

Application For Federal Assistance For
Construction of Health and Educational Facilities

COLLEGE OF PHARMACY
UNIVERSITY OF MINNESOTA
MINNEAPOLIS, MINNESOTA

An Educational Unit of the Health Sciences
at The University of Minnesota

Submitted June 15, 1972

UNIVERSITY OF MINNESOTA

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
WASHINGTON, D.C.

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APPLICATION FOR FEDERAL ASSISTANCE
FOR CONSTRUCTION OF HEALTH
AND EDUCATIONAL FACILITIES

STATE _____ DHEW _____
Date Rec'd. _____
Project Number _____

GENERAL INFORMATION

1. LEGAL NAME OF APPLICANT

Regents of the University of Minnesota

2. ADDRESS OF APPLICANT (*street, city, country, congressional district, state, zip code, and telephone number*)

Minneapolis, Hennepin, Minnesota 55455

Congressional District #5

3. APPLICANT APPLIES FOR FEDERAL FUNDS FOR CONSTRUCTION UNDER THE FOLLOWING PROGRAM(S):

(A) CODE NO. SHORT TITLE
(See Program Instructions)

- (1) School of Pharmacy
- (2) _____
- (3) _____
- (4) _____

(B) GRANT AMOUNT OTHER (IDENTIFY)

- \$ 12,367,230 \$ _____
- \$ _____ \$ _____
- \$ _____ \$ _____
- \$ _____ \$ _____

4. PROPOSED FACILITY AND PROJECT

(A) Name and Type
Health Sciences Expansion, Phase I
Unit F, University of Minnesota

(B) Address (*street, city, county, congressional district, state, zip code*)

Minneapolis, Hennepin, Minnesota 55455

Congressional District #5

(C) Type of construction (*Check all that apply*)

- New facility
- Expansion of existing facility
- Remodeling
- Acquisition
- Equipment only
- Other (*specify*) _____

(D) Type of Ownership

- Public Other Nonprofit

(E) Type of operational control in other than the owner

- Public Other Nonprofit

5. APPLICANT'S REPRESENTATIVE (*Name, title, address, telephone number*)

Stanley J. Wenberg, Vice President
Coordinate Campuses and Educational
Relationships
234 Morrill Hall
University of Minnesota

Telephone No. - 612-373-2054

6. PROJECT ARCHITECT (*Name, address, telephone number*)

The Architects Collaborative, Inc.
Architects and Master Planners
46 Brattle Street
Cambridge, Massachusetts 02138

Telephone No. - 617-868-4200

PROGRAM INFORMATION

7. APPLICANT ELIGIBILITY AND NEED FOR FACILITY

(See program instructions for detailed requirements for this item)

8. OCCUPANCY DATA

(See program instructions for detailed requirements for this item)

9. DESCRIPTION OF PROGRAMS TO BE CONDUCTED IN FACILITY

(See program instructions for detailed requirements for this item)

10. DESCRIPTION OF FACILITY

(See program instructions for detailed requirements for this item)

FACILITY INFORMATION

11. APPLICANT'S FINANCIAL RESOURCES APPLICABLE TO THIS FACILITY

A. Cash and negotiable and non-negotiable securities \$ _____ -

B. Pledges: Face value: \$ _____

 Discounted Value \$ _____ -

C. Contingent gifts and bequests \$ _____ -

D. Bonds authorized but not yet sold \$ _____ -

E. Mortgage \$ _____ -

F. Appropriations:

	Available (specify date)	Anticipated (specify date)
State	\$ _____	\$ 4,308,986 (June, 1973)
Local	\$ _____	\$ _____

TOTAL \$ 4,308,986

G. Other (Specify) \$ _____ -

H. TOTAL \$ 4,308,986

12. OTHER FEDERAL ASSISTANCE FOR THIS PROPOSED FACILITY

	PROGRAM	FED. AGENCY	STATUS	AMOUNT	PROJECT NUMBER
A.					
B.					
C.					

13. TOTAL DEVELOPMENT COST

(Sum of items 3, 11, and 12) \$ 16,676,216

14. SITE AND IMPROVEMENTS

A. Title or Other Interest in Site is or will be Vested in:

- Applicant - Agency or institution which is to operate the facility
- Other (specify)

B. Indicate whether applicant/operator has:

X Fee simple title _____ Leasehold interest _____ Other (specify)

C. If applicant/operator has leasehold interest, give following information:

(1) Length of lease or other estate interest: -

(2) Number of years to run: -

(3) Is lease renewable? - Yes - No

(4) Current appraised value of land: \$ -

(5) Annual rental: \$ -

D. Attach an opinion from acceptable title counsel describing the interest applicant operator has in the site and certifying that the estate or interest is legal and valid.

E. Attach site survey, soil investigation reports and where applicable copies of land appraisals.

F. Where applicable attach certification from architect on the feasibility of improving existing structures.

G. Attach plot plan.

15. CONSTRUCTION SCHEDULE ESTIMATES:

A. Target dates for completion of drawings:

Schematics _____ Working Drawings XXXXXXXX 30% complete Final _____

B. Target dates for: Bid advertising July 1973; Contract award August 1973;

Construction completed August 1975; Occupancy September 1975;

16. BUDGET INFORMATION
ESTIMATED FACILITY BUDGET

A. Building identification: _____
(if more than one structure)

B. Budget Line	C. New construction	D. Other (identify)	E. Total
1. Building work			
a. General construction	\$ 6,479,860	\$	\$
b. Plumbing	1,243,110		
c. Heating, air cond., ventilation	1,937,250		
d. Electrical work	1,143,980		
e. Elevators	229,880		
f. Other building work (attach list and itemization of costs)	11,000		
g. TOTAL FOR BUILDING WORK	11,045,080		
2. Site work			
a. Site preparation	90,513		
b. Site development and parking facilities	241,436		
c. Utility connecting lines			
d. Special use items			
e. TOTAL FOR SITE WORK	331,949		

ESTIMATED FACILITY BUDGET (Cont'd.)

B. Budget Line	C. New construction	D. Other (<i>identify</i>)	E. Total
3. Off-site work			
a. Connecting lines to central utility plant	\$	\$	\$
b. Other items (<i>list and itemize costs</i>)	22,040 29,530 51,570		
c. TOTAL FOR OFF-SITE WORK	51,570		
4. Central utility plant (<i>prorata share for this structure</i>)	149,568		
5. TOTAL-CONSTRUCTION COSTS	11,578,167		
6. Built-in equipment	663,700		
7. Architectural and engineering costs			
a. Architect's basic fee	830,614		
b. Supervision and inspection (<i>project representative</i>)	146,360		
c. Surveys, tests, and borings	82,500		
d. Other items (<i>list and itemize costs</i>)	163,570		
e. TOTAL-ARCHITECTURAL AND ENGINEERING COST	1,223,044		

ESTIMATED FACILITY BUDGET (Cont'd.)

B. Budget Line	C. New construction	D. Other (<i>identify</i>)	E. Total
8. Movable equipment	\$ 1,838,642	\$	\$
9. TOTAL COST FOR CONSTRUCTION FIXED EQUIP. A/E FEES AND MOVABLE EQUIPMENT	15,303,553		
10. Contingency	351,263		
11. Purchase of Land	1,021,400		
12. Purchase of Buildings			
13. Other (<i>list and itemize</i>)			
14. Subtotal-Lines 9 to 13 incl.			
15. Works of Art			
16. TOTAL DEVELOPMENT COST	\$ 16,676,216	\$	\$

17. SPACE ALLOCATION BY GRANT PROGRAM

A. Building identification (if more than one structure) _____

B. Gross area in facility 161,048 S.F. C. Net area in facility 87,244 S.F.

Alternate I	GRANT PROGRAMS				APPLICANT SPACE
	1) PROGRAM CODE	2) PROGRAM CODE	3) PROGRAM CODE	4) PROGRAM CODE	
D. Net area by program(s)	87,244 SF	SF	SF	SF	SF
E. Cost allocation ratio by programs (D/C X 100—to two decimals)	100 %	%	%	%	%
Alternate II					
F. Gross area by program(s)	SF	SF	SF	SF	SF
G. Cost allocation ratio by programs (F/B X 100—to two decimals)	%	%	%	%	%

18. COSTS ELIGIBLE FOR FEDERAL PARTICIPATION
(BY PROGRAMS)

A. Budget line	B. Total cost (col. E, item 16)	C. Total eligible cost	D. Amounts eligible for Federal participation (for each grant program)			
			1) Program code ____, ____% from item 17E ___ or 17G ___	2) Program code ____, ____% from item 17E ___ or 17G ___	3) Program code ____, ____% from item 17E ___ or 17G ___	4) Program code ____, ____% from item 17E ___ or 17G ___
1g. Building work	\$11,045,080	\$ 11,045,080	\$ 11,045,080	\$	\$	\$
2c. Site work	331,949	136,171	136,171			
3c. Off-site work	51,570	51,570	51,570			
4. Central utility plant	149,568	149,568	149,568			
6. Fixed equipment	663,700	663,700	663,700			
7e. A/E costs	1,223,044	1,223,044	1,223,044			
8. Movable equipment	1,838,642	1,838,642	1,838,642			
10. Contingency	351,263	351,263	351,263			
11. Purchase of Land	1,021,400					
12. Purchases of Building(s)						
13. Other						
15. Works of Art						
16. TOTALS (1g. through 15)	\$16,676,216	\$ 15,459,038	\$ 15,459,038	\$	\$	\$
17. Amount of Fed. Assist Requested			\$ 12,367,230	\$	\$	\$
18. Fed. Share Request- Percentage			80%	%	%	%

19. ASSURANCES

The following assurances are divided into two parts. Part A assurances are required for all applicants applying for construction program support including the acquisition of facilities where applicable, from the Department of Health, Education, and Welfare. Part B assurances are ones which relate only to individual construction grant or loan programs. Signature by the applicant's representative will indicate that the institution agrees to all Part A assurances and to the Part B assurances required by the program or programs to which it is applying for support.

The applicant gives assurance that:

Part A.

1. It possesses legal authority to apply for and receive the grant or loan, and to finance and construct the proposed facilities; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing board, authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.
2. It will comply with the provisions of the National Environmental Policy Act, PL 91-190; Executive Order 11296, relating to flood-plain elevation and necessary controls; and Executive Order 11288 relating to the prevention, control, and abatement of water pollution.
3. Sufficient funds will be available to meet the non-Federal share of the cost of constructing the facility, and that sufficient funds will be available when construction is completed to assure effective operation and maintenance of the facility for the purposes for which constructed.
4. Approval by the HEW Secretary or his designee* of the final working drawings and specifications will be obtained before the project is advertised or placed on the market for bidding; that it will construct the project, or cause it to be constructed, to final completion in accordance with the application and approved drawings and specifications; that it will submit to the Secretary or his designee for prior approval changes that materially alter the scope or costs of the project, use of space, or functional layout; that it will not enter into a construction contract(s) for the project or a part thereof until the conditions of the construction grant or loan programs have been met.
5. Except as otherwise provided by State/local law, all contracting for construction (including the purchase and installation of built-in equipment) shall be on a lump sum fixed-price basis, and contracts will be awarded on the basis of competitive bidding with award of the contract to the lowest responsive and responsible bidder. The provision for exceptions based on State and local law will not be invoked to give local contractors or suppliers a percentage preference over non-local contractors bidding for the same contract. Such practices are precluded by this assurance.
6. Except as otherwise provided by law, all laborers and mechanics employed by contractors and subcontractors on all construction and minor remodeling projects will be paid wages at rates not less than those prevailing as determined by the Secretary of Labor in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a-276a-5) and 29 CFR Part 1, and shall receive overtime compensation in accordance with and subject to the provisions of the Contract Work Hours Standards Act (40 U.S.C. 327-332); that such contractors and subcontractors shall comply with the provisions of 29 CFR Part 3; and that all construction contracts and subcontracts shall incorporate the contract clauses required by 29 CFR 5.5(a) and (c). Such contracts shall also include the applicable provisions of Executive Order 11246, as amended (Nondiscrimination in Construction Contract Employment), and the applicant shall otherwise comply with the requirements of section 301 of said Executive Order. The contractor shall furnish performance and payment bonds, each in the amount of the full contract price; and provide, during the life of the contract, for adequate fire, public liability, property damage, and workmen's compensation insurance.
7. It will provide and maintain competent and adequate architectural engineering supervision and inspection at the construction site to insure that the completed work conforms with the approved drawings and specifications; that it will furnish progress reports and such other information as the Secretary or his designee may require.
8. An assurance of compliance with Title VI of the Civil Rights Act of 1964 (Form HEW 441) applying to the facility described in this application was filed or is attached to this application.
9. It will maintain grant or loan accounting records (identifiable by grant or loan number), including all records relating to the receipt and expenditure of Federal grant or loan funds and to the expenditure of the non-Federal share of the cost of a project, for three years after the completion of the project if an audit is conducted by or on behalf of the Department within that period, or in the case where no audit is performed, for five years; except that should audit questions arise with respect to the grant or loan, the records will be maintained until all such questions are resolved. Representatives of the Federal Government shall have access at all reasonable times to the grantee's records and to work whenever it is in preparation or progress, and the contractor shall provide proper facilities for such access and inspection.
10. The facility will be operated and maintained in accordance with the requirements of

*The term Secretary or his designee shall mean Commissioner of Education with respect to Office of Education programs.

applicable Federal, State and local agencies for the maintenance and operation of such facilities.

11. The applicant will require the facility to be designed to comply with the "American Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped," Number A117.1-1961, as modified by other standards prescribed by the Secretary of HEW or the Administrator of General Services. The applicant will be responsible for conducting inspections to insure compliance with these specifications by the contractor.
12. The applicant will cause work on the project to be commenced within a reasonable time after receipt of notification from the Secretary or his designee that funds have been awarded, and that the project will be prosecuted to completion with reasonable diligence.
13. Any Federal funds received pursuant to a grant or loan will be used solely for defraying the development cost of the proposed project.

Part B.

1. Hill-Burton, Community Mental Health Centers, and Mental Retardation Facilities.

- a. That it will conform to all the applicable requirements of the appropriate State plan and the regulations pertaining thereto.
- b. That all portions and services of the entire facility for the construction of which, or in connection with which, aid is sought, will be made available without discrimination on account of creed, and no professionally qualified person will be discriminated against on account of creed with respect to the privilege of professional practice in the facility.
- c. That the facility will furnish a community service and:
 - (1) will furnish below cost or without charge a reasonable volume of services to persons unable to pay therefor; or
 - (2) will NOT furnish below cost or without charge a reasonable volume of services to persons unable to pay therefor, because of the justification which is attached.
- d. The facility will be used for the purposes for which it is constructed for not less than 20 years after the completion of the construction.

2. Community Mental Health Centers:

That the services to be provided by the facility, alone or in conjunction with other facilities owned or operated by the applicant, will be made available for a program providing principally for persons residing in a particular community or communities in or near which

such facility is to be situated, at least the essential elements of comprehensive mental health services-i.e., inpatient services, outpatient services, partial hospitalization services (including at least day care services), emergency services provided 24 hours per day, and consultation and education services available to community agencies and professional personnel.

3. Health Professions and Allied Health Professions Teaching Facilities, Nurse Training Facilities, Medical Library Facilities, and Health Research Facilities.

- a. The facility will not be used for sectarian instruction or as a place for religious worship.
- b. The Health Professions Teaching facility is intended to be used for the purpose set forth in this application.
- c. The Allied Health Professions Teaching facility or Health Research facility will be used for the purpose for which it is constructed for not less than 10 years after the completion of construction.
- d. The Nurse Training facility or Medical Library facility will be used for the purpose for which it is constructed for not less than 20 years after the completion of construction.
- e. The Health or Allied Health Professions Training facility or Nurse Training facility will provide for increased enrollment as set forth in the program instructions and in this application.

4. School Construction under P.L. 81-815:

- a. It is a local educational agency having administrative control and direction of free public elementary or secondary education in the applicant school district, or a State agency which has the responsibility for providing school facilities.
- b. It is a local educational agency created and authorized to construct and maintain school buildings under constitutional, statutory, or charter provisions; and that it may accept and disburse Federal funds to aid in financing the cost of constructing school buildings in accordance with constitutional, statutory, or charter provisions cited:

Legal Classification:

Citation:

- c. The applicant has or will have title to the site or the right to build the school facilities on the site and to maintain them on the site for at least twenty years.
- d. The applicant's school facilities will be available to the children for whose education contributions are provided with funds under Public Law 81-815, as amended, on the same terms, in accordance with the laws of the State in which applicant is situated, as they are available to other children in applicant's school district.

c. The applicant will cause due consideration to be given to excellence of architecture and design of project and to the inclusion of works of art the cost of which does not exceed one percent of the Federal share of the cost of the project.

5. Higher Education Facilities under Titles I, II, III of the Higher Education Facilities Act.

a. No part of the eligible areas included in the proposed project: (1) is intended primarily for events for which admission is to be charged to the general public; (2) is especially designed for athletic or recreational activities other than for an academic course in physical education; (3) will be used for sectarian instruction or as a place for religious worship or primarily in connection with any part of the program of a school or department of divinity (as defined in P.L. 88-204); or (4) will be used by a "school of medicine," "school of dentistry," "school of osteopathy," "school of pharmacy," "school of optometry," "school of podiatry," or "school of public health" as these terms are defined in section 724 of the Public Health Service Act, or by a "school of nursing" as defined in that Act under section 843.

b. The applicant is fully cognizant of the requirements regarding economical methods of purchase of movable equipment in accordance with sound business practice, as set forth in the applicable regulations, (45 CFR 170.4), and all movable equipment, the cost of which is to be charged to the project, will be procured in accordance with such regulations. It is understood and agreed by

the applicant that the eligible project development cost and the Federal grant or loan amount may be reduced at settlement by the Commissioner of Education based on the amount of any costs allocated under the project which are for eligible or extravagant equipment items.

c. It is understood and agreed by the applicant that the Commissioner of Education may, from time to time, after execution of a grant or loan agreement for the project, and prior to final settlement under the grant or loan agreement, make downward amendments in the grant or loan amount to adjust to a reduction in the cost of the facilities, the identification of ineligible costs, or a reduction in the size of the project.

d. The applicant has reviewed the academic and financial requirements for operation of the facilities upon completion, and considers the plans for operation of the facilities to be practical and within the financial capabilities of the institution.

e. The facility will be used as an academic facility for not less than twenty (20) years after completion of construction (unless otherwise approved by the U.S. Commissioner of Education), or for so long as the Government holds any of the bonds pursuant to a loan from the Government, whichever is longer.

20. CERTIFICATION BY APPLICANT

The applicant hereby certifies that the foregoing information in this application (including all assurances and all attachments) are correct to the best of its knowledge and belief.

Morrill Hall
University of Minnesota

Board of Regents, University of Minnesota Minneapolis, Minnesota 55455
(Legal Name of Applicant) (Address)


(Signature of Authorized Officer)

(Address if different than above)

Clinton T. Johnson, Vice President
(Typed Name and Title of Authorized Officer)

June 15, 1972
(Date of Application)

UNIT "F" APPLICATION

New Construction

<u>B. Budget Line</u>	<u>Total</u>	<u>Eligible For Federal Assistance</u>
1. Building Costs and Fixed Equipment		
A. General Construction	6,479,860	
B. Plumbing	1,243,110	
C. Heat, Air Conditioning, Vent.	1,937,250	
D. Electrical	1,143,980	
E. Elevators	229,880	
F. Other Building Work, Keying, Fire Alarms, etc.	11,000	
G. Total for Building Work		11,045,080
2. Site Work		
A. Site Preparation		
1. Cut off Utilities		
2. Remove electric service for parking ramps, temporary walks		
Site Work Subtotal	90,513	87,780
B. Site Development		
1. Permanent street lighting, walks, curbs, streets and landscaping, electrical feeder systems		
Site Development Subtotal	241,436	48,391
3. Offsite Work		
Switchgear (ProRata)		
$\frac{161,048 \text{ sfg}}{1,525,383 \text{ sfg Phase I}}$	X 208,821 = 22,040	
Control Center (ProRata)		
$\frac{161,048 \text{ sfg}}{1,525,383 \text{ sfg Phase I}}$	X 279,788 = 29,530	
Total Offsite Work	51,570	51,570
4. Central Utility Plant		
$\frac{14,500 \text{ \#/hr.}}{175,000 \text{ \#/hr. Phase I}}$	X 1,805,125 = 149,568	149,568
5. Total Construction	11,578,167	
6. Built-in Equipment	663,700	663,700

7.	A. Architect and Engineer Fees			
	7% x 11,708,780	819,614		
	Redesign	11,000		
	Total A/E fees	<u>830,614</u>		
	B. Supervision of Construction			
	1 1/4% x 11,708,780	146,360		
	C. Surveys and Test Borings	82,500		
	D. Other Items - Consultants, Printing, Travel, University of Minnesota Engineering Reviews and Miscellaneous Engineering	163,570		
	Total Architectural and Engineering Costs		1,223,044	1,223,044
8.	Moveable Equipment	1,698,642		
	Furnishing Consultant	40,000		
	Specification Consultant	100,000		
	Total Cost of Moveable Equip.		1,838,642	1,838,642
9.	Total Cost of Construction and Fixed Equipment, A/E Fees, and Moveable Equipment		15,303,553	15,107,775
10.	Contingency - Total Building Costs and Built-in Equipment x 3% -- 11,708,780 x 3%		351,263	351,263
11.	Land Purchase			
	3 Apartment Buildings	793,000		
	Staging Area	228,400		
	Total Land Purchase Costs	<u>1,021,400</u>	1,021,400	- 0 -
	TOTAL DEVELOPMENT COSTS FOR NEW CONSTRUCTION		16,676,216	15,459,038

June 15, 1971

Regents of the University of Minnesota
Morrill Hall

ATTENTION: Dr. D. K. Smith
Secretary

Re: Title Opinion
Health Science Expansion
Unit F

Gentlemen:

I have investigated and ascertained the location of the site or sites, rights-of-way, and easements being provided by the applicant for the facilities in its application for Federal Aid identified above to be constructed, operated and maintained thereon, described as follows:

All of the northerly 187.75 feet of "Barney's Subdivision of Block 30" City of St. Anthony as on file in the office of the Register of Deeds, Hennepin County, Minneapolis, Minnesota lying south of the southerly right of way line of Minnesota Highway #12.

I have examined the records of ownership of said sites and the applicant holds fee simple title, free and clear of all liens and encumbrances except for the following:

Lots 1, 2, 3 and 4 and the alley adjacent to the westerly property line of said Lots 1, 2, 3 and 4 which are in the process of being acquired by eminent domain and negotiation.

The encroachment above ground elevation approximately two feet North of the South line of Washington Avenue, also known as Minnesota Highway #12. The easement for this encroachment is being obtained by the Minnesota Highway Department.

In my opinion, the applicant has and will have upon completion of the acquisition of the afore mentioned lots and the rights-of-way, sufficient legal interest in the said site, rights-of-way, and easements to permit the construction of such facilities thereon and to

Title Opinion-Unit F
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permit the operation and maintenance of such facilities thereon by the applicant for not less than seventy-five years from the date of the application.

June 15, 1971
Date

[Signature]
Attorney at Law

224 Northrop Auditorium
University of Minnesota
Minneapolis, Minnesota 55455

The following narrative was taken from the Soil Exploration Company Report dated July 5, 1963, Health Sciences Soil Investigation.

SITE AND SOIL CONDITIONS

The proposed construction site is located on the University of Minnesota campus in an area which is quite heavily built up. The surface is quite level, with surface elevations at the boring locations varying from approximately 840.5 to 843 feet.

As indicated by the boring logs, the soil profile consists primarily of sand to a depth of approximately 15' to 19', underlain by glacial till consisting primarily of silty sand with some boulders which extends to bedrock. From 4' to 7' of fill exists at the surface, with the greater depth being encountered in Boring No. 3. A layer of silty sand from 7' to 9' was encountered in boring No.3 and in boring No.2 a layer of lean clay was encountered from 27.5' to 29.5'. Although boulders were encountered in the till below about 20', the borings were not obstructed by them. Bedrock was encountered and cored in each boring, and consists of thin layers of the Decorah, Shale, and Limestone overlying Platteville limestone at a depth of approximately 50'. Detailed information pertaining to the bedrock is contained on the boring logs.

GROUND WATER

Ground water was observed in the borings at the levels and times indicated on the boring logs. The ground water information contained on the log of boring No.3 is considered to be the most accurate since water was observed at a depth of 43' prior to introducing jetting water into the drill hole. The levels of the ground water observed in borings No.1 and No.2 may be affected somewhat by the fact that jetting water was introduced into these holes prior to the time ground water was observed. Ground water determinations made in relatively impervious soils as encountered in the borings may not be completely reliable even after several days of observation, and both yearly and seasonal fluctuations in the level of the ground water may be expected.

ITEM 7 - APPLICANT ELIGIBILITY AND NEED FOR FACILITY

This application seeks funds for construction of Unit F (College of Pharmacy) of the University of Minnesota Health Sciences expansion program. Unit F is the third step in this program to request federal funding. Unit A (Dentistry and Basic Health Sciences) has been awarded funds and is currently under construction, while Unit B/C (Medical School and outpatient facilities) is the subject of a separate application. An application for Unit F was previously submitted on June 30, 1971, and received the approval of the National Advisory Council but was not a funded project.

The decision to undertake the project was the result of University, State, and public dedication to the vital need of providing Minnesota and the Upper Midwest the highest quality health science training and service possible. The proposed project will not only allow for the earliest possible expansion of enrollments, but it will also provide an exceptional environment (both physically and psychologically) for the development of the health team concept as well as alleviating current space and facilities shortages.

Unit F will consist of nine floors of space located directly north of and adjoining Unit A. Three levels are below grade, the remaining six are above. The building will house the College of Pharmacy in toto, except for certain clinical functions which will remain with affiliated institutions. Through Unit A, Pharmacy will have direct accessibility to the remainder of the Health Sciences Center, including the Bio-medical Library.

Incorporated with the capital development program is the expansion of the pharmacy class size from 103 to 144 with eventual expansion to 150, as well as providing increases in the areas of graduate education and continuing education. The building will have an assignable square footage of 87,244 out of a total gross area of 161,048 square feet.

The dollar magnitude of the Unit F project is approximately \$16.6 million, of which \$11.5 million is for construction. The requested federal share is \$12,367,230.

The accrediting agency for schools of pharmacy is the American Council on Pharmaceutical Education. The last accreditation examination of the College of Pharmacy took place on February 9 and 10, 1967. Re-examination of each accredited school normally will be made at least once every six years. A copy of a letter of reasonable assurance for continued accreditation is attached.

THE AMERICAN COUNCIL ON PHARMACEUTICAL EDUCATION

77 West Washington Street • Chicago 2, Illinois • ANdover 3-6540 Area Code 312

April 4, 1969

Mr. Henry T. Cram
Chief Educational Facilities Branch
Division of Physician Manpower
300 North Quincy Street
Arlington, Virginia 22203

Dear Mr. Cram:

Dean L. C. Weaver of the University of Minnesota College of Pharmacy has asked us to provide a letter of "reasonable assurance" of continued accreditation. We understand that this institution is applying for matching funds for the construction of new teaching facilities within the Minnesota Health Sciences Center.

The present enrollment at this school is around 300 undergraduate students in the last three years and, we understand, that they are planning for an enrollment of 400 students by 1973 and an anticipated total enrollment of 560 by 1986. This school has had a strong graduate program for many years also.

It has been the experience of this Council that this College has traditionally met its needs in terms of faculty, supplies, and equipment relative to enrollment and space available.

As the only pharmacy school in the state and an important contributor to graduate-trained personnel in the pharmaceutical sciences and among the leaders in the recognition of need to strengthen the professional education of the pharmacist, it would appear to be important to remove space barriers to continued growth and to support the location of the school nearer to the other health professions. Certainly, the construction of such a facility will strengthen rather than detract from the School's accreditability.

Sincerely,

American Council on Pharmaceutical Education


Fred T. Mahaffey, Secretary

FTM:eil

cc Dean L. C. Weaver

RECEIVED
APR 7 1969

COLLEGE OF PHARMACY

ENROLLMENT INFORMATION EXHIBIT

[Please read Enrollment Information Instructions before completing form]

Complete this enrollment information for each health professions discipline. Use a separate form for each discipline scheduled to use the facility. If the application is for a teaching hospital or outpatient facility, obtain the information from the medical, dental or osteopathic school with which there is affiliation.

1. Present Enrollment as October 15

		Health Professions	Public Health
A	Undergraduate		Pre-degree Grad
	1st Year	42	1st XXXX
	2nd Year	96	2nd XXXX
	3rd Year	87	X X X X
	4th Year	73	
	5th Year	--	
	6th Year	--	
	TOTAL	298	
B	Advanced Education	42	
C	Continuing Education		

2. Expansion of Training Capacity

Highest Undergraduate
First-year Enrollment 103 Base Year 1967-68

3. Assured Enrollment Increase

Number of Students

Year	First-year Undergraduate	Advanced	Continuing Education
1975	120	70	
1976	130	80	
1977	145	85	

(use additional lines for entries)

Enter first-year student enrollment increase (for 10-year period of commitment) over highest enrollment shown in No.2: 12
(or 40%)

4. No Enrollment Increase

- (A) The facilities are so obsolete as to require the school to substantially curtail its enrollment:
- (B) The facilities are so obsolete as to require the school to substantially curtail the quality of training:
- (C) The school received a waiver under the expansion of enrollment requirement for accreditation aid:
- (D) Unusual circumstances exist:

ITEM 9 - DESCRIPTION OF PROGRAMS TO BE CONDUCTED IN FACILITY

SECTION I - ORGANIZATIONAL STRUCTURE OF THE SCHOOL

As stated in the Statement on the Mission of the Health Sciences, the Regents of the University of Minnesota have authorized a unified organization of the Health Sciences that has brought together in a single administrative structure programs in Medicine, Nursing, Public Health, Dentistry, Pharmacy, and the University Hospitals. Veterinary Medicine which has related interests is joined closely to this administrative unit.

Overall responsibility for this administrative structure is vested in the Office of Vice-President for the Health Sciences. The Vice President has responsibility for developing goals and operational plans in conformity with the missions of the Health Sciences and for developing inter-unit collaboration in fulfilling the missions of the Health Sciences. In addition, he works in close cooperation with the other Vice Presidents on Health Sciences matters relating to their areas of responsibility. The School of Medicine, the School of Dentistry, the College of Pharmacy, the School of Nursing, the School of Public Health, and University Hospitals comprise the Health Sciences on the Twin Cities campus of the University of Minnesota. Each unit is represented by a dean or director reporting directly to the Vice President for Health Sciences with the exception of the College of Veterinary Medicine which is an adjunct member. In addition, a Council of Deans and Directors serve the Vice-President in a cabinet capacity.

The College of Pharmacy is directed through the Office of the Dean in conjunction with the Assistant Dean for Student Affairs and the Assistant to the Dean/Director of Continuing Pharmacy Education. The major advisory body at the college level is the Faculty Council, with representation from each of the departments.

The following organization chart points out the educational interrelationships between the College of Pharmacy and the other Health Science units. The broken connecting lines represent a direct cooperation with and reliance on a given unit for course and/or experiential responsibility.

Coordination of the clinical experiences with the affiliated sites is carried out through the Department of Clinical Pharmacy. Letters of cooperation from these sites are available and will be supplied upon request.

