

TOPEKA CHILDREN'S HOSPITAL

by

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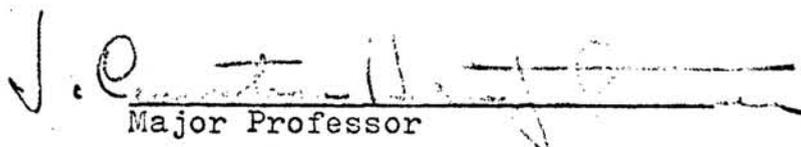

Major Professor

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CHAPTER I

INTRODUCTION

Man's basic needs are food, clothings, and shelter. As time progresses, the population increases, society becomes more complicated, and economy develops more, man asks for more than his basic needs: better life and enrichment. In order to satisfy these desires, professions should and must be specialized.

When people have confidence in their health, they can carry on normal everyday life and do something for themselves.

In planning a hospital, the most important aspect is to fully understand what the given problem is and to properly integrate the components of a hospital in order to create a physically and psychologically harmonious environment.

A child is not a small adult, and should not be treated as such. Since the middle of the 19th century, attention has been paid to the hospitalization of children. According to the necessity of children's wards or hospitals, it has been prevailed and is a general tendency to be more specialized.

The ultimate goal of this Topeka Children's Hospital project is to contribute in forming a medical center in Topeka, Kansas by designing one specialized hospital.

CHAPTER II

A CHILDREN'S HOSPITAL

1. HISTORY OF CHILDREN'S HOSPITAL

Looking at the past can be a great help for looking at the future.

a. No Children's Hospital

Until the middle of the 19th century, there were no hospital accommodations for children. Young children were admitted only as outpatients and never as inpatients except for some special cases, such as fractures, capital operations, and so on.

Both female and younger male children were admitted into adult female wards. Older male children were admitted into adult male wards.

Not on very frequent occasions, was a mother admitted to take care of her sick child.

But, children suffered from particular disease because of their ages.

b. Planned Hospital Accommodation for Children

In 1848, Guy's Hospital had a separate children's ward because they needed so many nurses.

In 1853, Charles West opened his hospital for children. The outpatients increased at a high rate. After that, children's wards became common in general hospitals.

c. Isolation Ward

In the last quarter of the 19th century, infectious diseases like scarlet fever, enteric fever, typhus, and diphtheria prevailed. Because of these infectious diseases, there should be an isolation ward as well as separate ward in the hospital.

d. Pavilion System

In France, about 1900, there were one-bed isolation cubicles in general wards for the children with infectious diseases. They were divided by glazed partitions and they had an observation units. Sometimes isolation cubicles were for a mother and child together because both the mother and her child had an infectious disease.

e. New Deal for Children in Hospital

Around 1920, it was pointed out that the nurses were much more important than isolation cubicles in controlling the disease. Here, it should be noted that a sick child and its mother are not to be separated ----- especially when the child is hospitalized because one needs the other.

<u>Home</u>	:	<u>Hospital</u>
(Mother)		Stranger
Not as well disposed		(Well disposed)
(Familiar		Unfamiliar
surroundings)		surroundings

f. General Trends of Children's Hospital

After the First World War, hospitalization of children began to be studied from the psychological point of view.

After the Second World War, the reluctance to be hospitalized, especially a young child, increased as was medically possible.

If the hospital could provide a psychologically easy atmosphere and mother-like substitute (or mother), the children would go to the hospital without any hesitation because they would have a good chance to see and mingle with other children as well as to cure their illness.

2. CHARACTERISTICS

There are four remarkable differences between children's hospital and general hospital: (a) playing, (b) learning, (c) psychologically a quiet environment, and (d) scale.

a. Playing

A child needs homelike surroundings: cheerful and playful

atmosphere and his mother.

Hospitalized children like to see other children. So it is desirable for them to have the chance to mingle with others if their health permits it. This will be a great help for their recovery.

Specially devised equipment and furniture are necessary to meet the demand of both the children's psychological and medical care. For example, "One way to interrupt the confinement of the bed is to carry the child to a low canvas cot in the playroom. This change of environment is refreshing in itself. There the child can watch other children or listen to records or stories. Since the cot is narrow, the child's movement is automatically restricted. Similarly we lift children onto a low push cart with sides which is large enough for a child to lie in. In the cart, they can easily be moved from place to place."¹

For ambulatory children, well-protected lawn, paved terrace, and sun court encourage them to play outdoors.

For the children in the isolation room, the contact with others is limited so that things have to be substituted for people to excite them: toys for stimulation and expression and music for amusement are available to break the monotony of long evenings.

¹Plank, Emma N.. Working with Children in Hospitals, The Press of Western Reserve University, Cleveland, Ohio, 1962 p. 36

b. Learning

For those children, especially for long-term (usually longer than a week) hospitalized children, who have no serious medical problems, schooling, which can also help their recovery comes next.

It has a special meaning to provide an educational program, since hospitalization is a good chance for pre-school children to become a member of a group and to interact with others away their parents, and for school-age children to continue some sort of their school work.

It is a better idea to carry on an educational program in a playroom. If the circumstances permit, it is desirable to provide audio-visual equipment to make the educational program greatly enriched. This equipment is valuable not only for schooling, but for group activity.

To set up an educational program, they must take into consideration the age of the children and the individual situation. And also close cooperation with the family should be made.

c. Psychological Care

As has been mentioned before, hospital environments, atmospheres, and psychological care are as valuable as medicine in children's recovery.

"Children, and indeed their parents, require a unique

psychological atmosphere where their peculiar needs are understood and cared for and where their natural anxiety and fear of the unknown are minimized. An improper approach to a child can produce a psychological impact, the result of which are felt for many years."¹

In dealing with the hospitalization of children, attention should be paid to the separation from their mother, admission to unfamiliar surroundings, and anxiety about the hospital which are unvoidable by-products of hospitalization.

"If you take away a sick child from its parent or nurse, you break its heart immediately."²

So far as infants are concerned, it is extremely important to counteract the feeling of deep loss which caused by the separation from their mother.

Special studies show that if children feel they must follow medical restriction, the period of hospitalization is longer to them than it actually is. Further more, in case of surgery, any medical restrictions make them feel great anxiety, even though it is a very simple operation.

Thus, the role of the mother and mother-substitute is to help the child to keep homelike emotions and behavior: the relationship between a child and its mother has a special meaning in the hospital.

¹Pratt, Edward L. M.D., Chief of staff at the Cincinnati Children's Hospital. From 'The Modern Hospital', Vol. 106 March, 1966. p.79

²Robertson, James. Young Children in Hospitals, Basic Books, Inc., New York, 1964 p.126

.. Mind over Matter ..

Recently, it has become emphasized that PSYCHOTHERAPY of many illnesses is necessary and effective.

The younger the child, the closer relationship between its mind and body.

.. Mental First Aid ..

It is a general trend to accept and recommend the technique of MENTAL FIRST AID.

In other words, the consideration of the needs of the mind is as important as those of the body.

At present, this kind of technique is in the experimental stage, but it is going to be practical in the future. This is the same trend as in general architecture upon the request of the time.

In planning a children's hospital, it is imperative that the architects cooperate with child psychologists as well as pediatricians.

d. Scale

As a measurement of the human being and the space around him, the scale has been argued.

"Scale means the comparison of one set of proportions and dimensions with another set of proportions and dimensions. We are most concerned with human scale in architecture, that is to say the comparison of the proportions of a human figure with the spaces and proportions of the building."¹

Therefore, special efforts should be made in order that all furniture, equipment, and facilities used by children are in scale with them, not with adults. Articles such as beds, chairs, window sill height, height and size of water-basin, and water closet pans would be made in varied sizes according to the age-group.

3. PROJECT PROGRAM

Effective programing and planning requires a basic understanding of the scope and nature of the facilities: the type, size, and other characteristics of the hospital planned.

a. Specialization

It is a general trend that hospitals will be more specialized. Also it is particularly true that specialized doctors make a group and they run a big hospital rather than small private clinics.

b. Potentiality

As reported by the United States Bureau of the Census in 1960, the City of Topeka is not a big city with an approximate

¹Danby, Miles. Grammar of Architectural Design, with special reference to the topics, Oxford University Press, London, 1963 p.121

population of 120,000. The City of Topeka provides an extensive up-to-date program of services such as general health education programs, visiting nurse service programs, and maternal and child health programs. There are seven hospitals in this area with a total of over 3,500 beds including Children's Psychiatric Hospital. Indeed, the Topeka area is recognized as an outstanding medical center with excellent medical clinics, laboratories and facilities, both public and private.

c. Location

The City of Topeka, Kansas is located in the geographical center of the United States. Therefore, Topeka Children's Hospital has an advantage of transportation in serving the patients from all over the country as well as the State of Kansas. As an example, Boston Children's Hospital provides the services for the patients from all over the world.

d. General Descriptions

"The hospital be no smaller than 100 beds to ensure good patient care, and no larger than 300 beds to ensure good teaching."¹

"The building should be low rather than high."²

"As many 10 bed clusters as possible should be put on one open floor."³

"Provide a mix of standardized spaces with a smaller

number of different-size rooms."⁴

Circulation should be fluent from entrance to exit without any congestion. Similar functioned space should be linked horizontally and vertically.

Plenty of windows and natural light are available to induce the outdoor's rich environment.

According to child psychologists, groups of six are ideal for play, study, and everyday activities. And 6-bed cottages are better than long-corridor hospital wards.

Based on the preconditions described above, Topeka Children's Hospital of 102 beds was planned as one of the specialized hospitals in Topeka, Kansas.

TCH will provide both outpatient with surgical and emergency departments, and inpatient services of short-term, averaging 6 days, and long-term hospitalization. TCH is only for the children under the age of 12: before adolescent age, who do not need sexual distinction.

1, 2, 3, and 4 U.S. Public Health Service. From 'The Modern Hospital', Vol. 106. March, 1966. p.78 and p.79, 'Study gives 33 rules for Pediatric Design'.

CHAPTER III

DESIGN CONSIDERATION

1. BASIC DESIGN CONSIDERATION

In the architectural design of Topeka Children's Hospital, every effort was made to create an intimate environment and an informal atmosphere, and to eliminate any suggestion of institutional character in the physical setting.

From the standpoint of architecture, the nursing units (in-patient department) and parking areas are more important than any other parts of the hospital and should be treated as such.

TABLE 1
AREAS FOR TCH

	Area(sq. ft.)	%
Nursing Units	49,728	30.3
Outpatient Department*	19,238	11.8
Administration & Staff	7,056	4.3
Services	24,960	15.4
Parking	47,024	29.0
Circulation**	14,896	9.2
Total	162,902	100.0

* Including radiology, laboratory, surgery, and emergency departments.

** Public circulation only

One nursing unit was considered as a physical setting unit in order to give more flexibility and identification and to pursue ideal condition of a nursing unit as well. Nursing units were dispersed: a upper level unit was partially stacked on the top of a lower level unit so that the advantages of a single-story building such as lighting, ventilation, and a feeling of intimacy were fully grasped.

The parking area was considered in terms of the importance of cars, the approach from the parking area to the entrance and the exploitation of the site. Thus, it was concluded that the parking area should be sheltered as a part of the building.

2. FUNCTIONAL ANALYSIS

See Plate I - III.

3. SITE SELECTION

Since the potential for an effective development of a hospital has deep concern with a site, the architect should have influence on the selection of the site.

a. General conditions to be Considered to Select the Site

.. General characteristics and functions of a children's hospital -----> Understanding

EXPLANATION OF PLATE I

Fig. 1. Traffic Diagram of a Children's Hospital

Fig. 2. Space Analysis of a Children's Hospital

c: Community
s: Secondary Social Space
p: Primary Social Space
i: Individual Space

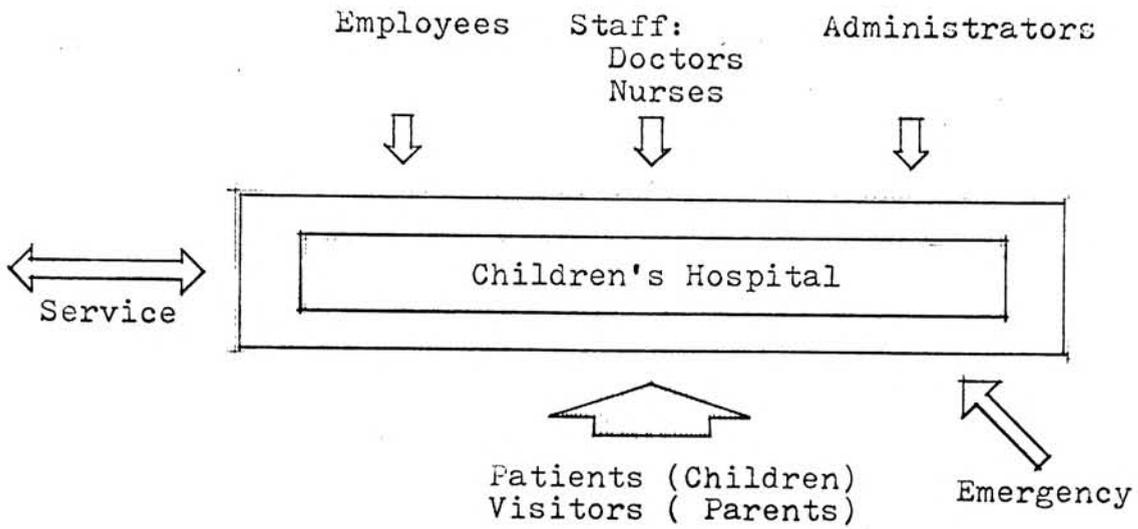


Fig. 1

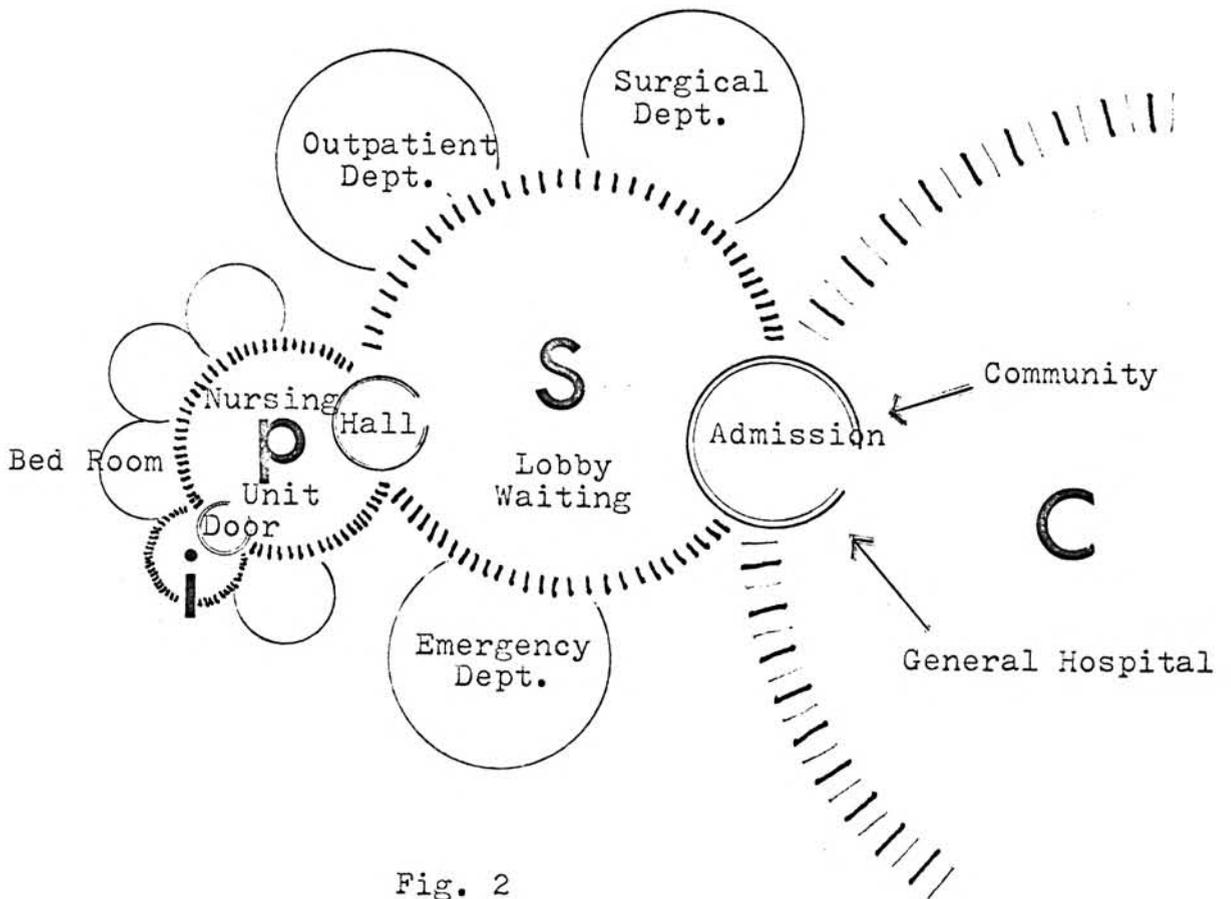


Fig. 2

EXPLANATION OF PLATE II

- Fig. 1. Functional Diagram of a Children's Hospital
- Fig. 2. Outpatient Department Functional Diagram

