exposed radiators and risers should be avoided. Exposed radiators under operable windows are particularly hazardous. Although cold floors are to be avoided, radiant panel floors seem to be undesirable because they aggravate conditions of impaired blood circulation in the legs.

SOUND CONTROL

While a certain degree of acoustical privacy is necessary in any building, it is perhaps more important in housing for the aged than in other residential work. There is a strong desire on the part of the aged to protect their privacy and to be assured of quiet during their rest periods and in the event of illness. Elderly occupants tend to be especially sensitive to the noise of children.

COMMUNICATIONS AND ALARM SYSTEMS

In any building devoted exclusively to housing the aged, an automatic fire alarm system should be provided. Because of the difficulties many elderly persons experience in bedrooms and bathrooms, particularly at night, it is desirable to provide some form of signaling device whereby they can summon help. Usually the device sounds in a neighboring apartment or in a resident manager's or superintendent's suite. In buildings or projects devoted exclusively to the aged, it may also be desirable to provide a conveniently located public telephone booth, since many aged cannot afford a private telephone. When installed in the dwelling, however, locate a telephone conveniently near the bed. Several outlets would be most helpful.

VERTICAL CIRCULATION

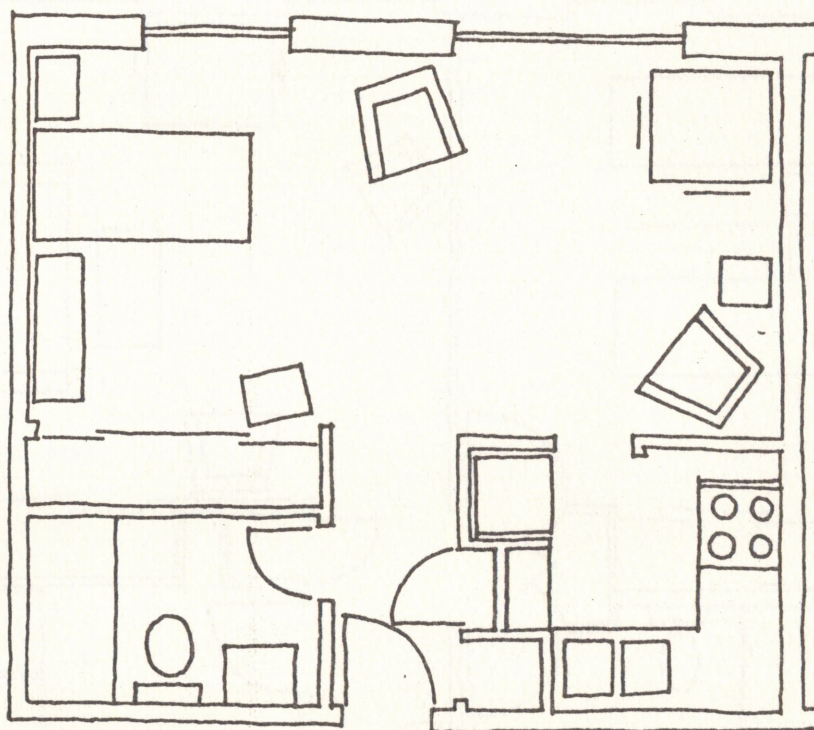
Whenever possible, accommodations for the aged should be on one level and, unless elevators are used, located on the ground floor. In the case of low buildings where elevators are uneconomical, the aged should not be expected to climb more than one flight. For small unavoidable changes in level, ramps with flat slope not over 5 percent are preferable to stairs. Where stairs must be used, the following precautions should be observed:

1. Risers should not be more than 7 in. high.
2. The proper proportion of run to rise should be scrupulously observed.
3. Fewer than two risers should be avoided.
4. Winders or curved treads should never be used.
5. Nonslip nosings should be used and should be of a contrasting color.
6. Continuous handrails should be provided on both sides of the stairs.
7. Handrails should be of the proper height, of a cross section which is easily grasped, and sturdy in appearance as well as in fact.
8. Stairs should not be less than 3 ft. 3 in. in clear width.
9. No doors should open directly onto the stairs.
10. Traffic should not cross the top or bottom of the stairs.
11. The stairs should be well lighted with shielded sources.

