

Montana State University Library, Bozeman

ARCHITECTURAL LIBRARY.

~~NA~~
~~2540~~
~~D679~~
P378
D6995

LIBRARY
Montana State University
BOZEMAN

921 S. 13th Avenue
Bozeman, Montana
March 6, 1964

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

Dear Sir:

The following paper is research data for a Civic Center at Harlem, Montana. This paper is the first requirement toward an undergraduate thesis in architecture.

For a thorough understanding of the project, I have presented material acquainting the reader with history, local and site conditions, need, aesthetics, and functions. I concluded this research with economic considerations and a building program.

Yours truly,

Fred O. Dolven

Fred O. Dolven

U N D E R G R A D U A T E T H E S I S

D e p a r t m e n t o f A r c h i t e c t u r e
M o n t a n a S t a t e C o l l e g e
H . C . R o s e ' D i r e c t o r

F r e d O . D o l v e n

M a r c h 6 , 1 9 6 4

W i n t e r Q u a r t e r - A r c h . 4 9 0

A C K N O W L E D G E M E N T S

I wish to thank the city officials of Harlem for their assistance and to the following staff members at Montana State College: Professor H. C. Rose', Director of the School of Architecture, Professor David Wessel, School of Architecture, and Professor John P. Parker, English Department. I am also grateful for the help given me by Bozeman City Manager, Oscar E. Cutting and Conrad, Montana, Consulting Engineer, Stanley J. Thill.

To my wife, Pat, I am especially appreciative for her assistance throughout the research.

I N T R O D U C T I O N

This paper is the first part of a two-part undergraduate thesis in architecture. It deals with research compiled about the proposed Civic Center for Harlem, Montana. Because Harlem is a small community and funds are limited, a more detailed examination of the need for the building and the means of financing such a structure are included in this paper.

The design of the proposed civic center, the second part of this thesis, follows the research. It involves the use of the research to draw plans, elevations, sections, perspectives and a model of the proposed building after considerable planning.

T A B L E O F C O N T E N T S

	Page
I LOCAL CONDITIONS.....	1
Geographical.....	1
Historical.....	1
Economic.....	3
Social.....	5
Climatic.....	5
II CONDITIONS JUSTIFYING A NEED.....	8
The Existing Building.....	8
Need and Aesthetics.....	10
III SITE CONDITIONS.....	12
Orientation.....	12
Adjacent Environment.....	12
Topography.....	13
Utilities.....	13
Soil Analysis.....	20
Zoning Regulations.....	20
Vegetation.....	21
Parking.....	21
Sun Angles.....	22
IV FUNCTION OF THE BUILDING.....	24
General.....	24
Public Lobby.....	26
City Council Chamber.....	26
Office of the City Clerk and Treasurer.....	27
City Library.....	28
Club Meeting-room.....	30
Auditorium-gymnasium.....	30
City Police Station.....	32
Fire Station.....	34
Maintenance Area.....	35
V AESTHETIC CONSIDERATIONS.....	37
The Type of Building.....	37
Environmental Factors.....	38
Function.....	39
Civic Responsibility.....	40
VI ECONOMIC CONSIDERATIONS.....	43
General Economics.....	43
Methods of Cost Estimation.....	44
Construction Costs.....	45
Building Lives.....	45
Cost Analysis.....	49
Special Aid.....	50
Financing the Building.....	50

CONTENTS (Cont.)

Legal Procedure.....	51
Costs to the Taxpayer.....	54
Site and Site Improvement.....	55
Operation and Maintenance Costs.....	56
VII BUILDING PROGRAM.....	57
Preliminary Flow Diagram.....	64
Final Flow Diagram.....	65
Relationship of Spaces.....	66
VIII APPENDICES.....	67
Appendix "A" - Questionnaires.....	67
Function.....	67
Special Considerations.....	67
Appendix "B" - Correspondence.....	78
IV REFERENCES.....	81

LIST OF FIGURES

Figure	Page
1. Early Harlem.....	2
2. Aerial View of the City.....	4
3. Population Growth of Harlem.....	6
4. Durable Room-finish Materials?.....	11
5. Attractive Entrance?.....	11
6. Site Within the City.....	14
7. Site and Adjacent Areas.....	15
8. The Site Showing Utilities.....	16
9. View to the North from the Site.....	17
10. View to the South from the Site.....	17
11. View to the East from the Site.....	18
12. View to the West from the Site.....	18
13. Front of the Existing Building.....	19
14. Rear of the Existing Building.....	19
15. Exploration Borings.....	20
16. Test Boring.....	20
17. Sun Angles.....	23
18. Environment.....	42
19. Aesthetic Use of Materials?.....	42
20. Preliminary Flow Diagram.....	64
21. Final Flow Diagram.....	65
22. Relationship of Spaces.....	66

L I S T O F T A B L E S

Table	Page
1. Mean Temperature and Precipitation.....	7
2. Building Life.....	45
3. Public Buildings.....	46
4. Cost of the Building.....	49
5. Tax increases.....	55

I

local conditions

LOCAL CONDITIONS

Geographical

Harlem is located in the north-central part of Montana approximately 35 miles south of the Canadian border at an elevation of 2370 feet. The city is five miles north of the Milk River which drains a small portion of the Great Plains.

The site of the existing civic center in Harlem is on Main Street and a block south of U. S. Highway Two. The building lies in the center of the business district.

Historical

In 1805 the Lewis and Clark expedition traveled along the Missouri River about seventy miles south of what is now the site of the city. Indians living near the present site were Gros Ventres and Assiniboinés. Until 1887 when the Great Northern Railroad was constructed through the area, "the whites could not settle with any chance of holding their claims." (1:1) * In 1888 the land from Harlem to the Canadian Border was opened to homesteading. A man named Al Cecil homesteaded the present townsite and sold lots from his land at extremely low prices.

The first house built on the present townsite was begun in 1887 and by the end of the year fifteen families had settled there. In 1889 the Fort Belknap Indian Reservation was moved from southwest of Chinook to its pre-

* References: First numeral is source; second is page number.



Figure 1. Early Harlem

sent location south of Harlem. This condition added population and trade. However, isolated burning of several buildings held growth of the town in check.

In 1910 Harlem was incorporated as a town and consisted of about a dozen houses, five saloons, two stores, a barber shop, and two churches. At that time the village was in Chouteau County. In 1912 Chouteau County was divided into three counties: Chouteau, Blaine, and Hill. The town was then within the borders of Blaine County.

The earliest industry in the area was sheep raising. In 1920 grain crops began to dominate the agricultural scene. By 1928 Harlem had four flour grain elevators, two oil supply stations, two hotels, two restaurants, and two mercantile stores. The highway through the town was completed in 1923 (approximately).

The existing civic center was begun in 1938 as a W. P. A. project. It was completed in 1940. Local men were employed to construct the building.

Economic

On the "Big Flat" north of town grain crops are grown. Sheep and cattle ranches are located all around the area. In the Milk River Valley crop lands of grain, alfalfa, and beets are irrigated. There are railroad connections East and West (Great Northern Railroad) and highways branch four directions.

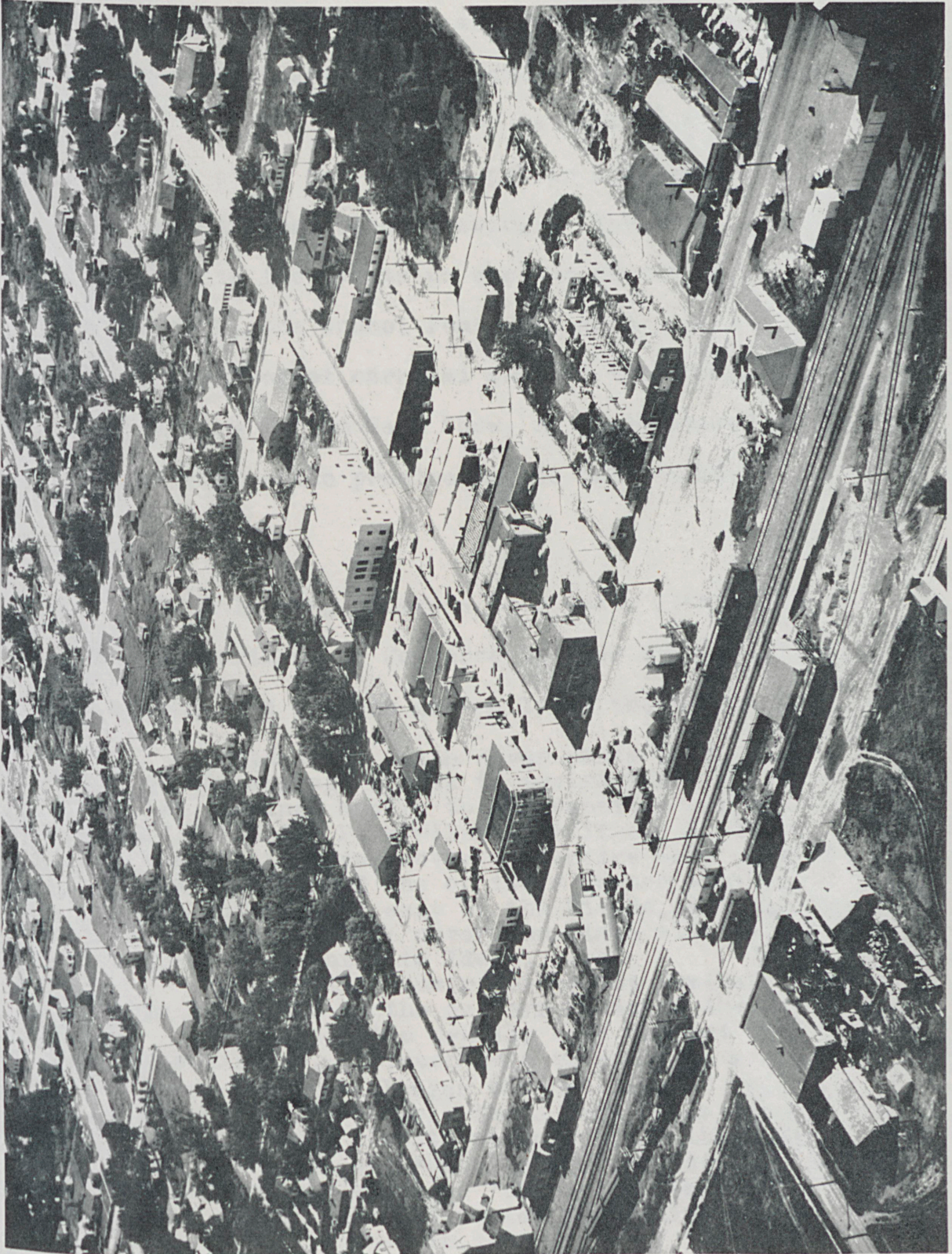


Figure 2. Aerial View of the City

Social

The people of Harlem are members of a small agricultural community. (See Figure 3 on population growth on page 6.) The civic center is used as a community gathering place for various public and semi-public events. There are dances, blood drawings, elections and other meetings held in the gymnasium section of the civic center. In addition, the school rents the gymnasium to hold the annual high-school carnival and all basketball games. Annually the Harlem Seed Show, an agricultural gathering of some state-wide prominence, is held there.

Climatic

The following excerpts were taken from a United States Department of Commerce Weather Bureau Bulletin on Montana and pertain generally to the Harlem area.

