LOW-RISE APARTMENT for BOZEMAN, MONTANA

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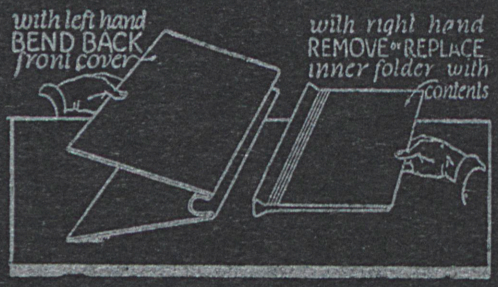

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LOW-RISE APARTMENT FOR BOZEMAN, MONTANA

Undergraduate Thesis in Architectural Design

by

Khosrow G. Davallou

Submitted to the School of Architecture as a partial fulfillment of the requirements for the degree of Bachelor of Architecture

at

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INTRODUCTION

This report is written for the School of Architecture of Montana State University as the first of a two-quarter thesis problem. This first part is preliminary research and study for the second part - the actual design of a building.

The most valuable part of this entire report is the information found in the building program. This information will be used as the "foundation" for the final portion of the thesis - the design of a low-rise garden-type apartment building.

conditions creating a need

CONDITIONS CREATING A NEED

Apartments are an investment. When one builds an apartment the rentability and the ability to make a profit must be evaluated. I feel Bozeman is a good market for apartment buildings. The basis for this can be divided into three categories:

1) increasing population
2) desired facilities not presently available and
3) undesirable characteristics of the present buildings.

INCREASING POPULATION

Since 1940, the population of Bozeman has increased an average of 27.5 per cent every 10 years.[1]

1940 - 8,665

1950 - 11,325

1960 - 13,366

These figures do not include over 6,000 students who registered for fall quarter 1965 at MSU. It is expected that the enrollment of the University will increase 400 per year.

---

[1] Basic Information for Bozeman, Montana; Bozeman, Montana Chamber of Commerce.

DESIRABLE FACILITIES NOT PRESENTLY AVAILABLE

At present there is a shortage of suitable housing for the middle class in Bozeman. This is evidenced by the University's long waiting list of people that are trying to live in married housing and the difficulty one has to find any apartments in the fall just as college resumes. There are many apartments with which people are dissatisfied, but they are forced to rent becuase of the lack of a place more suitable.

Many of these places include old homes that have been converted to apartments or older apartment buildings. The apartments lack privacy (sometimes they don't even have private entrances), lack an outdoor recreation area, have a poor view, and a poor or no parking area. (Photographs of some of these apartments follow.)

Even the newer apartment buildings lack many desirable activities. These buildings have little grassy areas for outdoor cookings, games and other such activities. None have a swimming pool.

Figure 1. Evergreen Apartments (rear view)

Figure 2. Evergreen Apartments (front view)