Some special considerations should also be observed with respect to elevators:

1. Self-operated elevators should be equipped with automatic doors.
2. A signaling device should be provided to summon assistance.
3. Continuous handrails should be provided, and if the car is sufficiently large, a small bench should be considered.

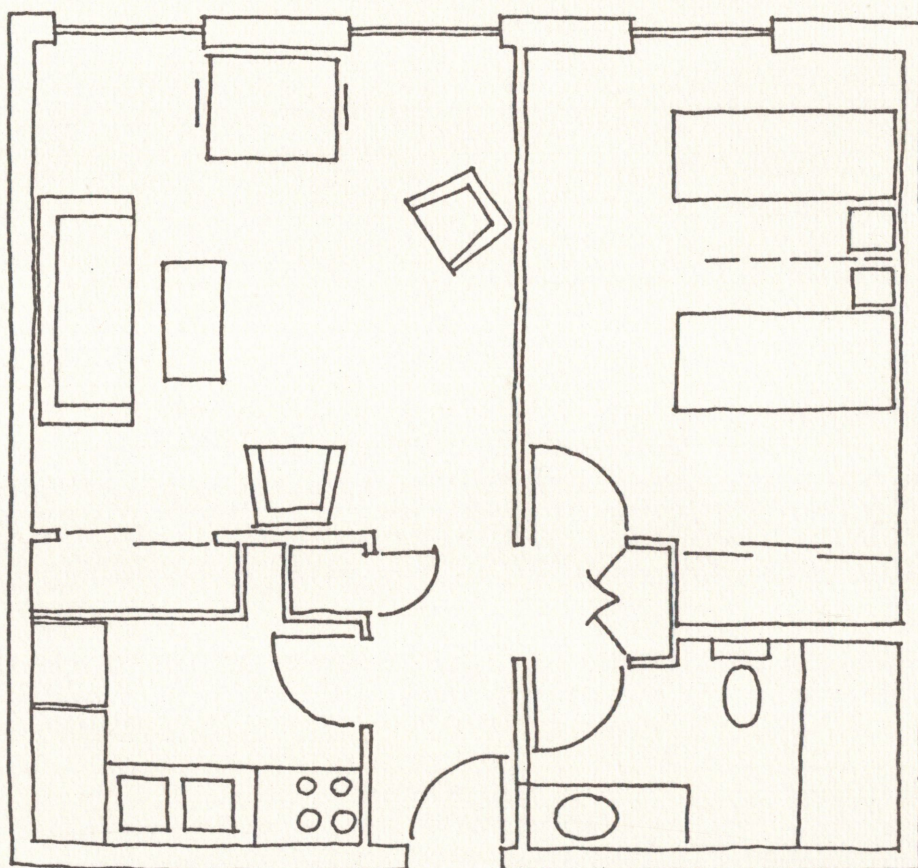
4. An automatic leveling device is necessary and should be inspected frequently.
5. If there is a possibility of use by a disabled person in a wheelchair, the control panel should be mounted low enough to be reached from a sitting position.