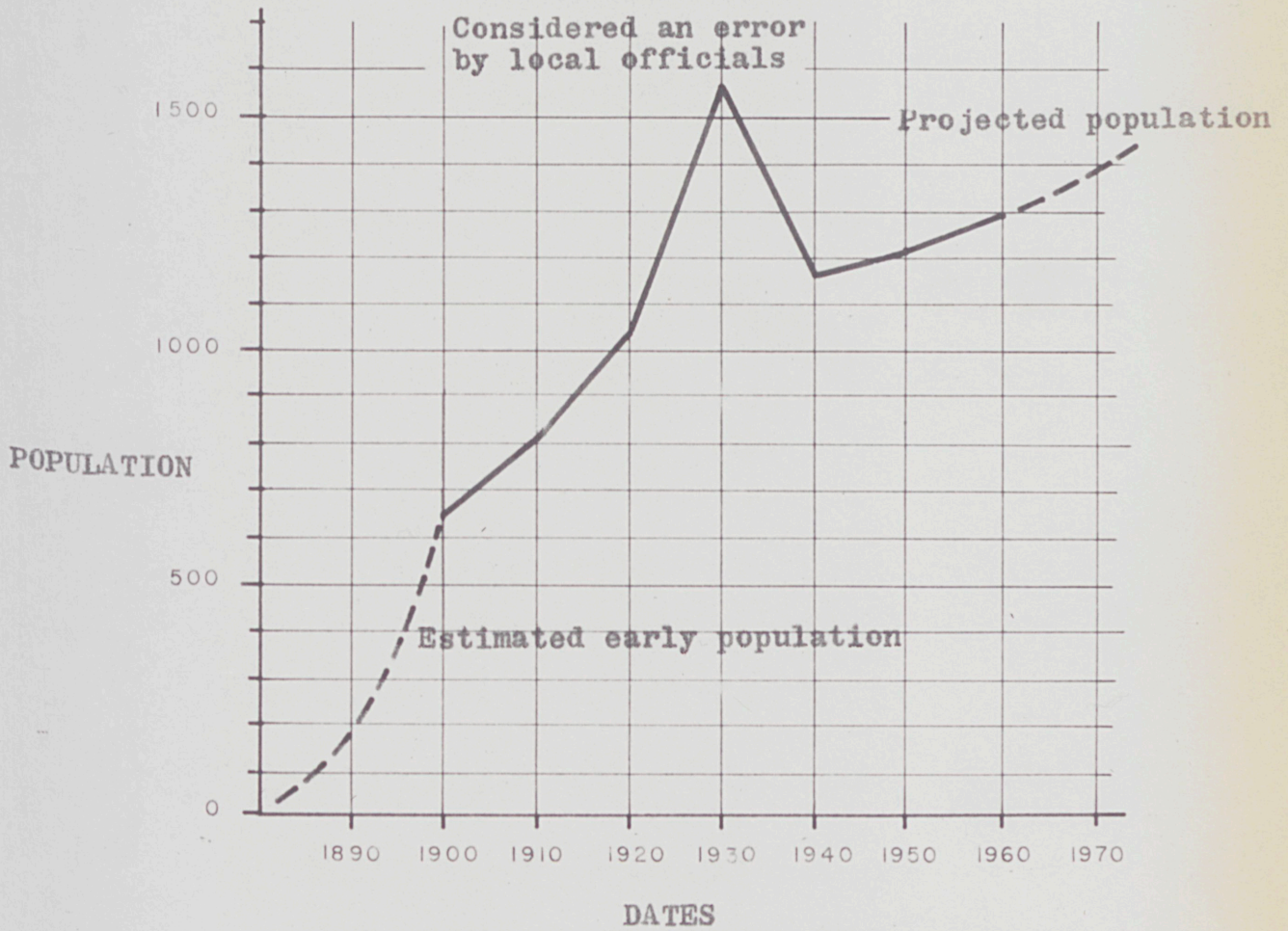
Cold waves which cover parts of Montana on the average of six to twelve times a winter are confined mostly to the sections northeast of a Glacier Park-Miles City line. A few of these cold waves cover the entire area east of the Divide, and one or two a season will cover the entire area east of the Divide, and one or two a season will cover the state all the way from the Dakotas to Idaho. ...

During the summer months hot weather occurs fairly often in the eastern parts of the state. ...

Winters while usually cold are not continually so. Between cold waves there are periods, sometimes longer than 10 days of mild but often windy weather. These warm windy winter periods occur almost entirely along the eastern and north eastern slopes of the divide, and are popularly known as 'chinook weather'. ...

Annual snowfall varies from quite heavy (up to 300 inches) in some parts of the mountains in the western half of the state to a-

Figure 3. Population Growth of Harlem



round 20 inches (during some years) in the two northern divisions east of the Continental Divide. ... January (the coldest month) temperature averages range from 10.0 degrees F for the Northeastern Division to 21.7 degrees F for the Southcentral (Upper Yellowstone Valley) Division. ... July (warmest month) average temperature ranges from 72.1 degrees F for the Southeastern Division to 63.7 degrees F for the Southwestern Division. ...

Ice jams which occur during the spring breakup, usually in March, cause backwater flooding. ... Severe storms of several types can occur, but the most troublesome are hailstorms which cause crop and property damage averaging \$5 million annually. (2:1,2)

Table 1. Mean Temperature and Precipitation (3:1)

Month	Average Mean Temperature in Degrees F	Precipitation in Inches
Jan.	13.2	.45
Feb.	15.7	.51
Mar.	27.3	.64
Apr.	43.6	.79
May	55.2	1.54
June	61.7	3.10
July	69.8	1.46
Aug.	66.5	1.13
Sept.	56.2	.93
Oct.	45.6	.68
Nov.	29.2	.52
Dec.	19.3	.49
Average - 41.9		Total - 12.30

In 1962 the highest temperature recorded was 96 degrees F on July eight and the lowest temperature was -34 on February twenty-eight. (3:1)

11

conditions justifying a
need

C O N D I T I O N S J U S T I F Y I N G A N E E D

The Existing Building

The present civic center at Harlem, Montana, is a two-story, gray-white stucco structure framed with a concrete bearing-wall. No particular style of architecture is dominant in the design.

Uses of several of the interior spaces (rooms) have changed numerous times since the civic center was built. This has created two undesirable conditions:

- (1) Some of the spaces or rooms are positioned poorly in relation to their purpose within the building.

One example of this is the library which is located on the second floor. (The library has been moved twice already within the civic center.) One can imagine an elderly person walking up a long flight of stairs, down a corridor, and around a corner just to browse a few minutes in the library. Placement on the second floor is bad enough, but the almost concealed location of the library is inexcusable.

Another example of undesirable location is the "fire-hall". This room is a gathering place for civic clubs and groups. It is used mostly by the volunteer firemen as a meeting room. It could be used much more now if it were not placed obscurely on the second floor and above the fire truck engine-house. In order to reach the room,

one must unlock the engine-house, pass to the rear of the room, and climb a flight of stairs.

- (2) Some of the spaces or rooms are inadequate because of size and shape.

The City Clerk and Treasurer's Office is combined with the City Council Chamber to form one large room. This may not be undesirable. However, the council room is as wide as it is deep and somewhat large for the typical number of townspeople attending meetings. (An exceedingly large group of townspeople in attendance would necessitate moving the meeting into the auditorium-gymnasium.)

The existing civic center has aged rapidly in approximately 25 years. The finish materials used throughout the interior are of initial low cost and now are difficult to maintain. Maintenance of the building has lagged. There are stained ceilings, punctured wallboards, and faded finish materials in many areas. (See Figure 4 on page 11.)

Sanitary provisions, specifically in the jail and gymnasium, are limited. Sanitary fixtures need replacements. The jail has only one toilet and one lavatory per cellblock and these are in poor condition. In the gymnasium, men use dressing-room facilities and women use an inadequate rest room.

Need and Aesthetics

Because the building has aged so rapidly, it has a dull and uninteresting appearance from both inside and out. Such a structure has a bad influence on the public in the city and on those people from neighboring areas who may be attending functions in the civic center. The phase on Aesthetic Considerations will more fully discuss the beauty of the building. (Note the entrance to the City Clerk and Treasurer's Office in Figure 5 on page 11.)



Figure 4. Durable Room-finish Materials?



Figure 5. Attractive Entrance?

III

site

conditions

S I T E C O N D I T I O N S

Orientation

The proposed site consists of the present site and three lots adjacent to and directly east of the site. The site is rectangular measuring 250 feet from east to west and 140 feet from north to south. It lies parallel with the street grids which are nearly north-south and east-west. The site is located on the southeast corner of Main Street and First Avenue South. (See Figure 6 on page 14.)

Adjacent Environment

The business district of Harlem is located north and west of the site. Most of the commercial establishments are located on Main Street and U. S. Highway Number Two, one block north of the site and running in an east-west direction.

Directly to the south of the site lies a farm-implement store. South of that is a residential area of middle class homes. Main Street divides the city into almost equal halves. West of the Main Street businesses is a residential area of middle class and older homes. On the western outskirts, homes are nearly in a blighted condition. Adjacent to and east of the proposed site is a two-story residence. In general middle class homes occupy the area east of Main Street.

Besides the present civic center, which would be torn down, three buildings exist on the proposed site: an insurance office, a telephone dial relay station, and a private two-story residence. These buildings would have to be removed if possible and their sites traded for city land. If no trades were possible, the land might be purchased.

The site is located geographically near the center of the city. It is easily accessible from both the business district and the residential district. Noise from activities within the civic center would not bother people in the residential area. (Note Figures 6 and 7 on pages 14 and 15.)

Topography

The site is nearly flat. The city itself is relatively flat. Harlem slopes north to south approximately three feet in a thousand feet. East to west the slope is 1.8 feet per thousand feet. (2.6) Harlem lies in a valley. Rolling hills slowly rise a half-mile north of the city.

Utilities

All required public utilities - gas, electricity, sewer, water, and telephone - are available to the existing building and to the proposed site. Main Street and First Avenue South are paved with a double penetration treatment of oil. (see Figure 8 on page 16.)