Figure 3. Apartment building on Lamme

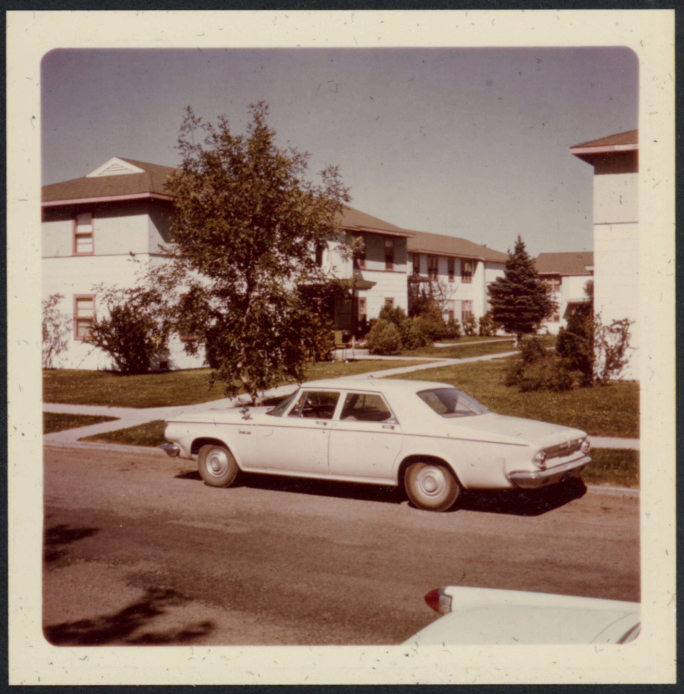

Figure 4. Townhouse Apartments

Figure 5. Westgate Apartments

UNDESIRABLE CHARACTERISTICS OF PRESENT BUILDINGS

There is currently an apartment boom. The age group which most favors apartments is the 20 to 25 category.[2] (The average age of Bozeman residents is 27.7).[3]

The reasons for these people's turning to apartment living include the growing scarcity and cost of land for housebuilding and the growing cost and inconveniences of transportation. And, as in the case of Bozeman, many people do not plan on living here permanently - as students or faculty members. Students can't afford to buy a house nor do they want the added responsibilities of keeping up a house. With an apartment, the owner worries about this.

When these people do look for apartments in Bozeman they find many of them have undesirable characteristics. These include dark basements, outdated kitchen facilities, poor lighting, over-all poor design, no privacy, and poor appearance - exterior and interior.

The nicer, more modern apartments are usually unsuitable for the average person because of their high rental rates. Some of the apartments rent for as much as $250. Still these lack real privacy and don't have patios or outdoor recreation areas.

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[2]Dale M. Thompson, Architecture Forum, July 1955.

[3]Basic Information for Bozeman; Bozeman, Montana Chamber of Commerce.

The housing problem in Bozeman could be helped by a well-planned, attractive looking garden-type apartment - reasonably priced.

local conditions

LOCAL CONDITIONS

GEOGRAPHICAL

Bozeman, Montana, is located at 45°40' north latitude and 111°03' west longitude. It is 4,795 feet above sea level.

Bozeman is surrounded by mountains except for a shallow canyon at Logan through which flows the Gallatin River. To the east of Bozeman is the Bridger Range, to the south is the Gallatin Mountain Range and to the west is the Madison Range.

ECONOMIC

The economy of Bozeman is based primarily upon revenue income from agricultural sources and from Montana State University. The university hires over a thousand employees and has an annual payroll of over 7 1/2 million, according to MSU's business manager, Bernard Copping. The agricultural operations are divided among small grain farms, livestock, and dairying. Bozeman is not an industrial center, but there are several small plants engaged in lumbering operations, grain milling operations, and several small manufacturing operations.

Bozeman is served by three banks with total resources of $38,357,326.93 and total deposits of $41,713,810.74. In addition, Bozeman has a branch office of Empire Savings and Loan Association, with resources of more than $10 million.

SOCIAL

There are nine recreational areas within the city limits of Bozeman, including picnic areas, playgrounds, softball and baseball parks, a heated swimming pool open during the summer months, tennis courts and supervised recreation for children. There are two nine-hole golf courses.

In the surrounding area there are numerous lakes which are used for fishing, boating, and water-skiing. There are, also, two ski areas - Bridger Bowl and Bear Canyon.

The civic clubs for men include: Kiwanis, Exchange Club, Optimists, Toastmasters, Rotary, Lions and Jaycees.

Fraternal groups include: American Legion, Veterans of Foreign Wars, Masonic Lodge, Eagles, Elks Lodge and Moose Lodge.

HISTORIC

Gallatin County was named after the Gallatin River which had been named by Captain Lewis in honor of Albert Gallatin, U.S. Secretary of the Treasury. It was one of the nine original counties established by the Territorial Legislature in 1865. Gallatin County was originally much larger but was reduced when new counties were formed. Located first at East Gallatin, the county seat was moved to Bozeman in 1868 and has remained until the present time.

CLIMATE

Bozeman has a dry climate with air free from industrial smoke and haze.

In summer, because of low humidity, the day heat is not oppressive and the nights are cool.

In winter, there are periods of extreme cold but they are broken by chinook winds.

