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PRELIMINARY RESEARCH FOR AN ART AND ARCHITECTURE
BUILDING FOR MONTANA STATE COLLEGE-BOZEMAN, MONT.

PART 1 OF AN UNDERGRADUATE DESIGN THESIS

SUBMITTED TO THE SCHOOL OF ARCHITECTURE AT MONTANA
STATE COLLEGE FOR PARTIAL REQUIREMENTS TOWARD A
DEGREE OF BACHELOR OF ARCHITECTURE

BY: PRESTON JACK BOLINGER

DECEMBER 12, 1964

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ACKNOWLEDGMENT

I would like to express my thanks to professor H. C. Rose', Mr. Stevens and those who gave of their time to provide suggestions and guidance throughout the preparation of this paper.

I would also like to thank my wife, Bonny for her patience and valuable assistance in the completion of this document.

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a p r o p o s a l

The present facilities of the art and architecture schools are rapidly reaching the end of their usefulness to the schools. This is due to their greatly expanding programs. Conditions at the art school are especially poor because of severe lack of laboratory and classroom space. The aesthetical and environmental conditions of the art labs in the basement of Herrick Hall leave something to be desired. They are poorly lighted and ventilated. Painting studios in the remodeled attic of Herrick Hall are very over-crowded and cluttered.

Conditions at the school of architecture are much better than those at the art school. Floor space in drafting rooms is adequate at present, but will decrease as the department expands its program.

Because there is an urgent need for a new building that will bring these two related schools closer together, I have chosen to do as an architectural thesis, a new Art and Architecture Building for Montana State College. In order to make my research as valid as possible, I have made use of factual information from a variety of sources as well as from interviews with individuals and experts connected with the Art and Architecture departments.

I propose to present the research part of my thesis in the following manner:

First Quarter (Autumn Quarter, 1964)

- (1) Gather information concerning the general conditions that make a new Art and Architecture Building necessary.
- (2) Propose and describe a possible site suitable for the new structure.
- (3) Analyze the aesthetic and economic conditions under which the building is to be built.
- (4) Investigate and analyze the necessary function of the facility.
- (5) Present a building program on which the design of a new Art and Architecture Building can be based.

Second Quarter (Winter Quarter, 1965)

- (6) Present a design solution for a new Art and Architecture Building using all of the gathered research material.

h i s t o r y

HISTORY OF MONTANA STATE COLLEGE

In 1862 the Congress of the United States passed the first Morrill Act which provided funds to be used to support at least one college per state. Because Montana was still a Territory at this time, it was not until the second Morrill Act of August 30, 1890 that Montana was eligible to receive any appropriated funds. The second Morrill Act provided an annual grant of \$15,000.00 for each state college of agriculture and mechanical arts. On February 16, 1893, Montana was named the Montana College of Agricultural and Mechanic Arts by Legislative action.¹

The Agricultural College of Montana's first term of instruction began on April 17, 1893 with an enrollment of 8 students on a proposed budget of \$48,940.00. Classes were held in an abandoned skating rink building located at the corner of West Main Street and Third Avenue. Courses offered were Agriculture, Domestic Economy, and Applied Science.²

The first President of the college was A.M.Ryon in 1893. His term of office lasted but one year. He was replaced by Reverend James Reid in 1894.

¹ Merril C. Burlingame, Montana State College-A Preliminary Sketch (Montana State College, 1943), p. 17.

² Joseph Scalabrin, Preliminary Research for an Arts Architecture Building (Montana State College, 1962), p. 23.

Today, the enrollment at M.S.C. is nearly 5200.
The campus consists of 32 main campus buildings.
The main fields of activity at Montana State College include:

1. Resident Instruction.
2. Continuing Education.
3. Agricultural Experiment Station.
4. Engineering Experiment Station.
5. Cooperative Extension.

It is financed from biennial state legislative appropriations; student fees: federal and land-grant income; special congressional enactments: trust funds derived from various sources such as the sale of surplus agricultural products, from special services, gifts, etc., private and other grants. Funds from many of these latter sources are now handled through the Endowment and Research Foundation at M.S.C. which was incorporated January 14, 1946.³

History of School of Art

The school of art at M.S.C. was started in 1893 in a small studio located in Montana Hall. It is now located in Herrick Hall. The attic of this building was remodeled in 1952 to accommodate the school's growth.

³ Montana State College Bulletin, Montana State College, 1964-1966, p.36.

The school occupies most of three floors in Herrick Hall. The basement is devoted to the lithograph and etching, jewel, sculpture, weaving, and ceramics studios. The third floor is devoted to lecture rooms, drawing labs, library, gallery, and faculty offices. The fourth floor is devoted to oil, watercolor, and drawing studios. The men's lounge, faculty offices, and very limited exhibition space.

The School of Art has two main objectives. The first is to train students for a profession in the field of Applied Art, Art Education, Commercial Art, Costume Design, and Interior and Industrial Design.

The second objective is to provide a balanced program of general education to produce well balanced citizens so that they may live a full and more meaningful life.

The creative approach to design and its relationship to society is the desired result in the different aforementioned fields.⁴

History of the School of Architecture

The School of Architecture at M.S.C. was initiated in 1916. It was part of the civil engineering department and was named the Department of Architect-

⁴ Ibid, page 184.

tural Engineering. The head of the department was W. R. Flew, a civil engineer. It was housed in two rooms on the second floor of the old engineering shop building which occupied the site of the present library building.

In the spring of 1920, there were two graduates. The following year Mr. Flew was assisted by H. C. Cheever. The enrollment of the school had grown by this time to 6 students.

The Architectural Engineering Department was changed to the School of Architecture and moved to the top floor of Roberts Hall in 1922. There was but one graduate in the spring of that year.

After World War II in 1946, W. R. Flew died and H. C. Cheever was put in charge of the Architectural Department. He was assisted by Hugo Eck and David Wessel. The department grew and expanded and in 1958 moved into the fourth floor of Reid Hall. The School of Architecture became fully accredited in 1960. Today the school has an enrollment of approximately 200 students, graduating about 12-15 students every year.

**conditions creating
a need**

ARCHITECTURE

The school of architecture is located on the fourth floor of Reid Hall. Floor space is sufficient to handle the present program. The school consists mainly of two large drafting areas separated by a core of classrooms, mechanical spaces. One drafting area is used by the freshmen and junior students and the other is divided proportionately between the sophomore, fourth year senior and fifth year senior classes. The drafting areas are adequate as far as drafting, but become somewhat cramped for throw space - extra work area. There is little physical separation and no acoustical separation between different classes. It is very difficult at times to concentrate on a design problem because of the noise created by conversation of students and instructors and movement of equipment.

At present there are but two lecture rooms in the entire department. One of these is a small seminar room and is inadequate. The jury room where the architectural problems are judged and graded, will not handle the bulk of problems that the classes turn out. As a result, there are conflicts in jurying and space has to be borrowed from the adjacent classroom. The existing facilities for drawing and model storage is inadequate because

there is limited space for storage of models and drawings of projects done over the past five years.

There is a need for spaces for special instruction in the practical application of knowledge in construction and related fields. There is also a definite need for more classrooms and seminar rooms as well as office space for future increase in staff members.

ART

Objectives

1. To train students professionally in their chosen area of specialization while providing a broad general background which will enable them to live more effectively in, and contribute creatively to society.
2. To provide opportunities to experiment with visual skills and ideas and to think independently and develop their intellect according to the nature of their capacities and interests.
3. To broaden the student's understanding of the cultural achievements of our time and the fundamental part that the visual arts play in our lives.¹

A full realization of the above objectives is now somewhat limited by a shortage of staff members

¹ Montana State College-Self Evaluation Reports I, II, III, Montana State College, February, 1960, pp. 166-174.

and a shortage of laboratory space and equipment. Staff members must handle too many different courses to be able to give their full attention to the development of any one course. This is especially true on the junior and senior level, when the choice of course option has been made by the student, thus creating over crowded classrooms.

At present the art school has on hand many fine art objects suitable for a small museum or some facilities in which to show them. Consequently, a large portion of the fine collection remains stored in boxes most of the time. At appropriate times, a few of these artifacts are removed from their boxes and displayed for use in connection with some of the different classes.

The greatest need for additional and improved facilities lies in the fields of industrial design and commercial art. The industrial design classes need additional facilities for drafting, model making, and rendering. Conditions that approximate those found in industry would be the most desirable. This is also true of the facilities available for training commercial artists. Additional airbrush and printing equipment, classrooms, seminar rooms, and staff offices are also badly needed. More space having excellent lighting and ventilation is needed for painting studios.

SCHOOL OF ARCHITECTURE
MONTANA STATE COLLEGE
4th FLOOR, REID HALL

SCALE: 1' = 40' 0"