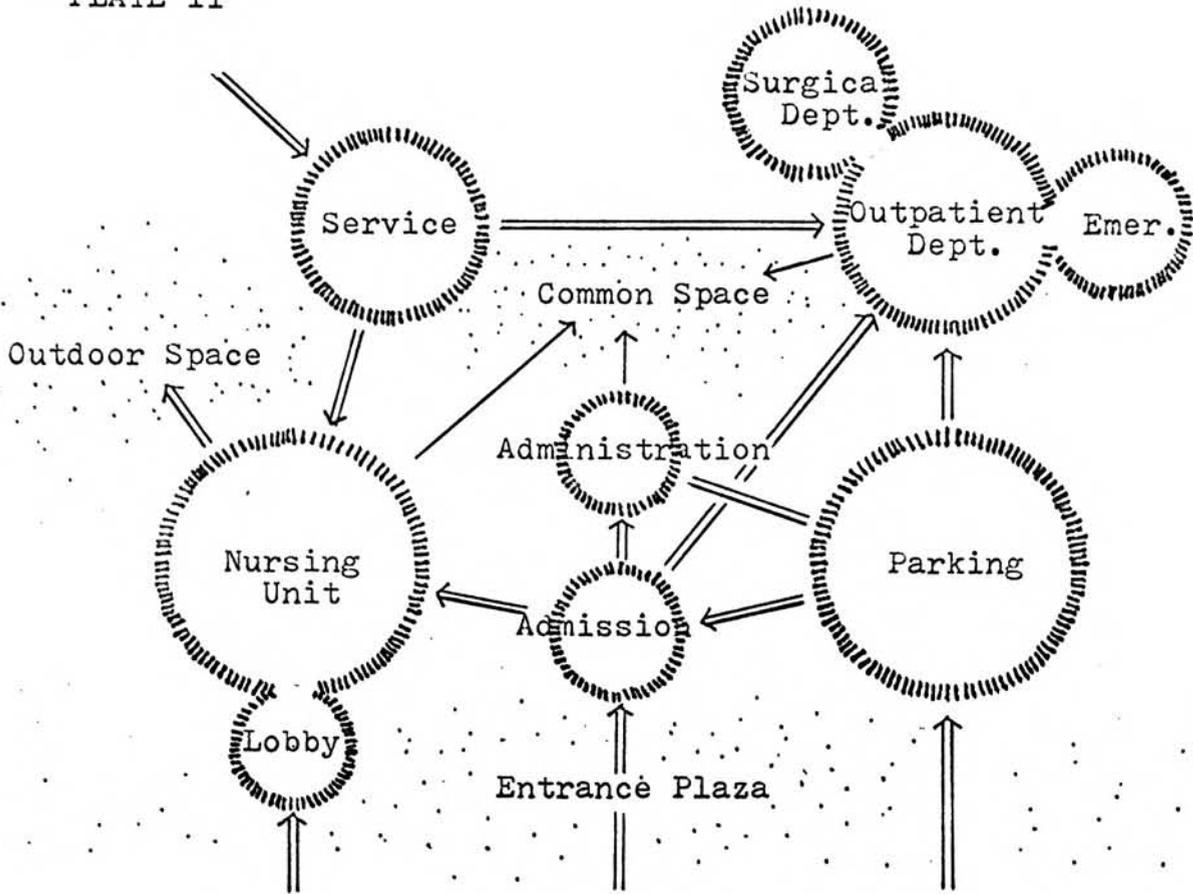


Fig. 1

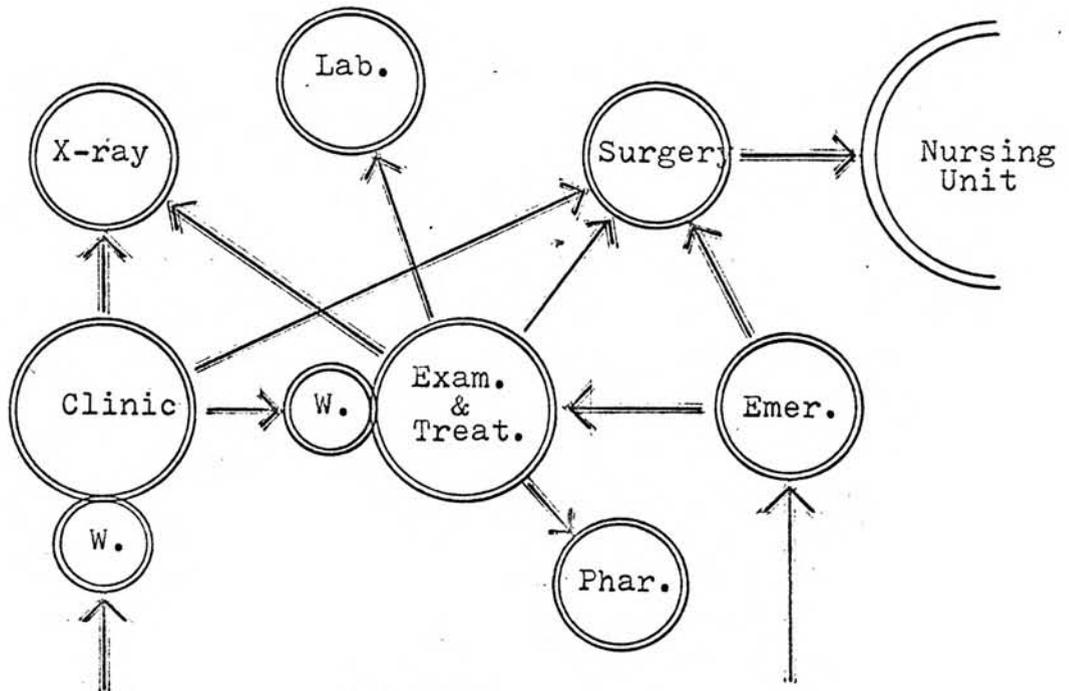


Fig. 2

EXPLANATION OF PLATE III

Fig. 1. Nursing Unit Functional Diagram

Fig. 2. Dietary Department Functional Diagram

Fig. 3. Laundry Department Functional Diagram

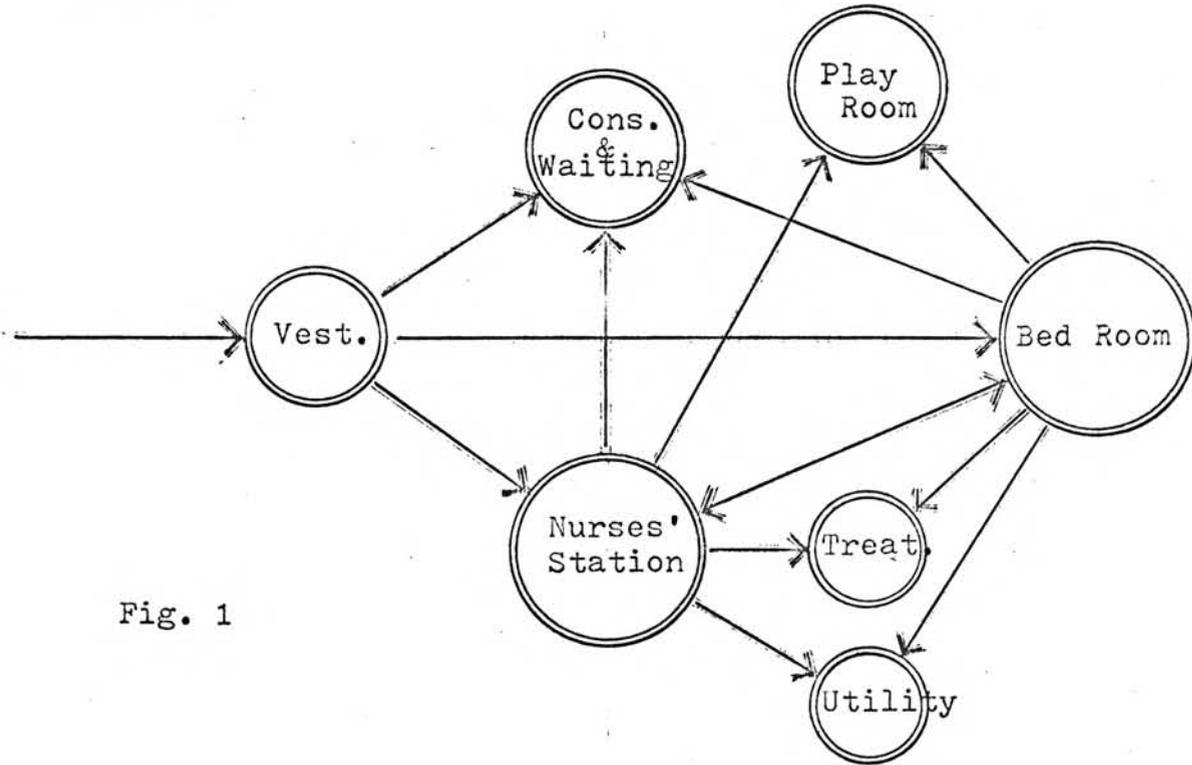


Fig. 1

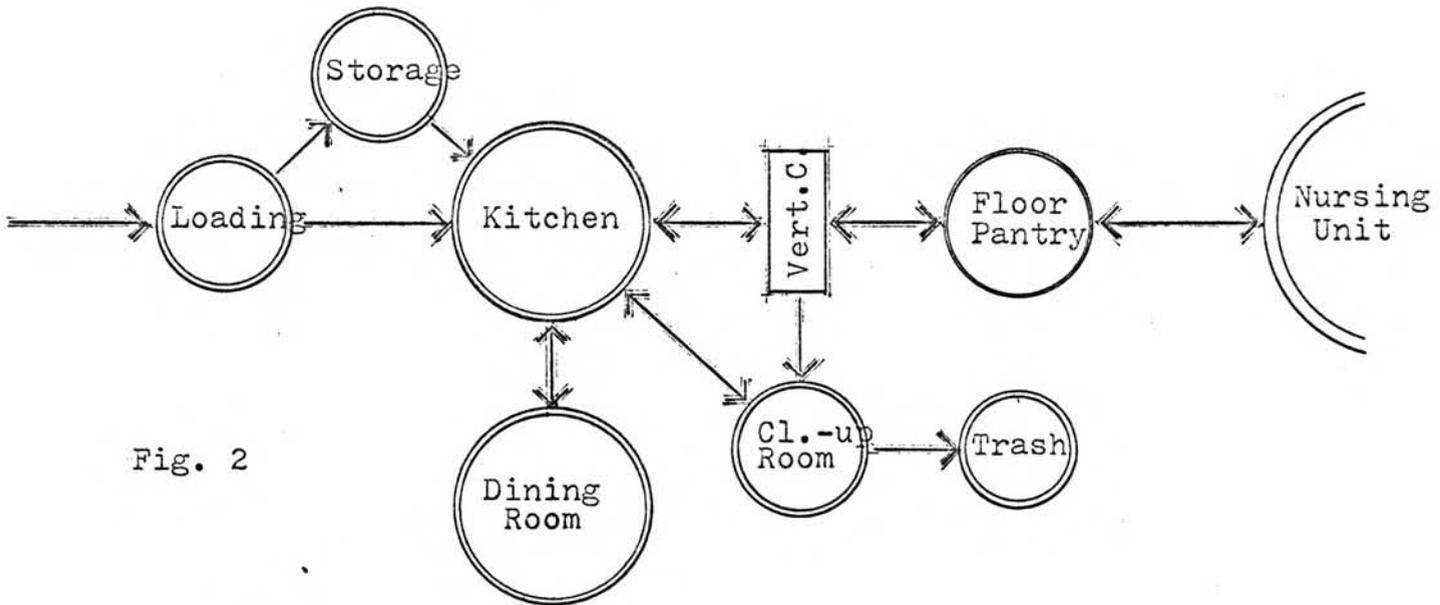
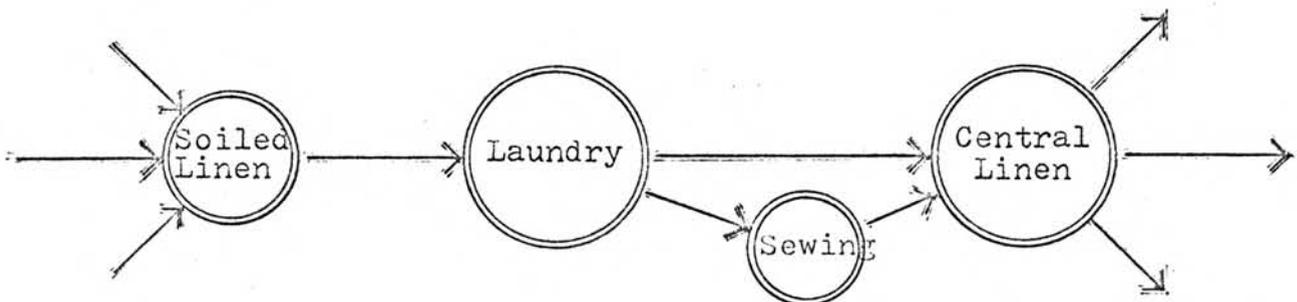


Fig. 2

Fig. 3



- .. Relationship to other hospitals in the particular community
-----> Affiliation
- .. Future expansion, site development -----> Growth
- .. Relationship to the neighborhood, in considering residents'
favor and other public buildings in particular ----->
Neighborhood
- .. Convenient approach and service access -----> Transportation
- .. Miscellaneous -----> Noise, Air, and Budget

b. Existing Conditions

In finding the site for the children's hospital, attention was paid through the whole City of Topeka, and finally the area from Sixth Avenue to Tenth Avenue and from College Avenue to Lane Street was selected.

The reasons and advantages of this area for a children's hospital are as follows:

- .. The City of Topeka predicted in its study that this area will be included in 'Office & Institutional Area' by the year of 1980.
- .. The affiliations with the existing Stormont-Vail Hospital and St. Francis Hospital can be established.
- .. This area is convenient to future growth and expansion.
- .. Easy access will aid the purpose of the hospital.
- .. This site is of medium density in a residential area located in the "Lowman Hill" part of town. According to the statistics

by the City of Topeka in 1960, the Neighborhood "Lowman Hill" has 21.9 persons per acre in comparison with 14.68 persons per acre in the City of Topeka area.

.. No objection from the neighborhood is anticipated.

See Plate IV.

c. Comparison between Two Sites

Site "A" and site "B" were particularly compared in the physical setting. See comparison chart below and Plate V - VI.