TEMPERATURE

Bozeman's monthly climatic data:[4]

MONTH	MEAN PRECIPITATION (F.)	PRECIPITATION (in.)
Jan.	20.2°	0.92
Feb.	25.2°	0.76
Mar.	27.8°	1.55
Apr.	42.5°	2.34
May	51.1°	3.06
Jun.	57.3°	1.08
Jul.	66.4°	1.12
Aug.	64.9°	1.65
Sep.	55.8°	1.45
Oct.	46.0°	1.07
Nov.	32.1°	1.30
Dec.	24.8°	0.91

Annual Temperature - 42.9°F.

Annual Precipitation - 17.6 in.

The highest recorded temperature is 104°F.; the lowest recorded temperature for Bozeman is - 43°F. below 0.

WIND CONDITIONS

For Bozeman, prevailing winds are from west and northwest. Storm winds are generally from the east and northeast. There are

---

[4] U. S. Weather Bureau, Department of Commerce, Washington D.C., 1960.

seldom long periods of severe weather. According to U.S. Weather Bureau Map for 1953 the mean wind velocity during January for the Bozeman area is 4 to 7 miles per hour; for June it is from 8 to 12 miles per hour.

TRANSPORTATION

Bozeman is located on U. S. Highway #191 South, connecting with 89 North. U. S. #10 is part of the Federal Interstate Highway and is four lanes wide and extends 62 miles west of Bozeman to 30 miles east of Bozeman.

Bozeman is served east and west by the Northwest Orient Airlines and Greyhound Bus lines. It is located on the main line of the Northern Pacific Railroad and is also served by motor freight carriers.

site conditions

SITE CONDITIONS

ORIENTATION

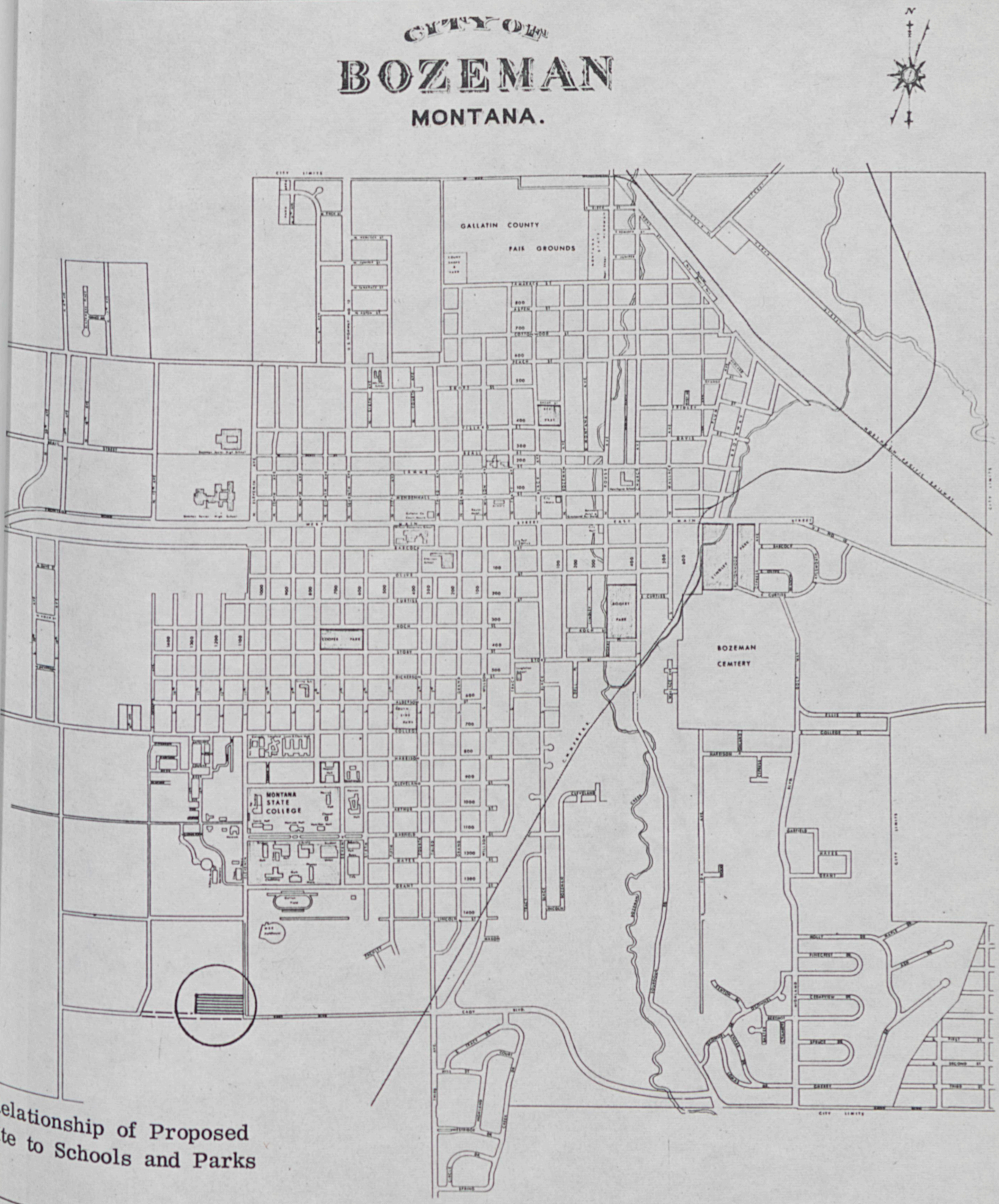
The apartment building will be located on the corner of 11th Avenue and Kagy Boulevard. The site is five blocks south of Hedges Hall. (A map of the site and site orientation is on the following page.) The site is 648.6 x 187.0 feet, or 121,269.5 square feet.