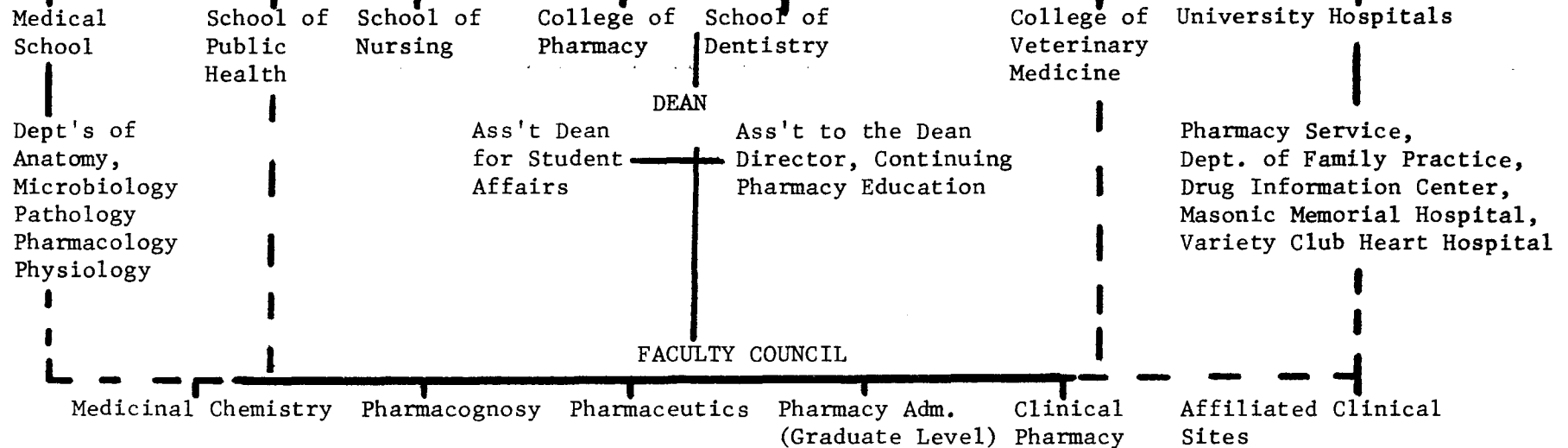
BOARD OF REGENTS

PRESIDENT OF THE UNIVERSITY

V.P. for Administration V.P. for Coordinate Campuses & Educational Relationships V.P. for Academic Administration V.P. for Health Sciences V.P. for Finance, Planning & Operations V.P. for Student Affairs

Coordinator for Allied Health Programs
Coordinator for Health Care Systems (Research & Development)
Ass't V.P. for Health Sciences Affiliations
Coordinator for Health Sciences Planning
Coordinator for Health Sciences Continuing Education

COUNCIL OF DEANS AND DIRECTORS



Other interdisciplinary and interdepartmental faculty committees include:

University Level: Council on Liberal Education
University Administrative Committee
University Coordinating Council
University Senate
Patent Advisory Panel

Health Sciences Level: Design Review Committee (Health Sciences Expansion)
Space Allocation/Educational Resources of Health Sciences
Cedar-Riverside Project (a Health Care Proposal)
Austin-Albert Lea Project (a Health Care Proposal)
Rural Health Care Project
Allied Health Committee
Clinical Research Committee
Health Sciences Constitution and By-Laws
Health Sciences Learning Resources Advisory Committee
Health Sciences Cancer Research Committee
Health Sciences Committee for Disadvantaged Students
Health Sciences Council
Health Sciences Learning Resources Committee
Health Sciences Constitutional Drafting Task Force
Health Sciences Receiving Committee Task Force

College Level: Educational Policy
Student Admissions and Scholastic Standing
Library
Scholarships, Fellowships, & Loans
Research Awards
Building
Safety
Continuing Education

Actions of these committees range from those which have purely advisory capacities to those of a policy formulation and implementation nature. The actions are reported to the administrations of the various levels indicated.

Contemplated Changes:

Health Sciences Level -- A Coordinator of Basic Health Sciences is anticipated to be added to the Vice-President's Office.

College Level -- The concept of utilizing three areas for academic coordination under the Dean is presently being studied. These areas would be:

1. Undergraduate Education
2. Graduate Education and Research, and
3. Continuing Education.

Besides providing greater efficiency and coordination, this set-up would allow for an integrated approach to pharmacy education.

SECTION II - FACULTY

A. Current and Projected Composition

Faculty usually are given A (12 month) or B (9 month) appointments and either full or part-time. Full-time enerally means a commitment of 5 days per week while part-time means an obligation of less than 4½ days per week for 9 or 12 months depending upon the type of appointment. The trend is toward 12 month appointments.

CURRENT FACULTY LISTING AND PROJECTED FACULTY LISTING FOR 1977-78
(Three years following building occupation):

<u>DEPARTMENT</u>	<u>1971-72</u>		<u>1977-78 (Full capacity assumed)</u>
	FT + PT = F.T.E.	Existing Vacancies	FT + PT = F.T.E.
Medicinal Chemistry	5 + 0.5 = 5.5	1	11 + 2 = 13
Pharmaceutics	6 + 0.1 = 6.1	0	10 + 1 = 11
Pharmacognosy	2 + 0.1 = 2.1	1	5 + 0.5 = 5.5
Clinical Pharmacy*	2 + 5.5 = 7.5	3 F.T.E.	10 + 10 = 20
Unassigned**	5 + 0.5 = <u>5.5</u>	0	8 + 2 = <u>10</u>
TOTALS	26.7		59.5

FT - - Full Time Faculty
PT - - Part Time Faculty
FTE - - Total Full Time Equivalentents

*Clinical Pharmacy classification includes personnel involved in the Graduate Program in Pharmacy Administration.

**Unassigned category includes administrative personnel, continuing education personnel, and joint appointments in Pharmacology.

With one exception, the vacancies listed are due to recent additions and changes in scope of the College's programs. Thus, these vacancies have not contributed a significant adverse effect other than a delay in implementation of the desired changes or additions. The one exception is the vacancy in Pharmacy Administration (listed under Clinical Pharmacy). Although curricular cutbacks

have not been necessary, a doubling of effort in both undergraduate and graduate areas has been required of the existing faculty member.

Out of College Teaching Responsibilities

At the present time only two regularly scheduled teaching programs are being pursued by the Pharmacy faculty in other areas of the University. There are, however, numerous instances of isolated lectures and/or programs being taught or contributed to by the staff, especially in the area of drug abuse. In the near future, the possibility of providing instruction for other areas of the Health Sciences is highly probable both on the undergraduate level and the graduate level. Due to the overload of present facilities these activities take place at other sectors of the University.

Current and Projected Salary Ranges

	<u>1970-71</u>	<u>1975-76</u>
Professor	\$ 16,580 - 24,750	\$ 20,000 - 30,000
Associate Professor	14,100 - 16,500	15,000 - 20,000
Assistant Professor	12,500 - 16,500	14,000 - 18,000
Instructor	13,500 - 14,300	12,000 - 16,000

B. Current and Projected Faculty - Student Ratios

In the determination of the faculty-student ratio, we have used enrollment figures only for those students in their last three years of professional study (3rd year - 60% of total; 4th year - 100% of total; 5th year - 100% of total) plus 75% of the total number of graduate students enrolled in the College of Pharmacy. This was calculated in this manner as:

- (1) The 1-4 program is being phased out in favor of the 2-3 program;
- (2) in the 1-4 program, very little teaching time is allocated to pharmacy faculty during the second year;
- (3) at least 40% of the teaching responsibility during the third year of studies falls upon the faculty of the Basic Health Sciences (Medical School), and;
- (4) in most cases, approximately one-fourth of the graduate

student's course load is pulled from areas of the University other than the College of Pharmacy.

CURRENT

3rd year students - -	96@ 60% =	57.6
4th year students - -	87@ 100% =	87.0
5th year students - -	73@ 100% =	73.0
Graduate students - -	42@ 75% =	<u>31.5</u>
Total.		249.1

Total F.T.E. Faculty =

$$\frac{26.7}{249.1} = \frac{1}{9.33} \quad \text{Faculty-Student Ratio}$$

1977-78

Three years following building occupation.

Entering class of 144 on the 2-3 program.

Assuming 13% attrition between the third and fourth years and 5% attrition between years four and five.

3rd year students - -	144@ 60% =	86.4
4th year students - -	125@ 100% =	125.0
5th year students - -	119@ 100% =	119.0
Graduate students - -	85@ 75% =	<u>63.8</u>
Total.		394.2

Total F.T.E. Faculty = 59.5

$$\frac{59.5}{394.1} = \frac{1}{6.63} \quad \text{Faculty-Student Ratio}$$

This lowering of the faculty-student ratio is to a large extent an evolutionary result of the increased emphasis on clinical educational programs. These directions in the curriculum would occur irrespective of the new facilities although progress in this direction would be

severely hampered without the expansion. These limitations would stem from the lack of physical space, from the lack of proximity to the Health Sciences Center, and from the lack of innovative teaching space and facilities. This projected faculty-student ratio compares favorably with the ratios for other Health Science areas.

SECTION III - APPLICANT'S CURRICULUM; INSTRUCTION PROGRAMS;
LEARNING RESOURCES.

A. Current

1. Undergraduate Program

The College of Pharmacy prepares its graduates to function in society as a provider and/or administrator of pharmaceutically oriented services. These services include drug information, drug distribution, and drug-use control of both prescription and non-prescription drugs to ambulatory and institutionalized patients and to prescribers and other health professionals.

The undergraduate curriculum provides two possible degree options - the five year Bachelor of Science degree and the six year Doctor of Pharmacy degree. The basic skills of communication and the basic background sciences are delivered to the students in both programs during the first two years of the pharmacy program. A thorough knowledge of these subjects is essential as:

- a. the pharmacist must be able to communicate and respond and he must be able to do this with confidence;
- b. the basic sciences form the framework on which the remainder of his courses will be built; and
- c. the pharmacist must be able to adapt to and deduce from a continually changing set of principles and trends.

Years three and four are also offered jointly for both programs and cover the basic health sciences, the pre-clinical pharmaceutical sciences, and related requirements. Clinical experience, along with specialization in areas of primary interest round out the final one or two years, depending upon the program.

The concept of the modern day pharmacist demands an education putting primary emphasis on the aspect of patient orientation. Resultingly, there has been an increase in the area of the biological sciences and in the area of society and human behavior. This is not meant to construe that there has been a de-emphasis of the physical-chemical aspects of pharmacy because of a lack of need for this particular function. It is simply an integration process resulting in a block of education which yields greater utilization and application in today's health care delivery system.

BACHELOR OF SCIENCE DEGREE

DOCTOR OF PHARMACY DEGREE

		BACHELOR OF SCIENCE DEGREE				DOCTOR OF PHARMACY DEGREE
Years of Study Required		5				6
Prepharmacy Years Required		2				2
Professional Years Required		3				4
ACADEMIC YEAR	COURSE	Qtr. Credits	Lecture-Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk	
1 (Prepharmacy) 28	General Chemistry	14	13	10	23	SAME
	Trigonometry	3	3	--	3	
	College Algebra & Anal. Geometry	5	5	--	5	
	Communications	12	12	--	12	
	Pharmacy Orientation	2	2	--	2	
	General Electives	9	?	?	?	
Total		45				
2 (Prepharmacy)	General Biology	10	8	6	14	SAME
	Introductory Physics	12	9	6	15	
	Organic Chemistry	13	13	8	21	
	Principles of Economics	7	7	--	7	
	Advanced First Aid	2	3	--	3	
	Pharmaceutical Calculations	2	2	--	2	
	General Electives	3	?	?	?	
Total		49				

BACHELOR OF SCIENCE DEGREE

DOCTOR OF PHARMACY DEGREE

ACADEMIC YEAR	COURSE	Qtr. Credits	Lecture- Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk	
3 (First Professional Year)	Quantitative Med. Chemistry	6	6	6	12	SAME
	Biochemistry of Medicine	6	6	--	6	
	Inorganic Medicinal Agents	5	5	--	5	
	Fundamental Prin- ciples & Processes	3	3	--	3	
	Personal & Community Health	3	3	--	3	
	Introductory Calculus	5	5	--	5	
	Elementary Anatomy	4	3	3	6	
	Human Physiology	7	6	2	8	
	Microbiology	5	3	6	9	
	Pathology	5	5	--	5	
	General Electives	3	?	?	?	
Total		52				
4 (Second Professional Year)	Organic Med. Agents	11	11	--	11	SAME
	Introductory Pharmacognosy	10	8	8	16	
	Fundamental Prin- ciples & Processes	4	3	3	6	
	Pharmaceutical Preparations	9	5	12	17	
	Management of Pharmaceutical Services	4	4	--	4	
	General Pharmacology	7	6	3	9	
	General Electives	5	?	?	?	
	Total		50			

BACHELOR OF SCIENCE DEGREE

DOCTOR OF PHARMACY DEGREE

ACADEMIC YEAR	COURSE	Qtr. Credits	Lecture-Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk	COURSE	Qtr. Credits	Lecture-Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk	
5 (Third Professional Year -- Last Year of B.S. Program)	Dispensing Pharmacy	6	4	6	10	Dispensing Pharmacy	6	4	6	10	
	Pharmaceutical Jurisprudence	3	3	--	3	Immunology	3	3	--	3	
	Economics of Professional Practice	3	3	--	3	Medical Microbiology	5	5	--	5	
	Management of Pharmaceutical Systems	3	3	--	3	Pathophysiology and Therapeutics of Disease	24	24	--		
	Biopharmaceutics	6	6	--	6	Biopharmaceutics	6	6	--	6	
	Environmental Health	3	3	--	3	Clinical Pharmacology	1				
	Clinical Clerkships	2(5)	6(15)	--	6(15)	Biometry	6	6	--		
	Clinical Conferences	2	3	--	3	Biomedical Computing	3	3	--	3	
	Clinical Therapeutics	6	6	--	6	General Electives	*				
	Toxicology	2	2	--	2						
	Social Psychology	3	3	--	3						
	General Electives	6	?	?	?						
	Total		45								

30

BACHELOR OF SCIENCE DEGREE

DOCTOR OF PHARMACY DEGREE

ACADEMIC YEAR	COURSE	Qtr. Credits	Lecture-Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk	COURSE	Qtr. Credits	Lecture-Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk
6 (Fourth Professional Year -- Last Year of Pharm. D. Program)	None					Clinical Clerkships General Electives * Varying to Meet Individual Students Needs.	* *			
31										
Total Qtr. Credits Required for Graduation		240					285			

All undergraduate courses within the College at this time are taught along departmental lines: namely Pharmaceutics, Medicinal Chemistry, Pharmacognosy, and Clinical Pharmacy. These courses do tend to be content oriented, however, rather than departmentally oriented. This breakdown will be valid even with the possibility of course integration as each department will provide the manpower for that segment of the course offering designated to it.

a. PHARMACEUTICS

The function of the Pharmaceutics department is to provide instruction for undergraduate students regarding the behavior of drugs in pharmaceutically related physical and biological systems. In effect, this training makes the potential graduate a dosage form expert. Basic instruction is provided in thermodynamics, chemical kinetics, radioactivity, and homogeneous and heterogeneous equilibria. In addition, the principles governing the absorption, distribution, metabolism, and excretion of drugs in the human are studied. Through lectures, demonstrations, and laboratory work, undergraduate students are instructed in the preparation of dosage forms, together with their physical, chemical, and pharmacological characteristics.

b. MEDICINAL CHEMISTRY

The undergraduate role of the Department of Medicinal Chemistry is to educate the student in the application of the principles of chemistry to therapeutic usage of both inorganic and organic medicinal agents. The use, nature, potency, and analysis of medication as well as molecular structure - biological activity concepts are considered.

c. PHARMACOGNOSY

Undergraduate emphasis is placed upon those drugs derived from cell systems (microorganisms, plants, and animals) used to treat or prevent a disease state. The lectures provide instruction in immunologicals, enzymes, antibiotics and the vitamins, hormones, and alkaloids. Among the subjects considered in the laboratory are poisonous plants and fungi, habit forming plants, enzyme extraction and assay, antibiotic production and assay, steroid isolation and biotransformation, and polypeptide hydrolysis and analysis.

d. CLINICAL PHARMACY

The mainstream functions of pharmacy practice are clinical in nature. They include a responsibility for drug distribution, accumulation and dissemination of drug information and drug-use control. Clinical pharmacy instruction

integrates that body of knowledge drawn from established pharmaceutical science disciplines into the social setting in which pharmaceutical functions exist. Emphasis is placed upon those biological, economic, ethical, legal political, and social factors which affect the selection, use, adverse effects, abuse, and non-use of drugs in our society.

A sequenced program of classroom and clinical education integrated throughout the pharmacy curriculum most effectively accomplishes the above objectives. Since a primary effort is being made to develop a particular attitudinal set and patient orientation, instruction through-out the last three years has been arranged in a logical flow with a proper sequence of material which promotes unifying concepts, integration of basic science education, relevance and growing independent demonstration of the ability to use this knowledge. The student focus is upon the promotion of learning instead of teaching, independence instead of dependence; in short, an educational environment which will produce a goal directed, socially aware, critically inquisitive pharmacist. This program is for a core of basic behavioral and clinical knowledge to be part of the education of all pharmacists and is then followed by sequenced study and training along tracks planned by the student from elective offerings in relation to his individual career interests. Provision is made to involve the student through case courses, discussion courses and patient contact with a minimal amount of lecture instruction. A multimedia approach using library resources, texts, special teaching aids such as film clips, slides and audio or video taped presentations supplements and lectures, handouts and syllabi, discussions, tutorials, and laboratory exercises.

The relevance of the entire educational process to the ultimate goal of pharmacy practice is dramatized by early introduction to the patient where clinical problems in a variety of settings are shown to the students from the first year of their pharmacy education. The relevance and importance of basic health and pharmaceutical science disciplines is built into the sequence. The concurrent exposure lends relevance to basic health and pharmaceutical science education. Special elective clerkships permit the student to select the emphasis desired in that area of pharmacy in which he anticipates practice. The following pages outline the characteristics of the various clinical setting options available to the pharmacy student.

Electives are considered a very important segment of the curriculum. Not only do they provide for a more liberal education, but they also allow for specialization in a given field closely linked to or an integral

2 CREDIT OPTION: CLINICAL CLERKSHIPS --AMBULATORY

SITE	LENGTH OF SESSION	CLASS TIME	STUDENT-INSTRUCTOR RATIO	EDUCATIONAL AIDS	OUTSIDE OF CLASS STUDENT INPUT
St. Louis Park (Medical Center Pharmacy)	5 weeks	One afternoon per week; 4 hours	5:1	Handouts; reference and journal article reproductions	General reference; answers to specific questions.
Appel Pharmacy (& Nursing Home)	5 weeks	One afternoon per week; 3 to 4 hours	2:1	Handouts	General reference; preparation of presentation to nursing home personnel.
Cambridge State Hospital*	5 weeks	One afternoon per week; 4 hours	4:1 8 students maximum	Films; handouts	Preparing patient work-ups; general reference; answers to specific questions
Diabetes Detection & Education Center	1 week	5 days -- 7am to 6pm**	4:1	Films; observation of patients interview; handouts.	General reference; preparations for talks with the diabetics.
University Hospitals (Out-patient)	5 weeks	2 weekly meetings; @ 3 hours each	2:1	Videotape critique; handouts	General reference; preparation for talk to nursing staff; answers to specific questions.
Veterans Administration	5 weeks	One afternoon	2:1	Handouts	General reference; answers to specific questions.

*Students are rotated through an epileptic service, a mentally retarded/physically handicapped service. a mentally retarded/mentally ill service and the outpatient infirmary.

**Same schedule as that of the diabetic patient.

2 Credit Option (Continued): CLINICAL CLERKSHIPS -- AMBULATORY

SCHEDULE ANALYSIS

SITE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
St. Louis Park Medical Center	<ol style="list-style-type: none"> 1. Luncheon with guest physician who gives a talk on his specialty 2. Discussion/Conference 3. Practice in pharmacy (consultations; patient records; etc.) 				
Appel Pharmacy	<ol style="list-style-type: none"> 1. Orientation 2. Visit to nursing home and talks with personnel 	Monitoring of patient drug therapy through use of patient drug profiles (at store).		Student presentation (on selected subject) to nursing home health personnel; e.g., drug interactions	
Cambridge State	<ol style="list-style-type: none"> 1. Orientation to hospital and types of patients 2. Patient work-up*** 	<ol style="list-style-type: none"> 1. Patient work-ups 2. Discussions with other health personnel (e.g., dentists, social service, psychologists) 3. Conference/Discussion/Review 			
Diabetes Detection and Education Center	<ol style="list-style-type: none"> 1. A review of the disease, its therapy and management 2. Patient management 3. Patient education 4. Medical team management <p>Participates in conferences and discussions. Talks to patients on OTC medications in relation to their disease.</p>				

***Work-ups are similar to those in the Clinical Conference Course.

2 Credit Option (Continued): CLINICAL CLERKSHIPS -- AMBULATORY

SCHEDULE ANALYSIS

SITE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
University Hos- ptials -- Outpa- tient	Orientation to: 1. Drug history interviews 2. Drug interactions 3. Psychology of interviews	Experience in: 1. Taking drug histories 2. Patient record systems 3. Handing out medications and counseling patients. Possible participation in func- tions of special interest (e.g., clinical pharmacology rounds)			Each student is re- quired to give a talk to the nursing staff sometime dur- ing the experience. Topics are picked with the aid of the clinical instructor.
Veterans Ad- ministration -- Outpatient	Experience in: 1. Patient histories 2. Patient record systems 3. Patient consultation and instruction to outpatients and patients being discharged.				

5 Credit Option: CLINICAL CLERKSHIPS -- ENRICHED

Site and Student- Instructor Ratio	Class Time per Session and Length of Session	Primary Focus of Study	Methods Used
University Hos- pitals -- Sta- tions 30,31 and 31 ICU (Medical Wards) 4:1	Variable No. of Hrs. per day; 3 days per week; up to 10 weeks	Antibiotic therapy -- all pa- tients on these wards with in- fectious diseases are followed and their therapies rational- ized.	<ol style="list-style-type: none"> 1. Rounding 2. Physician and other medi- cal personnel input 3. Infectious disease grand rounds. 4. Discussion/Conference ses- sions 5. Limited didactic presenta- tions 6. Background readings (e.g., New England Journal of Medicine)
St. Paul Ramsey Hospital 4:1	Mon.-Sat. 7:30 am- 12:00 noon; 4 to 6 weeks	Internal medicine -- the phar- macy student is assigned to one one of the medical teams (com- prised of two senior medical students, an intern and a med- ical resident). The pharmacy student is specifically in- structed to utilize the medi- cal student as a source of in- formation regarding the corre- lation of disease states with diagnostic procedures, tech- niques of the physical exami- nation and the significance of lab values.	<ol style="list-style-type: none"> 1. Daily rounding and famili- arizing himself with each pa- tient and his drug therapy 2. Evening on-call work with his team 3. Assignment (by medical resi- dent) of certain patients with drug problems so student can act as resource person 4. Assignment of other drug problems or evaluations 5. Twice weekly pharmacy con- ferences (2-3 hours each) 6. Medical journal and litera- ture articles/Discussion 7. Case presentations

5 Credit Option (Continued): CLINICAL CLERKSHIPS -- ENRICHED

Site and Student-Instructor Ratio	Class Time per Session and Length of Session	Primary Focus of Study	Methods Used
Cambridge State Hospital 2:1	2 full days per week; 3 weeks	Understanding of psychiatric and related drug therapy and the relationship to the total patient case. Students follow selected patients to develop patterns of therapy.	<ol style="list-style-type: none"> 1. Rounding with physician 2. Aid in outpatient clinic sessions. 3. Patient work-ups 4. Discussion/Conference Session 5. Assignment of outside reading material 6. Physician conferences
Drug Information Center (University Hospitals) 3:1	15 hours per week; 3 weeks	Understanding of the function and organization of a drug information center and the research materials associated with it.	<ol style="list-style-type: none"> 1. Working in the Center (25 hours) 2. Assignment of problems(gathered from previous requests); developing reports; attending meetings of interest; outside reading assignments; etc.
Family Practice Clinic (University) 2:1	8 hours per day for 2 days; 3 weeks	Relating to the physician and the patient in the family practice setting	<ol style="list-style-type: none"> 1. Taking drug histories 2. Patient consultation 3. Drug information resource person 4. Discussion/Conferences 5. Outside reading assignments
Stillwater State Prison	1 day per week; 5 weeks	Patient care in the prison setting, including drug education	Counseling; discussions

part of the profession of pharmacy. This can be especially noted in the Pharm. D. curriculum.

In addition to general electives offered from throughout the University, the student can select professional electives from the health science areas. Those offered through the College of Pharmacy include:

- Instrumentation in Medicinal Chemistry (3)
- Special Problems in Medicinal Chemistry (cr ar)
- Modern Concepts in Medicinal Chemistry (3)
- Cosmetics and Dermatological Preparations (3)
- Special Problems in Pharmaceutics (cr ar)
- Antibiotics (2)
- Special Problems in Pharmacognosy (cr ar)
- Veterinary Science (3)
- Biological Assay of Drugs (3)
- Pharmacometrics (3)
- Terminology of the Health Sciences (2)
- Pharmaceutical Manufacturing (6)
- Parenteral Products (3)
- Vitamins and Hormones (2)
- Vitamins and Hormones Laboratory (1)
- Over the Counter Preparations (1)
- Contemporary Pharmacy (1)
- Community Drug Education (1)
- Community Drug Education Laboratory (1)
- Clinical Clerkships (2 or 5) (Repeat)
- Clinical Conferences (2) (Repeat)

2. Graduate Program

The Master's degree and/or the Doctor's degree are offered in the areas of Pharmaceutics (M.S. only in Hospital Pharmacy), Medicinal Chemistry, Pharmacognosy, and Pharmacy Administration. The Graduate program is designed to provide a rounded experience by appropriate course work, seminars, and special lectures supporting a continuing, individualized research program.

Each student conducts original research under the supervision of a staff member who is selected by the student within one year of his matriculation. Such research is directed toward the development of the M.S. or Ph.D. thesis and is of central importance in the training of the candidate. The Graduate School offers the Master's degree under two plans; Plan A. involving a thesis, and Plan B. which substitutes additional course work for the thesis. These alternative plans are accepted by the College of Pharmacy.

Candidates for graduate study in the Pharmaceutical Sciences should possess a Bachelor's degree in some science field such as pharmacy, chemistry, biology, pre-medical study, etc. Ordinarily, a background including elementary course work in organic chemistry, biochemistry, biology, physiology, microbiology, pharmacology, and physical chemistry is desirable. Deficiencies in these areas may be removed by remedial course work early in the candidate's graduate tenure.

a. PHARMACEUTICS

The Pharmaceutics Department at the College of Pharmacy presents a comprehensive program of course work and research offerings leading to the M.S. and Ph.D. degrees. A basic background in the physical and biological sciences is provided as a firm foundation for the study of modern pharmaceutics. The broad scope of the program affords the student an exceptional opportunity to elect a course of study which best meets his individual needs and interests. Minor fields which are particularly desirable include physical chemistry, chemical engineering, biochemistry, and pharmacology. This program is designed for the student who desires to prepare himself for a career in education, industry, or research.

In addition, the hospital pharmacy program, leading to a master of science degree in hospital pharmacy, is offered. This program is designed for the student who desires a responsible supervisory and managerial position in the hospital pharmacy environment.

The core subject material which is considered to be essential for effective research or teaching in pharmaceutical technology is as follows: (quarter credits given in parentheses)

Differential Equations (3)
Theory of Statistics (3)
Physical Chemistry (16)
General Pharmacology (10) - normally satisfied by undergraduate training in pharmacy.
Seminar (3-5)
Advanced Analytical Methods (6-10)
Stabilization of Pharmaceuticals (3)
Pharmacokinetics (3-5)
Interfacial Phenomena (3-5)

For a total number of quarter credits of 37-45

The preceding listing of core courses represents approximately 55% of the total coursework required at the University of Minnesota for the Ph.D. degree. Thus, a substantial number of credits can be selected from related fields in which the candidate may have a special interest.

b. MEDICINAL CHEMISTRY

The Medicinal Chemistry Department at the College of Pharmacy presents a comprehensive program of coursework and research offerings leading to the M.S. and Ph.D. degrees. The program provides a background in modern medicinal chemistry and is characterized by having a strong biological component superimposed on a firm foundation in organic chemistry. The program has sufficient flexibility to permit designing a course of study to meet the needs and interests of the individual student. In addition to coursework offerings within the Medicinal Chemistry Department the student will also be engaged in interdisciplinary studies in other University departments such as organic chemistry, biochemistry and pharmacology.

The basic core curriculum would be required of all trainees, and deficiencies in organic chemistry, physical chemistry, biology, physiology, etc. must be removed during the first year of graduate study. The core subject material essential for effective research and teaching in medicinal chemistry is composed of the following: (quarter credits in parentheses)

Seminar: Pharmaceutical Chemistry (3)
Advanced Medicinal Chemistry (9)
Carbohydrates and Glycosides (3)
Research in Pharmaceutical Chemistry (thesis)
Organic Qualitative Analyses (4)
Chemistry of Natural Products (6)
Heterocyclic Compounds (3)
Graduate Survey of Organic Chemistry (8)
Stereochemistry (3)
Graduate Survey of Biochemistry (9)
Advanced Pharmacology: Physiological Disposition of Drugs (3)
Pharmacometrics: Evaluation of Drug Activities (3)

For a total number of quarter credits of 54.

The above listing of core courses represents approximately 75% of the total coursework required at the University of Minnesota for the Ph.D. degree. Thus, approximately 15 credits (25%) of the candidate's work can be selected from related fields in which the candidate may have a special interest.

c. PHARMACOGNOSY

The Pharmacognosy Department at the College of Pharmacy presents a comprehensive program of coursework and research offerings leading to the M.S. and Ph.D. degrees. The program provides an opportunity to study the medicinals in biological systems from any one of the following three

perspectives: biochemical (product biosynthesis, isolation, and identification), botanical (chemotaxonomy, ethnobotanical, growth, and physiology), and microbiological (antibiotics, antitumor, and antiviral screening, biotransformations, tissue cultures). Because of the multidisciplinary nature of pharmacognosy, each student's program will be constructed to meet their specialized needs and interests. In addition to the coursework offered within the Pharmacognosy Department, the student may also be engaged in interdisciplinary studies with other University departments such as biochemistry, botany, microbiology, medicinal chemistry, and pharmacology.

Applicants with a Bachelor's or Master's degree in pharmacy, chemistry, or biology would normally be accepted into the pharmacognosy graduate program. Applicants with a non-pharmacy degree would be required to complete the undergraduate professional course sequence in pharmacognosy and pharmacology. The core subject material for each Ph.D. candidate in pharmacognosy is: (quarter credits in parantheses)

Antibiotics (2)
Vitamins and Hormones (2)
Medicinal Product Isolation and Identification (8)
Seminar (5)
Research in Pharmacognosy (thesis)
General Biochemistry (9)
Elementary Physical Chemistry (6) or
Physical Biochemistry (3)
Medical Microbiology (4)

For a total number of quarter credits of approximately 35.

In addition, each Ph.D. candidate would be required to complete approximately 20 credits in their selected minor.

d. PHARMACY ADMINISTRATION

Pharmacy Administration is a flexible interdisciplinary program of education and research on the social, economic, psychological, and political aspects of the organization and distribution of drugs and pharmaceutical services; the use, misuse, and non-use of drugs and drug information by patients and practitioners; and the role of the pharmacist as a health practitioner in relation to the public, his profession, and other health practitioners. This program in Pharmacy Administration leading to the M.S. and Ph.D. degrees, has been developed in response to a need for persons who are capable of interpreting the social scene, reflecting upon the political and economic forces affecting it and then anticipating the need for change. These persons must have a broad knowledge of the social environment within which health care is

provided, the economics of health care provision, the political system, and the relationship of these to pharmaceutical function.

The graduate faculty includes a medical sociologist, a biostatistician, a market resource analyst, a comprehensive health planner, a hospital administrator, and clinical pharmacists. Students can expect some significant immersion into clinical settings in which pharmaceutical functions exist.

The curriculum emphasizes breadth of learning in contrast to technical development and is structured around six basic areas:

1. the economic system,
2. the social system,
3. the political system,
4. the health care system,
5. basic management techniques, and
6. pharmacy and its environment.

The following courses form the core of the major area: (quarter credits given in parentheses).

Seminar (1 cr. per year)
Research problems (cr. ar.)
Drug Marketing (3)
Legislative control (3)
Clinical Conferences (2)
Clinical Clerkships (2-5)
Clinical Therapeutics (6)
Special Clinical Problems (cr ar)
Pharmacy and its Environment (6)
Elements of Economic Analysis (6)
Social, Economic Aspects of Health Care (3)
Statistics
Data Processing

The following areas include courses that may be selected for addition to the major area, as a minor area or as a collateral field of study. A collateral field of study must include 9 credits. Minor area will include a minimum of 1/6th of the total coursework offered. The program of study will ordinarily include three of the following areas:

Anthropology
Business Administration
Education
Economics
Political Science

Psychology
Public Administration
Public Health
Sociology

3. Continuing Education

One of the primary objectives set forth by the College of Pharmacy is to provide the professional community with the opportunity of being able to keep abreast with changes, problems, etc. in the field of pharmacy. This is carried out under the guidance of the Director for Continuing Pharmacy Education, using a dual philosophy, namely:

- a. Every program should follow the three basic principles of education; i.e., objectives should be set, content should be designed to meet these objectives, and evaluation should be utilized to judge whether the objectives have or have not been met.
- b. Education should be taken to the audience as often as this is practical.

