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A PILGRIM CONGREGATIONAL CHURCH

for bozeman, mont.

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Bozeman, Montana
March 15, 1963

Prof. H. C. Rose'
School of Architecture
Montana State College

Dear Professor Rose'

I am submitting this research paper in partial compliance with the requirements for my thesis project.

In this thesis I have presented research material for a Pilgrim Congregational Church for Bozeman, Montana. The research material includes reports on existing conditions, local conditions, histories of the Congregational Religion and the local church, site conditions, building functions, allotted areas for these functions, aesthetic considerations, and economic considerations.

The purpose of this study is to analyze the need for a new church and to provide a concept and program on which to base further design studies, which will be the second part of the thesis program.

Respectfully yours,

Clark E. Wilcox

PRELIMINARY RESEARCH FOR A PILGRIM CONGREGATIONAL CHURCH
Bozeman, Montana

Part I of an undergraduate design thesis
Submitted to the School of Architecture
MONTANA STATE COLLEGE

By: Clark E. Wilcox March 15, 1963

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ACKNOWLEDGMENT.....

I am greatly indebted to Reverend Leonard J. Kovar, minister of the Pilgrim Congregational Church of Bozeman, for his generous assistance in this project. I am also grateful to Prof. H. C. Rose' and Assistant Prof. Wm. W. Carver for giving their time and advise whenever called upon.

PROLOGUE.....

"The architect has to arrange this earth and to provide the space for divine services to be held. He has to shape it into the original form of the prayer. He has to combine the people in a form standing openly before God, has to found an area where the world ends and is only threshold and gateway to eternity, adding to it, or rather setting aside, a quiet open region where God resides in heaven."

RUDOLF SCHWARZ

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Der Turm zu Hasbergen

THESIS PROPOSAL.....

Since I belong to the First Congregational Church in Billings, Montana, I have naturally been interested in the progress of the Pilgrim Congregational Church here in Bozeman. After hearing of their building program plans, I felt this thesis would be one of the more realistic problems I could tackle. After preliminary investigations into this problem, I have found a genuine spirit on the part of the congregation to grow and become a needed and deep rooted part of the city of Bozeman and the Gallatin Valley.

Although the actual construction of a Pilgrim Congregational Church for Bozeman may be in the near future, this is being considered as a hypothetical problem. Professional ethics would prevent actual construction of a building from a thesis project.

The purpose of this report is to analyze and present, in written form, all data and information collected through interviews, books, periodicals and personal observations that may help in the actual designing stage of the thesis.

Therefore, in this thesis, I propose to:

First Quarter

1. Inquire into local conditions which may affect the design of the church facilities.
2. Investigate the economical possibilities which may affect the design.

3. Propose a program to follow during the actual design stage of the church

Second Quarter

1. Present a solution for a Pilgrim Congregational Church on the new site utilizing the information gathered and contained in this report.
2. In this solution, design all of the interior equipment required such as pews, altar, storage units, Sunday school equipment etc.
3. Present color and material relationships for the sanctuary
4. Present a final report as to the approach used in the design.

Ulisty

HISTORY OF CONGREGATIONALISM.....

The actual beginnings of Congregationalism are hazy and open for debate, but historians generally agree that the religion had its start in England and that the first regularly constituted Congregational Church on English soil was located in Norwich, England in the year 1581.[1]

This small group of radicals, who had broken from the Anglican Church, lived in fear and anticipation since their meetings were contrary to the laws of the time. This small group of 20 or 30 decided, therefore, to seek another country where they might worship as they pleased. The most liberal country at the time was Holland where other groups had already gone. After living in Holland for twelve years, however, the Pilgrims, who cherished their English descent even though England had persecuted them, feared their children would cease to be English. They decided, therefore, to undertake an exploration to the unknown New World. In July of 1620, 102 brave Pilgrims started for the New World. They spent two

.....

1. Gaius Atkins, An Adventure in Liberty. The Pilgrim Press, Chicago 1950, p. 3.

months on the storm tossed Atlantic and finally landed on Plymoth Rock in 1620. Even here history is vague, for one source places the landing date as September 6, 1620[2] and another as November 21, 1620.[3]

From the Pilgrims' desire to govern themselves and set down their ideals on paper, the Mayflower Compact was drawn up and signed by 41 men on November 11, 1620.

> ...Haveing undertaken, for y.glorie of God, and advancemente of y.chriftian faith and honour of our king & countrie, a voyage to plant y.firft colonie in y. Northerne parts of Virginia. Doe by thefe prefents folemnly & mutualy in y. prefence of God, and, and one of another; covenant, & combine our felves togeather into a civill body politick; for our better ordering, & prefervation & furtherance of y.ends aforefaid; and by vertue hearof to enacte, conftitute, and frame fhuch juft & equall lawes, ordinances, Acts, conftitutions, & offices, from time to time, as fhall be thought moft meete & convenient for y.generall good of y.Colonie: unto which we promife all due submiffion and obedience.[4]

As Atkins states, "the compact was as simple as it was inevitable. If a partisan cared to press it, it was and is a Congrega-

2. Albert Christ-Janer and Mary Mix Foley, Modern Church Architecture. Mc Graw-Hill Book Company, Inc. New York 1962, p. 230.

3. George N. Marshall, The Church of the Pilgrim Fathers The Beacon Press, Boston 1950, p. 39.

4. Atkins, Ibid p. 5.

tional covenant drawn by a great social and religious philosophy, articulating a timeless passion, meeting a great occasion with the directness of freedom and the wisdom of discipline."

In these early colonial days, membership in the church was a prerequisite for voting in church or village affairs. This, in its early form, became our system of elections and later, after the separation of church and state, became the basis of our political freedom.

The Congregationalists were the first colony to set up a compulsory public school system. Their schools were strict and religion played an important part in their training but pupils were also given an academic background to prepare them for Harvard College, a Congregational institution.

Architecturally, the early Congregational churches were "meeting houses", wherein both church services and town meetings were held. These buildings were generally simple, bare, rectangular and lacked any distinguishing features to mark them as churches. Gradually, the historic Pilgrim churches evolved as we know them today with simple white steeples, undecorated interiors, and small-paned clear glass windows.

However, as Albert Christ-Janer says concerning today's churches, "congregationalists might well wish to express the changes that have occurred within their faith over the years, transforming it from one of the sternest and most ridgid of doctrines into one of the least dogmatic. Especially in other parts of the country where the New England architectural tradition is out of place, such a new expression is indicated."

HISTORY OF THE LOCAL CHURCH.....

Approximately 150 years ago, the Presbyterian and the Congregational Religions of Montana entered into an agreement which called for one religion to abstain from starting a church in a small community of less than 5000 people if the other church had already formed a church there. This pact was merely to avoid competition between the two similar religions. Therefore the Congregational Church started a church in Livingston and the Presbyterians founded one in Bozeman.

However, three factors have since developed that have shown a need for a Congregational Church:

(1) The Congregational Church desires to make itself felt in the larger centers of Montana. Bozeman, with its population of 15,000, qualifies as one of these centers.

(2) Up to 200 young Congregationalists are attending Montana State College. These people, finding no Congregational Church to turn to, were turning

to other churches for their needs and often became permanent members of these other churches.

(3) The Presbyterian Church was seriously considering starting another church and the Methodists- a third church. This, then, pointed out the need for another church.

The Montana Conference of Churches, therefore, met and decided that Bozeman needed another "liberal" church, preferably other than another Presbyterian or a third Methodist Church. Acting upon a request by the Montana Congregational Churches to start a church in Bozeman, the Montana Conference granted a "comity assignment" to the Congregational Church. This assignment allowed the Congregational Church up to two years to do something in the way of starting a Congregational Church in Bozeman.

Mr. Guy Barnes from Livingston, Montana immediately began to survey Bozeman to discover what interest, if any, the residents of Bozeman had in starting a new church. His efforts netted him six families which formed and constituted the

Pilgrim Congregational Church. These families met at Danforth Chapel and in private homes until a minister and worship center could be found.

On November 20, 1960, Reverend and Mrs. Leonard J. Kovar moved to Bozeman to answer the urgent call for a pastor. The Montana Congregational Conference purchased a parsonage in west Bozeman and also met with the small congregation to set up a budget. This budget called for $6200 of which half was to come from the 6 family members, and the remaining half from the Conference. This budget enabled the Congregational Church to rent and carry on services in the Seventh Day Adventist Church on South Black Avenue. Since the Seventh Day Adventists met on Saturday and the Congregationalists on Sunday, there were no problems. The weekly rate was a reasonable $12.50.

However, the Seventh Day Adventists were finishing their new church and were looking for a buyer for their old facilities. It became evident that the Congregational Church had to find a new worship center or find themselves out in the cold. After investigating

this situation it also became evident that these facilities were the only suitable ones available in the city of Bozeman.

At this point the Congregationalists found themselves faced with the long range problem of building a permanent home and a short range problem of finding temporary facilities for worship and Sunday school. It was obvious to them that the short range plan must be solved first so, on Sept. 11, 1961, the Congregational Church purchased the old Seventh Day Adventist facilities for $12,000 which included both buildings, property and all equipment. This purchase was made at the disapproval of the Congregational Board since the Board felt the purchase of these facilities would tend to make the members sit back and relax their goals.

However, the Congregational Church is now making final arrangements to acquire the property on South Third for $2,000 an acre and are presently in the preliminary study stage of their building program. With luck, hard work and the grace of God, they may be able to move into their new home by the fall of 1965.

Condition of Prevailing Need

Physical Conditions

Only fourteen months ago, the Pilgrim Congregational Church of Bozeman, Montana purchased the property and buildings of the old Seventh Day Adventist Church located on South Black. Already, these facilities are becoming uncomfortably cramped for this new and ambitious congregation. At their annual meeting held on January 13, 1963, the trustees launched a membership drive expected to raise the present membership from 67 to 200 members by September, 1963. The realization of this goal would make the present church, with its capacity of 90 people, extremely inadequate. To cope with this expected increase, a building program must be launched in the near future.

The present structure will not only lack seating for the congregation, but also for the choir. The chancel, which measures only 6 ft. by 21 ft., is inadequate to accommodate the minister, altar, piano (or organ) and the choir. Therefore

the choir will be seated in the front rows of pews until the new structure is built.

The present chancel also provides no screening for the upright piano, which becomes somewhat of an eyesore and distraction to the congregation. (Fig. 5)

Acoustically, the present facility lacks a church atmosphere. The bare walls, ceiling and floor make a reverberation time far in excess of the recommended 2 to 2½ seconds for a church. Any corrective measure for this could only result in a costly investment.

The present Sunday school facilities will be noticeably inadequate with the advent of new members. The photograph on page 21 shows one Sunday school room which measures only 8 ft. by 10 ft. Its cramped quarters can hardly be adventageous to Christian teaching or learning.

The present site is surrounded by older residences which afford such unsightly view as the one from the 9 ft. by 21 ft. social room shown in Fig. 7



front view

fig. 1



back view

fig. 2



fig. 3 side view



fig 4 church facade



worship area | fig. 5



Sunday sunday room | fig 6



fig. 7 | pleasant view?



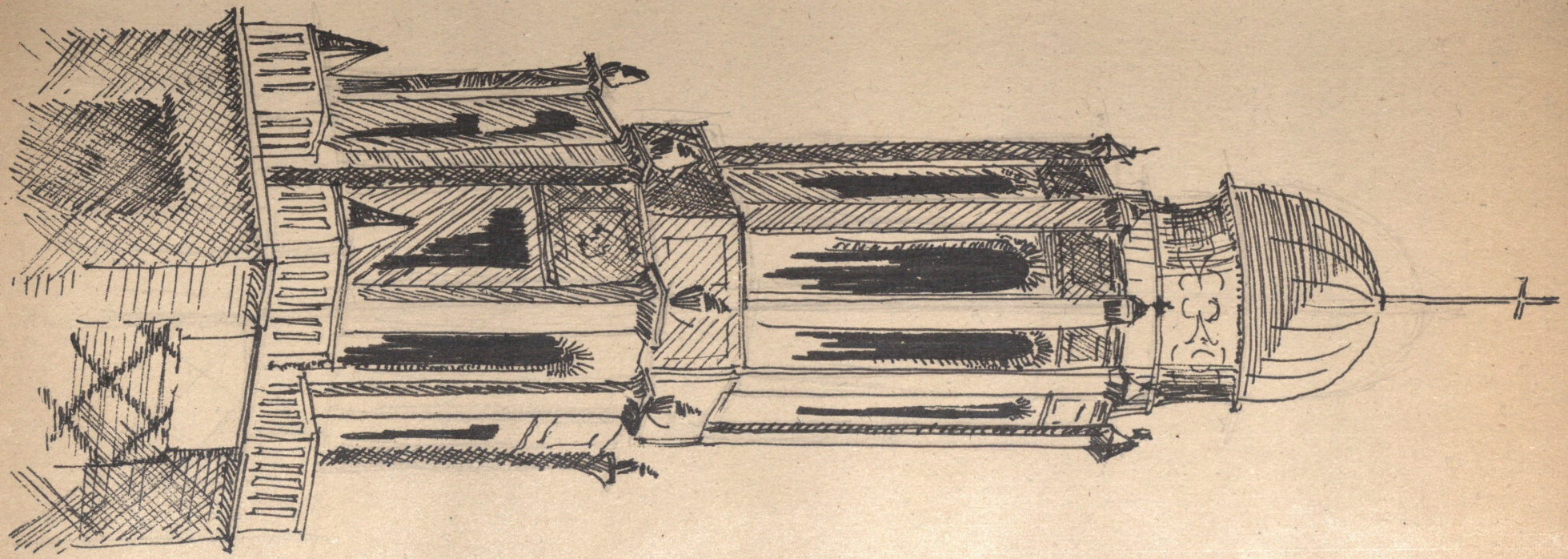
fig. 8 | parlor

Psychological Conditions

"Bozeman needs a new, contemporary expression of the Christian faith." These words of Reverend Leonard J. Kovar sum up the inspiration behind the new Pilgrim Congregational Church. Congregationalism is one of the most liberal thinking religions of our time. It is a religion unbound by ancient traditions and ceremony. It, rather, is free to create its own traditions within its own congregation. Its scientific, liberal and religious personality has brought a contribution to Bozeman but, in order for the church to grow, it must be noticed. The plain and old fashioned design of the present facility does little to attract the younger families of Bozeman to its congregation. The Reverend Dr. Curtis Beach, Minister of the Neighborhood Church in Pasadena, California stated:

> Our new members in recent years have been mostly young parents. I think our attractive, modern buildings have been a definite factor in drawing them.[5]

5. Christ-Janer and Foley, Ibid. p. 238.



Local Conditions

LOCAL CONDITIONS.....