scale $\frac{3}{16}'' = 1'0''$

TYPICAL APARTMENT PLAN

FIGURE C-1



scale $\frac{3}{16}'' = 1'0''$

TYPICAL APARTMENT PLAN

FIGURE C-2

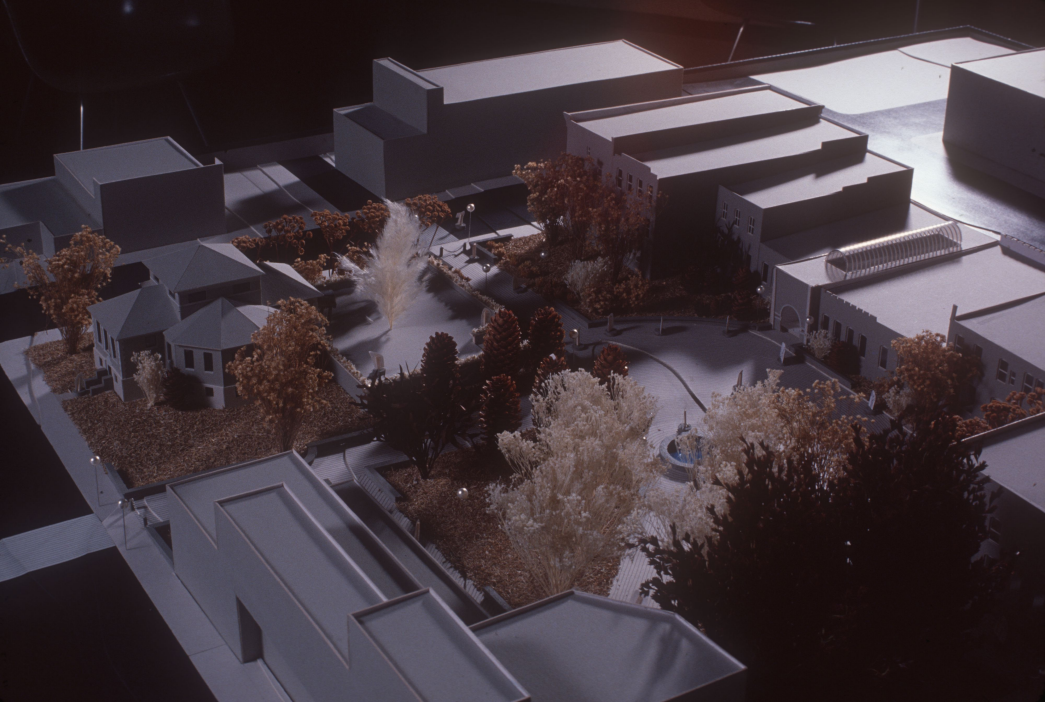
FOOTNOTES

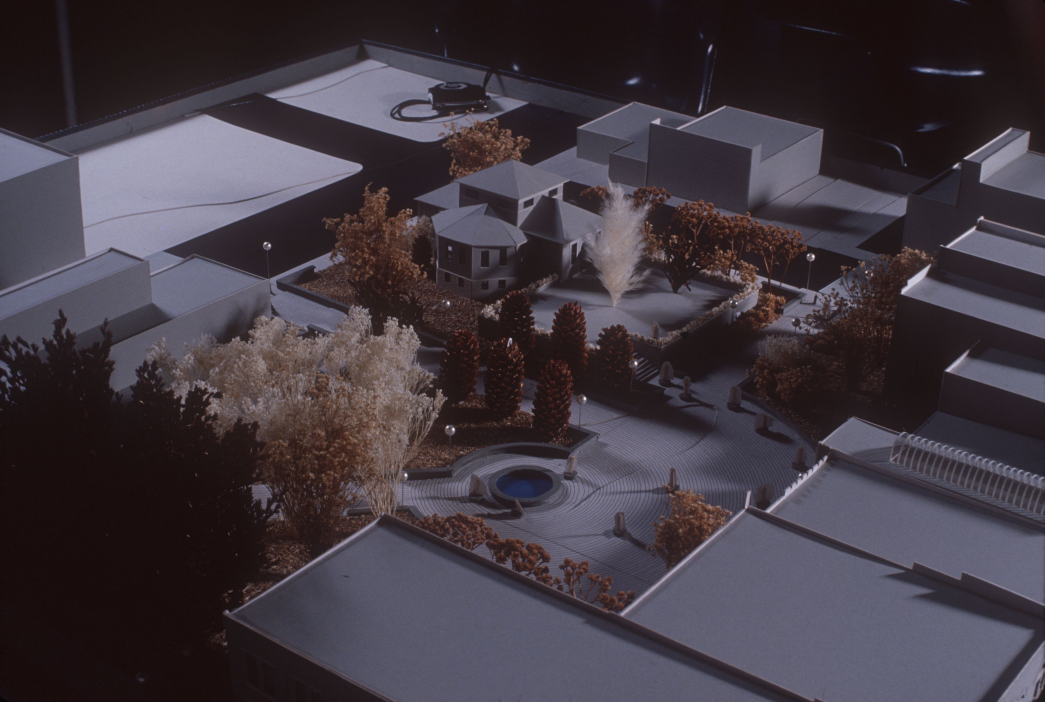