Since the program has been initiated, numerous activities have been held throughout the State of Minnesota. Last year's program included:

- a. T.V. Lecture Series #5 (1970-71): Drug Therapy in Disorders of the G.I. System.

Purpose: To give the pharmacist an understanding of the disorders, prognosis with and without treatment, and rational drug therapy. The five program series was shown at 11 different sites: Three in the Twin Cities area (St. Paul Ramsey, Methodist Hospital, and Burton Hall on the University of Minnesota campus), Rochester, Mankato, Bemidji, Brainerd, Fergus Falls, Duluth, St. Cloud, and Marshall.

- b. Modern Management Seminar: Annual seminar dealing with the hard facts and problems the pharmacist must deal with. The 1971 MMS was entitled "Making or Breaking It in Your Pharmacy." Topics included: how to buy and sell effectively; understanding the profit and loss statement; planning and implementing productive advertising and sales programs; and factors to look for and emphasize when buying or selling a store.

The 1969 MMS featured personnel management, while the 1970 seminar took the form of the Drug Abuse Seminar.

- c. Contemporary Topic Seminar: Annual seminar dealing with a variety of possible subjects. The 1971 CTS was entitled

"Update: The Pharmacist and Community Drug Education."
Program goals included: to present current, factual information on the drugs of abuse; to explore some of the social and psychological factors associated with drug misuse; to discuss the community's needs for education about drugs, referral and treatment resources, and a critical analysis of personal and community life; and to prepare participants to become involved in community action programs.

- d. Providing a series of articles for the Minnesota Pharmacist entitled "Practical Science for Pharmacists." The objectives here are threefold:
1. to provide practical scientific information to the pharmacist,
 2. to bring the faculty closer to the profession, and
 3. to provide for direct interaction between the pharmacist and the faculty.

Activities for the present year (1971-72) include:

1. T.V. Lecture Series #6: Infectious Disorders and Drug Treatment.
2. Contemporary Topic Seminar: The Health Professional and Venereal Disease Education.
3. Continuing education by audio cassette tape: The first series of tapes entitled "Infectious Disorders and Drug Therapy" has been produced. This consists of six cassette tapes complete with cassette holder notebook, lecture outlines, visuals, self-check tests, and final examinations.

A second series, dealing with biopharmaceutics, is under preparation.

4. Continuation of the "Practical Science for Pharmacists" series in the Minnesota Pharmacist.

As an indication of participation, the eleven sites involved in the T.V. lecture series #6 drew 344 registrants. This can be compared with a 1970 population figure of 2,269 in-state active pharmacists.

With the large amount of new drug information coming out each year, with the increased awareness the practicing pharmacist is developing toward the need for continuing education, with the probabilities of some type of mandatory continuing education for licensure, and with the need for the restructuring of the health care delivery system, this area will continue to grow and serve an ever increasing percentage of the profession.

4. Health Research Program

Faculty members are encouraged to undertake original research projects associated with their particular interests. A majority of this research is closely interwoven with the graduate teaching program. Essentially 100% of this research is health related. A large percentage of the non-teaching research program is funded from outside of college resources through the initiative of the individual researcher. It is estimated that approximately 10% of the college's own resources are devoted to this area.

The current research interests of the various departments can be broken down as follows:

a. **Pharmaceutics:**

Current research includes investigations regarding the mechanics and mechanisms of the segregation or demixing phenomena observed in systems of particulate solids. These studies include the experimental determination of relative and absolute rates of mixing and segregation in multi-particulate systems subjected to vibration or shear, as well as the theoretical interpretation of the observations.

Research interests also include the chemical activity and reactivity of molecules with anisotropic liquid systems. Such systems are under study with regard to the thermodynamic and steric contribution of the solvent to the observed solute behavior.

Physical and chemical Stabilization of Pharmaceutical Systems:
The systematic examination of pharmaceutical systems of interest, using physico-chemical knowledge, to elucidate causes of chemical and/or physical stability problems and the prevention or minimization of the problems.

In another area of Pharmaceutics, interests are generally concerned with diffusion and transport phenomena in pharmaceutical systems. Current activity centers around diffusional behavior of drugs in solutions of hydrophilic colloids and the mechanism of the reaction of fluoride salts with synthetic tooth mineral, hydroxyapatite.

Biopharmaceutics: Interests include the absorption and distribution characteristics of drugs and biochemical mechanisms and rates of metabolism of biologically active compounds. Currently, potential inhibitors of the conjugation process are being investigated.

Pharmaceutical Manufacturing and Product Development:
Current research and graduate lecture interests consist of the examination of the chemical, economical, physical,

political, psychological, and social problems associated with industrial and/or pharmaceutical development, manufacturing, and marketing of health sciences related commodities; including F.D.A. regulation, new drug application, patent application, etc. Current interests also include the industrial development of Minnesota and adjacent areas through recognition, study, application of various resources.

b. Medicinal Chemistry:

Studies involving isolation, purification, structure elucidation, and synthesis of a variety of natural products are being carried out for the purpose of obtaining leads toward potentially useful therapeutic agents. Recent studies have involved alkaloids from Argemone species as well as naturally-occurring coumarins from the Umbelliferae.

Structure activity relationships of active compounds are explored by means of suitable synthetic congeners. Other studies have involved naturally-occurring coumarins in the Umbelliferae with particular emphasis on a search for useful vasodilators. Structure-activity relationships of active compounds are explored by means of suitable synthetic congeners in order to maximize activity and minimize toxicity.

Also: The design, synthesis, and pharmacological evaluation of compounds possessing structural features which make them useful tools for the study of drug receptors and molecular mechanisms of drug action. Current studies emphasize stereochemical aspects of histamine receptors.

Phytochemistry-Medicinal Chemistry: Structure activity, relationships in the genins and the sugar residues. Investigations of the glycosides in the new species of Digitalis not previously investigated together with enzymatic studies in these plants.

The synthesis of medicinal agents: Object to enhance our knowledge from a structure activity standpoint.

Central Nervous System Acting Drugs: The chemistry, synthesis, and structural studies of substituted glutarimides, their reduced derivatives, the piperidines and novel spirano bicyclic compounds. Similar compounds in this general class have long been known to possess biological activity in the central nervous system.

Steric Aspects of Drug Action: Stereochemistry and conformational analysis of biologically active compounds. Synthesis of conformationally rigid compounds as receptor probes. Investigation of the relationship between stereo-

chemistry and activity. Design and synthesis of new medicinal agents. Biophysical and biochemical investigation of receptor mechanisms. Metabolism studies.

Synthesis of Enzyme Inhibitors: Enzymes are responsible for catalyzing all chemical reactions in living organisms. In the control of certain diseases we may wish to alter the enzyme reactions vital to the invading organism in order to selectively kill this microorganism without harming the host. Interest is in the designing and synthesizing of organic compounds which will selectively inhibit the reactions of certain enzymes which are vital to cellular growth. Since all cells must double their DNA content prior to cell division and also since cancer cells divide at a very high rate, special interest is in the preparing and testing of compounds which will interfere with enzymes involved in the DNA synthesis.

Amino Acid Antimetabolites; Drug Metabolism: Syntheses of amino acid analogs, homologs, and analogs of homologs, with antimetabolic or chemotherapeutic potential, using biochemical rationale as basis for their design. Presently, attention is being focused on the synthesis of proline and lysine analogs that are potential inhibitors of collagen biosynthesis, wherein blocking groups are placed in positions of enzymatic hydroxylation of these amino acids. Possibilities are also being explored for the synthesis of a wide variety of other proline, ornithine, lysine, citrulline, and arginine analogs and homologs.

The Metabolic basis for the action of certain drugs is being investigated by studying their biochemical transformations and metabolic disposition in animals with the aid of the radio-labeled drugs. Parallel interest lies in the design, synthesis and the biochemical and pharmacological evaluation of drugs latentiated by enzyme action.

c. **Pharmacognosy:**

Current research in the Pharmacognosy department is concerned with the growth, physiology, and biosynthesis of medicinals in higher plants; the use of multi-liter plant suspension cultures for the biosynthesis or biotransformation of medicinals; and the development of an antiviral and antitumor screening program; phytochemistry and pharmacology of aquatic plants; ginseng phytochemistry and physiology.

Medicinal Plant Tissue Cultures; A study of free cells and differentiated tissues derived from medicinal plants for their ability to biosynthesize and biotransform alkaloids, antibiotics, cardenolides, hallucinogens, steroids, etc. The biological systems examined are aseptic, continuously

subcultured, and grown as suspensions in either Erlenmeyer flasks or pilotscale fermentors. Of further interest and study are the effects of one tissue culture line upon another; the ability for a cell line to reorganize and form a new medicinal plant; and the inter-relationships between both plant and animal viruses to a plant cell line.

Mechanisms of Steroid Metabolism and Transformation: A study of the stereochemistry and mechanism of enzymatic hydrogenation and dehydrogenation reactions is currently under investigation. Another area of investigation is the microbial transformation of steroids and alkaloids. Other areas of investigative interest include a comparative study of the rates of enzymic hydrogenation reaction in the liver and hepatoma, steric aspects of catalytic hydrogenation and isolation of antibiotics from fungi.

d. **Pharmacy Administration/Clinical Pharmacy:**

Contemporary health care is intimately involved with drug use. There is a need for research to establish the pharmacist's role in society with respect to his colleagues, to other health professionals and to the general public. There must also be research into the system for the provision and delivery of pharmaceutical services. Another aspect of recent interest and effort has been directed towards comprehensive health planning, health care delivery systems, and the improved utilization of health manpower. Also there has been a specific interest in demonstration projects for health care delivery with specific interests in the pharmacist's role.

5. Library and Learning Resources

The College of Pharmacy Library is a college based function but is considered a part of the University Library System. It is located along with the College in Appleby Hall. Current holdings include 14,000 bound volumes, 270 serial titles, and indexes to domestic, foreign, and experimental drugs. On order for library use is a microfilm printer and the Iowa microfilm collection on clinical therapeutics. The library is open for general use approximately 45 hours per week and is accessible to graduate students and staff 24 hours a day, 7 days a week. Study space is included which can accommodate approximately 60 individuals at a given time.

Also located within Appleby Hall is the College's Learning Resources Center. Included are 4 study carrels, 2 audio-visual learning carrels, and some general study space. Physical limitations dictate the limited number of facilities available for student use. Audio-visual software includes slides, AV tapes, film strips and an audio cassette tape library. The Center also serves as the central storage point for the College's audio-visual equipment, ranging from projectors to CCTV.

The Bio-Medical Library is conveniently located and accessible for all Health Science users. It occupies four floors in Diehl Hall, a multipurpose building adjacent to the Health Sciences complex and connected to it by tunnel. This facility is approximately 8 blocks from the present location of the College of Pharmacy. Two floors of the Library were completed in 1960, and two additional floors were added in 1964. The total amount of floor space allocated for library purposes is 82,901 square feet exclusive of mechanical equipment rooms. This provides seating space for about 750 readers and a shelving capacity of approximately 250,000 volumes. The initial segment of a Learning Resource Center was opened in July of 1970 in order to provide students with a unified approach to print and non-print materials. The Center contains learning carrels for using a variety of audio-visual self-instructional materials, such as audio-tape cassettes, slides, filmstrips, and film loops. A basic collection of texts and reprints is also available. The Center at present contains ten learning carrels and space for forty readers.

The collections are broad in scope, covering all fields of medicine and biology, and are designed not only to support the teaching and research needs of its many users, but also to function as the major library resource for medical and biological materials for the University and the Upper Midwest. The Bio-Medical Library now has a total of 205,000 volumes and receives approximately 3,200 serials a year of which about 2,000 are current journal subscriptions. During the 1969-1970 fiscal year, 7,000 volumes were added to the Library. The outstanding feature of the collection is the strength of its periodical holdings, both current and retrospective. The Library has attempted to secure complete runs of all significant medical journals, not only from this country but from throughout the world.

The Library also has an excellent reference collection and a rapidly developing historical section. The Historical Collection occupies a separate facility within the Library and includes an extensive stack area, a reading room, lecture room, and offices for the staff. The collection now totals approximately 16,000 volumes (including pharmacy's Wulling Collection) and is growing steadily with funds provided entirely by private donors.

The Pharmacy and Bio-Medical Libraries are part of the University Library System and can draw on all library resources within the University. These resources total approximately 3 million volumes. Departmental libraries, particularly the Veterinary Medicine, Entomology, and Chemistry (24,000 volumes) Libraries, provide resources which supplement the Bio-Medical and Pharmacy libraries. Twice daily deliveries enable books and journals to be quickly and easily requested and delivered to and from other library units. Items which are not available on campus are usually secured either from the Mayo Clinic Library in Rochester which totals more than 100,000 volumes and with whom we have a mutual agreement to provide next day service and free photocopy, or from the Midwest Regional Medical Library located at the John Crerar Library in Chicago. Arrangements with local and state hospital libraries enable these libraries to obtain loans or photocopy from the Bio-Medical Library. A statewide regional medical library system is presently being developed. An extension librarian has recently been added to the staff to provide service to out-state hospitals and health science professions.

The Bio-Medical Library is open 98 hours a week and provides full service whenever open. Trained librarians provide a variety of reference services to users. This assistance includes locating specific information or facts, locating and borrowing materials from other libraries, verification of citations, compilation of selected bibliographies, instruction in the use of library indexes and reference books, and preparation of MEDLARS search requests. Request for MEDLARS bibliographic searches are forwarded to the Regional Medical Library for computer processing. Interlibrary loans, which are secured for patrons if the material is not available in the Library or on campus, are transmitted to other medical libraries via teletypewriter and are usually filled by photocopy at no charge to the patron.

The Bio-Medical Library has been developing computer based operations for the last four years. An automated system for handling all aspects of journal control went into operation in January of 1968 and an acquisition and accounting system was added in 1969. It is planned to eventually develop a fully automated system for all library operations. This would allow any user, whether within the Library or without, who has access to a terminal, to be able to determine what was in the Library for all types of materials, where the item was located, and whether or not it was available or in use. Audio-visual materials would be included in this system, allowing users to have access to a unified record for all types of learning materials, both print and non-print.

The University Library System serves mainly the students, faculty, and staff of the Twin Cities campuses where approximately 43,700 students were enrolled in the Fall of 1970. The collections are available to a wide range of individuals, however, through inter-library loans and through privileges granted medical and industry personnel.

Bio-Medical take-out circulation approaches 80,000 units per year while this figure for the central University Library is approximately 600,000. The College of Pharmacy's library take-out circulation is about 7,500 units per year. These figures do not include in-house library usage. Monthly head counts approach 15,000 for the Bio-Medical Library and 130,000 for the central University facility.

TEACHING BY MEDIA

MEDIUM	COURSE	% TIME USED
Computer	Biopharmaceutics*	15%
Programmed Text	Terminology of the Health Sciences**	100%
	Fundamental Principles and Processes*	50%
	Pharmaceutical Preparations*	20%
	Advanced First Aid**	50%
	Pharmacognosy (Vitamins)*	20%
Films and other Visual Aids	Basic*	5%
	Clinical**	3%
Video Tape	Clinical Clerkships**	5%
	Clinical Therapeutics**	5%
	The Pathophysiology and Therapeutics of Disease**	5%
	Continuing Education Video-Tape Series	100%
Closed Circuit TV	Management of Pharmaceutical Services**	40%
	Advanced First Aid**	10%
Slide/Tape	Quantitative Medicinal Chemistry*	15%
Audio-Tape	Orientation	10%
	Continuing Education Audio Tape Cassette Series	100%

*Basic Pharmaceutical Sciences

**Clinical Sciences

***Used at some time or another in several courses.

SELF-INSTRUCTION BY MEDIA

LEVEL OF STUDY	% OF HOURS	SELF-INSTRUCTION MEDIUM
Basic Science	5% (approx.)	Programmed text: Slide/Sound programmed text
Electives	5% (approx.)	Programmed text
Continuing Education	100%*	Audio-cassette

*of subscribers

The teaching media and self-instructional programs are just beginning to catch hold as part of the educational methodology. Existing programs have been successful as evidenced by their continuation and by their expansion. Lack of physical space, audio-visual equipment, and supportive personnel have hampered our efforts in this direction. The concentration of our present resources into the Learning Resources Center and the hiring of a part-time audio-visual technician have aided greatly in our present programs. This, however, is barely covering present demands and with the success and anticipated expansion of innovative teaching programs, the demand will be much greater in the near future.

6. Clinical Resources

Both hospitalized and ambulatory patients are required for clinical instruction. The number and type of sites for clinical exposure is more determinant than absolute numbers of patients. Students, during their senior year, are rotated through these environments as part of the clinical conferences and clinical clerkships.

For inpatient utilization, affiliations are presently operative with the following institutions:

- a. University of Minnesota Hospitals.....818 beds
 - 1. Surgery/transplant/pediatrics
 - 2. Oncology (Masonic Memorial Hospital)
 - 3. Neurology
 - 4. Cardiovascular (Variety Club Heart Hospital)
 - 5. Medicine
- b. Veterans Administration Hospital.....1014 beds
- c. St. Paul - Ramsey Hospital.....611 beds
- d. Hennepin County General Hospital.....382 beds

e. Mt. Sinai Hospital.....273 beds

Affiliations for ambulatory patients include:

- a. University of Minnesota Hospitals
 - 1. Pharmacy Service (outpatient)
 - 2. Family Practice Clinic
 - 3. Drug Information Center
- b. Veterans Administration Hospitals (outpatient)
- c. St. Louis Park Medical Center Pharmacy
- d. Appel Pharmacy (Nursing Home Environment)
- e. Diabetes Detection and Education Center
- f. Stillwater State Prison
- g. Cambridge State Hospital (Mentally Retarded and Epileptics)

The majority of these affiliations are within a ten mile radius of the College of Pharmacy. Distance, however, is not a limiting factor. In order to provide a wider range of experiential conditions, several sites are located away from the Twin Cities area - namely, Cambridge State Hospital (45 miles) and Stillwater State Prison (25 miles).

Being the only College of Pharmacy in the State, these institutions do not serve as clinical sites for other programs in pharmacy. Other health science units, however, to utilize some of these same environments for their programs.

B. Projected

1. Undergraduate Program

The curriculum to be utilized in the new facility will basically follow the same course concepts as the existing undergraduate curriculum. This has been outlined in a previous section of the application. Contemplated changes deal mainly with more efficient use of the student's and faculty's time. A concept or integrated approach rather than the departmental approach would be the most obvious implication. This would free up blocks of time in the last professional year for more extensive clinical experiences. Existing courses are presently following concept organization, but lack the coordination offered by total integration.

The newly emerging curriculum in the College of Pharmacy is placing increasing emphasis on (1) the patient and (2) the utilization of more self learning and small group teaching. The students will find more free time being provided in their schedules for auto-tutorial instruction using print and non-print materials. The patient aspect of this new emphasis has been well provided for in the past and with the move to the Health Sciences complex, this will be facilitated even to a greater extent. Present facilities severely limit the second area of emphasis - that of self learning and small group teaching. The new facilities do not.

Careful planning has been done for the Phase I construction program to develop integrated and coordinated educational resources facilities.

New and existing course presentation (including laboratories) will be much improved by the new facilities. Laboratories and classrooms have been designed with the individual student in mind. Being able to work off of the central production and control facilities of both the University and the Health Sciences, the College of Pharmacy will be provided with a myriad of audiovisual technique possibilities. The auditoria, conference rooms, and seminar rooms will be tied into the central control facility located in Unit A (under construction). One of the 150 seat auditoria within Unit F will be outfitted for computer response capabilities. Classrooms and conference areas provide complete flexibility. Computer facilities will be available which will tie in with the Health Sciences computer. The increasing emphasis on the individual in the laboratory setting is evidenced by planning which will permit activities such as multiple demonstrations, small group interaction, individual study, and individual experimentation. Television monitors are located throughout the building.

The utilization of these audiovisual techniques and materials will be in conjunction with the Learning Resources Center of the Bio-Medical Library and the study, lounge, and carrel areas within the College. These efforts will be facilitated and promoted by the Educational Development Center to be located in the College. Here, professional planning and technical assistance will be available for faculty and students.

Of great significance is the closing of the physical distance gap between the College programs and the Basic Health Sciences programs (i.e., pharmacology, anatomy, microbiology, physiology, & pathology). These activities will be directly adjacent to Unit F and will thus be of much easier access to the students who must fulfill requirements in these areas.

The Doctor of Pharmacy program hopes to implement specialization options for the candidates. Among these is a proposal for the development of a program in the science of applied clinical pharmacology. In addition to meeting the requirements of the undergraduate pharmacy program, these students will be required to complete approximately nine quarter credits each in the following courses (or equivalents):

Laboratory Pharmacy - laboratory instruction and training in the analysis of drugs in biological systems.
Clinical Pharmacokinetics - application of the principles of kinetics of drug disposition to patient therapy.
Clinical Therapeutics - understanding and application of drug action in patients.
Clinical Clerkship - experience in patient care.
Clinical Electives - Pharmacology 107 (Pharmacometrics);
Pharmacology 201-202 (Physiological Disposition of Drugs, Pharmacodynamics); Medicine 206 (Clinical Conferences);
Medicine 104 (Introduction to Internal Medicine);
Medicine 184 (Metabolism and Clinical Pharmacology); and
many others, depending on the interests of the student.

Another proposal will allow specialization in infectious disease therapy. In this program, as part of their elective options, students would opt for:

Clinical Rounds and Hospital Laboratory Intern Assignments
(infectious disease therapy and sensitivity testing laboratory);
Epidemiology and Venereal Disease Control;
Graduate level medical microbiology, virology, and/or immunology;
Antibiotic colloquium.

The options do not stop here. Highly individualized programs can be developed (and are encouraged) for all students (both B.S. and Pharm. D.). One of the most reaching effects of the new facility will be in this individualization and in the further development and promotion of the health team concept and the clinical role of the pharmacist within this concept. The interaction provided by the integrated facilities will work towards this goal.

2. Graduate Program

The existing graduate program will essentially be carried intact to the new facility. What will be evidenced is expanded student capacity, greater learning and research opportunities through improved physical facilities and equipment and the much greater opportunity for interprofessional educational and research activities with the other health sciences.

3. Continuing Education Program

The increased responsibility taken on by the College in the continuing education area has prompted need for expanded administrative and production space for this activity. This is in continuity with our philosophy that continuing education should be taken to the audience as often as this is practical.

This is not meant to imply that continuing education programs will not be presented on site from the new facility. The individualized laboratory and carrel areas can serve a dual purpose - undergraduate/graduate education and short-term on site continuing education. In addition, the multi-size auditoria available provide an ideal meeting/conference/convention setting. These concepts will be developed.

The continuing education administrative area will be located adjacent to the Educational Development Center and will thus be able to work closely with these individuals in planning and production.

4. Health Research Program

All health research within the College of Pharmacy is basically educational oriented and student participation is primary. Expansion of research will be in conjunction with the student increases in the graduate programs (approximately double) and with faculty increases. Improved specialized facilities and new equipment will allow greater range of research expression. Most notable expansions will provide for:

- a. greater biological research expression,
- b. improved cancer research methods,
- c. virus research (approved facilities),
- d. autoradiography,
- e. expanded tissue culture research,
- f. expanded synthetic chemical research,
- g. physical systems research,
- h. bioavailability research,
- i. health care delivery systems research, and
- j. sociological research.

Of special significance and aid will be the in-house computer facilities which will tie in with the larger health sciences computer.

5. Library and Learning Resources

The existing pharmacy library will be incorporated with the Biomedical Library in the new complex. This will serve the School of Medicine, School of Public Health, School of Nursing, School of Dentistry, University Hospitals, College of Biological Sciences, and users of biological and medical library materials within the University as a whole, along with the College of Pharmacy. This total incorporation allows for an enlarged resources base, as well as avoiding needless duplication of collections.

As part of the Unit B/C expansion, the Learning Resources Center within the Biomedical Library will be expanded to accommodate 176 individual carrels, 21 small group carrels (3-4 people), and 5 carrels to accommodate varying sizes of groups (up to 20 individuals). In addition, the College of Pharmacy is providing 16 additional individual carrels, along with numerous seminar/conference rooms and general study spaces.

At the college level, these learning resources materials will be coordinated through the Educational Development Center. This service will be actively available for undergraduate, graduate, and continuing education programs. Incorporated will be expertise in teaching methodology, curriculum planning, counseling procedures, and audio-visual production techniques. This Center will in turn utilize the University and the Health Sciences educational and production resources, again avoiding needless duplication.

Use of CCTV, audio-visual aids, computer teaching, and self-instruction methods will increase significantly with the new facilities. These methods are being introduced to our faculty at the present time as can be seen by the tabular presentation in Part A, Number 5 (current library and Learning Resources). These methods have been accepted and are increasing in use. Although our present resources are being taxed by this increased utilization, the methodology and interest are being encouraged now to allow for immediate appreciation and utilization in the new facility.

In addition, the increased proximity of the Biomedical Library and its many services (e.g., MEDLARS, Medline, inter-library loans) to the College will encourage their utilization.

6. Clinical Resources

The major expansion of clinical sites is in the area of the community pharmacy. A full-time clinical coordinator has been hired to organize a number of sites for this purpose. Students will be rotated through the sequence of sites in conjunction with the existing institutional exposure. The valid concept of utilizing clinical expertise in the community setting will thus be promoted.

Heavy reliance will continue on the institutional setting. These areas will be expanded and developed as the desirability and opportunity arises. Current affiliations will meet present needs as long as the professional staff can be adequately developed.

SECTION IV - APPLICANT RESPONSE TO NATIONAL HEALTH OBJECTIVES

A. Special Programs

1. Training Courses in Current Shortage Disciplines

The profession of pharmacy is clinical by its very nature and thus all students must be appropriately trained. The College of Pharmacy is committed to this concept. Accordingly, all students are required to take designated courses in this area as indicated in the previous section of this application outlining current curriculum (pp 32 to 38).

The College does not, however, believe that for all students this requires 6 years of formalized education (Pharm. D. degree). A majority of the needs for our health care delivery system can be met through the B.S. graduate who has had appropriate training in clinical areas (in addition to the basic pharmacy curriculum).

The 6-year Doctor of Pharmacy graduate is a clinical specialist with more refined expertise. This drug information specialist will provide manpower for a variety of shortage areas. Included here are clinical teaching roles, drug therapy advisors for specialized medical areas, ie., infectious disease, and applied clinical pharmacology.

The College's commitment to this training can be seen by the present number of F.T.E. clinical faculty (7.5 out of a total of 26.7) and the projected number of F.T.E. clinical faculty for 1977-78 (20 out of a total of 59.5).

The clinical pharmacy programs consists of a core of basic behavioral and clinical knowledge as part of the education of all pharmacy students. This is followed by sequenced study and training which the student selects from certain elective offerings and is designed to provide the opportunity to pursue further study in those areas of greatest interest to him.

The courses offered can be separated into three distinct groups. The first group encompasses those courses which are required of all pharmacy students. This includes the socializative and administrative orientation. This covers the general concepts in dealing with people and the application of these concepts (along with basic pharmaceutical knowledge) to a clinical (or people) situation. The second group includes courses which are elective in nature and are meant to provide depth to the basic clinical knowledge and experiences. The third group provides the basis for the Doctor of Pharmacy degree.

In October, 1971, a new proposal for hospital based clinical education was developed. This proposal is based on the need for the student to be exposed to direct decisions making involvement in patient care. This would be facilitated by formulating a learning hierarchy in which faculty are responsible for Pharm. D. residents who in turn are responsible for senior students who are responsible for junior students. Each person in this hierarchy has specific responsibilities for patient care and each is involved in teaching-learning. This experience, if instituted, would replace our clinical conferences and some of the

clerkships. It should be pointed out that this is a long range proposal and as such is purely in the speculative scope of our program as seen for the next several years. The new integrated facilities would promote this concept.

2. Interdisciplinary Training

The Health Sciences concept promotes interdisciplinary training. The College of Pharmacy is actively committed to this.

The Basic Health Sciences (e.g., Pharmacology, Physiology, Pathology, Microbiology, and Anatomy) are taught by the Medical School and are common components of each unit's curricula. The beginning of the pharmacy student's participation in these areas is during his third collegiate year (first professional year) and thus interprofessional cooperation can be noted early in his professional schooling. Other joint offerings are with the School of Public Health and the College of Veterinary Medicine. The Pharm. D. program utilizes the Phase B sequence of the Medical School (taught on the organ system approach) and adapts it into the 24 credit Pathophysiology and Therapeutics of Disease course.

Another common link between all health science areas is the University Hospitals (and clinics) which serve as the primary experience base for all health sciences students.

College of Pharmacy faculty work with the other units in providing lectures, materials, and information and through research cooperation. Interdisciplinary committee cooperation has been listed on page 21.

Indicative of student involvement is CHIP (the Council for Health Interdisciplinary Participation). Comprised of students from all health science disciplines, this group promotes the students' interests at the University level and places heavy emphasis on community involvement; e.g., drug abuse programs, venereal disease programs, and free clinic participation.

3. Distribution of Health Professions Personnel

No data is available to indicate the geographic distribution of graduates. Approximately 75% of the graduates of the College of Pharmacy remain in the State of Minnesota after graduation.

The emphasis being placed on the clinical aspect of community pharmacy will hopefully promote an understanding of the needs, wants, and relationships occurring in the smaller communities. This sensitization could not occur with a clinical component that was exclusively institutionally based. Biases for the institutional setting and misunderstandings about the role of the community pharmacist undoubtedly would have developed.

As a broader clinical program (community and institutional) is developed, an effort is being made to incorporate part of the licensure internship requirements into the College's program. The College is actively promoting such a concept. The State of Minnesota requires that one year (approximately 2000 hours) of internship be acquired prior to licensure. The National Association of Boards of Pharmacy (NABP) has recommended recently that up to 400 hours of this total time required could be derived from approved clinical pharmacy programs. No action has been taken in the State of Minnesota to allow such internship time credit. Hopefully, such action will be taken in the near future. With this occurrence, the College will be in a much improved position to encourage the distribution of pharmacists into areas of critical health manpower needs.

In an attempt to encourage a more active liaison between outstate communities and graduating health professionals, the Health Sciences Center promotes an annual Minnesota Opportunities Day for the Health Sciences. Representatives from many outstate communities are present and have the opportunity to present information about their community and their health care needs to the graduating professional.

4. Health Professions' Auxiliaries Training

The College of Pharmacy is presently involved in a unique demonstration project involving two community pharmacies with a publicly financed health center. One of the objectives is to train community residents as paramedical personnel so that they may assume responsibility for community drug information and education. Although such training has not yet been instituted, planning involving all health science disciplines, has proceeded.

Pharmacy's contribution to this training would have the following scope:

- a. Lecture and discussion of the pharmacist's role in the health care delivery system -- the pharmacist as a resource to paraprofessionals.
 1. Systems used to monitor frequency of drug use
 2. Dosage form design and modification. Sterility, packaging, storage.
 3. Source of drug supply.
 4. Drug information and interactions.
- b. Drugs - what are they? Why people take drugs.
- c. Rationale of regulatory control of drug distribution.
- d. Side effects of drugs.
- e. Drug pricing.

f. Counsel paraprofessionals on how to teach patients about drugs.

1. When and how much.
2. How to spot difficulties.
3. Appropriate use of over-the-counter drugs.

g. Taking drug histories.

h. Consumer Health Education (Preventative).

The College is an active participant in the Health Sciences Allied Health Committee. This group plans and initiates directions and opportunities for the training of paraprofessionals.

The Educational Policy Committee of the College of Pharmacy appointed a Task Force on Subprofessionals in Pharmacy which is currently active. Their role is to assess the possible alternatives and directions on this question. The College had planned to cooperate with Metropolitan Junior College on a Technician Training Program beginning in the Fall of 1972. The implementation of this program has been postponed for this coming year and its status will be determined in the near future.