Geographical[6]

Bozeman has a north latitude of 45° 40' and a west longitude of 111° 03'. It has an elevation of 4856 feet above sea level and is located in the rich, fertile Gallatin Valley. The city lies at the base of the Western slope of the Bridger Mountains and is surrounded on three sides by these mountains. As seen from the aerial view on page 25, the view can be very beautiful and may be considered when building orientation is being considered.

Population[7]

According to the 1960 census, the population was 13,361. It is now estimated, by the Bozeman Chamber of Commerce, to be approaching 15,000 people. With these figures and the figures from table I, a projected population graph for Bozeman Montana can be made (see page 27).

.....

6. Peter Remmen, A Central Office-Administration Building 1962. p. 23.

7. U. S. Census Population 1960 U. S. Dept. of Commerce, Bureau of the Census



Fig. 9

PROJECTED POPULATION FOR BOZEMAN MONTANA.....
table I

Period	Births	Deaths	Population (end of period)
1945-50	1175	464	10,462
1950-55	1330	448	11,925
1955-60	1230	507	13,340
1960-65	1388	527	15,022
1965-70	1577	563	17,014
1970-75	1804	604	19,380
1975-80	2075	668	22,182
1980-85	2396	721	25,566
1985-90	2771	780	29,532

Figure 11

PROJECTED POPULATION FOR BOZEMAN MONTANA.....

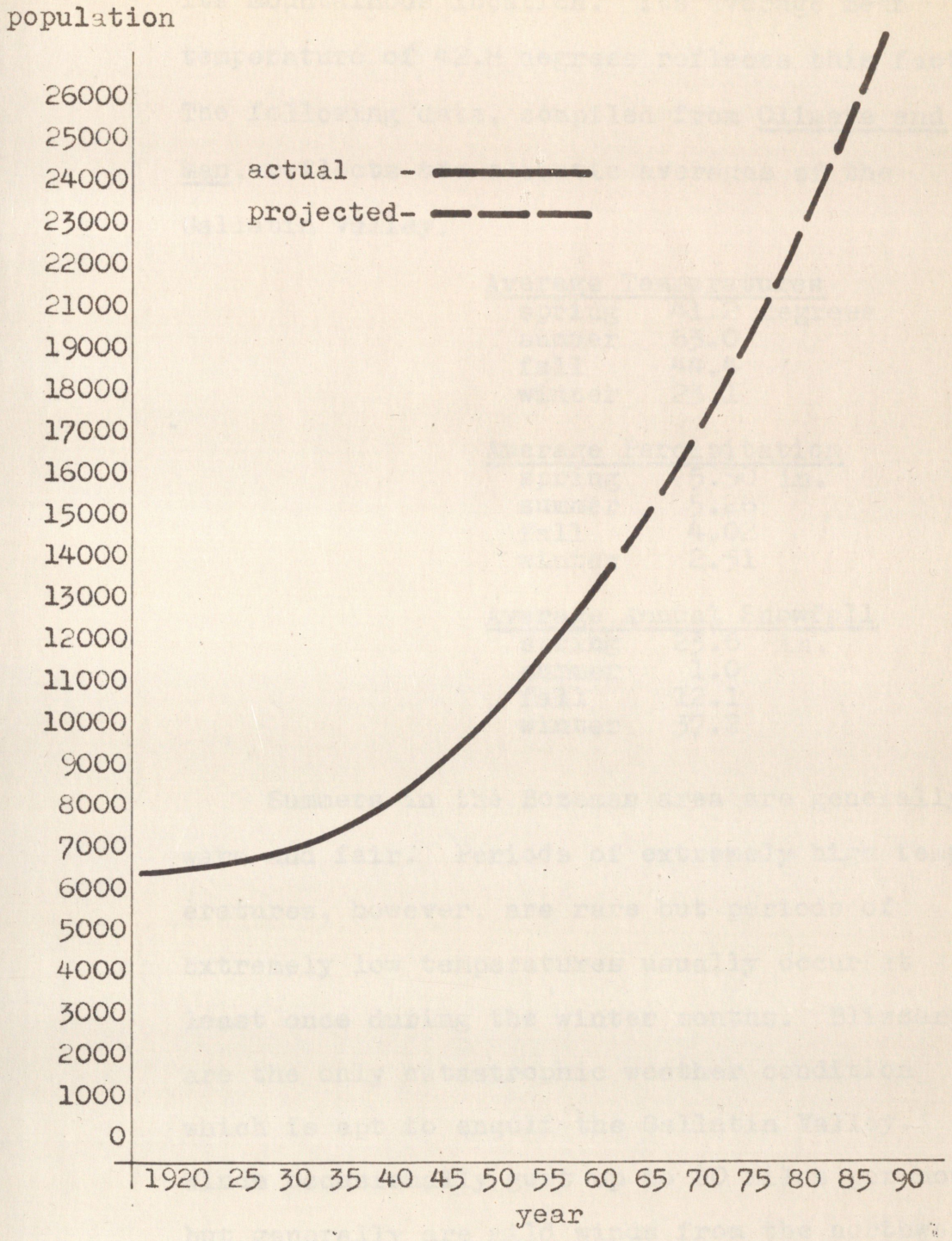


Figure 12

Climate[8]

The climate of Bozeman is influenced by its mountainous location. Its average mean temperature of 42.8 degrees reflects this fact. The following data, compiled from Climate and Man, reflects the climatic averages of the Gallatin Valley.

Average Temperatures	
spring	41.2 degrees
summer	63.0
fall	44.4
winter	23.1

Average Percipitation	
spring	5.50 in.
summer	5.26
fall	4.02
winter	2.51

Average Annual Snowfall	
spring	23.6 in.
summer	1.0
fall	12.1
winter	37.2

Summers in the Bozeman area are generally warm and fair. Periods of extremely high temperatures, however, are rare but periods of extremely low temperatures usually occur at least once during the winter months. Blizzards are the only catastrophic weather condition which is apt to engulf the Gallatin Valley. Winds occasionally gust up to 80 miles per hour but generally are mild winds from the northwest.

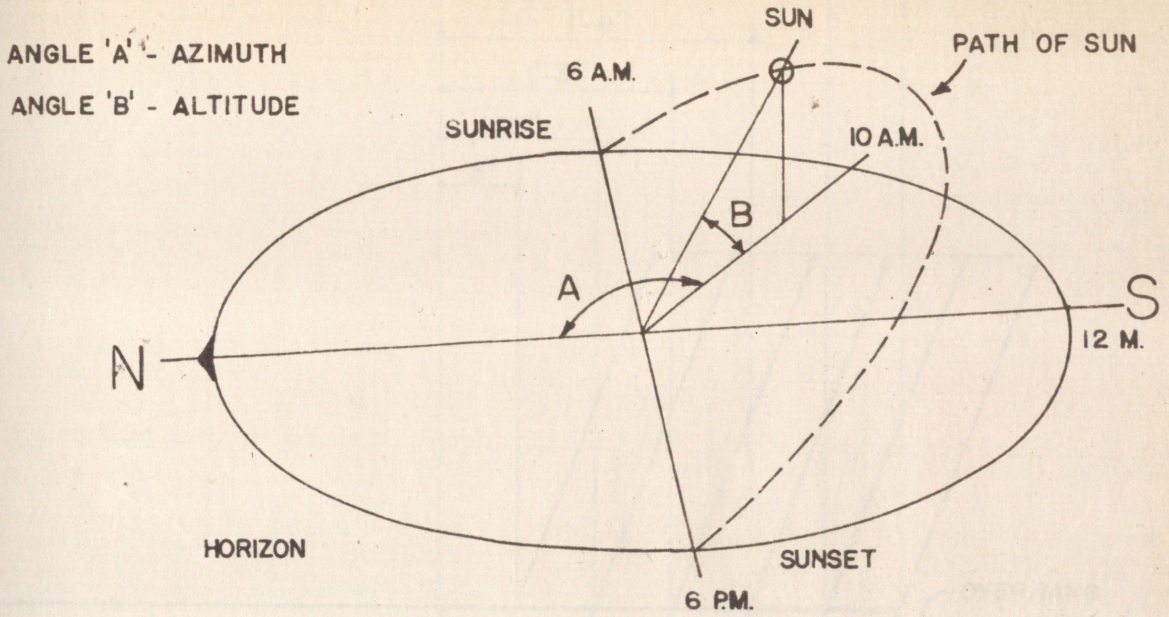
The growing season is approximately 110-120 days with the last killing frost coming about May 20-30 and the first about August 30.

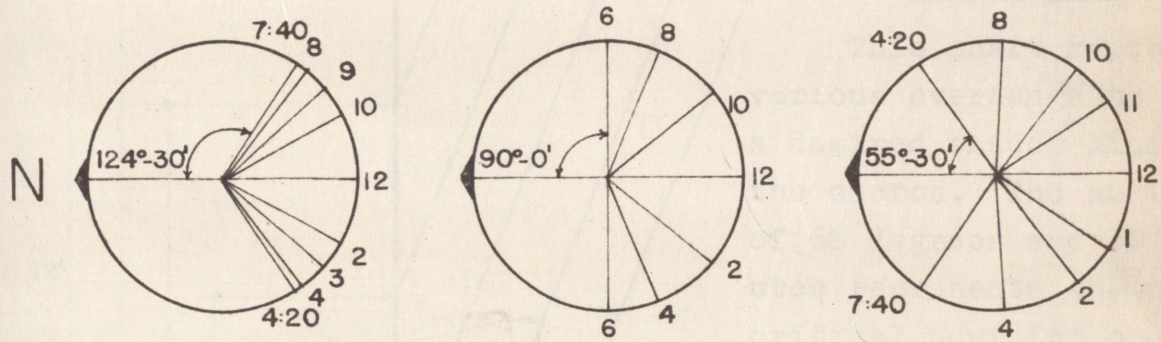
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8. United States Dept. of Agriculture, Climate and Man, U.S. Government Printing Office, 1949 Yearbook.