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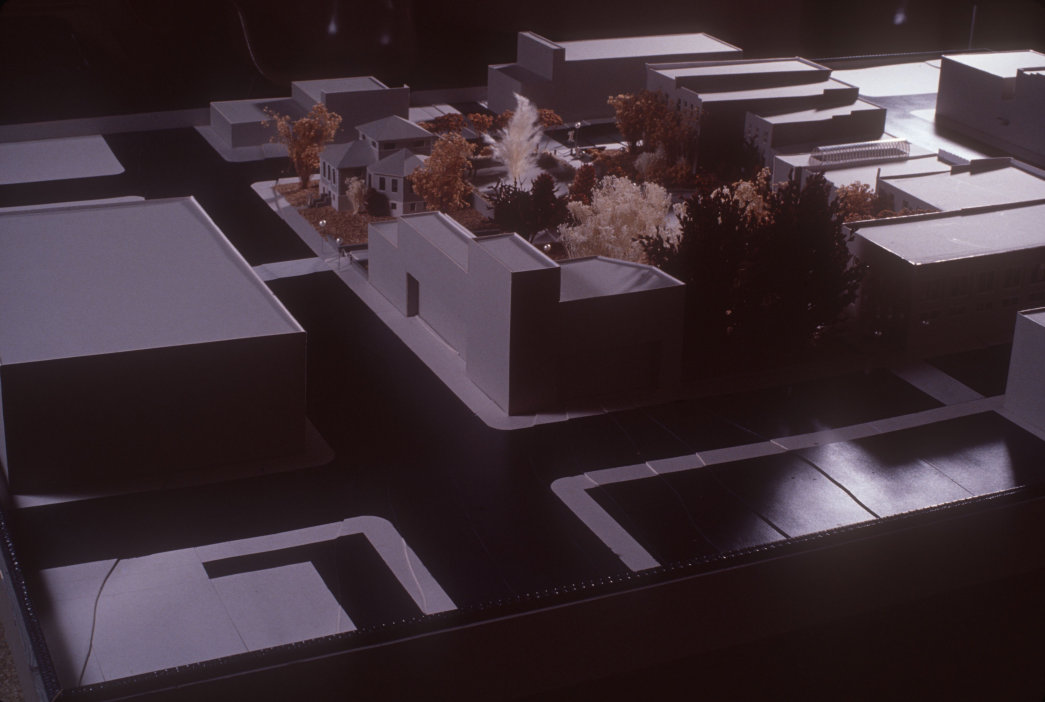
I wish to acknowledge that portions of this thesis format are based on The Revitalization of Older Residential Districts by John Leaning.