Site "A"

Site "B"

Differences

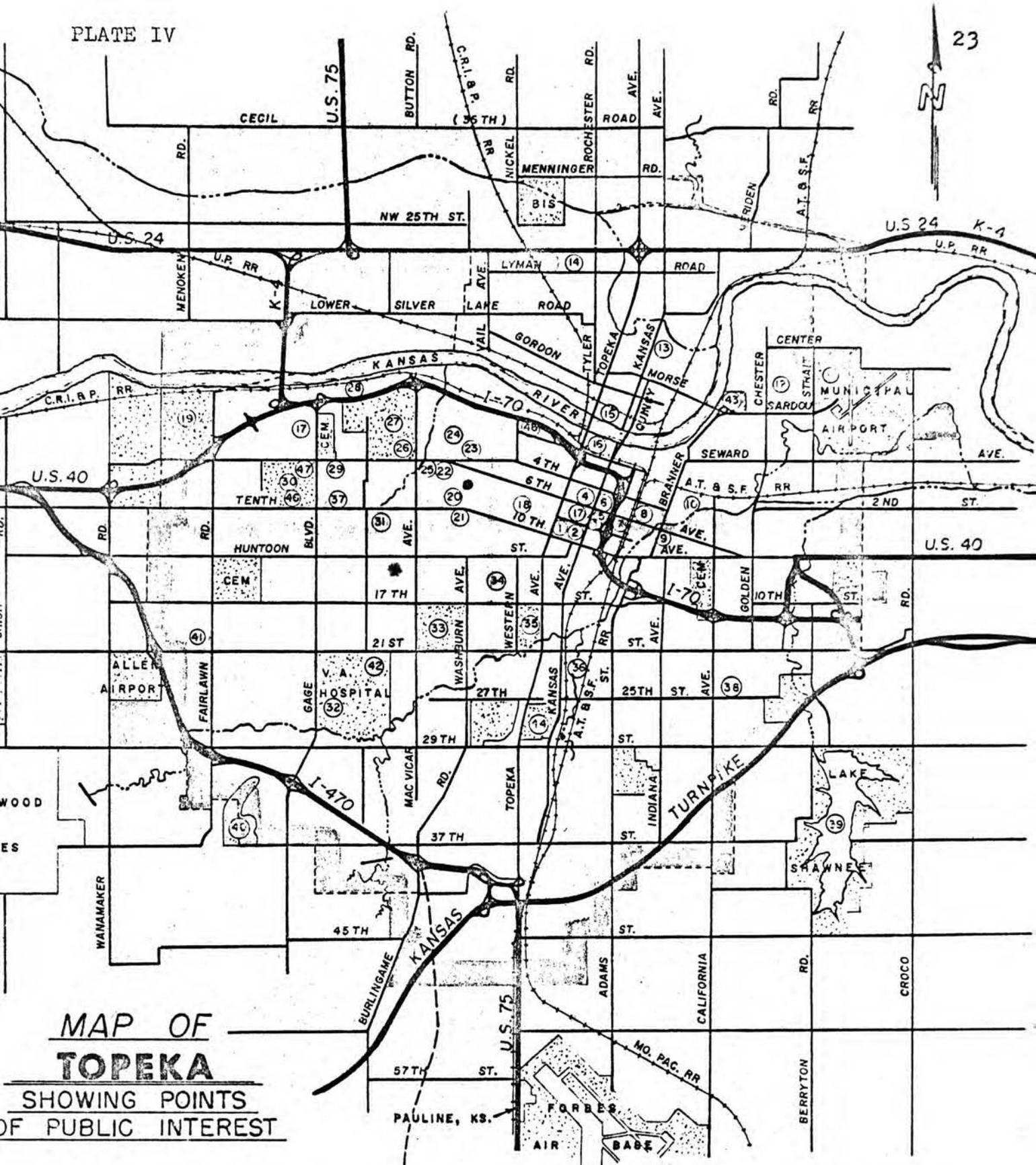
- | | |
|--------------------|--|
| 1. High Density | 1. Low Density |
| 2. Vertical Growth | 2. Horizontal Growth
-----> Vertical Growth |
| 3. Indoor Parking | 3. Outdoor Parking |

Advantages

- | | |
|-------------------------|--|
| 1. Flexible Circulation | 1. Ground Floor Garden, Better Landscaping |
| 2. More privacy | 2. Easier Identification |
| 3. Easier Control | 3. Flexible Future Growth |
| 4. Clear Approach | 4. Mostly Single Floors -----
Variety in Arch. Design |
| 5. Economical | 5. Two Separated Parking Areas |

EXPLANATION OF PLATE IV

Location of the selected site on the map of Topeka showing points of public interest.



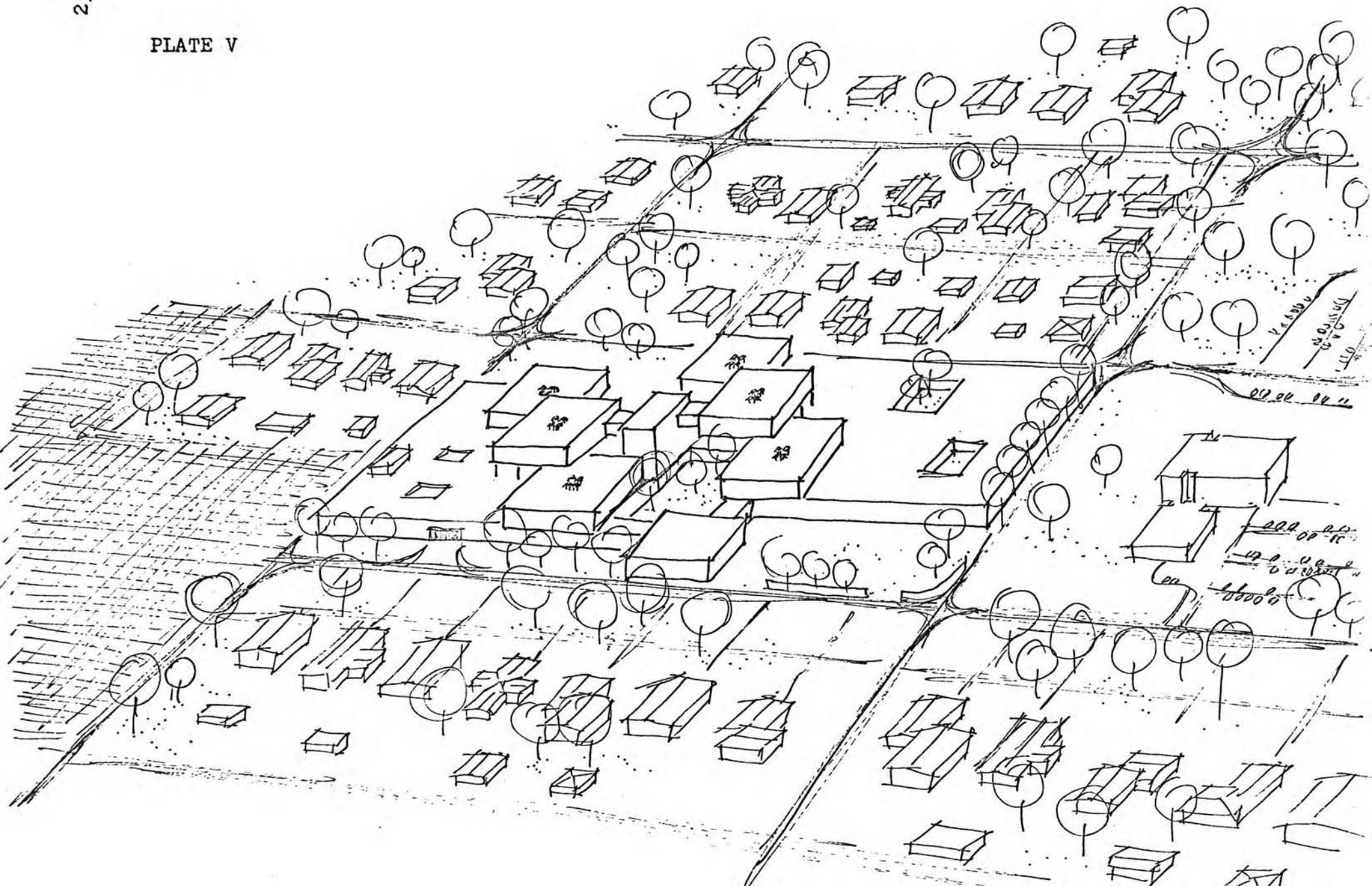
MAP OF TOPEKA
 SHOWING POINTS OF PUBLIC INTEREST

- | | | | |
|---|---|---|--|
| <p>1. STATE CAPITOL & OFFICE BLDG
 2. STATE HISTORICAL MUSEUM
 3. AUDITORIUM
 4. BUS TERMINAL
 5. SHAWNEE COUNTY COURTHOUSE
 6. FEDERAL BUILDING
 7. ST. FRANCIS HOSPITAL
 8. ST. FRANCIS STATION
 9. CENTRAL LAWN PARK
 10. WOODLEY PARK
 11. MUNICIPAL AIRPORT
 12. LAND PARK
 13. WOODFIELD PARK
 14. SHAWNEE HIGH SCHOOL
 15. PACIFIC STATION</p> | <p>16. CITY PARK
 17. HAYDEN HIGH SCHOOL
 18. TOPEKA HIGH SCHOOL
 19. GOVERNORS MANSION
 20. STORMONT VAIL HOSPITAL
 21. TOPEKA PUBLIC LIBRARY
 22. ST. FRANCIS HOSPITAL
 23. WILLOW PARK
 24. EDGEWOOD PARK
 25. CHILDRENS PARK
 26. TRAINING CENTER FOR BLIND
 27. TOPEKA STATE HOSPITAL
 28. CITY WATER WORKS
 29. MENNINGER FOUNDATION
 30. GAGE PARK</p> | <p>31. WASHBURN PARK
 32. VETERANS ADM. HOSPITAL
 33. WASHBURN UNIVERSITY
 34. CENTRAL PARK
 35. MID-AMERICA FAIR GROUNDS
 36. LAKEWOOD PARK
 37. CAPPER FOUNDATION
 38. HIGHLAND PARK HIGH SCHOOL
 39. LAKE SHAWNEE
 40. SKYLINE PARK
 41. TOPEKA WEST HIGH SCHOOL
 42. KANSAS NEUROLOGICAL INSTITUTE
 43. BILLARD PARK
 44. KAN. NATIONAL GUARD ARMORY
 45. TOPEKA PUBLIC GOLF COURSE</p> | <p>46. E.F.A. REINISH ROSE GARDEN
 47. GAGE PARK CONSERVATORY
 48. TOPEKA BOTANICAL GARDEN</p> |
|---|---|---|--|

EXPLANATION OF PLATE V

Initially proposed site "A" for the Topeka Children's
Hospital.

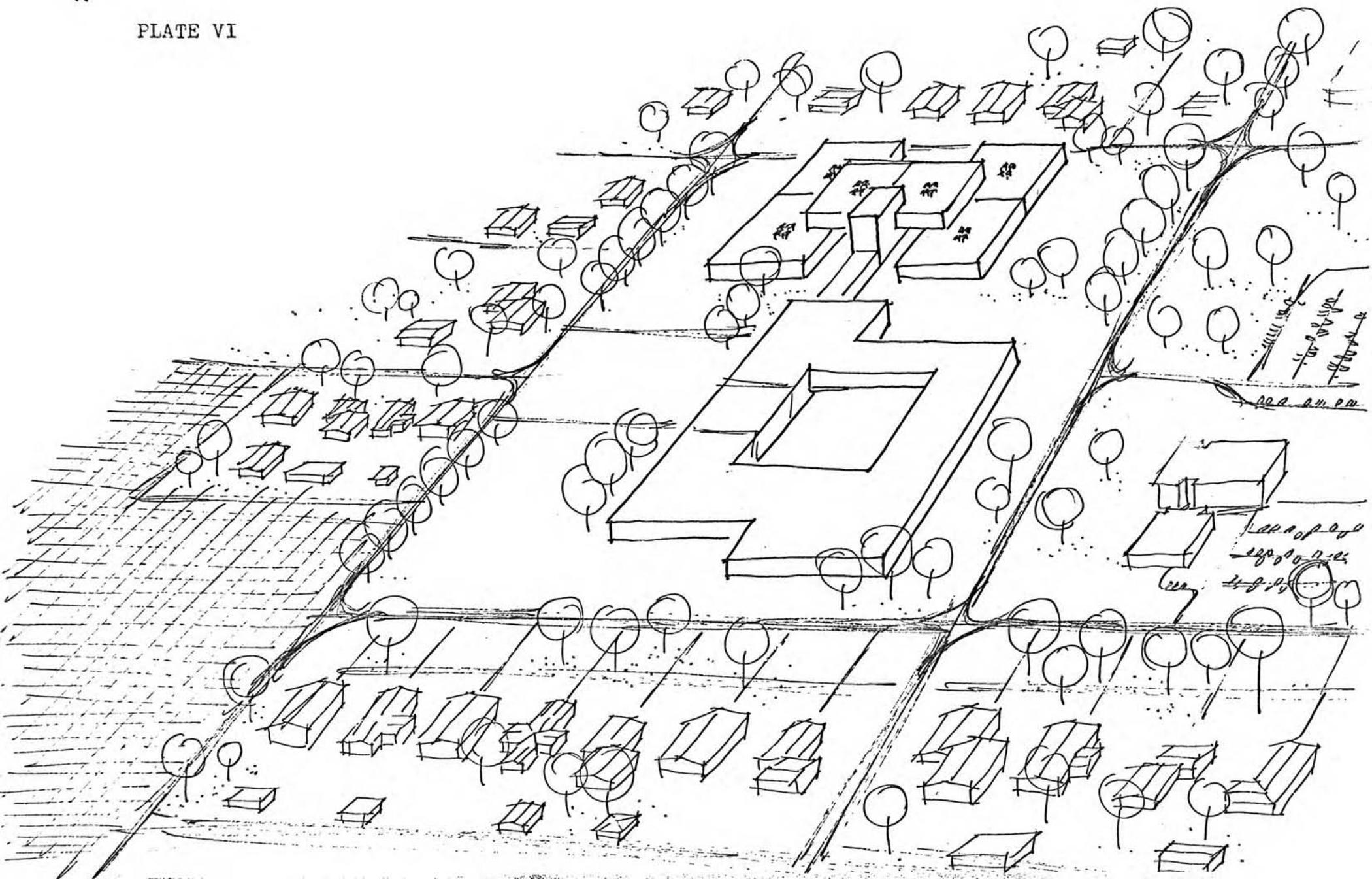
PLATE V



EXPLANATION OF PLATE VI

Initially proposed site "B" for the Topeka Children's
Hospital.

PLATE VI



d. Selection

Judging from the above comparison and considering that this area is expected to be a high density area, it was concluded that site "A" was more reasonable and more convincing.

4. PHYSICAL SETTING

The selected site for the hospital has a long rectangular shape of approximately 560 ft. x 310 ft. (= 4 acres).

Main Access ----- A convenient approach is the key to decide the main access. Service access can be fed in accordance with the main access.

As has been shown on TABLE 1, on page 12, nursing units, parking areas, and the rest of the hospital facilities have almost same potential in area.

Let's look at four initial proposals for the physical setting. See Plate VII and VIII.

Proposal "A-1" :

- a. Group of nursing units on the single-story parking area and the rest of the hospital facilities.
- b. Roof garden and courts.
- c. Easy connection to the two existing hospitals.

Proposal "A-2" :

- a. Separated parking garage building with connection to the outpatient department.

b. Well disposed garden with privacy

- Proposal "A-3" :
- a. Parking area over the outpatient department with an additional ramp.
 - b. Well arranged circulation between parking area and hospital facilities.

- Proposal "A-4" :
- a. Same arrangement as proposal "A-3" with a difference of parking areas below the outpatient department.
 - b. Possible architectural arrangement like court or top-light.

After a study of these four initial proposals, Proposal "A-4" was selected over the other three.

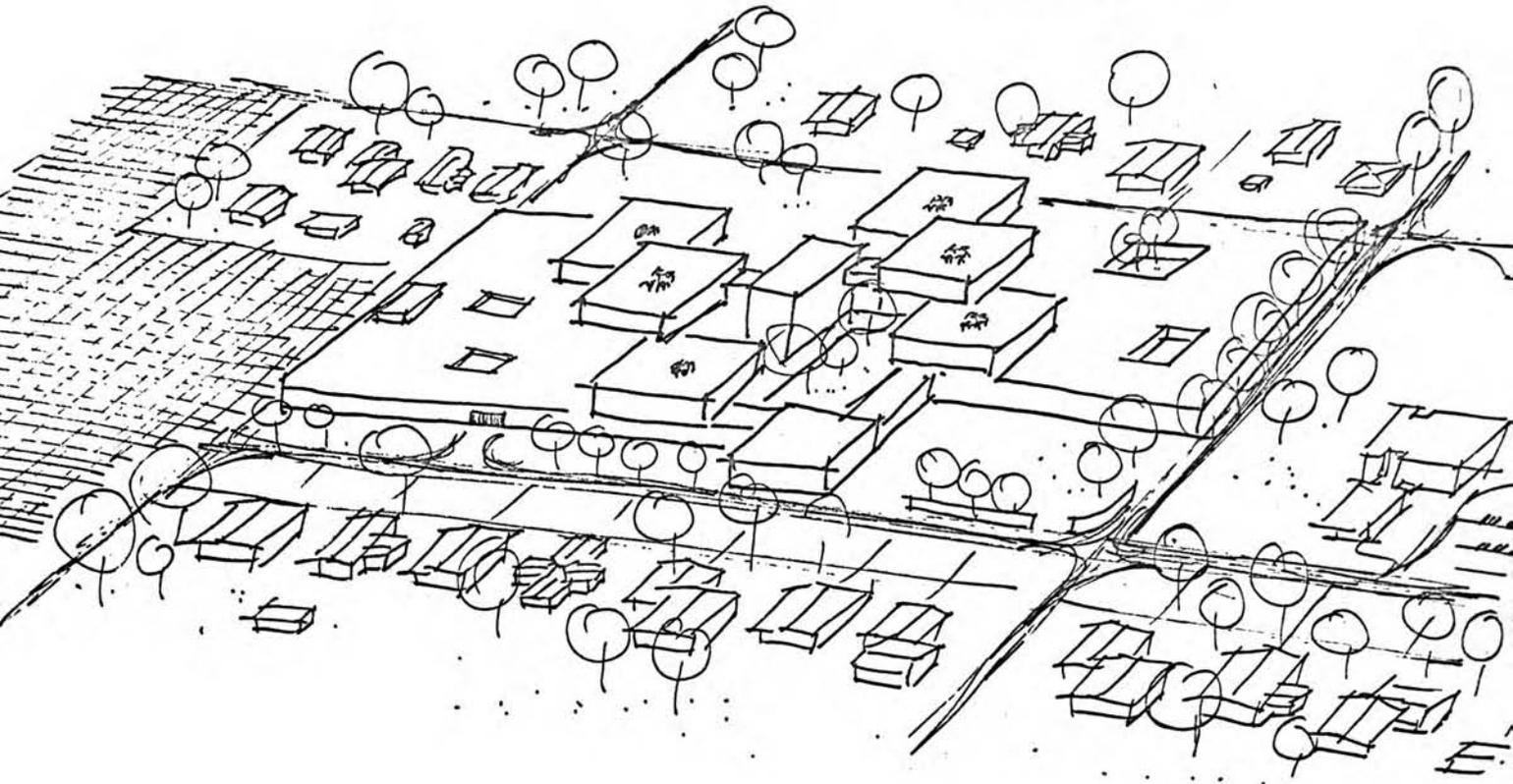
From Proposal "A-4" the final physical setting was fixed as follows: a building consisting a nursing unit complex and an outpatient complex with the connection corridor between the two. One contains seven nursing units, common space, and service facilities, the other one contains outpatient, surgical, emergency departments and a parking garage below.