ADJACENT ENVIRONMENT

Adjacent to the site on the north is a residence and next to that is the MSU campus. On the south is farm land, on the west grass lands and farm buildings, and on the east is a road and then a parking lot. To the northeast is the Fieldhouse. (See photograps on following pages.)

TOPOGRAPHY

This site is fairly level with a slight incline in the east to west direction. It is entirely covered with grasses and there are no trees.



Relationship of Proposed
ite to Schools and Parks

Figure 6

PREVAILING WINDS

For Bozeman prevailing winds are from west and northwest. Storm winds are generally from east and northeast. According to the U.S. Weather Bureau Map for 1953, the wind velocity during January for the Bozeman area is 4 to 7 miles per hour, for June it is 8 to 12 miles per hour.

ZONING REGULATIONS

According to Mr. Fargo of the City Engineer's Office, this property will be in the city limits within 5 to 10 years and will be in C zoning which allows apartment buildings. At the moment there are no restrictions because it is out of the city limits.

SOIL ANALYSIS

The actual soil analysis was not available in the engineer's office, but the soil test was available for Roskie Complex five blocks away. Mr. Fargo, the city engineer, said these were basically the same soils.

Oswald Berg, local architect, gave me the soil analysis for the Roskie Complex site. Baiscally it is lake deposits, although there

are some alluvial deposits on the surface. The upper soils are only 2 to 5 feet in thickness.

There are two distinct depositional layers in the lake. The upper layer extends to a depth of about 38 feet below the surface and is predominantly a compact, saturated, sandy gravel. In the second layer there are numerous lenses and discontinuous layers of variable thickness, of sandy, clayey gravel, and cobbles throughout the layers.

Soil construction problems will be experienced due to the combination of the high ground water table and the probability that lenses of sand will be encountered in some of the excavations. The support would have to be a piling or slab system.

IMMEDIATE AND DISTANT VIEWS

The immediate views, including the site, are shown by the photographs on the following pages.

To the immediate north is Hedges Hall and beyond is the city of Bozeman. (Figure 7).

To the south is grass land, trees and beyond the Gallatin Mountains are visible. (Figure 8)

To the east is grass land and in the distance is the Bridger Mountain Range. (Figure 9).

To the west are trees, farm buildings, and in the background is the Madison Mountain Range. (Figure 10).