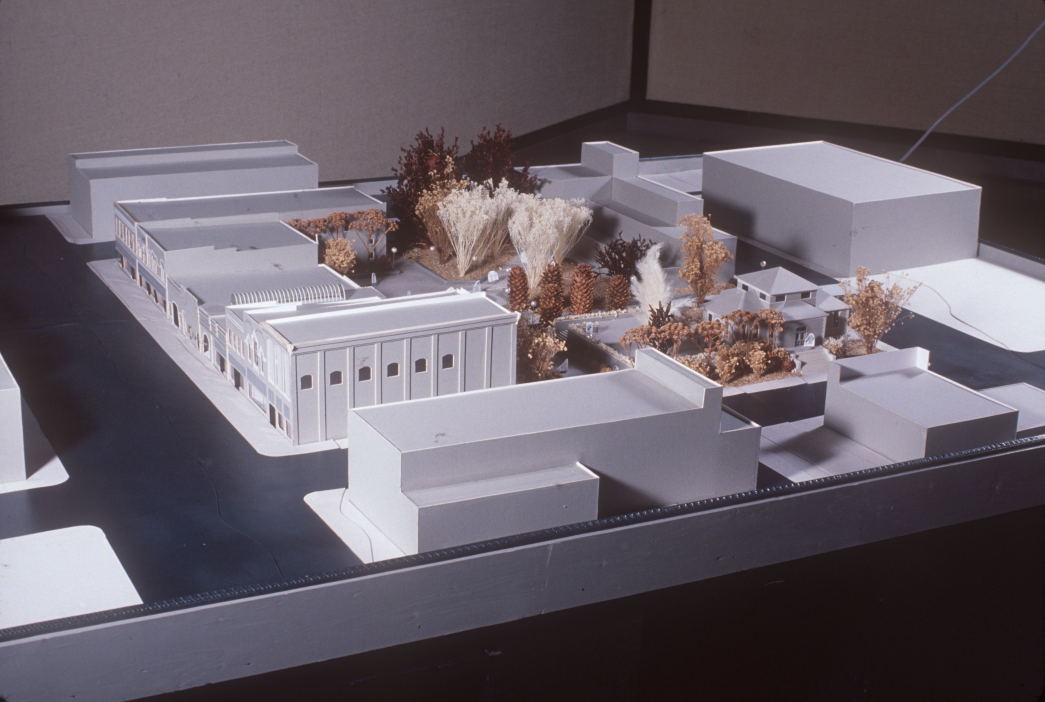


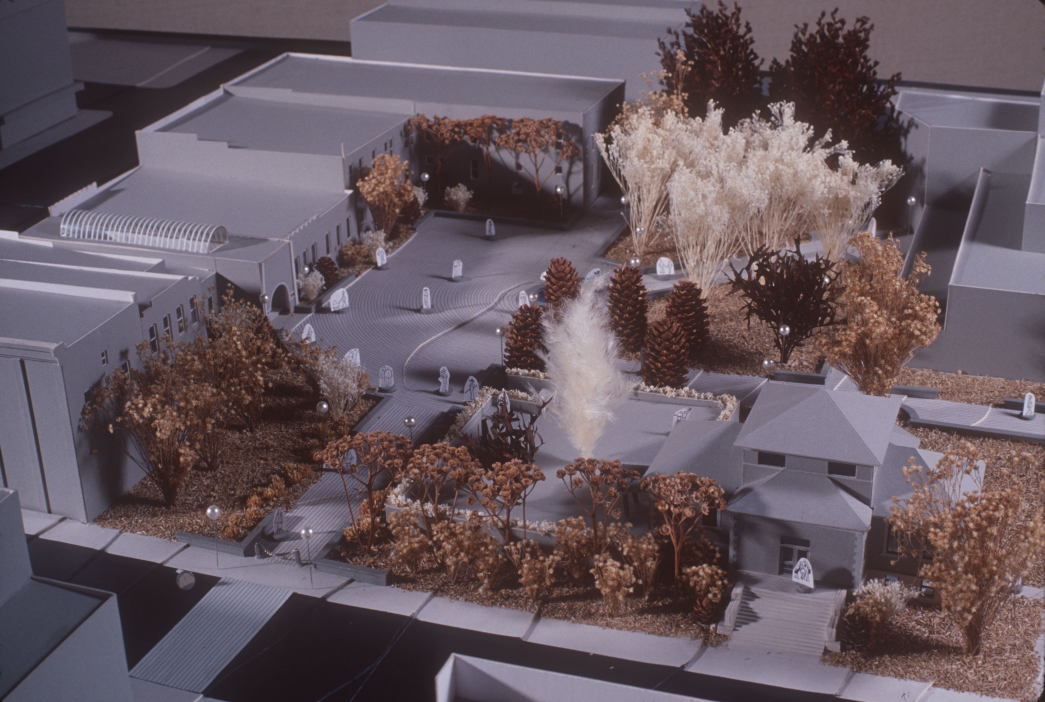


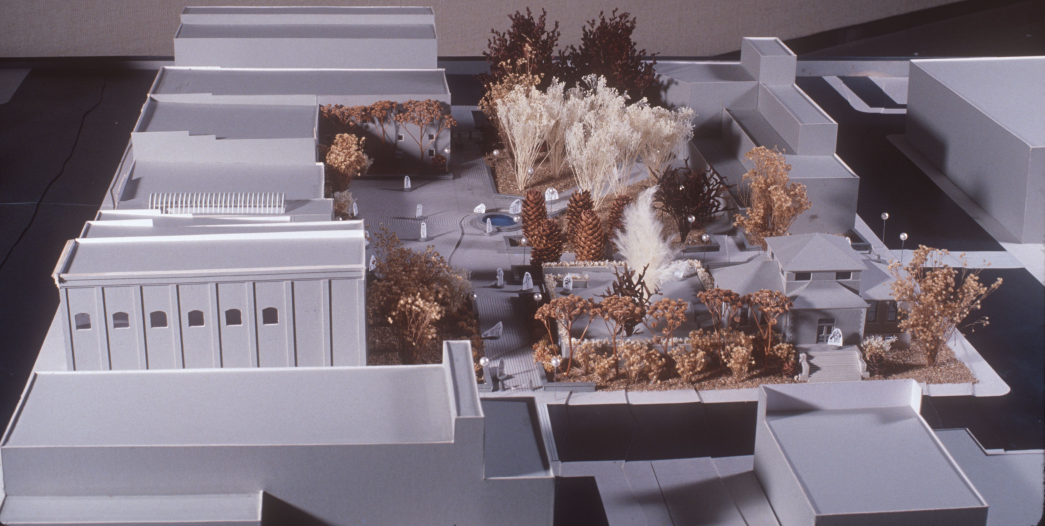


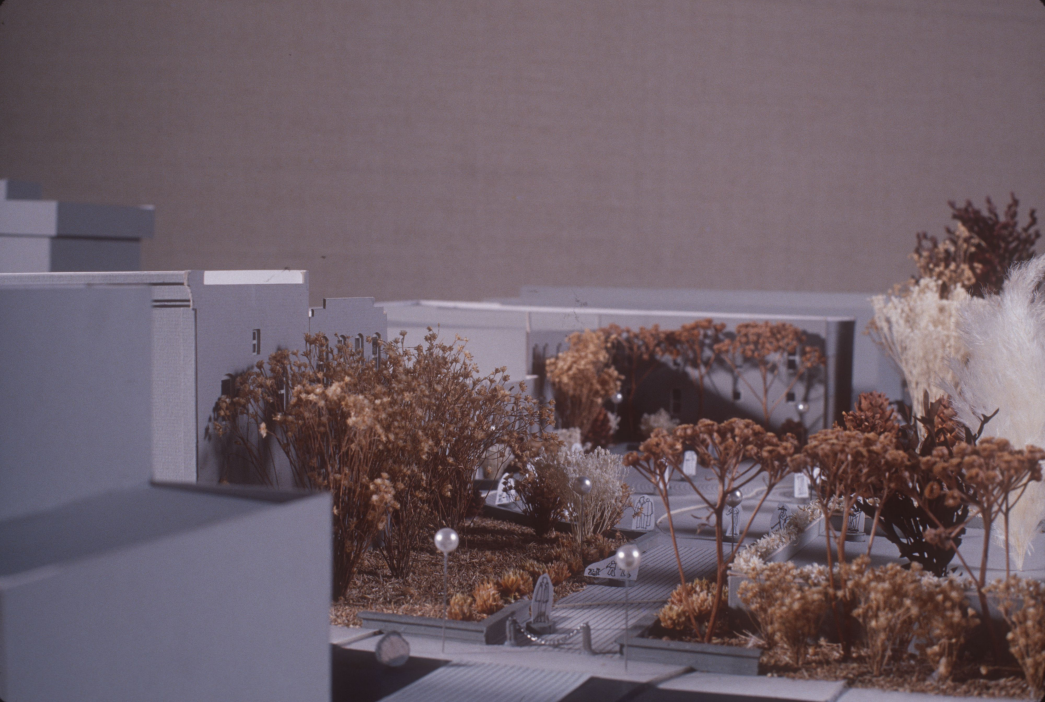


