PROPOSED ARCHITECTURAL BUILDING FOR THE UNIVERSITY OF NEBRASKA

by

JAMES GARFIELD PORTER

B. S., University of Michigan, 1948

A THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Architecture

KANSAS STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE

1956

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INTRODUCTION

A building devoted to architectural education should endeavor to serve its occupants in a far greater capacity than merely as an adequate enclosure of functional space. Out worn cliches and personalized idiosyncrasies are completely out of place in a building of this type. Unity, simplicity, proportion, balance, harmony, etc., should be embodied in the design to give the students a living definition of these qualities.

The solution presented comprises an honest effort to reach a satisfactory compromise between simplicity and complexity; and between individuality and comformity. This apparent contradiction requires further amplification.

There seem to be three basic steps that are necessary in the evolution of any design problem. The first step consists of breaking the problem down to fundamental essentials, disregarding minor considerations - in a word, oversimplification. The second step consists of elaboration and development of both functional and aesthetic factors - in other words, introducing a degree of complexity to the solution. The third step which, incidentally, is probably the most important and the most neglected, consists of integrating and balancing the first two steps in an effort to attain a unified and harmonious solution - in a word, compromise.

The over- emphasis placed on individuality of contemporary architecture is, in some respects, rather depressing. This attitude is comparable to the immature desire of some individuals to constantly be the center of attention. Too much of our modern architecture is of the

showmanship variety, superficial in character, and lacking those lasting qualities of dignity and serenity. Perhaps a reappraisal of the role of the architect and his contributions to society is in order. Certainly, his own self-glorification, by means of unusual and dramatic buildings, is of relative unimportance to society as a whole. The public is often much better served over a period of years by buildings, which might not produce initial contact shock, but have a restful feeling of belonging to their environment. Conformity does not need to be either repetitious or monotonous. A building which blends with its surroundings and compliments neighboring buildings, can be just as stimulating and satisfying to the mature mind as the unique or exciting building. The compromise between individuality and conformity is just as necessary and just as important as the compromise between simplicity and complexity.

SITE

The site of Grant Memorial Hall, soon to be razed, was selected as the future location for a new architectural building for the University of Nebraska. This site is near the center of the campus and in close proximity with most of the existing engineering buildings. Pedestrian access is from all directions, while vehicular access is limited to 12th Street which comprises the east boundary line of the site. Open lawn areas with large scattered trees provide an indefinite boundary line to the north, west and south. All service and utilities will approach from the east, together with the majority of visitors and students.

STATISTICS

Present Enrollment (1955)		Drafting Room Space Required	
First year	48-64	none	
Second year	36-48	3 bays @ 576 sq. ft.	1728 sq. ft.
Third year	24-32	2 " " " " "	1152 sq. ft.
Fourth year	24-32*	1 bay " " " "	576 sq. ft.
Fifth year	12-16**	1 " " " " "	576 sq. ft.
Total	144-192	7 bays @ 576 sq. ft.	4032 sq. ft.
Faculty	8-12	Included in office space	

*Architectural engineers have completed design courses

**Only fifth year design students

Anticipated Enrollment (1960)		Drafting Room Space Required	
First year	60-80	none	
Second year	48-64	4 bays @ 576 sq. ft.	2304 sq. ft.
Third year	36-48	3 " " " " "	1728 sq. ft.
Fourth year	36-48	3 " " " " "	1728 sq. ft.
Fifth year	36-48	3 " " " " "	1728 sq. ft.
Total	216-288	13 bays @ 576 sq. ft.	7488 sq. ft.
Faculty	12-16	Included in office space	

SPACE REQUIREMENTS

Drafting room space for 200 students @ 40 sq. ft.	8000 sq. ft.
Classroom space for 60 students @ 20 sq. ft.	1200 sq. ft.
Audio-visual room for 60 students @ 20 sq. ft.	1200 sq. ft.
Library space for 200 students @ 10 sq. ft.	2000 sq. ft.
Conference and seminar rooms for 40 students @ 20 sq. ft.	800 sq. ft.
Exhibition gallery for 200 students @ 5 sq. ft.	1000 sq. ft.
Lounge and lavatory facilities for 200 students @ 10 sq. ft.	2000 sq. ft.
Administration space for 200 students @ 3 sq. ft.	600 sq. ft.
Office space for 16 staff members @ 200 sq. ft.	3200 sq. ft.
	20,000 sq. ft.
Heating, storage and future expansion (15% of above)	3000 sq. ft.
	23,000 sq. ft.
Circulation and corridor space (20% of above)	4600 sq. ft.
Total space requirements	27,600 sq. ft.

SPACE ALLOCATION

Second Floor

Drafting rooms - 7 bays @ 576 sq. ft.	4032 sq. ft.
Offices, conference rooms, seminar rooms, lounge, etc. - 7 bays @ 384 sq. ft.	2688 sq. ft.
Corridors, stairs, elevator, lavatories, etc. (service facilities)	2496 sq. ft.
	9216 sq. ft.

First Floor

Drafting rooms - 3 bays @ 576 sq. ft.	1728 sq. ft.
Classrooms - 2 bays @ 576 sq. ft.	1152 sq. ft.
Library - 2 bays @ 576 sq. ft.	1152 sq. ft.
Offices, administration space, exhibition area lounge, etc. - 7 bays @ 384 sq. ft.	2688 sq. ft.
Corridors, stairs, elevator, lavatories, etc. (service facilities)	2496 sq. ft.
	9216 sq. ft.

Basement

Drafting rooms - 3 bays @ 576 sq. ft.	1728 sq. ft.
Audio-visual rooms - 2 bays @ 576 sq. ft.	1152 sq. ft.
Library storage - 2 bays @ 576 sq. ft.	1152 sq. ft.
Future expansion, research, special projects, storage, heat, etc. - 7 bays @ 384 sq. ft.	2688 sq. ft.
Corridors, stairs, elevator, lavatories, etc. (service facilities)	2496 sq. ft.
	9216 sq. ft.

Total Space Allocation

3 floors	27,648 sq. ft.

SOLUTION

Site and structural considerations were major factors in preliminary design decisions. The saving grace of the University of Nebraska city campus is the abundance of large beautiful trees which partially conceal the ugly, uninspired masonry masses that have been imposed upon their sites without taste, refinement, or discrimination. Fortunately, many of these buildings have outlived their usefulness and are soon to be razed. A logical conclusion, in regard to site selection for a new architectural building, seemed to be to choose an appropriate doomed building that would have the approximate gound coverage needed, and suitable location in relation to allied buildings. Grant Memorial Hall fulfilled these requirements quite satisfactorily. All of the existing landscaping, with the exception of some minor foundation planting, could be kept intact, and supplemented for specific purposes at very little extra expense. The new architectural building could thus have that rare and seldom considered advantage of a mature park-like environment, without waiting until it had, in turn, outlived its own usefulness.