COMMERCIAL



RESIDENTIAL

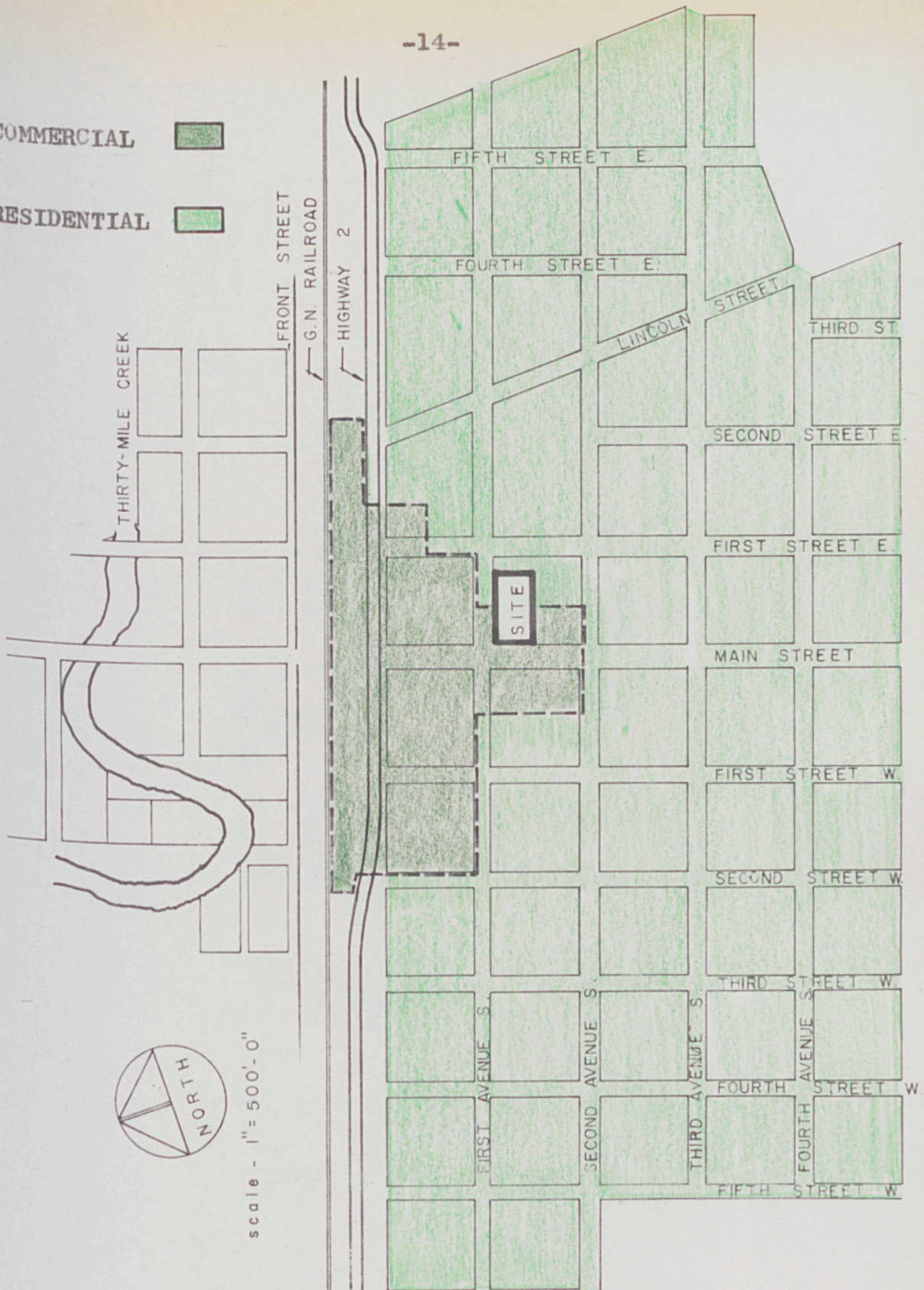
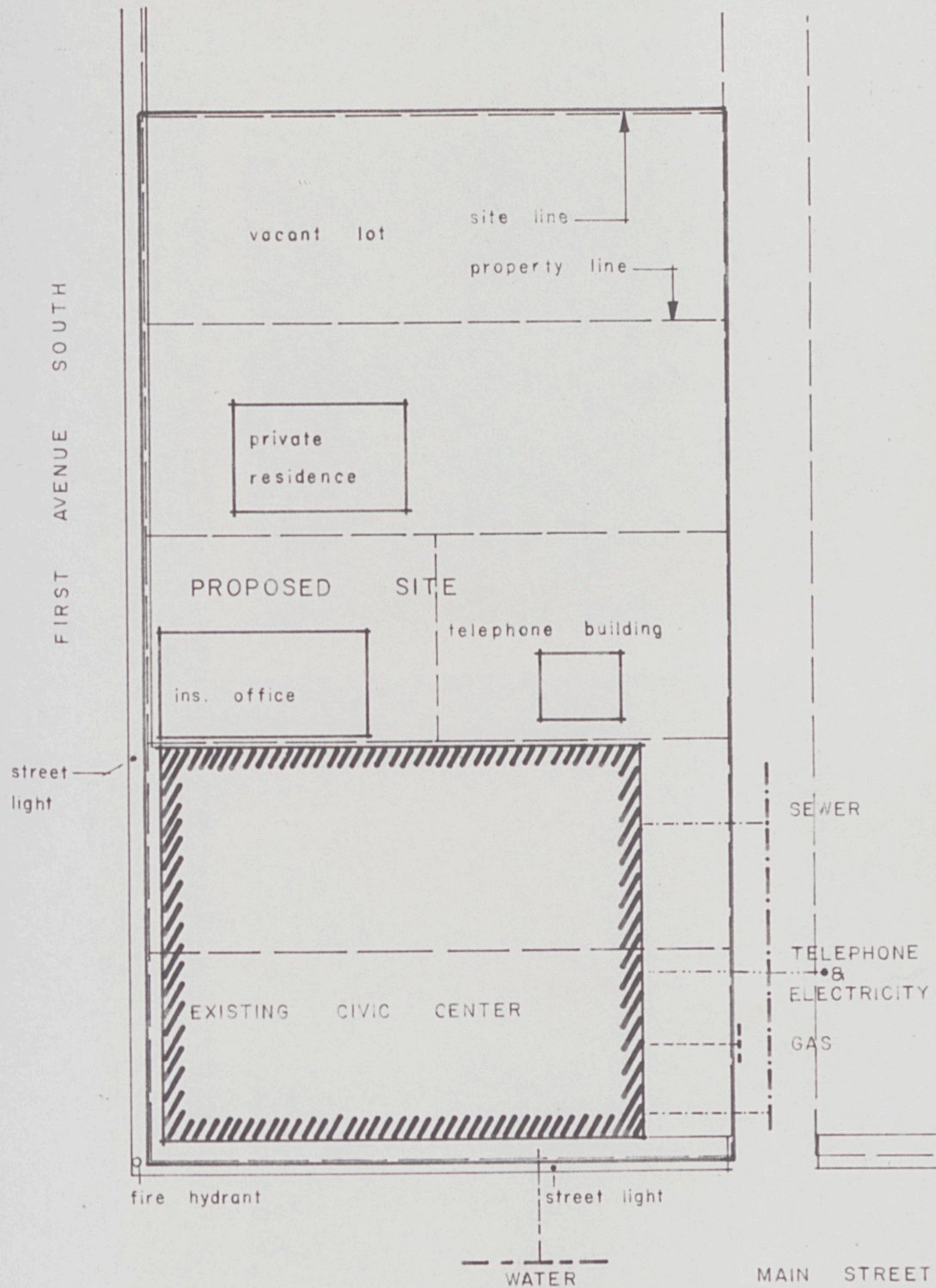


Figure 6. Site Within the City



Figure 7. Site and Adjacent Areas



scale - 1" = 40' - 0"

Figure 8. The Site Showing Utilities



Figure 9. View to the North from the Site



Figure 10. View to the South from the Site



Figure 11. View to the East from the Site



Figure 12. View to the West from the Site



Figure 13. Front of the Existing Building



Figure 14. Rear of the Existing Building

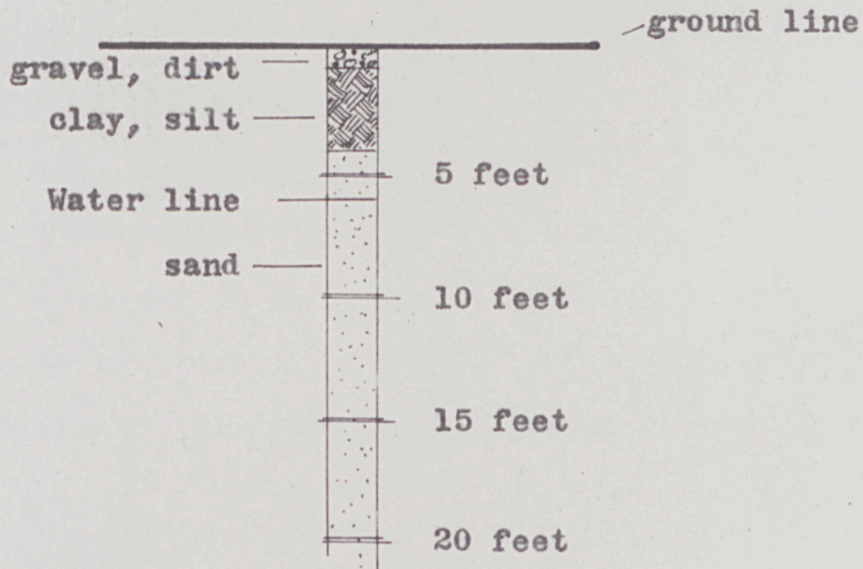
Soil Analysis

Soil tests on Harlem streets were taken by a consulting engineer. In the area surrounding the civic center, the approximate results below were found.

Figure 15. Exploration Borings (4:9-12)

<u>Depth in Feet</u>	<u>Soil Classification</u>
0.0 - 1.0	gravel and dirt
1.0 - 2.0	clay, silty, sand
2.0 - 4.0	clay and silty

Figure 16. Test Boring



Zoning Regulations

The proposed site of the civic center is located in the "Business District" according to zoning ordinances of the City of Harlem. "Business Districts" are least restrictive in order of zones following Classes "A, B, and C Residential Districts". Setback requirements state that building lines are to conform within reason to those of

neighboring buildings. There are no side-lot, height, or parking restrictions for the "Business District". (3:1)

Vegetation

The growing season is short, about four months, and winters are long and severe in the Harlem area. This condition limits the types of vegetation available to the site and its environment. Cottonwood and elm trees are common in the Milk River Valley. A few pine trees are grown with considerable care. Lilac and caragana bushes flourish. Grass grows abundantly (if adequate water is available) in the "gumbo" soil, a mixture of clay, sand, and silt. In the past, water was rationed - hours of usage were set - during the summer months. A larger water system installed two years ago may improve conditions. A small amount of funds will be set aside in the Economic Considerations for landscaping.

Parking

Two general groups of parking are needed. Provision for "official parking", school busses for basketball games, police cars, city-office staff and custodian vehicles, will be made. Parking for the general public also is necessary.

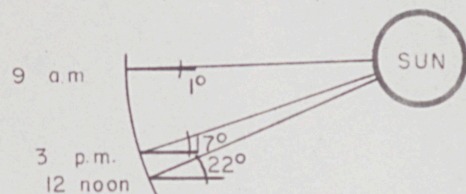
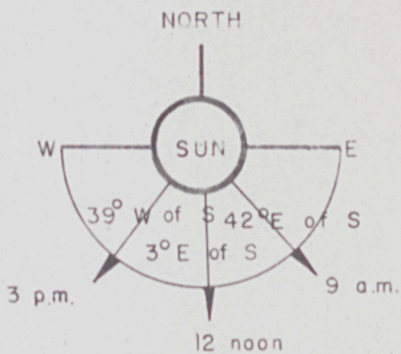
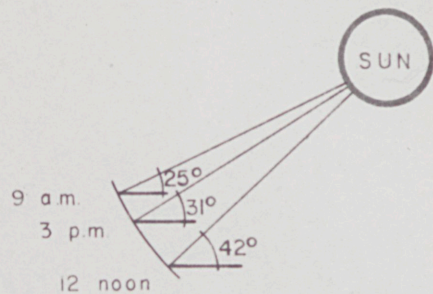
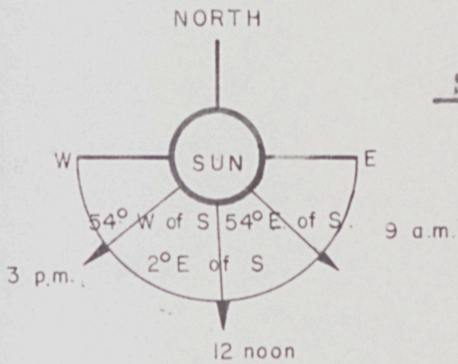
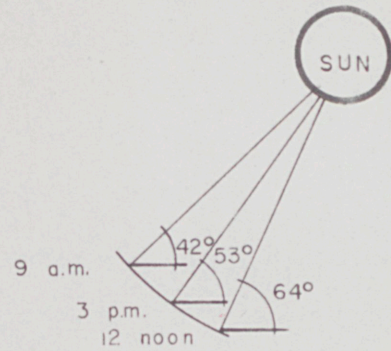
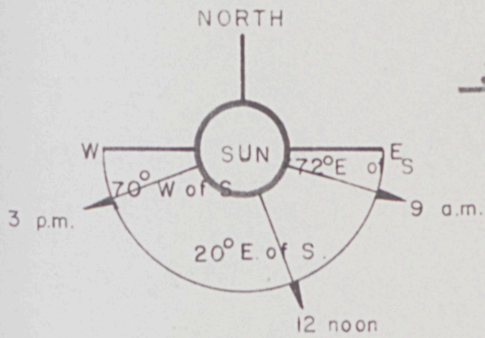
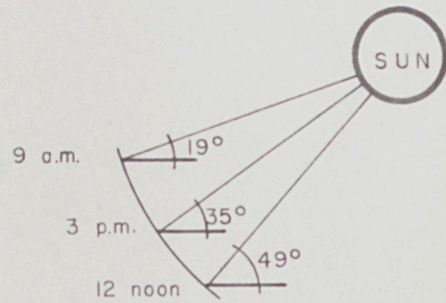
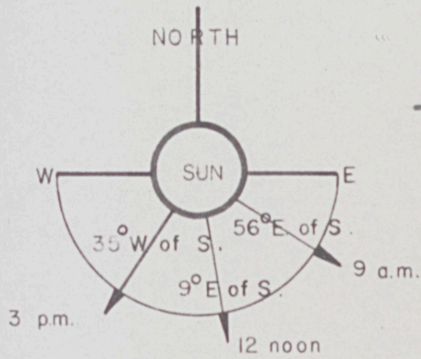
"Official parking" varies little, so a standard size can be chosen for this area - space for about eight cars and two busses.

Public parking varies with the size and number of functions taking place in the civic center. There is available on-street parking space for approximately 200 cars within one and one-half blocks of the building. Provision will be made on the site for off-street parking for about thirty cars. Parking in vacant lots is frowned upon, but this takes place regardless of risks involved (stolen or damaged property).

Sun Angles

Sun Angles for three different times during the day are estimated. The times are 9:00 a.m., 12:00 noon, and 3:00 p.m. The latitude for Harlem is approximately $48\frac{1}{2}$ degrees. (Please note Figure 17. Sun Angles on page 23.)
(6:399)

Figure 17. Sun Angles



IV

function

F U N C T I O N O F T H E B U I L D I N G

General

The civic center at Harlem, Montana, requires five general areas. They are the police and jail area, the public-use area, the auditorium-gymnasium, the maintenance area, and the fire station.

The public areas include the city council chamber, office of the city clerk and treasurer, library, and club meeting-room. These rooms have public use in common and might be grouped near a central lobby or court.

Although the auditorium-gymnasium is a public use area, it is larger than each of the other areas and has a slightly different function. It is used often for admission-paid activities and should be placed apart from the public-use area for this reason.