The different functions are housed in separate complexes, so that each one can be scheduled and added when considered necessary.

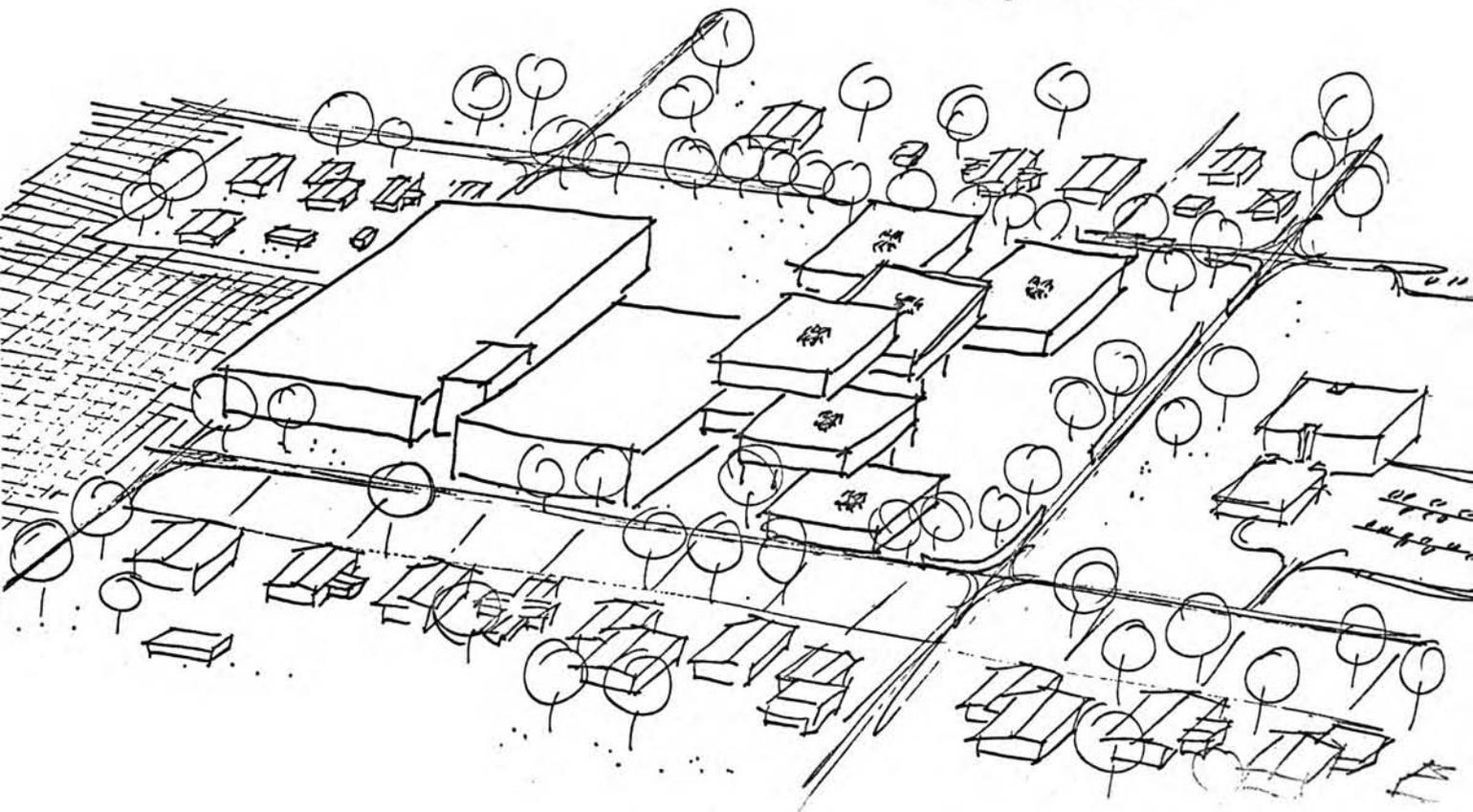
EXPLANATION OF PLATE VII

Proposal "A-1" and Proposal "A-2" for the physical setting.

Proposal "A-1"



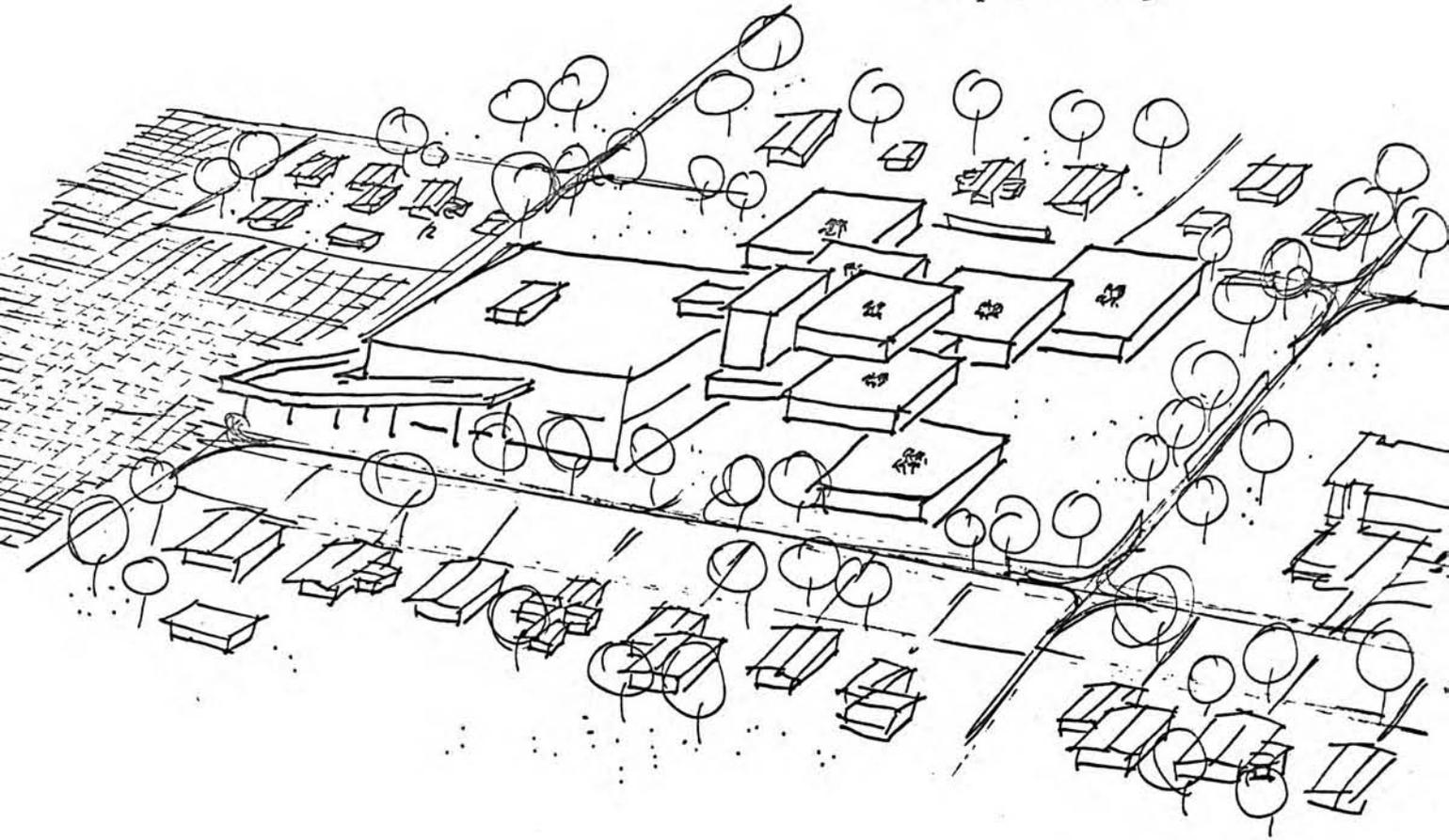
Proposal "A-2"



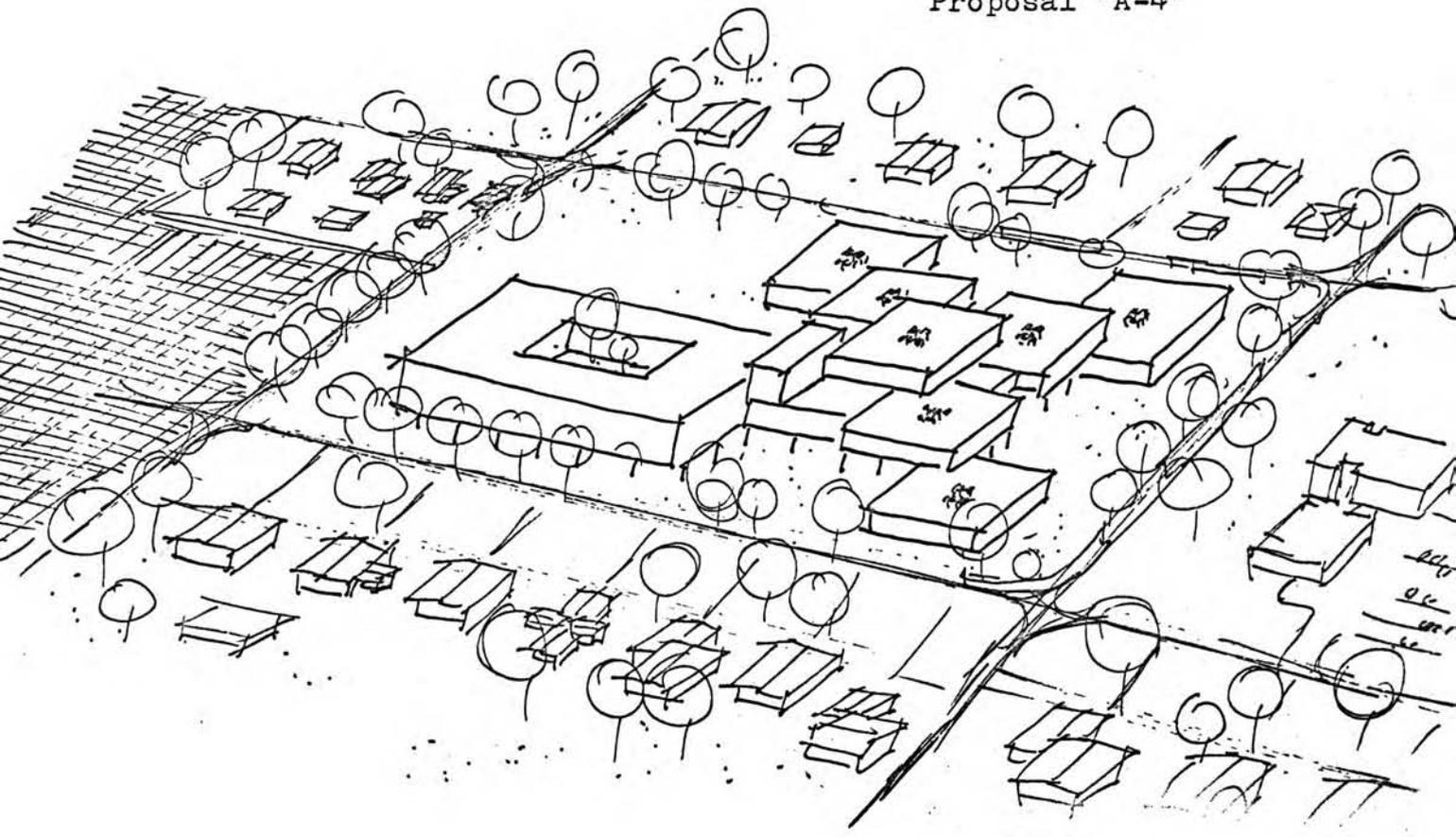
EXPLANATION OF PLATE VIII

Proposal "A-3" and Proposal "A-4" for the physical setting.

Proposal "A-3"

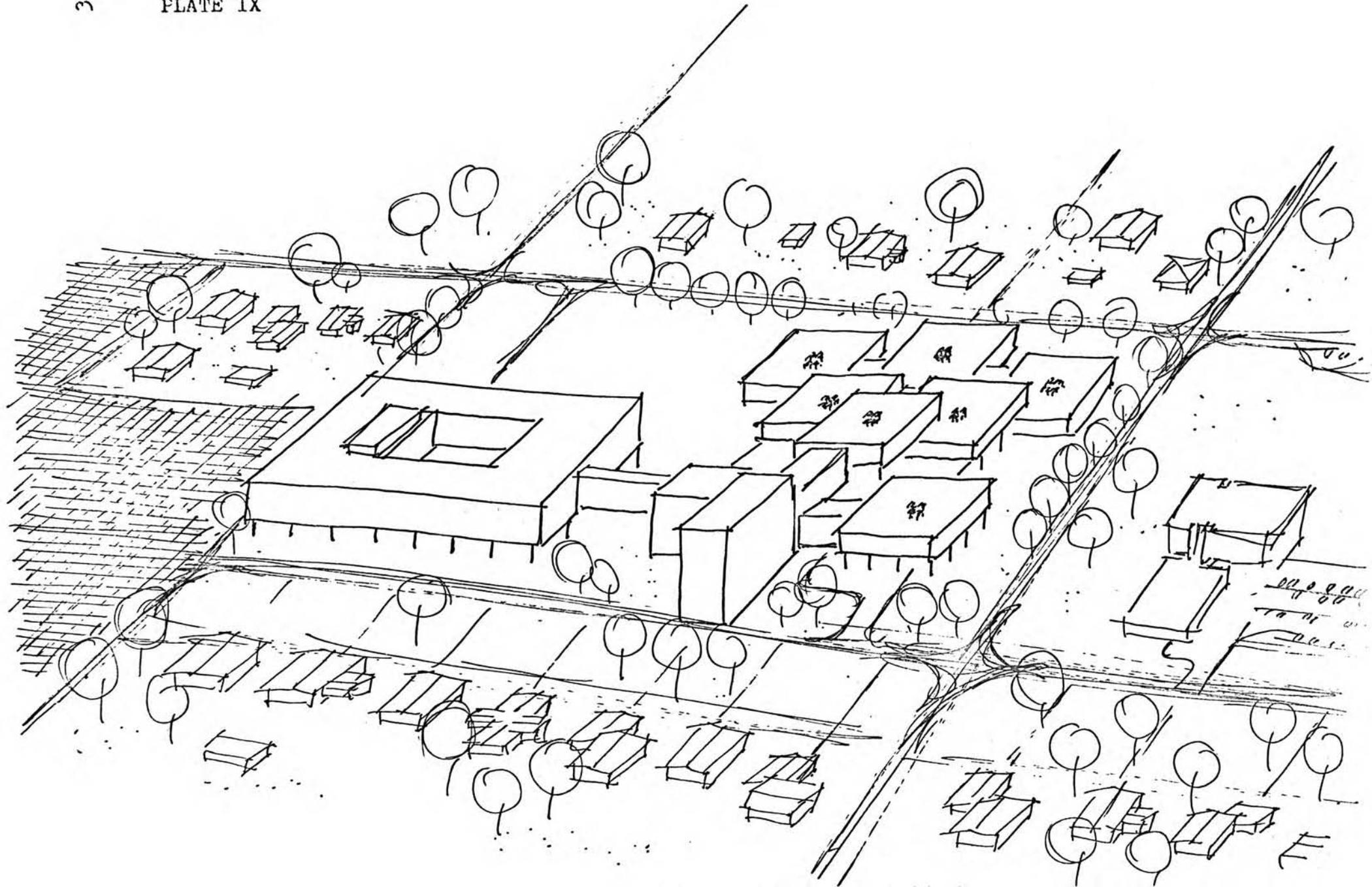


Proposal "A-4"



EXPLANATION OF PLATE IX

The final physical setting from the four initial proposals.



