



**JOML-**

**BASIC  
SCIENCES  
RENOVATION**

OWRE HALL

**PHASE  
ONE**

AUGUST 1980

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TWIN CITIES CAMPUS

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# INTRODUCTION

## BASIC SCIENCES RENOVATION

### RENOVATION REPORT

#### INTRODUCTION

The Basic Sciences Renovation Project consists of five combined structures occupying the area north of University Hospitals and bordered by Washington Avenue and Church Street on the University of Minnesota's Twin Cities Campus in Minneapolis, Minnesota. The five integrated buildings form a continuous complex, with approximately 260,000 gross square feet; which house five of the six Basic Science Departments and the Medical School Administration in addition to three auditoria.

The five buildings involved are:

<u>Building</u>	<u>When Constructed</u>
Jackson Hall	1910
Jackson Owre Addition	1958
Owre Hall	1931
Millard Hall	1910
Lyon Laboratories	1952

The structures combined, form a six level complex with a central courtyard. Two levels are below ground and four above with mechanical equipment occupying attic spaces.

Obviously the Basic Sciences are the vital component in any Health Science Teaching Institution and this complex

plays an important and vital part in the Health Science Expansion Program at the University of Minnesota.

The renovation effort involved meeting all new life-safety codes, energy conservation codes, accessibility requirements and fresh architectural endeavors and solutions for these antiquated facilities. Phase One of the new Basic Sciences Master Plan was completed in the first part of 1980. The project is part of the Health Sciences Expansion which represents years of study, planning, and design starting in 1964.

# HISTORY - MASTER PLAN

## HISTORY - MASTER PLAN

In 1964, the University of Minnesota Board of Regents authorized a study of the health manpower needs in the upper midwest and the effect this need would have on the role of the University, providing physicians, dentists and other Health Care personnel. The University President appointed a long-range Health Sciences Planning Committee to consider objectives. The committee was made up of Health Science Deans, the Director of Hospitals, and faculty thus creating a "team concept" approach to planning.

One of their major tasks was to identify existing space deficiencies and the long term needs associated with increased enrollment in the Health Sciences required for the improvement of health care delivery to the state and surrounding areas. The Committee developed an overall plan which was approved as the Health Sciences Expansion Program (HSEP) initiated in 1968. This plan included expansion of about 750,000 square feet, much of it in the form of new buildings for the Dental School and clinical departments of the Medical School. The space vacated by the move of these units into their new space would become available for remodeling and use by other Health Science units including the Basic Sciences Departments.



A Basic Science subcommittee of this parent committee was directed to consider the particular needs of the six Basic Science departments; Anatomy, Biochemistry, Microbiology, Pathology, Physiology, Pharmacology, who provide instruction for all the Health Science Schools. This committee recommended that these departments would be allocated approximately 100,000 square feet after the additions of the 750,000 square feet. Of this 100,000 square feet, about 32,000 would be new teaching laboratories in Unit A, 10,000 square feet for Microbiology in Mayo, and the remaining 60,000 square feet would be vacated space in the Jackson-Owre-Millard-Lyon Complex which would be remodeled space primarily for faculty laboratories and offices. In addition, the plans were to remodel approximately 20,000 square feet of obsolete teaching laboratories and other support facilities currently assigned to the Basic Sciences in the same complex.

The five Basic Science Departments housed in the complex (JOML) occupied 138,112 square feet; the additional space assigned has increased their total space to 218,925 assignable square feet. Space is distributed as follows.

AUGUST 1980 - UPDATE FIGURES

SPACE BY BUILDING

BUILDING	GROSS SQUARE FEET	ASSIGNABLE SQUARE FEET
Jackson Hall	67,253	49,358
Millard Hall	80,279	55,643
Owre Hall	84,475	59,955
Lyon Labs	41,848	27,018
Jackson/Owre	46,781	26,951
TOTAL:	320,636	218,925

SPACE BY DEPARTMENT

DEPARTMENT	NET SQUARE FEET
Associated (unassignable)	101,547
Medical Student Affairs	1,878
Medical School Administration	3,596
Curriculum Office	2,024
Classroom - General - Purple	6,133
Medical School Administration (future)	3,850
*Mortuary Science	3,602
*Anatomy	52,474
*Biochemistry	33,092
*Pharmacology	35,762
*Physiology	38,375
*Pathology	35,680

DEPARTMENT

NET SQUARE FEET

Continuing Education

1,491

\*(Designates one of five Basic Science Departments)

\*\* (Mortuary Unit is a division of Anatomy in Complex)

# JUSTIFICATION

## JUSTIFICATION

### Early Planning Assumptions - 1975

The facilities for which renovation was being requested, had been occupied by the School of Dentistry since the early 1900's with minimal remodeling since the building was completed. Not only were the facilities obsolete for the dental school before they moved to the new Unit 'A' in late 1974, but they were essentially unusable for Basic Science Teaching and research. Approximately 12,000 square feet of vacated dental clinics and labs were lying fallow, due to the unsuitable conditions. The facilities the departments were forced to use were originally designed to accommodate small staffs, fewer students, and educational and research support facilities. There was little question that a deterioration in quality of the departments programs was inevitable as a result of the enrollment increases under HSEP, if renovation did not progress immediately.

Some of the departments were attempting to conduct research and house graduate students in antiquated laboratories with wooden benches, poor lighting, broken window sashes, no fume hoods, or old wooden hoods, no cold rooms, and in most cases no temperature control. Acceptance of these conditions by the Basic Sciences was predicted (at the onset of HSEP)

upon the fulfillment of a coordinated sequential plan of construction and renovation.

There was no viable alternative to the replacement or updating of the complex. Any attempt to produce the desired results through alteration of the curriculum or class scheduling would have cancelled our efforts to maintain an integrated coorelative approach to medical and dental education.

The HSEP reviewed a number of alternatives for needed space for the Basic Science Departments. Their decision was to assign the vacated space in the Jackson-Owre-Millard-Lyon Complex to the Basic Sciences for a number of reasons. The complex is ideally located and is connected to all Buildings in the Health Sciences. The complex was being vacated by Dentistry and the University already owned the buildings and was performing maintenance on them. Renovation of the space would permit the maximum efficiency and use of all facilities at the lowest cost. Replacement of the facilities over 200,000 square feet by new construction was far too costly and would require relocation of the departments, thus having a probable cost factor of 4 times renovation costs.

FUNDING SOURCE

After acceptance of the master plan for the Health Sciences Expansion, the phases were developed and time frames finalized. Unit A and K/E were constructed and occupied, the Unit B/C (clinics) proposal was submitted to HEW and the state and the Basic Sciences Project followed. A grant request for the "Remodeling Basic Science Facilities, Jackson-Owre-Millard-Lyon" was submitted March 17, 1975 the University was notified that the project had been placed on HEW's ACTIVE FUNDING LIST, and to proceed with design. Notice of 'Grant Award' would follow in 12 months when all requirements for documents were met by the University. Tentative costs had been set forth in the Grant Application as:

Total Project	\$7,499,488.00
Construction Only	\$5,808,550.00
Federal Participation	\$2,362,338.00

The difference between the Federal Participation and project cost was funded by the State of Minnesota as part of a 1976 capitol improvement request. This request, in effect, fixed the budget at the \$7,499,488 mark and was composed of State and Federal funds.

## EARLY DESIGN PARAMETERS AND DESIGN TEAM

The Architects Collaboration of Cambridge, Mass., were chosen earlier as the project architects for the entire Health Sciences Expansion Project and therefore TAC assigned a team to the (JOML) Basic Sciences Renovation. TAC's local representatives were the Minneapolis based firm, Health Sciences Architects and Engineers (HSAE) who would be responsible for contract documents.

These firms were given the task of integrating the Basic Sciences requirements into the Master Plan and developing a master plan for the complex. The budget was identified and the following criteria was transmitted to both TAC and HSAE:

1. Budget: \$5,808,550 Constr. Cost
2. Renovation Square Feet: 80,000 Department Space
3. Master Plan entire complex: Scheme integration
4. Airconditioning and temperature control
5. Fire protection and management
6. Barrier Free design requirements
7. Upgrade to latest BUILDING CODE
8. Implement University Standard for Design
9. Meet all State, Federal and Local requirements.
10. Translate occupants requirements into construction documents.



11. Consult and assist University related to and budget.
12. Plan should inconvenience department as little as possible with no interruption of teaching or research programs.
13. Building's exterior should remain essentially unchanged.

The uniqueness of a project to renovate an occupied reasearch facility was a challenge to the design firms as well as University planners. Federal participation in the project required that no decrease in teaching or other educational research would be tolerated as a result of the renovation.

Vacating the Buildings or areas of the Buildings to accomodate the construction was discounted because of the extremely high cost of renting replacement space for research. 1978 figures for relocating the occupants were computed to be between \$150 and \$180 per square foot depending on type of lab, therefore it could have cost millions of dollars of project funds to vacate during construction. It was realized immediately that the project could not afford such expenditures and the decision to proceed with renovating an occupied structure was made during the Early Design Parameter Phase.

# PROGRAMMING

## PROGRAMMING

### COMMITTEES AND INFORMATION FLOW

For the purpose of developing the requirements, or program for the project and defining the Basic Sciences particular needs, the Vice-President for Finance appointed a Basic Sciences Building Advisor Committee in June 1973. This Committee was made up of distinguished representatives of the various Health Sciences Schools, Space Management, University Hospitals and was chaired by Paul Maupin (Health Sciences Planning Coordinator). This committee established guidelines for space assignment in the Complex and resolved all of the early planning assumptions, they established room assignments and began the process of identifying types of occupancy and compiled lists of occupants equipment needs for the Grant. They also aided in the Grant preparation to an invaluable degree.

In May 1975, the Building Advisory Committee was restructured to meet the particular requirements of the programmatic planning phase. Basically, this is the facility design phase and the architects are on board to begin schematic design. The restructuring involved appointing a representative from each of the Basic Science Departments occupying the structure, Physical Plant Operations, the Medical School Administration, Space Planning and the Health Sciences Planning Office. Once again

this committee was chaired by Paul Maupin and the members were as follows:

Executive Secretary	Ms. Virginia Lewis
Medical School	Mr. James Nelson
Physical Plant	Mr. Dick Hendricks
Anatomy	Mr. Don Robertson
Biochemistry	Dr. James Bodley
Pathology	Dr. Andreas Rosenberg
Pharmacology	Dr. Nelson Goldberg
Physiology	Dr. Richard Poppele
Mortuary Science	Mr. Dale Stroud

This new committee would function as an advisory body during planning, construction through occupancy.

The Health Sciences Planning Office would be the interface or contact for the committee with the consultants and the committee would provide information as requested and advise their departments on developments. This organization for information gathering and project management proved highly satisfactory both to the consultants and the future occupants.

Due to budget constraints or physical limitations to construction many decisions requiring alternate choices developed, and the committee was very responsive to these problem solving tasks. They greatly assisted the architects in meeting schedules

and design intent was facilitated. One example would be the Mechanical Towers and the evolution of this unique approach to renovation. The architects presented a number of schemes for installation of massive mechanical systems in the Complex to air condition and ventilate the re-use areas. The schemes either usurped too much assignable space, or produced too much noise and vibration, or were inefficient due to long duct runs and low head room.

The fact that the Complex is five separate structures in a rectangular configuration and that the areas to be renovated were peppered throughout the buildings and levels made the challenge intriguing for all. After extensive study the Health Sciences Planning Coordinator, architects and the committee arrived at a design solution appropriate to the needs. The solution was to design four separate mechanical towers, one in each quadrant of the Complex, to house the air handling units and other equipment to serve each floor of each quadrant independently. This enabled smaller units isolated from the structures and ducted into areas required. This design was more energy efficient, quieter, less expensive, allowed for variation of supply, and further allowed full use of assignable space.