Several structural systems were considered before selecting the lift-slab method. A skeleton frame system was deemed mandatory due to functional factors such as continuous glass walls for drafting rooms, flexibility of expansion and alterations, economy of construction, etc. Fireproofing considerations seemed to favor reinforced concrete over steel, and economy, simplicity, and aesthetic possibilities, formed the basis for the lift-slab selection. Certain disadvantages of this system, such as column spacing limitations, extreme temperature

effects on a continuous slab, etc., were recognized, but with proper precautions and protective measures, these liabilities could be minimized. The Youtz-Slick recommendations as to maximum column spacing (24' - 0" o.c., both directions) and slab cantilever (1/3 of adjacent span), were followed thruout.[1] The eight foot overhangs, which are primarily desirable aids in balancing the moments at the column, were utilized as combination balconies and glare reducing overhangs. Rigid insulation would be applied top and bottom, with built-up roofing on top, thus minimizing the effect of temperature differentials.

Sliding and fixed glass walls (double glazed) composed the bulk of the exterior wall surfacing. The end bays, which contain service and utility facilities, were unbroken cavity brick walls of "Yankee Hill" red brick, which is the dominant veneer for all adjacent university buildings. This attempt for harmony seemed quite reasonable and justifiable, from both a political and aesthetic viewpoint. The strong horizontal lines obtained by continuous balconies on both sides of the building seemed to require some rather definite termination. These large masonry anchors certainly produced this termination, and also provided a backdrop for special planting, bas-relief sculpture, or integrated murals.

Interior partitions were kept to a minimum, for both functional and economical reasons. All interior walls are non-bearing and, with the exception of the end bays, where the bulk of the plumbing is concentrated could be easily moved, removed or added as future requirements dictate.

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[1]Burton H. Holmes, Materials and Methods in Architecture, p. 58

All major piping, ductwork, etc. would be contained within the dropped ceiling of the main corridor on each floor, which would give direct access to all rooms. All ceilings would be continuous light sources, with opaque plastic panels diffusing the light evenly over the entire building. Rheostat controls will adjust the intensity to supplement natural light and maintain the desired foot-candle illumination at all times and under all conditions.

EXHIBITION GALLERY AND LOUNGE

Since the bulk of visitor and student traffic will come from the east, the exhibition gallery and lounge was located at the southeast corner of the ground floor. Administrative offices are adjacent to the west, the library is across the corridor to the north, and the glass south wall opens up to a paved terrace area. Exhibitions were mounted on pivoted panels that may be adjusted to any position desired. These panels may also be used to screen off the corridor from the exhibition area for closed juries. Additional fixed panels may be mounted at eye level along the glass south wall as desired. The unbroken masonry east wall served as a backdrop for a small informal lounge area open to the exhibition gallery and adjacent to the main entrance. The service entrance and freight elevator are in close proximity thus facilitating frequent changes of exhibits.

LIBRARY AND LIBRARY STORAGE

Contrary to conventional departmental library policy of centralization, the architectural library was purposely decentralized into two approximately equal spaces. The main reading room, with control desk, was located across the corridor from the exhibition gallery and lounge and near the main entrance. Only current periodicals, recent books, and frequently used reference material will be contained in U-shaped stack areas adjacent to the corridor wall. The center section of the reading room was set aside for work tables and chairs to accommodate study and research requirements. Along the glass north wall, which opens up to a paved terrace area, comfortable lounge chairs will be placed informally, in an attempt to create a more conducive attitude toward student utilization of library facilities. The library storage room was located directly below the main reading room. This room is below grade and windowless, with interior walls of masonry for fire protection. All valuable, irreplaceable, and seldom used books and periodicals, along with audio-visual aid equipment, will be stored here. All doors will be kept locked, and control will be thru the reading room librarian. The freight elevator serves both rooms directly and acts as a vertical link between them.

CLASSROOMS

Due to the laboratory nature of architectural education, classroom facilities were minimized in regard to space requirements. Two ground floor bays adjacent to the library were set aside for classroom use, and designed for multiple use and flexibility. In addition, two basement bays

directly beneath, which are planned for audio-visual lectures, could be utilized for classroom purposes. With proper scheduling, this limited space allocation for classroom facilities seemed quite ample to fulfill not only present needs, but also those of the foreseeable future. If the present drafting room approach to the study of architecture undergoes revision at some future date, classroom and lecture room facilities could be expanded quite easily at the expense of drafting room space.

DRAFTING ROOMS

All drafting rooms were given north orientation, along with classrooms and the library. The corridor wall to the south contains locker facilities. Flexibility was obtained by using nonbearing curtain walls or none at all, as desired, between drafting rooms in an east-west direction. The second floor drafting space was intended to be used as one large area housing the various design levels and readily adaptable to the constantly changing sizes of design sections. The ground floor drafting space was intended primarily for emergency expansion space from time to time and also for future expansion. An alternate arrangement, utilizing the second floor for elementary and intermediate design, the ground floor for advanced design, with basement drafting room space for special courses, would accommodate rapid expansion without excessive crowding.

OFFICES AND CONFERENCE ROOMS

Flexibility and privacy were the major factors considered in the design of faculty offices. Sufficient space was allocated to give each full time

staff member a private office generous enough to accommodate a desk, drafting table, couch, and miscellaneous furniture. Provisions were made for dual occupancy of some offices by part time staff members and student assistants.

Conference and seminar rooms were included adjacent to staff offices and could be subdivided quite easily for expansion of staff facilities. Additional conference and seminar rooms would be located in the basement under the ground floor offices.

All offices, conference rooms and seminar rooms were given south orientation. This decision was governed by two important considerations: first, the economy and compactness of a double loaded corridor; and second, the relegation to secondary importance of these areas in comparison with drafting rooms, classrooms, and the library, in competition for north orientation. However, with an eight foot overhang at each level eliminating direct sunlight, and pleasant tree-studed park area for the southern vista, not much rationalizing would be necessary to make this southern exposure acceptable.