SOLAR ANGLES

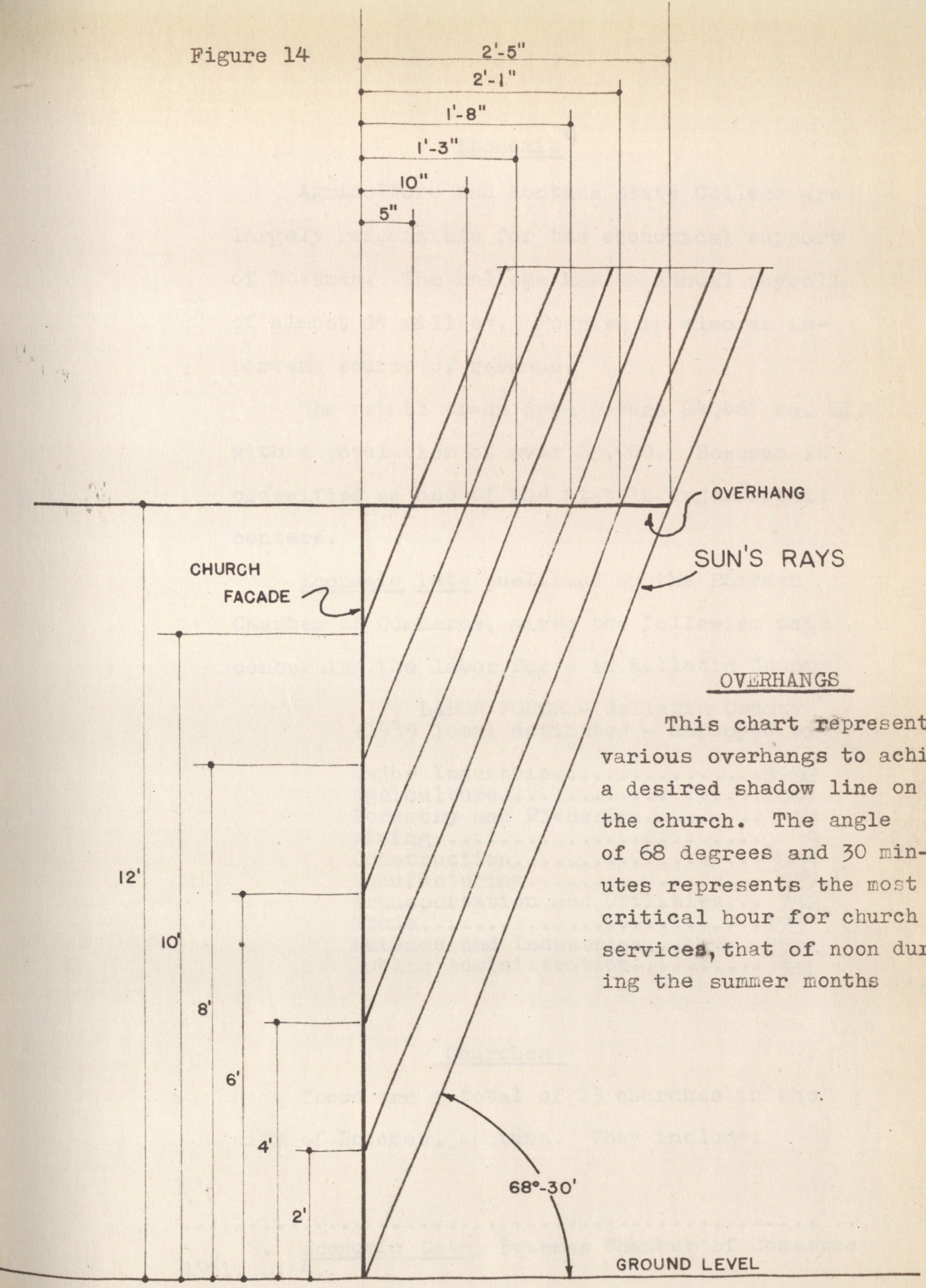
Figure 13





WINTER	DEC. 22		FALL	SEPT 23 MARCH 22		SPRING	JUNE 22		SUMMER		
A.M.	P.M.	AZIMUTH	ALT.	A.M.	P.M.	AZIMUTH	ALT.	A.M.	P.M.	AZIMUTH	ALT.
NOON		180°-0'	21°-30'	NOON		180°-0'	45°-0'	NOON		180°-0'	68°-30'
10:00	2:00	151°-30'	16°-0'	10:00	2:00	141°-0'	38°-0'	11:00	1:00	145°-30'	65°-30'
9:00	3:00	139°-0'	10°-0'	8:00	4:00	112°-0'	20°-30'	10:00	2:00	121°-30'	57°-30'
8:00	4:00	127°-30'	2°-30'	6:00	6:00	90°-0'	0°-0'	8:00	4:00	93°-0'	37°-30'
7:40	4:20	124°-30'	0°-0'					4:20	7:40	55°-30'	0°-0°

Figure 14



OVERHANGS

This chart represents various overhangs to achieve a desired shadow line on the church. The angle of 68 degrees and 30 minutes represents the most critical hour for church services, that of noon during the summer months

Economic[9]

Agriculture and Montana State College are largely responsible for the economical support of Bozeman. The college has an annual payroll of almost $4 million. Tourism is also an important source of revenue.

The retail trade area covers 24,465 sq. mi. with a population of over 65,000. Bozeman is classified as one of the State's major retail centers.

Economic Data published by the Bozeman Chamber of Commerce, gives the following data concerning the labor force in Gallatin County:

LABOR FORCE - Gallatin County
(1959 local estimate) - employed by:

Major Industries	8792
Agriculture	2004
Forestry and Fisheries	37
Mining	9
Construction	564
Manufacturing	627
Transportation and Utilities	752
Trade	1733
Science and Industries	2541
Public Administration	381

Churches

There are a total of 23 churches in the city of Bozeman, Montana. They include:

.....

9. Economic Data, Bozeman Chamber of Commerce 1961. p. 4.

Assembly of God
Baptist (2)
Christian
Church of Christ
Church of God
Church of Jesus Christ of Latter Day Saints
Christian Reformed
Christian Science
ELC and Missouri Synods
Episcopal
Evangelical United Brethren
Jehovah's Witnesses
Lutheran (2)
Presbyterian
Methodist (2)
Roman Catholic
Seventh Day Adventist
Pilgrim Congregational

Social

Bozeman is an unusually conservative community and its people generally are luke warm to new ideas and renovations. A classic example of their conservatism would be the defeat of the bond issue for a new, modern and much needed city hall. This defeat was mainly due to the inhabitants objection to a modern architectural design for a city hall that they were used to being housed in an old-fashioned, ugly and unsafe building.

College professors find it safer to keep their opinions and ideas to themselves in fear of city father rebellion against them and subsequent loss of jobs.

Die Conditionis

SITE CONDITIONS.....

Location

Five months ago, the Pilgrim Congregational Church purchased 2.6 acres of land in the south end of Bozeman. This land will be the future site of the new church facilities which will be built in two stages. The site is located on South Third Avenue, adjacent to the new Westridge Subdivision. The site is presently lying dormant, being used only in the summer months for grazing. The site is without tree coverage and contains only wild brush coverage. There are no buildings on the site.

Topographical Features

The proposed site has an approximate 450 foot frontage on South Third and a 250 foot depth extending east from South Third. The rise in grade is one foot in 40 feet with the highest point at the southwest corner of the site. As seen from the contour map, page 41, a natural drainage canal has formed through the middle of the site. The west side of the property is approximately two feet lower than South Third Avenue. Because of the tremendous amount of fill that would be required to level

The property with the street, I will design under the assumption that feeder roads and driveways will be sloped down to the site.

Traffic Patterns

South Third Avenue will be the feeder street to the church property and in all probability, according to the Bozeman Building Inspector, will be one of the main feeder roads to the new residential subdivisions sprouting up in the south Bozeman area. This fact should be remembered when considering the placement of the parking lot on the site. Even though this is a main street, however, the fact that congestion from the lot will occur on Sundays at noon when traffic is likely to be light. Hill street may be used as the entrance and/or exit to the lot.

Parking Lot and Zone Limitations

Preliminary thinking classifies the proposed site in a Class A zone. This will place the following limitations of building setbacks:

front - 35 ft.
side - 25 ft.
side - 25 ft. on street
back - 30 ft.

The size of the parking lot will be governed by the greater of the following two criteria:

1) One parking space per 4 seats.

or

2) One parking space per 30 square feet of building.

Utilities

At the present time, only power and gas are immediately available to the site. However, according to the building inspector who is also substituting as the city engineer, there will be water and sewer systems laid within 8-12 months.

Orientation

As seen from Fig. 16 , the property is bounded on the west by Third Avenue, and the south by the Westridge Subdivision. At present, the north and east lands are vacant. As Fig. 17 shows, however, the future site will be bounded on the north by Hill Street and on the east by North Park. The city has not officially set aside the land for this park but preliminary studies indicate a strong possibility for

the dedication of this park.

The relation of the sun to the site can and should play a very important part in the orientation of the building on the site. The table on page 38, taken from Climate and Architecture, gives a suggested list of appropriate sun orientations. Each x in the table suggests that the orientation indicated at the top of the column is suitable for the given type of accommodation. Wind and view, of course, are not considered here. The designer should keep in mind the excellent mountain views to the southeast and north of the site when considering the orientation.

.....

10. Jeffery Ellis Aronin, Climate and Architecture, Rhinehold Publishing Corporation 1953 p. 65.

APPROPRIATE SUN ORIENTATION.....

Figure 15

	N	NE	E	SE	S	SW	W	NW
TOILETS	X	X	X	X	X	X	X	X
ENTRANCES				X	X	X		
FELLOWSHIP HALL	X	X	X	X	X	X	X	X
NARTHEX				X	X	X		
ADMINISTRATION				X	X	X		
LOUNGE OR PARLOR				X	X	X		
OFFICES				X	X	X		
SUNDAY SCHOOL ROOMS			X	X	X	X		
WORK SHOP	X	X						X
KITCHENS	X	X						X
MEETING ROOMS				X	X	X		
UTILITIES	X	X						X

Fig. 16

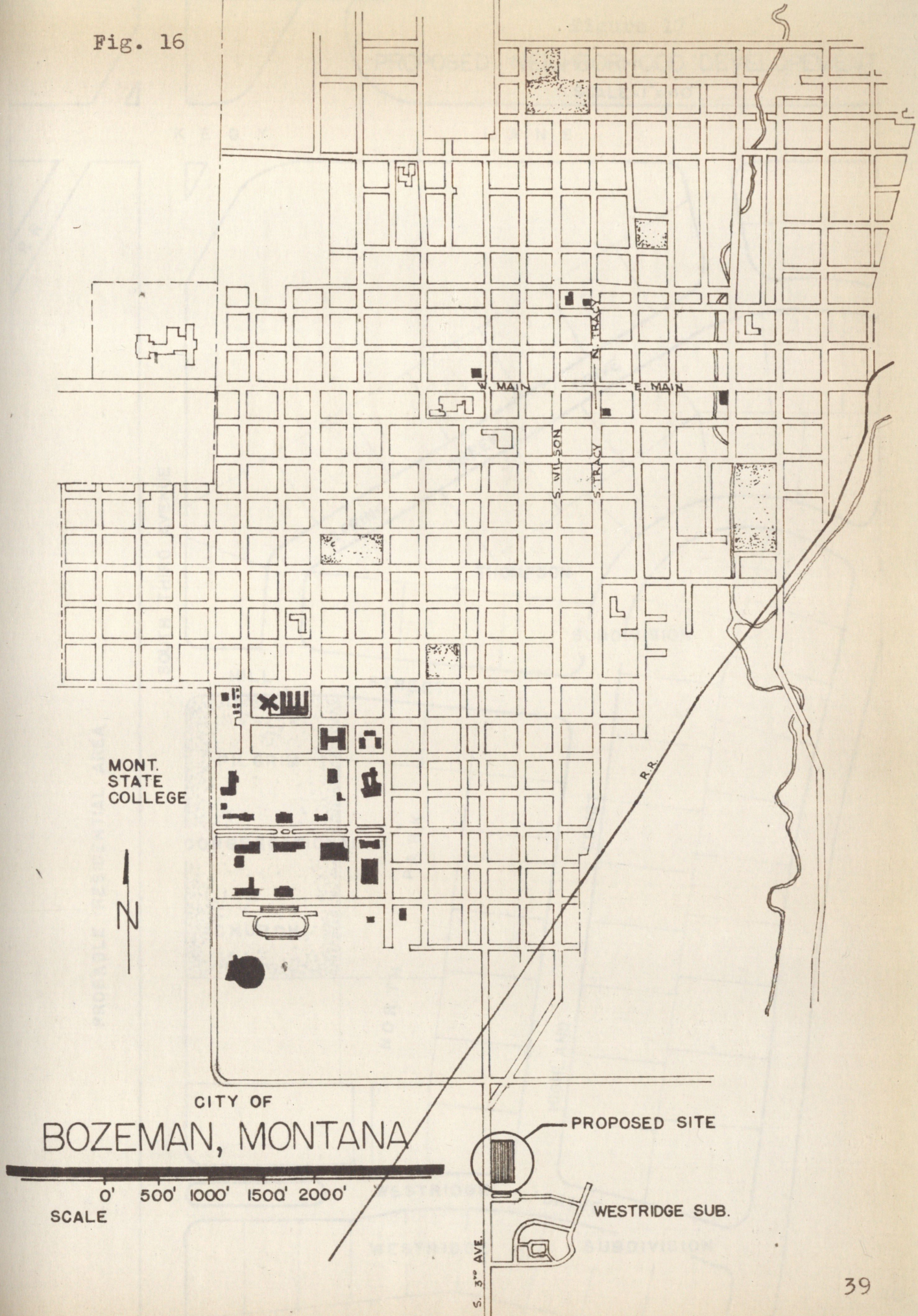

W. MAIN
E. MAIN
N. TRACY
S. TRACY
S. 19TH
MONT.
STATE
COLLEGE
N
R.R.
CITY OF
BOZEMAN, MONTANA
PROPOSED SITE
WESTRIDGE SUB.
S. 3RD AVE.
0' 500' 1000' 1500' 2000'
SCALE

Figure 17

PROPOSED NEIGHBORHOOD DEVELOPEMENT

SCALE - 1" = 40'