The committee continued to function well as an aid to designers throughout the design phases. Members of the committee also coordinated meetings with particular occupants

in their departments and the Health Sciences Planning Coordinator and his assistants.

The Coordinator appointed a project manager to represent the Owner (U of M) in all meetings with the architects and to oversee the design effort. The manager scheduled all meetings and managed the paper flow and distribution, as well as conducting the reviews. This effort insured continuity and protected the best interest of the University. Almost 300 meetings were scheduled and attended by the project manager in the year long design effort. He met approximately three times with each room occupant to finalize layouts, equipment locations, services required and casework (bench) layouts and elevations.

Extra design sessions were required for any special services or room requirements; such as: special finishes, computer rooms, temperature control, etc.

The architectural effort of course was to ensure Code compliance and to translate input from the Planning Office into architectural language for Construction Documents. They were responsible for identifying costs and schedules of events for timely execution of tasks. During the early design development phase TAC and HSAE identified the major code deficiencies for JOML - the main ones being Life Safety Code at vertical connections, fire protection, and ventilation in laboratories. The architects defined the requirements and explained options at this early

time in an effort to arrive at some early budget assumptions.

The University of Minnesota Engineering and Construction Division also had a large role in development of this project, as they provide interpretation of University Standards for construction. Engineering provided the consultants with lengthy evaluations of the mechanical and electrical systems available in the Health Sciences and evaluations of materials approved for use. Engineering also interpreted the University's documents prior to the Bidding.

Early on it became evident that the project would be phased due to occupancy requirements (occupants moving out of space into renovated space, etc.). In an effort to meet schedule it was decided that the first Phase would have to be mechanical systems, i.e. the towers - so the project was broken into two parts. Contract 'A' would be the newly constructed mechanical towers and Contract 'B' would be assignable space. This would allow for completion of documents for Contract 'A' and construction to begin on this Phase, within a year of 'Grant Award' as stipulated by HEW. Contract 'B' documents could be completed during Contract 'A' construction.

# EARLY BUDGET



### EARLY BUDGET ASSUMPTION

It had been evident from the onset of the design phase that definition of the scope of the project related to funds available would be a complex process. In any renovation it is difficult to discern a cut off point or degree of renovation. This project had a fixed budget designated to renovate 81,000 square feet of vacated and obsolete space as well as associated space. Once the cost of correcting the Code related items was identified the design teams and the Health Sciences Planning Office were accutely aware of a shortfall in funds for assigned space. A newer Uniform Building Code was adopted after funds were secured thus raising the cost of code correction and market cost escalation also outstripped all projections for cost of construction.

These situations required cautious planning with the emphasis primarily on functions related to teaching and graduate research, with all ancillary space identified as minimum renovation. The Group II funds usually reserved for moveable equipment purchase was entirely dedicated to purchase of environmental rooms. All office equipment and furnishings were omitted from consideration and no funds were available for laboratory equipment.

Federal (HEW) approval was granted to transfer approximately \$500,000.00 originally for equipment into the construction budget. The consultants still cautioned that the budget was

tight and obviously the impact on design was pervasive. Even with the funding problems all committee members and design participants eagerly took on the challenge of designing an up-to-date facility, and departments took the responsibility for office furnishings and equipment purchases upon themselves and sought other sources of funding.

The early budget allowed a construction cost of \$5,640,000 and a total project cost of \$7,499,488 including the site work and Group II (Cold Rooms), as well as consultant fees. Federal participation was in the Grant amount of \$2,362,338. The balance from the State Legislative Body was \$5,137,150.

March 26, 1975

EARLY BUDGET 1975

Replacement/Remodeling 81,000 NSF of Basic Science  
Facilities (Owre-Jackson-Millard Hall).

Cost Summary

Budget Line

1. Building Work

	<u>Eligible</u>	<u>Total</u>	
a. General Constr.	\$715,500	\$1,590,000	
b. Plumbing	364,500	810,000	
c. Heat, Vent, Air Cond.	870,750	1,935,000	
d. Electrical	427,500	950,000	
e. Elevator	45,000	100,000	
f. Other keying, fire exting., & towel cabinets	2,025	4,500	
TOTAL BUILDING	<u>\$2,425,275</u>		\$5,389,500

2. Site Work

\_\_\_\_\_

3. Off-site Work

\_\_\_\_\_

4. Central Plant

\_\_\_\_\_

5. Total Construction Cost

\$5,389,500

6. Fixed Equipment

112,500

250,000

7. A/E Costs

a. Architects Basic Fee			
1,590,000			
810,000			
1,935,000			
950,000			
100,000			
250,000			
<u>\$5,635,000</u> X 10%	253,575	563,500	
b. Redesign	4,500	10,000	
c. Supervision			
\$5,635,000 X 1 1/4%	31,697	70,438	
d. Surveys & Test Borings	_____		
e. Other items, consultants, reimbursables, U of M review etc.,	30,150	67,000	
	<u>319,922</u>	710,938	

# PROJECT DESCRIPTION

PROJECT DESCRIPTION

The buildings comprise a Complex as follows:

<u>NAME</u>	<u>BUILT</u>	<u>GROSS AREA**</u>	<u>NET AREA**</u>	<u>HEIGHT</u>
Jackson Hall	1910	83,946	64,574	6 levels*
Jackson/Owre Addition	1958	47,736	40,067	6 levels*
Owre Hall	1931	92,430	71,697	7 levels*
Millard Hall	1910	94,559	75,221	6 levels*
Lyon Lab	1952	47,411	40,996	6 levels*

Net assignable square feet is 220,000 for the entire complex in the above figures do not include the two new mechanical towers but reflect the condition prior to renovation.

All buildings are concrete frame structures, with face brick exteriors. Lyon Labs has aluminum frame windows and the other four buildings have wood frame, double hung windows and screens. The majority of the interior walls and ceilings prior to construction were gypsum plaster and the floors were either terrazzo or asbestos tile on concrete. The buildings were heated and steam radiation and was cooled by isolated window units in some areas.

\* 2 levels below grade.

\*\* Actual square feet listed elsewhere

The first thing to do after the space was reassigned to the five departments involved was to assess the structure and develop the departmental programs within the framework of the Complex Master Plan. Each Advisory Committee member was requested to provide the Health Sciences Planning Office with their functional space program. This input was reviewed with each and then assembled in one document by the Health Sciences Planning Coordinator.

The HSPO then assisted the Architect in interpreting the document in an Architectural language and the Schematic Design evolved.

The Schematic Design was then reviewed, corrected or modified, and approved by the committee, the HSPO, Engineering and Construction Division of the Planning Office and by Administration. HEW was also notified and approval requested.

The Schematic Design indicated the two Contract approach with Contract 'A' being the construction of two mechanical equipment buildings on the South side of the Complex and Contract 'B' being renovation of assigned space and associate space within the Complex in accordance with the HEW Grant.

At this point the architects once again indicated that a reduction of scope was necessary or more funding needed to be identified, as their projected cost estimate indicated a

deficite. The committee, departments and the Health Sciences Planning Coordinator developed a prioritized list of deductions that could be applied to the design.

The consultants developed a preliminary construction schedule indicating on August 1976 start for Contract 'A' tower construction. Then they outlined a phased construction for Contract 'B' as follows:

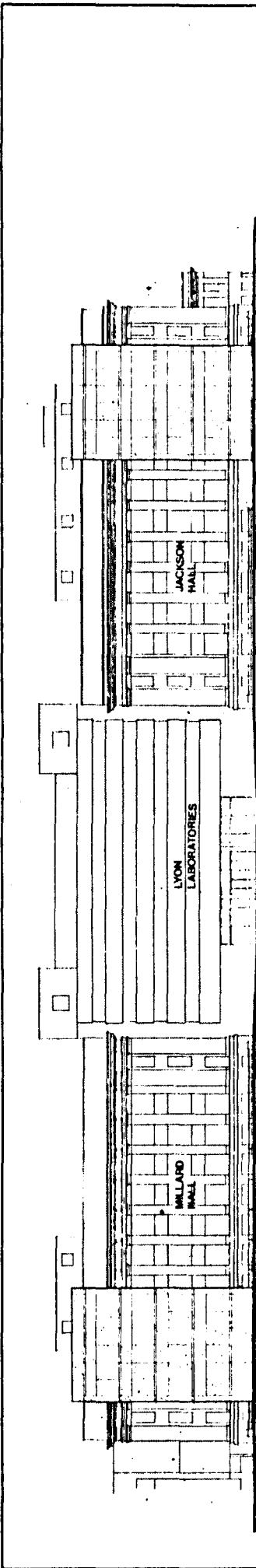
Phase I - Non-assignable areas of project and Owre Hall vacated clinics.

Phase II - 60,000 square feet of assignable space including Phase I completion.

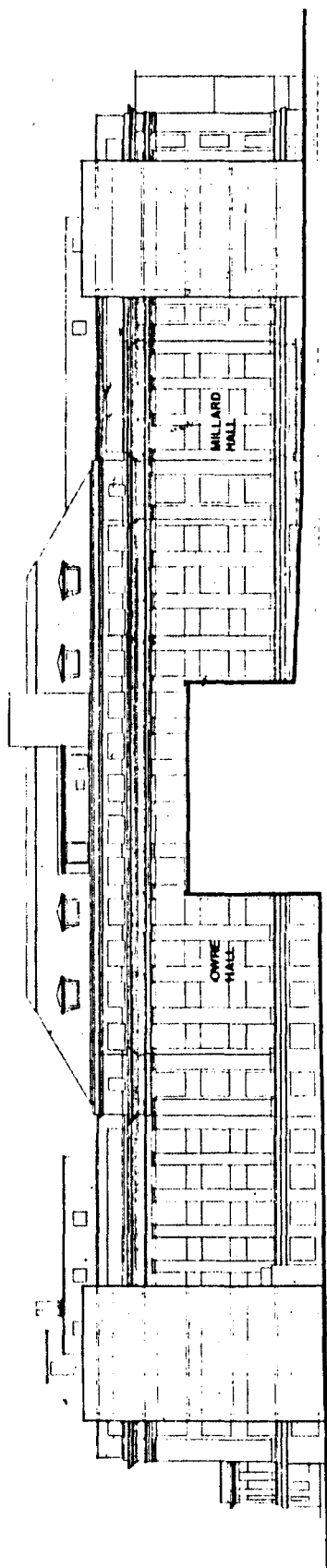
Phase III - 18,000 square feet of re-designed space.

Phase IV - 2,500 square feet of re-assigned space.

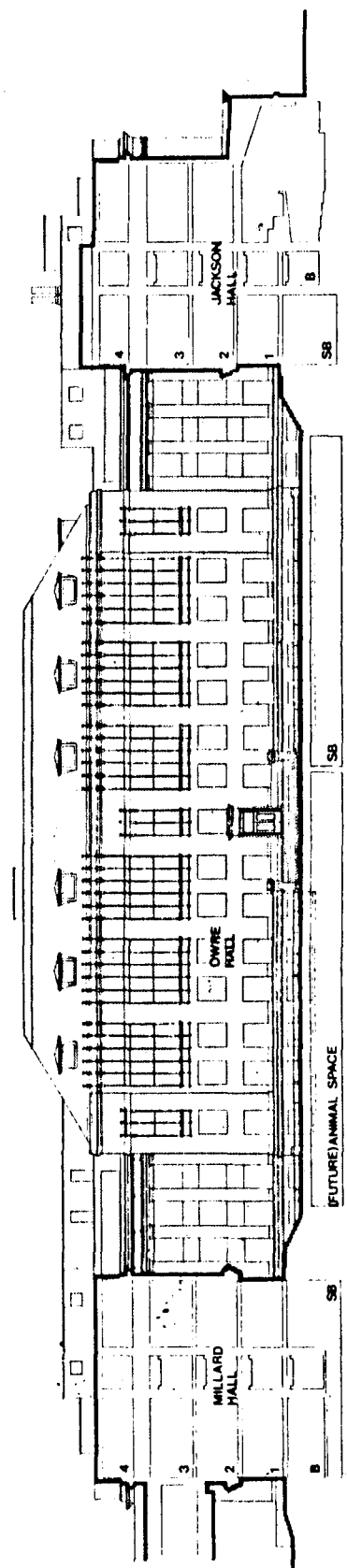
Of course phases overlap and are much more complicated than indicated. But basically the plan was to have occupants vacate areas and move into renovated spaces as soon as reasonable. This phased approach would require extensive planning and coordination between the Contractor and the project manager and U of M construction superintendent.