BASEMENT

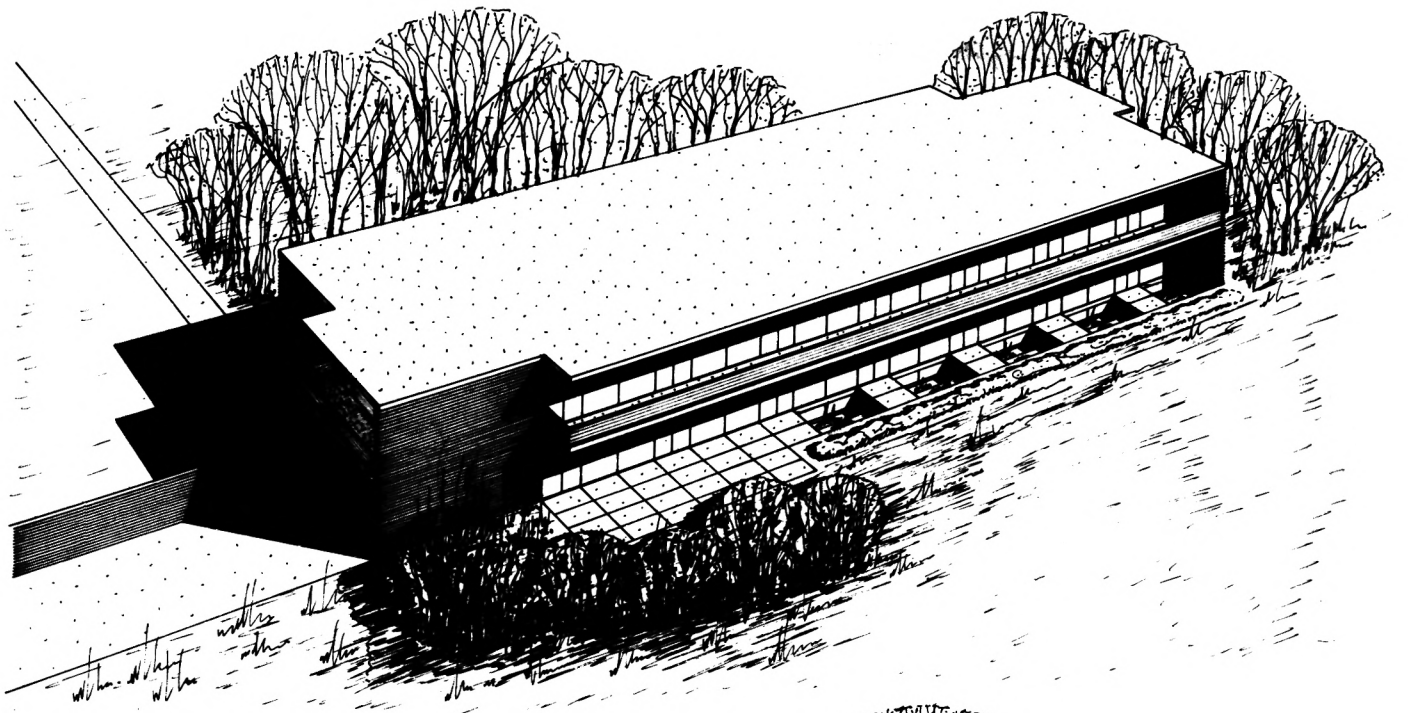
A full basement was planned for reasons of economy and more convenient vertical circulation. Except for the audio-visual room and enclosed storage, heating and lavatory facilities, the basement would be left unfinished and free of partitions for the present. Future use would be dictated by specific space demands, but an attempt was made to make this expansion space serviceable for a variety of uses. In order to obtain more natural light and to create a more pleasant environment, terraced window wells with low level

planting were extended the full length of the building on both sides, except under the two terrace areas at the east end. This relatively undesirable space without natural light seemed ideal for fireproof storage rooms, which, incidentally, would also be in close proximity to the elevator for vertical circulation in connection with the library and exhibition gallery directly above.