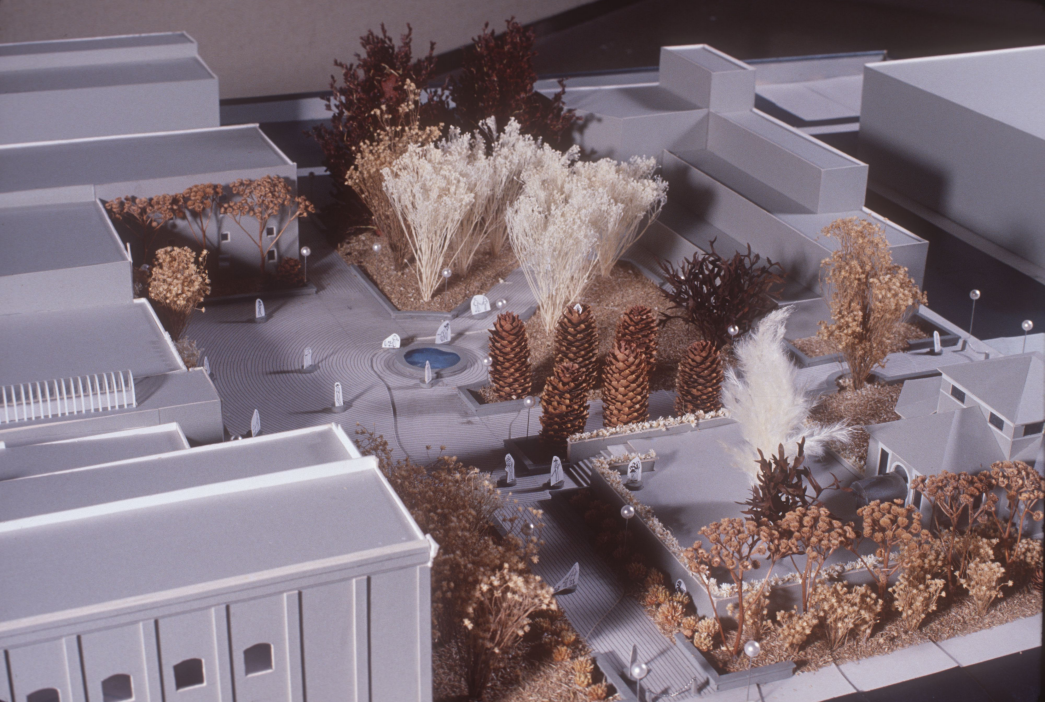


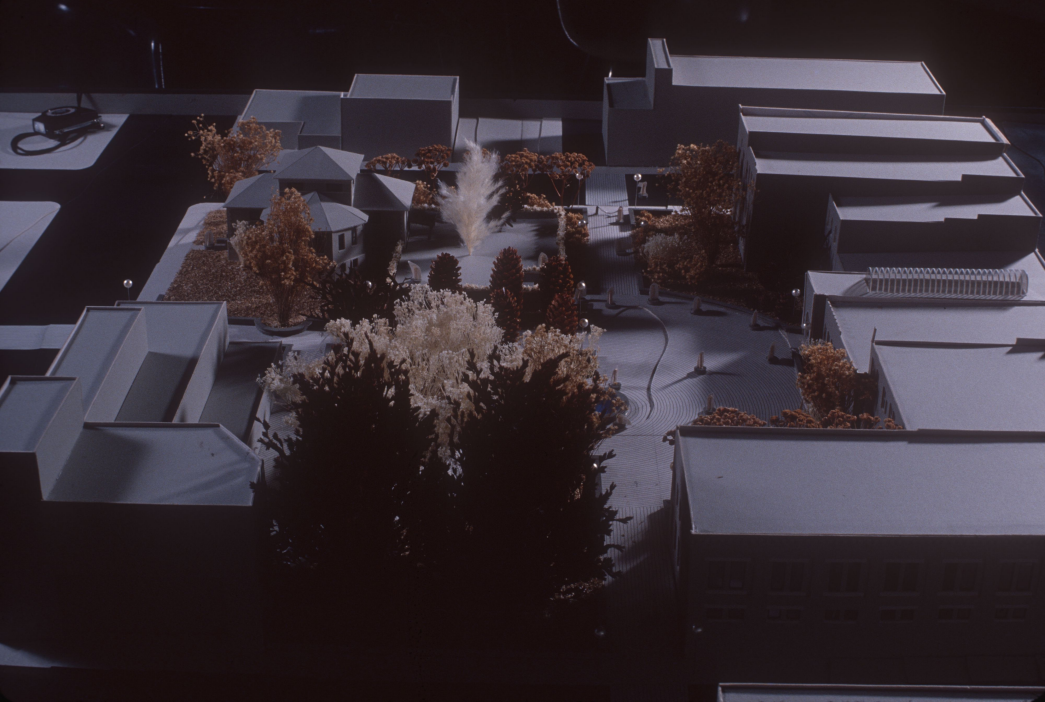




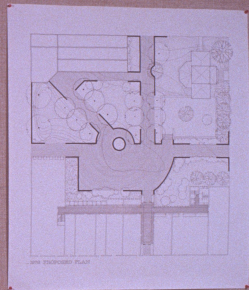
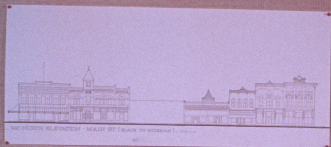


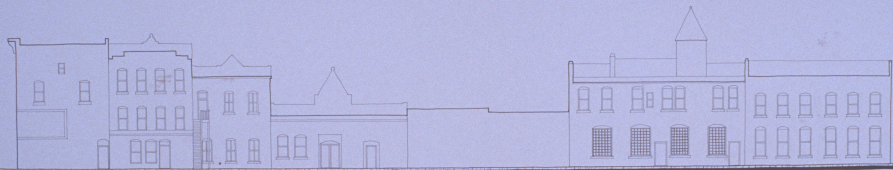












