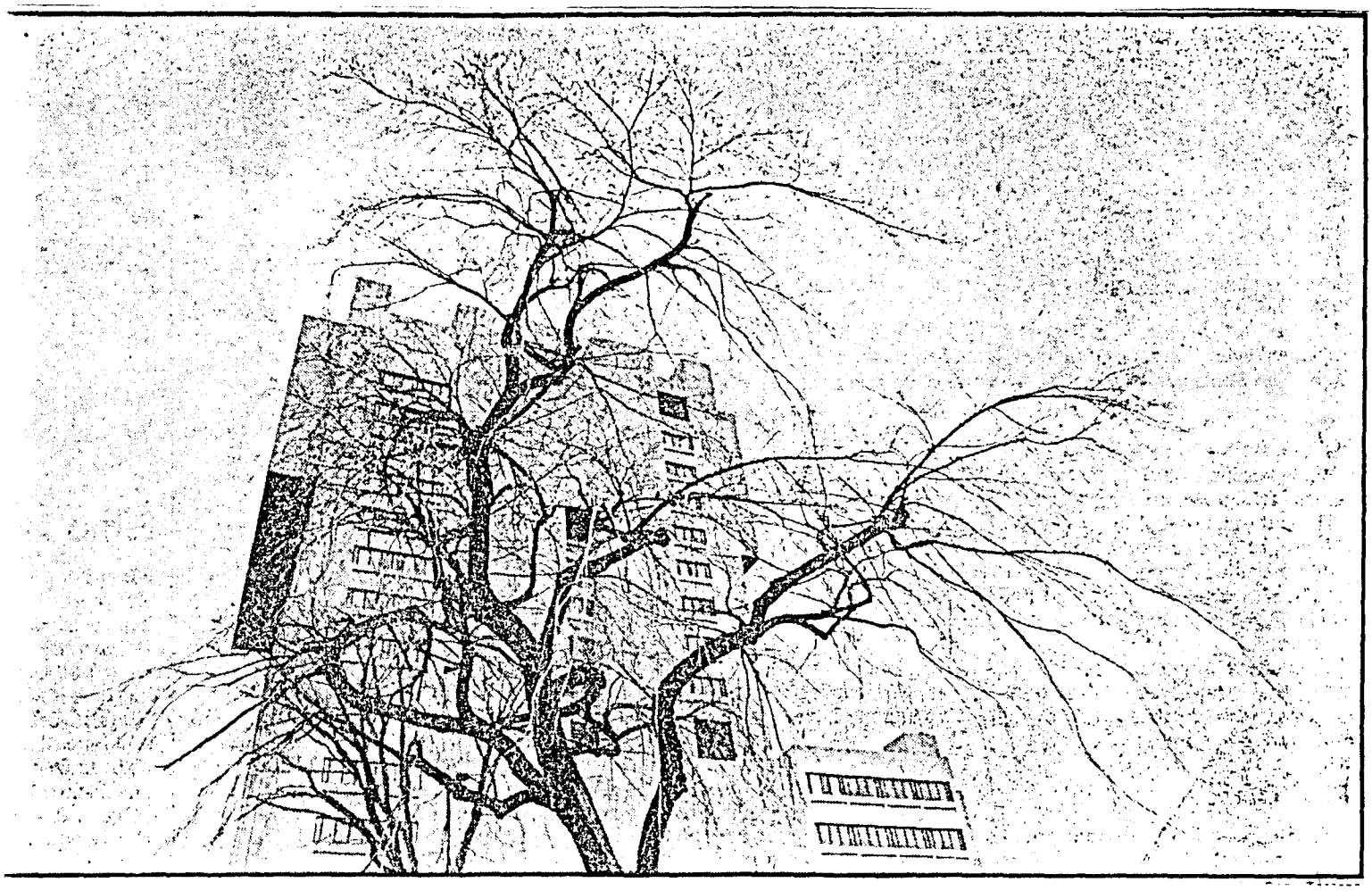
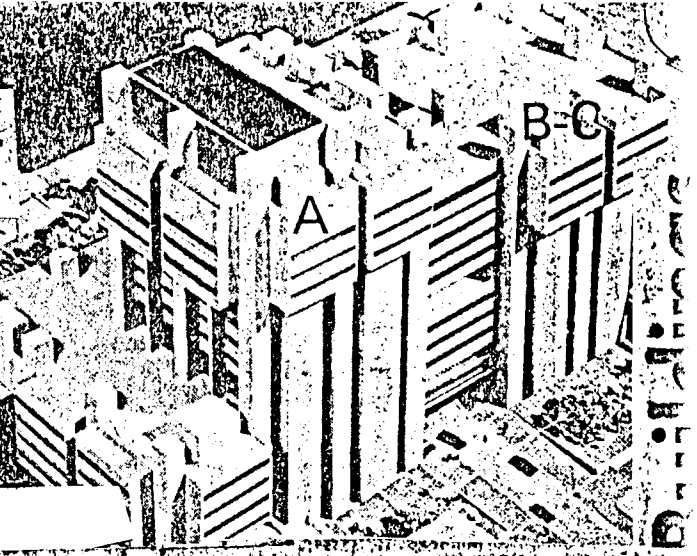