5. ELEMENTS OF PHYSICAL FACILITIES

Physical facilities for diagnosis, treatment, and care of inpatients require a comprehensive and flexible arrangement to accommodate the assigned services.

a. Outpatient Department

Entrance. In designing a hospital, the identification of public accesses cannot be overemphasized. In the motor age, automobile access tends to be the main entrance. Therefore, the circulation from the parking area to the entrance should be considered very carefully. In this project, an elevator and stairs will lead directly from the parking garage on the ground floor and base floor levels to the reception and main waiting area on the hospital above. For the pedestrian, out-stairs will lead them to the reception area via a vestibule.

Reception and Main Waiting Area. The true "frontdoor" of the hospital, reception area should be open and spacious and therefore should create a warm and inviting atmosphere. Since the entry and waiting area will be combined as a lounge, it will be provided with lounge-type furnishings to provide a more informal environment. The information desk will be located so that the waiting area will be under the control of the receptionist or staff concerned.

Medical Records. Adjacent to the waiting area will be

the admitting office, accounting office, files, and medical records.

Outpatient Department. The outpatient department will be connected to the nursing unit complex by a connection corridor. Separate OPD waiting area will be contiguous to the courtyard so that the waiting children can go out to the courtyard and play by themselves. Nine examination rooms, three treatment rooms, two utility rooms, a minor surgery room with an observation room, and a physical therapy room will be properly arranged.

Emergency Department. Easy access is the key for emergency department, so that emergency access and parking spaces will be reserved for this. Necessary facilities with an attendant waiting area will be conveniently located near the vertical circulation center for further treatment.

TABLE 2
AREAS FOR OUTPATIENT DEPARTMENT

	Area (sq. ft.)
Entrance Hall	480
Vestibule	288
Reception & Waiting Area	2,304
Admitting Office & Medical Records	768
Outpatient Department	3,264
OPD Waiting Area	1,344

Emergency Department	880
Corridor	960
<hr/>	
Total	10,288
<hr/>	

b. Radiology

The radiology department, located on the second floor, will be contiguous to the laboratory department and will be separate from the waiting area by a door. The X-ray room and the radiology room in which ionizing radiation producing devices or equipment or radioactive materials are to be used or stored shall afford radiation protection in accordance with the Kansas Radiation Protection Regulations and the recommendations of the National Council on Radiation Protection and Measurements.

TABLE 3
AREAS FOR RADIOLOGY DEPARTMENT

=====	
	Area (sq. ft.)
<hr/>	
Secretary & Waiting Area	160
X-ray Room	160
Radiology Room	88
Dark Room	88
Other rooms	220
Corridor	386
<hr/>	
Total	1,102
<hr/>	

c. Laboratory

The rest of the second floor will be occupied by the clinical laboratories and pharmacy, which will be separated by the secretary desk and lab. waiting area. Grouping all lab. functions together produces efficient operation.

TABLE 4
AREAS FOR LABORATORY DEPARTMENT

	Area (sq. ft.)
Laboratory Facilities	772
Room for Pathologists	96
Office Room	120
Pharm. Compounding Room & Utility	254
MFG. Room	96
Storage	96
Secretary & Waiting Area	336
Corridor	576
Total	2,344

d. Surgical Department

The surgical department will be located on the third floor and will provide two major operation rooms and one minor one. The suite of two major operation rooms will be planned to be separated from the rest of the surgical department.

TABLE 5
AREAS FOR SURGICAL DEPARTMENT

	Area (sq. ft.)
Suite of Major Operation Rooms	1,920
Minor Operation Room & Recovery	256
Central Sterilizing & Supply with Clean-up Room	576
Doctors' Locker Room & Toilet	256
Nurses' Locker Room & Toilet	256
Storage	192
Other Rooms	896
Corridor	1,152
Total	5,504

e. Nursing Unit

As has been mentioned on page 13, the nursing unit complex will consist mainly of seven dispersed and stacked nursing units.

The advantages and reasons why dispersing systems were chosen rather than corridor type systems in the arrangement of nursing units are:

1. According to the circumstances, it is quite necessary to set apart each nursing unit, particularly in case of contagious diseases. -----> Function
2. Persons who have concern with a particular unit will not

have concern with any other units. Only doctors will make a trip once or twice a day for regular check-ups.

-----> No Necessity

3. Small units of cottages give the feeling of intimacy which is very desirable in children's hospitals. ---

--> Atmosphere

4. Dispersing systems allow a flexibility in the arrangements of physical settings which means more possibility of variety. -----> Flexibility

Main Lobby. The first floor will be occupied by a main lobby and dietary facilities besides three nursing units. All traffic (visitors) from the main access will be fed into the nursing units via the lobby. Stairs leading the traffic to the nursing units on the second floor, will be located in the middle of the lobby. The gift shop will be located in the middle of the lobby.

The Size of a Nursing Unit. The nursing unit will be planned to serve up to 14 children at the same time. U.S. Department of Health, Education, and Welfare suggests that space for a pediatric nursing unit provide for at least 10 and no more than 20 beds. The number of children to be served can be changed by setting or removing a partition between rooms or by adding a third bed for each two in an emergency. See presentation Plate XVIII.

Three bays by three bays will make one nursing unit. 24

ft. x 24 ft. will make one bay which will be based on the desirable size of the bed room. This pattern will be used throughout the hospital for reasons of structural consideration.

Bed Room. One-bed rooms will be provided for critically ill patients who must have quiet. These will be large enough with the size of approximately 12 ft. x 24 ft. which will be the same as two-bed rooms to provide for a parent to stay overnight.

Enough clearances around the bed will be allowed to carry out nursing procedures: to move bed ridden patients, stretcher, or wheelchair; to accommodate necessary furniture and equipment; and to facilitate housekeeping.

Toilets will be placed toward the outside. They will help shade against glare and heat; also, they will not block the bed-patients' view of the nurses' station. In addition, valuable space and steps will be saved since wasted space of the awkward vestibule at the room entrance will be eliminated.

For visual control and watching the passing public, glass wall will be used in partitions between rooms and hallways.

In multi-bed rooms, cubicle curtains will be available for medical privacy.

Wall TVs will be installed at the height of 5 ft. 6 inches for the convenience of bed-patients. See page 54, for the lighting consideration.

Other furniture and equipment installed will be:

- . Over-bed table for trays and toys
- . Full-length closets
- . Adjustable racks
- . Cabinets for personal articles
- . Comfortable chairs which can be converted into sleeping units
- . Electric outlets
- . Piped-in oxygen outlets
- . Compressed air outlets
- . Vacuum outlets.
- . Telephone outlets

Isolation Room. One-bed rooms can be used as isolation rooms. A small utility cart or cabinet for clean gowns, masks, and other supplies will be needed.

Room for Emotionally Disturbed Patients. One-bed rooms can be used for this purpose. Safety glass windows, lockable toilet rooms and lockers, detention screens at the windows, switches in the hallway to turn off over-bed lights.

Doors to this room and to the toilet room should be equipped to be opened both inward and outward in an emergency.

Nurses' Station. A nurses' station will be located in the middle of the unit so as to minimize foot travel distance to take care of all the bed rooms and to allow general observation of activity and control of traffic within the unit. In order to support the counter-type nurses' station, a medical office room with a nurses' toilet, lockers, and adequate bulletin boards will be provided. Also this room will be shared with the physicians' charting area. In this area, space can be allotted for terminal devices related to computer systems, which might be installed in the future.

Treatment Room. Some treatments and examinations will be carried out here. Since this room will be used for admitting examinations, the room will be located near the entrance to the unit.

In addition to adequate examination and treatment tables, ample lighting fixtures will be installed. Materials should be readily cleanable and procedures for infection control must be set up.

Waiting & Consultation Room. The medical history of a child can be reviewed in this room. "The consultation room will often be the only place where nurses can demonstrate the care which the child will need when he goes home."¹ Comfortable furnishings, acoustical treatment, and decorations for children will be desirable.

Playroom. The playroom will serve as a multi-use area for group activities and recreation:

- . Playroom
- . Occupational Therapy Space
- . School Work Area
- . Social Room and Library

At meal time, it will be an ideal place for group feeding. It will be conveniently located to be observed and controlled from the nurses' station. The furniture both for food service

¹Architectural Record, Vol. 122. November, 1957. p.210
"Planning the Pediatric Nursing Unit".

and play activities, storage closets, and shelves for toys and other materials will be provided. Toilet facilities will be provided within the area.

Utility Room. The utility room, located at the end of the unit, will be equipped with the following:

- . Sterilizer
- . Utensil Cabinet and Counter Space
- . Sink with Drainboard
- . Hot and Cold Water Supply with Elbow and Knee Control
- . Bed-pan Washer and Disinfector

Bath and Shower Rooms. Two common showers and one tub room with toilet facilities will be provided. The tub room will be equipped to accommodate a wheelchair patient.

Linen, Stretcher and Wheelchair Storage. One stretcher and one wheelchair will be stored conveniently from the hallway.

Audio-Visual Department. In order to make an educational program enriched for long-term hospitalized children, audio-visual equipment will be provided on the second floor.

TABLE 6
AREAS FOR A NURSING UNIT

	Area (sq. ft.)
One-bed Room (288 sq. ft. x 2)	576
Two-bed Room (288 sq. ft. x 2)	576

Four-bed Room (576 sq. ft. x 2)	1,152
Nurses' Station	240
Playroom	480
Medical Office	192
Treatment Room	288
Utility and Bath Rooms	288
Waiting & Consultation Room	288
Hallway Area	912
Vestibule	288
etc.	240
<hr/>	
Total	5,520
<hr/>	

TABLE 7
AREAS FOR TOTAL NURSING UNITS

=====	
	Area (sq. ft.)
<hr/>	
Nursing Units (5,520 sq.ft. x 7)	38,640
Public Lobby	6,752
Giftshop	192
Vestibule	256
Audio-Visual Department	768
Corridor	2,256
etc.	864
<hr/>	
Total	49,728
<hr/>	

f. Medical Staff

Offices will ne required for physicians on the full-time medical staff. A doctors' lounge, placed in the middle of the doctors' offices on the third floor, will be provided as a place to relax during rest periods.

A nurses' lounge will be located on the second floor of the nursing unit comlex. Lockers and a toilet for nurses will be adjacent to the nurses' lounge. Nurses' circulation from both the nursing unit and outpatient complexes will be efficient.

TABLE 8

AREAS FOR MEDICAL STAFF

	Area (sq. ft.)
Doctors' Offices (216 sq. ft. x 12)	2,592
Doctors' Lounge	432
Nurses' Locker Room	288
Toilet for Nurses	192
Anti-room	96
Nurses' Lounge	576
Total	4,176

g. Administration

The administration offices, located on the third floor, will have good location accessible to visitors without undue congestion with other traffic.

On the third floor of the nursing unit complex, a library and a conference room will be located as to be convenient to both the doctors' offices and administration offices. Adjacent to the conference room, there will be a place where provisions can be made to serve coffee and light snacks.

TABLE 9
AREAS FOR ADMINISTRATION DEPARTMENT

	Area (sq. ft.)
Administrator's Office	256
Secretary's	128
Director of Nurses Office	192
Records Room	144
Business Office	432
Conference Room & its Service	1,152
Library	576
Total	2,880

h. Dietary Facilities

Considering the size of the hospital, dietary facilities will be centralized on the first floor of the nursing unit complex. General and private dining rooms will be provided for staff and visitors. Service traffic for the kitchen will be fed from the rear.

Food trays will be transported to the each floor pantry

directly via a vertical conveyer system. They will then be carried on smaller enclosed carts to the bed rooms or playroom in each nursing unit. Trays will be returned to dishwashing area in the kitchen by the same way they were delivered. After being washed, carts will be stored in the floor pantries.

Adequate refrigeration and food storage will be installed in the floor pantries for the preparation of between-meal nourishments, refreshments, and special types of food.

TABLE 10
AREAS FOR DIETARY FACILITIES

	Area (sq. ft.)
General Dining Room	2,880
Private Dining Room	576
Kitchen	3,168
Floor Pantry (384 sq. ft. x 4)	1,536
Total	8,160

i. Other Service Facilities

Employees' Facilities. A employees' lounge, located on the basement floor of the nursing unit complex, will be adjacent to both a male and a female locker rooms with attendant toilets.

Housekeeping Facilities. The housekeeping facilities will consist of a soiled linen room, a laundry area, a central

linen room with a sewing area, and an attendant office.

Each floor will have a janitor room for cleaning and maintenance behind the stair-case of the nursing unit complex.

All garbage and waste shall be collected in the trash room and disposed of in the incineration room.

Mechanical and Electrical Facilities. A boiler room, mechanical equipment room, maintenance & electrical shop will be located on the basement floor. Each floor will have mechanical room behind a floor janitor room. On the roof floor, two elevator machine rooms and cooling tower space will be provided.

Service Access and General Storage. Service access will be at the southwest corner of the site and service vehicles will drive directly to the basement floor via a ramp with an approximate slope of 15 per cent. A loading and uncrating area will be provided and a general storage room will be close to it.

TABLE 11

AREAS FOR OTHER SERVICE FACILITIES

	Area (sq. ft.)
Employees' Facilities	1,248
Housekeeping Facilities	1,920
Mechanical & Electrical Facilities	4,320
Miscellaneous Facilities	6,048

Horizontal Circulation*	9,136
Vertical Circulation	5,760
Unassigned Area	3,264
<hr/>	
Total	31,696
<hr/>	

* Public circulation only.

j. Parking Garage

As has been mentioned on page 36, automobile circulation is so important that the parking area will be sheltered at the ground floor and basement floor levels of the outpatient complex. This will be done to get rid of undesirable long unsheltered walks through the parking lot to the entrance and to do away with the usual ugly rows of parked cars.

Outpatients' and visitors' cars will drive directly to a 22 car garage at the ground level or to a 58 car garage in the basement via a ramp with an approximate slope of 15 per cent.

TABLE 12
AREAS FOR PARKING GARAGE

=====	
	Area (sq. ft.)
<hr/>	
Ground Floor Garage	16,496
Basement Floor Garage	30,528
<hr/>	
Total	47,024
<hr/>	

k. Outdoor Space

An outdoor landscaped enclosure is an essential extension of inside medical facilities.

The entrance plaza will give the first impression of intimate feeling as patients approach from the main access to the entrance. This grassed plaza will provide a fountain, benches, short trees, and simple structured equipment for ambulatory patients. The plaza will be enclosed with walls and trees for privacy.

The courtyard of the outpatient complex will provide two waiting areas that will induce a richer environment outdoor.

Two terraces on the second floor level of the nursing unit complex will provide sunshine, fresh air, and a view of the public passing on the grass areas.

Almost each bed-room will have its own small outdoor courtyard on the ground or on the roof of the nursing unit at the lower floor level. These private courtyards, properly enclosed with an attractive landscaped enclosure, will provide a cozy space for a nap in the sunny afternoon and a private play area.

CHAPTER IV

TECHNICAL CONSIDERATION

1. LIGHTING

The lighting of the hospitals presents many problems. Seeing condition should be satisfactory for doctors, nurses, patients, and housekeepers.

a. Bed Room

Personnel concerned with the bed room require different illumination levels to accommodate their individual needs. See Plate XVIII.

Patient's Reading Light. To provide the patient with a maximum amount of movement within the reading light zone, a horizontal bed-width lighting fixture will be installed 4 feet 6 inches above the floor.

Lighting for Dining. The directional recessed spot light will be installed in the ceiling to provide direct light on trays. This will make the food more attractive.

Lighting for Examination. A doctor's examination requires not only the dining light, but also another similar fixture located over the foot of the bed. Also this another light will give the feeling of importance of the doctor.

Night Lighting. The night lighting fixture whose brightness does not exceed 20 footlamberts will be installed on the wall.

Table Lamp. For a local (direct or indirect) illumination, mainly for parents, a table lamp will be provided.

Wall TV. TV will be installed on the wall at the height of 5 feet 6 inches from the floor. This will allow bed-ridden patients to watch TV in a comfortable position without light reflection on the TV screen.