... 1910 BACK ELEVATION ...

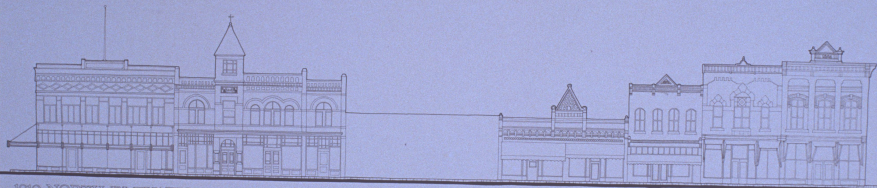


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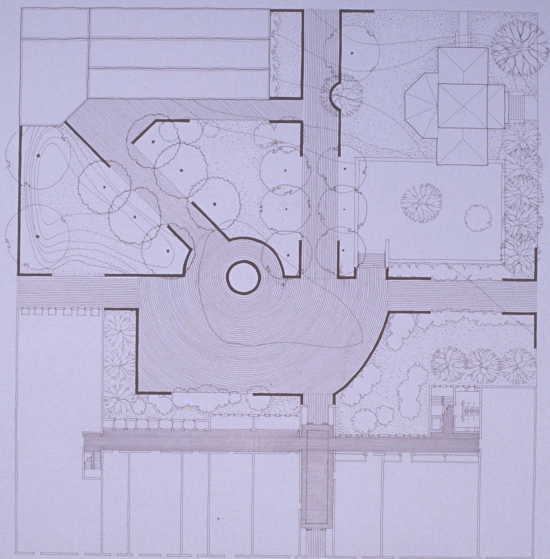
... 1810 NORTH ELEVATION · MAIN ST. (BLACK TO BOZEMAN) ...



... 1978 EXISTING ...



... 1978 PROPOSED



... 1976 PROPOSED PLAN

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III