NEW COMPLEX: UNIT A

Corner of Washington Avenue and Union Stree

Minneapolis

Health sciences East Bank expansion



mpls campus

about THAT building

Health Sciences Center To Rise At University

Included

ted from heavy cardboard,

The School of Dentistry will occupy about
two-thirds of Unit A. The rest will be used by
the Medical School, Basic Sciences and the
School of Public Health. Some labs and
offices are already occupied, others v
opening each month and the entire bu
will be utilized by next spring.

More than 14,000 meetings have go
planning of the building.

here are

Regents hire architects for U

U Gets Grant for Health Unit

Planning for University Growth

By Roger Bergerson
Staff Writer

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Health board votes unanimous approval of

NEW CENTERS RECEIVE PRAISE, CRITICISM

'U' funds for health building

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introduction

Unit A stands high on a bluff above the Mississippi River and towers over the densely-compacted Health Sciences complex at the University of Minnesota. Its design and 20-story height provide a vivid contrast with the near-by traditional, brick buildings. While distinct in every way, Unit A is an integral and vital component of a Health Sciences complex that has been growing to meet the health needs of the upper midwest since the late 1800's.

As its name implies, Unit A is the first step in a long-range plan for physical expansion. It signals the beginning of new concepts in health care as well as a new era of architectural design. The building, completed in 1974, represents years of study, research and planning. Its story began in 1964.

history

In 1964, the University of Minnesota Board of Regents began to consider Minnesota's growing need for health manpower and the manner in which this need would affect the role of the University in providing physicians, dentists and other health care personnel. To document this need, the Regents asked the Hill Family Foundation of St. Paul (now called the Northwest Area Foundation) to support a study of health manpower needs in the Upper Midwest. In June of 1966, the Foundation published a report which predicted a shortage of rural physicians and dentists and warned of an impending crisis in health care. The report confirmed a need for training additional health care personnel for Minnesota and recommended that enrollment at the University of Minnesota Medical School be increased as soon as possible to 200 students per class and eventually to 250. It further advised the University to encourage more students from the two-year Medical Schools of North and South Dakota to complete their training at the University Medical School and recommended that the University strengthen its teaching of skills and attitudes concerning the responsibilities of the personal or family doctor.

Concurrent with the Hill Family Foundation effort, the University President appointed a long-range Health Sciences Planning Committee to consider objectives and programs for the future. This committee, formed in the fall of 1964, included administrators from Central Administration, the Dean of the College of Medical Sciences, Deans from the Schools of Dentistry, Pharmacy and Veterinary Medicine,

the Director of Hospitals and members of the faculty. It formed the nucleus of a structured network of sub-committees representing all health sciences departments. This was the birth of the health sciences "team concept" approach to analyzing problems and planning for the future. (Prior to this time, the departments - Medical School, School of Dentistry, University Hospitals, Basic Sciences, Veterinary Medicine, Nursing, Pharmacy, Public Health - were wholly separate entities with little collective planning effort among them.)

The Committee initially concentrated upon defining the roles, objectives and programs of all the Health Sciences units, and, in January of 1966, a detailed report of their findings was published. Then, in the fall of 1966, attention turned to the methods and resource requirements needed to implement the programmatic plans. The Committee soon determined that the Health Sciences complex must be expanded and developed physically in order to meet academic, patient-care and other service objectives.

In July of 1966 the Board of Regents, acting on the Committee's resolutions and the Hill recommendations, presented a $54 million facilities development program to the Minnesota Legislative Building Commission. The Minnesota Legislature endorsed this program in 1967 and that same year appropriated $650,000 for land purchase and $500,000 for preliminary physical planning.

The University selected an architectural team, The Architects Collaborative of Cambridge, Massachusetts, to assist with the development of a master plan to serve the Health Sciences program through the mid-1980's. This master plan would serve both physical and curricular integration of the Health Sciences.