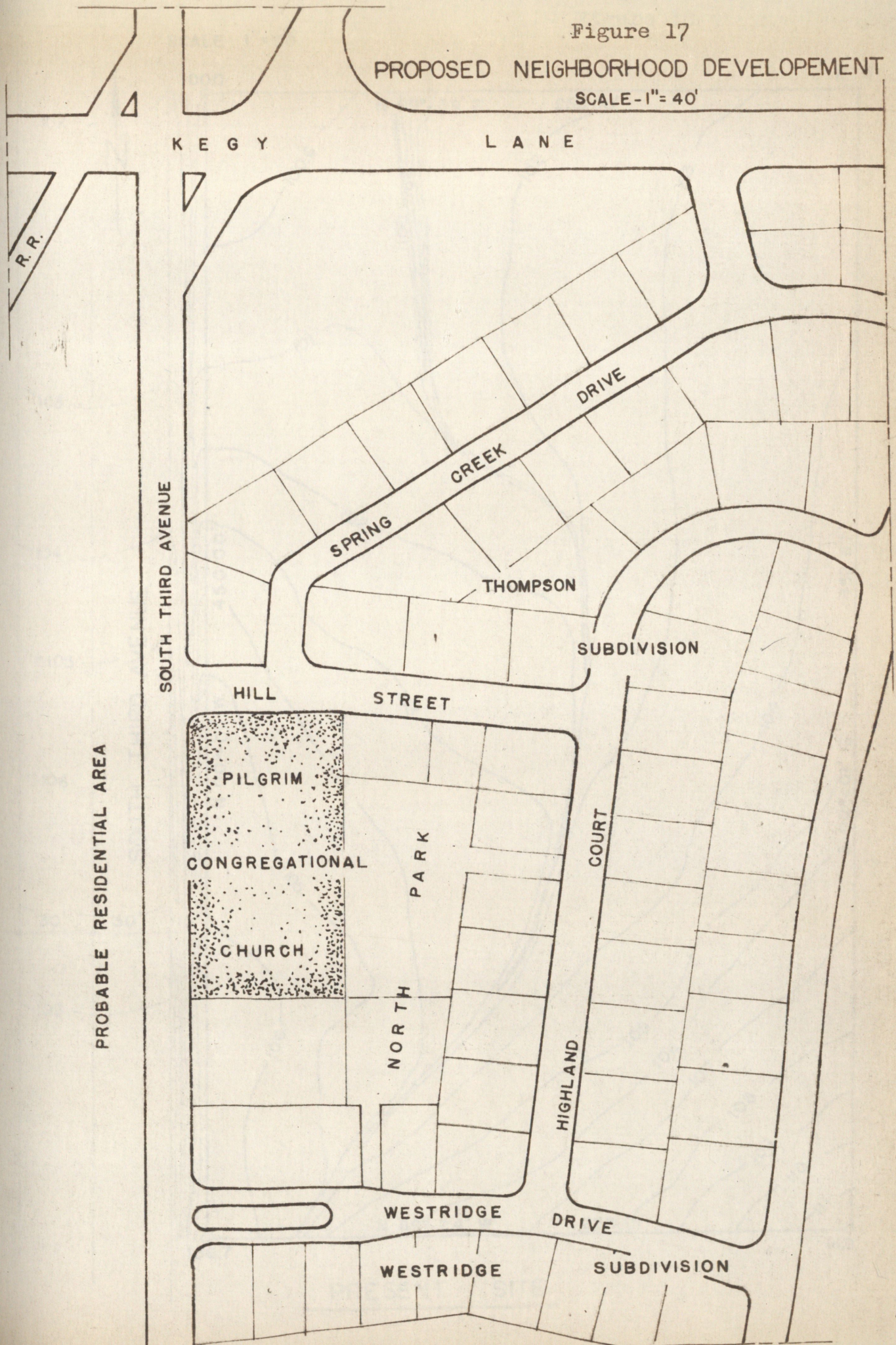
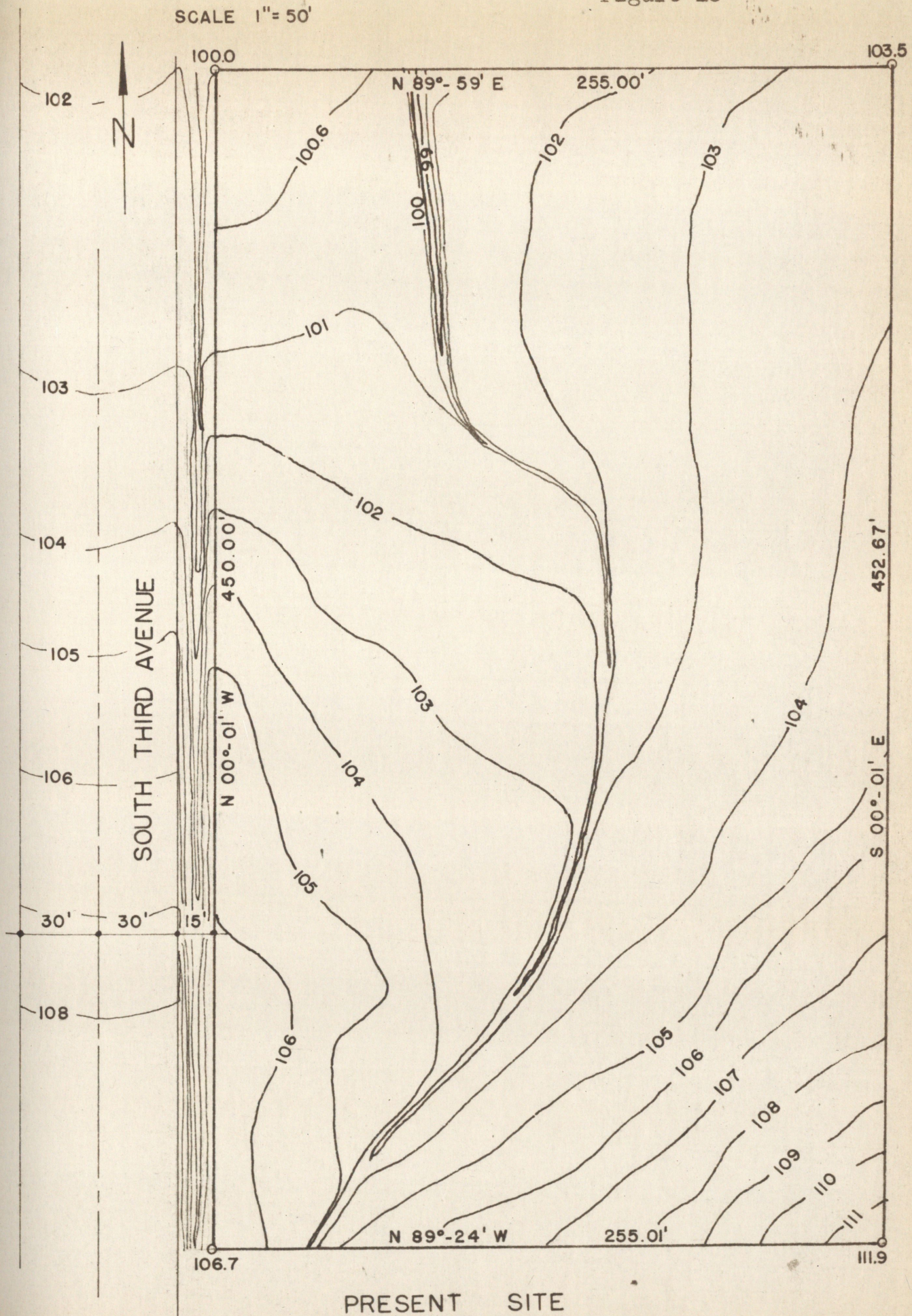


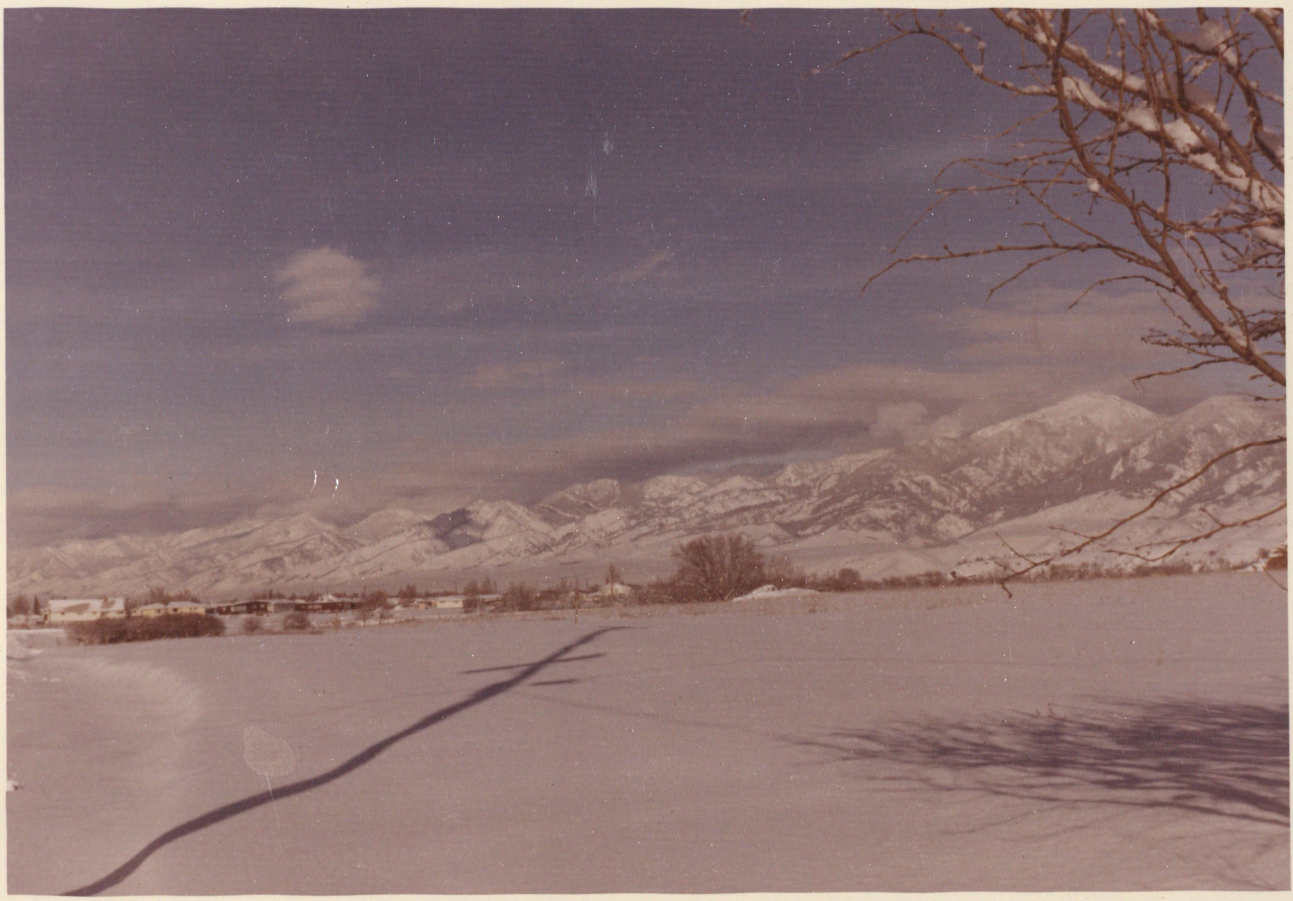
Figure 18



PRESENT SITE

site looking north

fig. 19



site looking south

fig. 20



Bozeman, Montana

fig. 10



looking s.w.

Մատուռ Սուրբ Աստուածածնի

Parking

As one minister sums up the problem of parking, "we must park the car before we can pew its passengers."[11] Cars are getting bigger and more numerous all the time and yet are arriving at church with fewer persons in them. The problem of parking cars is one of the big problems facing city builders today. According to Appendix "A" of the Zone Requirement Chart published by the City of Bozeman, Montana:

> Off street parking spaces shall be provided in connection with the erection of increase by units or dimension of any building or structure in the following amounts:
>
> Churches: 1/each 4 seats or
> 1/each 30 sq. ft. of
> floor area, whichever is the greater

Since the total square footage of the building cannot be calculated at this point, the required parking space for preliminary planning will be one-fourth of 350 seats or 88 cars.

The Zone Chart also contains the following paragraph:

---

11. John R. Scotford, When You Build Your Church, (Channel Press, Inc. Great Neck N. Y.) 1958 p. 4.

> LOCATION OF OFF-STREET PARKING AREAS: No more than 25% of the parking spaces required may be located within any required side yard. No off-street parking areas are to be located in any required front yard and/or corner lot street side yard.[12]

(for front and side yard minimums, see Zoning Requirements, page 35).

After interviewing the Bozeman Building Inspector, the above requirement may be waived only by the City of Bozeman Planning Board. However, according to the building inspector, the board is more interested in getting the cars off the streets than in the enforcing of an encroachment of side or front yardage by a parking lot. Therefore, I will base my planning on the premise that, if all the functions will not fit comfortably of the site under the present zone requirements, the planning board will waive the encroachment.

The following points, compiled from When You Build Your Church, should be considered when planning the parking lot.

1. Ample arrival and departure space should be provided for churchgoers off the highway.

2. Right-hand pickup and delivery is safest, especially for small children.

.....

12. Requirements Affecting All Zones, Zone Requirement Chart, Column 14 (City of Bozeman, Montana)

3. Lack of adequate parking is a major hinderance to the newcomer who has not committed himself.

4. If possible, the entrance to a church parking area should be accessible from side streets, rather than from main highways or streets.