Day Light. In order to direct daylight deep into the room and screen the patients from a view of the sky, light controlling glass blocks will be installed in the upper part of the window.

b. Toilet

The windowless private toilet in each bed room will have top light. See Plate XVIII.

c. Nurses' Station and Hallway

Special lighting consideration will be made for the illumination of the counter-type nurses' station and hallway: suspended lighting fixture and top light. At night artificial lighting fixtures will illuminate the hallway as does the top light in the daytime.

d. Emergency Lighting

Provisions will be made for emergency lighting of surgical tables, exit ways, stairways, and so on.

2. HEATING, COOLING, AND VENTILATION

The environmental problems for the hospital demand the Ductless Ceiling Panel System for both heating and cooling. This system does not depend on the movement of air for heating and cooling purposes. Primarily air is used only for ventilation and humidity control. This system will be used for bed rooms of nursing units and the rest of hospital facilities will be by conventional way.

a. Ductless Ceiling Panel System

Water circulation through the corrosion resistance pipes which will be installed on a Exposed Grid Suspension System from Airtex Corp. provides the source for radiant energy transfer.

When heating is needed, hot water will be circulated through the system so that heat will be conducted into the radiant ceiling panel. The radiant ceiling will warm all objects in the room, and then these objects will warm the air.

When cooling is needed, cold water will be circulated through the system so that ceiling will absorb radiant energy from sur-

roundings that are warmer than the ceiling.

b. Advantages of Ceiling Panel System

- .. Temperature can be controlled uniformly throughout the hospital. It is desirable especially for hospital patients who are sensitive to temperature, humidity, and air movement in their recovery. -----> Uniformity, Comfort
- .. This system makes it possible to keep surfaces clean and good hospital housekeeping since the equipment is completely invisible. -----> Cleanliness
- .. It makes no noise and does not produce drafts because large volumes of air are not required. -----> No Noise
- .. The ceiling panel system produces excellent acoustical control. -----> Acoustical Control
- .. This system allows to reduce the air-handling costs, maintenance, and operation costs. -----> Economy
- .. No recirculation of air.
- .. No mixing of odors.

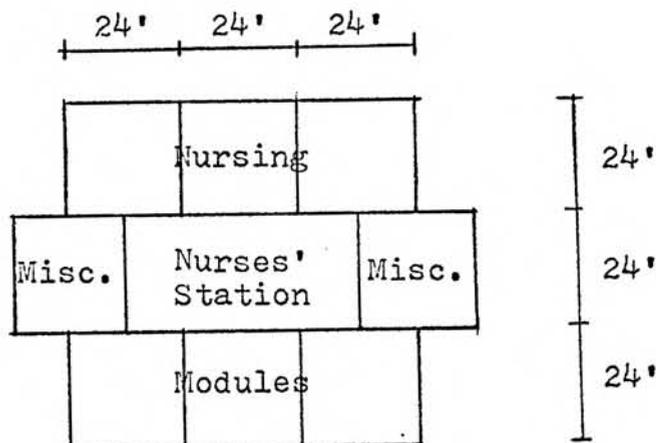
c. Humidity Control

Relative humidity throughout the nursing unit is controlled independently of temperature by resetting the control temperature of the wet coil. The same coil adds moisture to incoming ventilating air in the winter and exhausts moisture from the incoming air in summer.

d. Ventilation

In order to provide ventilation requirements, a fan coil unit will be installed on the roof of the each nursing unit. Three multi zones will be set: one is on the roof of the suite of the major operation rooms, another one on the roof of the corridor beside the vertical circulation center of the outpatient complex, and the last one on the roof of the connection corridor between outpatient and nursing unit complexes.

Ductless System



Nursing Module: 12ft. x 24ft. x 9ft. x 12 = 31,100 cu.ft.

Nurses' Station: 24ft. x 48ft. x 11ft. x 1 = 12,672 cu.ft.

Misc. Space: 24ft. x 24ft. x 9ft. x 2 = 10,368 cu.ft.

Total Unit: 54,140 cu.ft.

New air requirement: 54,140 cu.ft. x 2 = 108,280 CFH

= 1,805 CFM

$$\frac{108,280}{12,672} \cong 8.5 \text{ Air changes per hour in Nurses' Station}$$

All air system would require about 8 air changes,

$$54,140 \times 8 = 433,120 \text{ CFH} = 7,220 \text{ CFM}$$

Design Conditions:

Topeka: D.B. 100, W.B. 78

Wind: 10 MPH South

Indoor: 75°F, 50% Humidity

24 hour operation

Storage Load Factor: .8 (Concrete waffle construction)

Cooling Loads:

Ventilation load, sensible

$$108,280 \times .018 \times 25 = 48,800 \text{ BTU/HR}$$

Latent load as 1/2 sensible 24,400 BTU/HR

73,200 ----- about 6 $\frac{1}{4}$ Tons

Heat Gains:

Nurses' Station

$$\text{Roof : } 1,152 - (16 \times 4) = 1,088$$

$$1,088 \times 6 = 6,528 \text{ BTU/HR}$$

$$\text{Lights : } 1,152 \times 3 \times 3.4 = 11,800 \text{ "}$$

$$\text{People : } 215 \times 6 = 1,290 \text{ "}$$

$$\text{Skylights : } 3,500 \times 4 = 14,000 \text{ "}$$

$$\underline{33,618 \text{ BTU/HR}}$$

$$108,280 \times .018 = 1,951 \text{ BTU/°FΔT}$$

$$\frac{33,618}{1,951} = 17.2 \quad \dots\dots \text{Required } \Delta T$$

$$75 - 17 = 58 \quad \dots\dots \text{Min. supply air temperature.}$$

Nursing Units:

$$\text{Roof:} \quad 288 \times 6 = 1,518$$

$$\text{Lights:} \quad 500 \times 3.4 = 1,700$$

$$\text{Glass:} \quad 100 \times 70 \times .60 = 5,600$$

$$\text{People:} \quad 215 \times 4 = 900$$

$$\hline 9,718$$

$$\text{Latent:} \quad 150 \times 3 = 1,000$$

$$\hline 8,718 \times .8 = 6,974.4$$

$$\frac{6,974.4}{288} = 24.2 \quad \text{Cooling per sq.ft. ceiling.}$$

3. STRUCTURE

For the construction of TCH, concrete Waffle Flat Slabs will be used throughout the hospital for the easy and efficient installation of service facilities such as pipes, ducts, and so forth.

Design Conditions:

$$\text{Span:} \quad 24\text{ft.} \times 24\text{ft.} = 576 \text{ sq.ft.}$$

$$\text{Drop-D:} \quad 9\text{ft.} \ 6 \text{ in.}$$

$$\text{Form depth + Top slab:} \quad 10 \text{ in.} + 3 \text{ in.}$$

$$d = (M / K_b)^{\frac{1}{2}}, \quad A_s = M / f_s \times j \times d$$

Exterior Panel:

	Col. Strip			Middle Strip		
	ext. neg.	pos.	int. neg.	ext. neg.	pos.	int. neg.
% of M.	44	24	56	10	20	17
M (kip-in.)	1,276	696	1,624	290	580	493
d (in.)	10.75	10.75	10.75	10.75	10.75	10.75
A _s (sq.in.)	6.83	3.72	8.7	1.55	3.1	2.64

b. Roof Floor

Load:	Live Load:	100	x	576	=	17,280
	13" Slab:	162.5	x	576	=	93,600
						<u>110,880</u>
	Less 55 Domes:	55	x	717	=	39,400
						<u>(-)</u>
						71,480

Bending Moment:

$$\begin{aligned}
 M_o &= 0.09 \times 71,480 \times 1.09 \times 24 \times 12 \times (1 - 2 \times 1.5 / \\
 &\quad 3 \times 24)^2 \\
 &= 1,860,000 \text{ lb.-in.}
 \end{aligned}$$

Interior Panel:

	Col. Strip		Middle Strip	
	Neg.	Pos.	Neg.	Pos.
% of M.	50	20	15	15

Moment (kip-in.)	930	372	279	279
d (in.)	10.75	10.75	10.75	10.75
As (sq.in.)	5.0	2.0	1.5	1.5

Exterior Panel:

	Col. Strip			Middle Strip		
	ext. neg.	pos.	int. neg.	ext. neg.	pos.	int. neg.
% of M.	44	24	56	10	20	17
M (kip-in.)	818	446	1,042	186	372	316
d (in.)	10.75	10.75	10.75	10.75	10.75	10.75
As (sq.in.)	4.83	2.39	5.57	1.00	1.98	1.68

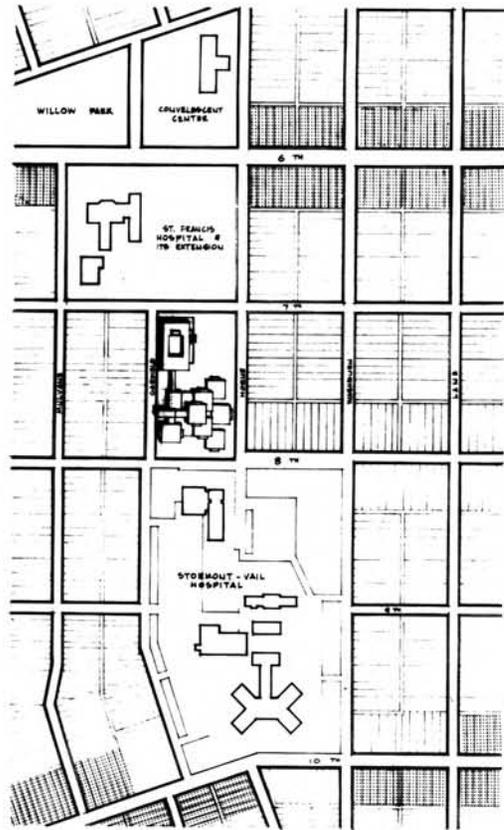
See Plate XX for drawing.

CHAPTER V

PRESENTATIONS

EXPLANATION OF PLATE X

Site selection for Topeka Children's Hospital



SITE SELECTION

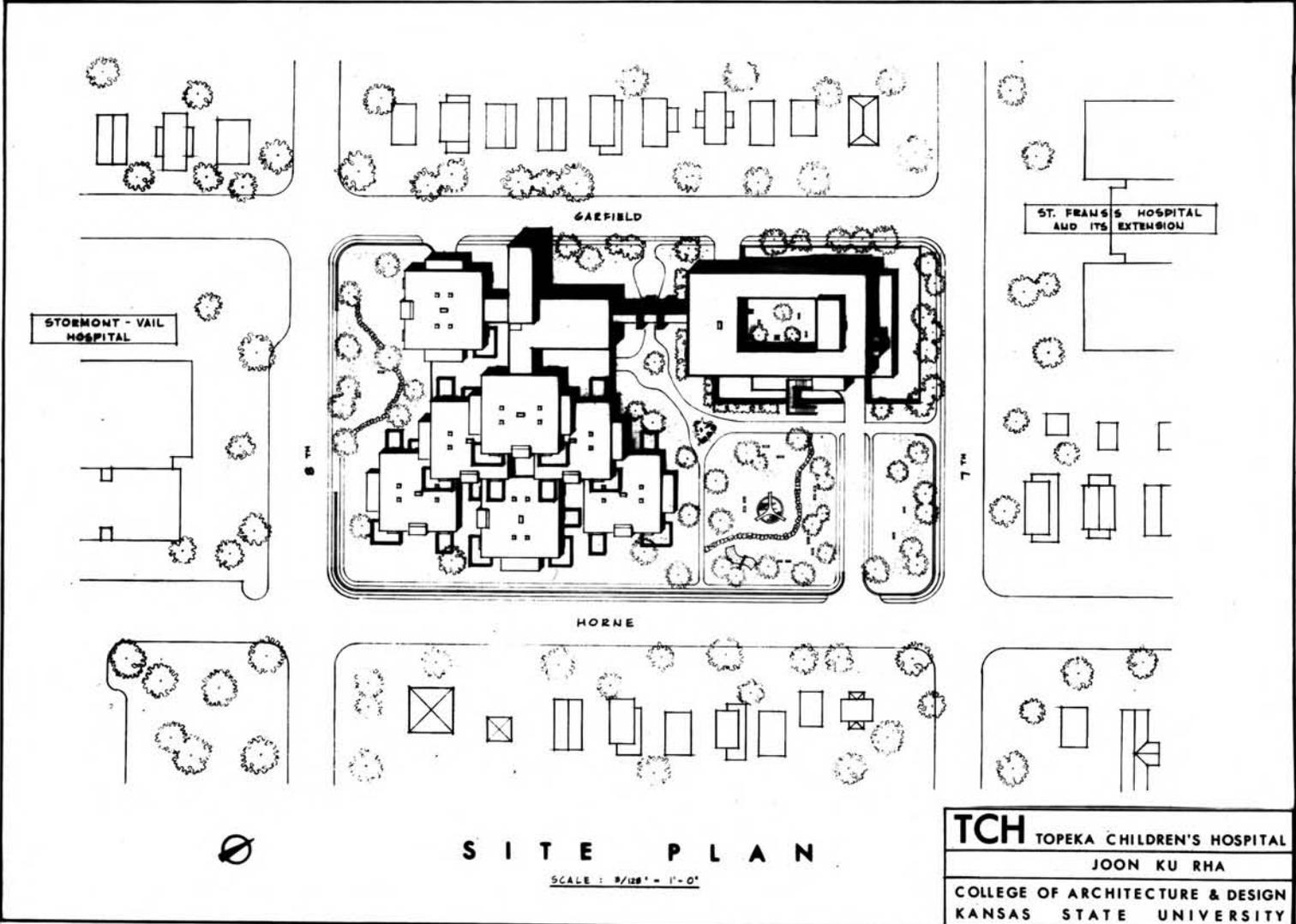
- : COMMERCIAL AREA
- : RESIDENTIAL AREA



TCH TOPEKA CHILDREN'S HOSPITAL
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EXPLANATION OF PLATE XI

Site Plan



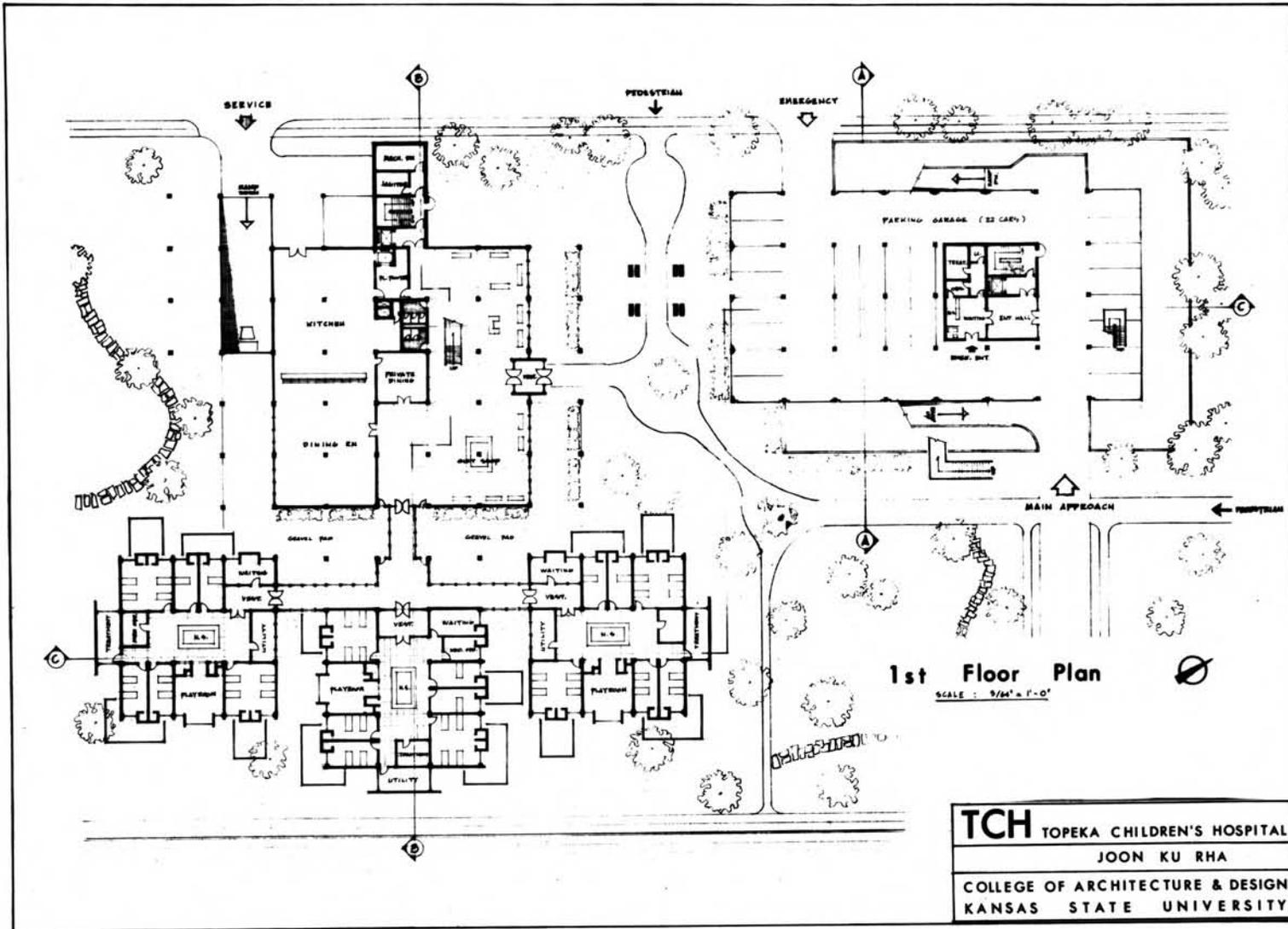
S I T E P L A N

SCALE : 1/8" = 1'-0"