DRAFTING AREA

STOR 404

STOR 405

STOR 406

SEM. 407

413

CLASSROOM 402

JURY & EXHIBITION 401

LOBBY

408 409 410 411 412

415 416 417

DRAFTING AREA 414

LIBRARY 420

SHOP

421 422 423 424

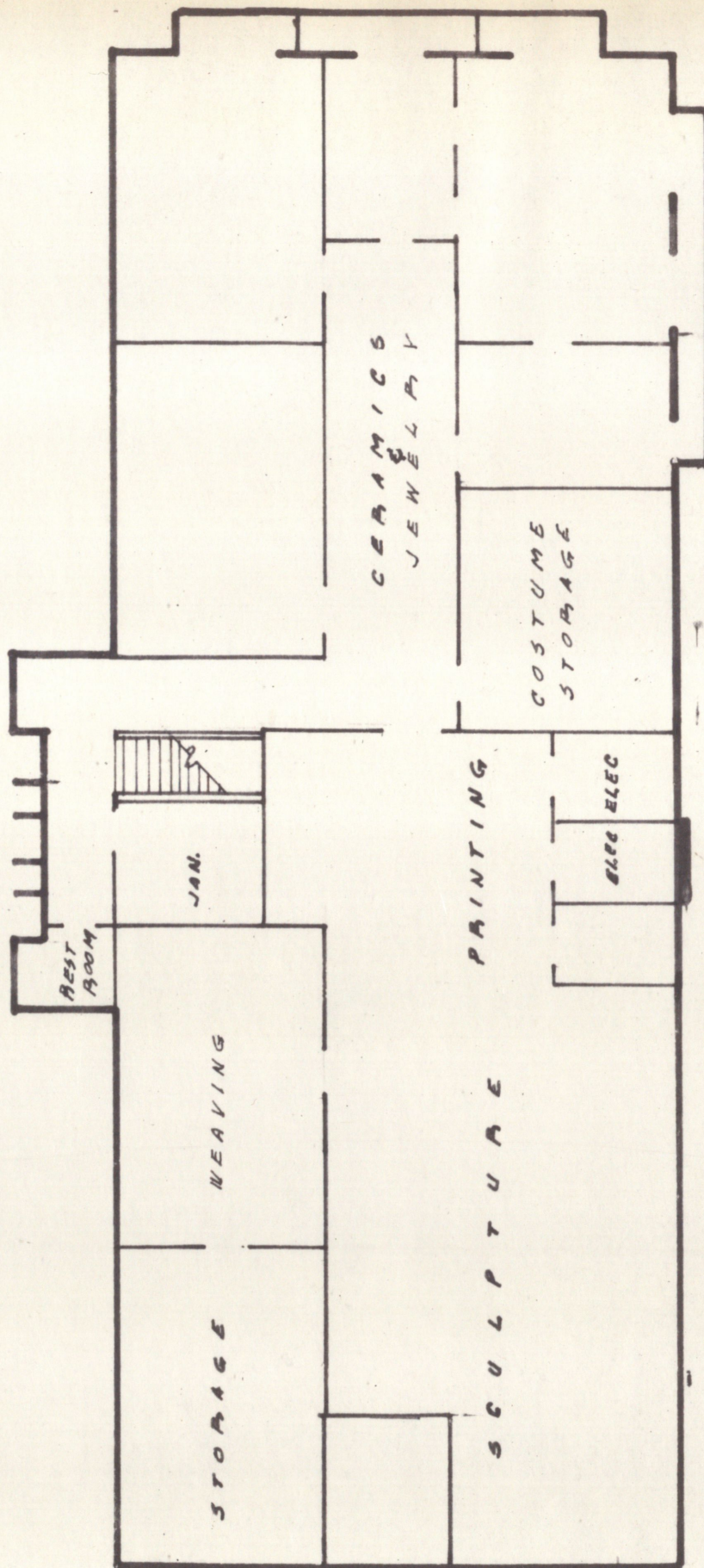
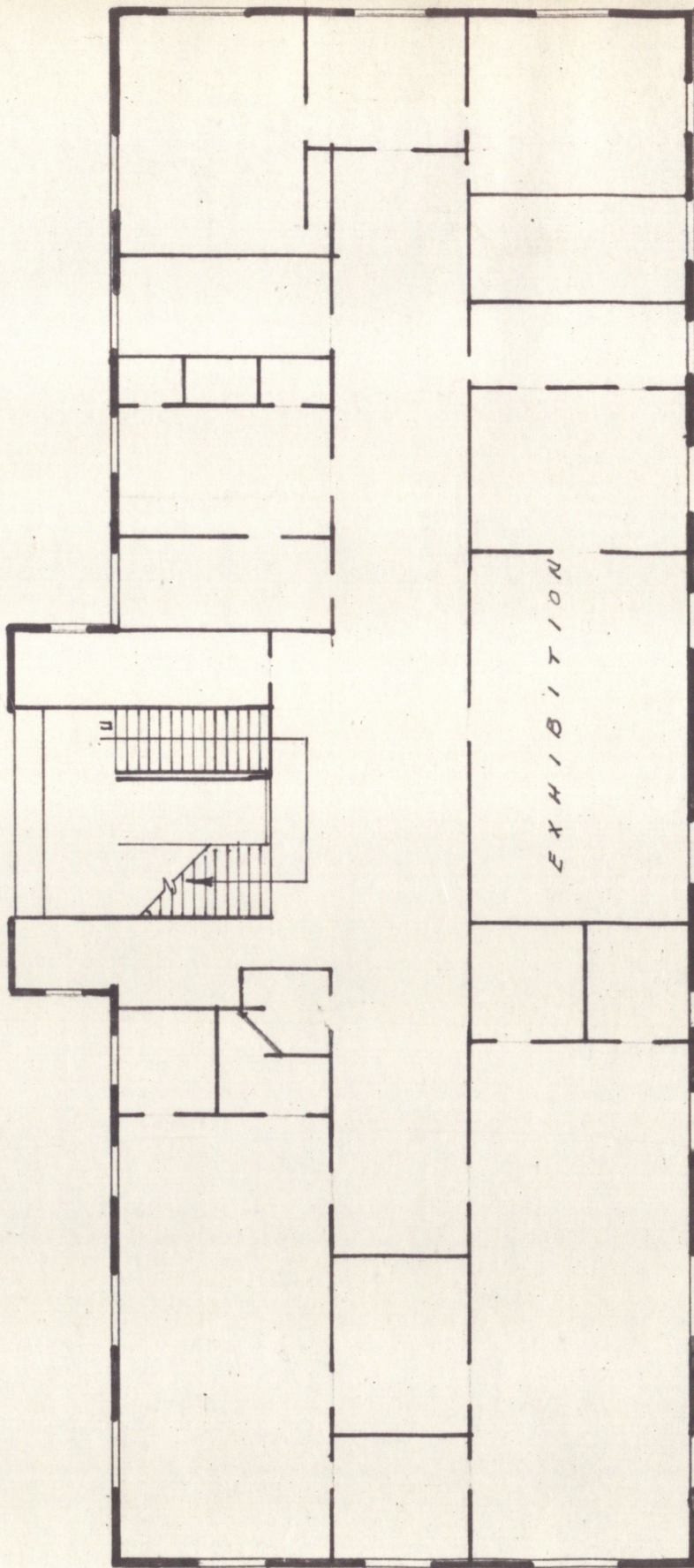
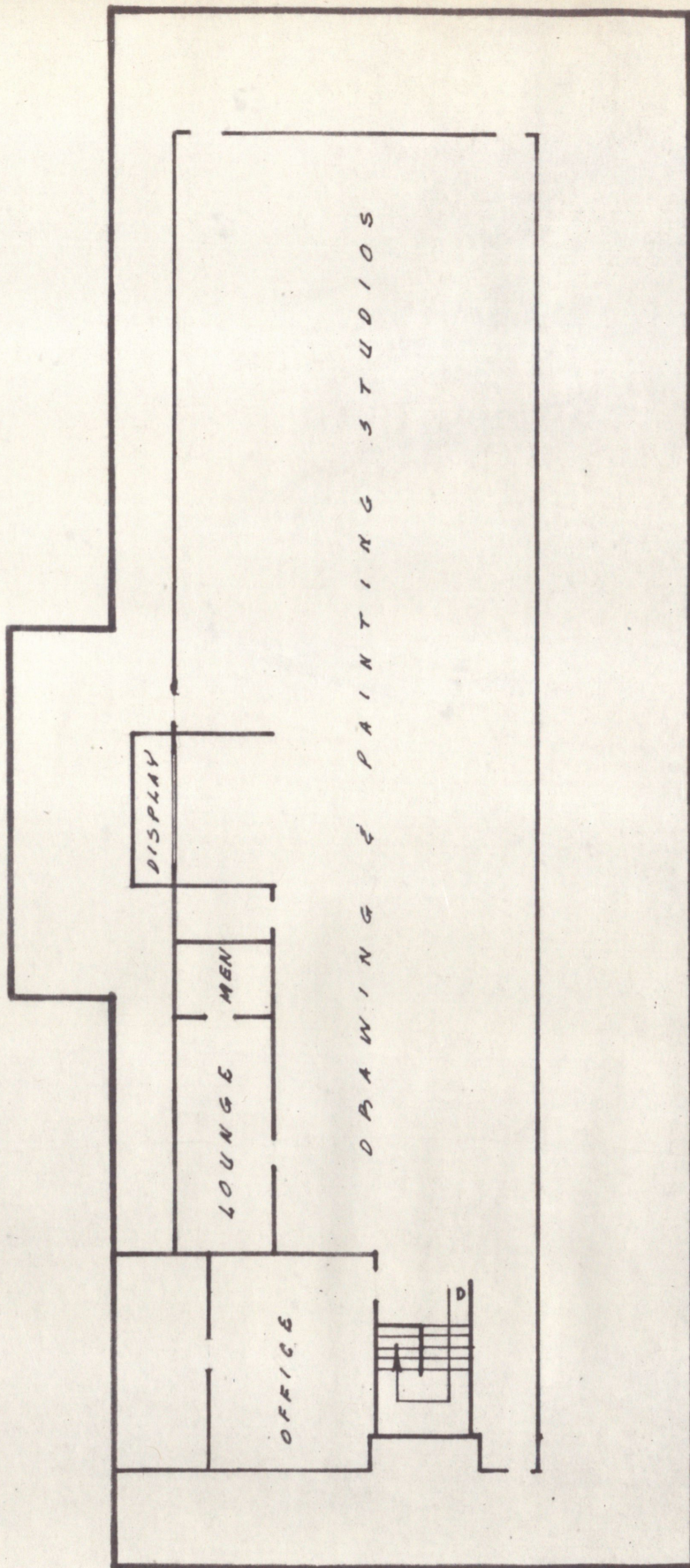


FIGURE #2
SCHOOL OF ART
M. S. C.
HERRICK HALL

B A S E M E N T P L A N
 $\frac{1}{16}" = 1'-0"$



SECOND FLOOR
1/16" = 1'-0"



FOURTH FLOOR PLAN

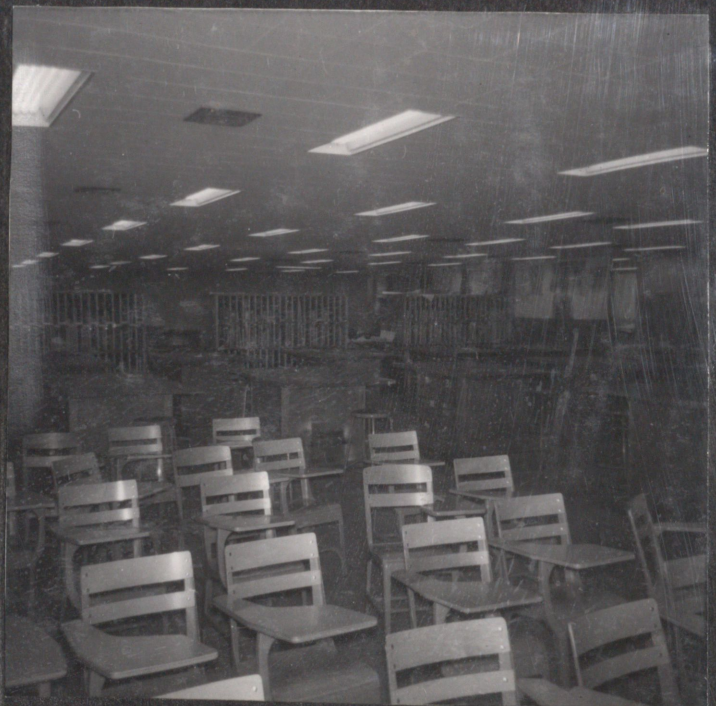
$\frac{1}{16}'' = 1'-0''$

ARCHITECTURE



INADEQUATE WORK
SPACE.....