B. Complementary Programs

1. Regional Planning and Coordination

The College has been deeply involved in State and local health programs. These may be enumerated as follows:

- a. State Comprehensive Health Planning - a faculty member has been chairman of the "a" agency Advisory Council during the years of its existence in Minnesota and a pharmacy student is serving on the Advisory Council at the present time.
- b. Metropolitan Health Board - a faculty member participated in the organization of the "b" agency and continues to work with them through a local pharmacist and a representative from the School of Public Health who are on the Board.
- c. Regional Medical Program - a part-time faculty member is on their advisory board. The College has worked very closely with their staff on several grant applications. They are funding our expanded Drug Information Center toward an integrated Medical Information System.
- d. Community Health Programs - the College is involved in a number of health related programs. They include:
 1. A joint effort with the Ramsey (county) Action Program to develop a Neighborhood Health Center

in West St. Paul, The College will be responsible for the drug component.

2. The College works with the Helping Hand Health Center (St. Paul) to effectively use community pharmacies in the area served to improve pharmaceutical services and serve as an outreach for the Center for entry into the health care system.
 3. The pharmacy students of the College have been involved with the development and operation of the "free" clinics in the metropolitan area.
 4. The College has a sound drug education program operated by students and staff concerned with drug use, abuse, and misuse for citizens of all ages. This will also involve consumer health education.
 5. The College operates the pharmacy in the Stillwater State Prison on contract. It is used as an educational unit. Equally important, an attempt is being made to develop a model pharmacy operation for prisons.
 6. The College is involved in Health Maintenance Organization development. They are seeking a contract jointly with St. Paul Group Health to evaluate pharmaceutical services in an HMO.
- e. Faculty members of the College are involved with a number of health related organizations serving the people of Minnesota.

It should be emphasized that many additional projects are in the planning stage (i.e., Cedar-Riverside Development Health Center; Miller Hospital Pharmacist Education Program; Fergus Falls State Mental Hospital Drug Education Program; Samaritan Hospital HMO; and an experimental Rural Primary Health Center involving extended roles for the pharmacist). Resources (personnel and dollars) have been the inhibiting factors to date.

The proposed project promotes State and Regional health objectives through increased enrollment, improved clinical training for pharmacists, the training of clinical specialists, increased interdisciplinary cooperation, and the resulting promotion of the health team concept in health services delivery. Letters from the State (a) and Regional (b) planning organizations are included on the following pages.

2. Interinstitutional Participation in Training Programs

The University of Minnesota is a participant with the other "Big Ten" schools and the University of Chicago in the Committee on Institutional Cooperation (CIC). This group promotes interinstitutional



STATE OF MINNESOTA

STATE PLANNING AGENCY
802 CAPITOL SQUARE BUILDING
550 CEDAR STREET
ST. PAUL, 55101

WENDELL R. ANDERSON
GOVERNOR AND
STATE PLANNING OFFICER

Gerald W. Christenson
State Planning Director

May 22, 1972

Vice President Lyle A. French
Health Sciences Affairs
424 Morrill Hall
University of Minnesota
Minneapolis, Minnesota 55455

Dear Dr. French:

The Advisory Council of the State Comprehensive Health Planning Agency adopted the position given below at its meeting May 17, 1972.

The Advisory Council of the State Comprehensive Health Planning Agency is familiar with the proposed expansion of the University of Minnesota Health Sciences Center. They encourage the emphasis being placed on the health team approach and the additional involvement with the community by the Center. The proposed expansion is not in conflict with programs being developed by the state agency.

Units A and F are facilities for dentistry and pharmacy, respectively. They are the only schools for these professionals in the state. The need for these facilities is recognized by the Council, and they strongly support their development. The BC unit is for medicine and is likewise supported. However, the Council recognizes that certain parts of the BC unit are subject to Certificate of Need legislation to be evaluated by the appropriate "b" agency.

We recognize the efforts of the University of Minnesota Health Sciences Center to assist in improving health care for all Minnesotans in particular and citizens in the upper midwest in general.

Sincerely yours,


Lawrence C. Weaver, Chairman

**METROPOLITAN
HEALTH
BOARD**



300 Metro Square Building, 7th Street and Robert Street, Saint Paul, Minnesota 55101 Area 612, 227-9421

June 7, 1972

Lawrence Weaver, Dean
College of Pharmacy
University of Minnesota
Minneapolis, Minnesota

Dear Mr. Weaver:

The University of Minnesota project notification for National Institutes of Health funds to assist in the construction of Unit F (to house the College of Pharmacy) was originally received by the Metropolitan Council for review on June 1, 1971.

In accordance with Federal procedures, units of local government were notified of the project and given the opportunity to comment on the project. Additionally, staff reviewed the project for compatibility with guidelines for development of the Metropolitan Area.

Based on the above process and review, it was concluded that: 1) this unit is needed to provide additional teaching and research space for the College of Pharmacy, and 2) this project does not conflict with any present guidelines for total Metropolitan Development.

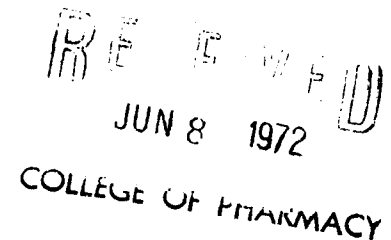
As the project remains the same as proposed a year ago, it is felt that the previous conclusions are still germane.

Sincerely,

A handwritten signature in cursive script that reads "Malcolm Mitchell".

Malcolm Mitchell
Acting Director

MM:lh



cooperation for a variety of educational and service roles. Most notable is the Traveling Scholar Program for graduate students enrolled in CIC institutions. This program enables a graduate student to travel to another of the member institutions for 1 or 2 quarters (1 semester) of study to take advantage of special resources available on another campus but not available on his own. This may include course offerings, research opportunities, unique laboratories, and library collections. This allows for program enrichment and diversification.

For the past five years, the University of Minnesota College of Pharmacy has provided leadership for a panel on Continuing Pharmacy Education sponsored by the CIC. Seven schools of Pharmacy have participated.

Following CIC guidelines, a cooperative program in continuing education has been developed utilizing audio cassette tapes as the media. Thus far, two schools (including Minnesota) have produced programs, with two more schools in the production phase. These programs will be jointly advertised as a first example of interinstitutional cooperation in Continuing Pharmacy Education. Hopefully, this can expand to the national level so that duplication and poor quality in continuing education soft-ware can be avoided and so that pharmacists nation-wide can benefit from a given institution's strong points.

The College of Pharmacy is an active member of the American Association of Colleges of Pharmacy (AACP). This group, comprised of all accredited Colleges of Pharmacy, promotes interinstitutional cooperation on a national level.

3. Team Approach: Health Care Delivery

The College of Pharmacy is an active participant in the planning and implementation of several programs involving the health care delivery team approach.

- a. Clinical program - Through the clinical conferences, clinical clerkships, and clinical residencies, the student is exposed to the actual health care delivery system and how he is a part of it. At the same time the medical students, nursing students, interns, residents, practicing physicians, registered nurses, and paraprofessionals are exposed to the pharmacist, his knowledge, and what he has to offer to total patient care. Students are assigned patients and follow them closely. They go on rounds and consult with other health professionals. The outline of the program course schedule has been included in the current curriculum section of this application as have been the elective options available. The College's program is based on 7.5 full time equivalent faculty members, the majority of whom are practicing pharmacists in their respective environments. They provide the point of entrance for the student into the delivery team environment and also provide the continuity needed for the program. The program

director who is based at the College, works closely with the principals at each of the clinical sites in developing the optimal program. The chart at the end of this section indicates the composition of program participants (pharmacy faculty) from the standpoint of student background and preparation.

- b. Free Clinics - The College of Pharmacy promotes the concept of its students working with other health professional students and health professionals in the innovative health care delivery systems found at the free clinics. Here, the pharmacy students are working with a wide variety of health care personnel (physicians, nurses, med techs, veterinarians, social workers, patient advocates, psychiatrists, etc.), as well as with community workers who are deeply involved with the welfare of community members. The College does not provide personnel, planning, or coordination - this is a task for the community and the volunteers - but it does provide its support.
- c. Community health programs - These have been listed on page 63. These programs are similar to the two listed above in that pharmacy personnel are working closely with other health professionals in the delivery of health care. Innovations include the utilization of existing community pharmacies in an experimental health care delivery system (Helping Hand Clinic) and the education of community residents as paramedical personnel (see page 62).
- d. Programs in the planning stages include:
 - 1. Cedar-Riverside Development Health Center - serving a high density population urban redevelopment (a new-town in-town);
 - 2. A Rural Primary Health Center - involves extended roles for the pharmacist as part of the health care delivery team;
 - 3. HMO development - including the pharmacists' role and evaluation of services.

These are in the planning stages and have been hampered by lack of resources.

One of the limiting factors in all of these programs is the inability, because of State Regulations, to fully utilize pharmacy technicians. Hopefully, this will change in the near future.

Unit F (College of Pharmacy) will be an integrated part of the Health Sciences Center. The physical intermingling between health sciences students that this will provide, along with the interdisciplinary courses offered, will do much towards the goal of the health care team. This recognition of interdependency must begin in the learning years if our system is to develop along these lines.

FACULTY BACKGROUND

Number	Degree	University Rank	E x p e r i e n c e			Orientation
			Residency	Teaching	Practice	
1	Ph.D.	Professor	1 year	15 years	7 years	Orientation of non-clinical personnel is through departmental meetings and through experience.
1	B.S. (Pharm) M.A. (Education)	Assistant Professor		5 years	16 years	
1	B.S. (Pharm) M.H.A.	Assistant Professor	1 year	4 years	14 years	
1	M.S. (Pharm)	Assistant Professor	1 year	4 years	8 years	
4	M.S. (Pharm)	Clinical Instructor	2 years	2- 4 years	2- 21 years	
2	M.S. (Pharm)	Instructor	2 years	1- 4 years	2- 9 years	
2	Pharm. D.	Assistant Professor	1 year	2 years	2 years	
1	Pharm. D.	Assistant Professor	2 years	2 years	2 years	
1	Pharm D.	Instructor		1 year	1 year	
1	B.S. (Pharm) L.L.D.	Clinical Instructor		1 year	6 years	
3 B	B.S. (Pharm)	Instructor	0- 2 years	4 years	4- 25 years	
4	B.S. (Pharm)	Clinical		1- 3 years	3- 23 years	

SECTION V - STUDENTS

A. Number of Applicants and Number Accepted

No records have been maintained by the College of Pharmacy as to the total number of applicants in recent years. In general, if the student is qualified he has been accepted into the College. Until recently, our facilities have been able to adapt to the increases in enrollment. This, however, is no longer true and with limited enrollment a greater number of qualified individuals will have to be rejected. Therefore, for the past five years, we may generalize by stating that the number of qualified applicants was equivalent to the entering class figures (see table below). It has been estimated that approximately 20 of all applicants in the past have been rejected not because of lack of facilities but because of lack of qualifications.

<u>YEAR</u>	<u>ENTERING STUDENTS</u> (on 2-3 program)
1966-67	79
1967-68	103
1968-69	83
1969-70	94
1970-71	96

For the current school year 112 students have been accepted out of approximately 162 applications.

B. Geographic Distribution of Enrollees

The number of non-resident undergraduate students in the College of Pharmacy has remained at a relatively constant level of 5-6% of the total number of undergraduate students. A majority of these non-residents come from the immediate surrounding states. Figures for the past five years and the current year are as follows:

UNDERGRADUATE

STATE	YEAR	1966-67	1967-68	1968-69	1969-70	1970-71	CURRENT
Arkansas				1			
California					1		
Hawaii			1	1	1		
Illinois	1	1	1	2	1		
Indiana			1	1	1		
Iowa	2	2	1	1	1	1	1
Michigan			1		2	1	1
Nebraska				1	1	2	
New Jersey				1	1	1	1
North Dakota				1	1	2	1
Ohio							1
Oklahoma							1
South Dakota			1	1	1		
Wisconsin	1	1	1	1	1	3	6
Wyoming	1	1	1	1			
Total Non-Resident		5	9	12	12	10	12
Foreign Students		1	1	2	2	3	5
Resident Students		191	248	236	232	243	264
TOTAL		197	258	250	246	256	281

GRADUATE

STATE	YEAR	1966-67	1967-68	1968-69	1969-70	1970-71	CURRENT
California					1		
Colorado						Geographic	1
Connecticut						Breakdown of	1
District of Columbia	1	1	1			Students	
Hawaii					1	Not Available	
Illinois			1	1		for this	
Kansas	1	1	1	1	2	Academic	1
Kentucky	1	1	1			Year	
Louisiana					1		
Massachusetts	3	3					1
Missouri	1	1		1			
Nebraska				2			
New York				1	1		2
North Dakota				2	1		1
Oregon							1
Pennsylvania	1			1			1
Rhode Island					2		1
Vermont					1		1
Wisconsin					1		
Total Non-Resident		8	8	11	11		11
Foreign Students		13	21	22	19		18
Resident Students		13	17	12	9		12
TOTAL		34	46	45	39	42	41

C. Minority and Disadvantaged Students

GROUPING	YEAR				
	1966-67	1967-68	1968-69	1969-70	1970-71
Total Under-Graduates	190	258	256	250	256
Male	156	211	212	203	201
Female	34	47	44	47	55
Minority	1	2	2	2	4

For the current academic year:

Class Year	SEX		ETHNIC BACKGROUND				
	Male	Female	Black	American Indian	American Spanish Surname	Asian Americans	Other
1st	84	26					3
2nd	64	20	2				1
3rd	71	16				1	
(Pharm.D) 4th	6	2					
Post Grad	30	11				1	15

D. Admissions Policy

The University of Minnesota is guided by the principle that there shall be no difference in the treatment of persons because of race, sex, creed, color, or national origin and that equal opportunity and access to facilities shall be available to all. This principle is particularly applicable in the admission of students in all colleges, and in their academic pursuits. It is also applicable in University-owned or University-approved housing, in food services, student unions, extra-curricular activities, and all other student services. It is a guiding policy in the employment of students either by the University or by outsiders through the University and in the employment of faculty and civil service staff.

Freshman applicants for all programs at the University of Minnesota are required to take the tests of the American College Testing Program (ACT). After completion of the required prepharmacy work, the students apply directly to the College of Pharmacy for admission to the professional segment of the program. Admission

is presently based upon evaluation of the prepharmacy studies, academic performance, interviews, and/or recommendations. In the past, all resident applicants with an average of C+ (2.5 on a 4.0 scale) or above, and meeting all prerequisites, have been admitted to the College. Non-resident applicants presenting above-average records will be considered individually as will other applicants (those with lower averages and those needing to remove deficiencies). Preference will be given first to residents of Minnesota and then to non-residents who have valid reasons for attending our pharmacy school. The College has no admission commitments or agreements in regard to personnel from other states.

Students wishing to continue their studies through the Doctor of Pharmacy program gain admission on much the same criteria as used for admission to the undergraduate 5-year program. Whereas admission to the 5-year program is largely grade point average dependent, admission to the Pharm. D. program is determined by more of a composite view of attitude, interests, communicative abilities and GPA. A high GPA alone does not secure admission. The selection process is carried out by an admissions council composed of basic pharmaceutical sciences faculty, clinical faculty, and Pharm. D. students.

E. Student Recruitment

There are three major routes in which the College of Pharmacy functions in the recruitment of qualified, motivated students:

1. The Community Pharmacist -- the influence this individual has with respect to recruitment is extensive. In order to aid him, the College of Pharmacy supplies printed informational material he can use in his presentations. He is also aided by the Alumni Association and the various state organizations.
2. The Faculty and Students of the College of Pharmacy -- Both faculty and students are encouraged to participate in various types of programs (drug abuse, 'college choice', 'profession choice', etc.) in which the nature of the profession of pharmacy, the opportunities available, the merits of various prepharmacy programs, and the merits of our own particular school may be discussed.
3. The College of Pharmacy -- Upon request from individuals who may be interested, the office of the College of Pharmacy routes questions to appropriate personnel, mails literature pertaining to the profession, and aids in the proper application and registration of the perspective student. In addition, both the offices of the Director of Continuing Pharmacy Education and the Assistant Dean for Student Affairs work in this area.

The need for quality recruitment is considered vital by the College in order to draw those individuals who will be outstanding representatives of the profession of pharmacy in the future.

Equally important is the recognition of the abilities and needs of minority, socio-economic disadvantaged, and handicapped individuals. Active recruitment on the health sciences level takes place through the Health Sciences Committee for Disadvantaged Students. This group plans and coordinates various programs directed toward the minority and disadvantaged population. Included here is the Career Opportunities in the Health Sciences program. This program provides an intensive orientation to a number (35 in 1971) of minority and disadvantaged high school students from the Twin Cities area. Implementation is through a teaming up of the students with faculty, researchers, and other students during the summer months.

At the College level, minority recruitment has been an extension of the regular recruitment methods outlined previously. Minority students presently enrolled at the College are especially encouraged to take part in the recruitment activities.

Funding for minority and disadvantaged students takes place through the regular scholarship and loan funds. If they are financially eligible, they receive priority in the distribution of these monies.

While the attrition rate of pharmacy students in general over the three years of professional schooling is 13 to 18%, that for minority students has been negligible. The number of graduates attributed to our program for the past five years may be found on the preceding charts.

The upper midwest area (including Minnesota) does have a relatively high proportion of the American Indian population. To date, the minority recruitment program at the College of Pharmacy has not been successful in their recruitment. This will be one of the areas of high recruitment activity in the future.

The College has had excellent success in the recruitment of female students as indicated by the preceding chart. Their recruitment will be continued to be encouraged.

The College is committed to an expanded minority and disadvantaged student recruitment program. This includes Blacks, American Indians, Chicanos, Asian-Americans, and others. Recruitment of the handicapped will also receive priority. To emphasize this commitment, 10% of all available slots for undergraduate enrollment, will be kept open for minority, disadvantaged, and/or handicapped students until a given cut-off date at which time those slots remaining will be filled by other applicants.

The new facility will aid minority and disadvantaged student recruitment mainly from our expanded student enrollment base. Another advantage lies in the fact that the new facilities have been designed so as to accommodate the handicapped student (the plans have been approved by the Minnesota Society for Crippled Children and Adults). Present facilities do not accommodate the handicapped.

BUDGET SUPPORTING STUDENTS IN COLLEGE OF PHARMACY (1970-71):

A. Federal Loans	\$77,500
B. Federal Scholarships	46,532
C. Privately Sponsored Scholarships and Loans	8,906
	<hr/>
TOTAL	\$132,938

SECTION VI - BUDGET

A. Income and Estimated Expenditures for Current Fiscal Year (1971-72)

1971-72 Pharmacy College Income Allotments:

1. Sponsored Pharmacy College Programs*

a. Training Grants	420,891
b. Federal Government Research	190,964
c. Non-Government Research	46,948

TOTAL INCOME FOR SPONSORED PROGRAMS \$658,803

2. Regular Teaching, Research, and Service Programs:

a. Pharmacy School Budget (State)

i. Salaries	556,258	
ii. Supplies-Admin	34,752	
iii. Supplies-MedC	8,928	
iv. Supplies-Phm	7,371	
v. Supplies-P'Cog	5,754	
vi. Supplies-Clinical	6,500	
TOTAL		619,563

b. Estimated administrative, building & grounds, library, insurance, depreciation, and other pharmacy college costs paid by the University but not included in the pharmacy college budget 298,544

c. Estimated value of services, commodities, or accommodations provided by basic science instruction 129,872

d. Estimated value of services, commodities, or accommodations provided by non-basic science instruction (liberal education costs not included) 34,855

TOTAL INCOME FOR REGULAR PROGRAM \$1,082,834

TOTAL PHARMACY COLLEGE INCOME PLUS SPONSORED PROGRAMS \$1,741,637

* Includes monies carried over from earlier budgets which were awarded on a multiple year basis.

A. Income and Estimated Expenditures for Current Fiscal Year (continued)

1971-72 Pharmacy College Estimated Expenditures*

1. Sponsored Pharmacy College Programs:

a. Training Grants	209,787	(190,715)
b. Federal Government Research	96,868	(88,062)
c. Non-Government Research	12,305	(11,186)

TOTAL EXPENDITURES FOR SPONSORED PROGRAMS 318,960 (289,963)

2. Regular Teaching, Research, and Service Programs:

a. Pharmacy School Budget (State)		
i. Salaries	556,258	
ii. Supplies-Admin	34,752	
iii. Supplies-MedC	8,928	
iv. Supplies-Phm	7,371	
v. Supplies-P'cog	5,754	
vi. Supplies-Clinical	6,500	
	TOTAL	619,563 (531,237)

b. Estimated expenditures for administrative, building & grounds, library, insurance, depreciation, and other College costs paid by the University but not included in the Pharmacy College budget	298,544	
--	---------	--

c. Estimated expenditures for services, commodities, or accommodations provided by basic science instruction	129,872	
--	---------	--

d. Estimated expenditures for services, commodities, or accommodations provided by non-basic science instruction (liberal education costs not included)	34,855	
---	--------	--

TOTAL EXPENDITURES (ESTIMATED) FOR REGULAR PROGRAM	\$1,082,834	
--	-------------	--

TOTAL PHARMACY COLLEGE ESTIMATED EXPENDITURES PLUS SPONSORED PROGRAMS	\$1,401,794	
---	-------------	--

Estimated monies (due to multiple year grants) to be carried over to the 1972-73 fiscal year: \$339,843

* Dollar figure in parentheses is actual expenditure figure as of May 19, 1972.

B. Expenditure Totals for Past Two Fiscal Years:

1969-70

1. Sponsored Programs	
a. Training Grants	73,032
b. Federal Research	155,158
c. Non-Government Research	5,253
2. Regular Programs	
a. Salaries	479,219
b. Supplies	59,191
c. Estimated University supplied services (including non-Pharmacy instruction)	379,040
TOTAL EXPENDITURE FIGURE FOR 1969-70	\$1,150,893

1970-71

1. Sponsored Programs	
a. Training Grants	234,376*
b. Federal Research	182,946*
c. Non-Government Research	14,467*
2. Regular Programs	
a. Salaries	556,053
b. Supplies	40,547
c. Estimated University supplied services (including non-Pharmacy instruction)	421,155
TOTAL EXPENDITURE FIGURE FOR 1970-71	\$1,449,544*

* Includes unspent portion of allotment and therefore cannot be used for comparisons with other figures listed.

C. Projected Budget Figures for Next Five Fiscal Years

1972-73

1. Sponsored Programs	
a. Training Grants	250,000
b. Federal Research	125,000
c. Non-Government Research	15,000
2. Regular Programs	
a. Salaries	556,258
b. Supplies	63,305
c. Estimated University supplied services	509,598
TOTAL ESTIMATED BUDGET FIGURE FOR 1972-73	\$1,519,161

C. Projected Budget Figures for Next Five Fiscal Years (continued)

1973-74

1. Sponsored Programs	
a. Training Grants	275,000
b. Federal Research	250,000
c. Non-Government Research	25,000
2. Regular Programs	
a. Salaries	1,183,814
b. Supplies	123,405
c. Estimated University supplied services (including non-pharmacy instruction)	560,558
TOTAL ESTIMATED BUDGET FIGURE FOR 1973-74	\$2,417,777

1974-75

1. Sponsored Programs	
a. Training Grants	300,000
b. Federal Research	400,000
c. Non-Government Research	40,000
2. Regular Programs	
a. Salaries	1,183,814
b. Supplies	123,405
c. Estimated University Supplied services (including non-Pharmacy instruction)	616,614
TOTAL ESTIMATED BUDGET FIGURE FOR 1974-75	\$2,663,833

1975-76 (Building Occupancy)

1. Sponsored Programs	
a. Training Grants	391,896
b. Federal Research	648,828
c. Non-Government Research	60,000
2. Regular Programs	
a. Salaries	1,362,022
b. Supplies	125,000
c. Estimated University supplied services (including non-Pharmacy instruction)	649,502
TOTAL ESTIMATED BUDGET FIGURE FOR 1975-76	\$3,237,248

C. Projected Budget Figures for Next Five Fiscal Years (continued)

1976-77

1. Sponsored Programs	
a. Training Grants	431,396
b. Federal Research	713,710
c. Non-Government Research	66,000
2. Regular Programs	
a. Salaries	1,498,399
b. Supplies	150,000
c. Estimated University supplied services (including non-Pharmacy instruction)	729,452
TOTAL ESTIMATED BUDGET FIGURE FOR 1976-77	\$3,588,957

ITEM 10 - THE PLANT AND THE FACILITIES

SECTION I - NEED FOR THE FACILITY AND BASIS FOR DECISION

For more than six years, the faculties of the University of Minnesota Health Sciences have carefully considered objectives and programs for the future. Paramount in these discussions and decisions has been the recognized desirability and need for greater interaction between the various disciplines within the Health Sciences not only in the learning environment but also in the service environment.

After extensive deliberation, the faculty of the College of Pharmacy published a report entitled "Future Planning for the Health Sciences - Pharmacy: on January 19, 1967. The conclusion of the study was that "the College of Pharmacy must become an intimate part of the Health Center Complex with regard to academic programs and to location. The following reasons supported this decision:

- "1. The curriculum is becoming biomedical in its orientation. Many of these needed offerings must come from the College of Medical Sciences.
2. For the pharmacist and other health professionals to attain the interprofessional relationships necessary for an integrated approach to the health care needs of the community of the future, we must develop the means for student exposure and cooperative effort. In the comprehensive clinic, it would be possible for the student pharmacist to work with the medical student, the dental student, and/or the student nurse. He should be exposed to coursework with these other professionals whenever possible.
3. While there are obvious minor disadvantages associated with a change in location insofar as our graduate program is concerned, there are also some advantages. Federal grants for research equipment could be procured more readily if several departments, including the College of Pharmacy, Departments of Pharmacology, Biochemistry, etc., would submit joint proposals.* Such an arrangement presently is not readily attainable due to the physical distance between our present facility and the medical complex. Another plus feature would be the greater collaboration in research between the College of Pharmacy and the Medical School.
4. As the state's major health training center, future programs involving pharmacy should be investigated and developed or rejected here after discussion by all areas of the health sciences (i.e., central drug information source).

*Such joint proposals now exist between the College of Pharmacy and the Department of Pharmacology.

5. More effective continuing education programs may be developed for health interprofessional use. This represents a big task for all professionals which must be attacked on a broad front. Since pharmacists and other health professionals work together in practice, these programs may be more expeditiously developed within the framework of a cooperative health sciences group.
6. We need the facilities of the hospital and student health center as teaching areas for our future programs in clinical pharmacy. Students must work in the patient-care environment studying the patients' charts, their drug history and records, and all of the collateral data which are a part of modern therapy and, all the while, reacting with other health science students (dental, medical, and nursing).
7. Opportunities for the development of integrated multilevel courses and advanced teaching techniques should be enhanced because of greater resources."

This decision to become an integral part of the Health Sciences Complex precluded the proposed building program for the College of Pharmacy which was a part of the University's 1967 priority planning. This proposal for an addition to Appleby Hall (the present facility) would have provided the space needed for present physical deficiencies but would not have corrected deficiencies which have come about because of needed changes in the pharmacy curriculum and the profession of pharmacy itself.

Throughout its 79 year history, the College of Pharmacy has never been housed in facilities designed specifically for its use. Appleby Hall, the former School of Mines building, was originally built in 1915 and was renovated in 1959 for pharmacy's use. Conditions were considered crowded almost at the time that it was occupied. The University's building program included a wing for this facility for 1967; however, the College faculty asked that this plan be delayed in order for them to complete a study of the future of pharmacy. This study resulted in the recommendation that the College could best prepare future pharmacists in an environment where all the health sciences were represented.

The present facility fails to serve our needs in several ways. Considerable curriculum changes have given our programs a start toward patient orientation. We must have students in the patient care environment and in contact with other health students to develop interprofessional relationships during the academic years and to provide an opportunity to experiment with health team approaches. To make this relationship successful, the Health faculties must be involved; this is not possible in our present facility. We must have the components necessary to continue leadership in the development of new health care systems.

The present facility is inadequate for the programs presently being administered. At the time when Appleby Hall was occupied,

it was projected that we would have a maximum of 80 students per class. This projection has not been adequate for quite some time to meet the needs of the State. As a result, academic programs have to an extent been arranged to permit larger classes which will come closer to providing the State's needs.

We have converted all the space available to us into laboratories for faculty and students. New faculty members who will be commencing their work within the next few months have yet to be provided with laboratory and office space. Faculty members have had to start sharing their office and laboratory space (space adequate for one individual), and this trend will continue. With the implementation of specialization programs for the Doctor of Pharmacy candidates (notably the applied clinical pharmacology option) additional student laboratory space will be needed. The editorial offices of the Journal of Medicinal Chemistry, which recently were awarded to the College, are being housed in a portion of the manufacturing suite. Another portion of the manufacturing suite is being utilized as a make-shift conference room.

We are attempting to get permission, without success to date, to block off ends of corridors to gain space for cold room facilities and laboratories. It has been necessary to block off portions of the Medicinal Chemistry graduate suite to provide space for work associated with tissue culture and biological systems. We have been successful in converting one stockroom into a laboratory, but have experienced difficulties and excessive expenditures because the facility was never intended for this type of use.

A total of two lecture rooms are in Appleby Hall. Only one of these can accommodate an entire class. Many classes are therefore fragmented to various parts of the University campus.

Small group interaction space is at a premium. The only space conveniently utilizable is the conference room associated with the College Administration suite. As the presentation of more and more classes tends to lean in this direction, more space will have to be found for this type of usage; and unfortunately, the further away these interactions are from the College, the less effective they will be. Seminar space poses the same problem. At present, several of the undergraduate laboratories are being utilized for seminars and small groups when not in use by the department - although acceptable due to lack of other facilities, they fall far short of providing optimum conditions and support for these functions.

An increased interest and emphasis in innovative teaching methods and hardware has been shown by the faculty during recent years. For several years we have experimented with programmed instruction approached as well as with various audio-visual aids, particularly television. This most certainly will increase as the initial soundings have proved successful. The present facility is not designed for the kind of instruction we foresee as being applicable to pharmacy. Provided leadership for a panel on Continuing Pharmacy

Education and in the area of educational development will emphasize the need for additional space.

The College of Pharmacy at the University of Minnesota is dedicated to providing the needed pharmacy health personnel particularly for the State of Minnesota, but also for the Upper Midwest and the nation as a whole. At the same time, these students (undergraduate and graduate) as well as established pharmacists (on a continuing education basis) must be provided with the type of education which will enable them to provide quality health care as dictated by current concepts and trends. As the only institution in Minnesota offering a degree in pharmacy and as the only institution in the Upper Midwest offering the Doctor of Pharmacy degree, the facilities of the College of Pharmacy at the University of Minnesota are generating a much greater usage demand than will be able to be provided.

The strain on present facilities is complicated by the fact that additional pharmacists are needed to handle the health needs of an ever increasing Minnesota population. This increase in the period of time between July 1, 1967 and July 1, 1970 was nearly 200,000 individuals. Other factors which suggest that a problem is in the making, if in fact it does not already exist, are:

1. The population of Minnesota is changing in nature as well as increasing in size -- rural population is declining and while core city population is also declining, the total urban population is markedly on the increase. While no figures can be shown to support it at the present time, there is a maldistribution of pharmacists and general health care between the rural and urban segments.
2. Hospitals and other health care institutions are demanding pharmaceutical services -- In 1952 there were 36 hospitals employing 54 pharmacists. Last year there were 180 pharmacists practicing their profession in 128 hospitals. Today in Minnesota we have the following institutional health care facilities:

General Hospitals.....	184
100+ beds.....	50
50-99 beds.....	31
25-49 beds.....	80
16-24 beds.....	19
3-15 beds.....	4
College Infirmaries.....	8
Specialized Hospitals.....	42
Mental Illness.....	25
Mental Retardation.....	3
TB Sanatorium.....	5
Chronic Disease.....	5
Other.....	4

TOTAL HOSPITALS.....	234
NURSING HOMES.....	392
BOARDING CARE HOMES.....	255

Medicare legislation requires hospitals and nursing homes to have a pharmacist or the consultive services of a pharmacist in order to qualify under the program; the pharmacist is the one responsible for drug use control.

3. The health care roles for the pharmacist are changing -- Changing roles will require that the pharmacist devote more time to assure the safe and effective use of drugs. In this context, the main-stream function of pharmacy is clinical in nature, one that may be identified accurately as drug-use control. This may be defined as the sum total of knowledge, understanding, judgements, procedures, skills, controls, and ethics that assure optimal safety in the distribution and use of medication. This definition relates professional function to patient welfare in the form of drug safety; it is patient oriented.