AVAILABILITY OF UTILITIES

The only available utilities at present are electricity. However, I talked with the Montana Power Company, the telephone company, and the City Water Company and they all said these are not available here but if needed the lines all could be extended. Sewage is available nine blocks away and couldn't be extended until the proposed site is in the city limits.

TRAFFIC PATTERNS

The road passing the site runs from north to south and is used mainly by the residents in the immediate area commuting to and from the University and the business district.

According to the city engineer, a road has been proposed to run east to west immediately adjacent to the site on the south and would connect Kagy Boulevard with South 19th Avenue.

Figure 7. North view from proposed site.

Figure 8. South view from proposed site.

Figure 9. East view from proposed site.

Figure 10. West view from proposed site.

Figure 11. Northwest view from proposed site.

Figure 12. Northeast view from proposed site.

function of the building

FUNCTION OF THE BUILDING

INTRODUCTION

When designing an apartment building the architect must seek to please both owner and renter. To the owner it is a business. He wants to make a profit. The renter wants a home. The building must be successful for both. Generally, if the building is successful to the renter, it will also be successful for the owner. A little extra expense in building will often save dollars over the years by making the renter happier and therefore eliminating reducing rent rates and vacancies.

Factors concerning the owner shall be found under the economic section of this paper. This section shall be concerned with the functions desired for the renter.

The tenants, if they are of the middle or upper classes, will be interested in privacy, spaciousness, cleanliness and convenience. Varieties of units must be provided to accommodate large or small families.

HOUSING

For the state of Montana, figures calculated from the census bureau show the following percentages of family sizes:

Families with no children under 18
(0 and 1 bedroom units).....40.1%

Families with 1 child under 18
(2 bedroom units).....17.5%

Families with 2 children under 18
(3 bedroom units).....18.8%

Families with 3 or more children under 18
(4 bedroom units).....23.6%

Many of the people living in these apartments will be college students and therefore will have fewer children than the average Montana couple. Also, many will still be single. The above percentages should be adjusted accordingly:

One bedroom units. 60%

Two bedroom units 25%

One bedroom and den. . . 5%

Two bedroom and den . . . 10%

The dens in these units could be converted to bedrooms for larger families. If tenants with smaller families rented them

they could be used as study rooms, sewing rooms and ironing.

According to the Federal Housing Administration Agency standards and the Uniform Building Code, the general requirements for housing are:

1) Each living unit shall have at least two habitable rooms - a bedroom and a bathroom.

2) All bedrooms are required to have closet space and must be enclosed for privacy during use.

3) All bathrooms must adequately house a water closet, lavatory, and a tub or shower. The access to the area must provide for a 90-degree door swing unless sliding doors are used.

The F.H.A. requirements for ventilation of housing units are as follows:

1) Habitable rooms: natural ventilation openings not less than 4% of the floor area of the room or space.

2) Appliances requiring venting shall have adequate provisions for such.

3) Kitchens shall exhaust air by range hoods or fans in the ceiling or wall.

4) Bathrooms shall have an air intake grille. Exhaust fans are desirable; often required where natural venting is unobtainable.

ACTIVITIES WITHIN THE BUILDING

Introduction

The housing unit must serve such functions as sleeping, eating, lounging, bathing, storing of clothing and equipment, and entertaining guests. Garbage storage and disposal, and laundry facilities should also be provided.

Living Room

The living room is the center of family activity. It should serve to entertain both occupants and guests. Furniture should include comfortable chairs, a couch, coffee and end tables, magazine and book racks, space for storage of paperwork and incidentals, and areas for radio and television. It should be designed to create a pleasant, comfortable and restful atmosphere.

Dining Room and Kitchen

The trend in apartments is to incorporate this area into a general space that includes both dining room and kitchen. Less

total space is thus required and does not detract from the living room. This room is not only used for food preparation, but also for eating, ironing, sewing, and often as a place to read or relax.

Bedroom

This room is used for sleeping and dressing. Ample storage closets for clothes should be provided. Bed lamps and nightstands should be included in the furniture.

Bathroom

This room is for personal hygiene. It should include storage closets for linens and medicine.