The police station must be isolated from the remaining areas. This is necessary for public safety when police are handling dangerous and unruly law offenders.

The fire station is similar to the police station in that it must be isolated from the remaining public-use areas.

The maintenance area includes the mechanical room, maintenance office, general-storage room and city-equipment garage. These areas do not have to be grouped

together. Their functions may necessitate that they be set apart from each other. An example might be the mechanical room's position somewhere near the center of the building contrasting the maintenance garage located near the exterior of the building.

Public Lobby--

Personnel - See Activities below.

Activities - This area is used as access to the city council chamber, city clerk and treasurer's office, library, and club meeting room. It might also serve as a secondary entrance to the auditorium-gymnasium.

Space and Equipment:

Lobby area - The lobby should be adjacent to the above mentioned areas and in the general vicinity of the auditorium-gymnasium and maintenance office.

Rest room - All public areas, excepting the club meeting room are furnished with rest rooms for the staff. However, two small rest rooms for the public are to be included: the men's with one toilet, urinal and lavatory and the women's with two toilets and one lavatory.

City Council Chamber--

Personnel - The city council consists of the mayor and four council members. The city clerk takes minutes at the meeting. In the public gallery are approximately ten townspeople at most meetings. If occasion demanded, the council would hold meetings in the auditorium-gymnasium.

Activities - The council meets once a month to discuss

and vote on city business. Townspeople in the gallery bring complaints before the council and listen to and discuss city business.

Space and Equipment:

Council Chamber - The council members, mayor, and secretary, sitting at desks, face the public seated at chairs or benches. The council chamber should be located adjacent to or near the office of the city clerk for ease of moving records back and forth from meetings. The council area might be accessible from the exterior either directly or through a lobby.

Office of the City Clerk and Treasurer--

Personnel - One city clerk is employed full-time and one city treasurer is employed part-time.

Activities - The city treasurer records financial data for the city. He (or she) issues warrants to the clerk to pay outstanding debts. The city clerk receives money from townspeople for water fees. He (or she) acts as secretary at city council meetings and records all proceedings of business pertaining to the city.

Space and Equipment:

Reception area - This space is used by the public when paying fees to the city clerk. There is seldom a waiting

line so that this area is small. The reception area is adjacent to the city clerk's office.

Office area - Work space for the city clerk and treasurer is necessary. There is no need for the two spaces to be isolated since the treasurer spends only a few hours weekly at the office and the time is usually spent conferring with the city clerk. A desk should be provided for the clerk and treasurer. A counter for receiving fees is also part of the office area.

Records safe - A walk-in records safe for city accounts, minutes, and governmental documents is to be included. A fireproof safe with shelving space is necessary for the office.

Restroom - One rest room with toilet and lavatory is needed. Because traffic is limited there is no need for more than one rest room in this part of the building.

Custodian Storage - A closet for storage of cleaning equipment is necessary within the office area because cleaning of the clerk's office and city council chamber is done by the clerk.

City Library--

Personnel - One librarian is employed full time at the library to serve the public. A maximum number of 25 people use the library at once.

Activities - The librarian supervises use of reading material and maintains and renews this material as the need arises.

Space and Equipment:

Library proper - The library proper must hold at least 4000 volumes. Near the entrance of the library is located the librarian's desk (in this case a circulation counter) so that she can control circulation of reading material. Besides shelves to store books and periodicals, seating and tables for browsers should be supplied.

Repair and storage room - Near to the librarian's desk should be located the binding room where the librarian maintains reading material. Also in this room should be located shelving for miscellaneous storage and a closet for room-cleaning equipment. The librarian also acts as custodian of the library.

Reference room - The reference room is situated apart from the library proper and contains encyclopedias, dictionaries and other reference materials.

Children's library - The children's library is also apart from the main library and contains children's literature and seating and tables for the children.

Rest room - A rest room is to be provided for use, primarily, of the librarian. It should contain one toilet

and one lavatory.

Club Meeting-Room--

Personel - There is no regular personnel on duty in the meeting-room. Club group sizes range from fifteen to forty members.

Activities - Civic groups of varied types gather in this meeting-room. Examples are the rod and gun club, the fire department, and the American Legion. Small dances and parties are also held in this room.

Space and Equipment:

Meeting-room - The location of this room should be within the public-use area. No special equipment is necessary for this room.

Kitchen - Clubs often serve a lunch after meetings. A kitchen with sink, small cooking stove, and storage shelving is to be included.

Auditorium-gymnasium--

Personnel - Persons attending activities carried on in this area make up the personnel. One part-time custodian cleans this area.

Activities - Various large activities as previously mentioned in the History of Harlem take place in the auditorium-gymnasium. Many of these are school activities.

Space and Equipment:

Auditorium-gymnasium proper - The capacity of this area is approximately two thousand persons. Seating for this number can be either accomplished with portable or permanent bleachers. Because this area dominates in size the other areas, its position and direction of orientation on the site are of primary importance.

Dressing rooms - Rooms for two complete basketball teams (twelve players each) are required. Complete shower facilities (six shower heads), one toilet, one urinal, and one lavatory are required per room. Lockers and benches are necessary for each team member also. These areas are to be directly adjacent to the playing floor.

Coach's and officials' room - Close to the dressing rooms is the coach's room. It is a small room used by the "home" coach for an office and for a dressing room for officials at basketball games. This room requires five lockers, shelving for medical equipment, and an office desk for the coach.

Public rest rooms - Rest rooms for public use adjacent to the auditorium-gymnasium are required. The men's rest room shall have four toilets, seven urinals, and ten lavatories. The women's rest room should include ten toilets, ten lavatories and a small powder room with chair space to seat six.

Lobby - A lobby placed between the entrance and the auditorium-gymnasium acts as a transition zone and place to purchase tickets if an admission-paid event is taking place inside.

Ticket booth - A small ticket booth or booths for two ticket sellers is required between the lobby and the auditorium-gymnasium. A concession booth may be incorporated into this area also.

Stage - A stage is necessary to complete the auditorium-gymnasium. Standard backdrops and curtain equipment must be provided. Lighting provisions should be made. The stage will have to be positioned adjacent to and facing the auditorium-gymnasium to offer good viewing to the largest number of spectators. A small dressing room or rooms adjacent to the stage is needed. A loft will be required for curtains and a small electrical-equipment area is needed.

Storage room - A small storage room is to be provided near the stage to act as a general-storage and stage-storage area.

City Police Station--

Personnel - The police force consists of two city police, each on one twelve-hour shift and one county deputy working irregular hours. The jail has as many as twelve inmates

on Saturday nights.

Activities - The city police are both law enforcement officers on duty and jailers at the same time. When on duty the policeman goes hourly to the police station to check for phone calls and on the condition of inmates.

Space and Equipment:

Police office - The police office is a base of operations (to make and take phone calls, "book" law offenders, and do police secretarial work). In the office is an office desk and a safe for personal belongings of prisoners.

Rest room - One rest room for police officers should be located adjacent to the office.

Custodian and storage room - A small room is necessary for the storage of cleaning equipment and police equipment. Other police equipment includes firearms and ammunition, medical supplies, jail laundry and dog-catching net.

Day room - This room acts as a buffer between the police office and the cellblocks. It also is an exercise room for prisoners. Installed in the day room are one shower, toilet and lavatory. The day room might adjoin both the male cellblock and the juvenile and female cellblock.

Male cellblock - The male cellblock shall have a capacity of eight. Most inmates in the jail are inebriates and are there only overnight. However, inebriates are sometimes dangerous and they must be isolated. There are to be a minimum of one toilet and one lavatory. This cellblock is reached from the day room.

Female and juvenile cellblock - This cellblock has a capacity of four. There are seldom as many juvenile or female prisoners as male. In extremely overcrowded conditions in the male cellblock and when the female and juvenile cellblock is empty, male prisoners are placed in the female and juvenile cellblock. There is one toilet and one lavatory in this cellblock. This cellblock is also reached from the day room.

Fire Station--

Personnel - The Harlem Fire Department consists of men who work on a voluntary basis.

Activities - At the fire department, no one is on permanent duty. When the town fire siren is sounded, men from their respective occupations go to the fire station and ride the fire truck to its destination.

Space and Equipment:

Engine house - The garage housing the fire truck should have direct access to either of the two streets

bordering the site. The entrance is to be located away from other public entrances to the civic center. The garage should contain racks to dry wet fire hoses. Most of the fire-fighting equipment is on the fire truck.

Storage room - A small room for the storage of fire-fighting equipment, cleaning supplies, and breathing resuscitator should be provided.

Maintenance Area--

Personnel - The city employs one full-time maintenance official and several part-time workers as the need arises.

Activities - The maintenance official works on city utilities - sewer, water, and streets - and keeps maps of these utilities up to date in his office.

Space and Equipment:

Office - The maintenance official thus needs a drafting table and office desk. There is also shelving needed for small and breakable parts to be kept in his office. The office should be the core of the maintenance department.

Storage room - A storage room is needed for spare city water and sewer parts of a large size. Tools for working on utility maintenance are to be kept here also. Sand and gravel for the city water plant (located a half-mile from town) is stored temporarily in this room. This

room should be located near the maintenance office.

Equipment garage - Garage space for storage of three city trucks and repair of a fourth should be included. This area should also be located near the maintenance office.

Mechanical room - The mechanical room should be as centrally located as possible. This room houses the heating apparatus.

V

a e s t h e t i c

c o n s i d e r a t i o n s

A E S T H E T I C C O N S I D E R A T I O N S

The Type of Building

The civic center to be developed in this thesis is a combination city hall and public-assembly area. Taken as a whole the building is to display a public feeling. How can this be best expressed architecturally? The structure must stand for the spirit of the public; it should display strength, unity, and dignity. Taken separately each area of the building has its own individual characteristics. These will be discussed.

The office of the city clerk and treasurer and the city council chamber are of symbolic importance to the city. In these areas official city business is held (official policy is determined) and a distinguished atmosphere should be apparent in contrast to the other areas.

A feeling of education, serenity, and enlightenment should prevail in the library.

The character of the building as a whole is transferred most directly to the club meeting-room. Here is a space that should reflect the spirit of the participating civic groups: civic pride, responsibility, and personality.

The police station is isolated in function: so also must it be isolated aesthetically. It should not appear

as an island prison, but its function - that of the police office and jail - is to be recognized from the exterior if possible. Security, safety, and sanitation describe a jail-like expression

The fire station, also isolated, is the base of an efficient operation and should be planned as such and appear that way. It is an area seldom used, but when necessary everything must be in order.

The auditorium-gymnasium is somewhat similar to the club meeting-room in its civic use. Because it plays an important part in school life, a bright young feeling should relate to its civic nature.

Environmental Factors

This building will be an attempt, in addition to its civic nature, to typify the architecture of the Northwestern Great Plains. A symbolic comparison will be made to describe the geographical area. One is led to contemplate natural environment to the extent that he visualizes cottonwood trees scattered along the Milk River Valley, fields of multicolored grass and grains, and snow-covered hayfields and pastures. With these, one may see colors, shapes, and textures which are reflected in material and structure used in the design of the building. One cannot neglect the city environment completely, however. Brick and stucco buildings are common along the Main

Street of Harlem. In order to satisfy the conditions created by location in the environment, any combination of brick, stucco, natural or painted wood, stone, or block might be considered as materials to use in the structure.

Function

One concept which must be considered in design is function. It should be asked what function has to do with aesthetics? Norman T. Newton in An Approach to Design states:

Let me note just one other fundamental objection to our use of these terms, especially the adjective "aesthetic". Unless my eyes and ears deceive me "aesthetic". has come to be used as implying the opposite of "functional". You are almost certain, sooner or later, to hear someone say about a work of design, "it's functionally good but aesthetically bad". This strikes me as a most misleading hitch in our evaluation of design and our language about it, a hitch that has had a profoundly limiting effect on our comprehension of what we mean by functional design. (7:113)

Function is commonly thought of as a mathematical or biological term. This term has a deliberate meaning. A functional relationship, then, is one where one variable depends on another. In calculus, "y" is a function of "x". $Y = f(x)$. Man is affected by what he feels or sees in his environment. He is affected by his environment. Newton calls this function "affective function". Another type of function, one more commonly used, is called mechanical function. This is the type of function we think of when we talk of a machine functioning or working well. If a room is not large enough to hold its occupants, it

does not function well. Are the two types of functions ever combined or overlapped? Newton states again:

But lets look at a homlier example. If a roof leaks, it is deemed mechanically inefficient-- not because people get wet, but because a predictable mechanical function has not been satisfied. And yet, when people do get wet from a leaky roof, or even when they see on walls and ceilings the unusual colors and textures that could possibly indicate former leaks, who is to say their responses-- their inner feelings and reactions-- will not be affected? Which is involved in this latter case, mechanical function or affective function? Both, sofar as I can tell. It is not a question of "either or", but a question of what order and sequence, and to what degree. Both types of function are important; neither provides by itself a complete solution in things designed for human use; both must be taken into account in any comprehensive functionality. (7:126,7)

Both types of function, then, are directly related to all aesthetic considerations.