NORTH ELEVATION




SOUTH ELEVATION

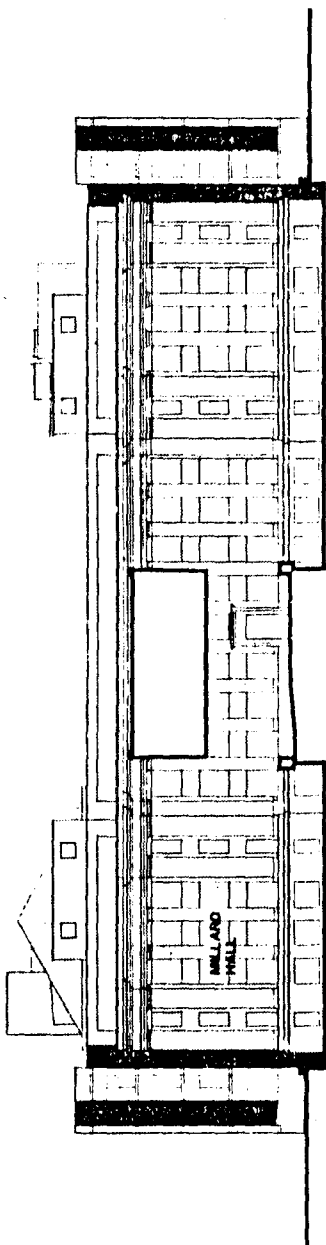


EAST/WEST SECTION - ELEVATION

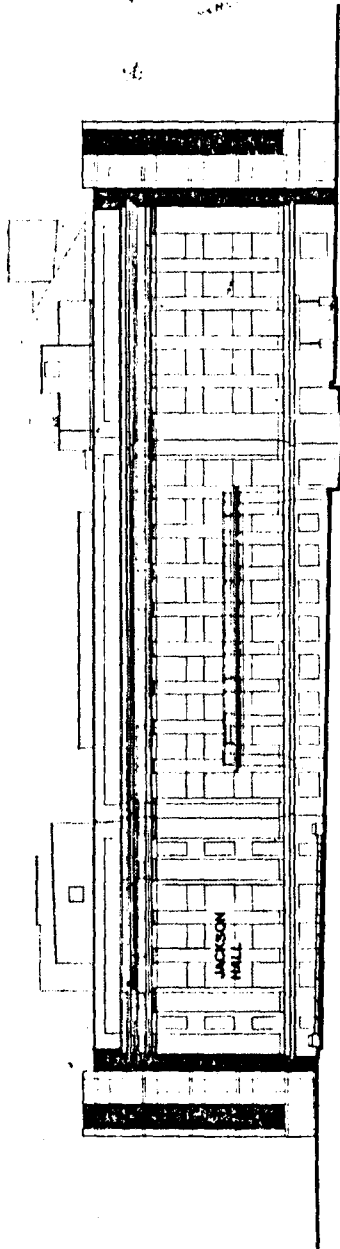
3-20

	<b>UNIVERSITY OF MINNESOTA</b> <b>HEALTH SCIENCES EXPANSION</b> <small>MINNESOTA</small>		<b>JOWL</b> <small>JACKSON OWRE MILLARD LYON          COMPLETE REBUILDING</small>		<b>ELEVATIONS</b>
	<small>THE ARCHITECTS COLLABORATIVE, INC. CAMBRIDGE, MASS. &amp;          THE HEALTH SCIENCES ARCHITECTS &amp; ENGINEERS, INC.          THE UNIVERSITY OF MINNESOTA          100 UNIVERSITY AVENUE, S.E.          MINNEAPOLIS, MINN. 55455</small>		<small>JACKSON OWRE MILLARD LYON          COMPLETE REBUILDING          100 UNIVERSITY AVENUE, S.E.          MINNEAPOLIS, MINN. 55455</small>		

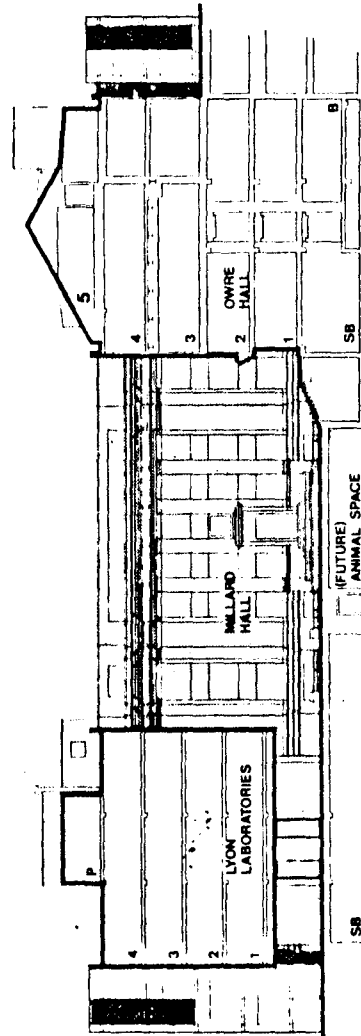




EAST ELEVATION



WEST ELEVATION



NORTH/SOUTH SECTION-ELEVATION

3-21

UNIVERSITY OF MINNESOTA  
HEALTH SCIENCES EXPANSION  
MINNEAPOLIS

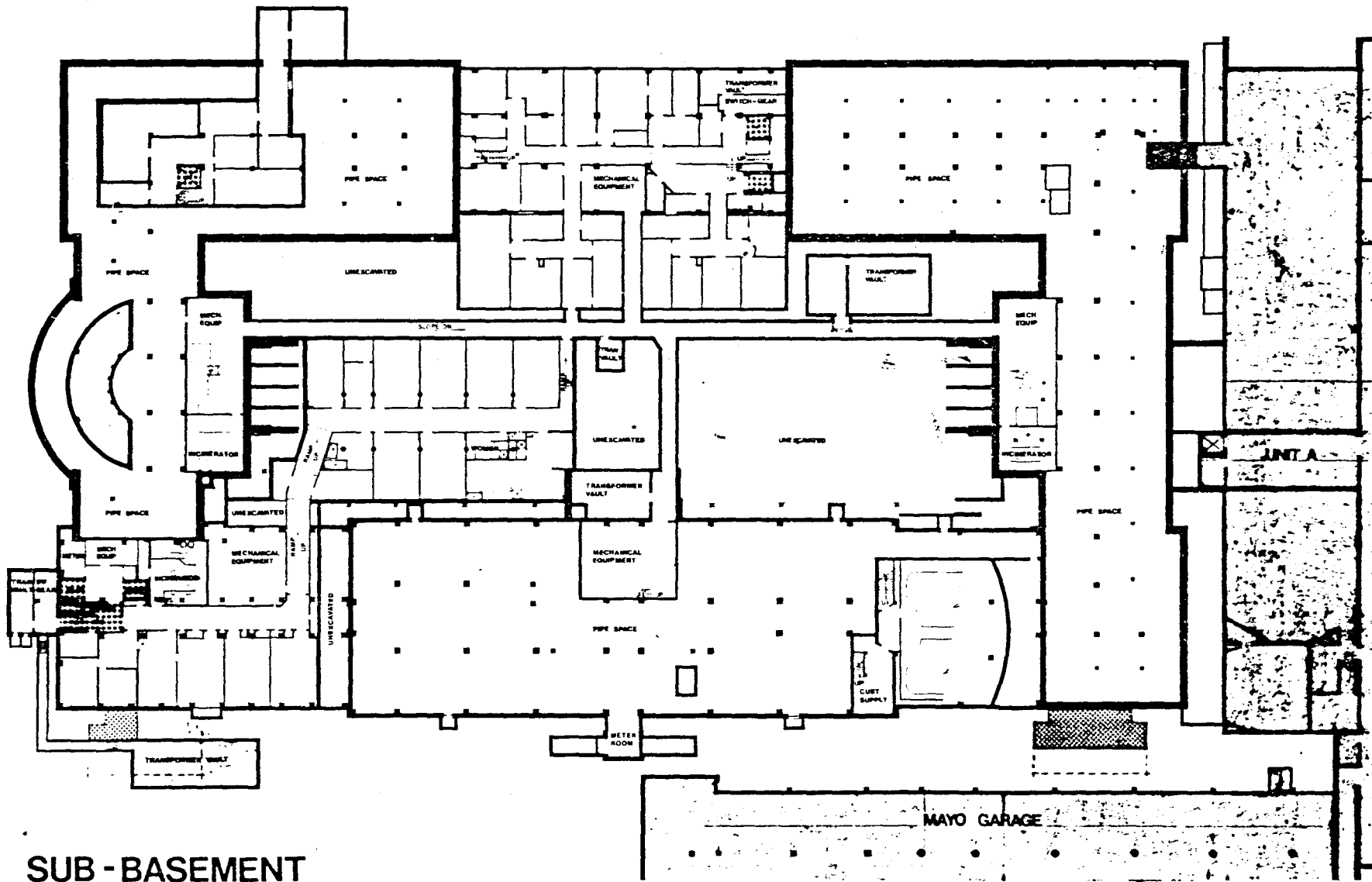
THE ARCHITECTS COLLABORATIVE INC CAMBRIDGE, MASS. &  
THE HEALTH SCIENCES ARCHITECTS & ENGINEERS INC  
MINNEAPOLIS, MINNESOTA  
100 EAST WASHINGTON ST.  
MINNEAPOLIS, MINNESOTA 55433