Sidewalk

The function of the sidewalk is for interconnecting units, play areas, and traffic. This sidewalk will be of concrete slabs.

Sauna Bath

There will be one sauna bath for men and one for women.

Recreation Room

There will be one large room to be used by the tenants for parties and other such activities. It will have kitchen and toilet facilities and a floor suitable for dancing. It will be about 1300 square feet and have a fireplace. When it hasn't been reserved for a party, it can be used as a lounge. TV will be included. in addition to telephone.

Laundry Room

This will include 10 washers, 4 dryers and a sink. A TV and a telephone will be added for convenience.

Swimming Pool

The swimming pool will be about 800 square feet and have a diving board. It will be fenced for safety.

Play Area

A play area will be a playground for children. This will be easily accessible from the units. A sandbox and children's play equipment will be provided.

Parking

A parking area will be provided and will have at least 1 1/2 parking spots per unit. One third of these will be car ports.

aesthetic considerations

AESTHETIC CONSIDERATIONS

BUILDING AS PART OF TOTAL ENVIRONMENT

The site is not crowded with buildings nor is it a rugged terrain. It is gentle countryside. When designing an apartment building for this site the architect must take these present factors into consideration as well as the future of the building site. This area will be part of the city limits in a decade and will have other buildings around it. The building must fit in today as well as tomorrow.

This building should enhance its environment and the environment should enhance the building.

The building should not be a stark structure against the gentleness of the countryside nor should it be rugged. It should be modern enough to fit in with future buildings. This modernness can be blended in with the environment by its exterior finish. Stained siding and stone will soften the stucco finish. Many trees, bushes, and grassy areas will also aid in making this building look at home in its surroundings.

THE DESIRED MOOD OR CHARACTER TO BE EXPRESSED

The architect should also take into consideration the function of the building and create aesthetic appeal for the tenants. With this and the total environmental facts in mind, he should undertake his final expression.

The final expression is subjective. It will depend on the designers beliefs and concepts.

I will try to express a mood of gentleness and informality. Every effort will be employed to make this building seem non-commercial.

Planning the building

PLANNING THE BUILDING

INTRODUCTION

In planning an apartment building, the site, building, and units must be considered in relation to orientation, noise and traffic, parking service, materials, and maintenance.

ORIENTATION

Sunlight is desirable in the building in the morning. At this time of day it is cheerful and the rays do not create a critical heat problem. During the afternoon, glare and heat are caused by the sun unless the building is partially oriented away from it. I plan to have trees to shade the windows of the units that have the living room windows to the south.

The prevailing winds are from west and northwest. Storm winds are generally from east and northeast. This must be taken into consideration in the design of this building, so that these winds won't interfere with the swing of the door.

VIEW

There are no views that are bad, however the best views are to the south and east. The units will not all be facing the same way and will have different views.

NOISE AND TRAFFIC

The site is adjacent to Kagy Boulevard which is not a main highway or street. Automobile traffic will not be a problem.

A road has been proposed to run east to west immediately adjacent to the site on the south and which will connect Kagy Boulevard with South 19th Avenue. This road will not have a great deal of traffic but an attractive wooden screen (or a hedge) will be erected on the south between this proposed road and the apartments to help shield noise and for privacy. The outside noise is not a problem but the units must be constructed so that the noise of the occupants will not disturb one another.

PARKING AND SERVICE

I intend to design the parking area so that it will not detract from the building but will still be convenient to the tenants. The service and parking will be treated together for economy of material and to prevent conflicting traffic patterns.

LANDSCAPING

Landscaping will be used for practicality and for beauty. It can provide for privacy and shade and at the same time enhance the building.

BUILDING PROGRAM

INTRODUCTION

As previously stated the following figures will be used in planning this building.

One bedroom units	60%
Two bedroom units.	25%
One bedroom and den.	5%
Two bedroom and den.	10%

The site conditions and the needs of the community call for a spacious garden-type apartment. This structure will be two stories high and will have 100 units. This will be the largest and most modern apartment building in Bozeman.