Each of these factors places a new demand upon pharmacists. Several things seem certain - the shortage of all health professionals will not be corrected in the near future and will likely become more severe; a team approach to health care will evolve which will take advantage of the special backgrounds and skills of all health professionals; and the trends in health care will require a much closer and more effective interprofessional relationship than has existed in the past. It is imperative that this interprofessional cooperation be initiated in the training years if present patterns are to be broken. It seems likely that present day roles of each profession will be modified if we are to supply the health care that will be demanded.

The University of Minnesota College of Pharmacy graduated 80 pharmacists last year; judging by past statistics 75% or 60 of these individuals will remain in the state. Taking into account population increases, new professional environments, and new roles, this number will not suffice in future years. Any dependence on recruitment of pharmacists from other states is hazardous. While there is no doubt that pharmacists trained out-of-state will continue to settle in Minnesota, the factors that cause Minnesota graduates to go to other states will also affect these pharmacists. Expansion of the number of pharmacy graduates from the University of Minnesota (the only College of Pharmacy in the state) is the choice alternative.

SECTION II - MASTER CAMPUS PLAN

The University of Minnesota Health Sciences Expansion provides facilities for the consolidated units of the Health Sciences: School of Medicine, University Hospitals, School of Dentistry, School of Public Health, School of Nursing and the College of Pharmacy.

The complex of new and remodeled existing buildings comprising the Health Sciences Facilities is the Architects' response to the University's goal of physical and curricular integration of the Health Sciences units with each other and the rest of the Minneapolis campus of the University.

The problem as defined by this goal was to develop a high density building system on a tight urban site with strong relationships to major existing facilities. This system needed to respond to the initial phase of expansion as well as to the continuing need for growth and change inherent in health sciences units.

The Architects' initial effort was to develop a master plan which provided for short and long term expansion and responded to the integrated relationships called for in the program. This master plan serves as a framework for growth by establishing the major paths of circulation knitting together new and existing buildings. A centralized receiving unit (Unit K/E) is the focus of a separate service circulation network connecting existing buildings and new construction two floors below grade. One floor above that a major pedestrian spine with branches to existing buildings and new construction and in addition, a 3,000 car parking ramp provides the capability of moving to all parts of the Health Sciences without being exposed to the frequently severe weather (see diagram pages). Two floors above grade another enclosed connection is provided permitting access to all Health Sciences areas.

Phase I of the master plan is scheduled to be complete by January 1976. Phase I is comprised of Units A, B/C, K/E and F as shown on the site plan on page 89.

Unit A, which houses the School of Dentistry, Basic Sciences teaching laboratories, Auditoria, and programs from the Schools of Public Health and Medicine is presently under construction with completion scheduled for October 1973.

Unit B/C, which is the subject of another application, was scheduled to be completed by Fall 1975. It was submitted November 1970, received approval of the National Advisory Council but was not a funded project. Due to the changes in Federal funding policies this unit is now being resubmitted at a reduced scope and therefore is out of phase with the schedule as outlined in the original master plan.

The lower floors of Unit K/E, as previously mentioned, constitute the centralized receiving unit for the Health Sciences. The upper floors house a Cardiovascular Research and Teaching Center.

Construction of the Unit is currently under way, with completion scheduled for June 1974.

Unit F, The College of Pharmacy, which is the subject of this application is currently in the Contract Document preparation phase. Construction is scheduled to begin in the Fall of 1973 with completion scheduled for Fall 1975.

The University has prepared a long-range plan for parking and circulation on the Twin Cities Campus. The Health Sciences facilities program includes provision of a 3,000 car parking ramp which will be constructed simultaneously with the construction of Unit A. This ramp has first priority in the implementation of the overall parking plan. The University is also cooperating with the Metropolitan Transit Commission and other agencies to develop improved public transportation for the area. Among the possibilities being considered is a series of satellite parking lots connected to the University by a rapid transit system. Within the past year a system of express bus routes was initiated jointly between the University and the Metropolitan Transit Commission.

A long range plan for housing is now in preparation and although a high proportion of student and staff housing will, of necessity, be provided by the private sector, it is likely that plans will include some University owned apartments or town houses in the vicinity of the Health Sciences facilities. A low cost housing development is about to be constructed on University land 1 1/2 miles west of the Health Sciences facilities.

Forseeable expansion of the Health Sciences beyond the Phase I planned program for completion in 1975 includes: new facilities for the School of Public Health, Unit G; and a new hospital, Units J and H, to replace beds now located in the existing Mayo Building. Space vacated by these beds and other hospital functions will be remodeled and used for expansion in the areas of clinical teaching and research, student study spaces, faculty and administrative offices.

Letters of comment from the State (a) and Regional (b) health planning agencies can be found on pages 65 and 66 of this application.

WASHINGTON

MILLARD

UNIT F

LYON

WRE

UNIT A

DELAWARE

UNIT B-C

VFW

MAYO

MARVARD ST

DIHL

MASONIC

ESSEX ST

POWELL

WOMEN'S CLUB
HOSPITAL

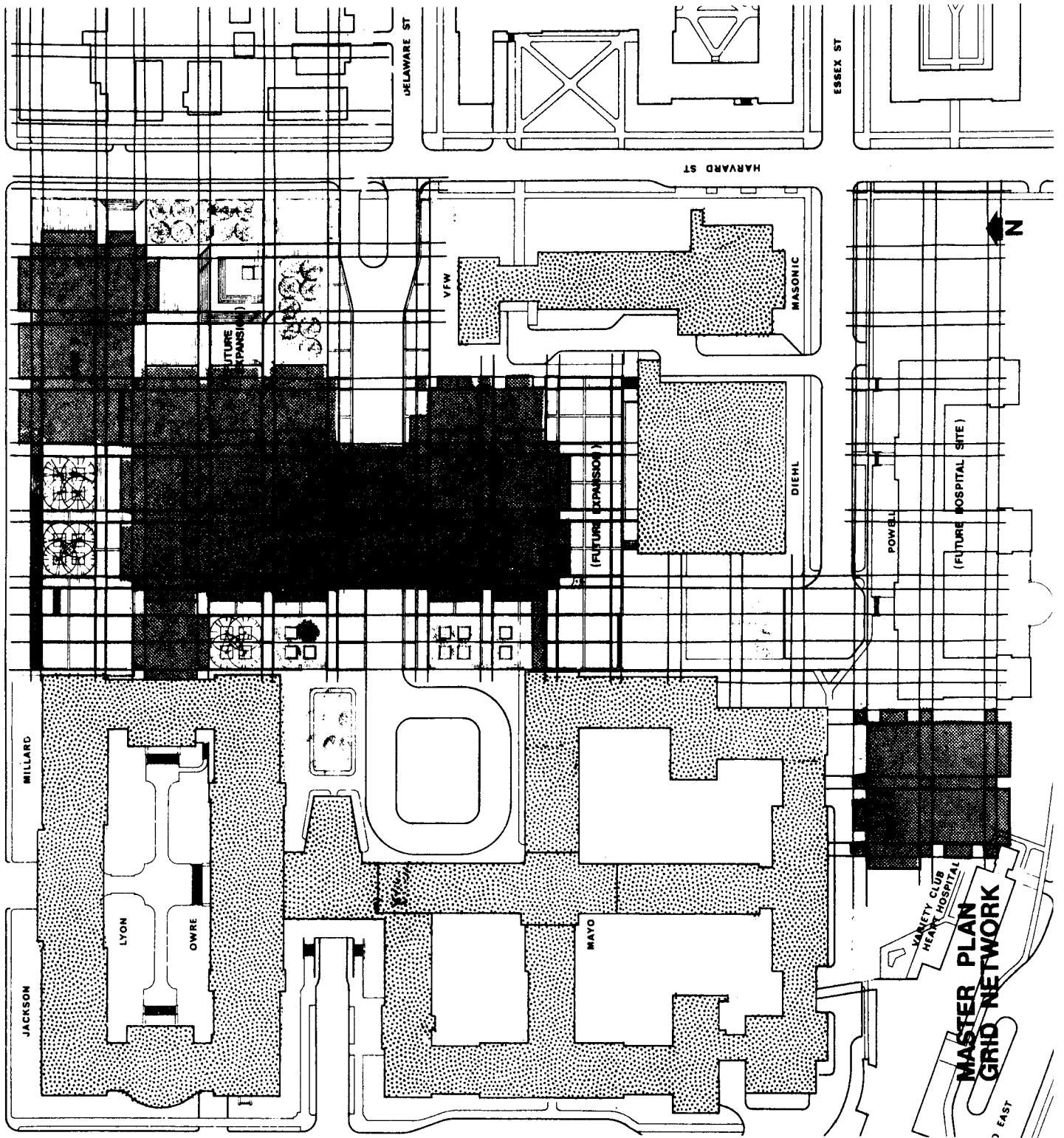


UNIT F

JOB NO.	79000
OWNER BY	
DESIGN BY	
DATE	1968.7.6
SCALE	AS SHOWN

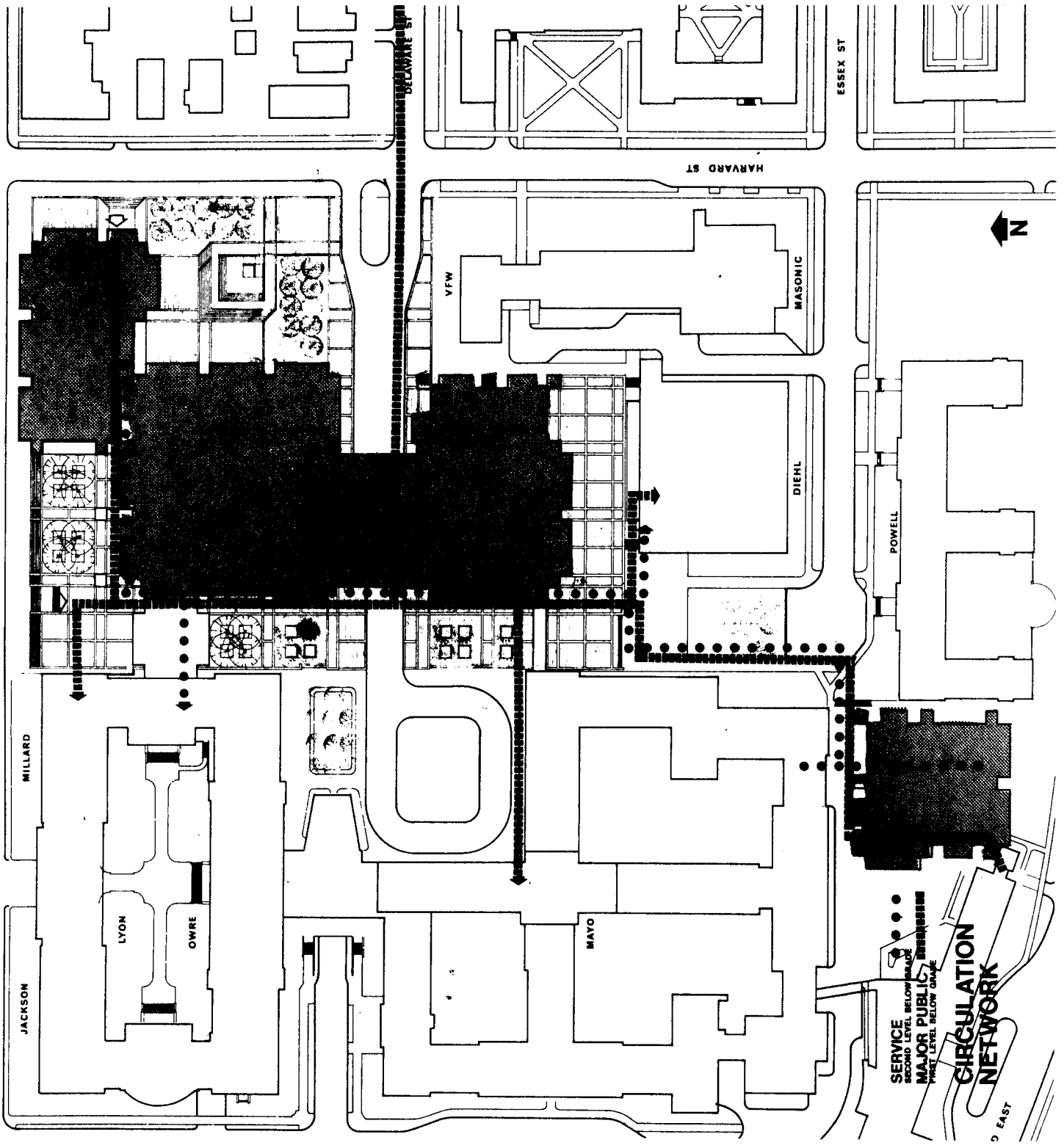
SITE PLAN UNIT F

SEE SITE LIMITS



**MASTER PLAN
GRID NETWORK**

EAST



●●● SERVICE SECOND LEVEL BELOW GRADE
 ■■■ MAJOR PUBLIC
 ■■■ MINOR LEVEL BELOW GRADE
CIRCULATION NETWORK
 9 EAST

SECTION III - FUTURE PLANT EXPANSION

Future expansion of the Health Sciences Center beyond Phase I is indicated in the master campus plan.

The College of Pharmacy has no future phased projects under consideration.

SECTION IV - CURRENT SPACE AND ITS UTILIZATION

A. General Purpose Classrooms

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Capacity</u>	<u>Remarks</u>
150	1220	90 - 100	Heat, acoustical problems
350	308	50	Good

B. Undergraduate Teaching Laboratories

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Capacity per Period</u>	<u>Dept.</u>	<u>Remarks</u>
104	1357	40	PHM	Only electricity & water
125	2100	56	PHM	Contains only hood on first floor and utilities for another; steam baths
225	1475	40	P'COG	No hoods
316	1334	40	MedC	Hood with complete utilities

C. Graduate Research Laboratories

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Capacity</u>	<u>Dept.</u>	<u>Remarks</u>
9	1008	6	PHM	Was classroom; remodeled in 1968
14	1144	8	PHM	Hood with utilities
18	483	4	Clin.	For hospital graduate students. Also make-shift conference room
206	851	5	P'COG	Remodeled 1965
215	828	5	PHM	Biopharmaceutics Grad. lab; Regulated temp; high pressure steam; still; hood

C. Graduate Research Laboratories (continued)

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Capacity</u>	<u>Dept.</u>	<u>Remarks</u>
228	532	3	P'COG	Stainless steel radiation hood; isotope vault
303	1704	12	MedC	Hood with complete utilities
325	2124	8	MedC	Two hoods only; room horizontally partitioned for biological work

D. Faculty Lab/Office Space

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Capacity</u>	<u>Dept.</u>	<u>Remarks</u>
5	300	1	PHM	Lab/Office
16	238	1	PHM	Lab/Office
22	126	1	MedC	Journal editorial office; part of manufacturing suite
22A	110	3	MedC	Journal editorial office; part of manufacturing suite
28A	204	1	PHM	Lab/Office
101B	228	2	Clin	Office
101C	150	1	Clin	Office
101D	150	3	Clin	Office/Graduate Assistance
136	264	1	PHM	Lab/Office
204	245	2	PHM	Office
216	253	1	PHM	Lab/Office
217	236	1	P'COG	Lab/Office
219	264	1	P'COG	Lab/Office
309	260	1	MedC	Lab/Office

D. Faculty Lab/Office Space (continued)

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Capacity</u>	<u>Dept.</u>	<u>Remarks</u>
328	288	2	MedC	Lab/Office
343	250	2	MedC	Lab/Office
345	270	1	MedC	Lab/Office

E. Special Purpose Laboratory Areas (Shared by Undergraduates, Graduates & Faculty)

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Dept.</u>	<u>Remarks</u>
23	287	PHM	Manufacturing Suite
23A	81	PHM	Manufacturing Suite
28	483	PHM	Manufacturing Suite
209	408	Shared	Animal Room; Surgery area; autoclave
209A	136	Shared	Small animal facilities
209B	169	Shared	Small animal facilities
209C	108	Shared	Small animal facilities
230	375	P'COG	Tissue Culture Lab; Building's only cold room
245	531	Shared	Central Instrument Room
303A	198	MedC	Hydrogenation Lab
303B	308	MedC	Instrument room
310	286	MedC	Balance Room
Separate Bldg.	3643	P'COG	Greenhouse

F. College Administration

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Capacity</u>	<u>Remarks</u>
101A	220	3	Secretary & Reading Room
109	252	1	Lab/Office used for Administration
110	45	-	Coat Room
110A	234	10 - 15	Conference Room
115	460	4-5	Secretarial Pool
115A	171	1	College Secretary
115B	66	-	Coat Room
115C/D	51	-	Toilet
115E	352	1	Dean's Office
118	242	1	Continuing Education Administrative Office

G. College Support Facilities

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Capacity</u>	<u>Remarks</u>
2	959	20-30	Student Lounge
2A	216	-	Storage
18A	182	-	Storage
32	577	14	Learning Resources Center
40	99	-	Storage
42	143	2	Student organization
44	247	6-8	Female Lounge
46	196	1	Instrument Repair
48	480	-	Locker area
138	517	2	Central supply

G. College Support Facilities (continued)

<u>Room Number</u>	<u>Sq. Ft.</u>	<u>Capacity</u>	<u>Remarks</u>
203	2108	60	Library
330	375	1	Central Supply graduate
4 40A	792	-	Storage-Penthouse Area

<u>TOTALS:</u>	<u>Net Sq. Ft.</u>
General Purpose Classrooms*	2,128
Undergraduate Teaching Laboratories	6,266
Graduate Research Laboratories	8,674
Faculty Lab/Office Space	3,836
Special Purpose Laboratory Areas**	7,013
College Administration	2,093
College Support Facilities***	<u>6,891</u>
Total	36,901 sq. ft.

* University Controlled

** Shared by undergraduates, graduates, and faculty

*** Includes 2108 sq. ft. which is part of University Library System.

	<u>Net Sq. Ft.</u>
Shared	6,135
Pharmacognosy	7,376
Medicinal Chemistry	7,258
Clinical/Pharmacy Administration	1,011
College Administration	2,338
University Controlled (Classrooms & Library)	4,236
Pharmaceutics	<u>8,547</u>
	36,901 sq. ft.

UTILIZATION:

General Purpose Classrooms:

<u>Room Number</u>	<u>Net Sq. Ft. Student</u>	<u>Average Student Occupancy</u>	<u>% of Day Scheduled*</u>
150	13.2	90-100%	80%
350	16.1	90-100%	60%

* Includes University Scheduling

Undergraduate Teaching Laboratories:

<u>Room Number</u>	<u>Dept.</u>	<u>Net Sq. Ft./student per period</u>	<u>Average student Occupancy/period</u>	<u>Departmental Scheduling</u>
104	PHM.	34 sq. ft.	40	6 hrs./week; 3 qtrs/year Unique lab. setting
125	PHM	37.5 sq. ft.	40	12 hrs/week 4 qtr/year
225	P'COG	37 sq. ft.	27	9 hrs/week* 2 qtrs/year
316	Med. C	33.3 sq. ft.	variable, up to 40 **	open lab;** 2 qtrs/year

* Used approximately 80% of remaining time for conferences, other classes, and graduate research work.

** Students come in at will and work individually at own rate.

Graduate Teaching Laboratories:

<u>Room Number</u>	<u>Department</u>	<u>Net Sq. Ft./occupant</u>	<u>Capacity</u>	<u>Present Occupancy</u>
9	PHM	168	6	5
14	PHM	143	8	4
18	CLIN	121	4	*
206	P'COG	170	5	5
215	PHM	166	5	4

Graduate Teaching Laboratories: (continued)

<u>Room Number</u>	<u>Department</u>	<u>Net Sq. Ft./occupant</u>	<u>Capacity</u>	<u>Present Occupancy</u>
228	P'COG	177	3	3
303	Med. C.	142	12	12
325	Med. C.	265.5**	8	8***

* Used as part-time laboratory facility for hospital pharmacy graduate students and as conference room when free.

** Invalid figure since over one-third of the laboratory space is shared. Spaced used for biological experimentation

*** Plus several technicians

In general, the physical condition of the above listed facilities is quite good. The building is very soundly constructed, but space-wise, for our programs, it has become inadequate. It must also be remembered that for pharmacy's purposes this building was renovated from former use by the School of Mines and thus many desirable features were unattainable from the start due to physical incompatibilities.

Appleby Hall is a laboratory oriented building. Many of the labs are fairly large and have been remodeled (to some degree) in the last ten years. Obviously, the best future use would be for a department or school requiring these lab facilities. Dependent on future needs, we should anticipate installation of more coldrooms and hoods and the possibility of need for animal storage nearby.

The College of Pharmacy intends to vacate Appleby Hall when their new facility is completed. Rumors are that Chemistry may acquire the space. At this point, apparently no firm commitments have been made.

SECTION V - THE PROPOSED PROJECT AND ITS UTILIZATION

A. Space Requirement Logic

Generally space requirements were established by a program analysis of individual work stations. The square footage resulting follows a graphical process of assembling the individual work stations into a larger operating unit i.e., a lab, office or classroom.

Student laboratories for all disciplines have a number of common characteristics. Sections are limited to 75 students. Student work stations are 4'-0' per student. Generally the labs are flanked by ancillary instrumentation and small discussion rooms as well as stock and preparation rooms.

Graduate and Faculty laboratories also have a number of common characteristics. A graduate student is provided with a 12'-0" bench and a 4'-0" study carrel unit. A faculty member is provided with twice as much space and work area. Graduate and Faculty Laboratories are generally juxtaposed and share instrumentation whenever possible.

Other miscellaneous room area requirements respond to University of Minnesota area standards. These include office sizes by academic ranking, auditoria and classroom square footage per student.

The bulk of Pharmacy's classroom activities will take place within Unit F, although, as needed, we will be able to draw from the shared classrooms in the remainder of the Health Sciences Complex.

The following tables are taken from the "Evaluation of Report of Task Force on Teaching Space for Health Sciences Design Coordinating Committee" of November 13, 1968 and revised on June 4, 1969.

Distribution of Class Hours in 1976

	Class Hours Scheduled	
	<u>PROFESSIONAL</u>	<u>GRADUATE</u>
Classes for medical students	32	73
Classes for dental students	47	
Classes for pharmacy students	39	4
Classes for nursing students	67	37
Classes for OT-PT students	76	12
Classes for public health students	180	
Classes for med. tech. students	17	14
Classes for dental hygiene students	5	
Classes for medical science service	3	
Shared nurses/dental hygiene	<u>4</u>	<u> </u>
	470	+ 140 = 610

Distribution of Class Hours by Hour and Size of Room

	I	II	III	IV	V	VI	VII	VIII	Totals
350	8	8	5	8	5	1			35
250	9	8	8	5	1	7	3	1	42
200	7	4	8	7		6	2	1	35
150	15	14	11	4	4	11	3	6	68
100	4	4		5	2	8	4	6	33
75	3	3	3			2	2	1	14
50	17	17	22	16	10	21	14	7	123
30	6	16	25	15	7	17	14	6	108
15	15	11	32	5	10	34	29	16	152
	—	—	—	—	—	—	—	—	—
	86	85	114	65	39	106	71	44	610

The simulated model took into account only those classed actually acheduled. Thus, small interaction groups (broken down for the larger classes), seminars, laboratory sections, clinical group meetings, etc., all a part of the total pharmacy program, are not shown. These groups will be adequately housed in pharmacy departmental discussion/conference rooms. The class room hours attributed to pharmacy were taken from the Spring 1968 class schedule. Pharmacy's representative on this task force was Dr. Frank DiGangi.

As can be seen from the tables, pharmacy's needs were taken into account in the total planning for the Health Sciences expansion of classroom space. These needs for the most part can be adequately handled through the classrooms in Unit F. These include:

- 2 seminar rooms
- 2 35-seat classrooms (convertible to one at 75-80)
- 2 150 seat auditoria
- plus several departmental discussion/conference type rooms.

Classroom needs beyond those provided in Unit F have been programmed in Units A and B/C under applicants space. In accordance with University policy, all classroom space is allocated through a central allocation office.

Breakdown of classrooms available in Unit A and B/C

<u>Unit A</u>		<u>Unit B</u>	
Seminar	11	Seminar	11
15 seat	3	Small classroom	8
20 seat	3	325 seat	1
50 seat	3		
100 seat	1		
200 seat	1		
250 seat	2		
350 seat	1		

Existing Health Sciences classrooms to be renovated

15 seat	3
30 seat	5
50 seat	2
75 seat	1
100 seat	2
150 seat	2
200 seat	1

numerous seminar and conference areas.

With the exception of a few seminar rooms and the classrooms to be renovated, virtually all of the shared classrooms within the projected Health Sciences Complex are on the level of main student entry and activity (level 2 - one level below grade). This provides maximum efficiency with regard to the movement of the bulk of the student traffic as well as permitting flexibility and ease of class scheduling. This flexibility also extends to future developments within the areas of curriculum and educational methodology as a wide range of classroom sizes is available. This precludes the necessity of putting small class groups in large rooms which does not provide a desirable teaching atmosphere.

Allocation of space within the University is administered by the Office of Space Allocation. This office operates under a set of policy guidelines established with the counsel and advice of a faculty advisory committee. Actual allocations are based upon the guidelines which are modified by statements of programmatic needs submitted by faculty and administrators at the Departmental and Collegiate levels. Examples of the guidelines are:

Deans' Office	300 square feet
Assistant Dean	300 square feet
Assistant to Dean	100 to 130 square feet
Department Head	195 square feet
Department Assistant Head	195 square feet
Departmental Multi-purpose	200 square feet and up (400 maximum)
Faculty Office	130 square feet

Double Faculty Office	195 square feet
First secretarial position (General Office)	195 square feet (1 person + files) 65 square feet (for each additional person)
Classroom	15 square feet per student station
Study Room	25 square feet (up to) per student station
Laboratory	According to number of people, function and equipment.

Utilization:

General Purpose Classrooms:

<u>Floor</u>	<u>Area Designation</u>	<u>Capacity</u>	<u>Avr. Student Occupancy</u>	<u>Use Hrs./Wk.</u>
2	Classroom	30	25-30	40
2	Classroom	30	25-30	40
2	Auditorium	150	125-150	40
2	Auditorium	150	125-150	40

The projected needs for shared classrooms for all health science units (Evaluation of Report of Task Force on Teaching Space for Health Sciences Design Coordinating Committee, 11/13/68) included two 250 seat and two 150 seat classrooms. Also, there was to be 5,422 sq. ft. of Pharmacy space for shared classrooms. Quite obviously the two 250 seat classrooms were not included. It is intended that the two small classrooms and auditoriums as well as all conference and seminar rooms in the Pharmacy facility will be available on a shared basis to the other units of the Health Sciences.

Teaching Laboratories:

<u>Floor</u>	<u>Area Designation</u>	<u>Capacity</u>	<u>Avr. Student Occupancy</u>	<u>Use Hrs./Wk.</u>
4	PHARMACOGNOSY Undergrad. Lab. & Related Space	50	40-50	24
4	Graduate Lab. MEDICINAL CHEM.	8	7	30-40
3	Student Lab. & Related Space	75	70-75 45-50	6 18
6	Graduate Labs. (3)	25	20	30-40
7	Graduate Labs.	4	4	30-40
2	PHARMACEUTICS Biopharmaceutics Lab.	75	60-66	24
2	Process and Preps. Lab.	75	45-50	24
3	Dispensing Lab.	50	45-50	24
7	Graduate Labs. (2) PHARMACY ADMINIS- TRATION	19	17	30-40
2	Student Lab. & Related Space	75	70	18

The conference areas will be available to other health science units. In addition, we are moving toward continuous general laboratory operation in which the student will be given access to the laboratory at all times when not scheduled specifically. This will apply even more to the more specific undergraduate laboratories (i.e. Analysis and Calculations Laboratory, Instrumentation Laboratory) and the graduate laboratories (i.e. Hydrogenation Laboratory, Testing and Control Laboratory). The self-learning concept will be pushed in laboratories as well. Thus, the laboratory becomes a unit not unlike the library.

It should be mentioned that the growth of the Doctor of Pharmacy program with its many specialization options will make unknown demands for classroom and laboratory space. This has not been projected above except for the biopharmaceutics laboratory. We will have 21 students in this program for the 1972-1973 academic year.

Finally, all classroom space in the University is controlled and assigned by the Space Allocation Division. Units have first call on classrooms located within their units. Available time is allocated to other health science units and, finally, any open University scheduling.

B. Design Flexibility

The complex of new and remodeled existing buildings comprising the Health Sciences Facilities is the Architect's response to the University's goal of physical and curricular integration of the Health Sciences units with each other and the rest of the Minneapolis campus of the University.

The problem as defined by this goal was to develop a high density building system on a tight urban site with strong relationships to major existing facilities. This system needed to respond to the initial phase of expansion as well as to the continuing need for growth and change inherent in health sciences units.

The Architects' initial effort was to develop a master plan which provided for short and long term expansion and responded to the integrated relationships called for in the program. This master plan serves as a framework for growth by establishing the major paths of circulation knitting together new and existing buildings.

The units designated by the master plan to be housed in new construction were analyzed for common systems criteria. These criteria generated one building system which, with appropriate variations, could respond to the requirements of teaching and research labs, dental clinics, hospital outpatient clinics, offices, classrooms, and auditoria. And, in addition, could provide a high degree of flexibility and expandability.

The building system employs a module of 12'-4" x 12'-4" throughout the site area. Service towers 12'-4" x 12'-4" (nominal) are spaced 49'-4" apart in two directions creating a tartan grid which is broken in one direction by a pair of columns placed midway between the towers. A one way structural system integral with the service shafts has steel girders spanning the 24'-8" direction and steel trusses spanning the 49'-4" direction (see Building Systems Framework Isometric and Dimensional Characteristics Diagram). Building services are distributed vertically through the service shafts and horizontally through the depth of the floor construction. The frequency of the service towers allowed a minimum of 4'-4" floor depth which is divided into separate strata for power and communication, mechanical, plumbing, and lighting. In general, for the entire complex, partitioning stops at a totally accessible continuous

ceiling plane 9'-0" above the floor permitting the services above to be distributed without interference. Typical floor to floor height is 13'-4".

All sub-systems were developed and designed to accommodate the criteria generated by the program functions. A detailed description follows of several sub-systems which will establish the degree of thought that has gone into the development and coordination of the various sub-systems resulting in the overall building flexibility.

SUPER-STRUCTURE:

Typical floor slab construction is a composite cellular steel deck with a lightweight concrete topping. The selection of this floor construction is based on the economies inherent in the lightness of the floor itself as well as the supporting steel framing and foundations. The system provides electrical raceways within the floor construction both for present and future needs and provides the required 2-hour fire rating without the need for additional fireproofing on the underside of the deck.

Open-web trusses are provided as floor supporting members to provide maximum flexibility for lateral distribution of the mechanical and electrical systems between the floor slab and ceiling below.

CEILING SYSTEM DESCRIPTION:

The ceiling system will facilitate a degree of planning flexibility equal to that afforded by the structural and mechanical system. The ceiling is conceived as a continuous suspended plane extending from exterior wall to exterior wall under which partitions can be located and relocated as necessary. Above the ceiling ducted mechanical services can be arranged and rearranged as required without interference from walls or other vertical barriers.

To accomplish this the ceiling has to embody the following characteristics:

1. The suspension system must be capable of supporting the head of all partitions and door frames and provide adequate lateral stability without additional bracing. Walls must be attached and detached without damage to the ceiling. Although most walls occur in modular locations, attachment at random locations must be possible.
2. The suspension system must provide a framework in which light fixtures, air supply and return elements, sprinklers, smoke detectors, speakers, laboratory service columns and infill panels can be located and rearranged in various combinations.
3. The ceiling must offer architectural characteristics suitable for small intermediate and large areas.

4. The ceiling must be accessible to allow routine maintenance and rearrangement of mechanical equipment at any location above the ceiling.

The proposed ceiling system is composed of continuous service strips and of infill. The service strips are oriented in an east-west direction and are located 6'-2" o.c. at the quarter points of the 12'-4" architectural grid. The infill closes the space between the all purpose strips and provides for access to the plenum and acoustical separation of rooms.

The service strip furnishes the location for all mechanical service penetrations in the ceiling system. It is made up of alternating 4'-0" fluorescent light fixture locations and 2'-2" service panel locations. The modular locations of a 4'-0" fluorescent fixture is centered on the quarter points of the architectural grid but such a fixture must be relocatable at any point in the strip to accommodate non-modular rooms.