ARCHITECTURE



NOT ENOUGH CLASS-
ROOMS.....

A R T



INADEQUATE LIGHT-
ING, VENTILATION &
...AESTHETICS...

A R T



INADEQUATE DISPLAY
& WORK AREA.....

A.P.T



INADEQUATE STORAGE SPACE.....

A.P.T



INADEQUATE LIGHTING & INSUFFICIENT WORK SPACE.....

THE CAMPUS EVALUATION

On May 18, 1964, a detailed report of a study of current use and utilization of all campus facilities was submitted to the Board of Regents at Helena Montana by Mr. William Johnstone, head of the Educational Research and Services Program at M. S. C. Also presented with this report was his group's recommendations for the priority of construction of future facilities. Similar reports from the five other units of the University system were also presented and all reports are now being reviewed and evaluated. By comparing current and projected space-per-student figures of each facility on each campus, the Board of Regents will then be able to recommend that certain facilities throughout the state be built.

The Board's recommendations are subject to the approval of the State Controller and are sent to the Governor who in turn makes the formal request for appropriation of necessary funds to the State Legislature. This procedure will be followed every two years as a part of the ten year building program, which is a projected look at the physical needs of each unit ten years hence.

Enrollment projections

The basis for the campus building study is arrived at by the projections of Full-Time (FTE) Students by level and by department. An FTE unit is obtained by dividing "Student Credit Hours Registered For" by 15 (average credit load for undergraduate students) at the undergraduate level and by 12 (average credit load at the graduate level) at the graduate level. The number of instructional staff members is also based on these; classroom and teaching labs needed are therefore developed from these projections.

The FULL TIME EQUIVALENT STUDENT LOAD at autumn quarter, 1963 was as follows:¹

Arts	Lower Div.	Upper Div.	Grad.
	163	88	3

The different departments were also given a ten year record of enrollment from which were projected enrollments for 1965, 1970 and 1975. These figures were reviewed by a special faculty committee and were adjusted until they met a medium suitable to the several departments.

1. MONTANA STATE COLLEGE BUILDING REPORT,
May 18, 1964, Montana State College.

These figures were further adjusted to the total estimates supplied by the Executive Secretary of the University System and interpolated for the following years.²

REVISED DEPARTMENTAL FTE STUDENT LOAD ESTIMATES
ADJUSTED TO EXECUTIVE SECRETARY'S TOTALS (4/28/64)

		1965	1967	1969	1971	1973	1975
Arts	L Div.	201	236	256	277	304	341
	U Div.	110	131	142	154	169	190
	Grad.	6	9	11	14	16	20

At present, there is no graduate program in the school of architecture and a limited graduate program in the art school. The following table clearly indicates that there will be a need for added facilities for these programs if they are to expand enough to meet growing demands.

PROJECTION OF GRAD. DEGREE STUDENTS AT M. S. C.³

		1965	1967	1969	1971	1973	1975
Arts	Grad.	11	16	20	27	30	37

Planning standards at M. S. C.

Three criteria are considered when planning

2. Ibid, p. 3, 4.

3. Ibid, p. 5.

needed classroom and lab space. They are as follows:

- (1) Classroom utilization is expected to be at 30 hours scheduled use weekly, with an average station utilization of 60%.
- (2) Lower division lab (LD) utilization is expected to be at 20 hours scheduled used weekly, with an average station utilization of 80%.
- (3) Upper division lab (UD) - 10 hours at 80%.

The following table indicates the average area per FULL TIME EQUIVALENT STUDENT needed.⁴

ASSIGNABLE SQUARE FEET

	Classroom Station	L.D. Lab* Station	U.D. Lab* Station	Acad** Off.	Grad Stu Off	Percent*** for misc.
Arts	15	40	60	140-220	115	15%

*includes normal lab service area.

**The lower figure is used when no graduate or research program is assigned to the department; the larger figure includes an allowance for research space except for special situations requiring large allotments.

***Miscellaneous, including noninstructional shops and storage is based on a percentage of the total standard academic staff, graduate students, and classroom-lab allowances. (exclusive of classroom)

4. Ibid, p. 6.

Planning for Instructional Staff

In projecting instructional staff, it was assumed that the student-faculty ratio would approximate the 15.5 to 1 ratio which was the standard set in 1961 by the Board of Regents. This standard was then modified to meet the needs of the different departments to the ratios of 20 to 1, 10 to 1, and 5 to 1. These ratios were to provide a basis for the instructional staff to 1975. Due to existing differences the above figures must be adjusted even further during the period of 1965 - 1975.⁵

Student Faculty Ratios

Dep.	FTE Staff 1963-64 Budget	Recommended FTE Student/Staff members, 1975.		
		Lower Div.	Upper Div.	Grad.
Arch.	9.86	20	10	5
Art	8.33	25	10	5

Instructional Staff Projections

In projecting the number of staff members required, it was assumed that the overall faculty - student ratio would be within the 15 - 1 to 16 - 1 range with a slight decrease. These ratios were used for the year 1975 with the figures for intervening years representing the present conditions to the proposed figures of that year.

⁵Ibid, page 9.

FTE INSTRUCTIONAL STAFF-PROJECTIONS--ON CAMPUS⁶

Arts	1965	1967	1969	1971	1973	1975
Regular	20.5	23.7	26.6	29.5	32.4	36.1
Grad. Asst.	.7	.8	1.0	1.3	1.6	1.9

The following tables will act as a summary of the foregoing information.

ACADEMIC OFFICE-RESEARCH-CONFERENCE ROOM-OTHER OFFICE SPACE.

Arts	1963	1965	1967	1969	1971	1973	1975
FTE Faculty (Inst. and Res.)	18.0	21.2	24.5	27.6	30.8	34.0	38.0
Grad. Deg. (FTE grad. Assis.)	2.7	10.3	15.2	19.0	25.7	28.4	35.1
ASF Needed	3,495	5,057	6,266	7,329	8,694	9,642	11,165
ASF Avail.	2,849	2,849	2,849	2,849	2,849	2,849	2,849

TEACHING LABS-LD

Arts	1963	1965	1967	1969	1971	1973	1975
Station Needs	212	262	307	334	360	396	444
Actual Station Avail.	219	219	219	219	219	219	219

TEACHING LABS-UD

Arts	1963	1965	1967	1969	1971	1973	1975
Station Needs	114	146	176	192	212	234	263
Actual Station Avail.	174	174	174	174	174	174	174