PROGRAM

Housing Units:	A R E A (Square Feet)			
No. of Bedrooms:	1	1 & den	2	2 & den
Living Room	200	200	250	250

Function:

Relaxation and entertainment.

	A R E A (Square Feet)			
No. of Bedrooms:	1	1 & den	2	2 & den
Furniture:				
Sofa, coffee table, and tables, lamps easy chair.				
Finish:				
Warm, relaxing, durable (carpeted).				
Dining - Kitchen	100	100	120	120
Function:				
Eating, preparation of food, storage of food and equipment, cleaning of cooking utensils.				
Equipment:				
Range, sink, counter area, cupboards, refrigerator.				
Finish:				
Easily cleaned, durable, cheerful.				
Bedrooms	130	130	130	130
Function:				
Sleeping and dressing, storage of clothing.				

	AREA (Square Feet)			
No. of Bedrooms:	1	1 & den	2	2 & den
Equipment:				
Bed, dressing table, night stands.				
Finish:				
Relaxing, pleasant, carpeted.				
Den	-	100	-	120
Function:				
Studying, reading, paperwork, sewing (can be used as multi-purpose room).				
Equipment:				
Desk, bookshelves, chairs, study lamp, carpeted.				
Finish:				
Relaxing, pleasant.				
Bath	40	40	50	50
Function:				
Personal hygiene.				
Equipment:				
Bathtub, shower, lavatory, water closet, linen storage, medicine cabinet.				

	AREA (Square Feet)			
No. of Bedrooms:	1	1 & den	2	2 & den
Finish:				
Durable, easily maintained.				
Storage	4	4	4	4
Function:				
Storage of broom, mop and other such cleaning equipment.				

Laundry Room - one 500 square feet

Function:

Laundry and drying of clothing.

Equipment:

Washers, dryers, sink, TV, and telephone.

Finish:

Durable, easily cleaned, and well-ventilated.

No. of Bedrooms:	A R E A (Square Feet) 1	1 & den	2	2 & den

Sauna Bath 1300 square feet

Function:

Sauna bath.

Equipment:

Sauna, shower, rest rooms, lounge.

Finish:

Special finish for sauna. Other area - very durable and easily maintained.

Recreation Room 1300 square feet

Functions:

Parties and other entertainment, meeting place.

Equipment:

Fireplace, kitchen, rest rooms, TV, telephone.

Finish:

Floor suitable for dancing; easy to maintain and very durable.

No. of Bedrooms:	A R E A (Square Feet) 1	1 & den	2	2 & den

Swimming Pool 800 square feet

Function:

Swimming and relaxing.

Play Area 400 square feet

Function:

Recreation for children.

Equipment:

Swing and sandbox.

Parking: 160 square feet per car

Function:

Provide parking space.

Total square feet in each unit will be as follows:

Bedrooms	Total square footage
1	650
1 & den	750
2	850
2 & den	970

economic considerations

ECONOMIC CONSIDERATIONS

INTRODUCTION

As an apartment building is an investment and to be successful it must make a profit; therefore, the element of cost plays an important part in the design. It must be planned so that space is not wasted. When choosing material one should seek quality but also try to be economical.

The upkeep of the building should be kept to a minimum. Often this can be accomplished by using better materials and equipment in the beginning.

FINANCIAL SOURCE

Financing of this type building will undoutedly be by an individual or by a private corporation. A large amount of capital will be involved and a loan will be necessary. This loan can be obtained on an investment basis from insurance companies or other organizations, and from governmental agencies.

RENTAL RETURN

An estimate of rental return can be made from the following formula as prepared by the Community Facilities Administration of the Housing and Home Finance Agency:

$$x = \frac{(i)\ (a)\ (b)}{0.90}$$

x = the annual rental charge per unit

a = the annual cost of the construction loan per unit

b = a debt coverage factor (amortization)

0.90 = an annual vacancy loss of 10%

ADVANTAGES TO RENTING

The three most important reasons for which people rent are:

1. The cost of living is less as there is little maintenance cost, and utilities serve adjacent units.

2. There are not as many taxes applied to the individual.

3. Renting allows the occupant to have flexibility in location. He can situate himself in a position most convenient to his livelihood.