Civic Responsibility

With the arrival of outlying population growth and shopping centers, larger cities are experiencing blight in their business districts. In the smaller cities, this is not always the case. Business districts decline, but only because there is no incentive through city growth to build or remodel. From the Boston City Hall Competition bulletin comes a statement which, although for another reason, holds true.

Because it is the seat of government, it (the city hall) should reflect the highest aspirations of the people served.

Since the project is expected to regenerate extensively a declining business district,

there is need for functional and aesthetic standards that will set a high mark for future developments to emulate. (7:15)

It is possible that a building project such as the civic center could rejuvenate standards and stir a city to grow and prosper.



Figure 18. Environment



Figure 19. Aesthetic Use of Materials?

VI

e c o n o m i c c o n s i d e r a t i o n s

ECONOMIC CONSIDERATIONS

General Economics

The costs of constructing a building are related to size, type, geographical location, life of the structure, and available funds.

Cost due to size explains itself. The functions within the building and capacity of rooms dictate size.

Related to size is type; building types differ in cost because the materials (room-finish and exterior-wall) and structural members vary in cost. (A hospital operating room would cost more than a club meeting room.) Utility fixtures also vary in cost for this same reason.

Labor and material costs range on a supply and demand basis. (A geographical location near a large available supply of materials or on a transportation hub brings the material prices down.)

If a structure is to be built to stand for many years, long-lasting materials with low maintenance cost should be used. The proposed civic center should last a minimum of forty years. (The building life is directly related to the "class" of building discussed later under Building Costs.)

The availability of funds demands definite attention; the building is to be for the public and the public will

pay only as much as it feels is necessary. However, without these funds, the building should not be proposed.

This is an attempt at a thorough study in the economy phase of the Harlem Civic Center proposal.

Methods of Cost Estimation

Three methods of figuring costs before the building is designed are given below:

- (1) Segregated cost method - Various portions of the building are estimated for cost. They are calculated separately and combined to make up the total cost of the building. This is an accurate process, but can't be used until the design is nearly completed.
- (2) Square foot method - With this method the total cost per square foot of floor area of the particular type of building is multiplied times the total floor area. The Marshall Valuation Service tabulates costs per square foot of different types of buildings.
- (3) Cubic foot method - This method is similar to the square foot method except that it uses cubic feet instead of square feet as the constant. To find the cubic feet of the average room, the Marshall Valuation Service multiplies the square feet of a room by ten feet.

In this research the square foot method will be revised so that five segregated areas will be estimated. The five areas are: (1) the municipal area, or public-use area; (2) the library; (3) the auditorium-gymnasium; (4) the jail or police station; and (5) the fire station.

Construction Costs

The Marshall Valuation Service lists four building-types. Each type or class can meet Harlem building and fire code standards. The classes are:

Class "A" buildings have fireproofed structural steel frame with reinforced concrete or masonry floors.

Class "B" buildings have reinforced concrete or masonry floors and roofs.

Class "C" buildings have masonry exterior walls, and wood or steel roof structure.

Class "D" buildings have wood or steel frame and roof structures. (9:1-6)

Building Lives

The time period of usefulness of structures is directly related to the building "classes". Listed below are "classes" of some of the various areas within the proposed civic center.

Table 2. Building Life (9:15-9 & 16)

Occupancy	Class - A	B	C	D
Good libraries -----	70	70	60	50
Average libraries -----	60	60	50	45
Low cost libraries -----			45	40
Good and excellent municipal buildings -----	80	80	70	60
Average municipal buildings -----	70	70	60	50
Average jails and fire stations ---	60	60	50	40
Good and average gyms -----	50	50	45	40

From Table 2 it was noted that the proposed building, with a minimum life of forty years, could be placed in any of the four "classes". However, a higher "class" denotes a longer building life.

Table 3. Public Buildings (9:15-5,6,14)

Class	Type	Exterior Walls	Interior Walls	Lighting, Plumbing, Mechanical	Heating	Cost/ Sq. Ft.
A	Average municipal	Metal, concrete, brick, large glass	Plaster, marble trim, vinyl tile, and terrazo	Good fluorescent large rest rooms	Steam	24.19
A	Average municipal	Concrete, marble, limestone, ornamental terra cotta	Plaster, marble wainscot, hardwood, marble floors	Ornate fixtures	Steam	23.93
A	Average jail	Concrete, brick, limestone	Plaster, concrete, some acoustic and asphalt tile	Adequate	Steam	24.83
A	Average library	Face brick, limestone, ornate front	Plaster, terrazo, asphalt tile, typical minimum library	Good lighting, adequate plumbing	Steam	21.44
A	Average fire station	Concrete, brick, limestone	Plaster, kitchen, showers, dorm, asphalt tile, concrete	Adequate	Steam	18.38
B	Average municipal	Metal, concrete, brick, large glass areas	Plaster, terrazo, vinyl tile	Good floor, large rest rooms	Steam	22.30
B	Average municipal	Granite, marble, limestone, ornamental terra cotta	Plaster, marble trim, hardwood, marble floors	Ornate fixtures, tile restroom	Steam	21.97
B	Average jail	Concrete, brick, limestone	Plaster, concrete floor	Adequate	Steam	23.10

Table 3. (Cont.)

Class	Type	Exterior Walls	Interior Walls	Lighting, Plumbing, Mechanical	Heat- ing	Cost/ Sq. Ft.
B	Average library	Face brick, limestone, ornate front	Plaster, terrazo, asphalt tile, typical minimum library	Good lighting and plumbing	Steam	19.88
B	Average fire station	Concrete, brick, limestone, ornamental front	Plaster, kitchen, shower, dorm, asphalt tile, concrete	Adequate	Steam	17.10
C	Average municipal	Brick, block, concrete, steel frame, and joists, ornamentation	Plaster, ceramic tile, terrazo, vinyl tile	Good fluorescent fixtures, good restrooms	Steam	18.91
C	Average municipal	Brick, bearing walls, wood trusses, ornamentation	Plaster, tile trim, terrazo, asphalt tile	Ornamental fixtures, few outlets, adequate plumbing	Steam	18.26
C	Average jail	Brick, concrete, block	Plaster, concrete floor	Adequate	Force air	21.98
C	Good library	Special designs, ornamental, much glass	Large city or university type, good quality throughout	Special lighting throughout	Hot water	19.25
C	Average library	Face brick, ornamental block, stone	Plaster, terrazo, asphalt tile, hardwood	Adequate	Hot water	15.89
C	Average fire station	Bricks, block, concrete, front ornamentation	Plaster, concrete floors, kitchen showers, dorm	Adequate	Force air	14.78

Table 3. (Cont.)

Class	Type	Exterior Walls	Interior Walls	Lighting, Plumb- ing, Mechanical	Heat- ing	Cost/ Sq. Ft.
C	Good gym	Steel columns and girders, face brick, ornamental stucco	Plaster, wainscot, basketball, terrazo, asphalt tile	Good lighting, tiled shower and restroom	Force air	14.76
C	Average gym	Steel or gluelam bents, brick or block	Plaster, basketball court, linoleum, exposed beams	Adequate light- ing, shower rooms, rest room	Heat- ers	11.88
D	Good gym	Wood or steel col- umn, trusses, brick veneer, stucco	Plaster walls and ceiling, hardwood, asphalt tile	Good recessed lighting, tiled showers and rooms	Force air	13.30
D	Average gym	Heavy wood frame, good stucco, little trim	Plaster walls, wain- scot, hardwood, as- phalt tile	Adequate light- ing, shower rooms, rest room	Heat- ers	10.99

Cost Analysis

Listed on Table 3, page 46, were cost estimates per square foot of the areas - municipal, library, auditorium-gymnasium, police station, and fire station - as they vary in "class". All "classes" were taken into account as a cost was chosen for each area; however, due to available funds for the project, class "C" costs were given priority. One reason for a rather low cost per square foot is that the maintenance department, part of the municipal area for these calculations, will be of inexpensive construction. The fire department, not furnished with kitchen, dormitory, and restrooms like larger fire stations, will also cost less.

Table 4. Cost of the Building

Area	Square Feet		Dollars/ Sq. Ft.	Dollars
Municipal	5620	x	17.00	= 95,600.00
Library	1650	x	15.00	= 24,800.00
Auditorium-gymnasium	20,220	x	12.00	=243,000.00
Police Station	1090	x	22.00	= 24,000.00
Fire Station	660	x	12.00	= 7,900.00
Corridors (5% total)	1460	x	10.00	= 14,600.00
TOTAL	30,700		Avg. 13.35	<u>409,900.00</u>
CONTINGENCIES (Architect's fee, legal fees - 10%)				41,000.00
LOT PURCHASES (Estimated at \$10,000/Lot - 3 Lots)				<u>30,000.00</u>
TOTAL COSTS-----				<u>\$480,900.00</u>

Special Aid

To help defray costs, the city can apply for and obtain through the Housing and Home Finance Agency a loan for Advance Planning. This loan would pay for all architectural plans and legal work in preparation for the construction of the building. There is no interest charge on this loan.

The Housing and Home Finance Agency will buy bonds at a rate of between 3 5/8 - 4%. This is considerably lower interest than most private financiers charge.

Financing the Building

Four principal ways of financing a local civic building are:

- (1) An "angel" erects the structure and leases it to the city for the life of the edifice. The cost of leasing the building usually is more than owning and paying for a bond to finance it. When an "angel" finances a privately owned building, the person leasing it has the advantage of writing part of the expense off. (The money can be listed as a business and can be deducted from income taxes.) The public, as a leasee, cannot do this.
- (2) Buildings that have a constant financial income can be paid for by revenue bonds. The bonds are set up on a basis such that the income of the structure covers them. The civic center has no sufficient revenue so that this type of financing would not be feasible. (However, if the high school district were to finance part of the building, this type of bond might be used if income from basketball games was sufficient.)
- (3) The most common way of financing public buildings is through general obligation bonds. Payment of the bond or bonds is accomplished by the tax-paying community. The bond is usually sold to a large finance company and is paid for at a small interest rate after a certain number of years.

(4) Private philanthropies are another method of defraying costs. A personal contribution of funds or land is given or loaned at extremely low interest. The entire structure or certain areas of the proposed building could be financed through this means. (A Carnegie grant might be applied to the library.)

From the analysis of the above four methods of financing, the third seems to be the most likely to choose. However, an assumption will be made that the high school district defrays one-third of the costs through the use of revenue bonds. (It is recognized that division of ownership complicates control and use of the project.)

The city will be left with two-thirds of the costs. A discussion follows involving the general obligation bond. Questions will be answered about the following: who has the power to create city indebtedness; how much can the city go in debt; what type of indebtedness is incurred; how long can the debt last; what is the maximum rate of interest on the debt; who votes on bonds; how does the city budget adjust to the debt; and just how much will the bond or bonds for the proposed building cost the property owner?

Legal Procedure

From the Revised Codes of Montana - 1947 come the laws regarding the finance of local public buildings.

The city or town council has power (1) To contract an indebtedness on behalf of a city or town, upon the credit thereof, by borrowing money or issuing bonds for the following purposes, to wit: Erection of public buildings,...and

to pay all or any portion of the cost thereof, and the funding of outstanding warrants and maturing bonds; provided that the total indebtedness, must not, at any time, exceed five per centum (5%) of the total value of the city or town, as ascertained by the last assessment for state and county taxes, said words "value of the taxable property" being used herein in the same sense as in section 6 of Article XIII of the Constitution; (Section 6 of Article XIII states that any other city bonds in aggregate of 5% become void also.) (10:628)

The indebtedness is usually contracted in the form of bonds. Bonds are limited by law to specific types:

All bonds hereafter issued by any city or town shall be either amortization bonds or serial bonds (both types are general obligation bonds) and all things being equal amortization bonds shall be issued in preference to serial bonds, otherwise ^{serial bonds} may be issued.