The specific goals established for the architects included:

1. Expansion to serve increased enrollments in Medicine, Dentistry and other related programs.
2. Improvement and conservation of existing facilities.
3. A physical arrangement that supports and encourages interaction among Health Sciences units and among all of the units and the entire University.
4. Flexibility in planning to adapt to future program changes.
5. Provision for expansion to accommodate future needs.

The University's input into the master planning effort was immense. A Design Coordinating Committee was appointed and later thirteen additional special sub-committees were formed to assist the Committee and the architects. In this early stage, more than 200 faculty members and staff attended and participated in innumerable planning sessions.

Since the Health Sciences were about to undertake the initial

phase of expansion by increasing enrollment by several hundred students, the architects needed to respond to immediate physical needs as well as long-range needs. Despite some adjacent land acquisitions, the challenge remained one of increasing the density of an already tight building complex on an urban site while promoting strong relationships among historically disparate major facilities. Thus, a master plan was developed which provided for both short and long-term expansion, which accommodated the need for functional flexibility, and which established the major paths of circulation knitting together new and existing buildings.

planning

The first phase of development for the Health Sciences included extensive new construction and remodeling. Unit A, a totally new facility, was to be the first true test of the master plan and of the interdisciplinary approach to teaching health sciences. The architects designed a 20-story building, about two-thirds to be occupied by the School of Dentistry. The Medical School would have some clinical departmental offices and research and teaching laboratories on four floors, and the Basic Sciences departments would have teaching laboratories on two floors. In addition, the School of Public Health would have space on one floor for two of its departments. Health Sciences shared space would be auditoria-classrooms, seminar rooms, student lounges, and student-staff dining areas. The building would be connected to Millard Hall via a skyway walkover and to other Health Sciences units via an underground tunnel system.

Once the University accepted the basic design of the building, a grant proposal was prepared and submitted July 1, 1969 to the Department of Health, Education and Welfare. Funding would be based on an H.E.W. formula using percentages of student increases. (The Dental School would increase from 115 freshmen to 150, and the Medical School would increase from 163 freshmen to 203.)

The grant application stipulated a projected total cost of $45,077,646 and the University requested federal funds in the amount of $21,108,039. Competition for these federal funds was fierce. N.I.H. was faced with approximately a half billion dollars worth of requests with a prospect of only $118 million being available. Of the half billion, a quarter billion dollars worth of projects were ready to proceed immediately while another $238 million were ready to go within twelve months.

In December of 1969, the University received word that the National Institute of Health's National Advisory Council on Education for Health Professionals had approved Unit A for funding at a higher rate than had been requested. The University's allocation was $24,421,995. A change in federal policy later reduced this amount by about $2 million (due to the elimination of Public Health eligibility).

The University also requested and received four separate appropriations from the Minnesota Legislature, including the initial funding in 1967. The 1969 Legislature awarded $12,682,000 to Unit A, the 1971 Legislature gave $7,400,968 and in 1973, $3,000,000 was appropriated. These funds, together with federal and other monies, presented a funding picture as follows:

H.E.W. Grant Award	$ 22,394,027
Remainder of original 1967 $500,000 State Appropriation for Master Planning	341,048
1969 State Appropriation	12,682,000
1971 State Appropriation	7,400,968
1973 State Appropriation	3,000,000
	$ 45,818,043

During the course of the project, an additional $922,761 was acquired from other University sources. In the end, a total of $46,740,804 was available for Unit A.

When most of the funding was secured, a whirlwind schedule of planning for Unit A began. The Architects Collaborative (TAC), which had assisted the University during the grant preparation stage, associated itself with the Health Sciences Architects and Engineers, a St. Paul based joint-venture composed of the Cerny Associates; Hammel, Green and Abrahamson; and Setter, Leach and Lindstrom. Thus, while the principal architects at TAC commuted several times monthly between Cambridge and Minneapolis, the University had daily access to local architectural services.

The University's own internal talent was essential to the early design phase and all subsequent phases of Unit A planning. Hundreds of faculty members from dozens of departments were involved.

The departments of Interior Design, Physical Planning and Physical Plant were frequently consulted. Dozens of committees were established and over 13,000 meetings were held. To coordinate this massive effort, the University created a special Health Sciences Planning Office which was headed by a planning coordinator and grew to include a coordinator for movable equipment, several draftsmen, and several staff workers. This office was charged with the overall coordination of the Unit A project as well as all current and long-range planning for the Health Sciences. Planning Office representatives assembled needed information, attended meetings with University users, architects, consultants, and state and federal agencies, and became trouble-shooters when disputes or misunderstandings arose.