JOML

JACKSON OWRE MILLARD LYON  
COMPLEX REWORKING

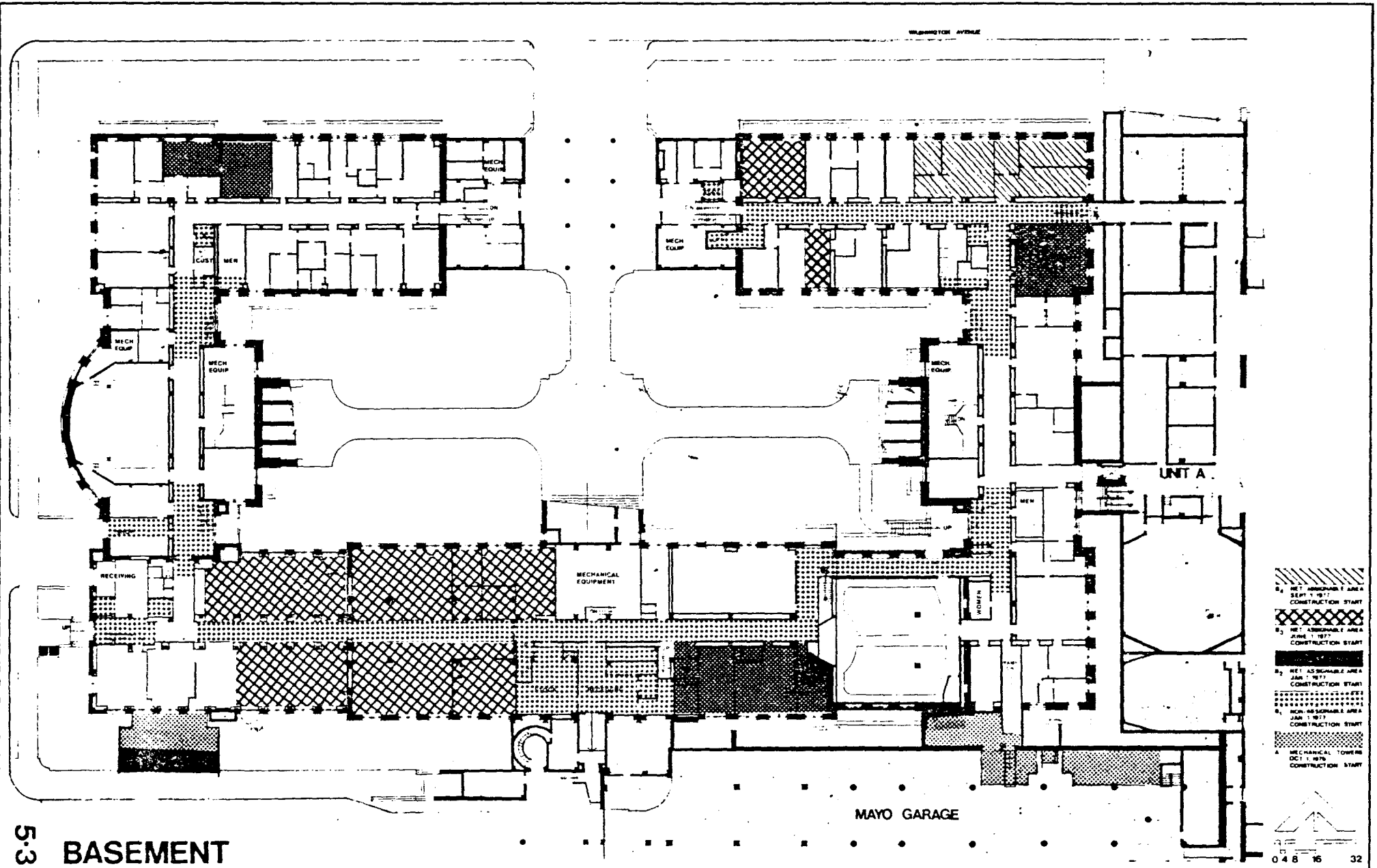
ELEVATIONS





5.2 SUB-BASEMENT

	<b>UNIVERSITY OF MINNESOTA</b> <b>HEALTH SCIENCES EXPANSION</b> MINNEAPOLIS MINNESOTA	THE ARCHITECTS COLLABORATIVE INC CAMBRIDGE MASS & THE HEALTH SCIENCES ARCHITECTS & ENGINEERS INC <small>THE HEALTH ASSOCIATES INC          100 WEST WASHINGTON ST          MINNEAPOLIS, MINNESOTA 55402</small>	<b>JOML</b> <small>CLARENCE J. JOHNSON          ARCHITECT &amp; ENGINEER          100 WEST WASHINGTON ST          MINNEAPOLIS, MINNESOTA 55402</small>	<b>JACKSON OWRE MILLARD LYON</b> <b>COMPLEX REMODELING</b> <small>100 WEST WASHINGTON ST          MINNEAPOLIS, MINNESOTA 55402</small>	<b>75 GRANT CONSTRUCTION</b>
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53 BASEMENT

**UNIVERSITY OF MINNESOTA**  
**HEALTH SCIENCES EXPANSION**  
 MINNEAPOLIS MINNESOTA

THE ARCHITECTS COLLABORATIVE, INC. CAMBRIDGE, MASS. &  
 THE HEALTH SCIENCES ARCHITECTS & ENGINEERS, INC.  
 THE LEADY ARCHITECTS, INC.  
 DONALD LATHIN & COMPANY, INC.  
 MINNEAPOLIS, MINNESOTA  
 11 PAUL WISNIEWSKI  
 MINNEAPOLIS, MINNESOTA

**JOML**  
 JACKSON OWRE MILLARD LYON  
 COMPLEX REMODELING

MINNEAPOLIS, MINNESOTA  
 11 PAUL WISNIEWSKI  
 MINNEAPOLIS, MINNESOTA

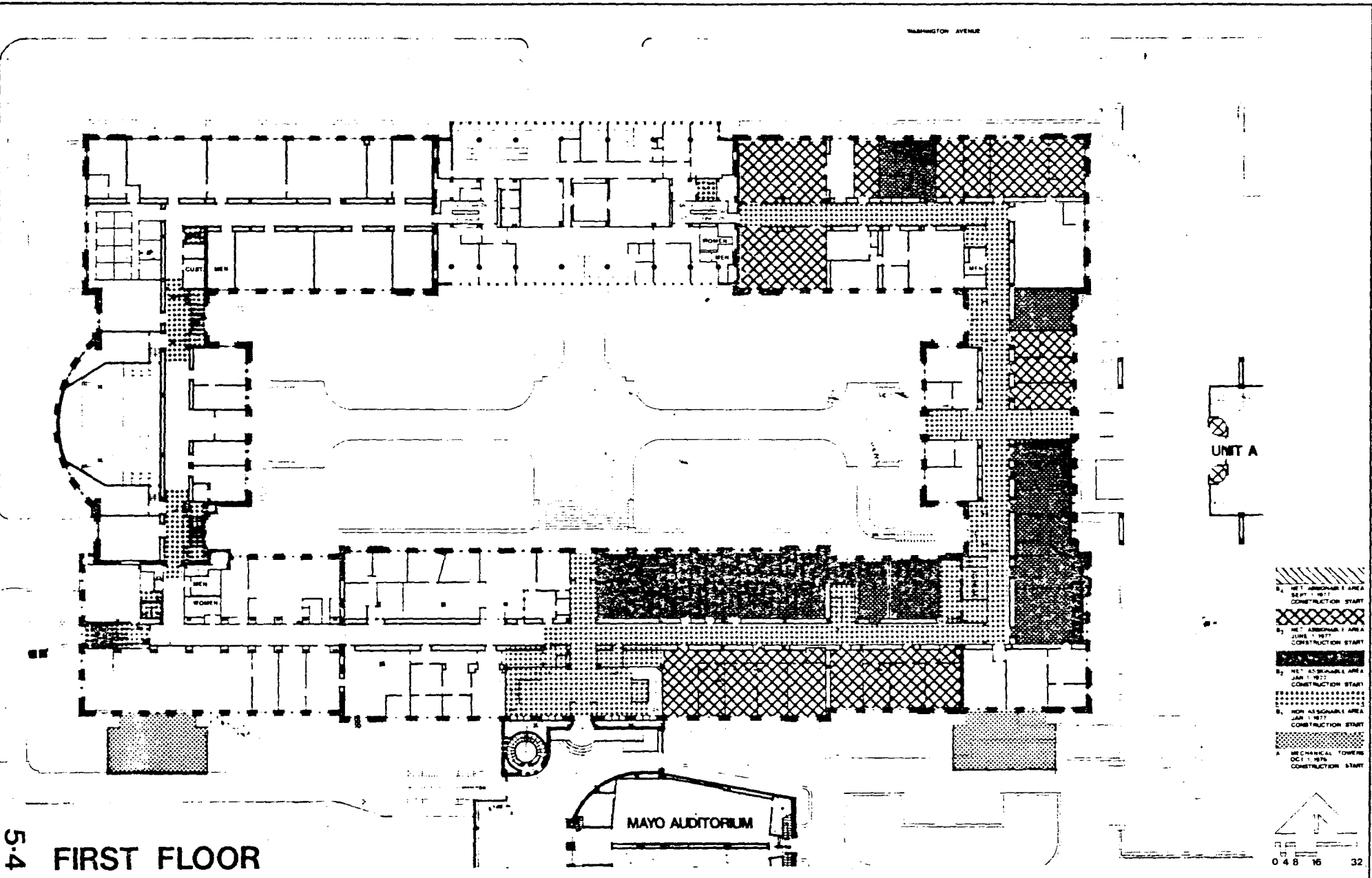
**75 GRANT CONSTRUCTION**

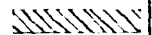
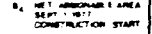

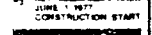

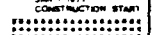
- 1. MECH. EQUIP. AREA  
 SEPT. 1, 1977  
 CONSTRUCTION START
- 2. MECH. EQUIP. AREA  
 JUNE 1, 1977  
 CONSTRUCTION START
- 3. MECH. EQUIP. AREA  
 JAN. 1, 1977  
 CONSTRUCTION START
- 4. MECH. EQUIP. AREA  
 JAN. 1, 1976  
 CONSTRUCTION START
- A. MECHANICAL TOWER  
 DEC. 1, 1976  
 CONSTRUCTION START