The term "amortization bonds", as used in this act, is hereby defined as meaning that form of bond on which a part of the principal is required to be paid each time interest becomes due and payable, which part payment of principal increases with each following installment in the same amount the interest decreases, so that the combined amount payable on both interest and principal is the same on each interest payment may vary in amount from the other payment to the extent resulting from disregarding fractional cents in other payments.

The term "serial bond" as used in this act is hereby defined as being a bond issue payable in equal annual installments, one (1) installment consisting of one (1) or more bonds, becoming due and payable each year, the amount to be paid and redeemed each year being determined by dividing the total number of years the issue is to run, so that the total amount of principal to be paid each year the bonds are to run will be the same: provided, however, that the payments becoming due the first year, or the first or second years, may vary in amount from the other payments to the extent resulting for the fixing the amount of each bond of the other payments at one hundred dollars (\$100.00), five hundred dollars (\$500.00), or some multiple thereof. (10:795)

In this research, because it has been recommended by law, the amortization bond will be used. The maximum rate of interest and length of bondage are discussed in section 11-2304:

No bonds for any purpose shall be issued for a longer term than twenty (20) years and when bonds are issued for the purpose of refunding bonds theretofore issued and outstanding, such bonds shall not be issued for a longer term than ten (10) years, provided that if the unexpired term of the bonds to be refunded shall be more than ten (10) years, then in such event, the refunding bonds may be issued for such unexpired term. All bonds issued for a longer term than five (5) years from the date of issue and on any interest payment date theretofore, and it shall be so recited in the bonds. The maximum rate of interest which any bonds may bear shall be six percent (6%) per annum and shall be payable semi-annually. (10:794)

The law states that only certain people can vote on bonds:

Only such registered electors of the city or town whose names appear upon the last preceding assess roll for state and county taxes, as taxpayers upon property within the city or town, shall be entitled to vote upon any proposition of issuing bonds by the city or town. (10:799)

Before the election to pass the bond is held, however, a petition must be circulated. The law requires that 20 percent of the recorded taxpayers who voted at the last general election be on the petition. If this requirement is fulfilled, the bond election is held and for it to pass, forty percent of the registered voters must vote and approve by a simple majority.

The bond or bonds must be paid for by the taxpayers over the twenty-year period. This would ultimately raise property taxes, unless some long-term planning had provided that funds be set aside for such an occasion. This has not been done in Harlem.

...The council shall then determine and fix the amount to be raised for each fund, for which a tax levy is to be made, by adding together the cash balance in excess of unpaid warrants at the close of the fiscal year immediately preceeding and the amount of the estimated revenues, if any, to accrue thereto during the current fiscal year, as before ascertained and determined, and then deducting from the total amount so obtained from the total amount of the appropriations and authorized expenditures from the fund as determined and fixed by the council in the budget adopted and approved, the amount remaining being the amount necessary to be raised from any fund by tax levy during the current fiscal year; provided that the council may add to the amount so found necessary to be raised for any fund by tax levy during the current fiscal year, an additional amount, as a reserve to meet and care for expenditures to be made from such fund during the months of July to November, inclusive of the next ensuing year,...

... , the council shall fix the tax levy for each fund at such rate, not exceeding limits prescribed by law, as will raise the amount set out in the budget as the amount necessary to be raised by tax levy for such fund during the current fiscal year, and no more; provided that the taxable valuation of the city for the then current fiscal year shall be the basis for determining the amount of tax for each fund and each tax levy shall be at a rate no higher than is required on such basis, ... (10:672)

Costs to the Taxpayer

The table below illustrates tax increases to accompany different market values of private property. From this, the taxpayer, (property owner) can see how

much extra tax per year that he must pay.

Table 5. Tax Increases

TOTAL COSTS-----	\$ 480,900.00
HIGH SCHOOL DISTRICT COSTS (1/3 total)-----	<u>-160,300.00</u>
CITY COSTS (2/3 total)-----	320,600.00
INTEREST ON CITY COSTS (4% city costs)-----	<u>12,800.00</u>
TOTAL CITY PAYMENT (interest $\times$ city costs)---	333,400.00
ASSESSED VALUATION (all Harlem property)-----	2,400,000.00
ALLOWABLE DEBT (5% assessed valuation)-----	120,000.00
OUTSTANDING INDEBTEDNESS (per annum)-----	17,500.00
ANNUAL CITY PAYMENT (\$333,400 / 20 years)----	<u>16,700.00</u>
TOTAL NEW INDEBTEDNESS (within 5% figure)---	34,200.00

Market Value of Property	Assessed Value of Property (40% of Market Value)	Taxable Value of Property (16% of Market Value)	Increased Tax per annum
\$ 5,000	\$ 2,000	\$ 550	\$ 18.10
10,000	4,000	1,000	33.00
15,000	6,000	1,650	55.40
20,000	8,000	2,200	72.50
25,000	10,000	2,750	90.50
30,000	12,000	3,300	108.90

Site and Site Improvement

The three lots adjacent to the present civic center will be purchased (as noted on Table 4) or traded for other lands. One of these lots is vacant. Another lot is split and owned by two commercial firms, a telephone company and a credit union. The third lot is the site of an old residence.

Costs of landscaping are estimated at between one and three per cent of the total cost of the building. Costs for sidewalks, roads, and parking are determined as follows by the Marshall Valuation Service: (9:10-1)

- | | |
|-------------------------------|------------------------|
| (1) Sidewalks ----- | \$.60 per square foot |
| (2) Paved asphalt roads ----- | \$.30 per square foot |
| (3) Paved asphalt parking --- | \$.30 per square foot |

Operation and Maintenance Costs

The new building will be planned so to coincide with present maintenance procedures. Maintenance costs are absorbed mostly by utility or operational expenses. Custodian costs are paid as part of salaries to various department employees within the structure. With more suitable finish materials and a more functionally planned building, maintenance costs should be somewhat less.

Present costs to operate now average approximately 2,300 dollars per year. The school pays 70 per cent of this for rental of the gymnasium. The size of the building will be slightly increased (about 5000 more square feet), but the costs will remain almost the same with improved insulation and heating apparatus.

VII

building program

BUILDING PROGRAM

Space	Description	Quantity	Total Area - Sq. Ft.
Public Lobby-- Lobby	Function: As stated. Equipment: None. Finish: Good quality, durable, requiring little maintenance.	1	400
Rest room (men)	Function: As stated. Equipment: One toilet, one urinal, one lavatory. Finish: Durable, hard, requir- ing little maintenance.	1	100
Rest room (women)	Function: As stated. Equipment: Two toilets, one lavatory. Finish: Durable, hard, requir- ing little maintenance.	1	100
TOTAL-----			<u>600</u>
City Council Chamber-- Council chamber	Function: Hold city council meetings. Equipment: Six desks and chairs, seating for twenty. Finish: Good quality, durable, requiring little maintenance.	1	600
TOTAL-----			<u>600</u>
Office of the City Clerk and Treasurer-- Office area	Functions: Management of city records and funds. Equipment: One teller's counter, two chairs, two desks. Finish: Good quality, durable, requiring little maintenance.	1	300

Space	Description	Quantity	Total Area - Sq. Ft.
Reception area	Function: Public waiting area while doing business at office. Equipment: None. Finish: Durable, requiring little maintenance.	1	50
Records safe	Function: Safe for city books. Equipment: Shelving for books. Finish: Durable, requiring little maintenance.	1	100
Rest room	Function: As stated. Equipment: One toilet, one lavatory. Finish: Hard, durable, requiring little maintenance.	1	40
Custodian storage	Function: As stated. Equipment: Shelving and slop sink. Finish: Hard, durable, requiring little maintenance.	1	30
TOTAL-----			<u>520</u>
City Library-- Library proper	Function: Furnish reading material for use of public. Equipment: Shelves for books and seating and tables for fifteen people. Finish: Good quality, durable, requiring little maintenance.	1	800
Repair and storage room	Function: As stated. Equipment: Shelving and table for repair of books. Finish: Durable, requiring little maintenance.	1	150

Space	Description	Quantity	Total Area - Sq. Ft.
Reference room	Function: Provide reference materials to the public. Equipment: Shelves for books and seating and tables for ten people. Finish: Durable, requiring little maintenance.	1	300
Children's library	Function: Provide reading material for youngsters. Equipment: Shelves for reading material, seats and tables for ten children. Finish: Durable, requiring little maintenance.	1	400
TOTAL-----			<u>1650</u>
Club Meeting-Room-- Meeting-room	Function: Gathering place for civic clubs. Equipment: Seating for forty, one blackboard, room partition, Finish: Good quality, durable, requiring little maintenance.	1	1000
Kitchen	Function: Fix lunches for club meetings. Equipment: Sink, cooking stove, shelf space. Finish: Hard, durable, requiring little maintenance.	1	200
TOTAL-----			<u>1200</u>
Auditorium-gymnasium-- Auditorium-gymnasium proper	Function: Hold large activities. Equipment: Seating for 2000 people, two complete basketball goals, standard school (Cont. on next page.)	1	15,000

Space	Description	Quantity	Total Area - Sq. Ft.
Auditorium-gymnasium (cont.)			
Auditorium-gymnasium proper	gym equipment, two water fountains.		
Dressing rooms	Function: As stated. Equipment: Six showers, one toilet, urinal, and lavatory, lockers and bench space for twelve. Finish: Hard, durable, requiring little maintenance.	1	@800 =1600
Coach's and Officials' room	Function: As stated Equipment: Five lockers, toilet, shower, shelving, and office desk for the coach. Finish: Hard, durable, requiring little maintenance.	1	200
Uniform drying and equipment room	Function: As stated. Equipment: One clothes washer and dryer, five equipment lockers, shelving. Finish: Durable.	1	100
Public rest room (men)	Function: As stated Equipment: Four toilets, seven urinals, and ten lavatories. Finish: Hard, durable, requiring little maintenance.	1	500
Public rest room (women)	Function: As stated. Equipment: Ten toilets, ten lavatories, and seating for six in a powder room. Finish: Hard, durable, requiring little maintenance.	1	700
Lobby	Function: As stated. Equipment: Two water fountains. Finish: Good quality, durable, requires little maintenance.	1	800

Space	Description	Quantity	Total Area Sq. Ft.
	Ticket booth Function: Vend tickets Equipment: Ticket window and counter for two. Finish: Good quality, durable, requiring little maintenance.	1 or 2	@20
	Stage Function: As stated. Equipment: Backdrops and curtain, special lights. Finish: Durable, requiring little maintenance.	1	1000
	Storage room and custodian storage Function: General and stage storage, cleaning equipment storage. Equipment: One slop sink and shelves. Finish: Durable, requiring little maintenance.	1	300
TOTAL-----			<u>20,220</u>
	City Police Station-- Police office Function: Keep police records and book law offenders. Equipment: Office desk, safe, telephone. Finish: Good quality, durable, requiring little maintenance.	1	300
	Rest room Function: As stated. Equipment: One toilet, one lavatory. Finish: Durable, requiring little maintenance.	1	40
	Custodian-storage room Function: As stated. Equipment: Storage shelves and one slop sink. Finish: Durable, hard, requiring little maintenance.	1	50

Space	Description	Quantity	Total Area - Sq. Ft.
-------	-------------	----------	-------------------------

Day room

Function: Divides office from cellblocks and is exercise and shower room for inmates.
Equipment: One toilet, shower, and lavatory.
Finish: Hard, durable, easily maintained.

1 or 2

@100

Male cellblock

Function: Hold prisoners.
Equipment: Minimum of one toilet and one lavatory.
Finish: Very hard, very durable and easily maintained.

1

400

Female and juvenile cellblock

Function: Hold prisoners.
Equipment: Minimum of one toilet and one lavatory.
Finish: Very hard, very durable and easily maintained.

1

200

TOTAL-----

1090

Fire Station--

Engine house

Function: Garage for fire truck.
Equipment: Racks to dry hoses.
Finish: Hard, durable.

1

600

Storage room

Function: As stated.
Equipment: Shelves.
Finish: Durable.

1

60

TOTAL-----

660

Maintenance Department--

Office

Function: Headquarters and drafting room for maintenance official.
Equipment: Drafting table, office desk, and shelves.