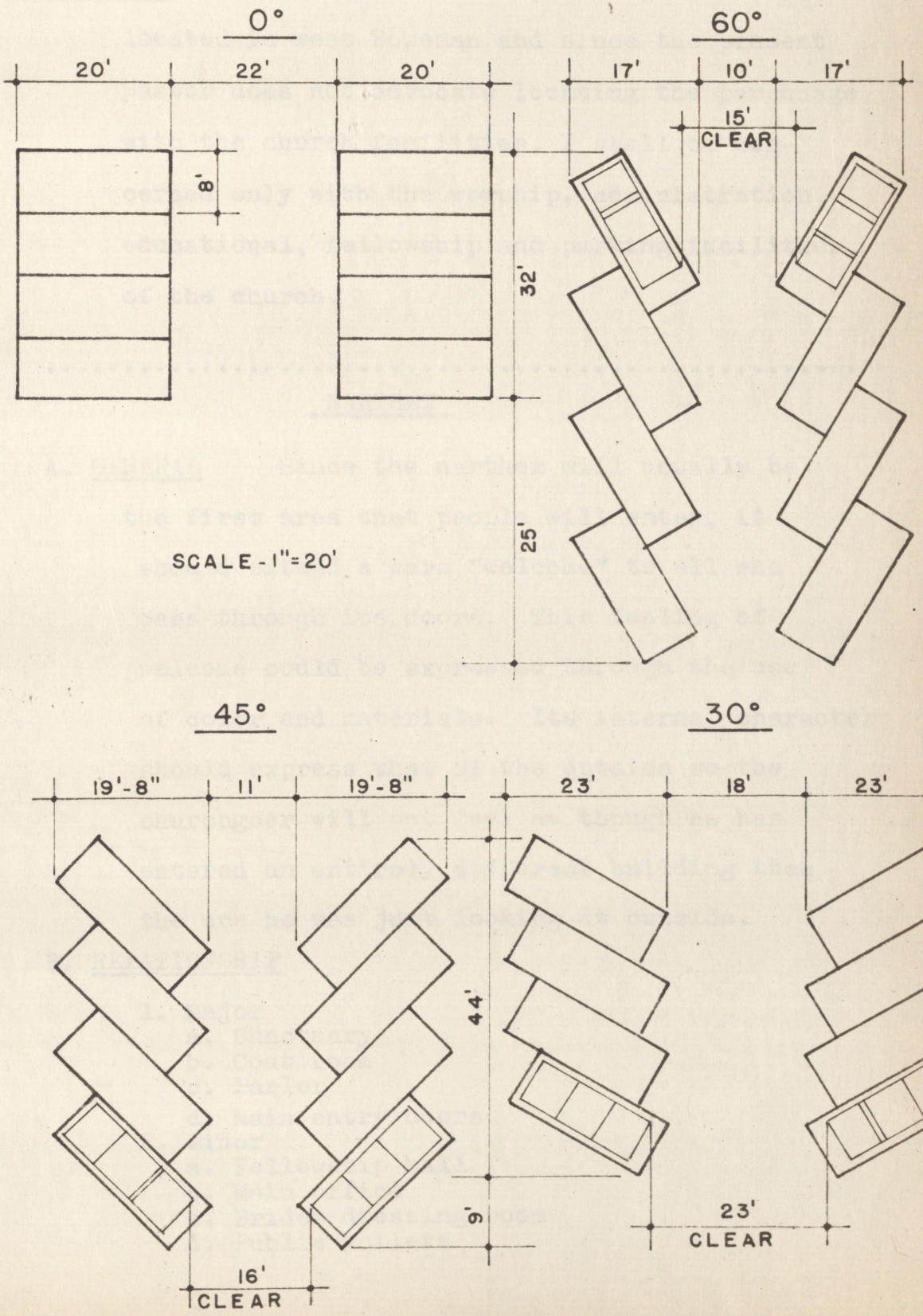
5. If church parking facilities are to be effective, they must be clearly visible.

6. Lots should be so placed that people will enter the church from the main entrance rather than short cutting through a service entrance.

7. The diagram on page 50 illustrates the minimum distances for 30-, 45-, 60-, and 90-degree parking angles.

MINIMUM DIMENSIONS FOR PARKING.....

Figure 21



Church

GENERAL Since the church parsonage is located in west Bozeman and since the present pastor does not advocate locating the parsonage with the church facilities, I shall be concerned only with the worship, administration, educational, fellowship and parking facilities of the church.

.....

NARTHEX

A. GENERAL Since the narthex will usually be the first area that people will enter, it should extend a warm "welcome" to all who pass through its doors. This feeling of welcome could be expressed through the use of color and materials. Its internal character should express that of the outside so the churchgoer will not feel as though he has entered an entirely different building than the one he was just looking at outside.

B. RELATIONSHIP

1. Major
   a. Sanctuary
   b. Coat room
   c. Parlor
   d. Main entry doors
2. Minor
   a. Fellowship hall
   b. Main office
   c. Bride's dressing room
   d. Public toilets

C. FURNISHINGS and EQUIPMENT

Bench seating for 5-10 people

D. SIZE

1. If used as overflow space, this room will need to seat 100 people. This would require a total of 800 sq. ft., using 8 sq. ft. per person.[13]
2. If this room is used for circulation alone, there should be room for 150 people. At 1.5 sq. ft. per person,[14] this would require a total of 225 sq. ft.

E. MISCELLANEOUS

1. The entry doors should be oriented to the south or southwest on order to capture the sunlight. This should be violated only if some type of heating system is used to keep the entry free of ice and snow.
2. The lighting level of this area should be at least average since this is a heavy traffic flow area.

.....

13. P.M. Torraca, Religious Architecture Architectural Engineering 431, Related Theory. p.2
14. Ibid p.2.

NAVE

A. GENERAL A discussion of the general aesthetic feeling for the nave is covered on page 79

B. RELATIONSHIP

1. Adjacent to narthex
2. Adjacent to overflow area

C. FURNISHINGS and EQUIPMENT

Pews for approximately 250 people

D. SIZE

As stated earlier, the Pilgrim Congregational Church presently has a membership of 67 members. Their future plans call for a membership drive to raise the congregation to 200 members by 1964. As the congregation approaches a membership of 500 people, the present thinking is to then start another Congregational Church. As the need becomes evident, two services will be held each Sunday. The thought behind limiting a total seating capacity and church membership is that a moderate-sized congregation will achieve a greater degree of participation than a large one and that the individual will feel a greater responsibility and a greater sense of fellowship in a smaller group.

Serious consideration could be given to designing on the three-foot module which, according to William Watkin, seems ideally adapted for churches since the three-foot spacing is normal for pews. According to Planning and Building the Modern Church, the width of a chancel for 300 seats is 30 ft. (16 seats per row) plus 12 feet for aisles or a total of 42 ft. Using this width, the required depth would be:[15]

$250/16 = 15.6$ or 16 rows

16 rows x 3'-0" = 48 ft. + 6 ft. front aisle and 6 ft. back aisle = 60-foot depth

42 x 60 = 2520 sq. ft. max.

E. MISCELLANEOUS

1. Lighting should be flexible to create the desired moods.
2. A carpet strip down the center aisle helps acoustically for processionals and also gives depth to the sanctuary.

15. William Watkin, Planning and Building the Modern Church, (F.W. Dodge Corp. New York)1953, p. 27.

CHANCEL

A. PULPIT

There are two possibilities for the positioning of the pulpit. These will be discussed separately.

ON-CENTER

The so called "on-center" pulpit is the traditional pulpit position that has been used throughout the ages. There are two disadvantages to this system, however. First, the speaker's voice does not carry well because of the absence of a hard-surfaced wall near his back unless this wall is provided. Secondly, the minister is tempted to swivel as he speaks, directing his attention first ~~at~~ to one side of the room and then to the other.

OFF-CENTER

The recent "off-center" pulpit position not only gives the minister a chance to see the entire congregation at once and throw his voice out more easily by utilizing the hard-surfaced wall at his back, but it also gives the designer a chance to put a lectern on the opposite

side of the chancel. Reverend Kovar, the present minister of the Congregational Church, favors the off-center to the on-center pulpit, mainly for the above-mentioned advantages. For this reason, the off-center pulpit will be used in the church design.

B. CHOIR

There are three main choral-seating arrangements that have been predominant throughout the ages in church design. These will be discussed separately.

BALCONY

The first method, that of seating the choir in the balcony, enables the conductor to lead in a vigorous manner and enables the choir to sing without self-consciousness. Also the congregation's attention is not distracted by the choir during the service. However, this method has its distinct disadvantages. Seating the choir in the balcony makes a processional very difficult if not impossible. Secondly, the choir is too far from the people to lead them in hymns. Lastly, the members of the choir often fall into bad habits of arriving late, leaving early and indulging in non-religious activities when they are not singing.

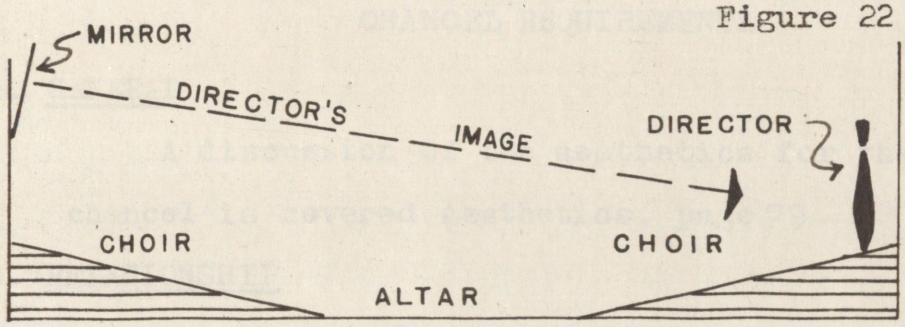
CENTER CHANCEL

In the center-chancel method, the choir stares at the congregation, and the congregation stares back at the choir. This method can become exceedingly distracting. Also, the choir director must stand with his back toward the congregation, which, though not extremely bad, is not ideal.

DIVIDED CHANCEL

The divided chancel seems to be more ideally suited for choral arrangements. Either the choir can all be seated on one side or they can be divided on both sides. The divided arrangement also compels the director to stand with his back toward the congregation unless a mirror is used for one side. A mirror system such as the one shown in Fig. 22 is used very effectively in the First Congregational Church in Billings, Montana

Figure 22



A solution which is possible in any of the three systems would be one in which the choir can see the minister but the congregation can only see the choir when its members are standing

C. ORGAN

The organ may or may not be hidden from view, according to individual preferences. Generally, however, the organist can be a fascinating distraction for some people and should therefore, in my opinion, be hidden from view. An important point to remember when placing the organ is to plan a convenient method of entry and exit for the organist.

According to Watkin, "organists prefer nearly unanimously to be seated on the side of the choir facing the organ chamber, rather than directly below."

The average electronic console organ is about 4 ft. deep and 5 ft. wide. The usual height is 46 in.[16]

CHANCEL REQUIREMENTS

A. GENERAL

A discussion of the aesthetics for the chancel is covered Aesthetics, page 79

B. RELATIONSHIP

There should be an access from the chancel to some other part of the church without necessitating a processional through the nave. Since the Congregational Church uses a pro-

16. An Architectural Record Book, Time Saver Standards, (F.W. Dodge Corp. New York) 1954, p. 872.

cessional entrance and exit, this access will be used mainly for weddings, nativity scenes, etc.

C. FURNISHINGS and EQUIPMENT

1. Altar
2. Cross
3. Lectern
4. Pulpit
5. Organ and organ sound equipment (see page 58)
6. Pews to seat approximately 24 choir members
7. Baptisimal font
8. Storage for Commumion equipment

D. SIZE

800-1000 sq. ft.[17]

E. MISCELLANEOUS

1. The lighting system should be flexible for various moods but should contain floodlights for the pulpit, lectern, altar, and cross. Floodlights may also be desirable for the choir, especially for Christian services.
2. The altar and cross should be unlike their entourage both in texture and color.

COAT ROOM

A. GENERAL

The coat room should be designed so that a maximum number of people can hang up or retrieve their coats in a minimum amount of time. Above all, it should not become a bottleneck.

B. RELATIONSHIP

Adjacent to narthex

17. Torraca, Ibid. p. 2.

C. FURNISHINGS and EQUIPMENT

Shelf for hats, packages, etc.

D. SIZE

1. Capacity of 200 coats- 5 coats/2 ft.[18]
   Therefore a minimum of 80 lineal ft. will be required.
2. Approximate area- .6 sq. ft./coat [19]
   Therefore a minimum area of 120 sq. ft. will be required

E. MISCELLANEOUS

Some provision should be made to hide this area from view when desired.

PARLOR

A. GENERAL

The parlor will be the central place of welcome for many of the activities of the church. This means it should have a welcome and informal atmosphere. This room will serve as the meeting room for a majority of the smaller church groups. Its activities may range from small seminars to larger picture showings. It therefore must have some flexibility to accomodate these various functions. In addition, this may also be considered as the place for possible expansion of

18. Francis de N. Schroder, Anatomy for Interior Designers, (Whitney Publications, Inc) 1954, p. 40.
19. Torraca, Ibid. p. 2.

church services.

B. RELATIONSHIP

1. Adjacent to narthex
2. Possibly adjacent to pastor's study and/or main office.

C. FURNISHINGS and EQUIPMENT

1. Comfortable seating for 20-30 people
2. Small kitchenette unit for serving coffee and refreshments
3. Floor lamps and coffee tables
4. Drapes
5. Art work
6. Shelves for books
7. Storage for folding chairs
8. Fireplace
9. Wall to wall carpeting
10. Provision for showing movies

D. SIZE

1. If the parlor is used as a sanctuary expansion of 1000 people, the minimum required area will be approximately 800 sq. ft.
2. If the parlor is used only as a parlor, the desired capacity will be approximately 50 people. At. 7 sq. ft. per person,[20] the minimum area will be 350 sq. ft.