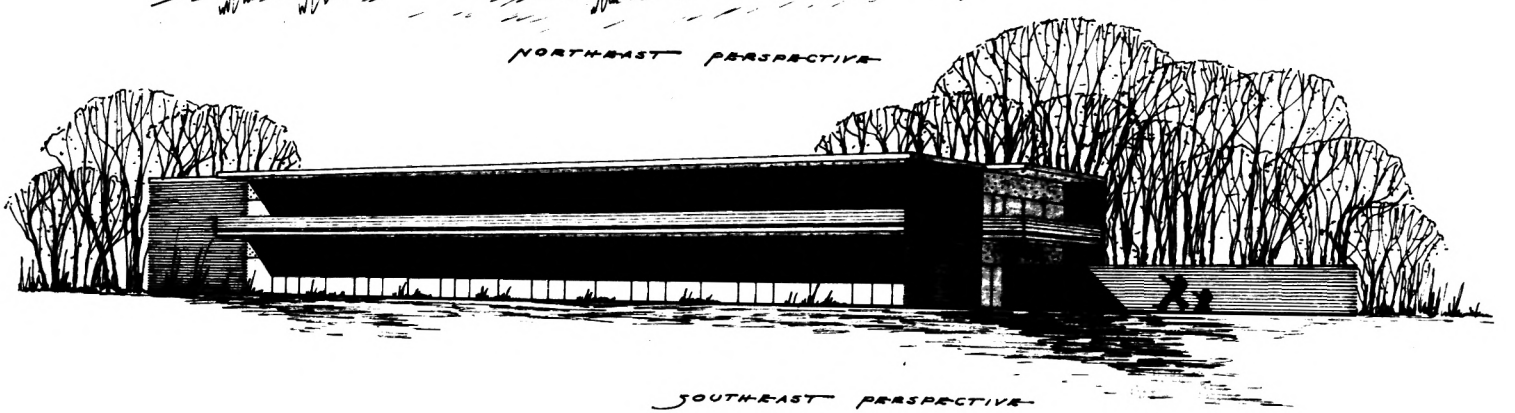
EXPLANATION OF PLATE I

Exterior Perspectives

PLATE I



NORTHEAST PERSPECTIVE

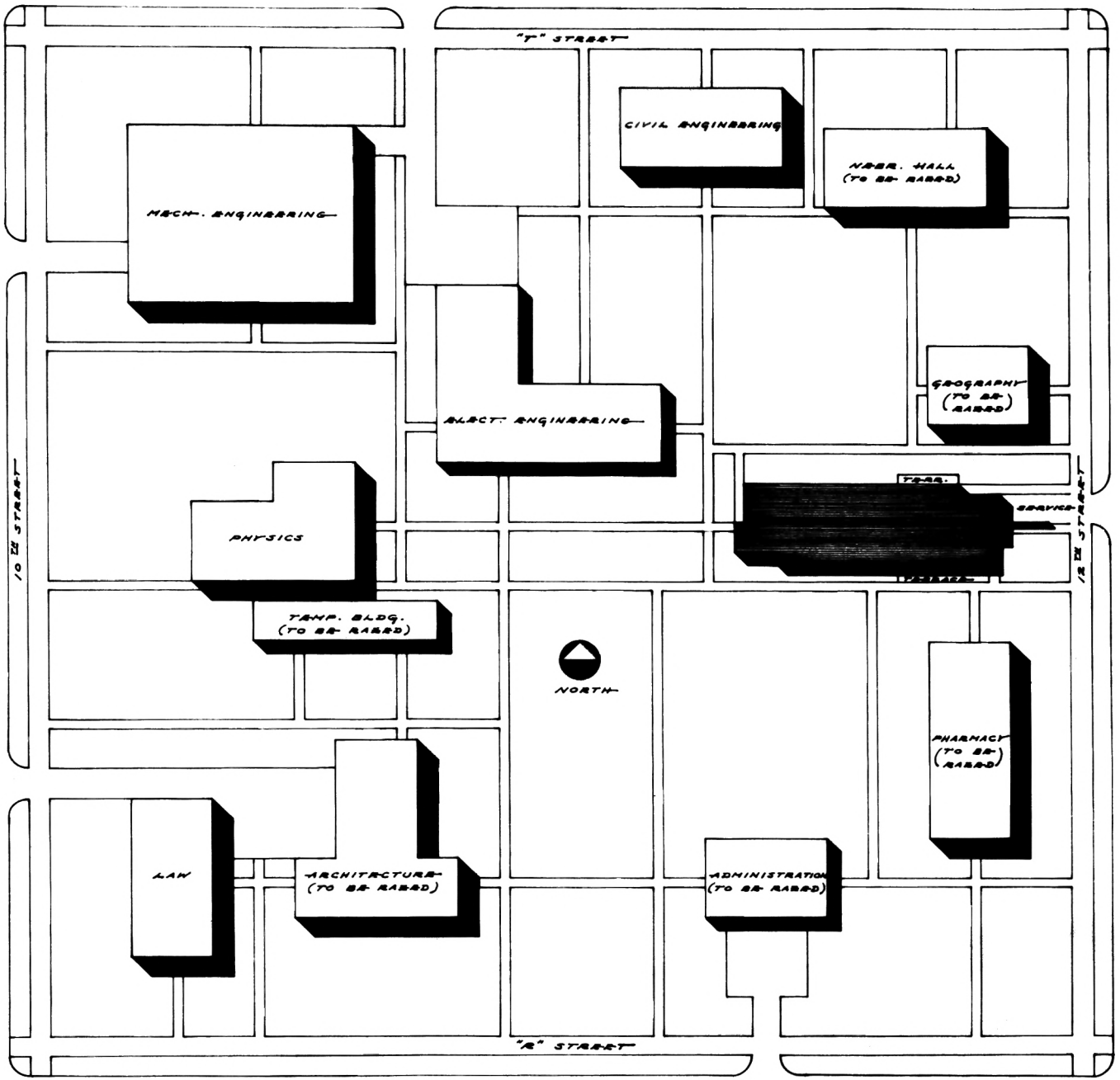


SOUTHEAST PERSPECTIVE

EXPLANATION OF PLATE II

Site Plan

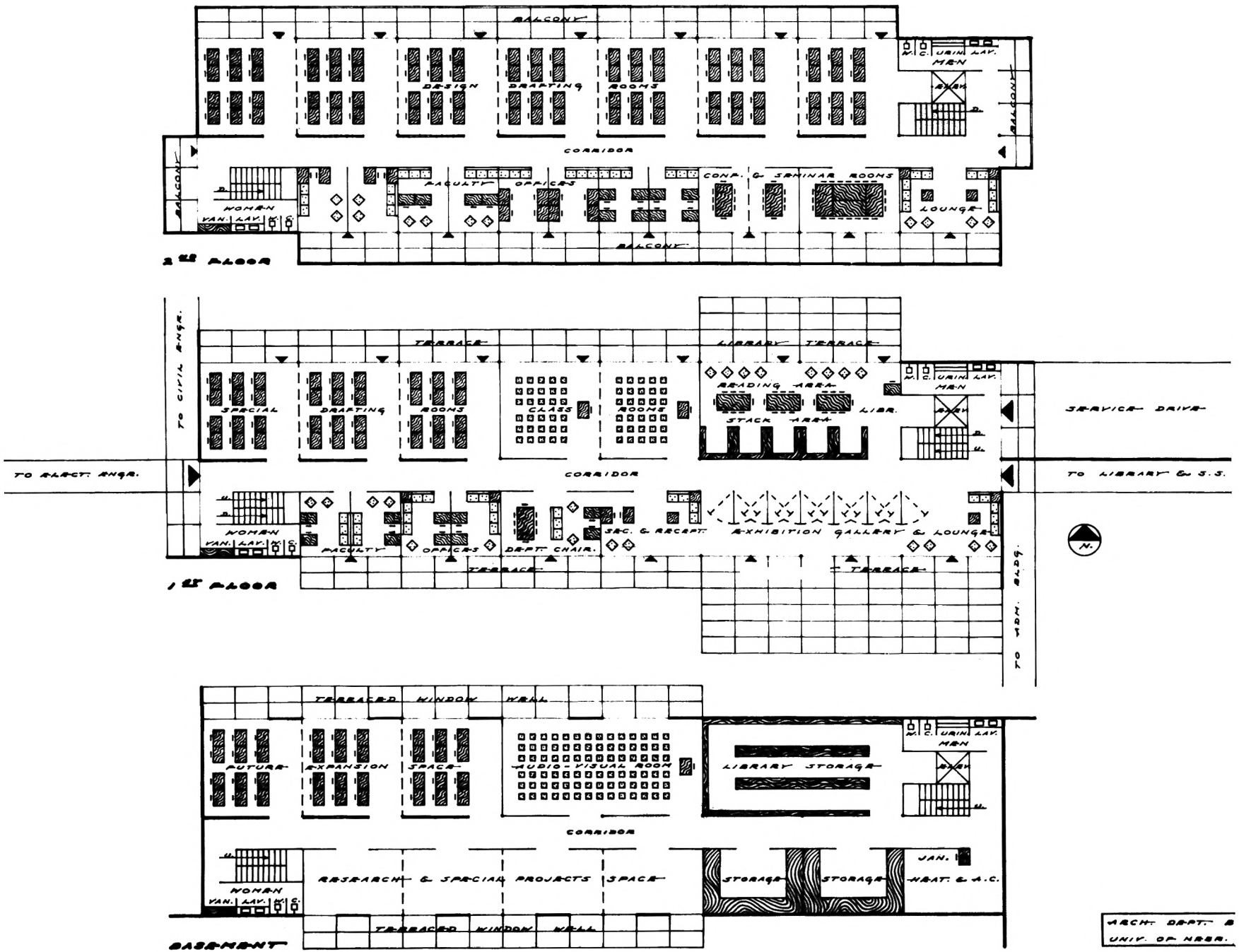
PLATE II



MECH. DEPT.