WASHINGTON AVENUE

-34-

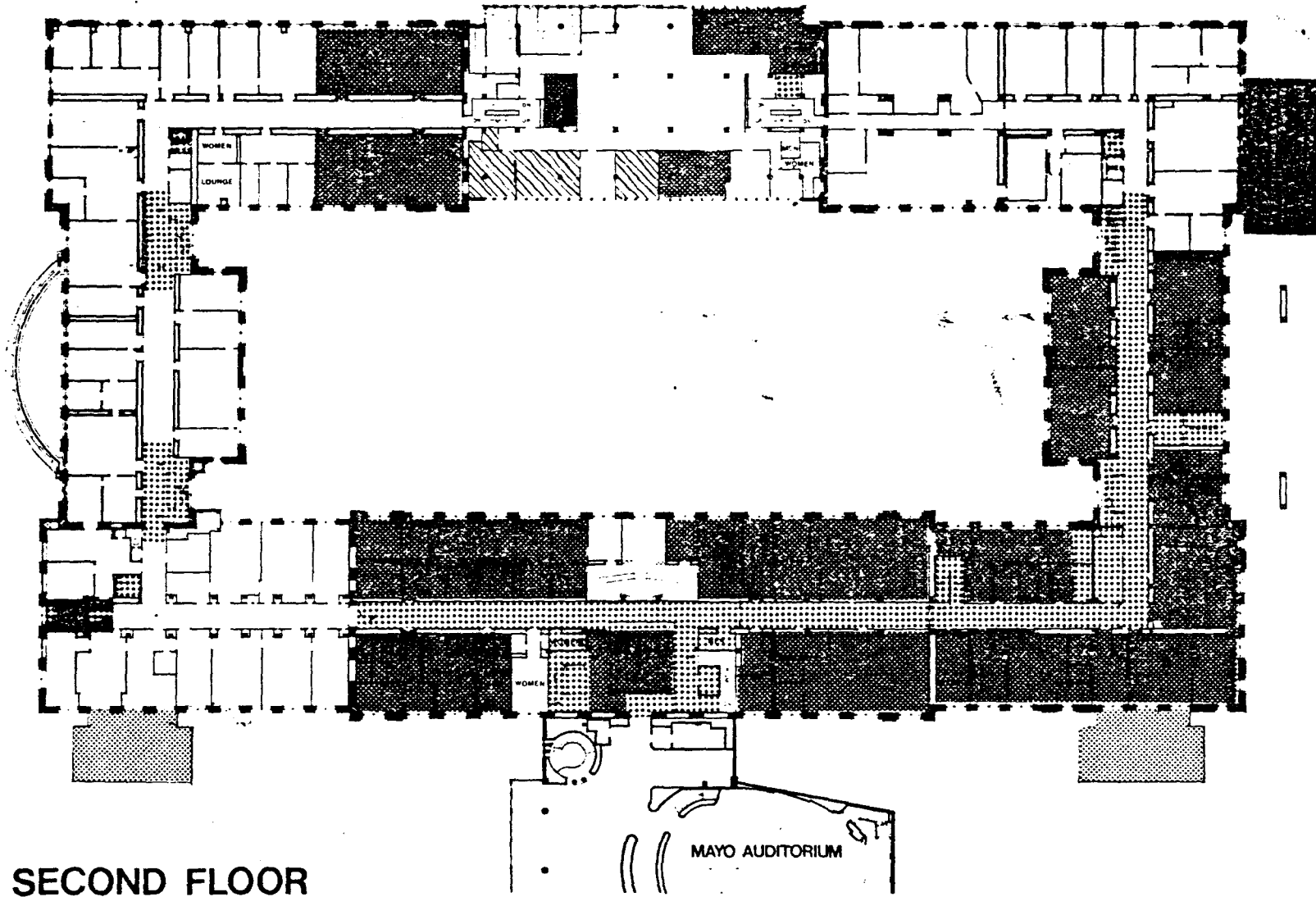


- 
 B1. MECHANICAL TOWER AREA  
 SEPT. 1977  
 CONSTRUCTION START
- 
 B2. ASSIGNABLE AREA  
 JUNE 1977  
 CONSTRUCTION START
- 
 B3. ASSIGNABLE AREA  
 JAN. 1977  
 CONSTRUCTION START
- 
 B4. ASSIGNABLE AREA  
 JAN. 1977  
 CONSTRUCTION START
- 
 B5. ASSIGNABLE AREA  
 JAN. 1977  
 CONSTRUCTION START
- 
 A. MECHANICAL TOWER  
 OCT. 1976  
 CONSTRUCTION START

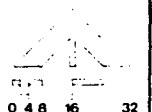
5-4 FIRST FLOOR



35



- 1. Hatched pattern: UNIT 1 ASSEMBLY AREA  
CONSTRUCTION START  
SEP 1, 1977
- 2. Cross-hatched pattern: UNIT 2 ASSEMBLY AREA  
CONSTRUCTION START  
JUNE 1, 1977
- 3. Solid black: UNIT 3 ASSEMBLY AREA  
CONSTRUCTION START  
JAN 1, 1977
- 4. Dotted pattern: UNIT 4 ASSEMBLY AREA  
CONSTRUCTION START  
JAN 1, 1977
- 5. Horizontal line pattern: MECHANICAL TOWERS  
CONSTRUCTION START  
OCT 1, 1976



5.5 SECOND FLOOR

MAYO AUDITORIUM

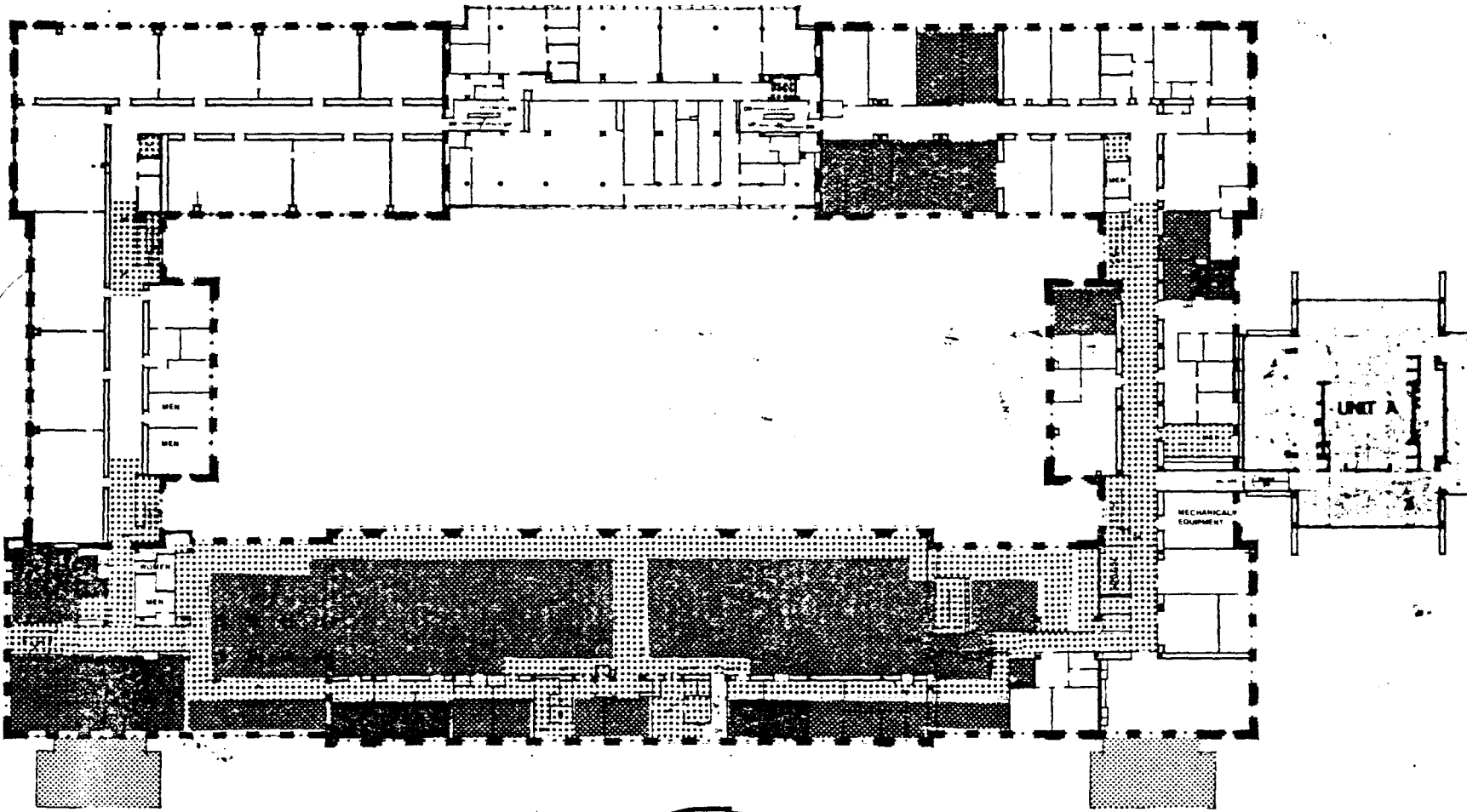
**UNIVERSITY OF MINNESOTA**  
HEALTH SCIENCES EXPANSION  
MINNEAPOLIS MINNESOTA

THE ARCHITECTS COLLABORATIVE INC CAMBRIDGE MASS &  
THE HEALTH SCIENCES ARCHITECTS & ENGINEERS, INC.  
THE CERNT ASSOCIATES INC MINNEAPOLIS, MINNESOTA  
LARRY GREEN & ASSOCIATES INC ST PAUL, MINNESOTA  
MINNEAPOLIS, MINNESOTA

JOML

JACKSON OWRE MILLARD LYON  
COMPLEX REMODELING  
MINNEAPOLIS, MINNESOTA

**75 GRANT CONSTRUCTION**



- 74 NET ASSEMBLY AREA  
CONSTRUCTION START  
SEPT. 1, 1977
- 73 NET ASSEMBLY AREA  
CONSTRUCTION START  
JUNE 1, 1977
- 72 NET ASSEMBLY AREA  
CONSTRUCTION START  
JAN. 1, 1977
- 71 NET ASSEMBLY AREA  
CONSTRUCTION START  
JAN. 1, 1977
- 70 MECHANICAL EQUIPMENT  
CONSTRUCTION START  
OCT. 1, 1976

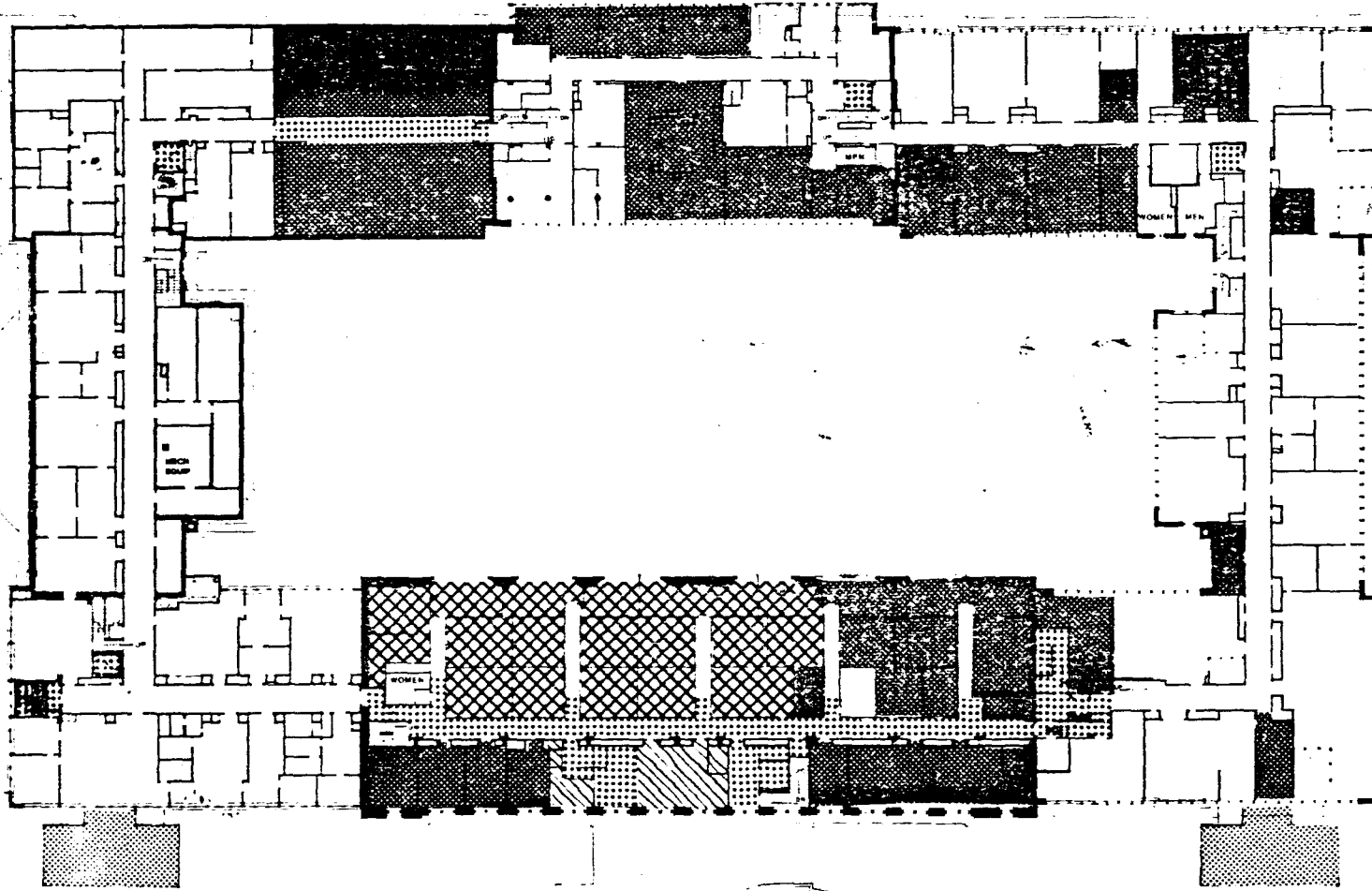





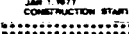
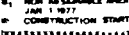
50