6. Ibid, page 10.

Local conditions

CITY OF BOZEMAN

M O N T A N A

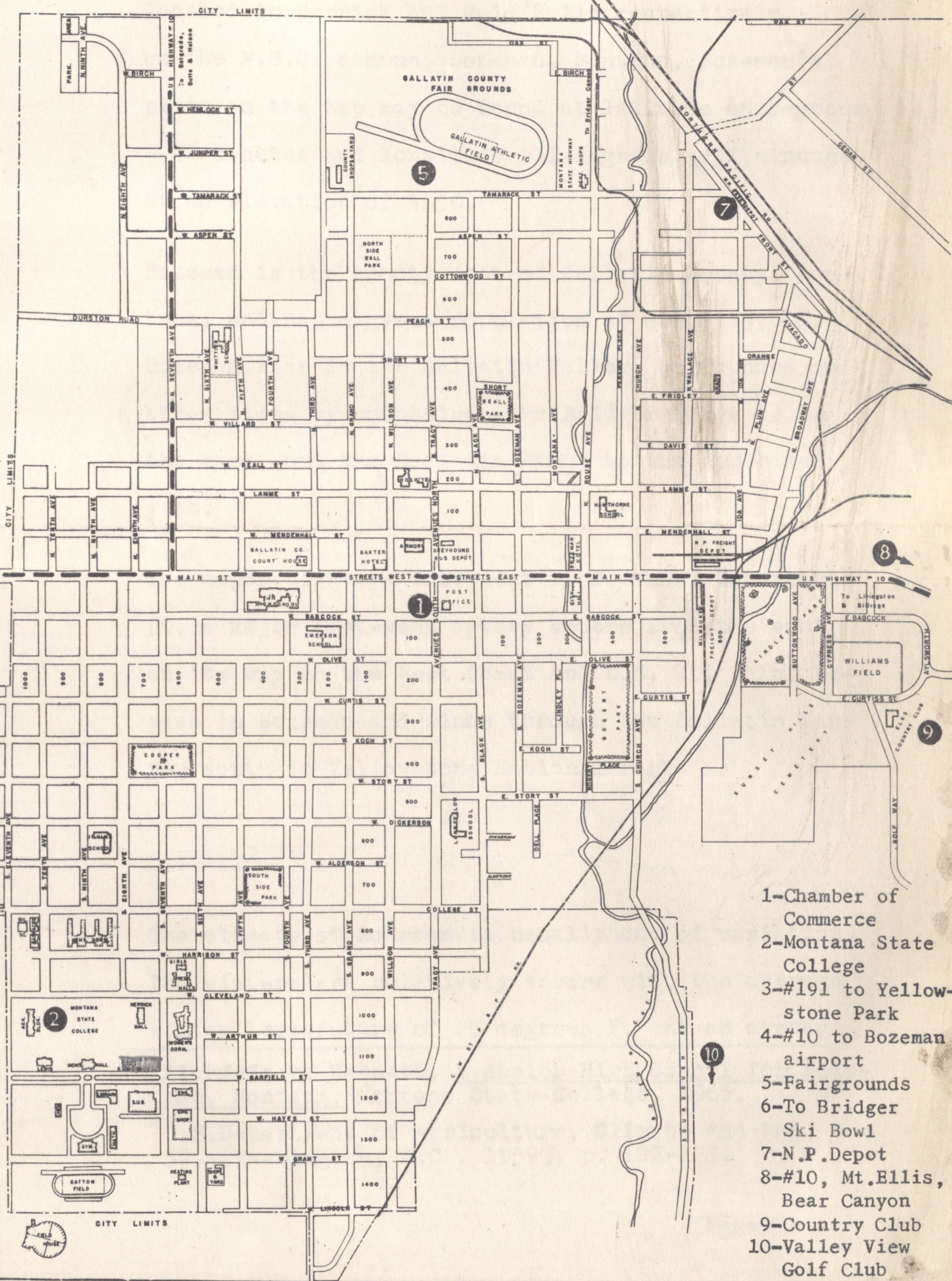


4

SCALE 0 500' 1000' 1500' 6

ELEVATION 4800 FT

POPULATION OVER 11,000



- 1-Chamber of Commerce
- 2-Montana State College
- 3-#191 to Yellowstone Park
- 4-#10 to Bozeman airport
- 5-Fairgrounds
- 6-To Bridger Ski Bowl
- 7-N.P. Depot
- 8-#10, Mt. Ellis, Bear Canyon
- 9-Country Club
- 10-Valley View Golf Club

low of -20 degrees. Temperatures as high as 40 degrees and as low as -40 degrees have been recorded in the coldest months of January and February. The average snowfall in Bozeman ranges from 30-50 inches, most of which falls between November and March.

Bozeman's summer days are usually warm and pleasant with the evenings being relatively cool. Extreme temperatures during summer months may occur bringing temperatures of 90 - 100 degrees. These are relatively short periods lasting only about 5-10 days in length.

Precipitation during the warm months falls mostly in the form of rain, most of which comes in May. Hail occasionally falls in July and August but severe hail storms are rare.

Prevailing winds are from the northwest while the storm winds blow from the southeast.

BOZEMAN'S MONTHLY CLIMATIC DATA³

<u>Month</u>	<u>Mean Temperature</u>	<u>Precipitation</u>
Jan.	20.2	0.92 in.
Feb.	25.2	0.76 in.
March	27.8	1.55 in.
April	42.5	2.34 in.
May	51.1	3.06 in.
June	57.3	1.08 in.
July	66.4	1.12 in.
Aug.	64.9	1.65 in.
Sept.	55.8	1.45 in.
Oct.	46.0	1.07 in.
Nov.	32.1	1.30 in.
Dec.	24.8	0.91 in.

Annual temperature - 42.9 F.

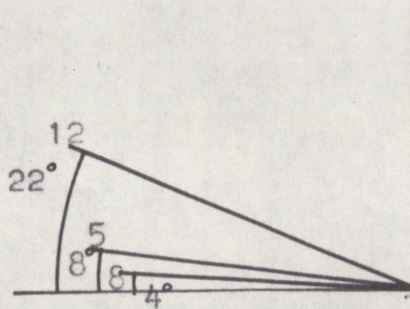
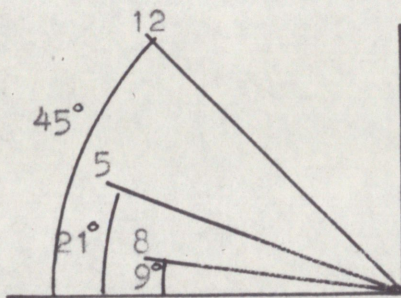
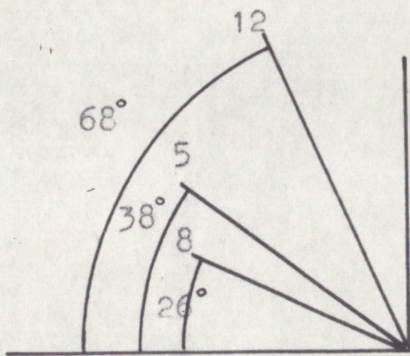
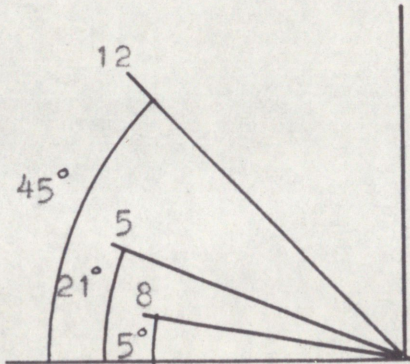
Annual precipitation - 17.62 in.

³U.S. Weather Bureau, Climates of the States, Year-book, (1941), p. 217.

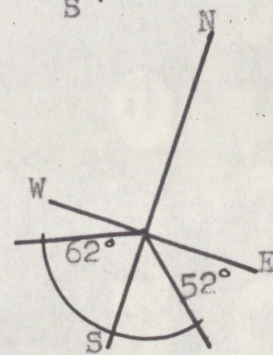
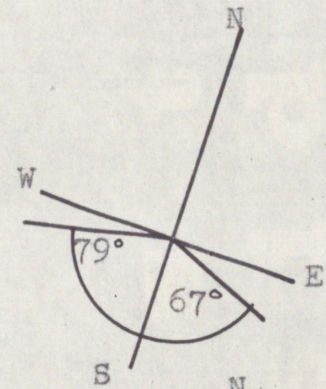
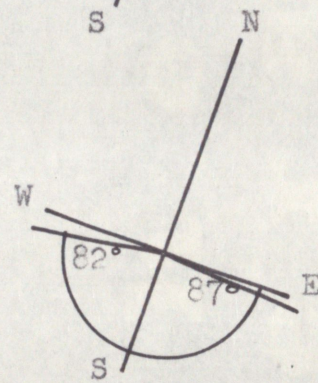
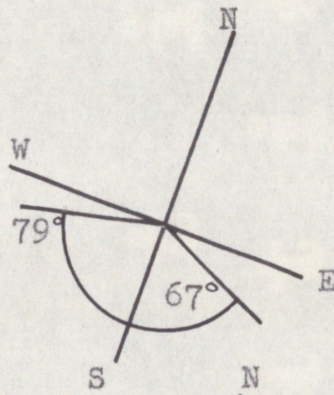
FIGURE #3

SUN ANGLES

Vertical



Horizontal



the considerations

UNITY

One of the most important prerequisites of good architecture is the unity among buildings that are common to a certain area.

"A building stands or falls, even as a pure work of art, by its just relation to the city around it."¹

Seldom is the case where an entire campus complex possesses a unity among the buildings that exist there. The conglomeration we find at Montana State College is a direct example that is typical of nearly all of the campuses throughout the United States. This chaos can be contributed to the changing eras of building and design, but most of all, the lack of a strong master plan for their developments. Montana State College's physical plant was set in 1896 with the building of Montana Hall, and was closely followed by Herrick Hall, Roberts Hall, Lewis Hall, as well as the Old Gym and Hamilton Hall. Since that time a steady deterioration has been working its way into the campus with each new structure that is built. About the only unity existing among them is that they are covered with brick.

When a new Art and Architecture building is planned for M.S.C., what character or style should the build-

¹ Lewis Mumford, Sticks and Stones - A Study of American Architecture and Civilization (New York, 1924) p. 177.

ing have? Should it go back to "Montana Hall" style, or the style possessed by some of the newer buildings such as Reid Hall, the new Chemistry building, the High Rise Dormitory, or should it be a completely new style thus adding to the chaos? I feel that perhaps it should recapture some of the feeling and style of the older buildings and combine them with some of the precedents of the newer styles.

REGIONALITY

We people of Montana are among the privileged few who have a site and setting that is characterized by rugged mountains, heavy snows, clear blue skies, and crisp mountain climate. These are criteria which provide the designer with the possibility of creating a distinct regional design.

"This ignorance of regional resources is not incompatible with grand effects, or even on occasion with decently good architecture. But it does not profit by that firm adaptation to site, that justness of proportion in the size of window and slope of roof, which is earnest to the architect's mastery of the local situation."²

It has been suggested that certain campus buildings such as the Library and Lewis and Clark Halls, are aesthetic failures from the standpoint of regionality. They are failures because they lack the indigenous character of this mountainous region.

On the other hand, it is felt that Montana Hall is a successful building, in that its sloping roof reflects the character of the mountains and its massive walls give a sense of security and shelter from the cold Montana winters.

These are the criteria that should be present in all new campus buildings and should set a goal for the architects who design them.

²Mumford, Sticks and Stones, pp. 137-138.

MATERIALS

The materials used in a building cannot establish Unity or Regionality but do contribute a great deal to help these characteristics materialize. In the design of a new Arts and Architecture building for M.S.C., the selection of materials should be carefully selected, preferably indigenous materials.

As mentioned previously, the exterior material for most of the campus buildings is brick, but a closer inspection shows the brick to be used in various color, texture and bond.

Such materials as wood and stone should be used whenever possible. Danforth Chapel is a good example of the use of these materials. Wood has been used to a great extent on the new Student Union addition.

Interior materials should be selected for their keeping with the character of the exterior portion of the building as well as their durability, easy maintenance, and cost. These materials should be used throughout the building in such a manner as to provide a relationship between the different spaces as well as to emphasize certain focal points.

CONCLUSION

Future buildings on campus should reflect a combination of unity, regionality, and good material selection. I think these criteria must be strongly considered in the design of a new Arts and Architecture building.

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

ECONOMIC FUNDAMENTALS

"One of the most difficult problems with architects is failure to accept the responsibility of designing the building within the funds which are initially made available for the structure." (anonymous)

"Requested appropriations are always reduced by the state legislature, so economy becomes the most important factor ----." (Tom Jenkins, President, State Teachers College, Mayville, North Dakota)

There are three very important economic considerations of a building, namely the cost, size, and quality. If the area of a desired structure is known, the total cost will depend mostly upon the quality of construction. On the other hand, if the sum of money available is known, the size of structure is greatly dependent upon the quality of construction.