TCH TOPEKA CHILDREN'S HOSPITAL
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 KANSAS STATE UNIVERSITY

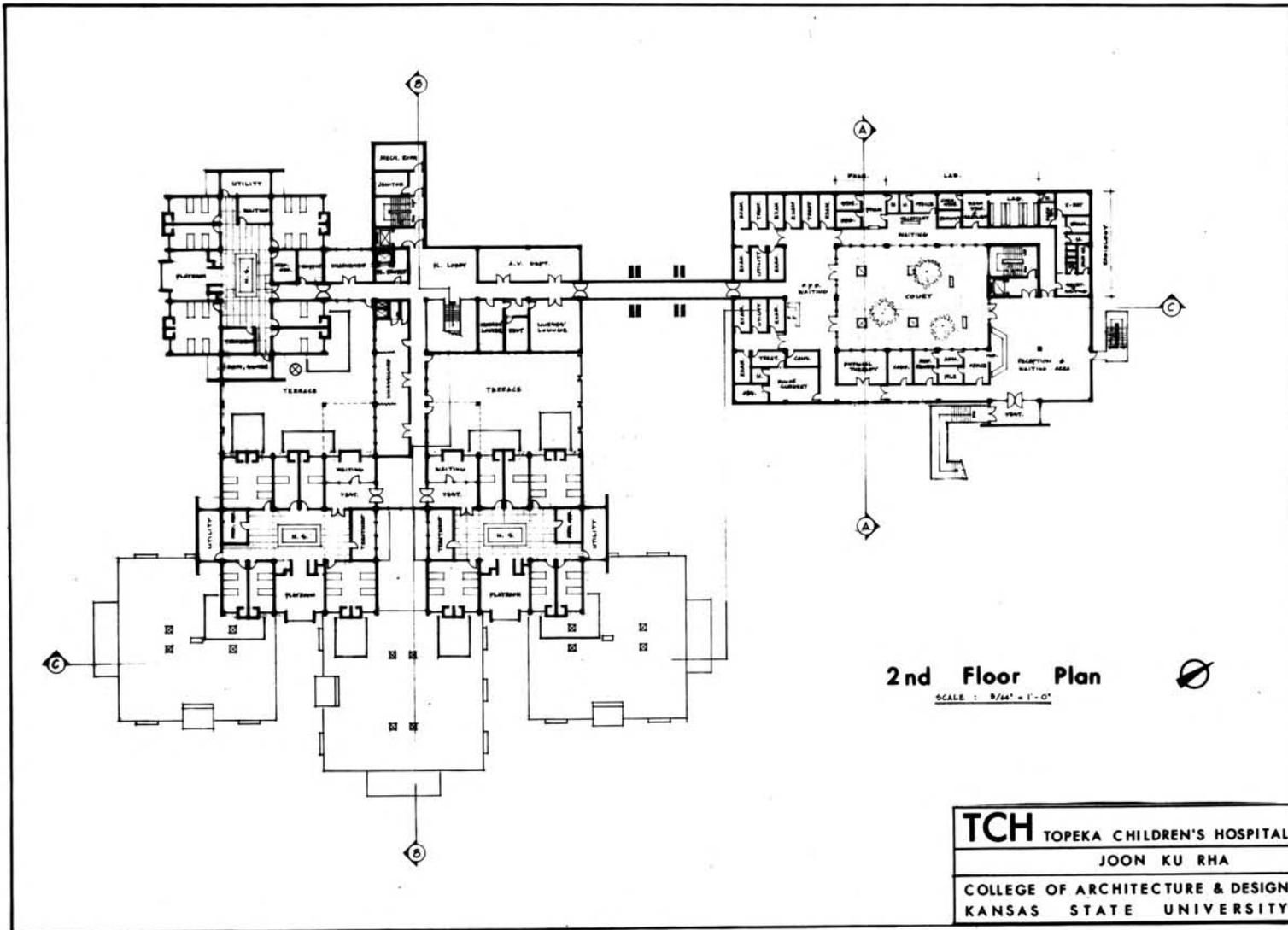
EXPLANATION OF PLATE XII

1st Floor Plan



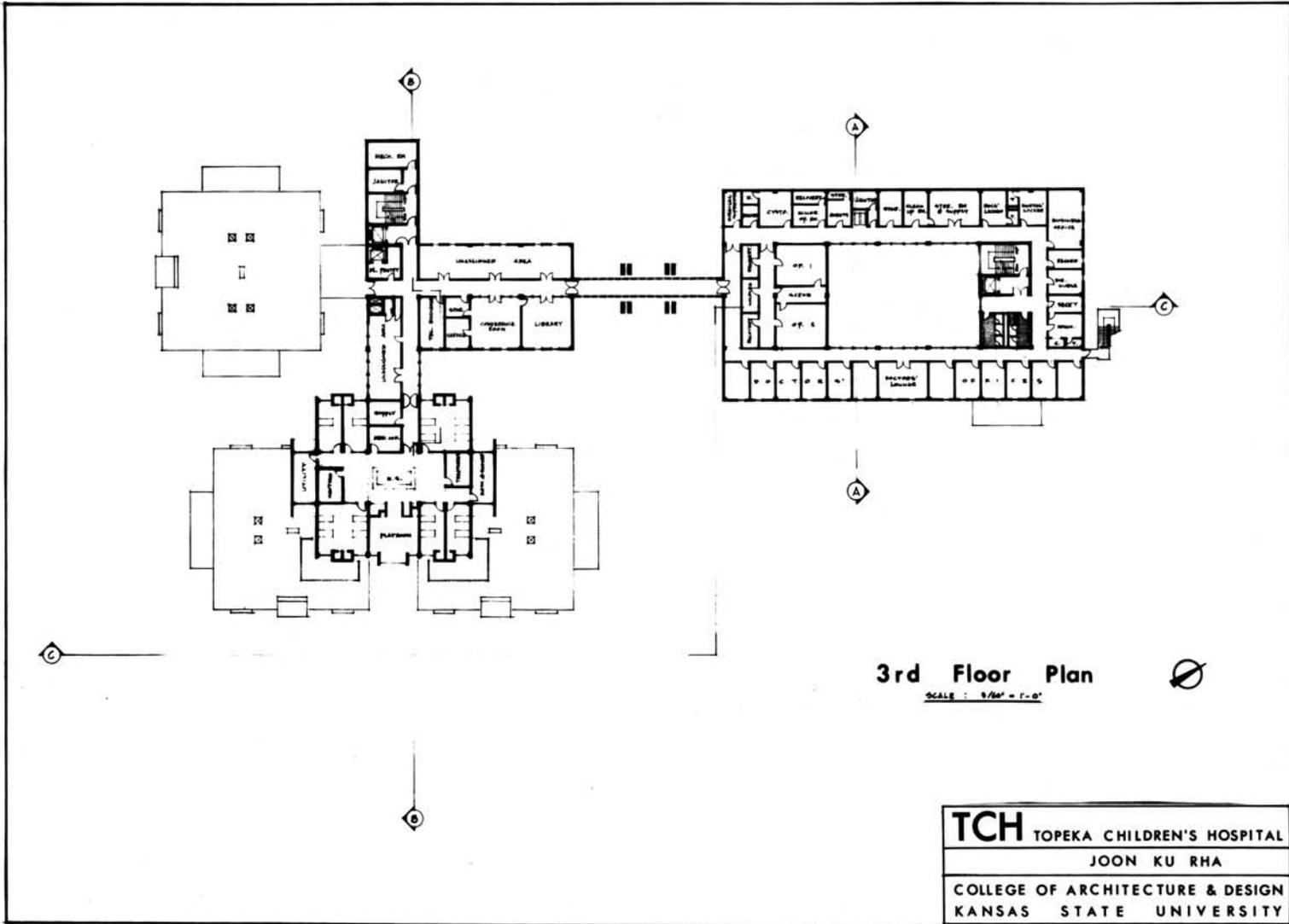
EXPLANATION OF PLATE XIII

2nd Floor Plan



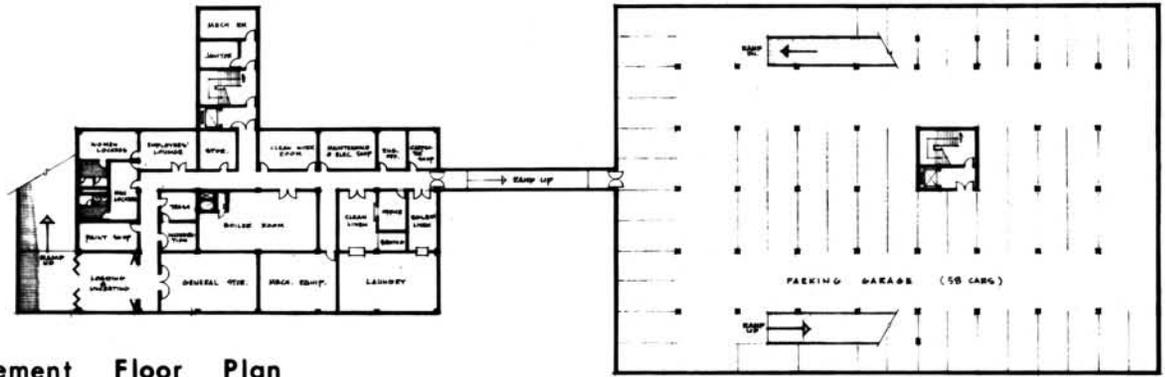
EXPLANATION OF PLATE XIV

3rd Floor Plan



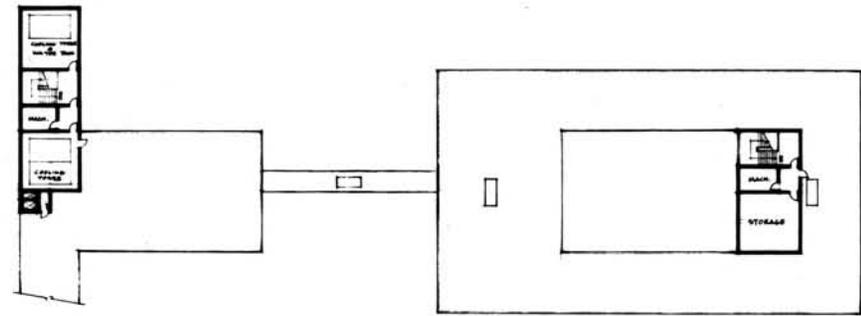
EXPLANATION OF PLATE XV

Basement Floor and Roof Floor Plans



Basement Floor Plan

SCALE : 3/32" = 1'-0"



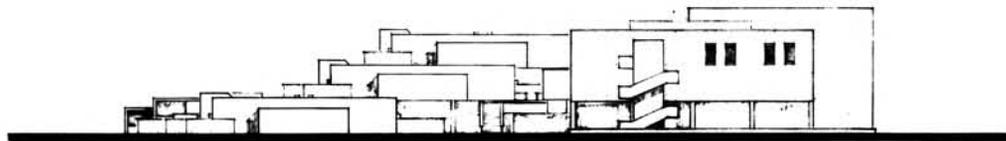
Roof Floor Plan

SCALE : 3/32" = 1'-0"

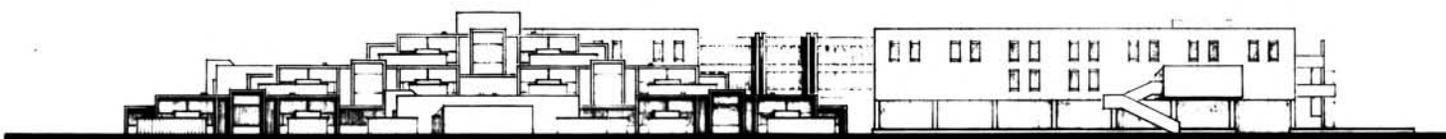
TCH	TOPEKA CHILDREN'S HOSPITAL
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EXPLANATION OF PLATE XVI

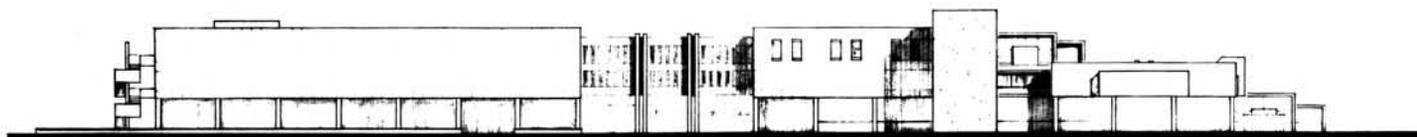
Elevations



N. E.



S. E.



N. W.

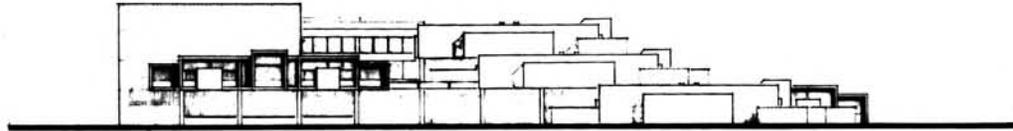
E L E V A T I O N S

SCALE: 3/4" = 1'-0"

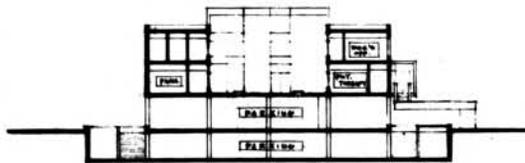
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EXPLANATION OF PLATE XVII

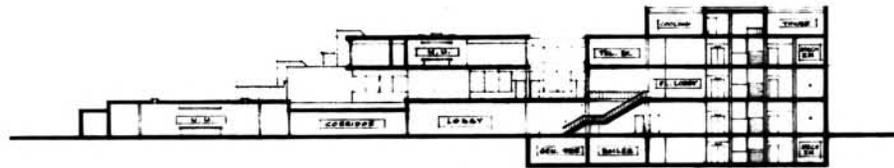
Sections



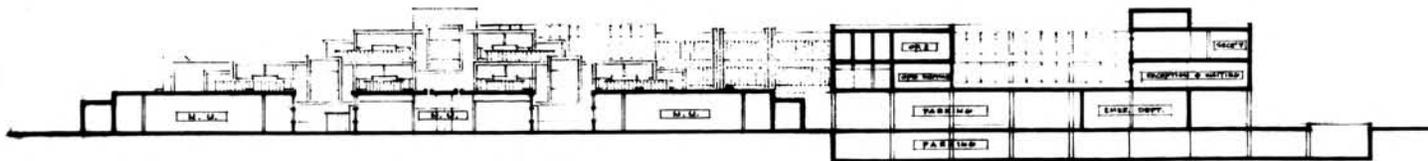
S.W. ELEV.