AMORTIZATION

Amortization of building is a product of the total cost and the interest rate of the loan or investment as it is paid off over a certain period of time. Since it is related to the projected life ot the building, care and judgment must be employed by the architect when selecting the buidling materials for quality and durability. If the building is in constant need of repair because inferior materials have been selected, this will prevent the owner from making as much profit as he could.

This project will have a wood frame and roof structure. According to the Marshall Valuation Service a building of this type would have a minimum life of 50 years.

ESTIMATE

There are three different methods by which building cost can be estimated:

1. The segregated cost method. In this method the costs of the individual portions of the building are calculated separately then added for total. This process is the most accurate, but the

building must be in the final stages of design to apply the segregated cost method.

2. Cubic foot method. The volume of the building is made use of in this method and the cost is estimated in dollars per cubic foot of total volume.

3. The square foot cost method. With this method the total building cost is determined by estimating the dollars of the building costs per square foot of floor space.

Since the design of the building is not complete and the quantities of materials are not yet known, the segregated method of estimating will not be used.

I will use the square foot method. With this method the total construction cost is taken to be the cost of only the building itself. This includes construction, fixed equipment, architect fees and incidentals. It does not include the cost of land, paving, landscaping, furniture, recreation area, or swimming pool.

A cost estimate was made with the use of the Marshall Valuation Service. The Marshall calculator method lists four classes of apartment buildings.

Class A - Buildings having fireproofed structural steel with reinforced concrete masonry floors and roofs.

Class B - Buildings having reinforced concrete frames and roofs.

Class C - Buildings having masonry exterior walls, and wood or steel roof structures.

Class D - Buildings having wood or light steel frame and roof structures. (Hence, my building falls in this class.)

A comparative cost is shown below:

CLASS	TYPE	COST PER CU. FT. IN $	COST PER SQ. FT. IN $
A	excellent	2.03	20.29
	low cost	1.25	12.48
B	excellent	1.39	18.89
	cold water flat	0.99	9.87
C	excellent	1.59	15.86
	cold water flat	0.77	7.66
D	excellent	1.40	14.02
	tenement	0.66	6.60

The Marshall Valuation Service also lists the following typical building lives based upon studies of actual mortality:

	CLASS (bldg. life in years)	A	B	C	D
Good to excellent apts.		60	60	55	50
Low cost to average apts.		55	55	50	45
Cold water flats and tenements.		50	50	45	40

ESTIMATE CALCULATIONS

100 units — Class D @ $11/Sq. Ft.

	Sq. Ft./Unit	Total Sq. Ft./Unit	Cost
60 - 1 bdrm units	650	39,000	$429,000
25 - 2 bdrm units	850	21,250	233,450
10 - 2 bdrm and den	970	9,700	106,700
5 - 1 bdrm and den	750	3,750	41,250
Laundry Room	500	500	5,500
Sauna Bath	1,300	1,300	14,300
Recreation Room	1,300	1,300	14,300
Swimming Pool			10,000
Sub-Total			$854,500
Add for pavement, walks and parking 10%			$ 85,450
Fireplace			700
Sub-Total			$ 940,650
Cost modifier for Bozeman is $1.04 $940,650 x $1.04 ≑			$ 978,276
TOTAL ESTIMATED BUILDING COST (this does not include cost of land, furniture, or landscaping).			$978,276

SUMMARY

I have decided on a 10 % deduction in the number of units in order to have more space for greenery and so that the apartments wouldn't be so close together.

Originally, I was thinking of 2600 square feet for recreation rooms and a sauna bath, but in the design stage I decided to reduce it to 1400 square feet and use the extra area for more storage.

Also, when I came to the actual design I learned that a new swimming pool is being planned for the new addition of the fieldhouse. After considering the expense involved in the building of the swimming pool in the apartment, in maintaining it and realizing that the pool would only be used about three months per year, I decided to eliminate it from my design and use the area for a playground and greenery. This will also enhance the appearance of the building as it was lacking in greenery.

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