THIRD FLOOR



-37-



-  NET ASSIGNABLE AREA  
SEPT. 1, 1977  
CONSTRUCTION START
-  NET ASSIGNABLE AREA  
JUNE 1, 1977  
CONSTRUCTION START
-  NET ASSIGNABLE AREA  
JAN. 1, 1977  
CONSTRUCTION START
-  NET ASSIGNABLE AREA  
JAN. 1, 1977  
CONSTRUCTION START
-  MECHANICAL TOWERS  
OCT. 1, 1976  
CONSTRUCTION START

5.7

# FOURTH FLOOR



 UNIVERSITY OF MINNESOTA  
HEALTH SCIENCES EXPANSION  
MINNEAPOLIS MINNESOTA

THE ARCHITECTS COLLABORATIVE, INC. CAMBRIDGE, MASS. &  
THE HEALTH SCIENCES ARCHITECTS & ENGINEERS, INC.  
THE FRANK ASSOCIATES, INC. ST. PAUL, MINNESOTA  
HEWLETT, GREEN & COMPANY, INC. ST. PAUL, MINNESOTA  
LETTING, TULLY & COMPANY, INC. ST. PAUL, MINNESOTA

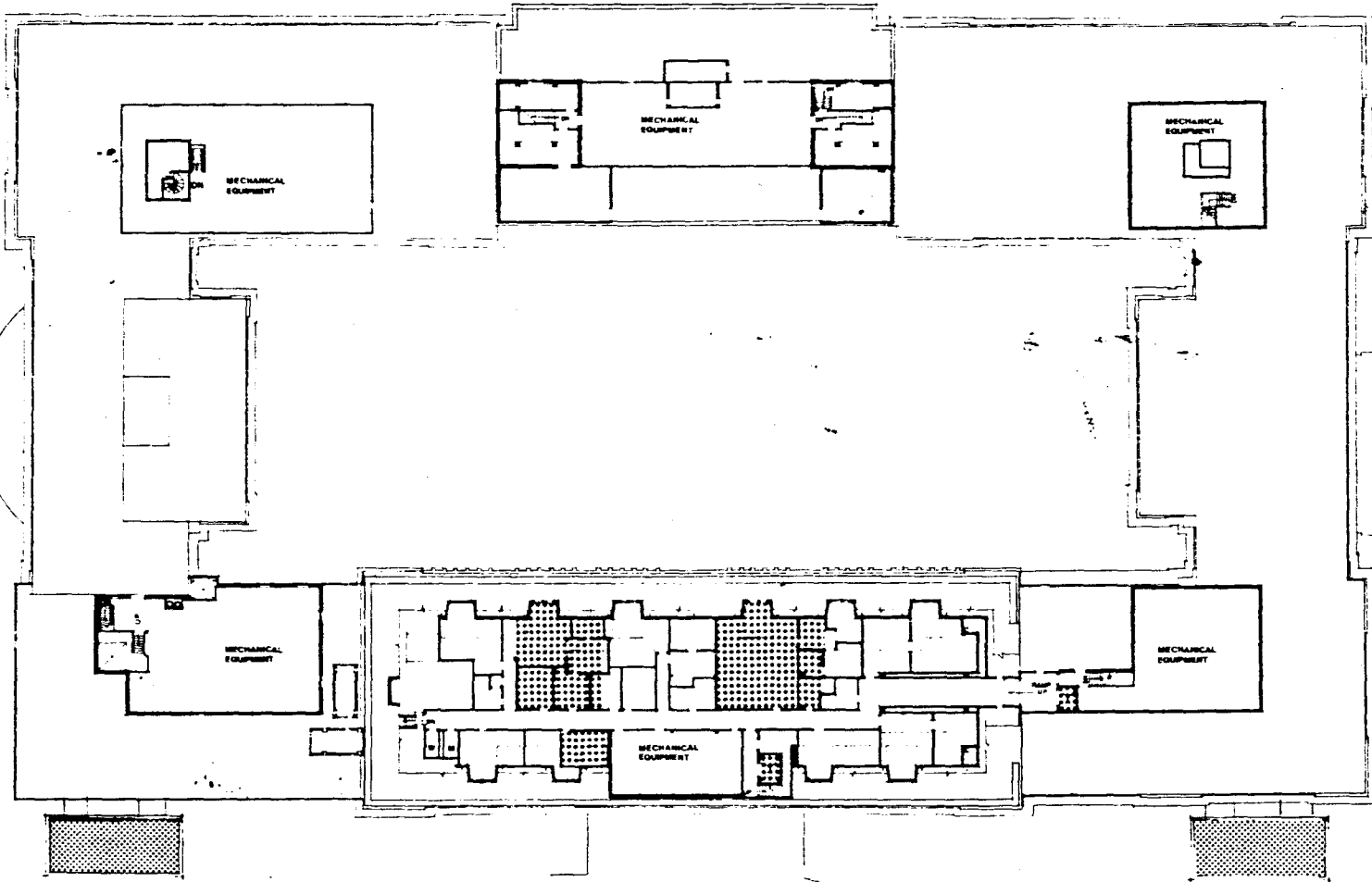
**JOML**  
OWNER & ARCHITECT

JACKSON OWRE MELLAND LYON  
COMPLEX REMODELING

## 75 GRANT CONSTRUCTION

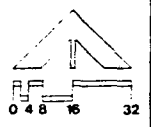


28



- 6.1 WEST ASSEMBLY AREA  
SEPT. 1, 1977  
CONSTRUCTION START
- 6.2 WEST ASSEMBLY AREA  
JUNE 1, 1977  
CONSTRUCTION START
- 6.3 WEST ASSEMBLY AREA  
JAN. 1, 1977  
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- 6.4 WEST ASSEMBLY AREA  
JAN. 1, 1977  
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- 6.5 WEST ASSEMBLY AREA  
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- 6.49 WEST ASSEMBLY AREA  
JAN. 1, 1977  
CONSTRUCTION START
- 6.50 WEST ASSEMBLY AREA  
JAN. 1, 1977  
CONSTRUCTION START

5.8 FIFTH FLOOR



The next phase of design, Design Development, was a more delineated representation of schematics showing room assignments, typical layouts, equipment and mechanical schemes, and materials assessments. The reductions in scope occurred at this time. Miscellaneous items were omitted, such as emergency generator, alarm systems for experiments, corridor ceilings in some areas. The decision was made to re-use as much existing casework (benches, wall hung cabinets, etc.,) as possible for cost reduction. Painting of corridors was deferred to Physical Plant on their regular maintenance schedule of every seven to ten years. The project was very austere compared to most, but still vigorous involvement of departments made the functional aspects of the design apparent. Final space to be renovated by department was as follows:

Department	Sqaure Feet Renovated
Anatomy	15,888
Biochemistry	23,567
Pathology	9,343
Pharmacology	18,093
Physiology	<u>14,109</u>
TOTAL	81,000

The space program was developed and each room involved was designed with input from the occupants of the rooms and the department representative. The Health Sciences Planning Office

coordinated approximately 300 meetings with consultants and departments. The coordinator oversaw the design to insure uniformity throughout and that the best interest of the Health Sciences as a whole was served. This, more often than not, required diplomatic and persuasive communication by the coordinator to inhibit individuality in Lab and Office design. Versatility in Lab design was the goal.

The following is a general description of each departments program:

**ANATOMY:**

Anatomy's primary concern was to renovate the antiquated instructional laboratories in the Owre Hall basement and remodel space on the second floor of Owre Hall designated for recently hired new faculty into laboratories for research. These labs would house the expanded faculty and a number of graduate students per lab. (15,888 square feet).

**BIOCHEMISTRY:**

The great part of this departments renovation was to be on the third floor of Owre Hall in the old Dental Clinic. The area was gutted and transformed into 6 faculty laboratories, 2 graduate student laboratories and ancillary spaces such as glass-wash rooms. The Department Offices were also relocated to vacated dental space on the second floor of Millard with

a large research laboratory adjacent for the department head - (23,567 square feet).

PHYSIOLOGY:

The renovation in this department was primarily done to antiquated laboratory space within Millard Hall and some expansion space on the fourth floor of Owre Hall (14,109 square feet).

PATHOLOGY:

Existing shell space was developed into laboratories in Jackson Hall for Pathology, plus some renovation of antiquated labs on the fourth floor of Owre Hall (9,343 square feet).

PHARMACOLOGY:

Space renovated for this department was primarily antiquated space in Millard Hall and some expansion space from Dentistry. The areas involved were basement and first level existing labs, and some space in Lyon Labs. Research Animal space in Owre Hall (14,109 square feet).

In essence "state of the art" laboratories were to be the result of renovation. This included airconditioning the southern half of the Complex and providing ventilation and fume hoods where necessary. Thirty-one new fume hoods were installed to insure laboratory safety procedures. New casework was to be installed after all re-usable casework was assigned. Re-usable

accounted for about 25% of the benches and shelving used.

Individual temperature control was to be added to each lab.

Eye wash and emergency showers were to be installed as necessary as well as air, vacuum, gas and deionized water as requested within a framework established by the advisor committee and the Health Sciences Planning Office.

Air conditioning and ventilation was to be delivered at each level of the buildings via the two new mechanical towers on the south exterior. All plumbing and electrical risers were to be installed in existing pipe chases in the complex, but additional care was to be taken to clean out obsolete materials from the chases and to seal the chases at each level to better promote Code compliance and Life Safety. Many unseen items such as this are necessary when renovating all older structure and adds to the cost of construction. During demolition it was intended to retain as much of the original as possible and to hopefully patch and paint old walls.

All toilet rooms within the renovation areas were to be upgraded to meet Barrier Free Codes (Handicap) as well as entrances and ramps. Fire codes dictated the need for electrically operated fire doors at all levels of four existing stairwells and to be tied into a new fire alarm system (and to Unit 'A' data control). All these code requirements were represented

costs above the cost associated with assigned space. The largest portion of the contract 'B' was to be mechanical work.

J.O.M.L. - FINAL PROJECT BUDGET EARLY BUDGET BREAKDOWN (IV:C)

November 9, 1976

CONSTRUCTION COSTS

Contract A (Mechanical Towers)	517,200	
Contract B	<u>5,122,800</u>	5,640,000

NON-BUILDING COSTS

Contract A		
A/E Fees		
Base Fee	74,994	
Reimbursables	3,750	
Sitework	12,712	
Supervision	6,465	
Miscellaneous engineering	1,500	
Soil borings	500	
Building Activation & Incidentals	3,000	
Health Sciences Planning Office	6,465	
SAC Charge	400	
Permits	900	
Material Testing	1,000	
Contingency	<u>15,516</u>	127,202

Contract B		
A/E Fees		
Base fee	512,280	
Reimbursables	28,000	
Master Planning	146,456*	
Consultants		
Special	5,000	
Testing & Balancing	10,000	
Sitework	7,000	
Utilities	10,500	
Supervision	63,645	
Miscellaneous engineering	6,500	
Building Activation	10,000	
Site Survey	1,500	
SAC Charge	4,000	
Permits	10,245	
Material Testing	3,000	
Furnishings and Equipment		
New Cold Rooms	187,500	
Remodeled Cold Rooms	55,200	
Other	<u>198,300</u>	
	441,000	
Contingency	270,836	
Control Center Wiring	40,000	
Chiller #5	<u>98,679</u>	

1,732,286  
7,499,488

\*This item is still under negotiation

Rather than carry a 10% Bidding contingency as a line item in the Budget, the Contract Documents identified a number of deductive alternates for contractors price. After award these items could be deducted from the scope of the project to reduce the Base Bid Amount in the event that the Bids were higher than funds available.