The service panel provides locations for sprinklers, smoke detectors, speakers, laboratory service columns and down lights.

Linear supply air handling elements are located as required, perpendicular to the service strip astride the cross runners with point returns located as required at the service panels.

In order to insure that partitions can be freely moved without unnecessary difficulty or damage to the ceiling system mechanical services passing between partition and plenum above are minimized. Plumbing fixtures located in areas not subject to change, are loop-vented underfloor. We recommend low-voltage switch legs be used in these areas. In areas subject to extensive future change, piped services to laboratory benches shall be fed down from the plenum space in umbilical chases.

Detailed study of code requirements regarding fire rated walls indicates that each level be divided by only one partition which must interrupt the suspended ceiling plane. In each case the penetrating wall has been chosen as being the one least likely to be relocated.

PARTITIONING SYSTEM:

The partitioning system achieves the degree of economy and flexibility at the planning level provided by the basic mechanical and structural systems.

The total project was studied to find the basic sets of functions to be served by partitioning systems. Seen in conjunction with the ceiling system, the basic approach to the partitioning system is that it should be floor to ceiling light-weight space division. The partitions should be removable without damaging the floor or ceiling and without interrupting the activities in adjoining spaces. In this approach, doors and glass are treated as panels in the partitioning system

and attached at the ceiling and floor in the same manner. The partitioning system must be locatable according to the module developed by the ceiling system - and the mechanical services provided by it, but it also must be able to adjust to non-modular conditions when functional requirements necessitate it. Prefabricated cold rooms, freezers and the like will be used and the partitioning system must accept them. There will also be several spaces which require R-F shielding and partitioning systems must be able to provide this.

Several alternatives for each required basic type were proposed and studied. The cost of each proposal was compared to the requirements for adequate sound isolation, flexibility, durability and the particular requirements of each type. Resulting from this study a selection was made.

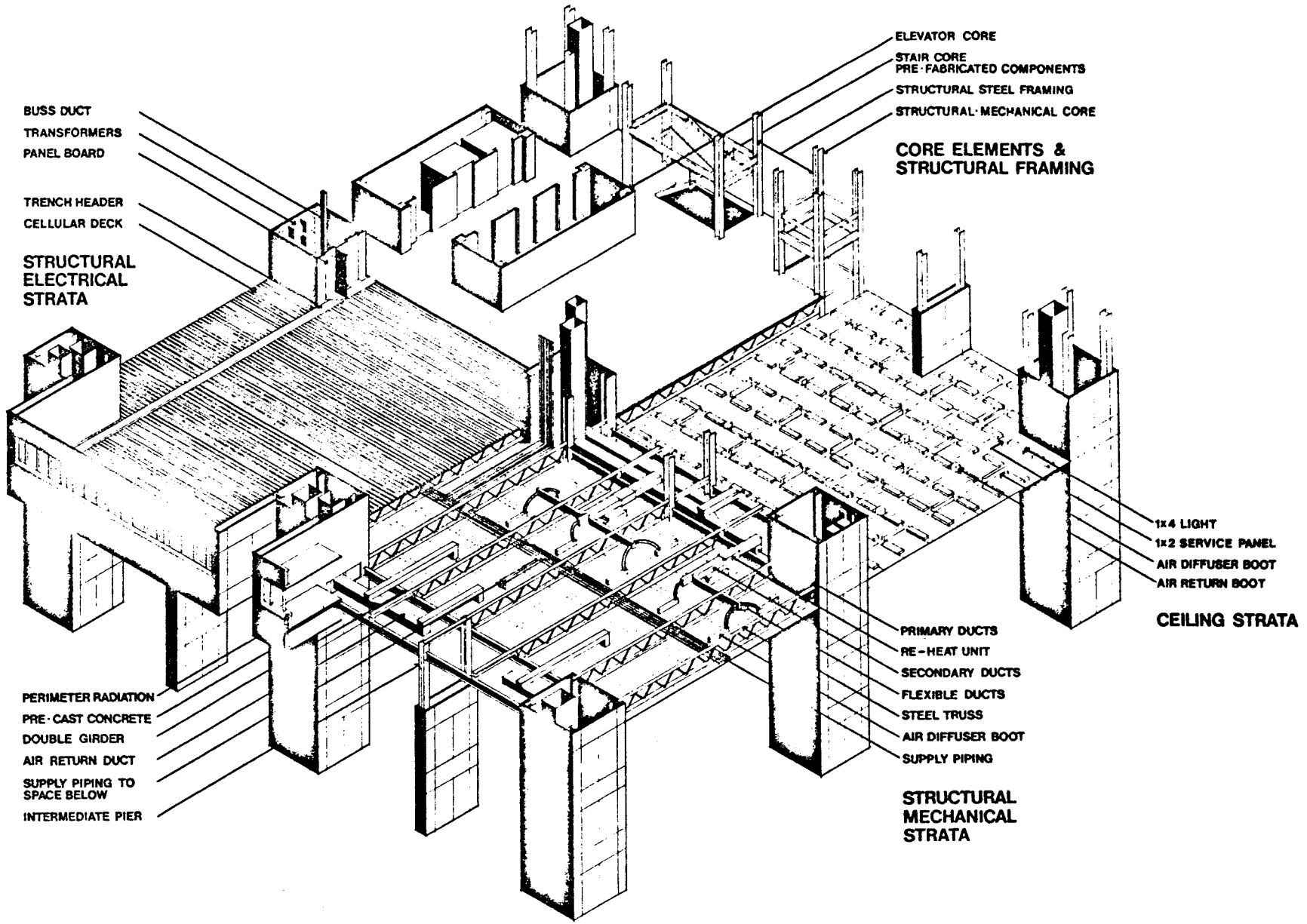
1. Gypsum plaster on gypsum lath screw attached to channel studs is proposed as the basic system on Floors 1 through 4. These floors contain most intensive teaching functions by large numbers of undergraduates, and therefore are subject to rather infrequent change.
2. Drywall on channel studs is proposed as the basic system for the laboratory and office functions located on Floors 5 through 7. These functions will require constant rearrangement of plan and will be used by a limited number of staff and graduate personnel.
3. Fireproof gypsum paneling is proposed to achieve the required fire rating around the floor to floor penetrations at stairs, mechanical cores, and elevator shafts.
4. Masonry is proposed for two applications:
 - a. Masonry with acoustic treatment will be used for the auditoria.
 - b. Both finished and unfinished masonry is proposed on mechanical floors and the animal room complex on Floor B, Bl, 1.

In areas of high humidity and/or where a high degree of cleanliness is required, a glazed coating is proposed such as the animal room complex or the manufacturing suite. This application may be used on plaster, dry wall and masonry.

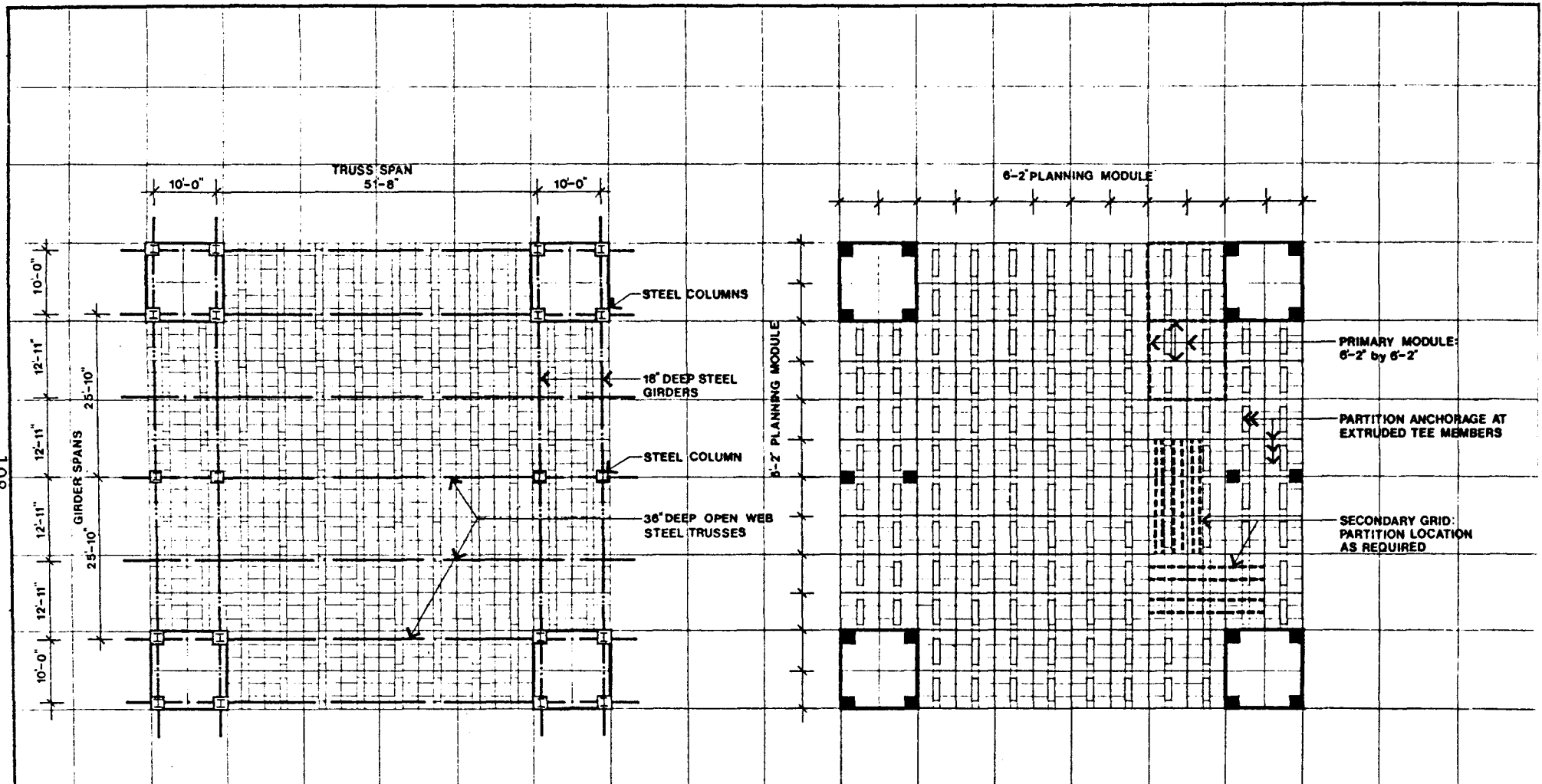
CASEWORK:

The flexibility afforded by the structural/mechanical system, interior partitions and ceilings will be matched by the system of casework. Elements will be dimensionally coordinated and capable of simple rearrangement to suit changing needs. The system used is the suspended or cantilevered type.

Dimensionally there has been a concerted effort to standardize the casework components. Typically units are either 2'-0" or 4'-0" wide. Unit types are readily interchangeable without expensive modifications



BUILDING SYSTEMS FRAMEWORK



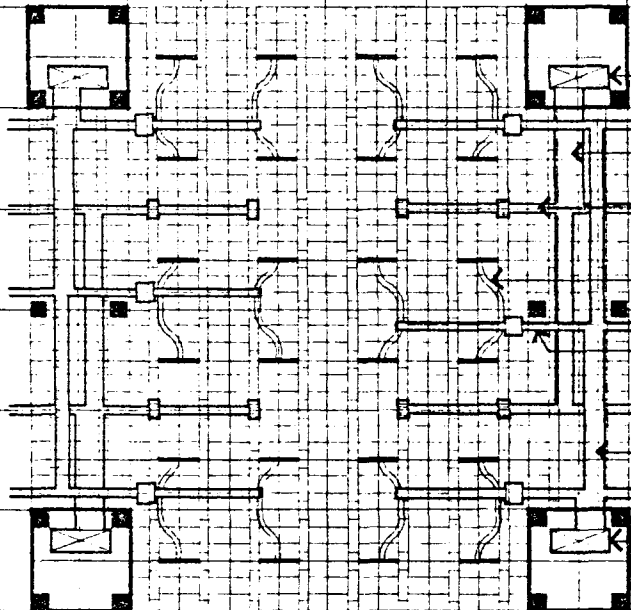
STRUCTURAL GRID

PLANNING GRID

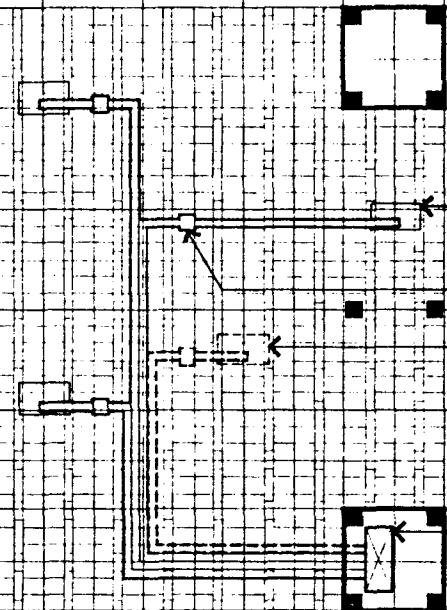
FOR MODULAR OR NON-MODULAR FUNCTIONS

DIMENSIONAL CHARACTERISTICS

109



- RETURN AIR RISER
- MAIN HORIZONTAL AIR RETURN DUCT
- SECONDARY AIR RETURN DUCT WITH GRILL
- FLEXIBLE DUCT CONNECTION TO LINEAR DEFFUSER
- SECONDARY AIR DISTRIBUTION WITH TERMINAL RE-HEAT UNITS
- MAIN HORIZONTAL AIR DISTRIBUTION
- LOW VELOCITY SINGLE DUCT AIR SUPPLY

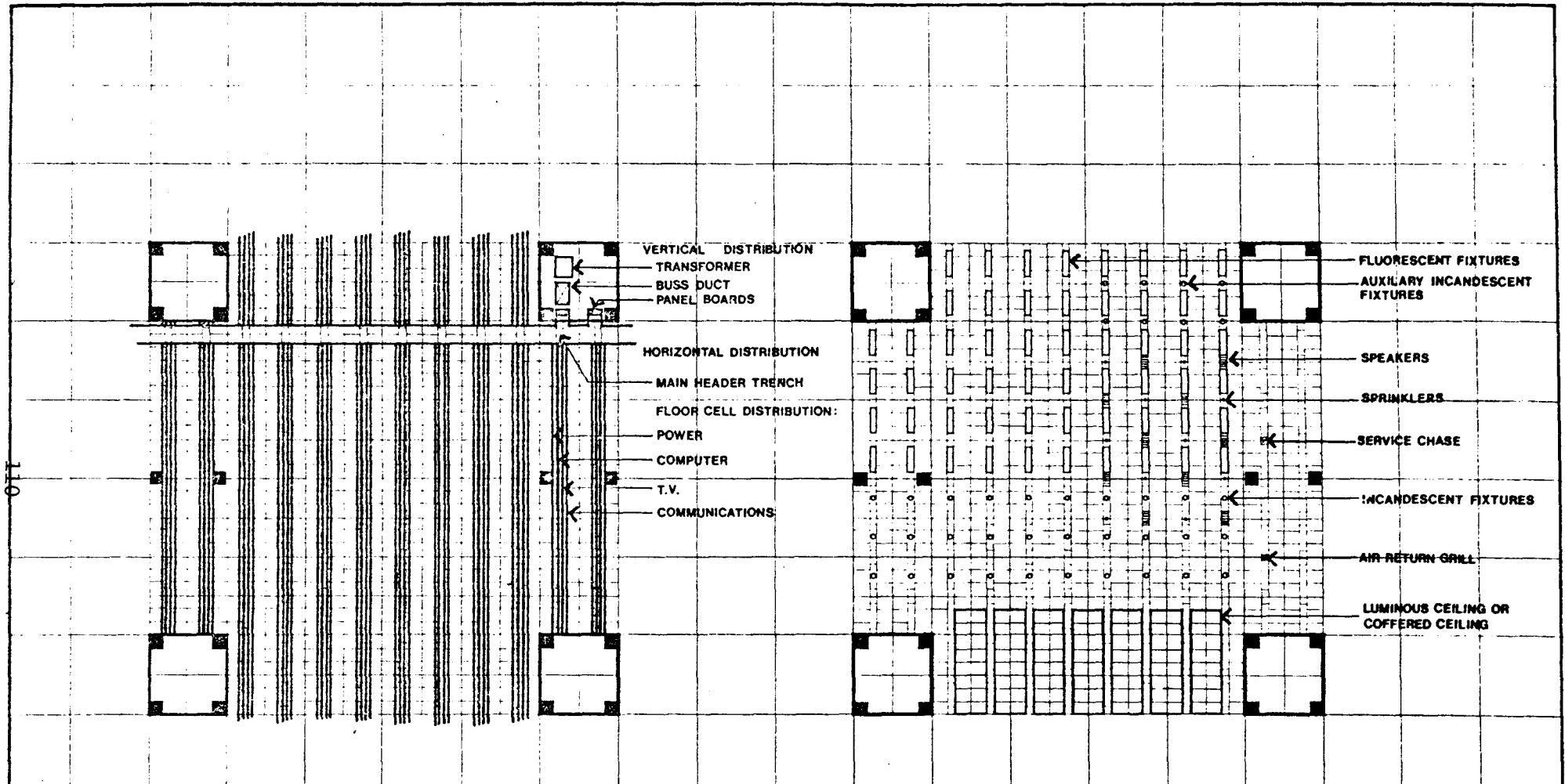


- FUME HOOD WITH INDIVIDUALLY DUCTED HORIZONTAL RETURN
- IN-LINE VANE-AXIAL FAN
- FUTURE FUME HOOD WITH DUCTED RETURN
- EXPLOSION PROOF SINGLE FUME EXHAUST RISER, SIZED TO PERMIT ADDITIONAL FUME HOODS

AIR DISTRIBUTION

FUME HOOD EXHAUST

H·V·A·C



DISTRIBUTION OF SERVICES

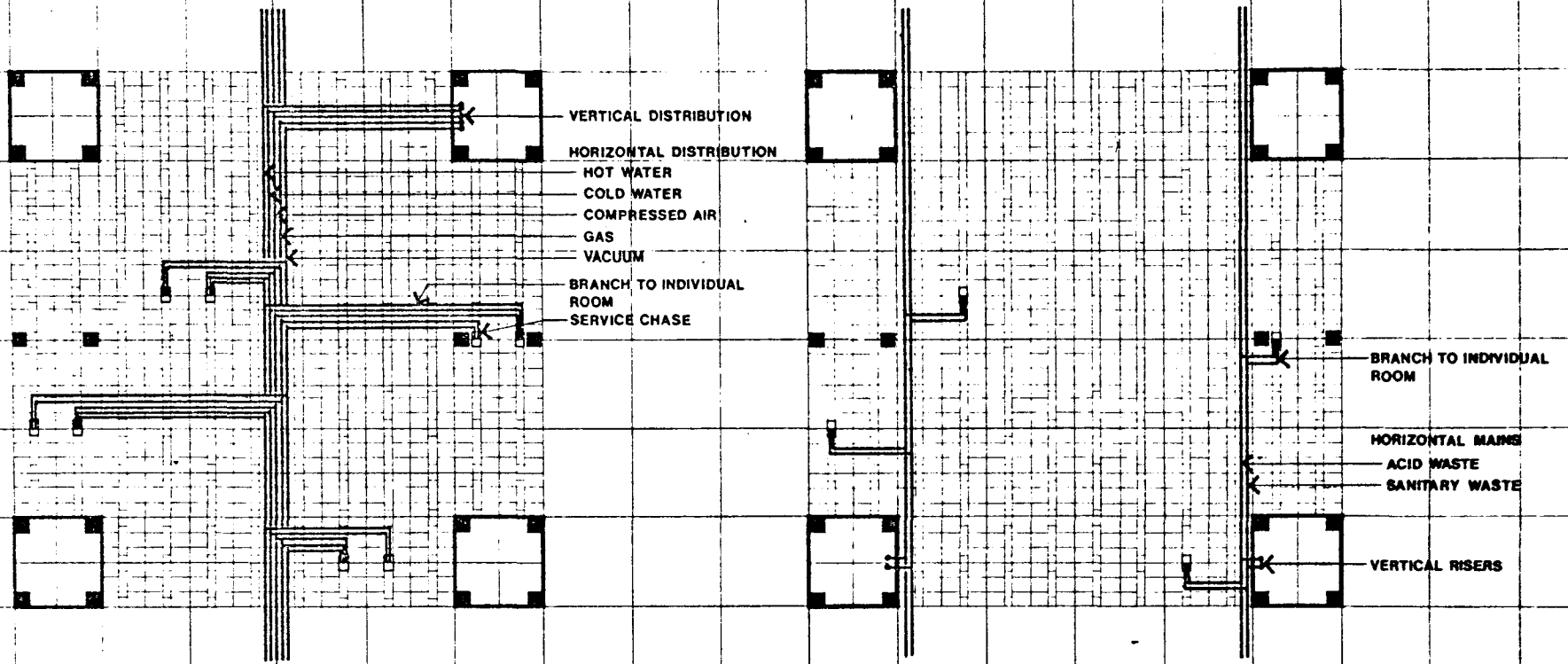
LIGHTING PATTERNS - REFLECTED CEILING

ELECTRICAL SERVICES

SUPPLY

WASTE

PIPED SERVICES



VERTICAL DISTRIBUTION
HORIZONTAL DISTRIBUTION
HOT WATER
COLD WATER
COMPRESSED AIR
GAS
VACUUM
BRANCH TO INDIVIDUAL ROOM
SERVICE CHASE

BRANCH TO INDIVIDUAL ROOM
HORIZONTAL MAINS
ACID WASTE
SANITARY WASTE
VERTICAL RISERS

associated with floor mounted casework.

Work stations have been standardized by dimension as well as by services provided therefore are not bound to one discipline.

C. Detailed Description of Unit F

Unit F will consist of nine floors of space located directly north of and adjoining Unit A. Three levels are below grade, the remaining six are above. Schematically Floors 1-4 relate to undergraduate teaching, Floor 5 is administrative and for special programs and Floors 6-7 are faculty and graduate research spaces. A detailed floor by floor description of function is as follows:

Basement

This level will be the primary location for major mechanical components serving the new construction. Mechanical space on this floor will be an expansion of the facilities provided in Unit A. Steam from the University central plant will be piped via the tunnel to Unit A on this level. Switch gear, pumps, chillers, emergency generating equipment will be located on this floor as well as on Floor 8. Major utilities will be distributed in vertical utility shafts 12'-4" x 12'-4" in dimension located typically 49'-4" apart.

Floor 1

The Central Service Corridor for the Health Sciences on this level connects with a service corridor in Unit F and will provide access to the new receiving center, Unit E. Major program elements accommodated on this floor are: college shared facilities; Central Supply with its support rooms of Receiving, Instrument Repair, Mechanical Workshop, and Glass Washing. Student Locker Facilities, along with general storage for the College of Pharmacy will be provided on this level. In addition, Pharmaceuticals will have its manufacturing unit on this floor. Elevating for Unit F consists of three cars grouped in one bank with two of the cars primarily for public traffic, with the other car having two openings to serve as both a passenger-freight elevator. A separate receiving room adjoining or in close proximity with the passenger-freight elevator occurs on all floors.

Floor 2

Floor 2 of Unit F, one floor below street level, will be a main entry point for students attending lectures in the Auditoria and classrooms. Two 150 seat auditoriums with projection booths and support facilities in addition to one classroom for 60 students which can be divided into 2 - 30 student classrooms are on this floor. The Pharmacy administration classroom for 75 students is located on this floor in conjunction with the other classrooms. Two of the Department of Pharmaceutic's undergraduate laboratories on this floor are the Bio-Pharmaceutics Lab and the Process and Prep-Lab. Both labs share

stock and prep rooms and are each capable of 75 student sections. The Unit F concourse will link with both the Units A and B/C Concourse, allowing movement of students and staff to other classroom facilities located at this level, and access to all other points within the Health Sciences Complex. In addition, access will be possible via a future tunnel connection to a proposed 2,000 car parking ramp located near the intersection of Oak Street and Delaware Street.

Floor 3, Ground Level

Unit F at ground level will be occupied by the Medicinal Chemistry Student Lab and the Medicinal Chemistry Instrumentation Lab. The Pharmaceutics Dispensing Lab is located on this floor so that the students can be observed by outsiders while filling their prescriptions. The Drug Reference area is located so that it might be used in conjunction with the Dispensing Laboratory and have easy access for use by the rest of the College. Formal entry for the building is on this level with a stair connecting floor 2 and floor 4, permitting undergraduate students to walk either up or down one level to attend their laboratories without taxing the elevator system.

Floor 4

Floor 4 houses the Department of Pharmacognosy. The Pharmacognosy student laboratory (under-graduate) is separated from the Graduate and Faculty laboratories space by the following shared functions: preparation and stock room fermentation room, chromatography room, instrument room, constant temperature and general purpose laboratories. Also housed on these floors are faculty offices and administrative space for the department.

Floor 5

Floor 5 of Unit F will provide a major horizontal connection between Millard Hall, Unit A, Unit B/C, and the Mayo Building. Functions which will be located on this floor include College Administration, the Department of Clinical Pharmacy, and the Department of Pharmacy Administration. In addition, shared space for Educational Development with its associated production, dark room, audio-visual, auto-tutorial space, and computer space will occupy this floor.

Floor 6

The Department of Medicinal Chemistry with the College shared rooms of Chemical and Equipment storage, and Central Instrument room, Radiation Synthesis and Counting will be housed on this floor. Graduate labs have been planned on an open, modular basis so that they may be sub-divided in the future if it is so desired. Faculty offices and laboratory space has been organized in conjunction with the graduate labs so as to achieve an appropriate distribution between the number of faculty members and graduate students. Special rooms, such as hydrogenation lab, chromatography lab, bio-process lab and a cold

room are also accomodated on this floor. Administrative space for the department, in addition to student study space is also housed on this floor.

Floor 7

The majority of Floor 7 will house administrative space, graduate laboratories, faculty offices and laboratories, for the Department of Pharmaceutics. The remaining Medicinal Chemistry Laboratory space is provided on this floor as is the Pharmacognosy Post-doctoral space with its associated Environmental Plant Room, drying and milling, extraction, and drug storage rooms. Animal Quarters for the College is located on this floor directly behind the elevator bank so that a connection for service, cage washing, and use by other departments is easily accessible. A student study space is also provided on this floor.

Floor 8

Greenhouse facilities for the Department of Pharmacognosy are located on this level so as to permit the best possible exposure to natural light. The remainder of the space on Floor 8 will be occupied by Mechanical Equipment.

Expansion

Unit F is being planned so that all floors can be expanded laterally 1 bay (approximately 62 feet) to the east. This will allow a potential increase of approximately 40% gross square feet at some future time.

D. Space Summary

Floor by floor summary of requested space:

	<u>Total NSF</u>	<u>Total SFG</u>
Floor B		14,521
Floor 1	9,892	19,049
Floor 2	14,039	18,520
Floor 3	9,994	15,829
Floor 4	10,323	16,328
Floor 5	11,747	18,731
Floor 6	15,659	22,890
Floor 7	14,886	22,890
Floor 8	704	12,290
Totals	87,244	161,048

Department summary of requested space:

	Undergraduate Teaching Laboratories	Graduate Teaching Laboratories	Teaching* Related	Total NSF
College Shared Facilities	--	--	22,208	22,208
Pharmacognosy	3,031	1,604	7,721	12,356
Medicinal Chemistry	4,449	6,559	7,943	18,951
Pharmaceutics	9,896	3,729	8,971	22,596
Pharmacy Administration	1,437	1,062	1,920	4,419
Clinical Pharmacy	--	835	1,410	2,245
College Administration	--	--	4,469	4,469
Totals	18,813	13,789	54,642	87,244

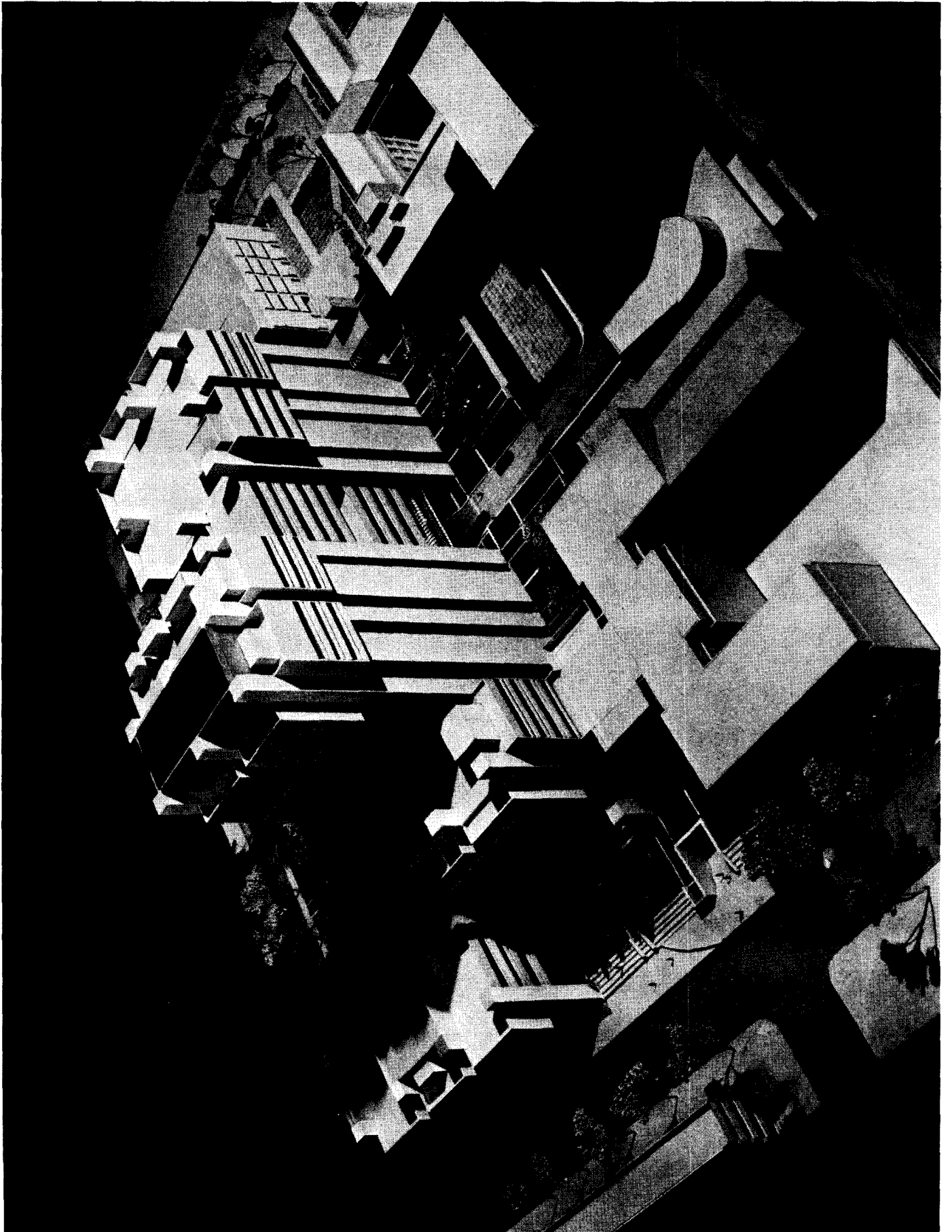
*Including classrooms, office space, supportive areas, and specialized laboratory functions.