A - A



B - B



C - C

S E C T I O N S

SCALE : 3/4" = 1'-0"

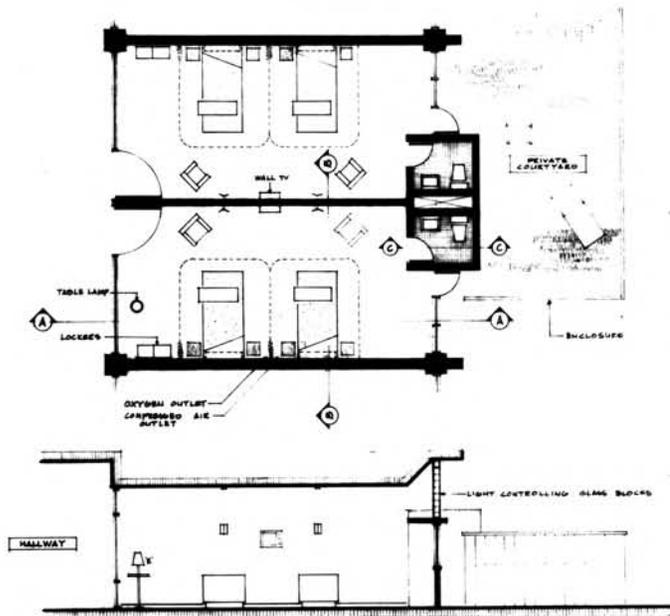
TCH TOPEKA CHILDREN'S HOSPITAL
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EXPLANATION OF PLATE XVIII

Typical bed room and 14 bed nursing unit plans & sections

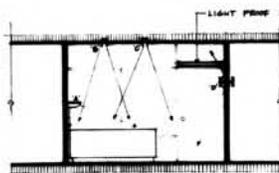
Typical Bed Room

SCALE: 1/4" = 1'-0"

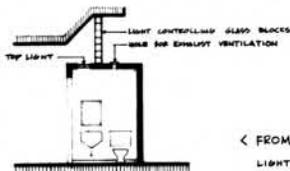


SECTION A-A

SCALE: 1/4" = 1'-0"



SECTION B-B



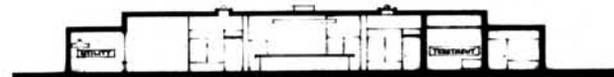
SECTION C-C

< FROM SECTION B-B >

- LIGHT 'A': FOR READING.
- LIGHT 'B': FOR MEAL TIME.
- LIGHT 'C': FOR EXAMINATION WITH LIGHT 'B' ON.
- LIGHT 'D': NIGHT-LIGHTING.
- LIGHT 'E': TABLE LAMP.

14 Bed Nursing Unit

SCALE: 3/32" = 1'-0"



SECTION M-M

SCALE: 3/32" = 1'-0"



SECTION N-N

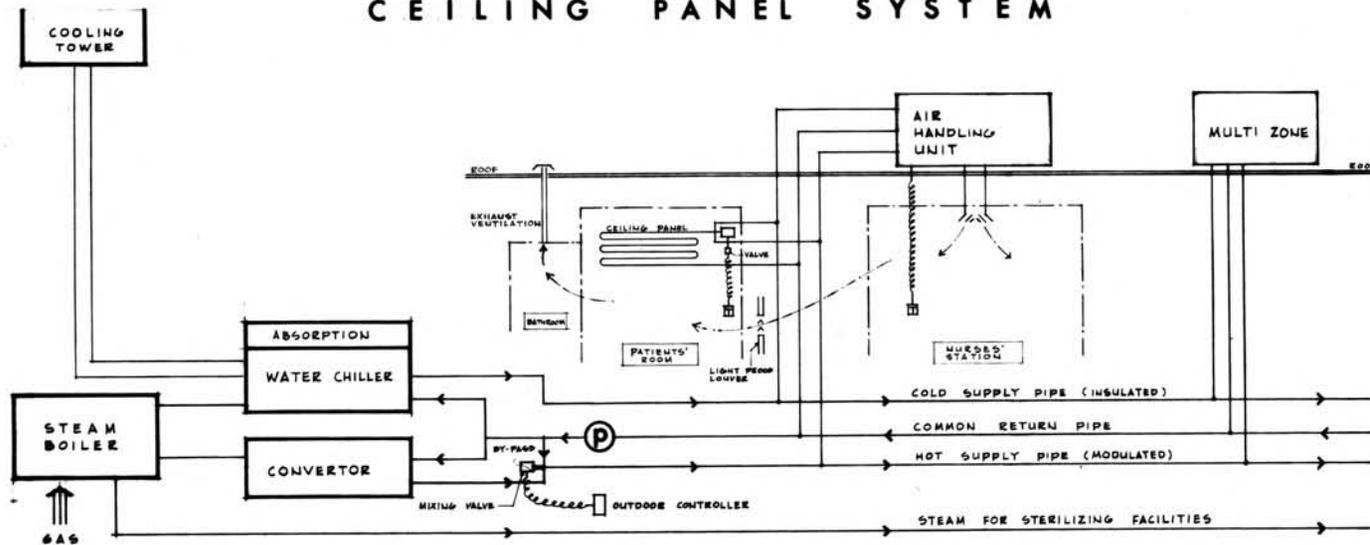
SCALE: 3/32" = 1'-0"

TCH TOPEKA CHILDREN'S HOSPITAL
 JOON KU RHA
 COLLEGE OF ARCHITECTURE & DESIGN
 KANSAS STATE UNIVERSITY

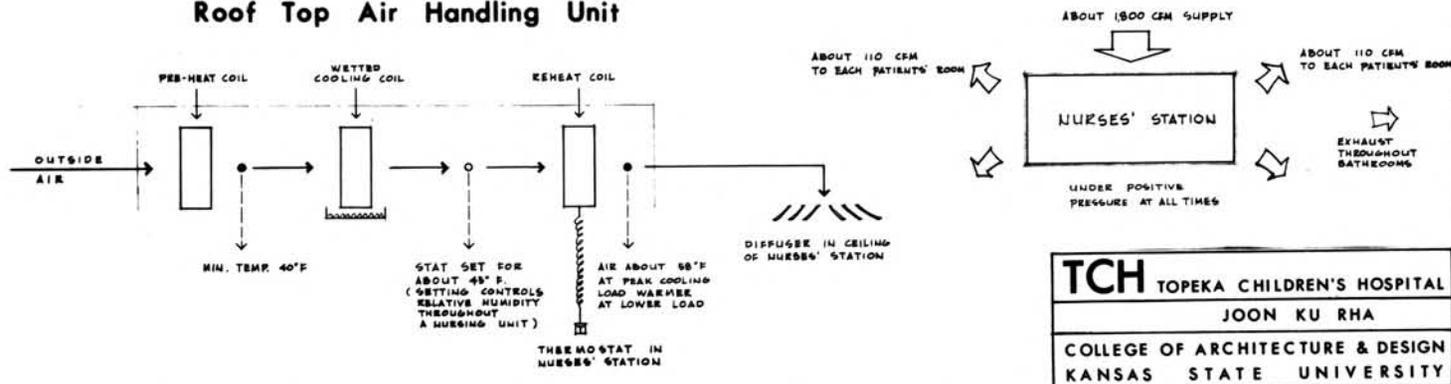
EXPLANATION OF PLATE XIX

Mechanical Consideration

C E I L I N G P A N E L S Y S T E M



Roof Top Air Handling Unit

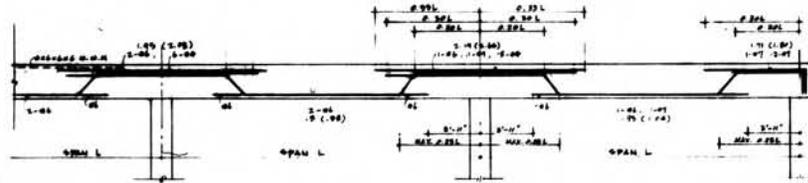


EXPLANATION OF PLATE XX

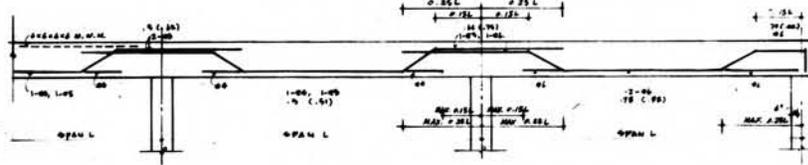
Structural Design

Structural Design

TYPICAL FLOOR

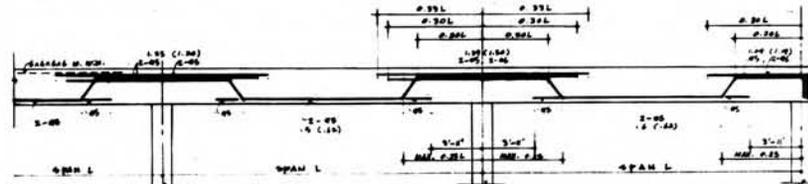


COLUMN STRIP

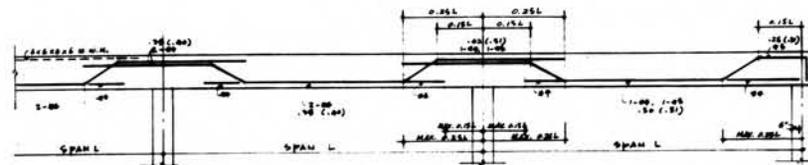


MIDDLE STRIP

ROOF FLOOR

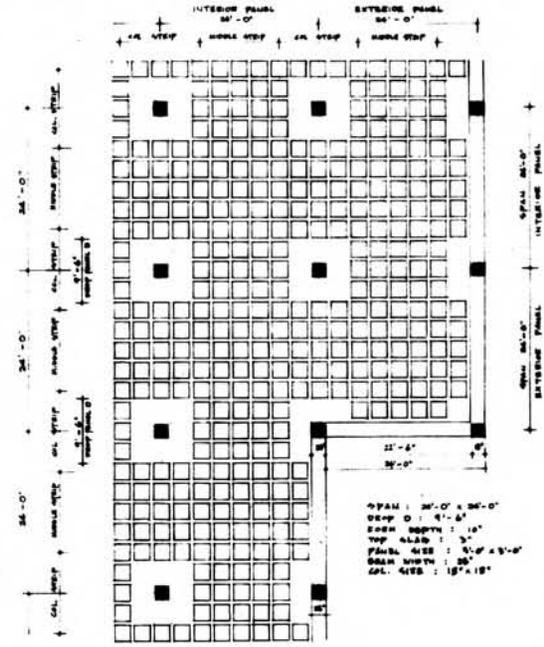


COLUMN STRIP

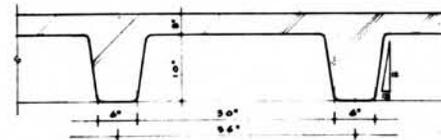


MIDDLE STRIP

* SAME AS THE OTHER DIRECTION.



TYPICAL PLAN



TYPICAL SECTION

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CHAPTER VI

CONCLUSION

In the designing of the Topeka Children's Hospital, the following can be pointed out as a conclusion.

1. The study of site selection and physical setting of the hospital by comparing the initial proposals was an appropriate approach to find the proper solution.

2. Each nursing unit was considered as a physical setting unit rather than conventional corridor type system in its arrangement. This made it possible to take advantage of a single-story building and a feeling of intimacy. Also there were not any structural defects.

3. The parking area, which is the most troublesome in contemporary architecture, was sheltered below the outpatient complex. This kind of sheltered or indoor parking garage is a desirable solution for the convenience of the patrons and the exploitation of the site, especially in an urban area. Also it is worth while to think about placing a parking garage above the building with a separate ramp.

4. The model study of lighting conditions of the bed room where different personnel need different illumination levels was very valuable to accommodate their individual needs.

5. In the stage of the physical setting, the site plan should have been more carefully considered from the standpoint of landscape: relation to neighboring buildings, the view along the main approach, and so on.

6. In order to promote the affiliation with the existing neighboring hospitals, a physical care should have been made which is more than the distance between two hospitals.

It is hoped that the study of Topeka Children's Hospital can be a reference for others.

BIBLIOGRAPHY

- The Nuffield Foundation. Children in Hospital, studies in planning, Oxford University Press, London, 1963
- Plank, Emma N.. Working with Children in Hospitals, a guide for the professional team, The Press of Western Reserve University, Cleveland 6, Ohio, 1962
- Bergmann, Thesi. Children in the Hospital, International University Press, Inc., New York, 1965
- Robertson, James. Young Children in Hospitals, Basic Books Inc., New York, 1958
- Robertson, James. Hospitals and Children: a parent's-eye view, Victor Gollancz LTD, London, 1962
- Wheeler, E. Todd. Hospital Design and Function, McGraw-Hill, Inc., New York, 1964
- Rosenfield, Isadore. Hospital Architecture and Beyond, Van Nostrand Reinhold Company, New York, 1969
- Kansas State Board of Health. Kansas Hospital Regulations, fifth edition, Topeka, Kansas, 1969
- U.S. Department of Health, Education, and Welfare. Manual for the Care of Children in Hospitals, 1968
- The City of Topeka. Neighborhood Analysis, Topeka, Kansas, 1965
- U.S. Department of Health, Education, and Welfare. Design of Facilities for the Mentally Retarded, Washington, D.C. 1965

- Danby, Miles. Grammar of Architectural Design with special reference to the tropics, Oxford University Press, London, 1963
- Illuminating Engineering Society, IES Lighting Handbook, Waverly Press, Inc., Baltimore, Maryland, 1966
- American Concrete Institute. Building Code Requirements for Reinforced Concrete, ACI Standard, 1963
- Concrete Reinforcing Steel Institute. CRSI Design Handbook, Vol. II, Kingport Press Inc., Kingport, Tennessee, 1965
- Danham, Clarence W.. The Theory and Practice of Reinforced Concrete, McGraw-Hill, Inc., New York, 1953
- Architectural Forum, Vol. 107. July, 1957. p.128 "For a Mental Hospital, an Intensive-care Children's Wing"
- Architectural Forum, Vol. 100. January, 1954. p.138-p.143 "Hospital Designed to Bring Cheer to Children"
- Architectural Forum, Vol. 95. July, 1951. p.152-p.155 "Children's Hospital to Make Them Match New Medical Thinking"
- Architectural Forum, Vol. 95. July, 1951. p.156-p.157 "Cheerful U.S. Children's Hospital is a Community Project"
- Architectural Forum, Vol. 65. December, 1936. p.511-p.516 "Children's Hospital, Denver, Colorado"
- Architectural Record, Vol. 136. October, 1964. p.177-p.196 "Children's Medical and Surgical Center", The Johns Hopkins Hospital, Baltimore.

- Architectural Record, Vol. 134. November, 1963. p.170-p.173
"Children's Psychiatric Hospital" in Topeka.
- Architectural Record, Vol. 122. November, 1957. p.208-p.210
"Planning the Pediatric Nursing Unit", abstract from
'The Care of Children in Hospital' by American Academy
of Pediatrics.
- Architectural Record, Vol. 112. December, 1952. p.113-p.120
"Le Bonheur Children's Hospital" in Memphis.
- Architectural Record, Vol. 96. October, 1944. p.60-p.67
"Children's Hospital, Mexico City"
- Modern Hospital, Vol. 106. March, 1966. p.78-p.79 "Study
Gives 33 Rules for Pediatric Design", A three-year study
in Boston has produced new planning guidelines for
children's hospitals.
- Modern Hospital, Vol. 66. January, 1946 p.48-p.51 "Life
Begins in Safety in this Remodeled Nursery"
- Modern Hospital, Vol. 57. September, 1941. p.56-p.59 "This
Out-Patient Department is Outgrowth of Careful Planning"
- Modern Hospital, vol. 53. November, 1939. p.56-p.59 "From
8 Beds to 80" by Raymond P. Sloan
- Progressive Architecture, Vol. 36. November, 1955. p.128-p.133
"Crippled Children's Hospital", New Orleans, Louisiana
- Progressive Architecture, Vol. 35. November, 1954. p.12
"Children's Hospital with Psychiatric Unit"
- Pencil Points, Vol. 26. August, 1945. p.67-p.69 "A Type Plan
for a Pediatric Hospital Unit"

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TOPEKA CHILDREN'S HOSPITAL

by

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B. S., Seoul National University, 1968

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF ARCHITECTURE

College of Architecture and Design

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1970

A child is not a small adult, and should not be treated as such. Since the middle of the 19th century, attention has been paid to the hospitalization of children. According to the necessity of children's wards or hospitals, it has prevailed and is a general tendency to be more specialized. The ultimate goal of this Topeka Children's Hospital project is to contribute in forming a medical center in Topeka, Kansas by designing one specialized hospital.

Topeka Children's Hospital of 102 beds will provide both outpatient with surgical and emergency departments, and inpatient services of short-term, averaging 6 days, and long-term hospitalization. TCH is only for the children under the age of 12: before adolescent age, who do not need sexual distinction.

In the architectural design of TCH, every effort was made to create an intimate environment and an informal atmosphere, and to eliminate any suggestion of an institutional character in the physical setting. The final physical setting was fixed as follows: a building consisting a nursing unit complex and an outpatient complex with the connection corridor between the two. One contains nursing units, common space and service facilities, the other one contains outpatient, surgical departments and a parking garage below. The different functions are housed in separate complexes, so that each one can be scheduled and added when considered necessary.

Physical facilities for diagnosis, treatment, and care of

inpatients require a comprehensive and flexible arrangement to accommodate the assigned services.

Automobile circulation is so important that the parking area will be sheltered at the ground floor and basement floor levels of the outpatient complex. This will be done to get rid of undesirable long unsheltered walks through the parking lot to the entrance and to do away with the usual ugly rows of parked cars. An outdoor landscaped enclosure is an essential extension of inside medical facilities.

It is hoped that the study of Topeka Children's Hospital can be a reference for others.