Another aspect of the project requiring coordination and departmental and committee input was the Group II Budget. The Group II money are designated for non-contract items related to the project and program; such as: equipment, furnishings, blinds and draperies, moving expenses, graphics and other miscellaneous items required for occupancy. This project had originally identified \$980,000 for Group II, but had transferred an amount to the construction budget early on, thus the final figure was \$441,000. This amount was the portion of Group II representing the Federal participation and could be reduced no further. As part of the program, (14) fourteen Environmental Rooms were needed, either new or renovated rooms. It was obvious to all that 14 new rooms would cost more than the funds available. So a number of existing rooms were designated for upgrading and most new rooms were designed as economically as possible. These rooms were included as equipment in the Group II Budget and the University used its own engineers to design the mechanical systems to



further reduce the cost. The University, furthermore, had more faith in its own engineers for this purpose as it had been necessary for them to re-engineer both Unit A and B/C environmental Rooms to suit special Health Sciences needs. They were confident that the savings would be at least 30% by specifying components that could be locally supplied.

# AWARD OF CONTRACTS

## AWARD OF CONTRACT

Bids for Contract 'A' were accepted in August of 1976. Low bidder was Adolfsen and Peterson of Minneapolis with a construction cost of \$517,200 for the two mechanical towers on the south side of the complex. With the nonbuilding costs included the total cost for Contract 'A' was \$640,652. This sum subtracted from the Basic Sciences Renovations Budget of \$7,499,488.00 left a balance of \$6,858,836. The remaining funds indicated a construction budget for Contract 'B' of \$5,122,800. The Consultants and the planning personnel knew the funds were tight and it was assumed that some of the deductive alternates would be taken after Bids were received on 'B' Contract.

The Architect had computed the probably costs themselves they had hired a consultant to independently prepare an estimate and they had paid a contractor to round estimate, all in an effort to insure accuracy as there were no additional funds available should the project cost be too high. The Architect was liable for redraw and scope reduction planning in the event that the bids were more than 10% away from their final estimates.

Bids for Contract 'B' were opened on June 16, 1977. The low Bidder was Kraus Anderson of Minneapolis, with a bid of \$5,698,000, or \$575,200 over budget. The University was

able to award the contract to Kraus Anderson after taking deduct alternate number one (air conditioning various portions of existing space on the second floor), three materials alternates, negotiating with the contractor for future modifications and reducing various non-building costs (supervision, contingency, etc.). The project was to be very difficult to manage due to these shortfalls and contingency reductions, but all parties eagerly proceeded determined to keep modifications at minimum and search for ways to conserve funds. The modifications processed immediately saved the project \$60,000 ultimately - the largest savings being from switching from epoxy resin bench to plastic laminate countertops.

Construction Budget at award date was as follows:

I. Construction Cost		\$5,588,500
A. Prime Contracts	\$5,588,500	
Kraus Anderson of Minneapolis, Inc. Minneapolis, Minnesota		
Base Bid:	5,698,000	
Deduct Alternate #1	100,000	
Material Alternate		
Deduct B C and D:	27,000	
Net Bid:	<u>5,571,000</u>	
B. Sitework	7,000	
C. Utilities	10,500	

II. Non Construction Cost		1,620,517
A. Furnishings & Equipment	441,000	
B. Fees & Services	1,044,167	
C. Contingencies	135,350	
Total Contract B Cost		\$7,209,017
III. Contract A Previously Awarded Cost		<u>632,971</u>
Total Project Cost		\$7,841,988
Less Anticipated Change Orders to be Process		<u>- 56,000</u>
Total Net Project Cost		\$7,785,988

A pre-construction meeting was held with Engineering and Construction Supervision from the U of M, the Health Sciences Planning Office, the Architect and Contractor (K/A). The Health Sciences Planning Coordinator was in charge of working out the construction schedule with the contractor and interfacing with the departments occupying the Complex in an effort to have minimum disruption of teaching and research. U of M superintendents would supervise the project from a contract document perspective, with the Architects playing an advisory, or interpretive role.

# CONSTRUCTION

## CONSTRUCTION

Kraus Anderson of Minneapolis was on the site and beginning demolition in the middle of August 1977. The contractor and the University agreed to meet every two weeks for the duration of the project for progress reports and to discuss schedules and problems or requirements. It was obvious from the first day that construction was not compatible with occupants needs and extensive effort was required on everyone's part to complete tasks. Isolating construction areas was nearly impossible as it obstructed traffic flow and materials handling. Most of the demolition in the vacated spaces proceeded uneventfully. However, service outages of water, electricity, etc., were a constant problem until the occupants could adjust their schedules to better benefit the contractors needs.

The Contract Schedule of work was broken into five basic phases, or areas to be started and completed on specific dates. The first few phases were primarily empty space vacated by dentistry which could be moved into upon completion, thus vacating additional space for renovation. These phases were developed through the collaborative effort of the Contractor, Health Sciences Planning Coordinator, department heads and individual users with their schedules. At each critical construction point occupants were advised and input from occupants were considered before proceeding. A simplified identification of the phases is as follows:

- Phase I: Mechanical Space  
Jackson Shell space, 4 floor  
vacated Owre & Millard basement.
- Phase II: 1st, 2nd, 3rd floors Owre and  
Millard Hall (South)
- Phase III: Jackson Hall Basement & Owre 4th  
Floor
- Phase IV: Millard Hall Basement, 1st and 2nd  
Floors (North)
- Phase V: Stair enclosures, Lyons Lab 4th  
Floor Millard Hall (North) and  
complete mechanical systems and  
fire management systems.

Of course, in an occupied structure, progress on construction was painfully slow. The Contractor was soon behind schedule and revised the dates relative to his ability to satisfactorily finish areas. One contributor to delay was the existing conditions (pipe locations, structural supports, conduits, etc.) that conflicted with the construction documents; due to the buildings having been renovated many times in their half century of existence. Changes to the structures in the past had not been accurately recorded for transmittance to the architects and other consultants. Actually the buildings original contractors didn't follow the plans in all instances either, thus the foreman on the crews were consistently discovering conditions which required interpretation and/or a modification to the documents.



The modification process is costly in time and funds. Often a field work order could be written and the modification process would follow the work; but usually the modification is written and costed-out first. This process typically takes 8 weeks. The complete construction contract required 137 modifications to be written. The contractor attempted to work around each problem, but no doubt it caused significant delays. This type of construction sequence is typical of all renovation projects and accounts for the high contingency costs of renovation. Typically renovation can expect, or should plan for, a 10% contingency budget to cover these unforeseen expenses and time delays. This project, however, had only about a 3% left for contingency after low-bid award, so modifications were scrutinized especially carefully. Many items of importance were put off to a future time when additional funds and projects occur.

As phases were completed the departments moved into their new spaces; some departments had delayed hiring for funded positions until their expansion spaces were completed and other departments keyed faculty sabbaticals into the construction schedule to accommodate contractors. The acceptance of conditions, and optimistic efforts made by departments and individuals during the construction phases can not be over estimated in importance in the success of this project. Without their patience

and assistance, no doubt the contingency would have needed to be doubled. This effort by the Basic Science Department was and continues to be greatly appreciated by University planning personnel.

The Group II Cold Room contract was awarded during Phase I construction and its schedule keyed into the Prime Contract. Fourteen Environmental Rooms were constructed (4 were renovations) in the same 5 phases as the original contract so that when occupancy occurred in all areas the cold room associated to that area was ready also. This process, though difficult considering the two separate contracts and contractors, worked out fine through the joint efforts of the planning and supervision people, occupants, and the contractors.

The first phase of construction proceeded quite well, but gradually fell behind schedule due to modifications related to existing conditions. Once the contractor fell behind it took even greater effort by Planners and Superintendents to meet both contractors and occupants requirements. Modifications to the construction schedule were carefully computed and compromise reached. Then in early summer of 1978, the pipe covers and then electricians went on strike for about 8 weeks; causing delay that could not be made up for. The schedule could not be met and some phase I classrooms would not be ready for Fall Quarter

Teaching. The General contractor continued at a slow pace with what he could and the job was not picketed by the striking Unions. The University had to occupy the classrooms even though they were not completed and work continued on the rooms after hours at premium cost. Eventually the strikes ended and work proceeded on a normal basis in January of 1979.

The project was scheduled for completion in that same month, but was two phases behind, rather than being finished in January, the contractor was starting phase IV of five phases. The contractor became very difficult to work with as the schedule deteriorated. Kraus Anderson installed a new project manager on the project and relations improved somewhat but they were frustrated with the number of modifications due to conflicts on the documents vs. existing conditions. Occupants were also frustrated at delayed moving dates - up to 6 month delays. Then various materials failures occurred in making progress difficult and schedule futile. The first material failure was the door hardware. The lever handles broke off after little use and the supplier had to reorder and install new handles; a task as yet uncompleted but promised. Next, the plastic laminate at laboratory sinks began delaminating. The sub-strata would absorb water leaks and swell, splitting the bench top. The supplier reinstalled were necessary, but delay resulted and the problem still persists in some areas. Then the worst

material failure is the rupture of the deionized water lines serving the laboratories. There have been about (90) ninety of these breaks resulting in floods of labs, equipment damage, and insurance claims. The problem persists and after countless meetings between suppliers, U of M personnel, installers and the general contractor no resolution has been reached. At present the University is repairing damage and the whole issue may have to go into litigation for satisfaction. Nearing the last phases of the project the University became dissatisfied with the contractors performance, and the architects performance relating to modifications. The contractor was not making any money after such long delay. The job was nearly a year late for completion and his subcontractors were not responding in a timely way to problems and schedules. Most of the moneys had been paid out by the University; the usual 10% held back till completion had been reduced to about 6% in an effort to keep the job going but things were slowing down too much. Uncompleted items and corrections of work after final inspections were not being done by the contractors until the University threatened non-payment. There were close to a thousand items needing attention from contractors and it took nearly six months to get these items responded to, although they were all minor. Many of the corrections were done by the University's Physical Plant and deducted from the contract cost. The Physical Plant did

the work on some of the later modifications as the contractor refused to do any modifications after 1980 in an effort to get off the site.

Another area the contractor had difficulty with related to performance was the re-use of existing casework. He couldn't coordinate removal and reinstallation once the schedule deteriorated and the University tried vainly to get a schedule for removal and installation. Finally the planning office developed a schedule, with the aid of the University superintendents, the Physical Plant assisted in some casework removal. Eventually the Resident Superintendent managed casework relocation on a daily basis with the laborers; this amounted to the University acting of labor foreman for the contractor. Far too often the University had to take over project management to ensure protection of occupants research and timely performance of contract work.

The preceding listed problems are illustrative of the difficulty of renovating an occupied building and how trying it was on all involved. The project began in August, 1977 and an occupancy permit was requested on June 17, 1980, indicating the project was completed about a year later than originally proposed. Most of the delays were due to strikes, modifications relating to existing conditions, and difficulty scheduling construction around occupied research laboratories.

The result of the construction, however, is more satisfactory, with 81,000 square feet of assigned space renovated into modern and efficient classrooms and laboratories.

The occupants of the complex generally are pleased to be able to conduct their various programs in up-to-date comfortable surroundings with appropriate temperature control, proper lighting, durable and cleanable surfaces and safe conditions for staff and students. It is difficult to imagine now, how they persevered under the previous conditions and their gratitude is not unnoticed. The Medical School and Basic Sciences Departments are optimistically pursuing approval and funding for the next Phase of the continuing upgrading of the Complex. All those involved feel the renovation went well and the lessons learned will contribute to even more successful future projects. The departments appreciated the opportunity to be involved in each phase of the project development and construction and undoubtedly their efforts contributed to the projects successful outcome.

# FINAL BUDGETS

JOML STATUS REPORT - Commentary

The history of the financial picture for the JOML project clearly reveals the nature of a renovation project with the variables for a renovation project being significantly different from building new structures.