While University input was essential, the numbers of people involved and the time-consuming meetings inevitably complicated the planning process. Each department entered the process with a separate history and with its own style of problem analysis and decision-making. The fact that the building would contain multiple disciplines meant that users had different needs and different sets of priorities. It was the natural inclination of each department to march to its own drummer, and it fell to the Planning Office and the architects to orchestrate these disparate inclinations into a coherent whole.

The architects decided that computerization was the answer to coordinating the users' demands and developing reasonable space allocations for each department. They chose to use a computer-based information system for building design called Facilities Planning Data Bank (FPDB), which at that time was capable of processing tabular data for large projects with many rooms and elaborate sets of attributes and equipment. The FPDB system lent itself most usefully to those portions of the design and construction process which were tabular in aspect, such as cost estimates, room attributes, occupancy densities, related areas and furnishings inventories. As applied to Unit A, this data system stored and reported information on the location, area, finish, acoustic requirements, health hazards, fire hazards and other attributes of spaces and provided a running account of the handling of special considerations updated at regular intervals during the design development process. At any given date, the print-out would include a column of comments carrying such notations as "room may be combined with adjacent lab" or "consult with department head" or "check special power requirements." At later stages the print-out included progress reports on these comments and also provided summations of completed areas and costs at each phase of development.

To supplement the computerized data, meetings were regularly held to discuss and analyze specific needs in such areas as

casework. Since much of the space in Unit A was designated as lab or clinic space, a substantial system of casework was required. Flexibility was the goal of the casework design effort so that elements would be dimensionally coordinated and capable of simple rearrangement to suit changing needs. Many different types of casework were required - laboratory cabinetry, special cabinetry such as that used in darkrooms and dental labs, dental operatory casework, and so on. To avoid having to order all the necessary casework from several different manufacturers and thereby compromising consistency in style and dimension, the architects developed a single specification for all but the dental casework. They attempted to design a truly interchangeable cabinetry with a consistency of design detail, fittings and finish. This would not only hold down the initial cost due to the magnitude of the order, but would also enhance the aesthetic and utilitarian features of the casework and simplify maintenance. Dental casework was designed separately due to the specialized needs of the users. Again, the users contributed invaluable assistance to this design aspect.

Concurrently with the design phase, an immense effort was undertaken to coordinate the equipment and furnishing needs of the Unit A users. Of the total funds available, over $5 million was allocated for movable equipment, furnishings and accessories. After deducting amounts for drapes, blinds, graphics, artwork, plants, accessories and contingencies, approximately $4,560,000

remained. This amount was then apportioned among the departments and was used to purchase needed equipment and office furnishings.

Nothing near the magnitude of Unit A equipment had ever been experienced at the University. Careful consideration had to be given to the organization and methodology of the equipment purchasing effort, and the responsibility for overall coordination fell to the equipment coordinator of the Health Sciences Planning Office.

Working with the users and the equipment coordinator, the architects prepared a computerized list of equipment needs along with general specifications for each item. This list was turned over to the University and was reviewed item by item. Time was a crucial factor. Bids had to be advertised and contracts had to be awarded by certain specified dates in order for the equipment to be delivered and installed before scheduled occupancy dates. However, it was also crucial that extreme care be exercised in selecting each piece of equipment. It was necessary to inspect closely many items under consideration, making certain that user needs would be met. Countless meetings with manufacturer's representatives were held, and faculty involvement in the evaluation and selection process was paramount to a successful outcome.

The dentistry units required the most extensive equipment purchases. Dental equipment, including chair-units and lights totalled approximately $1,100,000. Dentistry faculty, in anticipation of their new facilities, had been evaluating dental equipment over the previous five years. Operating concepts in dentistry were changing so rapidly that it was necessary to keep abreast of the most advanced equipment designs on the market. The selection of dental chairs in the adult clinics provides an example of the thorough evaluation which preceded final decision-making. After considerable study of many chair-units, the choice was narrowed to two designs. Because these designs had not yet been marketed, prototypes of the designs were fabricated and shipped to the University and installed for special evaluation. The faculty spent several days with the manufacturer's representatives during the evaluation and made suggestions for design changes. These suggestions were incorporated into the chair design selected by the faculty and became a part of the manufacturer's standard design.