Because of the nature of the Montana University System, facilities for a specific academic area, such as Science, Education, or Architecture are usually determined by the number of students who will use these facilities. Consequently, funds are appropriated according to student usage and the size and quality of the structure are determined by student enrollment. The practice of appropriating funds before the quality of construction has been agreed upon can be quite hazardous. This is because the client wants the absolute maximum amount of floor area for his money. As a result, the architect finds himself in an almost impossible sit-

uation and may be forced to attempt an inferior quality of construction in order to meet the designated spatial requirements within the appropriated funds.

The most logical solution to the above problem would be to agree upon the overall function and purpose of the building in question. That is, determine its spatial requirements and its quality of construction to be used, and then come to some decision as to the funds needed to accomplish the desired quality.

MEANS OF ACHIEVING INITIAL ECONOMY

The most significant means of achieving initial economy is to provide for functional flexibility of space.¹ Flexibility, the ability of a space to be easily altered to meet changing demands, in building may be accomplished through expansibility, convertibility, and versatility.

Expansibility is the capacity of a building to accommodate additions to the original structure without added expense. This can be accomplished through the use of a modular structural system (unit of floor area) that lends itself to expansion.

Convertibility is the measure of the ease with which

¹ Overturf, Thomas A., A Military Science Building for M.S.C., Montana State College, 1964.

a building may undergo interior changes suitable to the changing needs of students, instructors, as well as administration.

Versatility is the measure of ease with which specific spaces, areas of spaces within a building can accommodate different functions. For instance, lecture rooms could perform as exhibition rooms by providing facilities for displaying problems. Also two lecture rooms could be changed into one large area for special programs in which very large numbers of students may participate.

COST COMPARISONS

The Marshall Valuation System has been used extensively in determining preliminary costs. It is considered to be one of the most accurate methods because of the thoroughness in standardization of evaluation methods and regional factors. It also is brought up to date each month and is adjusted for regional and economic conditions. Many of the variables normally found in cost-per-square foot or cost-per-cubic foot methods have been eliminated.

The costs indicated in the following table from the Marshall Valuation System, are the averages of

of final costs which include built-in equipment and furnishings of an average classroom building.²

ESTIMATION OF COST

Type	Description	Cost Range	Average Cost
<u>Science</u>	Buildings with large amount of lab space.	\$17.00-25.00	\$21.55
	Good quality construction	\$ 1.75- 2.50	\$ 2.16
<u>Class-room</u>	Buildings divided into classrooms and offices.	\$17.00-25.00	\$21.45
	Good quality construction	\$ 1.65- 2.45	\$ 2.15

ESTIMATED AVERAGE COST PER SQUARE FOOT	<u>\$21.50</u>
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TOTAL ESTIMATED COST OF PROPOSED NEW
ART AND ARCHITECTURE BUILDING
CONTAINING APPROXIMATELY 55,000 sq. ft.

\$1,182,500.00

² Marshall-Stevens Co., Marshall Valuation Service,
Cleveland, p. 15.

LOCAL ECONOMIC CONDITIONS

Montana State College, along with the remaining five units of the University System, is financed and controlled through the State of Montana. All school building projects are therefore subject to approval by the State. Where State funds for a new function, such as a School of Medicine, are involved, the State Legislature must approve the project. However, if other funds are involved, the Board of Regents is authorized to approve the construction.

In past years, new classroom buildings such as Reid Hall and the New Chemistry Building were financed by "building fees" paid by students each quarter. In 1961 the Montana State Legislature passed an act which killed this type of fund raising program. At present then, there is no specific way or means of financing a new building except by one of the following means:

Appropriation

The State Legislature can approve the appropriation of tax money for the new classroom building. It has been suggested that this tax money come from a two or three cent state cigarette tax which currently produces a revenue of $2\frac{1}{4}$

million annually and is presently used to pay off Korean Veteran Bonuses which will be paid off by the end of 1965. This money can also be directly appropriated by the State Legislature. An appropriation of this type was used in 1962 for the completion of the commerce department located on the third floor of Reid Hall.

Bonds

M. S. C. can be bonded through the State of Montana similar to the municipal school district bond issues levied by cities and counties throughout Montana. The state bonds could be paid off through property taxes and cigarette taxes.

Grants or donations

Grants and donations have been directed toward building funds. The donations are limited and would require a tremendous amount for a building that would house the schools of art and architecture.³

Although the financing of a new Art and Architecture Building might seem to be a difficult problem, it is not impossible. The need for

³ Overturf, Thomas A., A Military Science Building for M.S.C., Montana State College, 1964.

a new facility must be proven to the administration of M. S. C. and to the Board of Regents.

Procedure for receiving funds

The procedure for receiving appropriated funds begins with the submission of an evaluation rating of existing facilities of all divisions of education at M. S. C. to the Board of Regents of Montana in Helena. After careful examination of the reports the board then arranges a priority list of all construction within the System and recommends to the legislature that funds be appropriated for facilities needed within the next two-year period. The State Controller as well as the Governor must also approve the request for appropriation.

Once the funds have been appropriated for a particular unit an architect is selected and approved by the Board of Regents. The architect will then complete the necessary plans and specifications. After the board's official approval of the plans and specifications a public bid letting is advertised and held in Helena. The contract is then awarded to the low bidder.⁴

⁴ Ibid.

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

LOCATION

The site that I have selected is, at present, the location of old Hamilton Hall and faculty parking lot. It is bounded on the south by Garfield Street, on the east by 7th Avenue South, on the north by Danforth Chapel, trees and open lawn areas, and on the west by Montana Hall.

SOIL CONDITIONS

The soil is composed of 12-16 feet of clay deposited upon a deep layer of gravel. The water table is located at a depth of about 10-12 feet.

PHYSICAL FEATURES

1. 5% tree and shrub coverage.
2. Mostly grass covered. The parking lot on the east side is asphalt paving.
3. There is a gentle slope toward seventh avenue.

IMMEDIATE VIEWS

The site, being on a corner lot, has a good view of the surrounding campus. The Student Union Building is directly south across Garfield Street. The new Library Building and Roberts Hall and Reid Hall can also readily be seen. To the east across 7th avenue south, lies a vacant lot dotted here and there with an occasional tree. Quiet Danforth Chapel lies com-

fortably in a group of trees immediately to the north of the site. When looking in this direction, one observes mostly foliage as well as wide open grass areas. To the west one can only observe the Montana Hall Annex, a bad example of campus architecture. The most favorable views lie either to the immediate north or across 7th avenue.

DISTANT VIEWS

To the south, the Hyalite Mountains provide the most interesting view although the Bridger Range can also be seen when looking in a northerly direction from the site.

LOT SIZE

1. Dimensions are 160' x 425'.
2. Area -- 68,000 square feet.

ADVANTAGES OF SITE LOCATION

The most important advantage of this site is its close proximity to the Library, Math-Physics, and Engineering Buildings as well as other classroom buildings which are used to a great extent by art and architectural students.

Another advantage is the removal of undesirable parking areas in very valuable areas as well as rather shabby looking buildings.

DISADVANTAGE

The possibility of a large structure on this particular site may result in the destruction of the scale of the pleasant areas around Danforth Chapel.

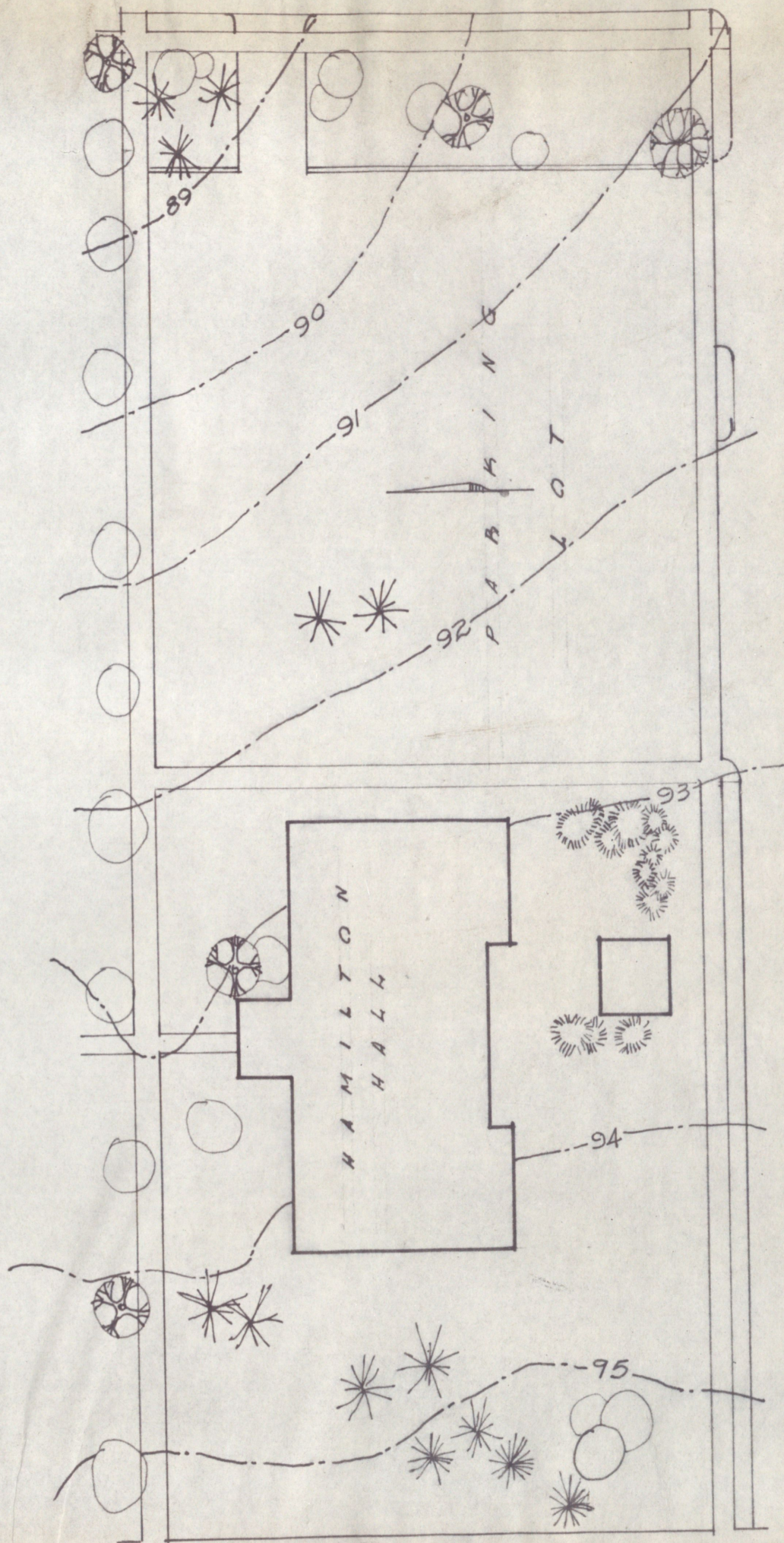


FIG. #4 SITE PLAN



VIEW TO NORTHEAST
FROM SITE.....