The bids for the project came in over the budgeted amount. Several measures were taken to allow the University to award. The contingency fund which was originally established at \$286,352 (for both contracts A and B) was cut to \$150,866.00. It was recognized that this was an insufficient amount at that time. In addition, \$60,000 of credit program modifications were written to reduce the contract dollar amount.

It is reasonable to allow a 6 to 8% contingency for any renovation project. The 2% originally allowed would of course be now where near adequate to cover those itmes usually covered by contingency funds.

The total dollars spent for contingency items breaks down as follows:

Modifications to Contracts A & B	\$185,065.63
Architects fees for modifications	50,635.90
Physical Plant Services	93,673.33
Miscellaneous Expenses	<u>15,568.67</u>
Total Contingency Expenditures	\$344,943.53



It is important to note that the dollar amount of \$344,943.53 represents 6% of the construction contracts which is right in the ball park for contingency on renovation projects.

Therefore, based on the number of change orders and field problems associated with this project it became necessary to ask the Vice President of Finance to supplement the funds for this project. This was done in two requests, the first in August, 1978 for \$150,000 and the second in June, 1979 for \$200,000 to insure that the project had adequate funds for total completion

The time delay on completion, of 18 months, accounts for additional expenditures for some non-building items such as supervision as well as others. A comparison shown on the preceding pages, outlines this completely.

The total project expenditures as of July 31, 1980 show the project at 108% compared to the original budget prior to award. Based on the nature of award and the unforeseen problems with the renovation, we consider this a successful project.

The project will show approximately \$18,000 available funds to be used for consultation on some of the unresolved problems in the complex, such as the glass piping breakage problem.

July 31, 1980

JOML FINANCIAL STATUS :

SOURCE OF FUNDS:

9100 - Temp. Invest.	\$ 120,780.84	
9211 - HEW Grant	2,362,338.00	
9309 - 1973 State Legislature	200,000.00	
9312 - 1976 State Legislature	4,937,150.00	
9399 - Central Administration	82,691.00	
9600 - Medical School	2,485.45	
9960 - Central Administration	<u>436,500.00</u>	
TOTAL FUNDS AVAILABLE		\$ 8,141,945.29
FUNDS ACTUALLY EXPANDED		<u>8,013,260.16</u>
BALANCE OF COMMITMENT		128,685.13
		<u>106,945.36</u>
BALANCE OF FUNDS		\$ 21,739.77

JOML REMODELING PROJECT  
 Financial Status  
 as of July 31, 1980

	Original Budget	Committed Funds	Funds Expended	Bal. of Commit.	% of Expended To Budget	Projected % at Completion
Contract A	644,402.00	637,313.74	626,456.39	10,857.35		
Contract B	6,414,086.00	7,043,984.29	6,971,528.20	72,456.09		
Equipment	<u>441,000.00</u>	<u>438,907.51</u>	<u>415,275.57</u>	<u>23,631.94</u>	107%	108%
TOTALS	7,499,488.00	8,120,205.54	8,013,260.16	106,945.38		

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JOML REMODELING PROJECT  
 Financial Status  
 as of July 31, 1980

	Original Budget	Funds Actually Expended
<u>CONTRACT A:</u>		
CONSTRUCTION (Adolph Peterson)		
Original Contract	\$ 517,200.00	\$ 516,440.90
<u>NON-BUILDING COSTS</u>		
A/E Fees (Contract A Portion)		
Base Fees	74,994.00	64,994.00
Reimbursables	3,750.00	2,653.25
Change Order 1-5	-0-	155.00
Construction Site Development		
Reimb. Project B/C-I Mod. 61-P	-0-	2,775.00
Site work - Landscaping	12,712.00	4,645.39
Construction Supervision	6,465.00	18,640.61
Soil Borings	500.00	-0-
Miscellaneous Engineering	1,500.00	7,272.24
Building Activation	3,000.00	425.79
Health Sciences Planning	6,465.00	6,465.00
SAC Charges	400.00	350.00
Permits (A portion only)	900.00	1,034.40

Materials Testing	1,000.00	250.00
Misc. Expense-Travel	-0-	364.80
Contingency (see comments)	<u>15,516.00</u>	<u>-0-</u>
CONTRACT A - COSTS	644,402.00	626,456.39
<u>CONTRACT B</u>		
CONSTRUCTION (Kraus Anderson)		
Original Contract	5,122,800.00	5,622,279.63
<u>NON-BUILDING COSTS:</u>		
A/E Fees		
Base Fees	512,280.00	477,260.00
Reimbursables	28,000.00	52,243.07
Master Planning	146,456.00	250,542.13
Modification Fees	<u>-0-</u>	<u>34,980.90</u>
Total A/E Fees (B Portion)	686,736.00	815,026.10
Consultants		
Special	5,000.00	-0-
Testing & Balancing	10,000.00	28,895.13
Total Consulting	<u>15,000.00</u>	<u>28,895.13</u>
Miscellaneous Travel	-0-	257.36
Site Work "B" Portion (See "A" Portion)	7,000.00	7,000.00
Utilities	10,500.00	16,999.34
Construction Supervision	63,645.00	99,278.45
Miscellaneous Engineering	6,500.00	8,338.91
Physical Plant Services	-0-	93,673.33
Building Activation	10,000.00	3,614.00

Site Survey	1,500.00	-0-
H.S.P.O.	63,645.00	68,988.00
SAC Charges	4,000.00	(11,250.00)
Permits	10,245.00	11,142.00
Material Testing	3,000.00	987.71
Control Center Wiring	40,000.00	40,000.00
Chiller #5	98,679.00	98,679.00
Future A/C Provision	-0-	12,405.40
Other Expenses	-0-	10,867.84
Other Reimbursement	-0-	4,346.00
Contingency (See Comments)	<u>270,836.00</u>	<u>-0-</u>
TOTAL "B" CONSTRUCTION PORTION	6,414,086.00	6,971,528.20
<u>EQUIPMENT BUDGET:</u>		
COLD ROOM CONTRACT	441,000.00	341,965.59
Less-Reimbursables	<u>-0-</u>	<u>(51,599.00)</u>
Total Construction:	-0-	290,366.59
Cold Room Spec & Eng. Rm.	-0-	32,045.87
Plant Services	-0-	5,546.96
Construction Supervision	-0-	4,446.33
Building Activation	-0-	1,016.00
H.S.P.O.	-0-	69,017.91
Moving	-0-	6,408.15
Graphics	<u>-0-</u>	<u>9,628.16</u>
Total Equipment	441,000.00	415,275.57

# SUMMARIES

## SUMMARIES

The planning for the Basic Sciences expansion and renovation involved the departments occupying the Complex in every phase from the original preparation of the request for approval and funding to occupancy. This was not necessarily a new approach but the extent of involvement was expanded on this project because the departments were to continue their operations in the midst of construction. This procedure proved very rewarding. Each Phase of the planning process was reviewed by the many University Departments who could best offer their considerations; creating an interdisciplinary approach to planning. Some of the departments and organized bodies involved in the details were:

Space Management

Physical Planning Office

Physical Plant

Health Sciences Planning Office

Environmental Health & Safety

Basic Sciences Departments

Medical School

Health Sciences Master Planning Committee

Basic Sciences Building Advisor Committee

Engineering & Construction Division of Physical Planning

Office of the Building Code Official



A Health Sciences Planning Coordinator was appointed at the beginning of the project's development and was to stay with it as coordinator through design, construction and occupancy and budget close out.

Considering the complexity of this project, as in all renovation and remodeling projects, the planning process functioned very well indeed, especially in protecting continuity of design and preservation of program intent within a prescribed budget. The process allowed for versatile design readily adaptable to future needs with a limited amount of individuality which would lead to obsolescence. Future planning processes will do well to follow the same structure for data flow and approvals at each decisive point of a project.

The construction process for renovation could profit from the experiences of this renovation. Much more construction planning should be implemented in subsequent renovations as this contractor (Kraus-Anderson) was not thorough enough or thoughtful enough in his materials ordering, work scheduling, or coordination of subcontractors and work areas. Although areas for construction were computed within the 81,000 square feet with the aid of departments, the contractor could have made a greater effort to do all the work in a certain building quadrant at one time. He could have, and should have, planned more and updated his

schedule continually rather than jump ahead in an unconnected pattern without regard for his schedule. The construction schedule was unreasonably short due to Federal constraints to start with, so in going beyond the completion date by an additional year was not surprising considering labor interruptions and modifications. Considering the task and the unknown, factors, the progress was satisfactory but perhaps a different contractor would have come up with a more efficient approach to renovation. The University's persistent requests for coordination and updates were ignored by the contractor and it is to the University's credit that it assumed a larger than usual role in the construction management. The quality of construction and methods used were of the highest standards available within the framework of the Construction Documents and occupants are very satisfied with the outcome, in general. There are many areas where it would have been good to renovate further, or beyond, the document limitations for aesthetic reasons, however, funds were not available. This once again is the problem of partial renovation--deciding how far to go and balancing the possibilities with the funds.

Occupancy was phased as each room or suite became available. Due to dismal conditions prior to renovation occupants were more than pleased to use new labs and classrooms even with occasional interruptions by the contractor. Faculty and staff

were most appreciative of their new quarters and during conditional occupancy were very helpful in working out difficulties and adjusting their schedules to aid the construction. After completion of contract work the entire Complex was renumbered and new signage was installed to identify the buildings in the same manner as the entire Health Sciences. Grade (street level) is now the third floor with the sub-basement number floor 1, basement number floor 2, etc. The new numbers list the entire complex consecutively rather than each of the five buildings having separate numbers. This resigning has been very effective in improving transportation and security.

The Budget was not over extended in light of the tasks and at the onset of construction the Administration had been alerted to the need for additional contingency funds. Those funds were expended at a minimum and University Standards were complied by.

A successful renovation of the Complex and development of a Master Plan for future projects and full integration of the facility into the Health Sciences Master Expansion was the goal. With patience, dedication and perservance that goal was met.

# CONCLUSIONS

## CONCLUSIONS AND OBSERVATIONS

In planning future projects a more realistic approach to funding perhaps could be implemented which would accommodate inflation over the years of development. The Basic Sciences Renovation funds were computed approximately five years prior to contract award and much was sacrificed to inflation at 13% per year. Another aspect would be to guarantee appropriate contingency funds for type of renovation. A plan to vacate entire sections of structures to be renovated would also simplify construction and cut costs tremendously.

As far as Architectural efforts, more time should be spent in verifying existing conditions prior to Contract Document Preparation.

For the benefit of Departments and Environmental Health perhaps all laboratories in future projects should be labeled with the room number as to type or capabilities. For example the P-1, P-2, P-3 or P-4 designations indicating what type of Hazardous Material or activity could be performed or used in which labs. In subsequent renovations also the labs should have new thermo pane windows and sashes installed. The present system is too difficult to operate and balance with the convection currents related to ancient single pane windows. Of course there are many, many additional suggestions to be made relating

to the complex. Hopefully the future will bring adequate funding to complete a project that has a very good start.

# PHOTOGRAGHS

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Jack Geretz, Physical Planning  
Lee Meyer, Interiors  
Robert D. James, Purchasing

Architects

The Architects Collaborative Inc., Cambridge, Massachusetts  
Principal Architectural Firm

Health Sciences Architects and Engineers, St. Paul  
A joint-venture firm from the Cerny Associates, Inc.,  
Minneapolis; Hammel, Green and Abrahamson, Inc.,  
St. Paul; and Setter, Leach and Lindstrom, Inc.,  
Minneapolis

CONTRACTORS

General- Kraus Anderson of Minneapolis  
Mechanical- Lamb Plumbing and Heating  
Electrical- Commonwealth Electric