Ultimately, Unit A equipment lists totalling some 5,000 different categories of items were prepared. These lists required constant revisions to meet changing needs, even after bids were received. Bids were advertised and received in five phases, according to scheduled occupancy and the dates equipment would be needed. The mass purchasing provided an excellent bidding climate. Some items had as many as 60 to 70 bidders.

As contracts were awarded, each vendor was notified that 10% of the contract sum would be withheld until the equipment had been certified in working condition by the user. In this way, the University avoided receiving and paying for damaged or unspecified items and was assured that its long and painstaking effort would be brought to a successful conclusion.

During the equipment planning phase, the University's interior designers were also meeting with users to determine furnishing needs. A conscientious effort was made to maintain coordinated colors and styles throughout the building. In cooperation with TAC, a color scheme was selected consisting of six colors: orange, red-orange, gold, green, blue, and purple. These basic colors now appear throughout the building in varying combinations and serve to emphasize the contemporary design of the facility. Foam-filled, cube-type furnishings decorate lounge and office areas while office fixtures and cabinets are metal with clean, modern lines.

One of the most singular features of the building's interior is the bold, dramatic use of supergraphics which are painted directly on large wall spaces and which sometimes serve as directional guides as well as artwork. These supergraphics brighten white wall spaces and, as in the pedodontic dental clinic, minimize the clinical atmosphere, thus making visitors more comfortable. The framed artworks which adorn lounge and

office spaces were chosen with an eye toward their color, form and non-subjective qualities. Three hundred graphics, ranging from signed pieces to posters, were purchased from New York galleries and framed locally. The furnishings and accessories are not only functional but compliment each other and serve to enhance the over-all design and purpose of the building.

At each stage in the design process, users reviewed for approval all plans, drawings and specifications. Each floor plan was closely checked by individuals who had been assigned responsibility for each area. Approval was indicated by signature on the plan along with any comments about necessary modifications. By the time the project reached the final design stages, a building had evolved which appeared to meet the criteria imposed on it by users and the University, as well as by federal, state and local agencies.

construction

As the pre-construction planning proceeded through the final stages, arrangements were being made to prepare the site for construction. But the federal funding picture imposed some constraints on the rate and method of proceeding. Although N.I.H. had approved the Unit A grant in December of 1969, no actual funds had been released. N.I.H.'s coffers for construction grants were virtually dry, and it was awaiting further congressional appropriations. Meanwhile, the University was caught in a somewhat uncomfortable position. On the one hand, planning had to proceed at a speedy pace so that contract awards could be made within N.I.H.'s one-year time limit subsequent to receipt of funds. On the other hand, delayed building could cause costs to inflate beyond the budget and would postpone occupancy.

The University's solution accommodated both situations. To allow maximum time for planning and to conserve construction time and therefore costs, it opted for a system of phased construction. That is, four separate and sequential construction contracts would be awarded: (1) demolition; (2) excavation and footings; (3) steel fabrication and erection; and (4) general construction. Demolition, the only contract not involving federal funds, was awarded in September, 1970; the others were held pending notification of federal fund allocation.

Fortunately, the University enjoyed a high funding priority

on N.I.H.'s list of eligibles. In December of 1970, the University received the good news that funds had been released. Bids were immediately advertised for the second construction phase, excavation and footings, and in March, 1971, a contract was awarded. The steel contract was awarded in June, 1971.

On November 4, 1971, bids were received for the remaining construction work on Unit A. The University had advertised for and received bids on the general construction (6 bids), mechanical work (2 bids), electrical installation (7 bids), vertical transportation (3 bids), and casework installation (4 bids). At this point, the total cost picture became more concrete. A detailed breakdown of the proposed budget follows:

CONSTRUCTION		
General	$ 13,488,000	
Mechanical	8,727,000	
Electrical	3,032,800	
Vertical	1,419,870	
Casework	1,445,000	
	$ 28,112,670	
Contracts Previously Awarded		
Excavation	$ 812,830	
Structural Steel	3,690,976	
	$ 4,503,806	$ 32,616,476
ASSOCIATED COSTS		
Oil Storage	$ 408,548	
Primary Electrical Distribution	461,527	
Boiler Expansion	559,608	
Heat Tunnel	1,042,756	
Piping - Heat Tunnel	254,787	
Heating Plant Building Expansion	1,233,345	
Site Work	322,645	
Architects' and Consulting Fees	2,636,864	
Advertising for Bids	678	
Supervision of Construction	407,706	
Material Testing	26,500	
Misc. Engineering & Plan Checking	25,000	
Contingency	815,411	
Cardiovascular Move & Miscellaneous Costs	375,144	
Fire Extinguishers, Towel Cabinets, Etc.	15,000	
Schedule Management	25,000	
Testing & Balancing, Heating & Cooling Systems	90,000	8,700,519
		$ 41,316,995
Funds Available (as of November, 1971)		40,450,027
	Deficit	$ 866,968

Faced with a $866,968 deficiency, the University immediately requested the State Commissioner of Administration to transfer this amount from the State Building Reserve to the University. The State complied with the request by recognizing "the possible need for additional funding not to exceed $866,968." With this assurance, the University claimed a balanced budget and awarded the five contracts in December, 1971.