EXPLANATION OF PLATE III

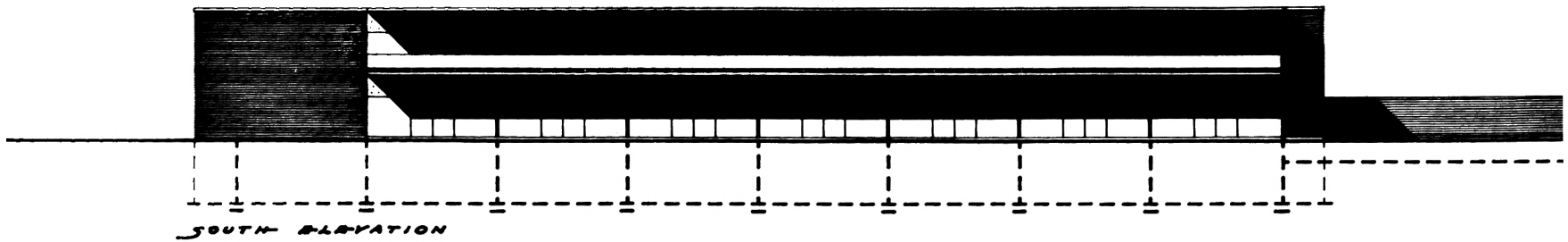
Floor Plans


BALCONY
DESIGN
DRAFTING
ROOMS
M.C. URIN. LAV. MEN
CORRIDOR
FACULTY OFFICES
CONF. & SEMINAR ROOMS
LOUNGE
WOMEN
VAN. LAV.
2ND FLOOR
TO CIVIL ENGR.
TERRACE
LIBRARY TERRACE
SPECIAL
DRAFTING
ROOMS
CLASS
ROOMS
READING AREA
STACK AREA
LIBR.
SERVICE DRIVE
TO ELECT. ENGR.
TO LIBRARY & S.S.
SEC. & RECEPT.
EXHIBITION GALLERY & LOUNGE
DEPT. CHAIR.
TO MECH. BLDG.
N.
1ST FLOOR
TERRACED WINDOW WALL
FUTURE EXPANSION SPACE
AUDIO-VISUAL ROOM
LIBRARY STORAGE
RESEARCH & SPECIAL PROJECTS SPACE
STORAGE
STORAGE
VAN.
HEAT. & A.C.
BASEMENT
ARCH. DEPT.
UNIV. OF NEBR.

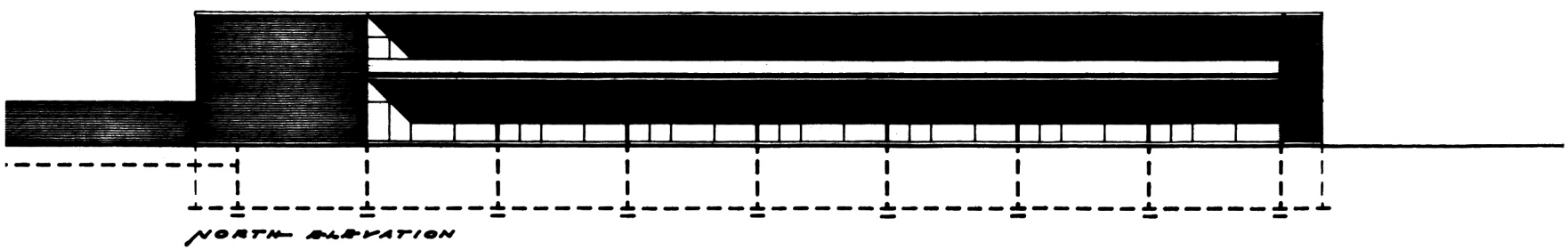
EXPLANATION OF PLATE IV

Elevations

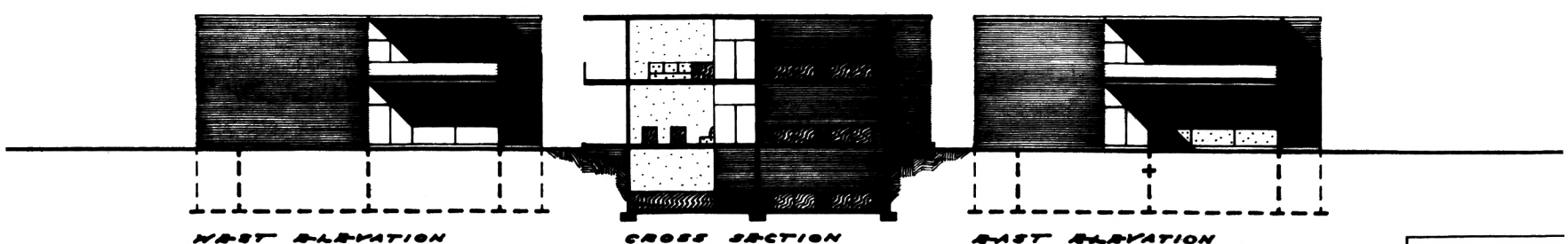
PLATE IV



SOUTH ELEVATION



NORTH ELEVATION



WEST ELEVATION

CROSS SECTION

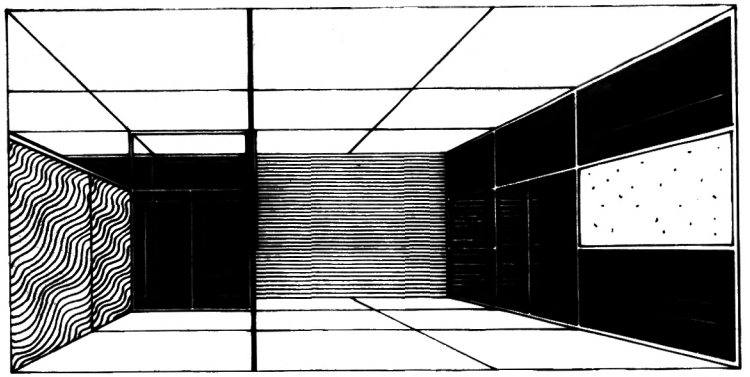
EAST ELEVATION

MACH. DEPT.