VIEW TOWARD THE
SITE FROM SOUTH-
EAST.....



VIEW TO THE SOUTH-
WEST FROM SITE...



VIEW TO THE SOUTH-
EAST FROM SITE...

f u n c t i o n

GENERAL

"Since buildings exert strong influences for good or bad upon those who use them, it is obvious that students of architecture (and art) can be either directly benefited or handicapped by the quality of the space provided for their work....For this reason alone, they have a legitimate claim to quarters which exemplify to the utmost degree the scientific and aesthetic precepts which they master. It is axiomatic that a school of architecture (and art) should occupy a building which in itself comprises an integral part of the education of its occupants and becomes a teaching device in the educational program."¹

Ever since the above statement was published, it has served, and will continue to serve as the criteria upon which schools of art and architecture can develop the program details for the buildings which will meet their individual needs. It is easily seen that the goal in setting up a building program is to achieve a building of such size, character, and attractiveness as will be needed to accommodate and to enlighten the school's teaching program. I feel as the author of the preceding paragraph feels, that only by being housed in an environment that

¹ Bannister, Turpin C., *The Architect at Mid-Century - Evolution and Achievement*, Reinhold Publishing Co., New York, 1954, p. 211.

demonstrates the highest standards of structure and of aesthetics can a school of architecture and art hope to be stimulating and inspiring in its teaching of the fundamentals of good works of architecture and art. There has been suggested several topics a school should consider before setting up a program. First of all, a school should examine very carefully its present educational program, determine its needs and plan the long range development of this program. This might involve changes in curricular patterns and organization; changes in the length of the course; expansion of the undergraduate program into graduate program as well as expanding these to include programs in related fields; increase or restriction of the number of students and methods involved; present and future size of staff, both full time and part time, and their possible extra-curricular activities, both research and professional.

The second important topic to be considered is flexibility. The programming of area requirements should not only be concerned with the functional uses and the area standards, but also with some provision of maximum flexibility so that future unforeseen developments can be accommodated and integrated effectively and economically into the building spaces. A rigid plan will limit and con-

trol the future development of a school's program of instruction.

A third topic that must be considered is that students and teachers are grossly responsive psychologically to attractive surroundings. This aspect should be kept constantly in mind as the aesthetics of the programmed environment are being determined.

"In a college building, you can create an atmosphere which is conducive to study and to work, and which produces rapport between teacher and student."

--Edward D. Stone

In other words, a building with too positive and fixed aesthetics may so dominate the student's development that his standard of aesthetic appreciation and judgment may become very stereotyped.

A fourth important consideration is the importance of a school of art and architecture building as a focal point on the campus. The campus community of teachers and students, as well as the general public, should experience the best possible campus architecture and campus planning. The building which houses the school of art and architecture should be an admirable and outstanding example of usefulness and efficiency as well as the attractiveness and beauty of a fine piece of art and architecture in itself.²

²Journal RAIC, Aug. 1960, p. 326.

The program of the actual physical facilities of a school of art and architecture will vary from school to school, depending upon its teaching program, its staff, its student enrollment, its research program, its extra-curricular activities, and its relationship to the rest of the university community. The following elements are those which I have found that should be included in the art and architecture school for M. S. C.

Note:

It may be seen that some functions of the art and architecture schools are very similar and therefore could be combined into one space. These areas include the library, lounges, and circulation areas.

At the beginning of the second part of my thesis, I will analyze these questionable areas to determine if they could be combined. This would result in a more economical design solution.

ARCHITECTURE

Drafting studios

Adequate desk space and storage space are the prime requirements for each student, together with evenly distributed illumination of more than adequate intensity. The area per student should be a minimum of 50 sq. ft. This may vary depending upon the level a student is in. First year students may have 30 sq. ft. per person, 40 for those in the second year, 50 for those in the third year, and 60 for the two upper classes.

Special studios

Provision should be made for the teaching of various media of graphic presentation, model making, sculpture; for workshops equipped with hand and power tools to provide for the making of models and for courses in basic and experimental design; for a well-equipped photographic laboratory and dark room to allow for both instruction and individual experimentation in this important means of presentation and record. Provisions for a large, unobstructed area adjacent to the workshop to enable classes to experience actual building projects of various kinds.

Exhibition -- Assembly

Ample exhibition space for traveling and ex-

change exhibitions and an area large enough to seat the entire architecture department for special assemblies and visiting lecturers. There should be a self-supporting exhibition panel system to provide great flexibility in the arrangement of exhibitions. A sectional platform and stacking chairs could be used to convert the exhibition area into an excellent lecture hall and film projection theatre. Provisions for a projection booth and screen as well as a built-in speaker system should be included to give good coverage for lectures, seminar discussions and sound movies.

Classrooms

Lecture rooms should have good sight lines, excellent ventilation, excellent lighting, including special lighting for note taking when slides are being shown, and excellent acoustics. In some cases, black venetian blinds and recessed ceiling spotlights provide excellent slide lecture conditions. There should be at least one projection screen, an adequate chalkboard and tack board provided in each lecture room.

Library

The library is an absolute essential for every school of architecture. It should provide ample

reading space for one quarter of the student body. It should have ample shelf space for an expanding collection of current architectural magazines, text books and reference books. Space should be provided for slide filing cabinets as well as vertical files. There also should be an adjacent librarian's office and work space.

Materials sample room

A school of architecture should have and maintain an up-to-date collection of structural and finishing materials, typical structural sections, and a file of manufacturers' data and booklets for instruction and research aids. It should be housed in an area carefully planned for efficient filing and organized display of samples. Students should have easy access to this area at all times thus it could be located adjacent to the drafting areas.

Drawing and model storage

An architectural school can never have too much storage space. Ample space should be provided for organized filing of the current year's student work as well as for the systematic filing of past work for reference and historical record. Some provisions should be made for open flexible shelving to enable short term storage of models.

Offices

Offices used by staff members should be large enough for interviews and allow enough area for drafting facilities. They should also be large enough to provide sufficient space for grading of graphic assignments.

Lounges

Such items as lounges for staff and for students may appear to be luxuries but it has been shown that most schools which have them will agree that they contribute greatly to the morale of people who make use of them. The staff lounge should contain a large table for meetings as well as several lounging chairs. A small kitchen unit should be provided for the preparation of coffee and limited refreshments. The student lounge should provide an attractive and comfortable space for relaxation and informal discussion.

Circulation

Provide ample circulation space in the form of hallways and open court areas for easy and quick access to all parts of the building. Provide ample space for mechanical equipment such as boilers, blowers, ducts, etc.

ARCHITECTURE

<u>Description</u>	<u>Area Sq.Ft.</u>	<u>No.</u>
<u>Drafting studios</u>	13,750	1
<u>Function</u> -Areas where students work on design projects and related subjects.		
<u>Equipment</u> -Drafting tables with storage drawers.		
<u>Finish</u> -Good quality.		
<u>Capacity</u> -265 undergraduate students. -10 postgraduate students.		
<u>Graphic studio</u>	1,000	1
<u>Function</u> -Lettering and graphics design.		
<u>Equipment</u> -Drawing tables and storage cabinets.		
<u>Finish</u> -Good quality.		
<u>Power tool workshop</u>	1,500	1
<u>Function</u> -Space for model making, wood working, etc.		
<u>Equipment</u> -Workbenches, sander, drillpress, table saw, band saw, storage cabinets, assortment of hand tools, and material storage.		
<u>Finish</u> -Simple and durable.		
<u>Dark room laboratory</u>	300	1
<u>Function</u> -Space for experimenting in photography, development and printing.		
<u>Equipment</u> -Developing equipment, enlarging equipment, chemical and material storage.		
<u>Finish</u> -Simple and durable		

<u>Printing room</u>	150	1
<u>Function</u> -Space for an Ozilid machine for printing drawings.		
<u>Equipment</u> -Ozilid printing machine, slop sink, paper storage and work table.		
<u>Finish</u> -Simple and durable.		
<u>Exhibition-Assembly area</u>	2,500	1
<u>Function</u> -Exhibition space for traveling exhibitions and assemblies. Also serves as jury room for grading problems.		
<u>Equipment</u> -Self supporting exhibition panel system, adjacent chair storage and projection booth.		
<u>Finish</u> -Good quality.		
<u>Lecture room</u>	1,500	1
<u>Function</u> -Lecture and instruction area for 100 students.		
<u>Equipment</u> -100 desk chairs, projection screen, chalkboard, tack board and projection booth.		
<u>Finish</u> -Good quality.		
<u>Lecture room</u>	1,200	1
<u>Function</u> -Lecture and instruction for 80 students.		
<u>Equipment</u> -80 desk chairs, projection screen, chalkboard, tack board and projection booth.		
<u>Finish</u> -Good quality.		
<u>Lecture room</u>	1,200	2
<u>Function</u> -Lecture and instruction for 40 students.		
	(600 ea.)	

Equipment-40 desk chairs,
projection screen, chalk-
board, tack board, and pro-
jection booth.

Finish-Good quality.

Seminar rooms 1,000 2

Function-Lecture, instruc-
tion and group discussions
of 20 students. (500 ea.)

Equipment-Tables and seating
for 20 persons, projection
screen, blackboard, and tack
board.