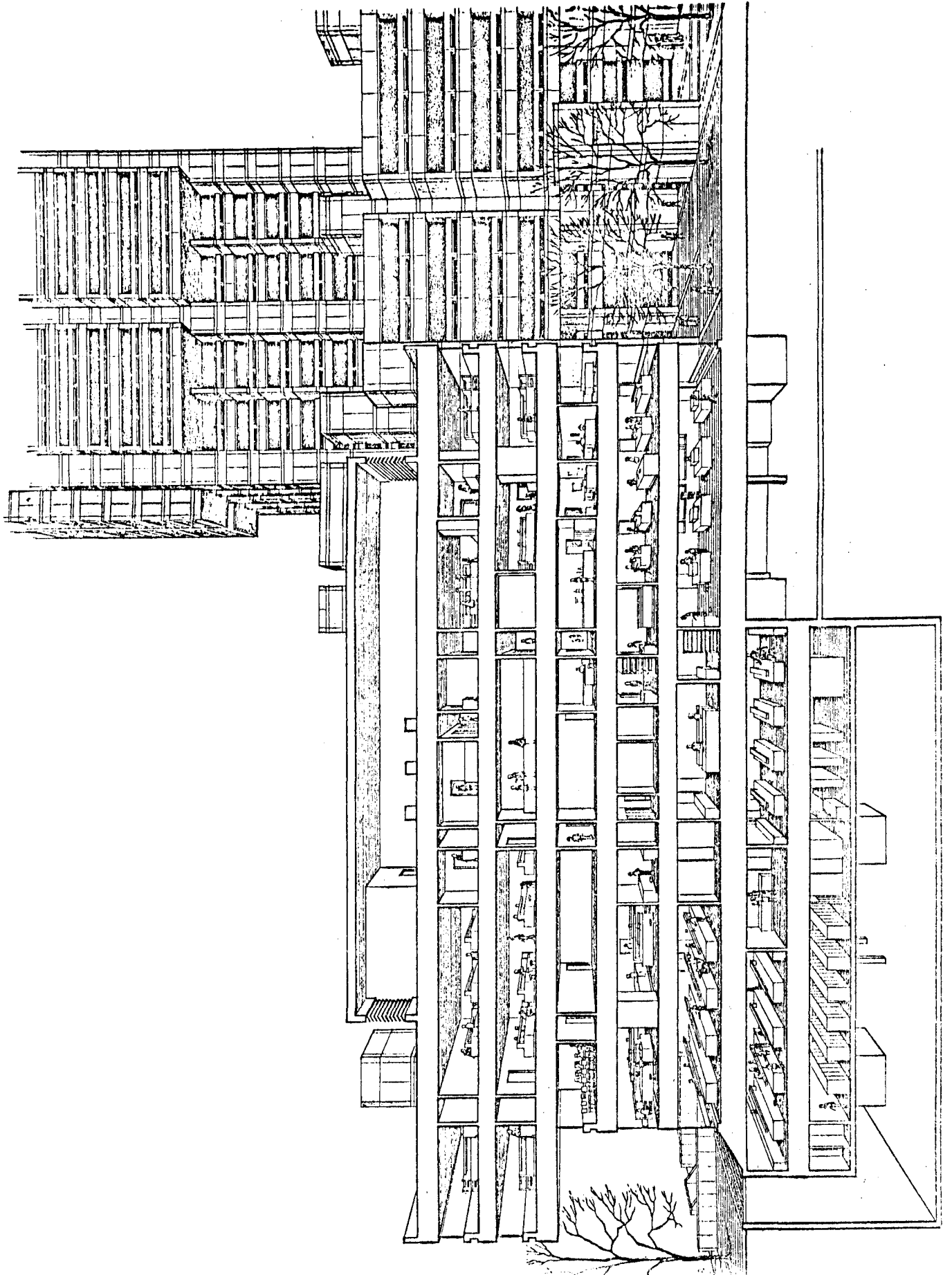
E. Projected Student Occupancy

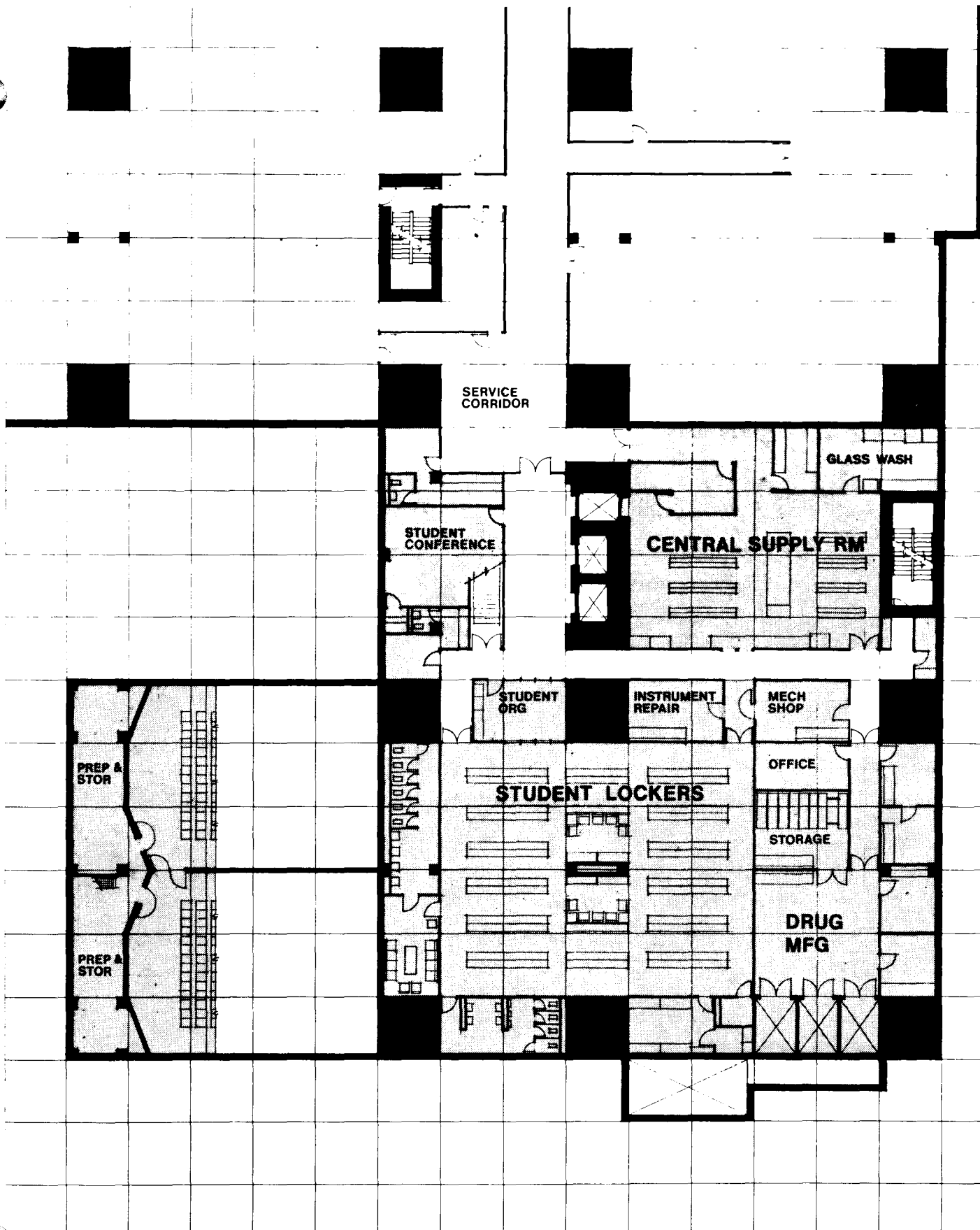
<u>Floor</u>	<u>Area Designation</u>	<u>Capacity</u>	<u>Sq.Ft.</u>
	COLLEGE SHARED FACILITIES		
1	Student Conference	25	400
1	Student Organization	8	225
2	Classroom	30	408
2	Classroom	30	408
2	Auditorium	150	1,793
2	Auditorium	150	1,793
2	Seminar	16	205
3	Drug Information Center	40	965
5	Auto-tutorial	15	304
6	Radioactive Synthesis Lab and Counting Room	4	462
6	Central Instrument	12	925
	PHARMACOGNOSY		
4	Conference/Library	20	396
4	Undergraduate Lab. and Related Spaces	50	3,031
4	Fermentation Lab.	4	342
4	Chromotography Lab.	4	302
4	Constant Temperature Lab. Suite	5	389
4	General Purpose Lab.	3	469
4	Instrument Lab.	10	310
4	Graduate Lab.	8	1,300
4	Graduate Study	6	304
4	Discussion	6	139
7	Extraction Lab.	4	241
7	Drying and Milling	4	258
7	Post-Doctoral Lab.	2	413

<u>Floor</u>	<u>Area Designation</u>	<u>Capacity</u>	<u>Sq. Ft.</u>
MEDICINAL CHEMISTRY			
3	Student Lab. and Related Teaching Spaces	75	3,119
3	Balance Lab	12	221
3	Instrumentation Lab	20	1,109
6	Conference / Library	30	461
6	Graduate Lab.	13	2,530
6	Graduate Lab.	4	608
6	Post-Doctoral Lab.	2	306
6	Post-Doctoral Lab	1	234
6	Graduate Lab.	8	1,224
6	Hydrogenation Lab	4	359
6	Chromatography Lab.	2	225
6	Bio-Process Lab.	2	325
6	Graduate Lab.	8	1,378
6	Instrument Room	5	308
7	Graduate Lab.	4	819
PHARMACEUTICS			
1	Manufacturing Suite	30	1,873
2	Bio-pharmaceutics Lab. and Related Spaces	75	3,093
2	Process and Preps Lab. and Related Spaces	75	3,162
3	Dispensing Lab. and Related Space	50	3,641
7	Conference / Library	30	454
7	Graduate Lab. with Instrument Space	13	2,661
7	Graduate Lab	6	1,068
7	Testing and Control	6	308
7	Special Projects Lab	6	919
7	Post-Doctoral Lab	2	600
PHARMACY ADMINISTRATION			
2	Student Lab. and Related Space	75	1,021
5	Conference	30	490
5	Reading and Reference	20	420
5	Graduate Office Suite	9	835
5	Analysis and Calc. Lab	15	416
5	Analysis and Calc. Graduate Lab.	5	227
CLINICAL PHARMACY			
5	Conference	30	456
5	Graduate Office Suite	9	835







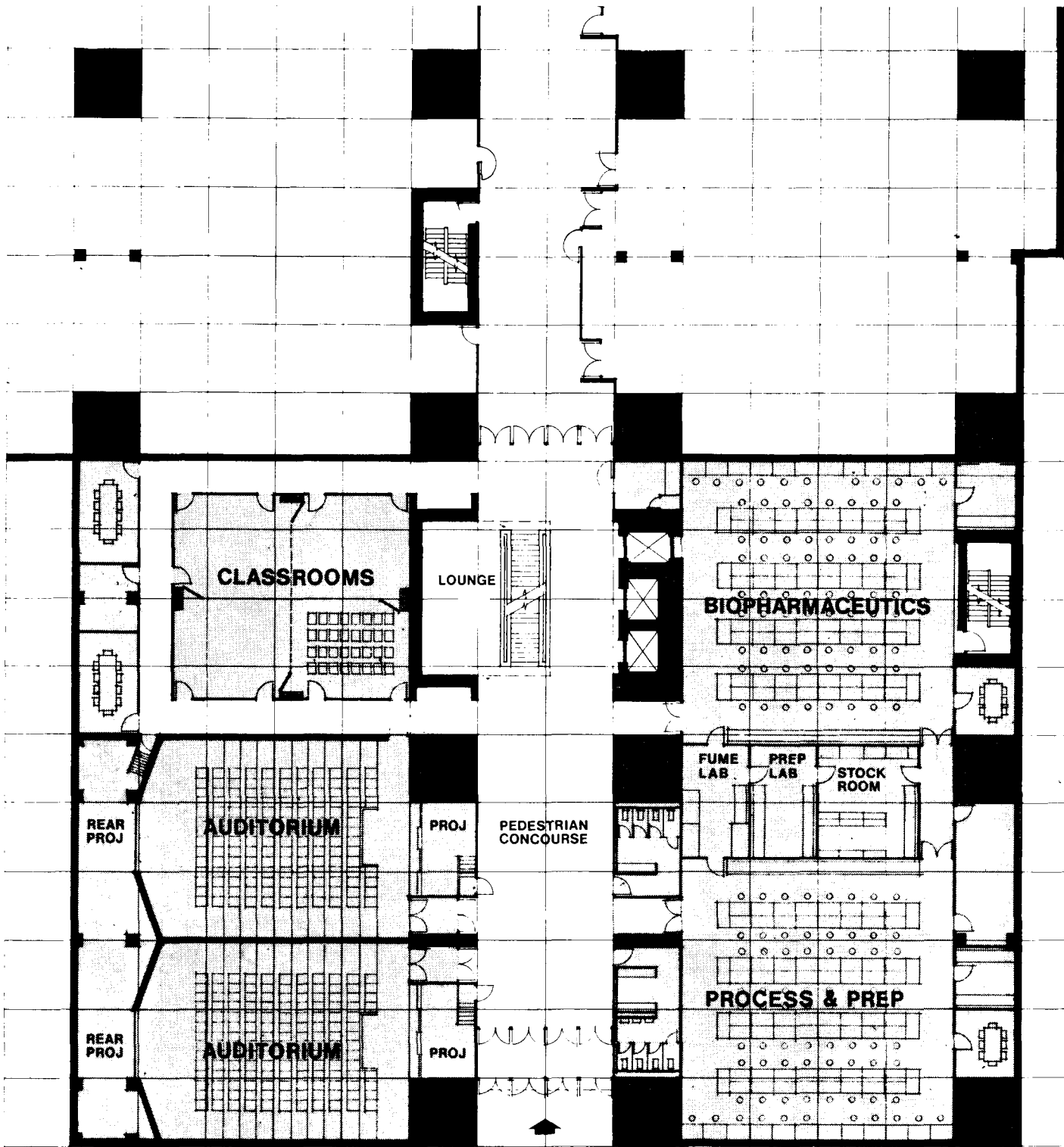


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**COLLEGE OF PHARMACY
UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION**

PROGRAM UNITS:
SHARED FACILITIES
PHARMACEUTICS

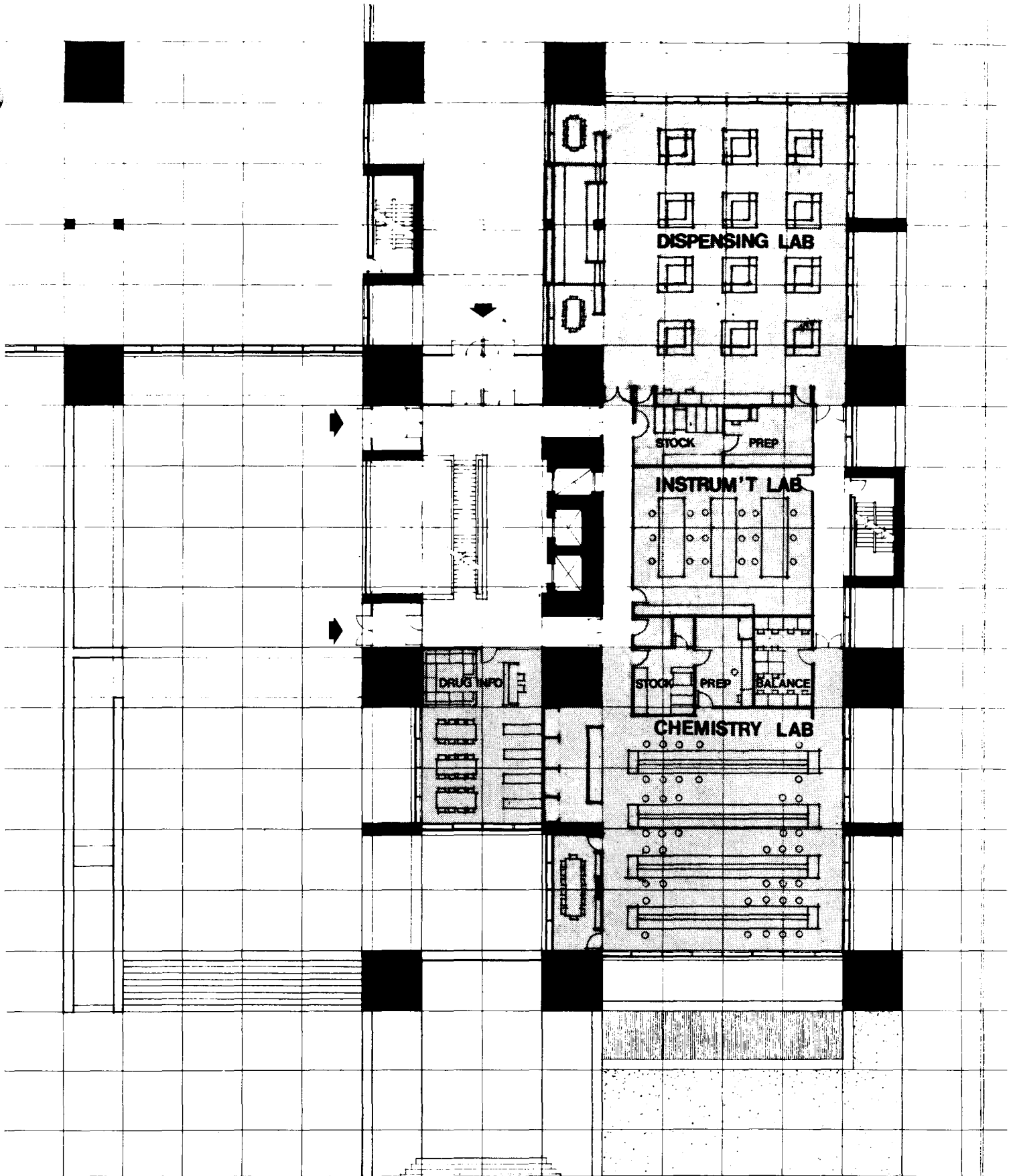
**FLOOR
1**



**COLLEGE OF PHARMACY
UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION**

PROGRAM UNITS:
SHARED FACILITIES
PHARMACEUTICS
PHARMACY ADMINISTRATION

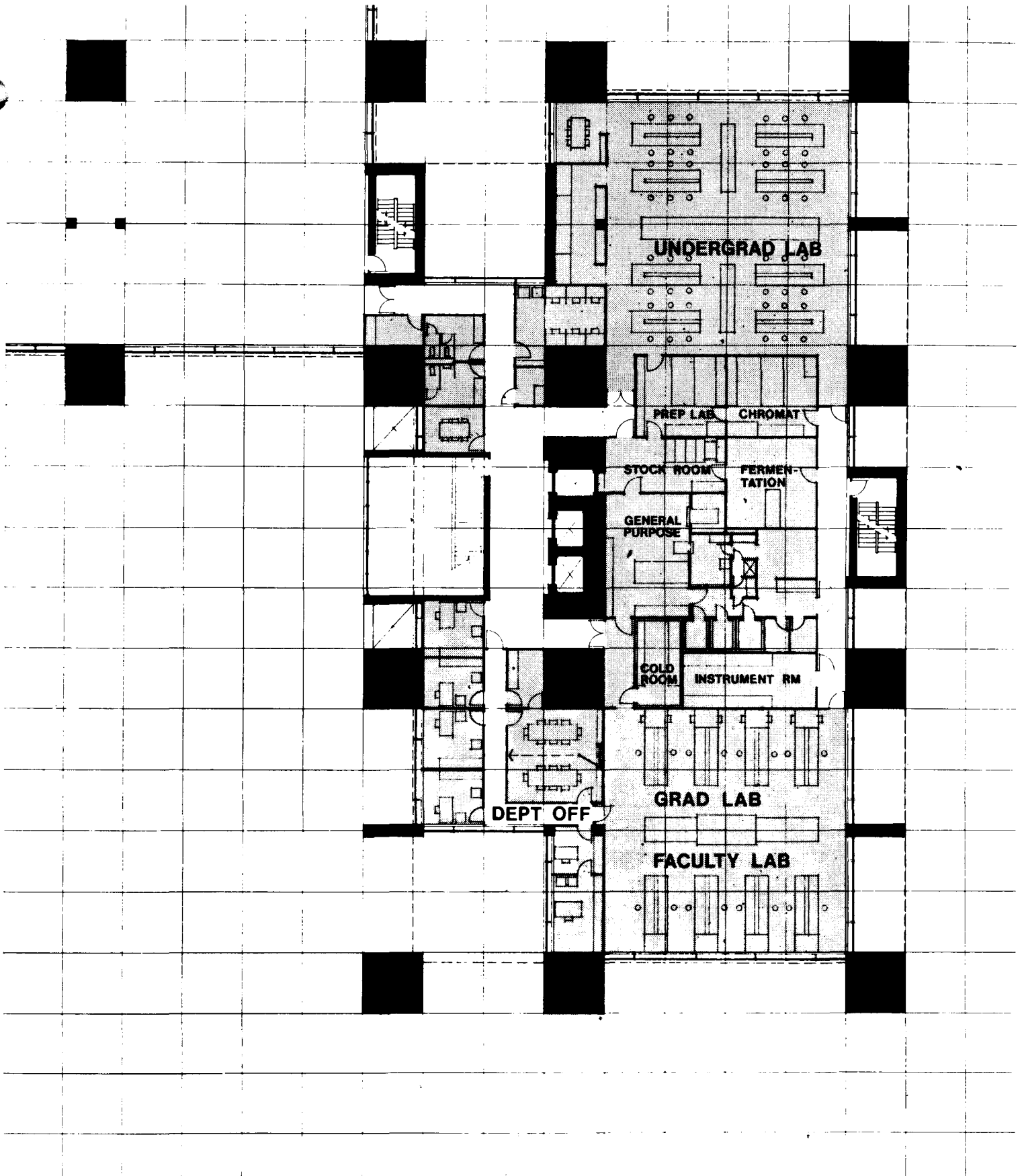
**FLOOR
2**



COLLEGE OF PHARMACY
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:
 SHARED FACILITIES
 MEDICINAL CHEMISTRY
 PHARMACEUTICS

FLOOR
3

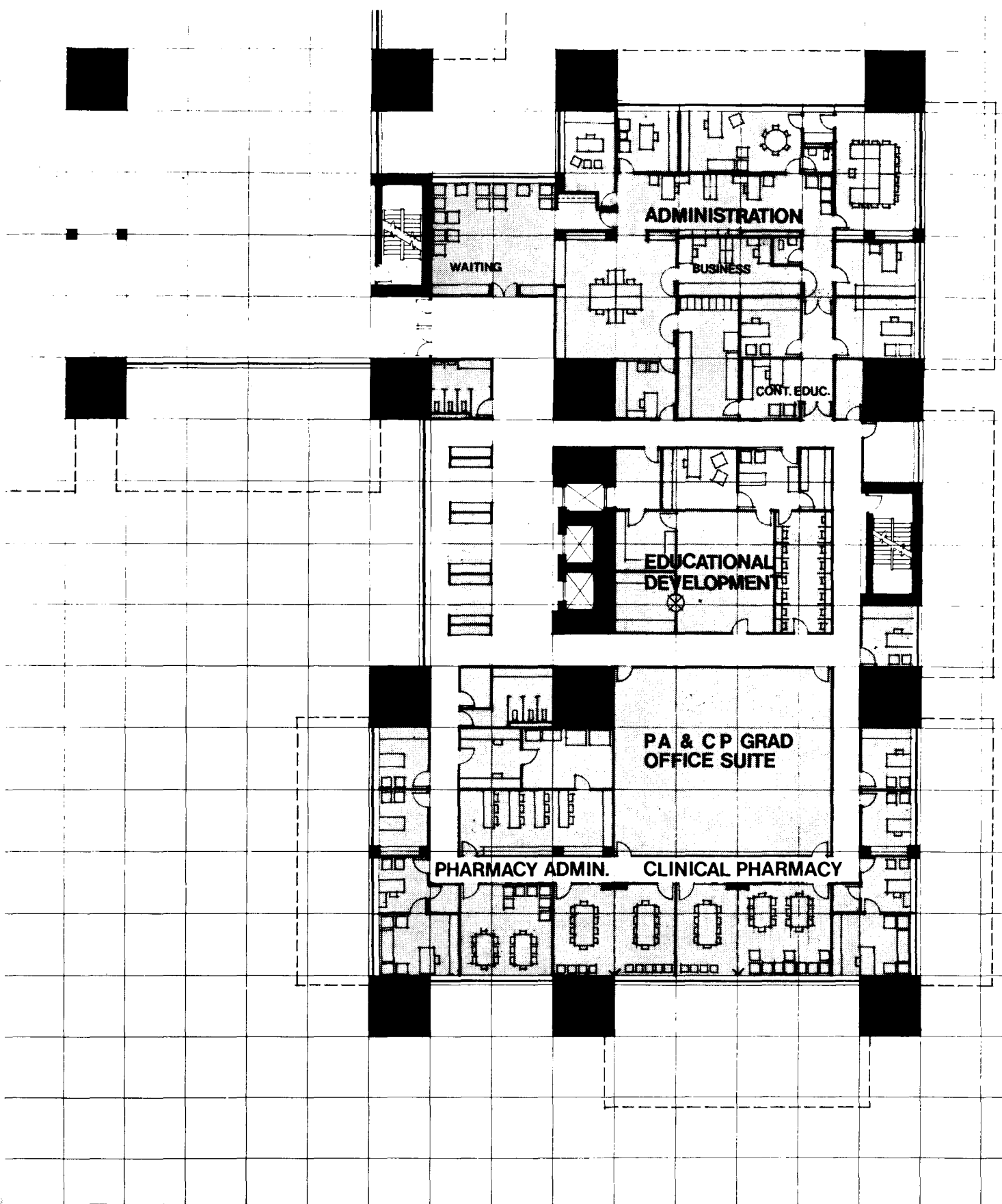


COLLEGE OF PHARMACY
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS: PHARACOGNOSY

FLOOR

4



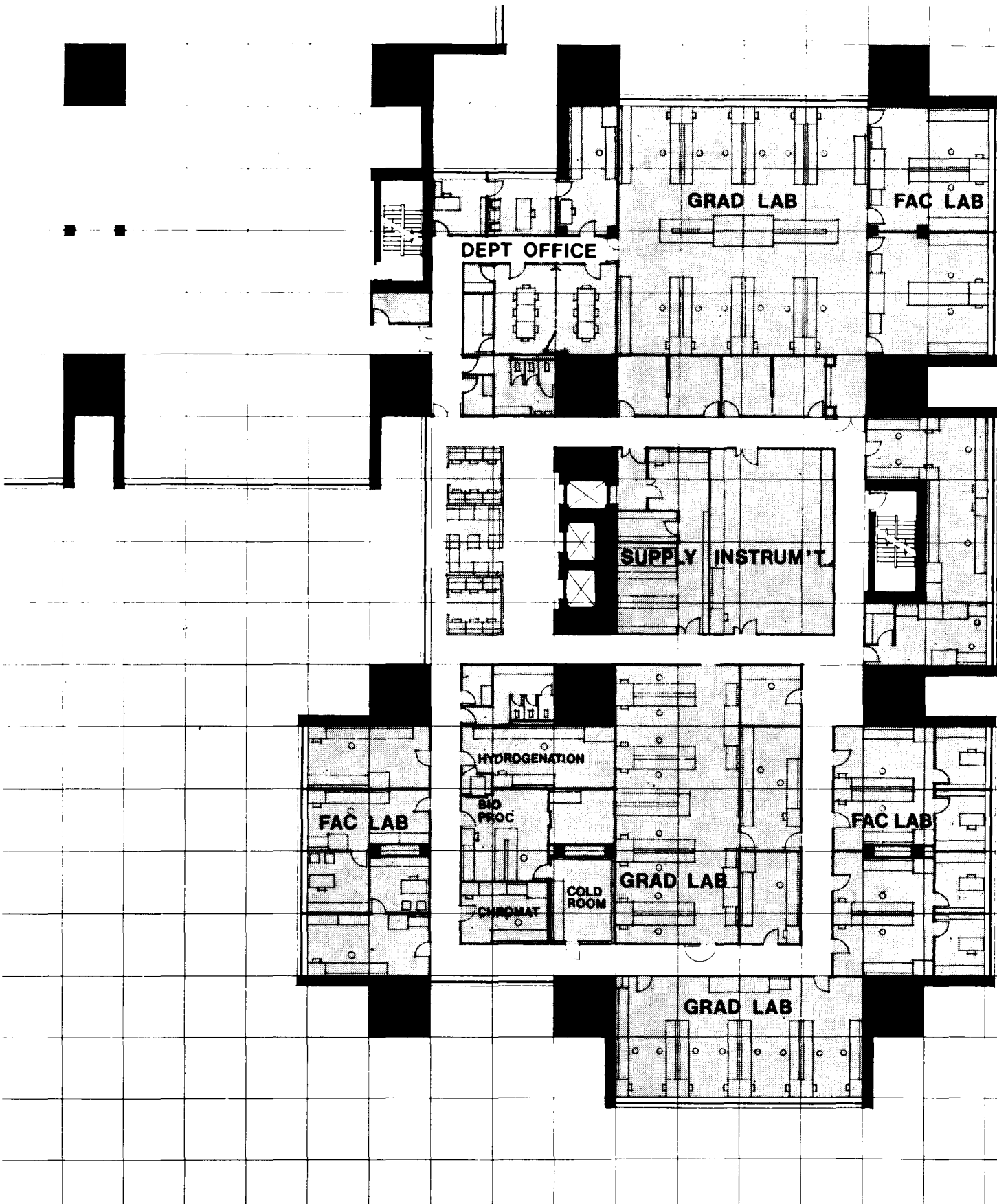
TAC

**COLLEGE OF PHARMACY
UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION**

PROGRAM UNITS:
SHARED FACILITIES
PHARMACY ADMINISTRATION
CLINICAL PHARMACY
ADMINISTRATION

FLOOR

5



TAC

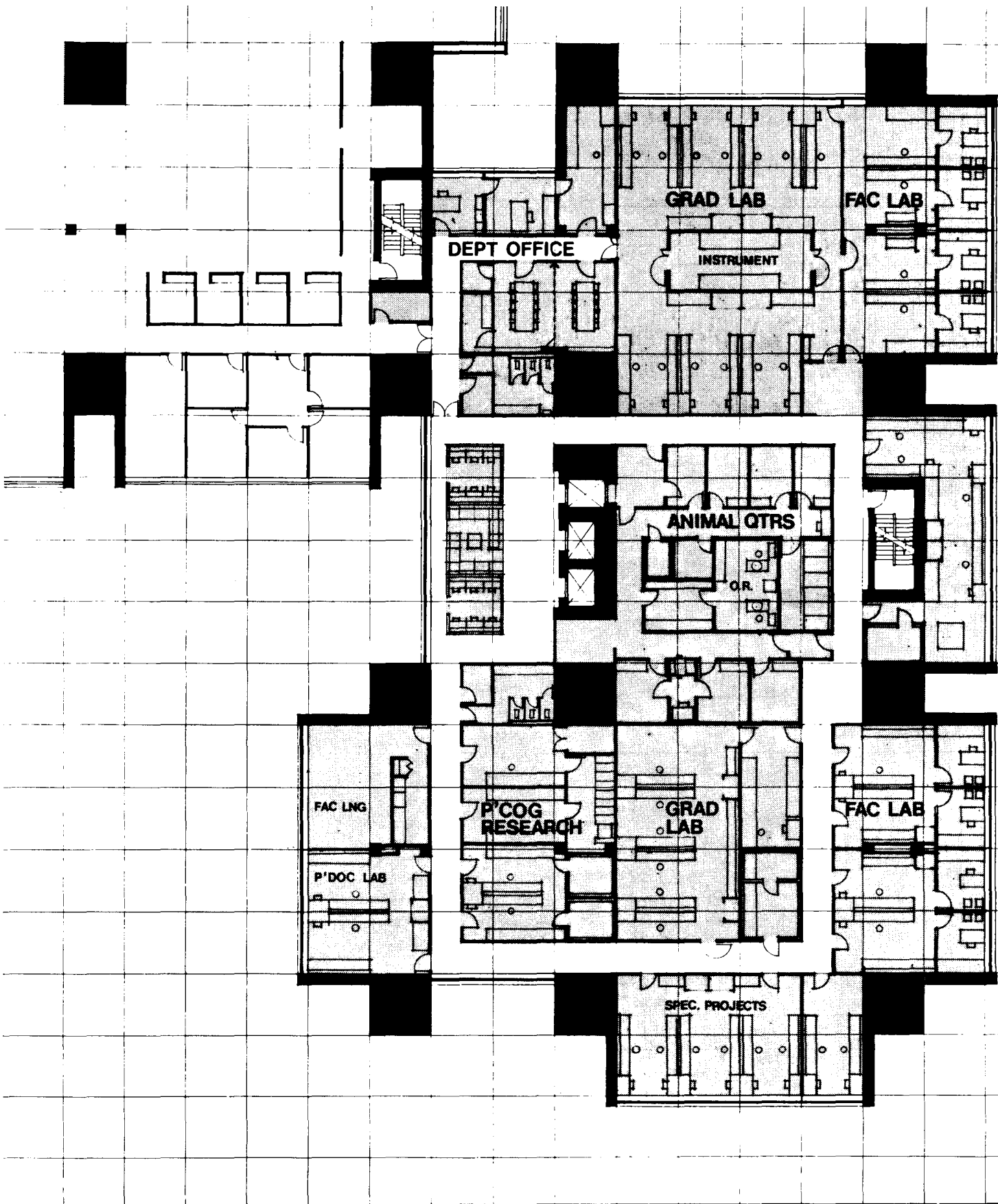
**COLLEGE OF PHARMACY
UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION**