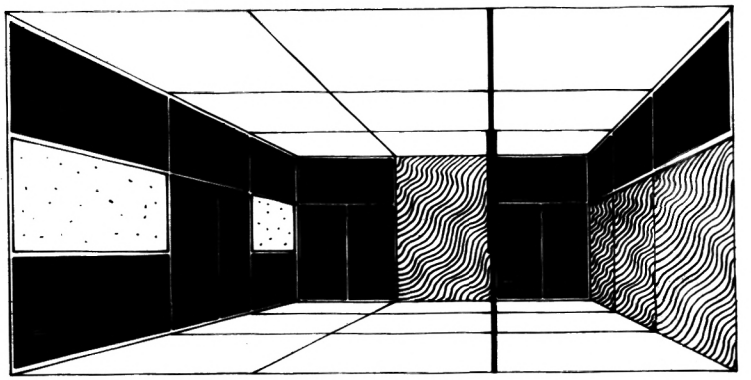
EXPLANATION OF PLATE V

Interior Perspectives

PLATE V

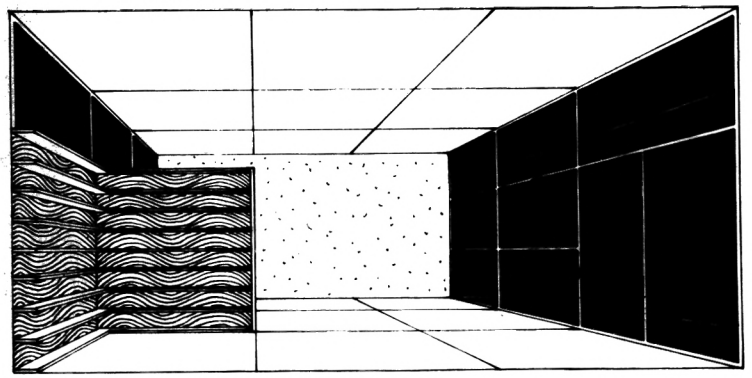


EAST WALL

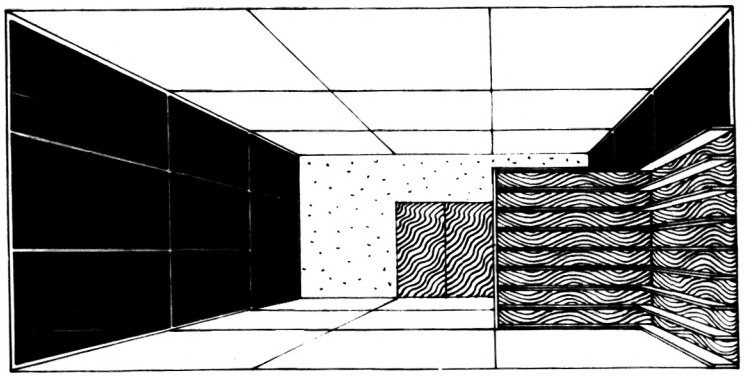


WEST WALL

INTERIOR OF EXHIBITION GALLERY & LOUNGE



WEST WALL

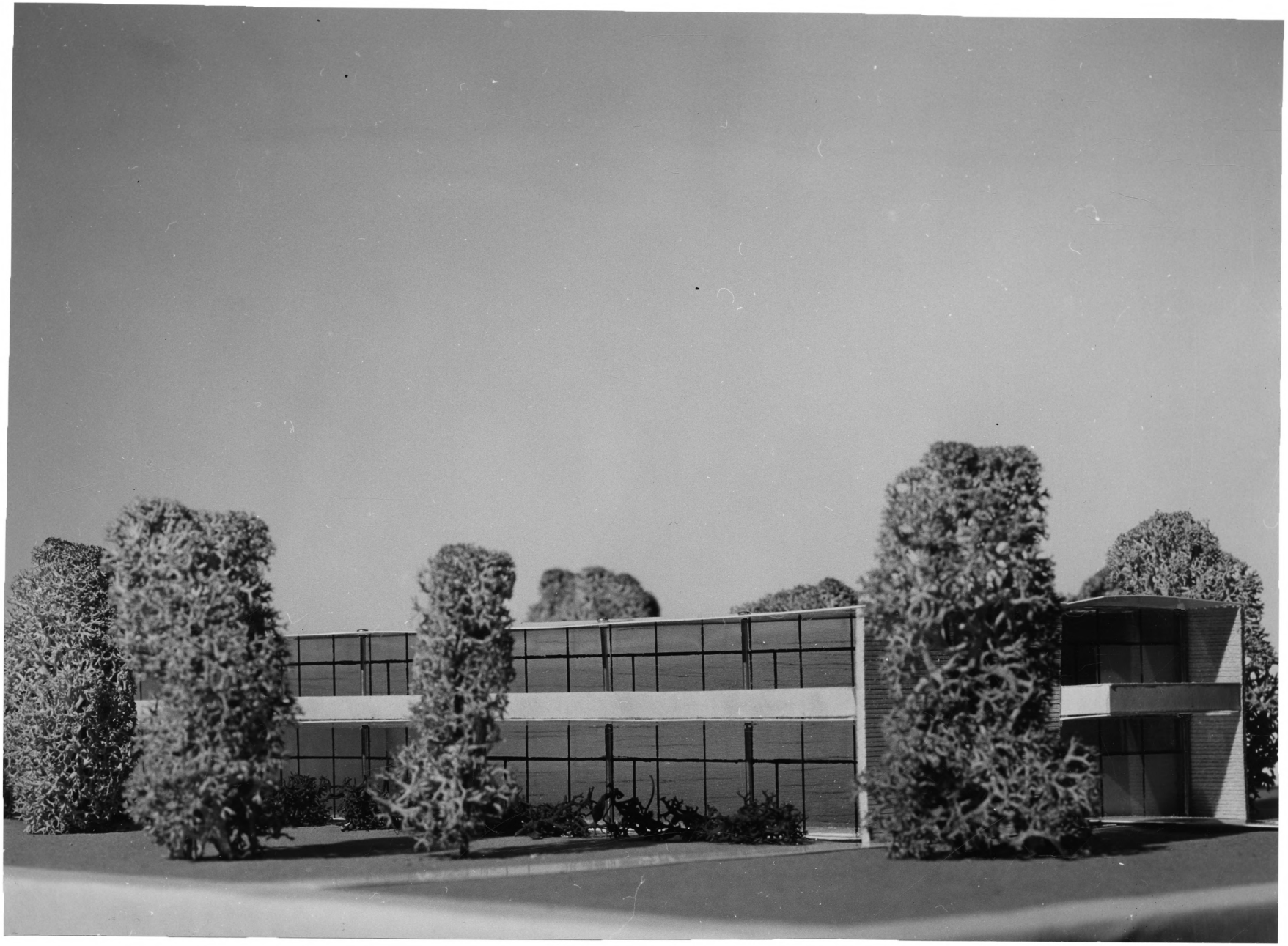


EAST WALL

INTERIOR OF LIBRARY

EXPLANATION OF PLATE VI

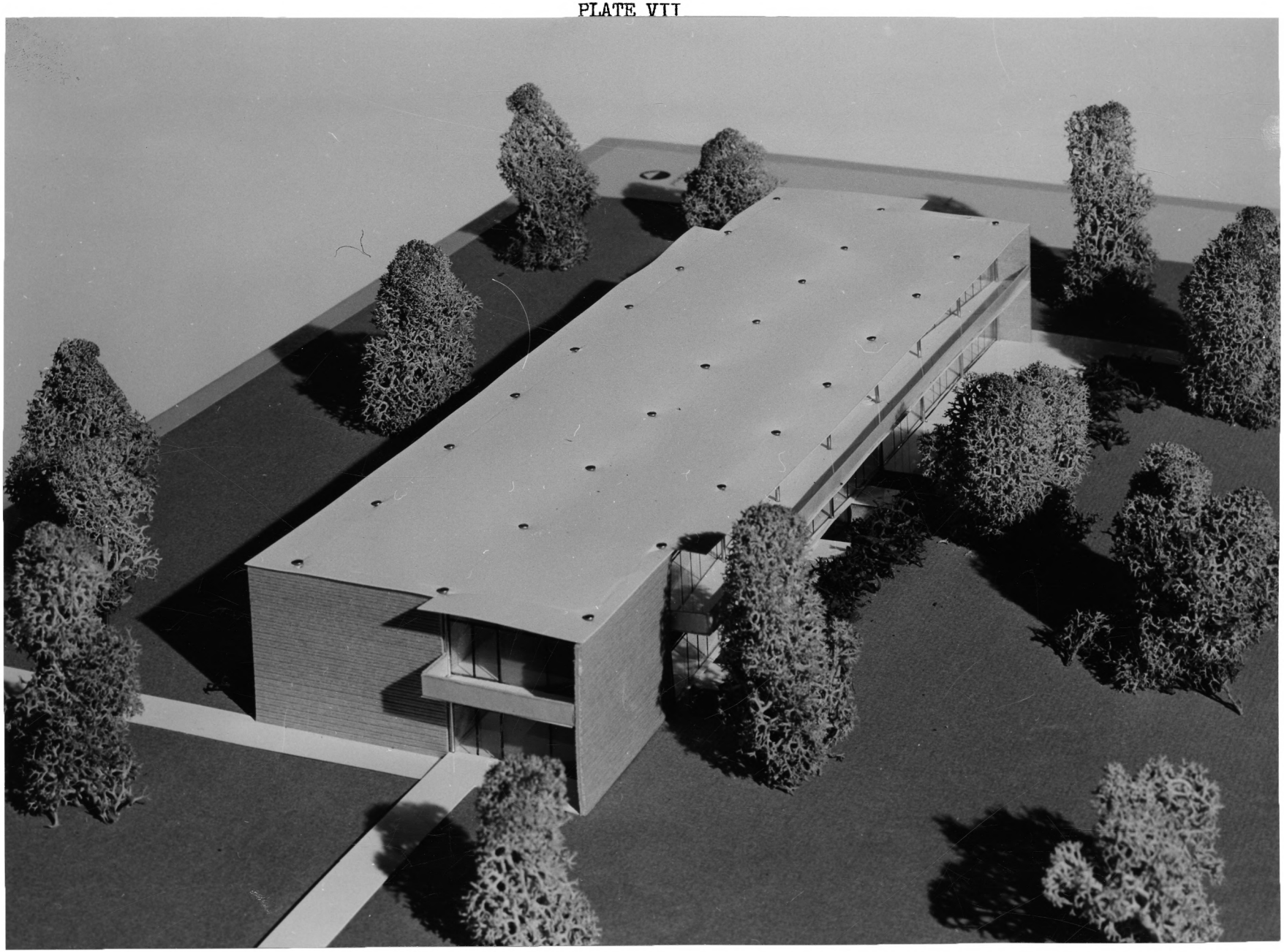
Northwest Perspective of Model



EXPLANATION OF PLATE VII

Southwest Perspective of Model

PLATE VII



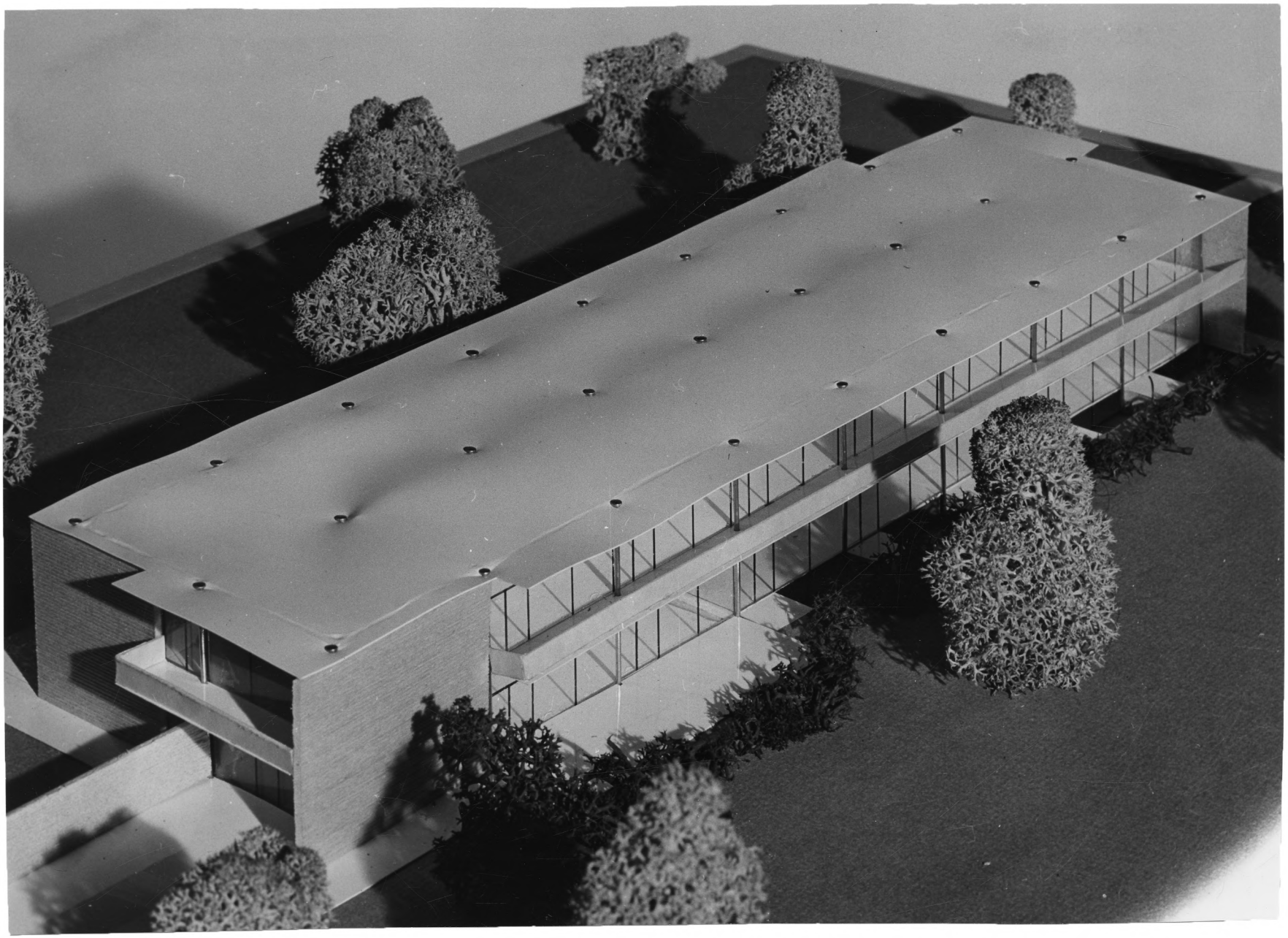
EXPLANATION OF PALTE VIII

Southeast Perspective of Model

EXPLANATION OF PLATE IX

Northeast Perspective of Model

PLATE IX



SUMMARY

Good architecture might be classified as either "dynamic" (exciting, stimulating, dramatic, imaginative, etc.) or "static" (restful, dignified, serene, unpretentious, etc.). Some buildings, of course, overlap this arbitrary division line, but most seem to fall to one side or another. Accepting the basic premise that a building is a functional, earth rooted edifice, the "static" approach seemed to be the logical selection in the development of this thesis.

Buildings have personalities in much the same way as people. The "dynamic" building, like the extrovert, must be taken in small doses and infrequently for proper digestion. The "static" building, like the introvert, does not constantly show off for attention, and as a result, can become a more extensive and less objectionable companion.

Most buildings should be considered as functional and aesthetic backdrops for the people and activities contained within. Simplicity and restraint, handled with finesse and discrimination, should be the objectives of the "static" approach to design. Function should not be forced or twisted to conform to some preconceived idea as to shape or effect, but should assume and assert its primary role in the overall composition.