Finish-Good quality.

Library 2,500 1

Function-Provide seating for
60 students, shelving for
3000-5000 volumes, slide
collection and librarian's
desk.

Equipment-Study tables and
chairs, book shelves, file
cabinets. Adjacent storage
room.

Finish-Good quality.

Materials sample room 900 1

Function-Storage and display
of structural and finishing
materials, typical struct-
ural sections, etc.

Equipment-Display tables,
racks, desks, blackboard
and tack board.

Finish-Durable.

Drawing and model storage 1,500 1

Function-Space for filing
past work for reference
and records.

Equipment-Filing cabinets with 4 in. deep drawers, flexible shelving for model storage.

Finish-Durable.

Director's office

200 1

Function-Office work and receiving visitors.

Equipment-Large desk, filing cabinet, book shelves, four occasional chairs.

Finish-Excellent quality.

Conference room

300 1

Function-Used for staff meetings and general conferences.

Equipment-Conference table and sixteen conference chairs, desk high storage and filing cabinets.

Finish-Excellent.

Receptionist-Secretary

200 1

Function-Stenographic and record work of the office and receiving students, faculty, and visitors to meet the Director.

Equipment-Desk for office work, receptionist's chair, filing cabinets, printing machine, typewriting facilities and four occasional chairs.

Finish-Excellent quality.

Staff Offices and studios

2,250 15

Function-Used for interviews, drafting, correcting and grading problems, and general office work.

(150 ea.)

Equipment-Desk and chair, drafting table, bookshelves, and filing cabinet.

Finish-Good quality.

<u>Lounge and meeting room</u>	300	1
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Function-Used for meetings
coffee breaks and lounging.

Equipment-Small kitchen unit,
board table, and occasional
chairs.

Finish-Good quality.

<u>Lavatories</u>	300	2
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(150 ea.)

<u>Student lounge</u>	1,000	1
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<u>Vestibules, concourses, circulation, mechanical equipment, etc.</u>	4,000	1
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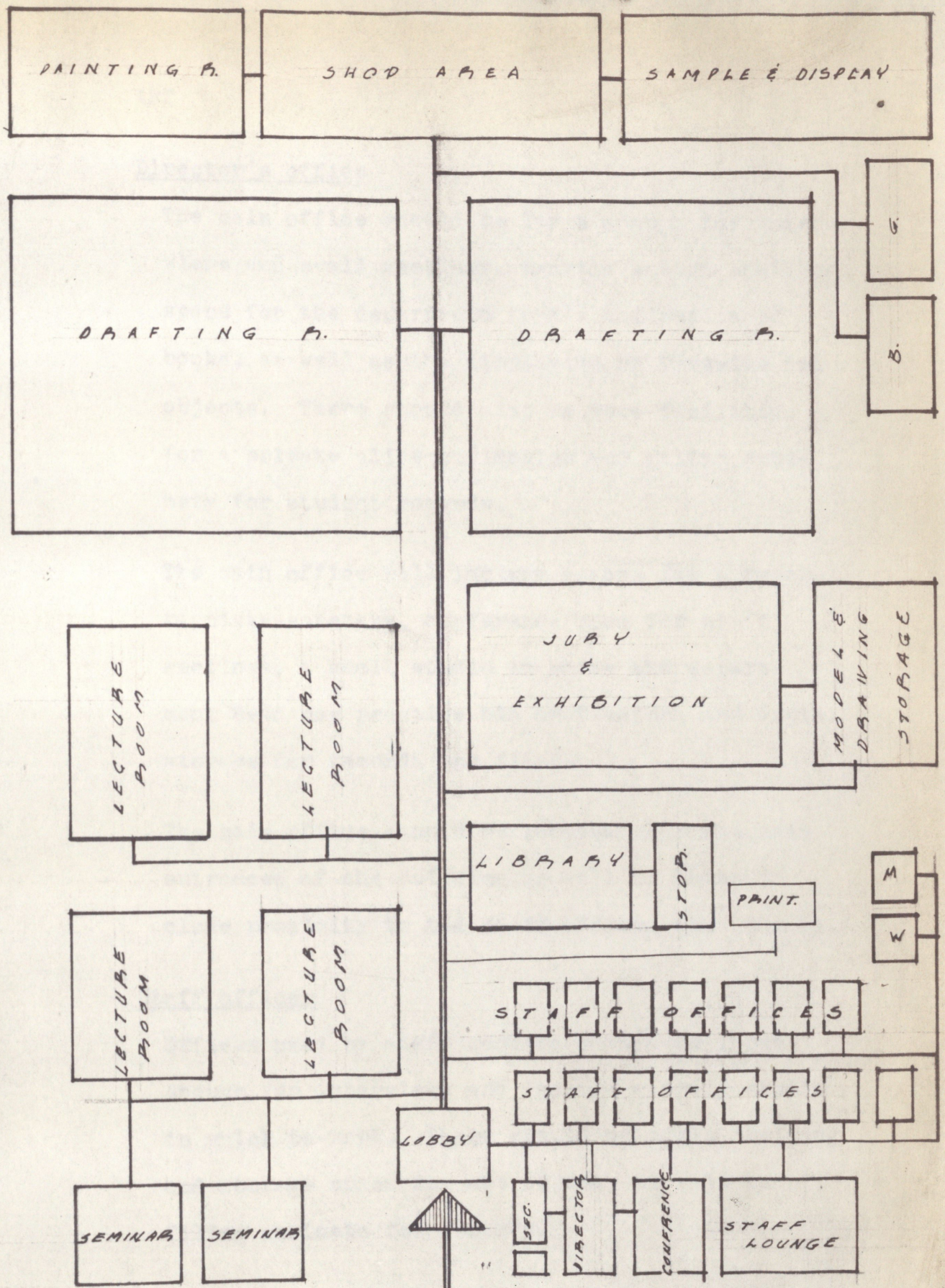


FIGURE 5 FLOW DIAGRAM--SCHOOL OF ARCHITECTURE.

Director's office

The main office should be large enough for interviews and small meetings, provide enough shelving space for the department head's collection of books, as well as the displaying of favorite art objects. There should also be some facilities for a private slide collection and filing cabinets for student records.

The main office will include spaces for a receptionist-secretary, conference room for staff meetings, a small studio in which the department head may practice his profession, and ample storage for records and files.

The main office should be located near the main entrances of the building as well as being in close proximity to the staff offices and library.

Staff offices

Offices used by staff members should be large enough for interviews and include a small studio in which to work. There should be ample shelving and storage space for art objects as well as filing cabinets for records.

Lecture rooms

Art lecture rooms should have good sight lines, excellent ventilation and lighting, including

special lighting for note taking when slides are being shown, and excellent acoustics. Black venetian blinds and recessed ceiling spotlights have been suggested to provide excellent slide lecture conditions. There should be at least one projection screen, an adequate chalkboard and tack board provided in each lecture room. There should be some facilities for displaying art objects on stands and hanging pictures on the walls.

Ceramics studio

Throwing room--Pieces of ceramics are formed and molded by use of potter wheels. There should be enough space for at least five electric potter wheels and ten to twelve manually operated ones. There should be facilities for storing chemicals that are used in the potters clay. Shelving should be provided for temporary storage of pots and other ceramic pieces. Work table and an adequate water supply are needed for molding and working the clay.

Cooling room--After the pots are formed they are then placed in cooling units for water retension until they are ready for the kiln. Approximately ten to twelve units will be needed for this operation. Other equipment that may be included in this room are work tables, electric clay mixers,

and an ample water supply. Storage space for drawing batts and clay vats should also be provided in this area.

Kiln room--Pots are glazed and fired in this area. There should be enough space for at least one large electric kiln, and four or five smaller portable kilns. At least two glazing booths will be needed for finishing the pots. Other equipment needed in the final operation are work tables, storage space for glazes, adequate shelving for pot storage, and an ample water supply with sinks.

Sculpture studio

Sculptures of all kinds are designed and built in this studio. A more than adequate ventilation and lighting system is necessary. Equipment required in this space might include several work tables, slop sinks, an acetylene welder, an arc welder, a table saw, and one sander. Adequate storage for different materials used in sculptures is mandatory. There should be some provision for hoisting heavy pieces of stone onto work stands.

Lithography and printing studio

Visual organization and technical processes of lithography in black and white as well as color, is investigated in this studio. Also courses in

etching and engraving are also taught in this area. Equipment needed in this area includes several work benches and tables for sketching and layout work. Benches on which stones are inked for printing are needed. A special table is needed for the wetting of the paper or printing media prior to the actual printing. An etching and lithography press as well as a stone grinder is required. There should be ample storage spaces for lithograph stones, printing materials and storage for chemicals used in the printing process. There should also be an adequate water supply with slop sinks.

Jewelry studio

The designing of jewelry in sterling silver with stones, wood, etc., using simple techniques of sawing filing, drawing, rolling, raising, soldering, stonesetting, finishing, and polishing are investigated in this studio.¹ Equipment that is needed includes several work benches and tables, a soldering bench with two or three gas soldering torches, enameling booths, a polisher and kilns for baking enameled jewelry. There should be storage for various hand tools, cabinets for enamels and lacquers, a space for material storage, display cases and shelving.

¹Montana State College Bulletin, 1964-1966, p.224.

Painting and drawing studios

Oil--Painting organization and techniques are studied and developed in this studio. Excellent ventilating and lighting systems are mandatory for this area for removal of odor and the proper lighting of the studio. There should be ample space for approximately twenty-four easels and paint mixing stands. Facilities for storing canvas and stretches are needed. An area for placing paintings for drying is also needed. There should be an area for displaying finished paintings. Blackboards and tack boards should be furnished for instruction and discussion of problems in layout and design. A water supply and slop sink is also needed.

Watercolor--All aspects of techniques and organization of watercolor are investigated in this studio. Equipment used in this area includes work tables and painting benches and a water supply with sinks. There should be adjacent storage areas for storage of materials used in still lifes or other subject matter. Blackboards and tack boards are needed for instruction and aids in discussion of techniques.

Drawing--There will be several types of drawing courses taught, ranging from introductory courses to more advanced courses including life drawing in which the structure of the human body, its bony and muscular structure, will be investigated. Several different medias will be used as well as live models. There should be an area for models to pose, drawing tables, adjacent storage, and a display area in which individual problems may be discussed and criticized.