As stated in the contract specifications, the building was to be finished and ready for occupancy by September, 1973. This tight time period called for careful planning, scheduling and supervision. The University established a Construction Coordinating Office and staffed it with engineers from its own department of Physical Planning. An engineer was assigned to each aspect of the construction (such as mechanical, electrical, etc.) and was responsible for reviewing the relevant plans, conducting on-site inspections and, generally, protecting the interests of the University and the integrity of the project. In addition, the Health Sciences Planning Office maintained channels of communication among the users, the construction coordinators, and the architects. In this way, the University facilitated and encouraged maximum communication among all interested parties.

The architects prepared a construction schedule based on the computerized Critical Path Method (CPM). Because of unfore-

seeable delays and miscalculations, however, the schedule soon became outdated and was abandoned half-way through the project. Early delays occurred because of disagreements among the contractors and the University over fireproofing and enclosure. Strikes also hampered progress. There was an elevator strike which delayed temporary vertical transportation, and, later on, an iron workers strike. The major, overriding concern, however, was the lack of cooperation among the contractors, a situation the University could do very little to control.

During construction more than 500 modifications were made to the contract documents. Many of these changes originated from the users and the Planning Office when, in their review of the plans, omissions or errors were detected and necessary alterations were identified. While these changes were all essential to the function of the facility, they tended to slow the progress of construction.

Despite the delays typical of all large construction projects, the basic construction was completed in the fall of 1973. The School of Dentistry and other early occupants began moving to Unit A in August, 1973, and students first began utilizing finished portions of the building during the fall term of that year. The last building occupants arrived in March, 1975.

Although costs of the Unit A project are still accumulating, current analysis indicates that the project cost will approximate

the following breakdown:

Construction Costs	$ 33,386,260
Associated Costs	8,107,340
	$ 41,493,600
Movable Equipment and Interior Design Costs	5,247,170
	$ 46,740,770
(Total Funds Available	$ 46,740,804)

It is a credit to the University's budget management that the project stayed within the funding limits - a rare accomplishment in these days of vast cost over-runs.

design

Unit A is a 20-story steel structure clad with precast concrete. Three stories are below grade and seventeen stories above grade. As specified in the grant, the School of Dentistry occupies about 70% of the space. Eleven of the floors (4 to 9 and 15 to 19) are devoted to dentistry and include multipurpose clinics, teaching labs, administrative and business offices, and specialty clinics such as Orthodontics, Pedodontics, Oral Surgery and Radiology. Four floors (11 to 14) are assigned to the Medical School departments of General Surgery, Obstetrics-Gynecology, Pediatrics and Medicine. Two departments, Epidemiology and Physiological Hygiene, of the School of Public Health, occupy the first floor. The Basic Science departments of Pharmacology, Physiology, Pathology, Biochemistry and Microbiology share floors 2 and 3. The tenth floor and basement are reserved for mechanical equipment and operations.

The building contains approximately 679,600 total gross square feet of which 593,100 is considered net square feet. Using a ratio of actual usable space to gross square feet, the building is about 55% efficient. This compares favorably to other similar health sciences facilities where the average efficiency is about 50%. A teaching, clinical, and research facility such as Unit A typically has a slightly lower efficiency index than a conventional office building, for example, because of such factors as large concourses and greater requirements for mechanical and service areas.

In an effort to enhance flexibility and efficiency, the building structure is based on a modular design. A subsystem module, 12 feet 4 inches square, is employed throughout the building and creates a checkered effect on the planning grid. Service shafts are located at the corners of each square module and provide vertical passage for electric and mechanical services as well as structural support. With only minor variations, this modular design can respond to the requirements of teaching and research labs, dental clinics, offices, classrooms and auditoria.