Monumentality and symmetry have been almost completely cast aside in our search for a contemporary style of architecture. Now, perhaps, during a brief cycle of maturity and reflection, another item might be dispensed with; namely, novelty. The unique, the different, the unusual, etc., at times seem to be the false gods of our civilization and our architecture. Must we have this constant change just for the sake of change, without reason or rationality? Can't we attain some balance and perspective in

regard to the relative merits of change by evolution rather than by revolution? This thesis was an attempt to illustrate, by a specific problem and solution, some of the forgoing premises and conclusions. Abstract principles and vague generalities mean very little when applied to architectural design, unless accompanied by examples, elaboration and crystalization.

ACKNOWLEDGMENT

The writer wishes to express his appreciation to the following for their cooperation and help in the preparation of this thesis:

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1956

Unity, simplicity, proportion, balance, harmony, etc., are still fundamental criteria for the evaluation of architectural design. The primary purpose in the development of this thesis was to illustrate these basic principles by means of a specific building design solution.

The site selected was near the center of the campus and in close proximity with most of the existing engineering buildings. Ground coverage for the proposed building would be approximately the same as for the existing building, soon to be razed, thereby allowing all existing landscaping to be kept intact.

At present, there are 160 students enrolled in the department of architecture. Space requirements were based on a generous square foot statistical allocation for 200 students, which could accommodate up to 300 students without excessive crowding.

Economy, simplicity, and aesthetic possibilities, formed the basis for selecting a lift-slab structural system. Sliding and fixed glass walls composed the bulk of the exterior wall surfacing, terminated by unbroken masonry end bays. Interior partitions were kept to a minimum, for both functional and economical reasons. All utilities were contained within dropped ceilings, thus concealing all piping, ductwork, lighting fixtures, etc.