.....

20. Torraca, Ibid p. 2.

OFFICE and/or WORKROOM

A. GENERAL

The receptionist acts as a "middle man" in a church just as in any business. She therefore must be located in a convenient position from the main entry. Since economy may not permit a separate workroom, the designer must attempt to conceal the work area so that this area does not become an eyesore.

B. RELATIONSHIP

1. Adjacent to pastor's study
2. Conveniently located near main entrance

C. FURNISHINGS and EQUIPMENT

1. Seating for three visitors
2. One desk
3. One long work table for mimeographing
4. Storage space for books and supplies
5. Book shelves
6. Filing cabinet

D. SIZE

Approximately 150 sq. ft.

PASTOR'S STUDY

A. GENERAL

The pastor's study should possess a semi-informal atmosphere. It must not only be a refuge for the minister and a comfort for those that need a minister's counsel, but also it must be able to take on a business-like atmosphere when small meetings, such as the trustee meetings, are held there. This room would be an excellent one to take advantage of the mountain view to the northeast of the city (see Fig. 19).

B. RELATIONSHIP

1. Adjacent to receptionist's office
2. Centrally located within the church plant

C. FURNISHINGS and EQUIPMENT

1. Comfortable moveable seating for 5 to 8 people
2. Shelves for books
3. Desk
4. Built-in cabinets and cloak rack
5. File cabinet
6. Couch (can be used in case of first aid emergencies)

D. SIZE

Approximately 225 sq. ft.[21]

E. MISCELLANEOUS

1. The room should be well lit.
2. Separate thermostat to avoid heating the entire building

.....

21. Torraca, Ibid. p. 2.

FELLOWSHIP HALL

A. GENERAL

The fellowship hall could be referred to as a "catch-it-all" room. This room must be flexible enough to accommodate the various functions that will occur within it. These various functions will include:

a. Young peoples games, dances, and activities

b. Large and small meetings

c. Large and small banquets

d. Varieties of entertainment with music or movies

B. RELATIONSHIP

1. Direct exit to outside
2. Adjacent to kitchen

C. FURNISHINGS and EQUIPMENT

1. Seating for approximately 300 people
2. Tables to accommodate 200 people

D. SIZE

1. The church desires to serve 200 people at banquets. At a minimum of 10 sq. ft. per person,[22] this would require an area of 2000 sq. ft.
2. Tables must be at least 7'-0" center to center and each person must be allowed 2'-0" lineal width at the table.

.....

22. Torraca, Ibid.p. 2.

3. At 2000 sq. ft., the allowable seating for lectures would be 300 people. This is allowing 6 sq. ft. per person.[23]

E. MISCELLANEOUS

1. Storage space for tables and chairs
2. Free of columns

KITCHEN

A. GENERAL

According to one source, "the virtue of the kitchen does not consist in its size but in its organization." [24] Efficiency of operation should be remembered when designing this area. In the actual operation of a church kitchen, four main problems must be eliminated to afford an efficient kitchen:

1. Separating the servers from the food-handlers in the kitchen
2. Routing of the food from the place of storage by way of the place of preparation to the serving counter
3. Keeping dirty dishes separated from clean ones
4. Providing ample and efficient storage

.....

23. Torraca, Ibid. p. 2.
24. Scotford Ibid. p. 170.

B. RELATIONSHIP

1. Adjacent to fellowship hall
2. Adjacent to food storage
3. Easily accessible from service entrance

C. FURNISHINGS and EQUIPMENT

(see flow diagram, page 98)

D. SIZE

According to Torraca, 2.0 sq. ft. per person served should be ample. At a banquet capacity of 200 people, the total square footage for the kitchen would be 400 sq. ft.

Additional storage room area of 150 sq. ft.

CHOIR ROOM

A. GENERAL

Because of the commotion between the members of the choir and the Sunday school children, I feel it is compulsory to have a separate choir rehersal and robeing room. This commotion would be extremely bad in the event that two services are needed in the future. This choir room could also serve as a bride's dressing room during a wedding.

B. RELATIONSHIP

Accessible to the narthex

C. FURNISHINGS and EQUIPMENT

1. Folding chairs
2. Storage for robes and music
3. Adequate mirrors for choir and wedding preparations

D. MISCELLANEOUS

Acoustically treated to prevent sound transmission

E. SIZE

Approx. 325 sq. ft.

Church School

John Scotford stated in his book, "the church cannot start too soon." With this thought in mind, the architect should attempt to design a church school so that both teaching and learning become easy and pleasant. Environment is very important to children, especially the younger tots. Careful selection should be given to the design, fabrics, furnishings and colors which go to make up these surroundings. This environment could include a glimpse out of the windows to attractive landscaping. Nature's handiwork often means more to the younger people than to the older folks who have come to take so many things in life for granted.

Window areas are important in Sunday school rooms. Their area should be at least 18-25% of the floor space of the room.[25]

The chart shown below indicates the number of pupils per hundred total attendance. These figures are general averages.[26]

DEPT.	PRESBYTERIAN	METHODIST	DECIPLES OF CHRIST
NURSERY	6%	8%	8%
KINDERGARTEN	12	8	8
PRIMARY	18	12	12
JUNIOR	15	12	11
JUNIOR HIGH	12	11	11
SENIOR	10	10	10
OLDER YOUTH	--	5	40
ADULT	27	35	

25. C. Harry Atkinson, Building and Equipping for Christian Education (Nat'l Council of the Churches of Christ in the U.S.A.) 1959, p. 18.

26. Atkinson, Ibid. p. 26.

NURSERY

A. GENERAL

The nursery should be a clean and simple room. The room should not only be clean but look clean as well. It should be a room where parents can take their very youngest children and feel at ease throughout the service.

B. RELATIONSHIP

Small toilet adjacent (see page 74 for height dimensions)

C. FURNISHINGS and EQUIPMENT

1. Cribs (approx. 5)
2. One or two chairs for the supervisor(s)
3. Play pens
4. Storage space

D. SIZE

30 sq. ft. per child at 5 cribs = 150 sq. ft. min.

KINDERGARTEN

A. GENERAL

Generally, it is wise to allow a smaller room off the main kindergarten room. This allows the supervisor(s) to isolate a troublemaker or a child who has had his feelings hurt. The larger room is generally a rumpus room and must be safe for small children.

B. RELATIONSHIP

Near children's toilet

C. FURNISHINGS and EQUIPMENT

1. Two chairs for adults
2. Chairs for toddlers (10" high)
3. Tables for toddlers (20" high)
4. Bulletin boards
5. Individual coat racks
6. Storage space for toys, books, etc.
7. Record Player

D. SIZE

15-20 children max. at 25 sq. ft. per child [27] = approx. 350 sq. ft.

E. MISCELLANEOUS

1. Sunlight highly desirable
2. Gay color scheme
3. Durable finish materials

GRADES 1 & 2

A. FURNISHINGS and EQUIPMENT

1. Chairs for children (14 in. high)
2. Tables for children (30 in. high)
3. two chairs for adults
4. Bulletin boards
5. Storage space
6. Cloak rack

.....

27 Atkinson, Ibid. p. 43.

D. SIZE

10-20 children at 25 sq. ft/child = 375 sq. ft.

GRADES 3 & 4

A. FURNISHINGS and EQUIPMENT

1. Chairs (16 in. high)
2. Tables (30 in. high)
3. Piano
4. Storage for Sunday school equipment
5. Bulletin boards

B. SIZE

Approximately 350- 400 sq. ft.

GRADES 5 & 6

A. GENERAL

This room will be used as a general meeting room throughout the week for meetingstoo large or active for the parlor and too small for the fellowship hall. In particular, the Senior High Pilgrim Fellowship will meet here. This will require a versatile room since it will be used for activities ranging from worship to semi-active games.

B. RELATIONSHIP

This room should be as far away from the choir room as possible in case of duplicate meeting times

C. FURNISHINGS and EQUIPMENT

1. Chairs and tables
2. Storage for:
   a. Tables and chairs
   b. Worship equipment
   c. Sunday school supplies
3. Small altar and piano

D. SIZE

Approximately 400 sq. ft.(at 20 sq. ft/occupant)

E. MISCELLANEOUS

Lighting for worship services

GRADES 7 & 8

A. GENERAL

Since Boy Scouts generally are in the sixth to ninth grades, this room would seem the most logical of the Sunday school rooms to combine as a Boy Scout meeting room. The room will be used for meetings or demonstrations only, since any games, drill work or other vigorous activities can be carried on in the fellowship hall or outside.

B. RELATIONSHIP

1. Close to the entrance to keep the scouts from tracking dirt all over the building
2. Close to toilets if possible

C. FURNISHINGS and EQUIPMENT

1. Folding chairs and folding tables

2. Storage space for:

   a. Scouting equipment

   b. Folding chairs and tables

   c. Sunday school equipment

3. Bulletin boards

D. SIZE

Approximately 365 sq. ft. at 15 sq. ft. per person

TOILETS

MAIN PUBLIC TIOLETS

A. RELATIONSHIP

Easily accessible from the narthex

B. SIZE

1. Minimum fixture requirements:[28]

	W.C.	Urinals	Lavatories
101-150 Men	4	3	7
111-150 Women	6		7

Note: These figures seem slightly high for a church since most of the people are only in the church for one hour and then usually go directly home.

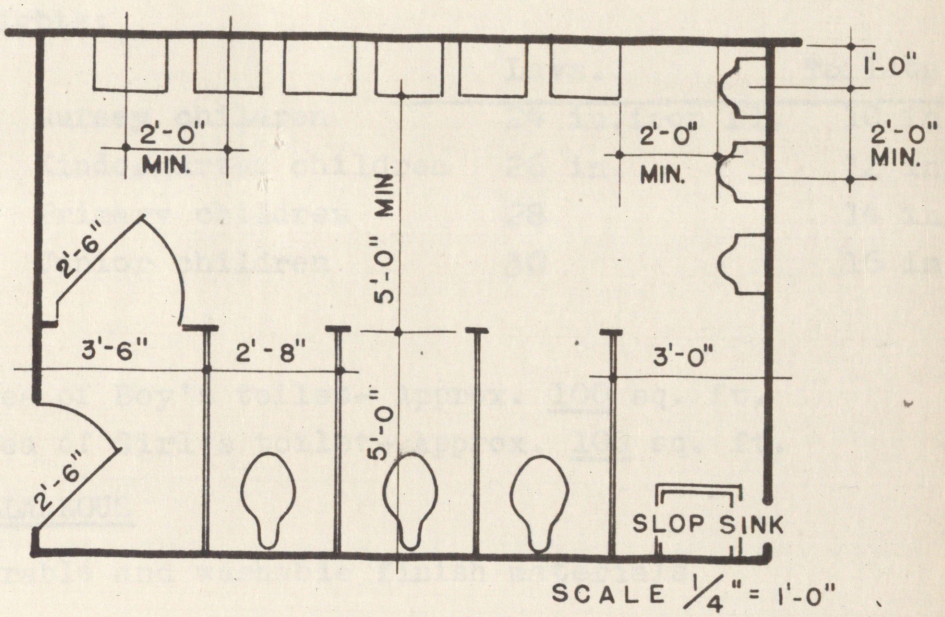
2. The figure on the following page shows the recommended minimum fixture clearances for adult toilets.

.....

28. Time Saver Standards, p. 810.

MINIMUM FIXTURE CLEARANCES.....

Figure 23



3. Area

a. Men's toilet- 130 sq. ft. approx.

b. Women's toilet- 150 sq. ft. approx.

C. MISCELLANEOUS

Durable and washable finish materials

SMALL CHILDREN'S TOILET

A. RELATIONSHIP

Easily accessible from Sunday school area

B. SIZE

1. All fixtures must be installed at children's heights:

	Lavs.	Toilets
Nursey children	24 in. from fl.	10 in.
Kindergarten children	26 in.	12 in.
Primary children	28	14 in.
Junior children	30	16 in.

2. Area of Boy's toilet- Approx. 100 sq. ft.
   Area of Girl's toilet- Approx. 100 sq. ft.

C. MISCELLANEOUS

1. Durable and washable finish materials
2. Colorful walls and floors

JANITOR'S CLOSET

A. GENERAL

If possible, at least two closets for janitorial equipment should be provided, one for interior cleaning equipment and supplies and the second for exterior maintenance equipment. One or both should be equipped with a service sink.

B. SIZE

If two, approx. 20 sq. ft. each

If one, approx. 35 sq. ft.

ESTIMATED AREA OF CHURCH FACILITIES.....

CHURCH

Narthex.....	225	sq. ft.
Nave and chancel.....	3420	
Parlor.....	800	(assume expansion area)
Office.....	140	
Workroom and storage.....	100	
Pastor's study.....	225	
Fellowship hall.....	2000	
Kitchen.....	400	
Kitchen storage.....	150	
Choir room.....	325	
TOTAL	7785	sq. ft.