The ceiling system, unique to Unit A, was designed for flexibility equal to that afforded by the structural system. The ceiling is designed as a continuous suspended plane extending from exterior wall to exterior wall under which room partitions can be located and relocated as necessary. Above the ceiling, which is totally accessible, ducted mechanical services can be arranged and rearranged as required without interference from walls or other vertical barriers. The interior room partitions are mostly plaster or wallboard on steel studs and can be easily removed when functional requirements necessitate it. Thus, both flexibility and expandability are served by creative design.

Economics, always a major factor in design, is likewise served by the modular concept. Because the design called for a minimum number of different parts, fabrication costs were reduced and installation was simplified. As an example of economic prudence,

the window design required only two basic sizes of windows which could be arranged in various combinations.

The main mechanical and electrical systems of Unit A are monitored by a data center located in the basement. This data center, which also monitors the systems of other facilities in the Health Science complex, is similar to a digital computer and is staffed around the clock. The entire heating, ventilation and air-conditioning (HVAC) system, as well as fire alarms and smoke detection devices, are controlled from the data center to provide a maximum of efficient operation with a minimum of manpower.

The sophisticated HVAC system was designed with energy conservation measures in mind. All air coming into the system is conditioned to 50 degrees, which can then be further regulated by individual room thermostats. In the summer, cooling towers on the roof cool the air, and, when conditions permit, outdoor air is used for natural cooling and ventilation. A heat recovery system picks up heat from exhaust air and returns the energy to incoming air. In this way, heat loss is reduced to a minimum.

Energy conservation measures are apparent in other design aspects of the building. Typical of these measures are the following:

1. Exterior precast panels are backed up with insulation.
2. A large volume of the building is below grade with virtually no heat loss and no solar load.
3. The percentage of interior space is high and the interior volume again has no heat loss and no solar load.
4. The building, designed as a high rise, has a small roof area in proportion to the building square footage. The heat loss and heat gain through the ceiling is therefore minimized.
5. The service cores at the perimeter of the building act as a buffer zone between the outside climate and the occupied space.
6. Building overhangs and projections are used for solar shading.
7. The entire building is humidified which provides comfort conditions at lower settings of the thermostats.
8. The classrooms and lecture halls are on separate air handling systems so that the operation of the units can coincide with the usage of the space.
9. The location of the equipment rooms on the basement, 10th and 19th floors cuts the length of run for pipes, ducts and conduits.
10. Tepid water at 100 degrees Fahrenheit is supplied to the dental chair units to avoid the waste of blending 140 degree water down to a usable temperature.

11. The domestic water system is separated from the laboratory water supply by a central vacuum breaking system, thus eliminating the need for and problems of individual vacuum breakers at thousands of lab sinks and cup sinks.

12. Fluorescent and mercury vapor fixtures are used throughout. This provides a power consumption advantage in a range of 2 to 3 times less than incandescent. (Incandescent lights are used only where necessary for aesthetic, dimming or special purposes.)

Along with conservation measures, care was taken to install health and safety features where necessary. For example, eye washes and deluge-type showers were installed in labs where highly dangerous chemicals and materials are frequently used. Also, care was taken to insure that requirements for the use of the building by the physically handicapped were met. This included placing restroom fixtures, elevator controls, and drinking fountains at the proper height.

All of these design considerations -- flexibility, efficiency, energy conservation, health and safety -- contribute to the over-all function and purpose of the facility. Certainly there were and still are minor problems with the building, and some things, partly due to subsequent code modifications, will not be repeated in future health sciences construction.

observations

A dental patient, enroute to one of the clinics, is likely to approach Unit A from the wide brick plaza off Washington Avenue. If he enters the building from the plaza level, he will find himself already on the third floor. Large, black directional signs are abundant, and he can easily find his way to the special, brightly-colored patient elevators which will take him to clinics on the upper floors.

If the patient enters the building on the second and main level, via a flight of stairs descending directly from the plaza, he passes through a wide concourse off which the four auditoria-classrooms are located. Directional graphics indicate basic science teaching labs and again point the way to the special patient elevators. Beyond the elevators, he can see one of several spacious public lounge areas, furnished in vivid hues of orange, purple and red, and inevitably, scattered with lounging students and white-coated interns. Through the lounge and down one flight he will find a large public cafeteria where he can join students, staff and faculty for lunch. Or, if he prefers, he can buy his lunch in a smaller cafeteria in the fifth floor skyway link to Millard Hall.

When the patient steps off the elevator into one of the main dental admissions and check-in areas located on floors 6, 7, 8 and 9, he is greeted by an open, brightly-colored waiting room.

After checking in at the reception counter, he is directed to a multi-purpose or specialty clinic on one of these four floors.