1

300

Space	Description	Quantity	Total Area - Sq. Ft.
Storage room	Function: Storage for utilities. Equipment: None. Finish: Durable.	1	200
Equipment garage	Function: As stated. Equipment: None. Finish: Durable.	1	2000
Mechanical room	Function: Contains heating and electrical equipment. Equipment: Heating and electrical apparatus. Finish: Durable, fireproof, easily maintained.	1	200
TOTAL-----			<u>2700</u>
TOTAL ROOM AREA-----			<u>29,240</u>
Corridor Space (Add 5% of Total Room Area)-----			<u>1460</u>
ADJUSTED TOTAL-----			<u>30,700</u>

Figure 20. Preliminary Flow Diagram

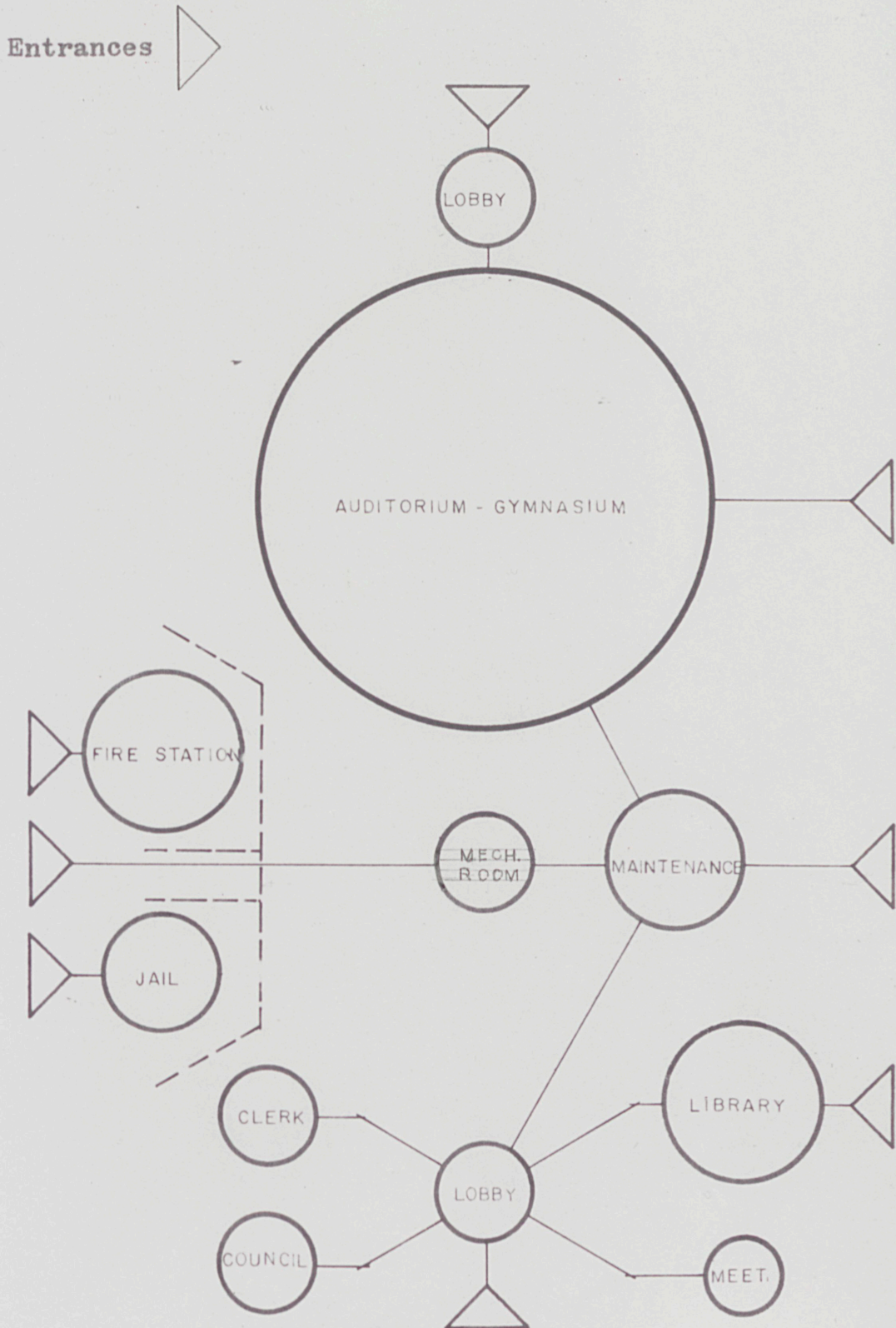
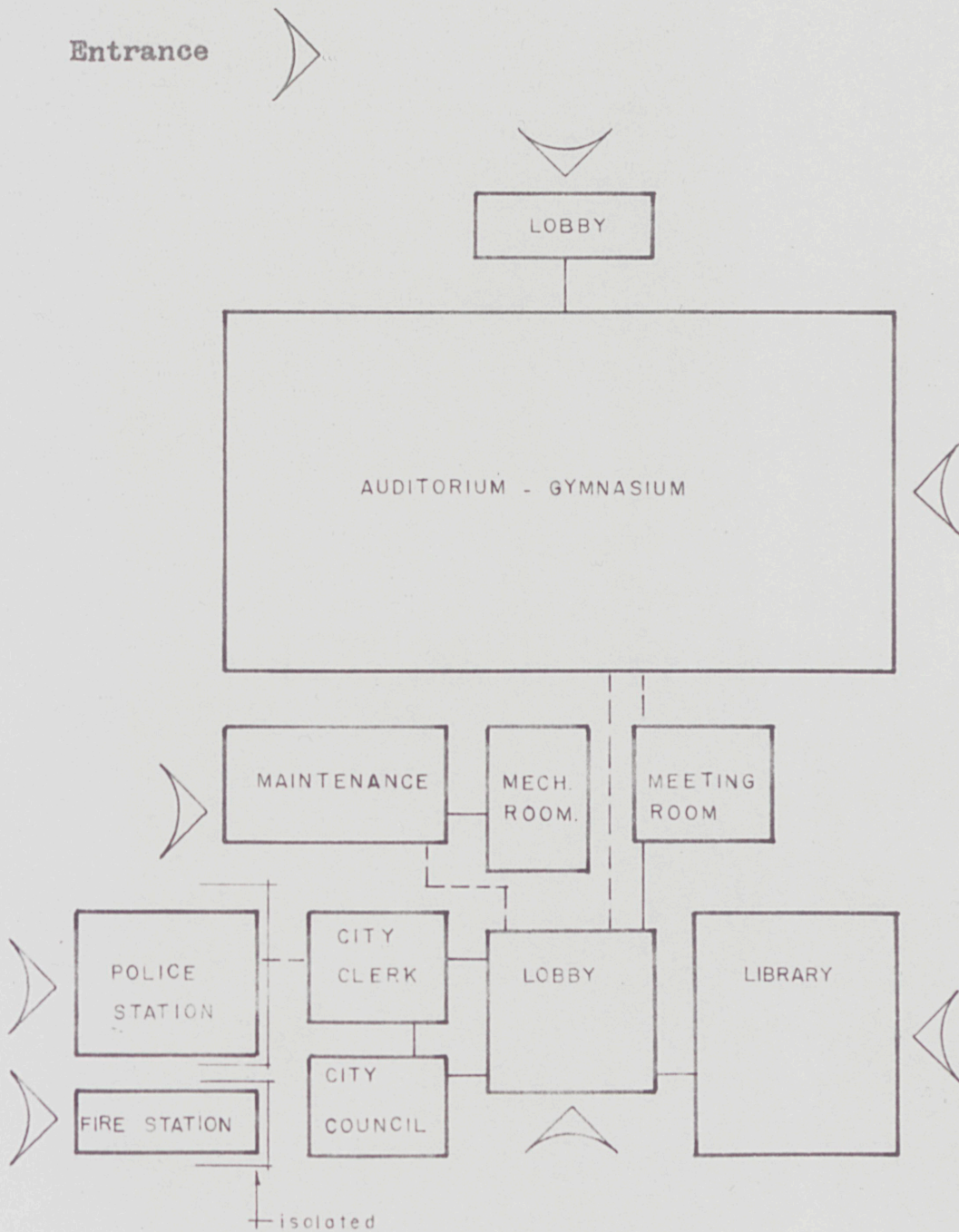


Figure 21. Final Flow Diagram



VIII

a p p e n d i c e s

A P P E N D I X "A"
Q U E S T I O N A I R E S

The questionnaires are used for two primary reasons. The first is to gain information about the function of the building and the second is to find out about special considerations. These are explained below.

Function

Under the building program were listed the following items: the space in question and a description including function, equipment and finish. Questions concerning these are inserted in the questionnaires.

Special Considerations

These concern heating and air conditioning, illumination, and acoustics.

There is no apparent problems with heating. However, control of heating is not adequate. (The police officer cannot control heat in his office - he has to go to the gymnasium to do this.) Also, rooms will have to be positioned so they will not receive the warm, summer-afternoon sun from the southwest.

Illumination and light control (from the exterior) is found to be inadequate throughout.

In a building of this sort, sound control is essential. The gymnasium, especially, must be sound isolated.

QUESTIONNAIRE

ARCHITECTURAL THESIS RESEARCH
A Civic Center for Harlem, Montana

To the office of the City Clerk and Treasurer:
Regarding the city council chamber:

Activities--

What purpose does the city council chamber serve?

Office of the city clerk; hold all meetings of the city council

What are the duties of the members of the city council and what other activities take place in the chambers? c.c. attend meetings, take care of city business; - Prescribe the duties of all city officers, fix their compensation, subject to the limitations contained in this title; have power to make and pass all by-laws, ordinances, orders, and resolutions. Chambers reserved for city meetings.

Space and Function--

Is the council room large enough for its purpose? x Yes No

Is the council room too large for its purpose? Yes x No

In what way might the council room space be improved?

Room Finish Materials--

Are the room finish materials (walls, ceiling, floors) adequate for the room? Yes x No

Do they collect dust or dirt? x Yes No

Are they easily cleaned? Yes x No

Are they attractive? Yes x No

Comments on room finish materials

Need to refinish floor - suggest tiling or inlaid linoleum.

Equipment--

What special equipment is needed in the council room?

One 36 by 90 council table; 4 chairs for aldermen, one chair for mayor; benches for audience.

QUESTIONNAIRE (continued)

Heat Control--

Is the council room too warm in the summer? Yes ☐ No ☒
Is the council room too cold in the winter? Yes ☐ No ☒
Is it difficult to adjust heat in the council room? Yes ☐ No ☒

Comments on heat control

Acoustics--

Does sound from adjacent areas escape into the council room? ☐ Yes ☒ No
If so is it annoying? ☒ Yes ☐ No at times (Basketball practice)
Is it difficult to hear in the council room? Yes ☐ No ☒ (not usually)

Comments on sound control

Illumination--

Is lighting bright enough in the council room? Yes ☐ No ☒
Are lighting fixtures positioned for maximum efficiency? Yes ☐ No ☒

Comments on lighting

Out moded style

General Comments--

I will appreciate your cooperation if you will fill out this questionnaire and mail it in the enclosed envelope. This questionnaire is partial fulfillment of an architectural thesis - A Civic Center for Harlem, Montana.

Thank you,

QUESTIONNAIRE

ARCHITECTURAL THESIS RESEARCH A Civic Center for Harlem, Montana

To the office of the City Clerk and Treasurer:

Activities--

Please list all duties of the city clerk and treasurer.

C.C. to attend all meetings of the city council, to record & sign the proceedings, etc., authorized by council; to issue warrants & keep records of warrants; file and keep all records, books, papers and property belonging to city. Give notice of all elections required by law; keep financial records; to take and administer oaths, perform such other duties as the council may prescribe. Treasurer: receive money deposited by clerk & to pay the same out on warrants issued; present statement to council accounting for receipt & disbursements & bank balance.

What other activities take place in your office? Water collector in Harlem - duties: issue water bills, collect water accounts - keep records thereof.

Space and Function--

Is your office large enough for its purpose? ☒ Yes ☐ No
Is your office too large for its purpose? ☒ Yes ☐ No

In what way might the office space be improved?

Partitioned off.

Room Finish Materials--

Are the room finish materials (walls, ceiling, floors) adequate for the room? ☐ Yes ☒ No
Do they collect dust or dirt? ☒ Yes ☐ No
Are they easily cleaned? ☐ Yes ☒ No
Are they attractive? ☐ Yes ☒ No

Comments on room finish materials

Need to refinish floor - suggest tiling or inlaid linoleum

Equipment--

What special equipment is needed in your office?

Desk & chair; counter & cabinets, adding machine, typing table.