CHURCH SCHOOL

Nursery.....	150	sq. ft.
Kindergarten.....	350	
Grades 3 & 4.....	400	
Grades 5 & 6.....	400	
Grades 7 & 8.....	365	
Tiolets		
Men.....	130	
Women.....	150	
Boy's and girl's (100 ea.).	200	
Janitor's closet.....	40	
SUB-TOTAL	2185	sq. ft.
	+ 7785	
	9970	

plus 10% for corridors (1000 sq. ft)

TOTAL AREA EQUALS APPROXIMATELY 11,000 sq. ft.

성당 내부 모습

AESTHETICS.....

Exterior

> The church must reassert its own leadership to answer these needs not only in its ministry but in its building as well. Furthermore, it must answer them with such assurance that people will be forced to stop and say: "Here is something strong and sure. Here is the peace, the beauty, the warmth I have been looking for. I could think clearly here. Perhaps I could even pray...
>
> ...This is no longer the time nor the place for the delicate tracery of the Gothic, the quiet, classical, curves of the Romanesque, the extravagant decoration of the Baroque or Rococco. Our need is for a fundamental "definiteness." [29]

The Pilgrim Congregational Church is a young, growing church. It must stand up and say, "here I am- look at me!" One of the most effective ways to express this is through the language of architecture. This language may be referred to as "significant form." According to Peter Collins, significant form may mean one of four things: [30]

1. The form is expressive of the structural system and materials used.
2. The form is suggestive of the activities which go on inside it.
3. The form "symbolizes" some spiritual value.
4. The form invites attention from a select and initiated group of people such as the editors of architectural magazines.

.....

29. Michael Scott, A Journey Among Churches Architectural Forum (Dec. 1959) pp. 112-113.
30. Peter Collins, What is Significant Form P.A.(Dec. 1961) p. 18.

To me, the honest and most intelligent approach would be that of "symbolizing" some spiritual value through form. This form, however, can take on any of an unlimited number of architectural shapes. In this case, however, this form should be noticed without being gaudy. It should be different without being ridiculous. It is bringing a new and liberal faith to the city of Bozeman and in order to grow, and continue to grow, it must be noticed and admired.

I also feel that the expression of the Congregational Church should be an expression of the Christian religion, not just of Congregationalism. I feel the Christians, particularly the Protestant Christians, are and should be growing together. The faster we are able to break down traditional patterns and idiosyncrasies, the faster the Protestant religion can grow together.

Regionality

The geographical setting of Bozeman and the Gallatin Valley poses a definite possibility of "regional design." By this, I mean the rugged mountains, heavy snows and brisk mountain climates suggest and even cry out for a building that will fit into these inspiring surroundings. To completely ignore these conditions could lead to a failure on the architect's part to fulfill his

obligation as a designer. Bozeman is not without good examples of poor church architectural solutions in this respect.

Regionality can be gained not only through design expression but also through the material selection. The possibility of using natural stone and wood should be strongly considered in this solution. Their very rough and rugged appearance can aid in expressing the church's indigenous character.

Interior

A favorite expression of the church layman is, "I want a church that looks like a church." Perhaps their desires are valid but what does or should a church look like? According to Vernon Drake, a prominant Montana architect, the first step a congregation should take toward their building program is to look at themselves and their faith and ask the question, "what do I come to church for?"

The churches main purpose is for worship and this should be the prime consideration when considering the aesthetics for the nave and the chancel. If a room is to draw people together, it must have a minimum of distraction and a maximum of unity. Neither the eye nor the mind should be allowed to wander but should be directed toward a common goal, that of the cross and the altar. These two focal points must be unlike any of their entourage in

color (and material and texture if feasible).

Many great church builders, church clergy and religions will differ as to the feeling, method or even purpose of religious services. For example, many people adhere to the "church-in-the-round" principle. The philosophy here is that people are in a closer-knit fellowship when they can look across the way and see their fellow man. They feel more like they are worshiping together. But why should this feeling of group worship be forced upon a congregation? The worshiper should have the alternative of individualism in the church service if he so desires. This cannot be accomplished when people are staring at each other.

The selection of color, materials, and textures are extremely important in expressing a unity of design. They should impart a psychological uplifting and warmth to the worshiper.

Another possibility in design expression which is often overlooked is the use of planting in the worship area. As Scotford says:

> The function of plants in a church is to break up ridgid lines and offset any atmosphere of austerity. In the ornate churches of the past they might add to the clutter, but in the more simple structures of today, greenery

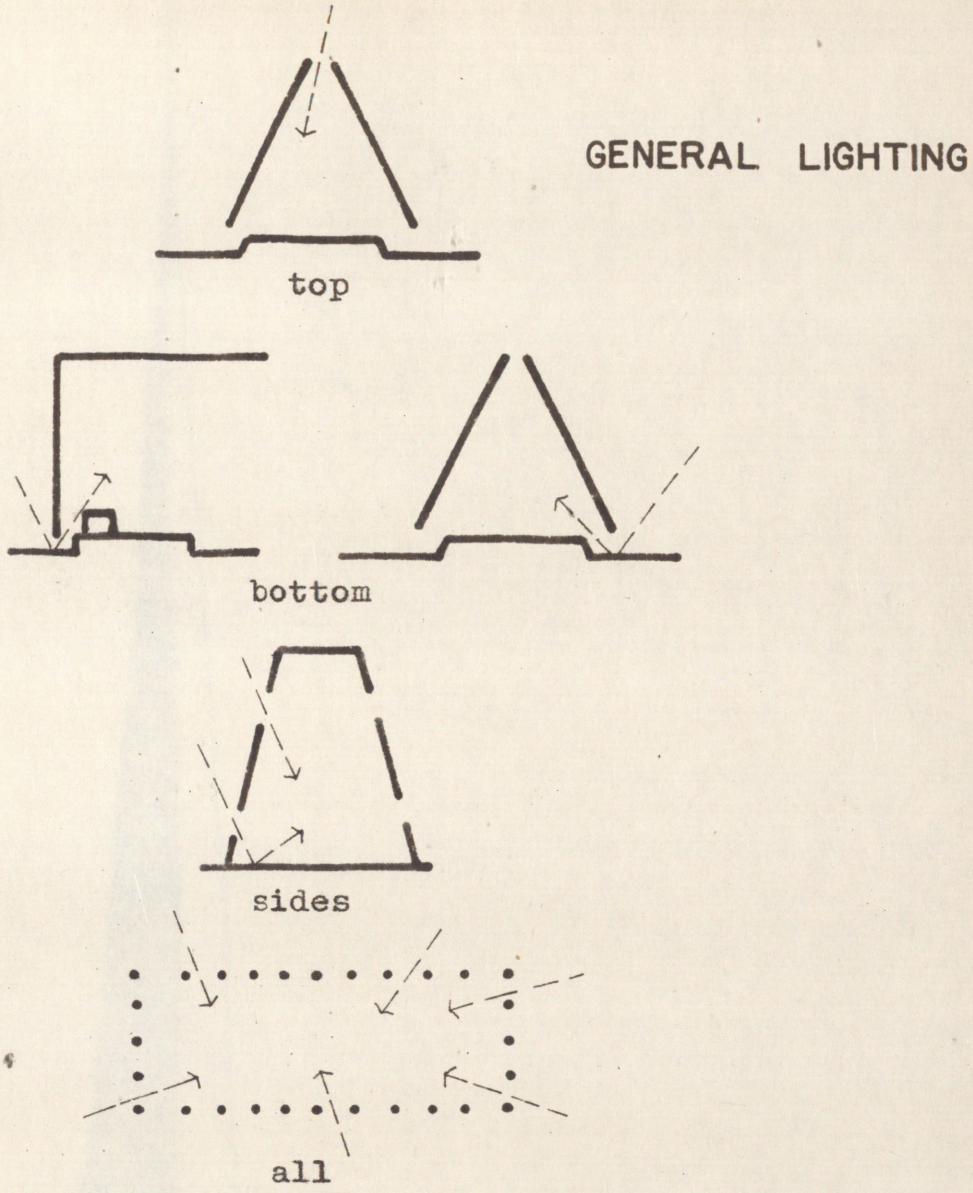
> can refresh the eye and uplift the spirit. Here is color in its original and most natural form. This is particularly needed in churches with brick or cinder block interiors. A climbing vine can redeem a flat surface while a fern can take the stiffness out of a straight line. Here is where the future will see a great development.[31]

A method of design expression as old as architecture itself is the play of light and shadows on surfaces to reveal forms and textures and even more important, to create a spiritual atmosphere. The diagrams on the following page illustrate several ways of admitting light into the worship space. The amount of light can be controlled by the size of windows, height of windows, relation of window to wall space, and the use of stained or clear glass.

.....

31. Scotford Ibid. p. 95.

Figure 24


GENERAL LIGHTING
top
bottom
sides
all
ALTAR LIGHTING
top
bottom
sides

Considerations

ECONOMIC CONSIDERATIONS.....

General

Whether the architect likes it or not, he is, has been and usually will be plagued by a budget. The dollar has a very important effect on when, where, and how a building is built and operated. The architect, as well as the client, must keep the economic considerations before him at all times. Since the Pilgrim Congregational Church is very young and will have a minimum number of members to move into the new church, it will be on a very limited and tight budget. This budget will have an effect on and will be affected by the following considerations.

Construction Costs

Construction costs will vary in different parts of the country depending upon transportation and labor costs. Bozeman has a limited supply of both labor and materials and prices will therefore be comparatively higher here than in centrally located areas

Some idea of the cost of the finished building should be given to the client during the preliminary design stage. It is difficult to estimate a building before any designing has been done but an approximate cost may be computed utilizing costs of similar churches already built. These figures can be obtained from the Marshall Valuation Service Calculation Method.[32] The cost figures below have been computed to comply with local and current cost figures.

CLASS	QUALITY	SQ. FT. COST
"C" (Masonry walls, wood or steel roof structure)		
GOOD CHURCH	Exterior Face brick, stucco, stone trom, good windows Interior Good plaster and detail, vinyl tile, hard-wood Lighting and Plumbing Good lighting and plumbing, P. A. system Heat Steam	$19.40
AVERAGE CHURCH	Exterior Block or brick, stucco trim. few stained glass windows Interior Some plaster, asphalt tile, hardwood, carpet or con crete Lighting and Plumbing Adequate lighting and plumbing Heat Forced air	$16.00

32. Marshall Valuation Service (Marshall and Stevens Publication Company) Oct. 1962. Sec. 16 pp. 4 & 5.

CLASS	QUALITY	SQ. FT. COST
"D" (Masonry exterior walls, wood or steel roof structure)		
GOOD CHURCH	Exterior Brick venner, good stucco, stained glass, ornamental Interior Good plaster and hardwood trim, terrazzo, vinyl trim Lighting & Plumbing Good lighting and plumbing system Heat Forced air	$17.05
AVERAGE CHURCH	Exterior Stucco and siding, few stained glass windows, some trim Interior Plaster and venners, hardwood, asphalt tile, carpet or concrete Lighting and Plumbing Adequate lighting and plumbing Heat Forced air	$14.05
"C"		
GOOD SCHOOL	Exterior Steel columns, bar joists, face brick, ornamental Interior Plaster, ceramic wainscot, terrazzo, asphalt tile, pool Lighting and Plumbing Good fluorescent lighting, tile restrooms Heat Hot water	$17.62
AVERAGE SCHOOL	Exterior Brick, block, concrete. steel frame or bearing walls Interior Plaster, acoustical tile, asphalt tile, hardwood Lighting and Plumbing Adequate lighting and plumbing Heat Hot water	$15.02

CLASS	QUALITY	SQ. FT. COST
"D"		
GOOD SCHOOL	Exterior Steel frame, bar joists brick veneer, stucco Interior Plaster, hardwood, vinyl tile, terrazzo, ceramic tile Lighting and Plumbing Good fluorescent lighting, tiled restrooms Heat Hot water	$16.35
AVERAGE SCHOOL	Exterior Wood frame, good stucco, brick trim Interior Plaster, hardboard, acoustical tile, asphalt tile Lighting and Plumbing Adequate lighting and plumbing Heat Forced air	$14.19

COST ESTIMATE.....

CHURCH (Including fellowship hall)

1. Type of building	church
2. Cost range (per sq. ft.)	$14.05-$19.40
3. Average cost (per sq. ft)	$16.73
4. Total area of church	6,195 sq. ft.
5. Cost range	$87-120,000
6. Average cost	$103,500

CHURCH SCHOOL (Including administration, toilets, and corridors)

7. Type of building	school
8. Cost range (per sq. ft.)	$14.19-$17.62
9. Average cost (per sq. ft.)	$15.91
10. Total area of church school	4,775 sq. ft.
11. Cost range	$67,500-84,100
12. Average cost	$75,800

TOTAL COST (6 & 12) $179,300

Note: Because of the extreme cold temperatures experienced in Bozeman during the winter months, the above figures have been adjusted to compensate for the extra insulation and heating equipment required. The local and current multipliers have also been used.

The total cost does not include landscaping or equipment.

Financing

The actual building of the church will be done in two stages. Stage I could be built in one of two ways:

1. Build the Sunday school plant and fellowship hall with worship services temporarily being held in the hall.
2. Build the sanctuary and fellowship hall with Sunday school temporarily being held in the hall.

Stage I would total approximately $90,000 and would be financed through local church pledges and the balance would come through the National Congregational Board of Home Administries on a 3% loan payable in 10-15 years. A "grant loan" may also be given to the local church. This grant loan does not have to be paid back unless the church feels it wants to do so at a later date. Stage II would be financed in a similar manner but the local church should be able to carry a greater load through increased pledges by the time construction for this stage is feasible.