PROGRAM UNITS:

SHARED FACILITIES
MEDICINAL CHEMISTRY

FLOOR

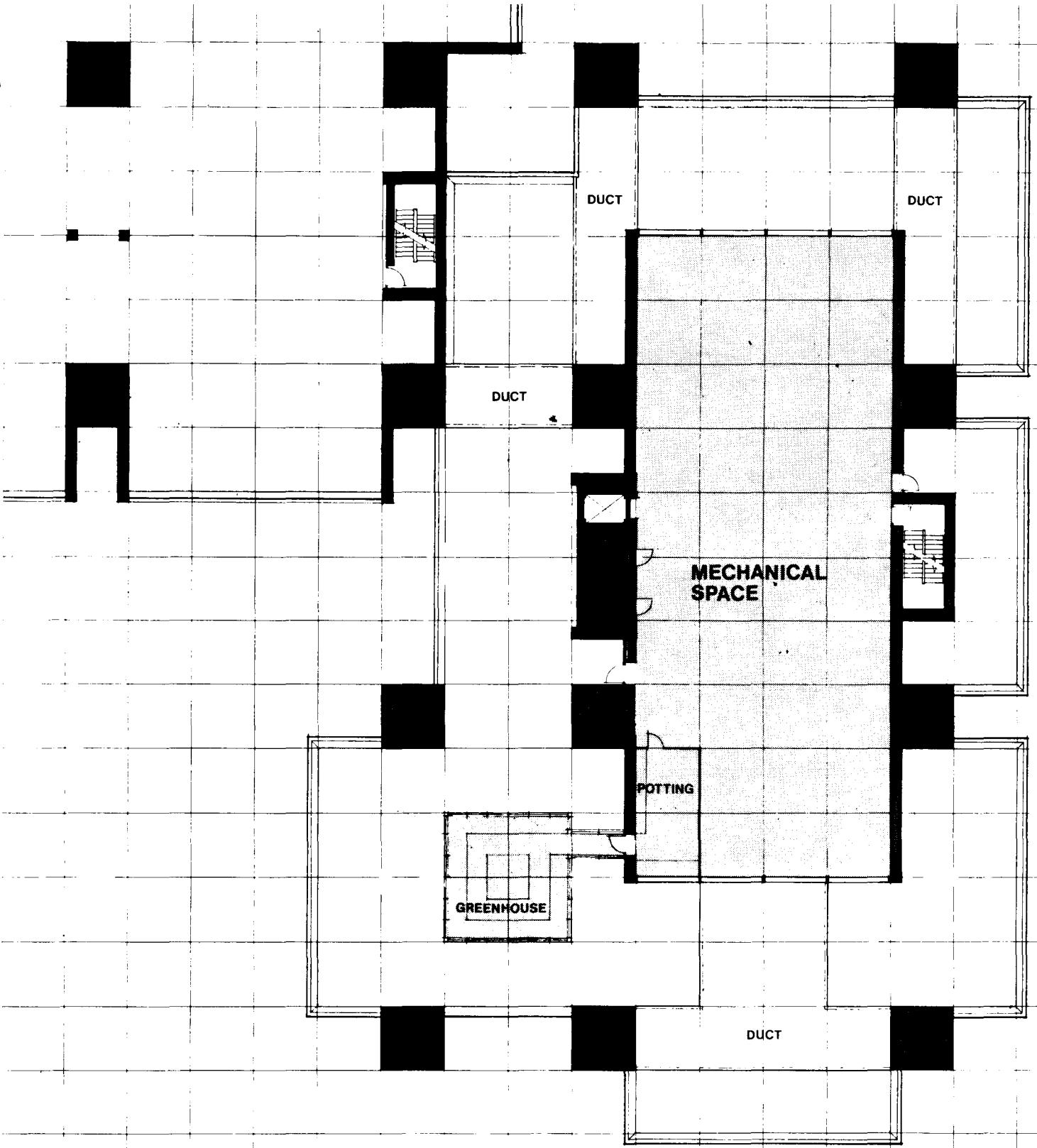
6



TAC COLLEGE OF PHARMACY
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:
 SHARED FACILITIES
 PHARMACOGNOSY
 MEDICAL CHEMISTRY
 PHARMACEUTICS

FLOOR
7



TAC

COLLEGE OF PHARMACY
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:
 PHARMACOGNOSY

FLOOR

8

F. Tentative Scheduling of Instructional Space and Analysis

A very careful effort has been made to plan and create facilities to satisfy the programs described in Item 9 - Section III, while at the same time providing the flexibility needed to adapt to changing curriculum patterns and to changing professional roles of the pharmacist.

As the curriculum now stands, activity in the proposed facility will basically follow the same guidelines for the pharmaceutical sciences as are now followed in the present facility. Immediate advantages will be noted through increased enrollment capability, the environment in which all health sciences are represented, ability to provide lower student to faculty ratios, and the availability of various educational support systems to aid in providing the relevancy and individuality needed in the curriculum.

The two large auditoria provided (150 seats each) will form the core for the curriculum delivery. Each will seat an entire class at one time so that the background lectures for the respective courses may be presented.

Based upon the spring quarter (due to the heaviest lecture schedule), the program for the 5-year curriculum indicates that for the required courses within the College of Pharmacy, 35 lecture hours per week must be delivered. A large majority of these lecture hours must be provided in the morning between the hours of 8 am and 12 noon. This is based upon the necessity of having afternoons free for laboratory offerings. These 35 hours will in effect more than take up the possible morning scheduling time of the 2 - 150 seat lecture halls. Additional large classroom space, if needed, will be available through Unit A, and reciprocately the Health Sciences and the University will schedule needed time within Unit F. It should be pointed out that no 150 seat classrooms have been planned for in Phase I construction, other than those in Unit F.

A majority of the conference/seminar rooms have been dealt joint functions. These functions may include departmental reading rooms, student study areas, lounge areas, or media preparation space. The 35 classroom hours indicated above do not take into account space needed for small group interactions, lecture areas for the Doctor of Pharmacy program, or seminar space. These activities will be designated space from the conference/seminar rooms and/or from the larger auditoria if necessary.

The following table indicates the laboratory usage for both the conventional 5 year curriculum and the Doctor of Pharmacy program.

PHYSICAL* PHARMACY & BIOPHARM- ACEUTICS	PROCESS* AND PREP LAB	DISPENS- ING LAB	PHARMA- COGNOSY LAB	MEDICINAL CHEMISTRY LAB
--	--------------------------------	------------------------	---------------------------	-------------------------------

For 2-3 (4)
Program:

1st professional
year --

FALL.....(xx)
o
WINTER.....(xx)
o
SPRING

2nd professional
year --

FALL.....o.....(xx)
WINTER.....o.....(xx).....(xx)
(xx)
SPRING.....(xx).....(xx)
(xx)
o
o

3rd professional
year --

FALL(xx).....o
WINTER.....(xx)
SPRING.....o

4th professional
year --

FALL.....o
WINTER.....o
SPRING.....o

- * The Physical Pharmacy/Biopharmaceutics Laboratory and the Process/Prep Laboratory will be adjacent to one another and therefore may be interchangeably used when one or the other (notably the Process/Prep Lab) is over scheduled.
- (xx) Conventional 5-year curriculum. Two sections for each course.
- o Doctor of Pharmacy specialization program. During 1st, 2nd, and 3rd professional years labs may be incorporated with the laboratories of the 5-year program when feasible.

Consolidation:

	PHYSICAL PHARMACY AND BIO- PHARMACEU- TICS LAB	PROCESS AND PREP	DISPENS- ING LAB	PHARMA- COGNOSY LAB	MEDIC CHEMISTRY LAB
--	--	------------------------	------------------------	---------------------------	---------------------------

Quarter

FALL	oo	(xx)	(xx)	o	(xx)o
WINTER	oo	(xx)	(xx)	(xx)	(xx)o
SPRING	o	(xx)	(xx)oo	(xx)	o

Each letter in the above charts represents a laboratory period of 3 to 4 hours each. Not shown in these charts are times needed for laboratory preparation study. The proposed scheduling stated above is based on the traditional formal laboratory period. This is breaking down in favor of 'open' laboratories where students work at their own rate. The current undergraduate Medicinal Chemistry laboratory is of this type and it is expected that others will follow their example in the future.

In accordance with the policy of placing the greatest emphasis on the individual student, numerous areas within the building (Unit F) and within other areas of the Health Sciences Center have been designated to complement this individuality. Within Unit F are found student conference rooms, locker rooms, laboratory reference areas, discussion rooms, the drug information center, demonstration and study carrels within the laboratories, and lounge and vending areas. To aid in the educational process, space has also been included for an Educational Development Center, a computer center, and a Continuing Education Administrative suite.

In addition, the Health Sciences Center as a whole will provide library and study space, the Learning Resources Center, and lounge space for all health sciences personnel.

Animal Facility Analysis:

Current animal facilities for the College of Pharmacy are located in Appleby Hall. They consist of a complex of four small interconnected rooms, one of which serves as an operating and general work area with the remaining three rooms providing the actual housing. With no Pharmacology offerings within the College of Pharmacy itself, no great inadequacies as far as space needs are concerned have been noted. This relieves the animal needs for both the undergraduate and graduate programs. However, as Biopharmaceutics continues to expand and as a greater emphasis is placed upon biological orientation within all disciplines, a greater need for space and improved facilities will ensue; again involving both the undergraduate and the graduate programs.

In regard to the status of animal quarters serving the remainder of the Health Sciences; these are currently located in the research areas of seven different buildings of the medical complex. Approximately 50% of the animals at this institution are cared for by personnel of the departments using the animals. The remainder of the animals are under the care of the personnel of the Research Animal Hospital. The School of Dentistry is providing approximately 6000 square feet of space on the 19th level of Unit A for their needs, while major expansion for the Research Animal Hospital will be provided for through Unit B/C.

Although a close working relationship will be developed between Pharmacy and the remainder of the Health Sciences concerning animal needs, a certain amount of space will be necessary for housing animals under experimentation.

No facilities for breeding and raising our own animals are planned. All animals will be ordered as needed either direct from involved companies or through the Research Animal Hospital. Housing, therefore, will be minimal except in cases of prolonged experimentation.

The lay-out will allow for separation of all animal species (seven small rooms plus a dog room) and will also allow for maximum flexibility with regard to possible variations in program. The separation of species, along with refuse isolation, feed isolation, separate receiving area, surgery area, recovery area, and the availability of a room for quarantine and isolation, will minimize the possibility of disease outbreaks and resulting contamination problems.

Facilities for the cleaning and sterilization of individual small cages will be made available within the cleaning and equipment room. The bulk of the cage washing (e.g. large cages and racks of cages) and general upkeep of the animals and their quarters however, will be provided through cooperation with the Research Animal Hospital. The animal room complex will have direct service elevator connection with the service corridor on level 1 which leads to the Research Animal Hospital facilities. This is a service corridor and as such does not provide public access.

Animal deliveries to the Research Animal Hospital are made via a separate service dock, the access of which is through the Mayo underground garage. Distribution throughout the Health Sciences complex will then be carried out from this point. Small animal purchases are normally direct through central stores while the purchase of all other animals will be coordinated by the Research Animal Hospital.

Animal health care provisions are available also through the Research Animal Hospital in conjunction with the College of Veterinary Medicine's holding facilities.

Daily carcass and refuse disposal will be provided by the University. The separate refuse storage area will have refrigeration for such storage needed until the time of pick-up and disposal. The refuse will be adequately bagged within the refuse storage area and at the time

of disposal will be brought to the service corridor on Level 1 via the service elevator.

It is recognized that the main problem arising out of the University's organization regarding research animals is that of dealing with animal transportation. It is for this reason that a separate isolated service corridor horizontally connecting all Health Sciences Units floor 1 was established. Vertical movement in other Units which have a high degree of animal traffic is accommodated by a separate animal service elevator. Unit F, by comparison, has a relatively low degree of animal traffic contemplated at this time and, therefore, it was felt a combination passenger-freight elevator would be satisfactory. Detailed analysis of both passenger and service movement, their volumes, frequencies, etc., has not been undertaken. Numerous possibilities exist and will be considered in terms of isolating animal movement by using various control techniques to complete isolation of elevator and shaftway. The full range of these alternatives will be examined concurrent with a detailed analysis of materials movement.

The placement of the animal facilities on the 7th floor of our proposed facility is based upon the premise that high density use facilities be situated on the more readily accessible lower levels while functions that require low level continuous activity be placed within the upper levels. Resultingly, classrooms, undergraduate laboratories, student facilities, and supply functions have been placed on the lower levels of Unit F. Supportive reasoning for placing the animal room complex on an upper level comes through the definition of the primary user. Biopharmaceutics, as well as other biologically oriented segments of our graduate research program comprise this user group. All of these segments are on the upper four floors of Unit F and biopharmaceutics itself is on the same level as the animal room complex.

The minimal animal holding and experimentation facilities we are proposing are in line with completely centralized or coordinated University of Health Sciences animal facilities.

We would urge cooperation in this area to eliminate duplication of facilities and in being able to provide the best possible care for the animals being housed.

SECTION VI- PROJECT COST ESTIMATE

The construction budget as entered in HEW Form 537 is a detailed breakdown based on completed schematic drawings and actual unit cost of the various systems as they were bid on Unit A (Dentistry, under construction). The successful systems cost format was developed by the Architects Collaborative, Inc., and Hodges, Jage, Sullivan, Aller Construction Consultants.

Gross square feet = 161,048
Net square feet = 87,244

Total Project Cost = \$16,676,216
Cost/GSF = \$103.55
Cost/NSF = \$191.14
(Instructional)

Total Construction Cost = \$11,573,167
Cost/GSF = \$ 71.89
Cost/NSF = \$132.71
(Instructional)

Amount of Federal
Assistance Requested = \$12,367,230

Minimal First-Year Student Increase = 42
(within three years)
Per student capital
outlay of project = \$397,052
Per student cost of
project to the
government = \$294,453

Eventual First-Year Student Increase = 47
(capacity of 150 students per class)
Per student capital
outlay of project = \$354,813
Per student cost of
project to the
government = \$263,133

THE FACILITY, HISTORY, AND BACKGROUND

The University of Minnesota began the planning process that led to the development of a long term program for the Health Sciences eight years ago.

A study supported by the Hill Family Foundation included the recommendations that the University should expand its entering Medical class to 200 students as rapidly as possible with a commensurate increase in the number of Dental students, increase the number of transfer students from the two-year medical schools in North and South Dakota, and strengthen the teaching skills and attitudes relevant to the responsibility of personal and family physicians.

The Regents of the University acting upon the Hill recommendations and preliminary reports of the University Long Range Planning Committee that was appointed by the President in September 1964 proposed physical facilities development program for the College of Medical Sciences and the School of Dentistry. This proposal included facilities essential to the maintenance of quality programs in the Health Sciences. In addition, it would make possible introduction of new programs and increases in enrollment recommended by the Hill Family Foundation study - entering classes in Medicine would be increased from 160 to 200, in Dentistry from 110 to 150, and there would be proportionate enrollment increases in related health professional programs.

Students, staff, and the faculty made significant contributions during the planning effort.

More than 100 faculty members participated in the planning effort. Most of their time has been devoted to programmatic study which includes expression of goals and objectives and definition of instructional, research, and service activities that are appropriate to the University's efforts to meet the needs of the state and nation.

The general criteria which established the basic planning framework are as follows:

- 1) Because of the great investment from public and private sources in existing facilities, the plan must conserve and enhance the desirable characteristics of the present Health Sciences Center.
- 2) The plan must be adequate in scale to serve all contemplated programs of the Health Sciences Center - programs that include substantial enrollment increases in all areas.
- 3) The plan must facilitate and, in fact, encourage interaction among persons in all Health Sciences programs.
- 4) The plan must provide maximum flexibility for adaptation to anticipated but unspecified changes in programs in the wake of social and scientific progress.
- 5) The plan must be compatible with other aspects of University development and enhance the involvement of the Health Sciences with the rest of the University and the community.
- 6) The plan must provide opportunity for development beyond any programs now contemplated.

In March, 1966, the new dean of the College of Pharmacy first involved his unit in the planning process initiated earlier by the other Health Sciences units. The faculty was able to complete sufficient review of college needs in the first six months to establish that future programs would require close participation with the other Health Science professional schools if a needed health team were to become a reality. The faculty concluded that a high priority request for funds from the legislature for a new wing to its present facility should be withdrawn and planning initiated to bring Pharmacy into the developing Health Sciences Center. This request was supported by the University, and planning for Pharmacy facility integrated into the Health Sciences Center was begun.

After many cooperative studies with representatives of the other health professional units the present plan has evolved. The detailed drawings for the College of Pharmacy facility are being developed. A great deal of space in the Health Sciences Center is planned for shared use with the other health units including the classrooms in the pharmacy facility.

The College of Pharmacy will carry out a number of programs in the new facility. Presently the largest program is the undergraduate B. S. in Pharmacy, a five-year professional program. During the academic year just completed (1971-72) the College initiated the professional Doctor of Pharmacy degree program. It is a six-year program available as an undergraduate and a post-graduate program. The College also offers graduate programs leading to the M.S. and Ph. D. in Medicinal Chemistry, Pharmacy Administration, Pharmacognosy and Pharmaceutics. Further, they have an established M. S. program in Hospital Pharmacy. The program with the greatest growth potential is the professional Doctor of Pharmacy program - it is the only one of its kind in the upper midwest.

The Health Sciences Expansion Project is bounded almost entirely by existing University dormitories, libraries, hospitals, and classroom buildings. The notable exception is the block to the east of the site along Washington Avenue. The block contains commercial and housing functions and has been considered a logical direction for long-range future expansion. The University is in contact with a community planning group and is developing a policy for future land acquisition in the area so that property holders are appraised of the time-table well in advance of any University acquisition.

With the exception of the aforementioned block, future expansion of the Health Sciences will involve the demolition of existing buildings. Therefore, future long-range expansion is expected to have minimal effects on the surrounding environment.

The site area for Unit F is currently occupied by three apartment buildings. A plan will be implemented to help relocate these residents. A long-range plan for housing is now in preparation and although a high proportion of student and staff housing will, of necessity, be provided by the private sector, it is likely that plans will include some University owned apartments and townhouses in the vicinity of the Health Sciences facilities.

THE PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT

The area proposed to receive Unit F is already urban and developed so it seems unlikely that wildlife, fish, or marine life will be affected directly. There is the possibility that construction of Unit F (and construction of the Health Sciences Expansion as a whole) could have some secondary influence on the ecosystems of the area. For instance, increased electrical demand means increased power plant output and this in turn could affect the ecosystems of the Minneapolis area by increased air pollution or heat pollution. But effects such as these are difficult to assess.

The area planned for use by Unit F is presently occupied by three brick-veneer 3-story apartment houses, one single family home and three converted duplexes, comprising a total of sixty-nine dwelling units. One of the brick-veneer buildings are in fairly good condition. The single-family dwelling has already been bought and razed by the University. One of the duplexes is owned by the University and is presently being maintained in good condition and rented out. The other two duplexes are still privately owned and are in fairly good condition.

The construction of Unit F, then, will displace approximately 120 people.

The land use will change from residential/small commercial use to public, non residential use.

Unit F will provide services to many people, both directly and indirectly. A report by Bather, Ringrose, Wolsfeld, Inc. indicates the following populations for Unit F by 1975: 42 faculty members, 490 grad and undergrad students, and 45 employees will be housed in Unit F. These, of course, are the people that will be affected most directly by the proposed facility.

The construction of Unit F will have a considerable impact on resource use. A new 16" water main will be installed, which will have the capacity to deliver 1820 gpm. This water main will be shared by Units A, B/C, and F. The projected use by Unit F will be 200 gpm. At present, this area is served by a 6" water main, which can deliver between 200 and 400 gpm.

A new sanitary and storm sewer line will be installed also to be shared by other units in the Health Sciences Complex. At present, the line is 12" and the proposed new line is 24", which will give roughly four times the capacity of the present line.

Gas use will be about the same or possibly slightly lower. The existing residential units use gas for cooking and heating, while Unit F will use gas only for laboratory purposes and to run emergency generators.

New electrical feeders are presently being installed to handle increased electrical demand. It is estimated that Units A, B/C, and K/E, and F combined will increase the total campus load by 10 to 15%. Unit F's share will be about $\frac{161,043}{1,525,383}$ of the total increased load.

The new building will be heated by steam for the University's central heating plant. The heating plant is being expanded and renovated to accommodate additional demand by Health Sciences as a whole, Unit F will cause an additional demand of 14,500 #/hr., which is $\frac{175,000}{1,525,383}$ of the total increased demand.

There will be increased demand upon other public services, such as streets, public transport, parking facilities, highways, etc. A parking ramp for the use of the Health Sciences Complex is planned, which would contain 2,000 parking

spaces. A type of shuttle-bus service from the parking ramp to Health Sciences is proposed. Also proposed is an underground service street which will concentrate supplies receiving at Unit K/E and which would eliminate most delivery-truck traffic. Highway 1-94 at present has an incomplete interchange which feeds into and out of the University area. Completion of the interchange would enhance vehicular circulation from the city as a whole to the Health Science Complex.

The Health Sciences Complex, including Unit F, is presently served by MTC bus line 16-A on Washington Avenue; this bus line runs directly to downtown Minneapolis to the west and downtown St. Paul on the east. It is expected that an increase in bus ridership will result from this development.

ANY PROBABLE OR POTENTIAL ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

Units F and B/C are part of a master plan adopted in 1968 for the Health Sciences. A decision was made at that time to locate the project contiguous with the existing Health Science Plant to make optimal use of sound, well maintained structures and provide for an orderly phasing into new construction and the phasing out of old. The result is a very dense developme

In order to obviate the congestion the University has prepared a comprehensive long-range plan for parking and circulation on the Twin Cities Campus. The Health Sciences Facilities program includes provision of a 2,000 car parking ramp which will be constructed simultaneously with the construction of Unit A. This ramp has first priority in the implementation of the overall parking plan. The University is also cooperating with the Metropolitan Transit Commission and other agencies to develop improved public transportation for the area. Among the possibilities being considered is a series of satellite parking lots connected to the University by a rapid transit system.

ALTERNATIVE TO THE PROPOSED PROJECT

Units B/C and F are tied to a 4-year old Master Planning decision on Site location. The site for B/C and F evolved from an in-depth analysis that determined that the most ideal site, among those considered for the development of the Health Sciences Expansion Program (related specifically to cost, efficient management and the desirability for interaction with other University programs and the major public and private investment in existing facilities, as well as environmental commitments), to be the area of the existing Health Sciences Complex. There are no significant adverse affects regarding the environment on these sites, and in fact, the present location will help to rectify many of the internal problems of a Health Sciences center on a growing campus that has limited availability of land thus requiring critical decisions on land use programming.

THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The appropriate selection of site and developmental phases for a project of this magnitude (Health Sciences Program) imposed an obligation on the University to initiate and organize careful pre-planning efforts to insure that the development of the site selected fitted into the context of present and future community patterns.

A careful analysis of site development required to accommodate the Health Sciences Expansion Program determined that higher land utilization and building densities were necessary to effectively satisfy programmatic needs and to insure a minimal jeopardization of the integrity and function

of existing land use on the campus and Community environs. The decision to increase building activity within the area for expanded programs will prove to have been a wise decision, both functionally and environmentally in future years.

The developmental plan for this unit is a direct expression of the program and philosophy of the Health Sciences and the design influences (landscape, architecture, traffic, etc.) of the surrounding campus and community. Its development will provide a significant contribution to the physical environment and the academic (instructional and research) and service activities of the unit will prove immeasurably beneficial to succeeding generations.

A policy of minimum disturbance of the existing environment with an over-all goal of enhancement guided decisions on physical development. The expansion proposal was coordinated with local and state agencies (i.e. establishing traffic patterns and land uses) to assure an orderly efficient and attractive development of the Health Sciences Complex that related functionally and aesthetically to the surrounding environs. The resultant framework will accommodate the changes, demands, and in-puts of coming generations.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The projects will not curtail the range of beneficial use. In fact, the interior environment created will function to improve the Health and well being of the world and particularly that of the upper midwest region:

Due to the fact that boulevard trees will remain - no trees of consequence will be cut. (one 5" caliper) However, the development will include site improvements such as numerous trees and planting areas which will enhance the environment.

ANALYSIS OF CONSTRUCTION EFFECTS

The construction schedule for Unit F is as follows:

	Begin	End
ECX		
ECS		
Contracts	June 73	
Completion	Fall of 75	

This portion of the construction which would be likely to have the most adverse effects would be the excavation phase. This is the time when excavating and the driving of piles, etc. will take place, and is the most likely to create noise, dust, etc. All of the construction of course, will create some of the above problems.

Steps will be taken to prevent hazards to the people in the area. Fences will be erected, warning and directional signs posted, etc.

Traffic flow in the area will not be impeded unduly by the construction. Harvard Street will probably be made 1-way for the duration of construction. One lane may be closed on Washington Avenue for a short period during construction.

The watershed will be changed as a result of the construction of Unit F, from a run-off factor of .5 to .9.

Erosion does not seem likely to be a problem. Areas around the excavation will be retained by cribbing's sheet piling.

There will be a certain amount of emissions into the air during construction, such as exhaust from equipment, dust from excavation, and equipment working, etc. It does not seem likely that there will be any water pollution caused by construction.

Trees will be preserved wherever at all possible, and will be protected during construction. The landscape of the area will be redone, but planting and sodding will be carried on both by the contractor (within bounds of project) and the University (in public-use areas, such as along the boulevards).

ESTHETICS OF THE PROPOSED FACILITY

The complex of new and remodeled existing buildings comprising the Health Sciences Facilities is the Architect's response to the University's goal of physical and curricular integration of the Health Sciences units with each other and the rest of the Minneapolis campus of the University.

The problem as defined by this goal was to develop a high density building system on a tight urban site with strong relationships to major existing facilities. This system needed to respond to the initial phase of expansion as well as to the continuing need for growth and change inherent in health sciences units.

The Architect's initial effort was to develop a master plan which provided for short and long term expansion and responded to the integrated relationships called for in the program. This master plan serves as a framework for growth by establishing the major paths of circulation knitting together new and existing buildings.

The units designated by the master plan to be housed in new construction were analyzed for common systems criteria. These criteria generated one building system which, with appropriate variations, could respond to the requirements of teaching and research labs, dental clinics, hospital out-patient clinics, offices, classrooms and auditoria. And in addition could provide a high degree of flexibility and expandability.

As a three-dimension physical statement the building is a framework which is filled as space is required. The strongest visual elements of the frame in this case are the core element, stairs, elevators and service cores, which are 12'-4" square and are spaced 49'-4" apart in two directions. Depending upon the space requirements of the various floors the exterior envelope is located at (1) the back face of the cores, (2) flush with the front or, (3) cantilevered 12'-4" in front of the exterior core face. The result is a highly articulated and interesting one.

The verticality introduced by the core elements is balanced by the horizontal lines created by continuous window bands. These bands are particularly evident where the envelope of the building cantilevers out from the face of the cores. As seen in the enclosed model photographs the number of levels comprising a cantilevered projection corresponds to the overall height and mass of the particular unit.

The massiveness of Unit A as a isolated entity will be softened by the addition of the remaining units, B/C and F. Unit F is a lower mass which related rather closely to the scale of the adjacent existing facilities. Unit B/C is an extension of the scale of Unit A but somewhat diminished in height. The resulting composition from low to medium to highest massing we feel is a harmonious one.

Due to the fact that the new development is of a much different scale and concept than the existing plant it was decided rather early to depart from the traditional brick masonry construction of adjacent buildings. Exposed aggregate pre-cast concrete panels were chosen for the envelope, the color of which relates to limestone cornices and banding on existing buildings. Plazas surround the new construction and are paved with brick resembling that of the adjacent buildings.

The primary public circulation level for the complex is the Floor 2 Concourse, one level below grade. This level is reached in numerous points along its length by various exterior and interior stairway and escalator spaces, which also admit light to this level. All major assembly, admission and lounge facilities are located off this concourse. Exterior materials are used i.e. exposed aggregate concrete cladding on cores and brick pavers on floors to create an extension of exterior treatment to the interior "pedestrian street." Also, the treatment will help the visitor to understand the framework concept of the building.

An existing church located on the site, which in the 1920's won an architectural design award, will be incorporated into the landscaping. Thus, old will be integrated with the new which will be advantageous to both.

Due to the tremendous demand for space in the complex almost all open spaces have occupied space below them. Great care was taken, however, to provide trees on these plaza areas by integrating tree planting pockets into the plaza structure. The softening and humanizing effect of the plantings in conjunction with seating areas was judged by the Client and Architects to be well worth the expense involved.

ENVIRONMENTAL APPROVALS AND CONSULTATIONS

In the State of Minnesota there is no agency which is empowered to review proposed construction for compliance with Minnesota air and water quality legislation. In the case of the University, the Health Service is the official agency responsible for surveillance of the physical environment.

The Division of Environmental Health and Safety is composed of a team of specialists in industrial health, sanitation, safety, microbiology, public health engineering and health physics. All of these specialists work in protecting the University community from the hazards of the physical environment.

Toxic materials, explosives chemicals, and flammable liquid wastes are collected once a week and taken to the University's Research Center at Rosemount, Minnesota for treatment and disposal.

Radioactive liquid and solid wastes are collected in the laboratory in yellow waste containers which are labeled to indicate whether the waste is combustible or non-combustible. The division of Health Physicists supervises the collection and disposal or storage of this waste. The temporary storage facility for radioactive waste is located at the University Rosemount Research Center. This facility is a brick building 36 feet long, by 19 feet wide, by 15 feet high, protected by a cyclone fence and posted in accordance with Title 10, part 20, section 20.203 of the Federal Regulations. Stored waste is picked up periodically by a commercial waste disposal firm which transports it to an Atomic Energy Commission (AEC) approved burial ground for final disposal.

Regular and infected combustible waste is collected and taken to the University incineration facility which is located approximately 1/2 mile from the Health Science Complex. The incinerator has two reciprocating grate stokers, with a loading capacity for each unit of 50 tons per day. The high temperature combustion gases are conducted to the 225 foot high incinerator stack.

All small animals carcasses including those containing residual radioisotopes are put in plastic bags and transported from the research laboratory to the cold room, to the incinerator, and each morning are placed on the animal hearth of the incinerator after a consuming fire has been established. After the furnace has cooled, the ash residue is dumped from the animal... hearth onto the grate for removal to the waiting truck. These non-combustible solid wastes are disposed of in a licensed landfill.

University Plant Services are now able to continuously monitor the stack to evaluate the efficiency of combustion and dilution of radioactive combustible products.

Sewage of the University of Minnesota is discharged into the sewers of the City of Minneapolis, then to the sewage treatment plan of the Minneapolis-St. Paul Sanitary District where secondary treatment is provided.

In addition, to reviewing plans and specifications with the University agencies, the following agencies reviewed the project at the termination of the Design Development Phase of the work:

State Fire Marshall's Office
Minneapolis Fire Department
Minnesota Society for Crippled Children and Adults
Regional Office of Facilities, Engineering and Construction, Chicago,
Illinois

All plans met with approval.

License - None required.

Permits - We require wrecking contractors to have a wrecking permit. Wrecking permits are required by the City of Minneapolis and are a part of their files.

The City of Minneapolis requires that the University of Minnesota take out permits for cutting off sewer and water services to buildings when buildings in the site area for both Unit "F" and Unit "B/C" are raised.

State, Local and
Regional Planning
Authorities - The alley between Washington Avenue Southeast and Delaware Street Southeast west of Harvard Street Southeast must be vacated for construction of Unit "F". University of Minnesota will then request vacation agreements from the City of Minneapolis.

SECTION VII - ENVIRONMENTAL ASSESSMENT OF THE PROJECT

The environmental assessment portion of the application is under preparation and will be completed within the week following the final submission date of June 15.

It will be transmitted to the NIH as soon as possible thereafter.