QUESTIONNAIRE (Continued)

Heat Control--

Is your office too warm in the summer? Yes x No
Is your office too cold in the winter? Yes x No
Is it difficult to adjust the heat in your office? Yes x No

Comments on heat control

Acoustics--

Does sound from adjacent areas escape into your office? x Yes No
If so is it annoying? x Yes No at times (Basketball practice)
Is it difficult to hear in your office? Yes x No (not usually)

Comments on sound control

Illumination--

Is lighting bright enough for your type of work in the office? Yes x No
Are lighting fixtures positioned for maximum efficiency? Yes x No
Is there ample daylight lighting in your office? x Yes No
Does the daylight lighting ever create glare during the year? x Yes No

Comments on lighting

Installation of new west windows (non-glare) glass brick

General Comments

I will appreciate your cooperation if you fill out the above form and mail it in the enclosed return envelope. This form is part of research for an architectural thesis, A Civic Center for Harlem, Montana.

Thank you,

QUESTIONNAIRE

ARCHITECTURAL THESIS RESEARCH
A Civic Center for Harlem, Montana

To the Librarian of Harlem :

Activities--

What purpose does the library serve?

To further the continuing of educational and cultural pursuits for all the members of the community as well as provide recreational reading for all ages.

What are your duties and what other activities take place in the library?

To administer the library and carry out the policy of the library board. Book selection, readers advisor, reference, maintaining materials in good condition, anticipating needs and seeking to provide means of obtaining them.

Space and Function--

What is the approximate number of people in the library at one time? sometimes 25

Is the library space large enough? Yes ☒ No

If not, which areas might be enlarged?

Are there any areas which might be added to the library for ideal conditions?

☒ Yes No

If so, what are they?

A work room close to the desk, a sepearte childrens section, a room for periodicals and a study with easy chairs.

Is the shape of the library suited to its activities? Yes ☒ No

If not, why isn't it?

A wider building which could be supervised from a central location would be better, allowing for a work room near the circulation desk. It is not so bad now.

Room Finish Materials--

Are the room finish materials (walls, ceilings, floors) adequate for the library? Yes ☒ No

Do they collect dust? ☒ Yes No

Do they show dust or dirt? Yes ☒ No mostly not

Are they attractive? ☒ Yes No could be improved with modern easy care materials.

Comments on room finish materials

Tables could have tops that would not show scratches and dust. Chairs could be matching and quiet. Ceilings should be accoustical throughout. Shelves should be finished in a light natural wood finish.

QUESTIONNAIRE (continued)

Equipment--

What special equipment is needed in the library?

A charging desk of the proper height for patrons to sign cards. A book deposit bin at the desk. A larger deposit bin downstairs for return of books after hours. More filing cabinets. A new typewriter, and additional book truck. Deep cupboards for storage of large items such as posters and newspapers.

Heat Control--

Is the library too warm in the summer? ☒ Yes ☐ No

Is the library too cold in the winter? ☐ Yes ☒ No only when a strong west

Is it difficult to adjust the heat in the library? ☐ Yes ☒ No wind blows.

Comments on heat control

In summer months with the library windows on the west only and being upstairs, it is extremely warm in the afternoon necessitating morning hours only. Hot air with a separate thermostat is provided except in the reference room where steam heat is provided controlled downstairs by

Acoustics--

the city clerk.

Does sound from adjacent areas escape into the library? ☒ Yes ☐ No

If so is it annoying or bothersome? ☒ Yes ☐ No

Is it difficult to keep the library properly quiet? ☒ Yes ☐ No

Comments on sound control

The civic center is used for basketball practice and the noises carry into the library. Also noises originating within the library carry well too.

Illumination--

Is lighting bright enough for reading in the library? ☒ Yes ☐ No

Are lighting fixtures positioned for maximum efficiency? ☒ Yes ☐ No mostly

Is there ample daylight (window) lighting in the library? ☒ Yes ☐ No

Does the daylight lighting ever create glare during the year? ☒ Yes ☐ No
west windows

Comments on lighting

West windows allow sun to shine in but venetian blinds are on most windows. More light would be advisable.

General comments

We are grateful for the library at present but there is still much room for improvement providing the proper tax structure were set up to support it to the maximum provided by law. A federation of libraries with all doing their share would be ideal.

I will appreciate your cooperation if you will fill out the above form and mail it in the enclosed return envelope. This form is part of research for an architectural thesis, A Civic Center for Harlem, Montana.

Thank you,

QUESTIONNAIRE

ARCHITECTURAL THESIS RESEARCH
A Civic Center for Harlem, Montana

To Mr. Murray
Regarding the gymnasium

Activities--

What activities take place in the gymnasium in the civic center?

Basketball, P.E., Dancing, Seed Show

Space and Function--

What, approximately, is the seating capacity of the gymnasium? 674

What, approximately, would the capacity be to hold divisional tournament crowds? 2,500 to 3,000

What, approximately, is the average attendance per game? 425

In what ways, if any, could the gymnasium space be improved in the civic center? By taking out library, city office and jail

and remodeling

(the center should be replaced)

Room Finish Materials--

Are the room finish materials (walls, ceiling, floors) adequate for the gymnasium? no yes no
x Yes x No

Are they attractive? Yes x No

Comments on room finish materials

The walls are cheap and not durable.

The floor is becoming wavy.

Equipment-- Not adequate in any area

What special equipment is needed in the gymnasium?

The gym is not adequate in its construction to allow the installment of proper equipment to carry a successful program in athletics or P.E.

QUESTIONNAIRE (continued)

Heat Control--

Is the gymnasium warm enough during the winter months? Yes ☒ No
Is it difficult to adjust the heat in the gymnasium? ☒ Yes No

Comments on heat control

1/2 of heat is controlled from the city
clerk office. (The building will not hold heat properly)

Acoustics--

Does sound from adjacent areas escape into the gymnasium? ☒ Yes No
If so, is it annoying or disturbing? ☒ Yes No
Is it difficult to hear in the gymnasium? ☒ Yes No

Comments on sound control

There is no real sound control.

Illumination--

Is lighting bright enough in the gymnasium? ☒ Yes No
Are lighting fixtures positioned for maximum efficiency? ☒ Yes No
Is there ample daylight lighting (windows) in the gymnasium? Yes ☒ No
Does the daylight lighting ever create glare in the gymnasium? ☒ Yes No

Comments on lighting

Poor due to the construction of the building.

General Comments

From any standpoint of the school, the school
should have its own gym constructed for its needs.

I will appreciate your cooperation if you will fill out this questionnaire and mail it in the enclosed envelope. This questionnaire is partial fulfillment of an architectural thesis - A Civic Center for Harlem, Montana.

Thank you,

QUESTIONNAIRE

ARCHITECTURAL THESIS RESEARCH
A Civic Center for Harlem, Montana

To the Police Chief of Harlem :

Activities--

What purpose does your office serve?

For city and county to book all prisoners and keep files and records.

What are your duties and what other activities take place in your office?

I work 12 hrs. a day and the other policeman works 12 hrs.

Space and Function--

Is the office in which you work large enough? Yes ☒ No

Is it too large? Yes ☒ No

Are all hallways and entrances large enough? Yes ☒ No

Are any too small? ☒ Yes No

If so, which hallways or entrances are too small or too large?

The hall to the cells is too small.

What is the capacity of the male cellblock in your jail? five

What is the capacity of the female and juvenile cellblock? two

What is the maximum number of male prisoners in your jail at any one time?
18

What is the maximum number of female prisoners in your jail at any one time?
about 10

What is the maximum number of juvenile prisoners in your jail at any one time?
6 of them

Roughly, how many 30-day offenders do you have in your jail per month? 3

Roughly, how many 60-day offenders do you have in your jail per month? 2

Roughly, how many 90-day offenders are there per month? 1

Roughly, how many 10-day offenders are there per month? 10

What would you say, approximately, is the average length of term in your jail? 5 to 15 days

What is an average number of prisoners on weekends? 3 or 6

How many of these weekend prisoners are inebriates? $\frac{1}{2}$

Room Finish Materials-- Yes

Are the room finish materials (walls, ceilings, floors) adequate for your office? ☒ Yes No

Are they easily cleaned? ☒ Yes No

In the jail area, are they resistant to scuffing and punctures? ☒ Yes No

QUESTIONNAIRE (Continued)

In the jail area, are the rooms escape-proof? ☒ Yes ☐ No

Comments on room finish materials

All cement

Equipment--

What special equipment is needed in your office?

Adding machine, typewriter, camera, finger printing

Heat Control--

Are your office and jail cellblocks too warm in the summer? ☐ Yes ☒ No

Are your office and jail cellblocks too cold in the winter? ☒ Yes ☐ No

Is it difficult to adjust the heat in your office? ☒ Yes ☐ No

Comments on heat control

We don't control it from the office

Acoustics--

Does sound from adjacent areas escape into your office and cellblocks?

☒ Yes ☐ No

Does sound from within your jail and office escape from one portion to another? ☒ Yes ☐ No

Comments on sound control

They can hear the prisoners on the streets.

Illumination--

Is lighting bright enough for your book work in the office? ☐ Yes ☒ No

Is lighting bright enough to light the halls and jail areas? ☒ Yes ☐ No

Is there ample daylight lighting (windows) in your office? ☒ Yes ☐ No

Is there ample daylight lighting in the cellblocks? ☐ Yes ☒ No

Does the daylight lighting ever create glare in your office during the year? ☒ Yes ☐ No

Comments on lighting

I will appreciate your cooperation if you will fill out this questionnaire and mail it in the enclosed envelope. This questionnaire is partial fulfillment of an architectural thesis - A Civic Center for Harlem, Montana.

Tex D. Henderson, Chief of Police

Thank you,

A P P E N D I X "B"
C O R R E S P O N D E N C E

STANLEY THILL & ASSOCIATES, INC.

Consulting Engineers



February 19, 1964

PHONE 278-3542
P. O. BOX 1266

9 4TH AVE. S.W.
CONRAD, MONT.

Mr. Fred Dolven
921 S. 13th Avenue
Bozeman, Montana

Dear Mr. Dolven:

Reference is made to your letter dated February 15th in which you requested additional information as to Government Aids granted local cities in civic projects and also regarding test borings we have made in the Harlem area.

The only Government Grant Program that I am aware of is the aid on improvements of sanitary sewer and disposal systems. This grant is a 30% grant to the city on all outfall lines and disposal lines of the project. It does not include a grant of the land purchased for the site of the disposal unit or any of the collection system within the city limits.

However, in the case of a Civic Center for the City of Harlem, the city can apply for and obtain through the Housing and Home Finance Agency a loan for Advance Planning and after the project has been planned and bonds have been voted by the city, they may sell the bonds to the Housing and Home Finance Agency at a rate of between 3 5/8-4%. In some cases this rate is considerably lower than private financiers will bid for the bonds.

I am enclosing for your information a fact sheet and instruction sheet on the Advance Planning Program that they provide, and also a fact sheet and an instruction sheet on the Public Facility Loan. Please remember that under these two programs the city must repay the money in the same manner as they would a private financier.

Fred Dolven

-2-

February 19, 1964

In regard to the question about test borings to a depth of twenty feet, for any of our work in the City of Harlem it was not necessary to make tests of that depth; therefore, I am not able to give you any factual information. However, in viewing the country around the City of Harlem, I am quite sure that you would find a clay soil and also that you would encounter water long before you reached the footage mentioned above.

I hope that the information given and the enclosures are of some value to you. If I can assist you in any other manner, please feel free to write.

Sincerely yours,

STANLEY J THILL & ASSOCIATES, INC.

By: _____
Stanley J Thill, President

SJT:as

Enclosures:

As stated above

R E F E R E N C E S

1. Brower, Dorothy. A History of Harlem. Harlem, Montana, 1952
2. U.S. Weather Bureau. Climates of the States, #29. Washington, 1962
3. U.S. Weather Bureau. Annual Summary, 1962 - Climatological Data. Washington, 1963
4. Thill, Stanley J. Preliminary Engineer's Report - Street Improvement Project, Harlem, Blaine County, Montana. Conrad, Montana, 1962
5. City of Harlem. Ordinance No. 121 - Street Zoning Regulations. Harlem, Montana, 1944
6. Ramsey & Sleeper. Architectural Graphic Standards. New York, 1956
7. Newton, Norman T. An Approach to Design. Cambridge, 1951
8. Government Center Commission. Boston City Hall Competition. Boston, 1958
9. Marshall & Stevens. Marshall Valuation Service. Los Angeles, 1962
10. Montana Legislature. Revised Codes of Montana - 1947. Helena, 1947

MONTANA STATE UNIVERSITY LIBRARIES



3 1762 10034168 2