Site Improvement

The extent of site improvements will depend on the final design. There is, however, a 12-foot slope from the southeast corner to the northwest corner of the lot that will present a drainage problem. This slope should be considered when designing the site plan. The size and complexity of the design will affect the grading and excavation costs as will the drainage solution.

Landscaping will also play an important part in the cost of site improvements. Generally, the landscaping for a small church development will run about 5-6% of the total contract. See page 91 for landscaping suggestions.

Maintenance and Operation

The Marshall Valuation Service estimates a life expectancy of 60 years for an average class C church. This figure, however, varies with the selection of materials. Materials and finishes should not be chosen merely on the basis of low initial cost, but rather on lowest overall cost. Sometimes a more durable and expensive material may be cheaper than a low initial cost material in the long run.

Care of selection should also be taken in the frequency of use these materials will be exposed to.

LANDSCAPING.....

Project trees-

COLORADO BLUE SPRUCE
COLORADO GREEN SPRUCE
NATIVE RED CEDAR
CREEPING SAVIN JUNIPER
ANDORRA JUNIPER
PFITZER JUNIPER
RED OAK
WEEPING WILLOW
WHITE BIRCH
MOUNTAIN ASH

Boulevard trees-

GREEN ASH
MOUNTAIN ASH

Project shrubs-

RED DOGWOOD
HONEYSUCKLE
MAPLE
STAGHORN SUMACH
SPIREA
TAMARIX

Hedges-

RUSSIAN OLIVE
CANTONEASTER ACUTITOLIS
CARAGANA

In a space subject to heavy use, materials should be selected for their duribility and ease of maintenance. On the other hand, materials that have a lower durability can be used in spaces that are subject to light use.

Amoritization

The write off on a good church building with a 60-year life expectency is about 2% per year.

Space Utilization

Productive spaces may be defined as those in which the required functions of the building take place. In the case of a church, these functions are worship and Christian education. Non-productive spaces, such as administration, food service, corridors, toilets, storage, and service spaces are all essential in carrying out this primary purpose. They should, however, be kept at a practical minimum, keeping in mind the primary objectives of Christian worship and education.

Combination of facilities often proves very economical as long as conflict of func-

tions does not occur. This often calls for flexible rooms to accomodate varying types of functions which the architect must solve to achieve a "workable" room. Some of these combination facilities could be: Choir room-bride's room; Sunday school room-Boy Scout room; parlor-narthex; parlor-overflow; narthex-overflow.

Uniformity

Repetition of various components such as materials, structural arches, and windows simplifies the construction and saves money both in material costs and labor expenses. This may be one way of economizing to meet the limited budget. Another savings may lie in the use of a modular building system. The "planning module" is a repetitive dimension grid system which is used over the entire building and permits a duplication of many components.

Economics of Aesthetics

The cost of hireing an architect is often off-set not only in construction savings but also in client satisfaction. The more pleasant our environment is to live and work in, the more

pleasurable our lives become. The services an architect renders in the aesthetic contributions to a community can be written off in good will and efficiency of function.

A client should therefore not be too quick in his adverse judgement of a preliminary design solution just for its uneconomical feasibility alone but he should first weigh its aesthetic contribution to the welfare of those who must look at it and/or move within it.

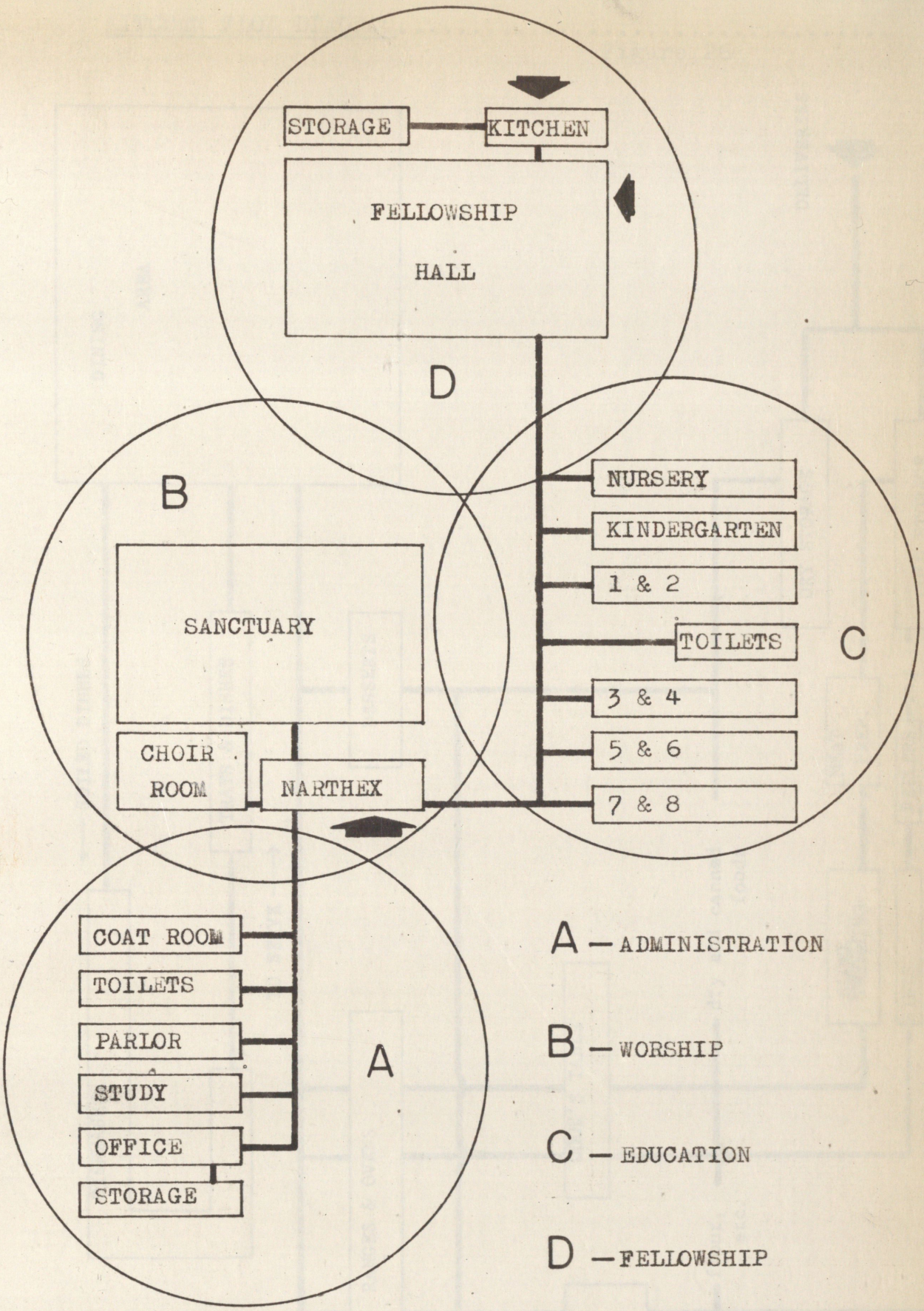
Many people today shy away from "speculative buying". It is always more difficult to obtain pledges before the completion of a new church than after its completion. An attractive building may attract contributing members and make the present members more generous.

Flow Diagrams for Minutes

FLOW DIAGRAMS.....

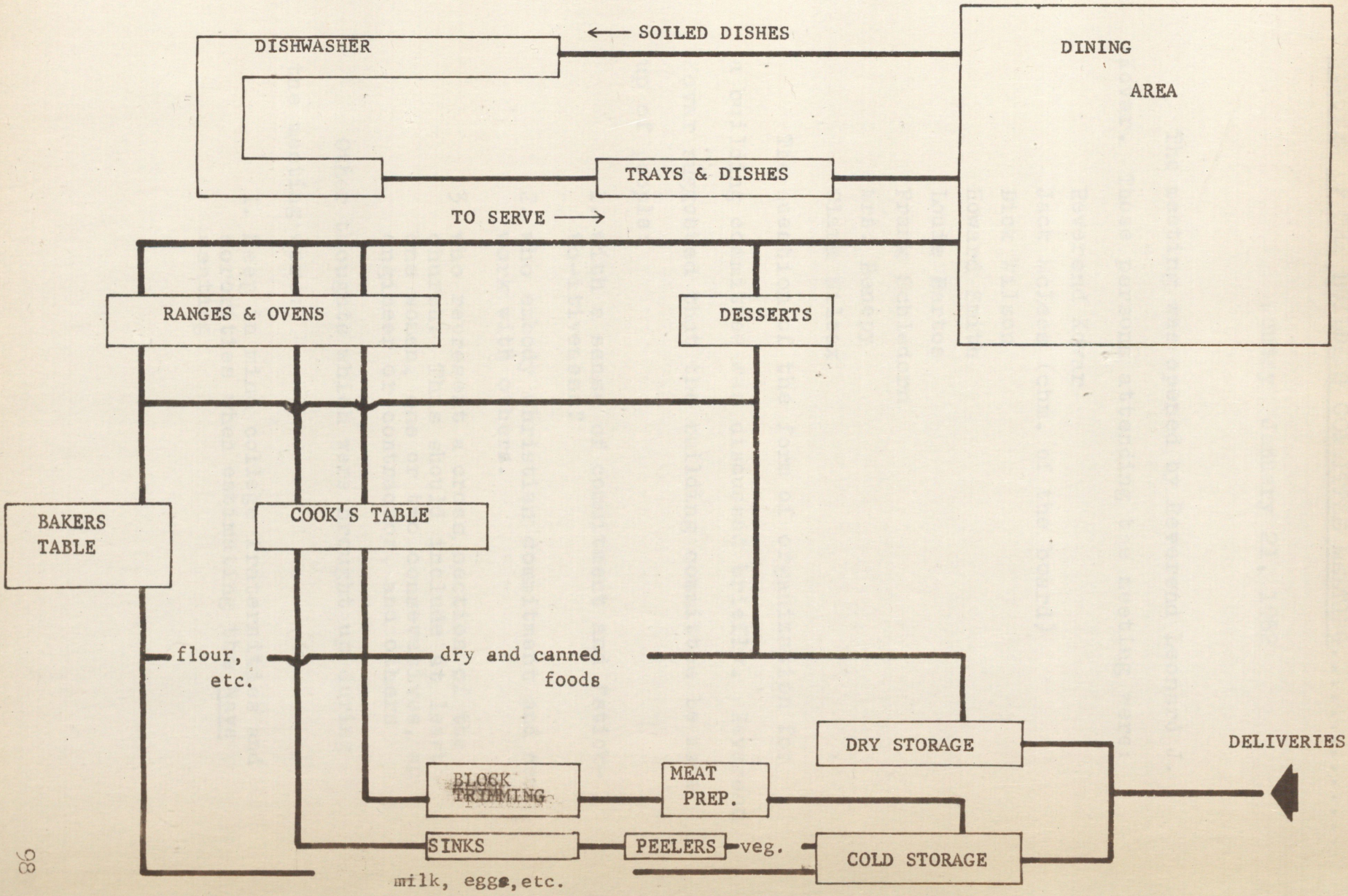
The flow diagram on the following page shows the relation of rooms to each other. The arrows indicate entrances and exits and the large circles represent the general functions of a church, those of administration, worship, education and fellowship.

The diagram shown on page 98 shows the general flow of food and dishes through the kitchen. This general flow should be followed to produce an efficient work area for the kitchen.



FLOW DIAGRAM.....

Figure 25



KITCHEN FLOW DIAGRAM

Figure 26

MINUTES OF THE BUILDING COMMITTEE MEETING.....

Monday January 21, 1962

The meeting was opened by Reverend Leonard J. Kovar. Those persons attending the meeting were:

Reverend Kovar
Jack McLees (chm. of the board)
Dick Wilson
Howard Smith
Louie Bartos
Frank Schledorn
Mrs. Benepy
Clark Wilcox

The question of the form of organization for a building committee was discussed briefly. Reverend Kovar suggested that the building committee be made up of people:

1. with a sense of commitment and "stick-to-itiveness!"
2. who embody Christian commitment and can work with others.
3. who represent a cross section of the church. This should include at least one women, one or two consevatives, an engineer or contractor, and others

Other thoughts which were brought up during the meeting were:

1. Keep in mind college fraternities and sororities when estimating the Nave seating

2. Possible Nave seating of 250 with expansion of 150.

3. Expansion into another room was definitely favored.

4. Church-in-the-round intrigued some members.

5. Expansion favored in the back or a balcony- not sides.

6. A split chancel was favored

7. A total of 500 members should be a maximum since a loss of unity develops after this point.

The committee agreed that several more meetings should be held to stimulate ideas before an architect is called in.

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16. Credit must be given to those listed below for information obtained through personal interviews.

Mr. H. C. Rose', Director of the M.S.C. School of Architecture

Mr. Wm. W. Carver, my personal advisor

Mr. John Parker, M.S.C. English Dept.

Rev. Leonard J. Kovar, pastor of the Pilgrim Congregational Church

Rev. John McClelland, minister of the First Congregational Church- Billings

Chandler C. Cohagen, Billings architect

Vernon Drake, Billings architect

Ben Nielsen

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