The clinics are spacious areas partitioned into numerous cubicles, each a complete, modern dental station in itself. A total of more than 400 dental chair-units are distributed throughout these clinics. Consultation and x-ray rooms are located around the clinic perimeters. The quiet and professional environment, pleasant for patients and students alike, facilitates staff monitoring of both student and patient progress. The assembly-line approach to patient care does not exist here, as the facility emphasizes and promotes patient well-being as well as student learning.

The circumstances of the School of Dentistry were not always so pleasing, however. Dentistry's old quarters were located in Jackson-Owre, Owre and Millard Halls and consisted of only 63,190 net square feet. This compares to the 203,176 net square feet it now occupies in Unit A. The old space had been inadequate and out-dated for some time and became even more crowded as Dentistry began to expand its student enrollment prior to its move into Unit A.

The new space has allowed Dentistry much more freedom to expand, both in terms of students and programs. New programs such as

Clinical Systems and the Comprehensive Care Program have been instituted, and other programs, such as Oral Biology, the Cleft Palate Program and the Division of Human and Oral Genetics, have expanded considerably. Enrollment in the D.D.S. program has been increased from 414 students in 1967 to 565 students in 1974. The Dental Hygiene program, an auxilliary program with a dramatic enrollment increase, has grown from 81 students in 1966 to 285 in 1975.

One of the most important services a dental school can supply, and one of its perennial concerns, is the sterilizing and distribution of instruments to students. The improved space and increased personnel have enabled the School to institute a new system whereby 56,000 to 60,000 instruments are sterilized and distributed per day. Few dental schools in this country have been able to perfect such a system.

As in the School of Dentistry, both staff and students in the Medicine, Public Health and Basic Sciences departments are enthusiastic about their new facilities. In Biochemistry, for example, greater lab and teaching space has made possible new and expanded programs. For instance, the graduate program has been realigned so that the lab experience begins immediately in the first year rather than at the end of the first year. This gives the students earlier contact with the elements of biochemistry and a chance to learn a variety of techniques

before they become prejudiced against any particular ones. Microbiology, another example, has likewise expanded in all directions. Greater lab space allows the department to better accommodate the increased numbers of medical students while also responding to an increased undergraduate interest in microbiology. Graduate students are able to spend more time in the labs and are being offered more lab-oriented courses. New devices such as laminar flow hoods, deluge-type showers and eye washes add to the safety of lab-users and minimize the dangers in working with hazardous materials.

Along with the good, however, all departments have experienced some degree of problems, usually attributable to the newness of the facility. A building as large and sophisticated as Unit A typically needs a long breaking-in or "shakedown" period. The maintenance department has, of course, carried most of the shakedown burden, tackling problems ranging from broken elevators to frozen pipes to insulation in ventilating ducts. Gradually, these kinds of wrinkles are being ironed out of the building systems, but other problems, just as annoying and serious, may be more long-term.

One such problem is the clinic lighting system which, for many users, is inadequate and aesthetically displeasing. Light from the fluorescent fixtures is poorly diffused, reducing the desired and necessary lighting levels in the clinics. Acoustics have also

proven to be a cause of concern. Noise carries easily from one room to another, a sensitive issue particularly with respect to consultation rooms. The two banks of elevators, one for students/staff and one for patients/visitors, are inconveniently located and provide inadequate service insofar as elevators designated for students/staff use rise only to the 9th floor. Consequently, students and staff often crowd the patient elevators, which service all floors, and patients (especially children), having access to all floors, occasionally wander into labs on upper floors where hazardous materials are being used. Another problem concerns the failure of the environmental rooms to perform according to specifications. Until the University legally resolves this problem, lab-users must take extra care to monitor the erratic climate variations within the rooms.

While problems such as these cannot be lightly discarded or overlooked, they have hardly detracted from the over-all enthusiastic approval and acceptance of the building.

conclusion

Unit A is a source of pride at the University of Minnesota. It is the cornerstone of the master plan for physical growth, soon to be joined by several other new Health Sciences buildings. But more than this, Unit A is a building which can stand alone on its own merits. Designed for flexibility and expandability, it will serve both the programmatic and enrollment demands of the future.

The planning and design effort that created Unit A is now history, but many of the organizational structures for inter-departmental planning and cooperation still exist. These committees and offices have already been instrumental in the planning of other Health Sciences construction projects. But perhaps one of the most valuable benefits to emerge from the past twelve years is the spirit of cooperation among the Health Sciences units. This spirit has lent reality to the goal of a truly interdisciplinary approach to health care.

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