The exhibition gallery and lounge were placed adjacent to the main entrance for convenience to the public. Pivoted panels were employed to obtain the maximum degree of flexibility and deversity.

The library was purposely divided into two approximately equal spaces. Current periodicals, recent books, and frequently used reference material will be housed in the ground level reading room, while all

valuable, irreplaceable, and seldom used books and periodicals will be kept in a windowless, fireproof room below grade.

Due to the laboratory nature of architectural education, only two ground floor bays were set aside for classroom use, with two additional basement bays planned for audio-visual lectures.

Thirteen north bays were provided for drafting room use. Flexibility was obtained by using non-bearing curtain walls or none at all, as desired, between drafting rooms in an east-west direction.

Conference and seminar rooms were included adjacent to staff offices and could be subdivided quite easily for expansion of staff facilities. Sufficient space was allocated to give each full time staff member a generous private office.

A full basement was planned for reasons of economy and more convenient vertical circulation. The bulk of the basement area would be left unfinished and free of partitions for the present. Future use would be dictated by specific space demands, but an attempt was made to make this expansion space serviceable for a variety of uses.

Good architecture might be classified as either "dynamic" (exciting, stimulating, dramatic, imaginative, etc.) or "static" (restful, dignified, serene, unpretentious, etc.). Some buildings, of course, overlap this arbitrary division line, but most seem to fall to one side or another. Accepting the basic premise that a building is a functional, earth-rooted edifice, the "static" approach seemed to be the logical selection in the development of this thesis.