Library

The library is an absolute essential for every school of art. It should provide ample reading space for at least one fourth of the student body. It should have ample shelf space for an expanding collection of art periodicals as well as text and reference books. There should be ample space for slide racks and files of prints and reproductions of paintings. Equipment needed would include reading tables and chairs, book shelves and a librarian's desk. A storage room for files and records should be located adjacent to the library.

Museum

A museum is needed to store and display valuable works of art that are presently kept in boxes in dark closets. Equipment would include display cases, display stands, shelving, and facilities for hanging paintings and reproductions. The museum could be incorporated with the library into one area.

Gallery

The gallery serves as an area for viewing special collections of art works, normally paintings. It also may serve as a lounge and meeting place for informal discussions. A storage area should be located adjacent to the gallery.

Lounges

The lounges should provide a comfortable and attractive area for informal meetings and discussions. The staff lounge should contain a large table for meetings as well as a lounge group. A small kitchen unit should be provided for the preparation of coffee and limited refreshments.

Circulation

Ample area for circulation is needed for the movement of people and objects throughout the building. Space for mechanical and electrical equipment must also be provided.

ART

<u>Description</u>	<u>Area Sq.Ft.</u>	<u>No.</u>
<u>Director's office</u>	200	1
<u>Function</u> -Receiving visitors, students, general office work, studio work, and counseling.		
<u>Equipment</u> -large desk and chair, book shelves, visitors chairs, and desk high storage cabinets.		
<u>Finish</u> -Excellent quality.		
<u>Conference room</u>	300	1
<u>Function</u> -Staff meetings and conferences with visitors.		
<u>Equipment</u> -Conference table and chairs, desk high storage and filing cabinets.		
<u>Finish</u> -Excellent quality.		
<u>Receptionist-Secretary</u>	200	1
<u>Function</u> -Stenographic and record work of the office, receiving and directing students, faculty and visitors to the Director's office.		
<u>Equipment</u> -Desk and chair, filing cabinets, printing machine, typewriting facilities, and occasional chairs.		
<u>Finish</u> -Excellent quality.		
<u>Staff offices and studios</u>	1,500	10
<u>Function</u> -Used for interviews, studio work, correcting and grading problems.		
<u>Equipment</u> -Desk and chair, work table, bookshelves, and filing cabinet.		
<u>Finish</u> -Good quality.		

Lecture room 1,500 1

Function-Lecture and instruction for 100 students.

Equipment-100 desk chairs, projection screen, chalk-board, tack board and projection booth.

Finish-Good quality.

Lecture room 1,200 1

Function-Lecture and instruction for 80 students.

Equipment-80 desk chairs, projection screen, chalk-board, tack board and projection booth.

Finish-Good quality.

Lecture room 1,200 2

Function-Lecture and instruction for 40 students. (600 ea.)

Equipment-40 desk chairs, projection screen, chalk-board, tack board and projection booth.

Finish-Good quality.

Seminar rooms 1,200 2

Function-Lecture and instruction and group discussions for 20 students. (600 ea.)

Equipment-Tables and seating for 20 persons, projection screen, blackboard and tack board.

Finish-Good quality.

Graduate studios

2,000

1

Function-Facilities enabling graduate students to work on their more advanced projects.

Equipment-Generally left to the individual doing graduate work in some particular field.

Finish-Durable.

Ceramics studio

2,500

1

Function-Throwing glazing and firing of clay objects.

Equipment-Five electric potter wheels, twelve manually operated pottery wheels, chemical storage, work tables, twelve cooling units, two electric clay mixers, fifteen clay vats, one or two large electric kilns, five small portable kilns, two glazing booths, adequate shelf storage, drawing batt storage, chemical storage, and an ample water supply and slop sinks.

Finish-Durable.

Sculpture studio

3,000

1

Function-Study of sculpture in various media.

Equipment-Work tables, slop sinks, acetylene welder, arc welder, a table saw, sander, water supply and material storage.

Finish-Durable.

<u>Lithography and printmaking studio</u>	2,000	1
<u>Function</u> -Study of visual organization and technical processes of lithography, etching and engraving.		
<u>Equipment</u> -Workbenches and tables, printing presses storage for materials, water supply with sinks.		
<u>Finish</u> -Durable.		
<u>Jewelry studio</u>	1,500	1
<u>Function</u> -Facilities for instruction and designing jewelry in various mediums.		
<u>Equipment</u> -Work tables and benches, gas soldering torches, enameling booths, polisher, small kilns, and adequate storage for enamels, lacquers, materials and display cases.		
<u>Finish</u> -Durable.		
<u>Oil painting studio</u>	2,000	1
<u>Function</u> -Instruction and practice in the use of oil colors in painting.		
<u>Equipment</u> -Enough area for twenty four easels, and paint mixing stands, blackboards, tack boards and adequate storage.		
<u>Finish</u> -Durable		
<u>Watercolor studio</u>	2,000	1
<u>Function</u> -Instruction in the various methods of watercolor painting.		
<u>Equipment</u> -Work tables and benches, chalkboards, tack boards and adequate storage for equipment.		
<u>Finish</u> -Durable.		

Drawing studio

2,000 1

Function-Instruction in problems of drawing from elementary to the more advanced courses.

Equipment-Drawing tables, blackboards, tack boards and adequate storage for materials.

Finish-Durable.

Library

2,000 1

Function-Provide reading space for one fourth of the student body, storage for periodicals, books, slides, and records.

Equipment-Reading tables and chairs, bookshelves, file cabinets for slides, a librarian's desk and chair, adequate storage adjacent to the library.

Finish-Excellent quality.

Museum

1,000 1

Function-Display and store works of art.

Equipment-Display cases, shelving and facilities for hanging paintings and reproductions.

Finish-Good quality.

Gallery

500 1

Function-Area for displaying traveling collections of artworks and paintings.

Equipment-Storage space adjacent to the gallery.

Finish-Good quality.

Lounges (staff)

500 1

Function-Used for meetings
coffee breaks and informal
discussions.

Equipment-Small kitchen
unit board table, and oc-
casional chairs.

Finish-Good quality

Student lounge

500 1

Lavatories

300 2
(150 ea.)

Vestibules, concourses, circulation,
mechanical equipment, etc.

4,000 1

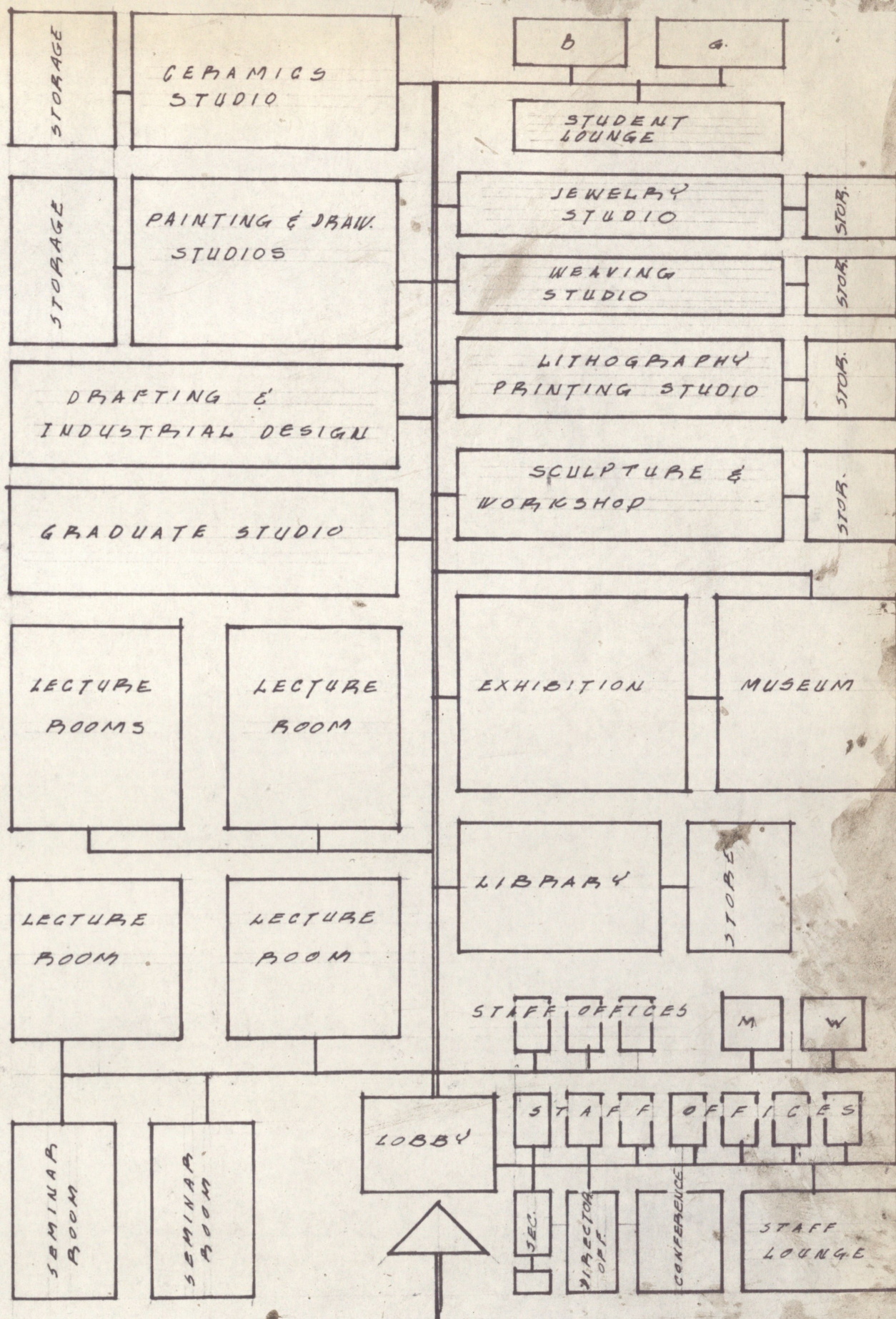


FIGURE 6 FLOW DIAGRAM--SCHOOL OF ART

b i b l i o g r a p h y

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