

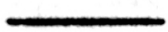
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A STUDENT HEALTH CENTER FOR
KANSAS STATE COLLEGE

by

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B. S., Kansas State College
of Agriculture and Applied Science, 1933



A THESIS

submitted in partial fulfillment of the

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Department of Architecture

KANSAS STATE COLLEGE
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INTRODUCTION

It was almost a century ago that Amherst College recognized the fact that the health of a student must be good if he was to complete his college education, so provided medical treatment for their students.

Vassar in 1865 and Wellesley in 1875, both girls' schools, provided in their dormitories an infirmary, convalescent room and living quarters for a resident physician and a trained nurse, to be the first institution of higher learning to furnish any means of hospitalization.

It was not until 1891 and 1892 when the universities of Leland Stanford, Princeton and Chicago provided infirmaries so that men could enjoy the same benefits.

Since the beginning of the twentieth century, most colleges and universities had made some provision for medical care of their students, now practically every school of higher learning has a dispensary and most of them a separate building for this service. Many of these are among the most modern and up to date hospitals in the United States.

In 1871 the legislature of Kansas authorized the township of Manhattan, Riley County, to issue bonds to be expended for the purchase of a farm near Manhattan. This farm contained a residence which was erected in 1866. It was occupied by the college presidents until 1885, and then was occupied by the Professor of Agriculture.

The west wing was added in 1920 by using the razed material of a stone barn which was erected in 1889 for the horticulture

department and has been the student infirmary since 1920.

Kansas State College is in dire need of a building to care for its students who become ill. The present hospital is much too small, its 25 beds are less than one third enough, the size of the kitchen is adequate for a family of about five. It was originally designed to house a small family. There is no food storage space, needed very badly by any hospital. The laboratory room will permit only one laboratory technician while four or five are needed. A curtain is stretched across the hall on the second floor to permit patients to go to the bathroom in privacy.

The state of Kansas owes to this school a modern, up to date health center to care for students who are away from home; for many of them it is their first experience. The data given in Table 1 show the number of students who are given medical attention and also the number hospitalized. This in itself proves the need of a health center and dispensary. It is also very difficult to retain an efficient staff under such working conditions.

STATEMENT OF THE PROBLEM

The requirements for the Student Health Center are: 80 beds; offices and examination rooms for eight doctors; operating suite; treatment rooms, (radiographic, physical therapy and out-patient treatment room); emergency room; food preparation and dispensing for patients, doctors, nurses, students needing special diets, office help and kitchen help; pharmacy dispensary and storage; a men's and a women's lounge for convalescent patients; and a linen receiving room.

Table 1. A Comparison of Dispensary Visits, Medical Attention and Hospital Services Rendered by the Student Health Service During the Past Nine Years 1st and 2nd Semesters 1936-37 to 1944-45.

Year	Dispensary visits	Medical attention	Hospital adm.	Rate per 1000 students registered	Total hosp. days	Avg. hosp. stay per patient in days	% of H.S. clientele hospitalized	Avg. no. students in C.H. per day	Avg. % of H.S. clientele in C.H. each day
1936-37	34,508	19,752	932	236	4,967	5.30	23.6		
1937-38	41,434	23,814	927	236	3,615	3.89	23.6		
1938-39	42,243	27,146	946	243	2,666	2.81	24.3		
1939-40	48,025	21,929	1,168	283	3,333	2.85	28.3		
1940-41	50,866	24,043	1,328	255	4,548	3.42	25.5	17.84	.41
1941-42	45,793	22,530	1,231	267	4,515	3.66	26.8	18.00	.45
1942-43	14,546		685	179	2,563	3.74	17.9	21.74	.64
1943-44	27,356	15,991	1,081	419.7	4,817	4.46	41.97	19.05	.74
1944-45	11,201	7,106	285	179.81	1,114	4.06	17.98	4.59	.29

LOCATION

A possible location for the proposed Student Health Center is in the area east of the cafeteria. In this location the students who pass through Aggieville on their way to school would no doubt stop at the health center for any medical treatment necessary. The same thing would be true for those living directly east of the campus, should the location of the Student Health Center be south east of the president's home. In both of the above locations the building would be either rectangular or T shaped. In the author's opinion neither of these locations would benefit any large concentration of students and the one east of the cafeteria would be subject to more confusion due to traffic in Aggieville.

Women's residence halls are now being planned to the south and west of Van Zile Hall which will ultimately accommodate 600. Also possible construction of men's residence halls north or north west of the campus is contemplated to accommodate between 900 and 1000 men. A site east of Mid Campus Drive, north of Van Zile Road and west of Campus Creek was selected. This location will be in the vicinity of a large per cent of the students' living quarters and is ideally located near the edge of the campus for quietness, yet well within walking distance for everyone.

An L shaped building seems to be the only solution in this trapezoidal area, and it certainly has its advantages. Its main entrance is to the southwest which gives equal importance when

driving on either Mid Campus Drive or Van Zile Road. The service area is to the rear and its view is completely obstructed from either of the fronts.

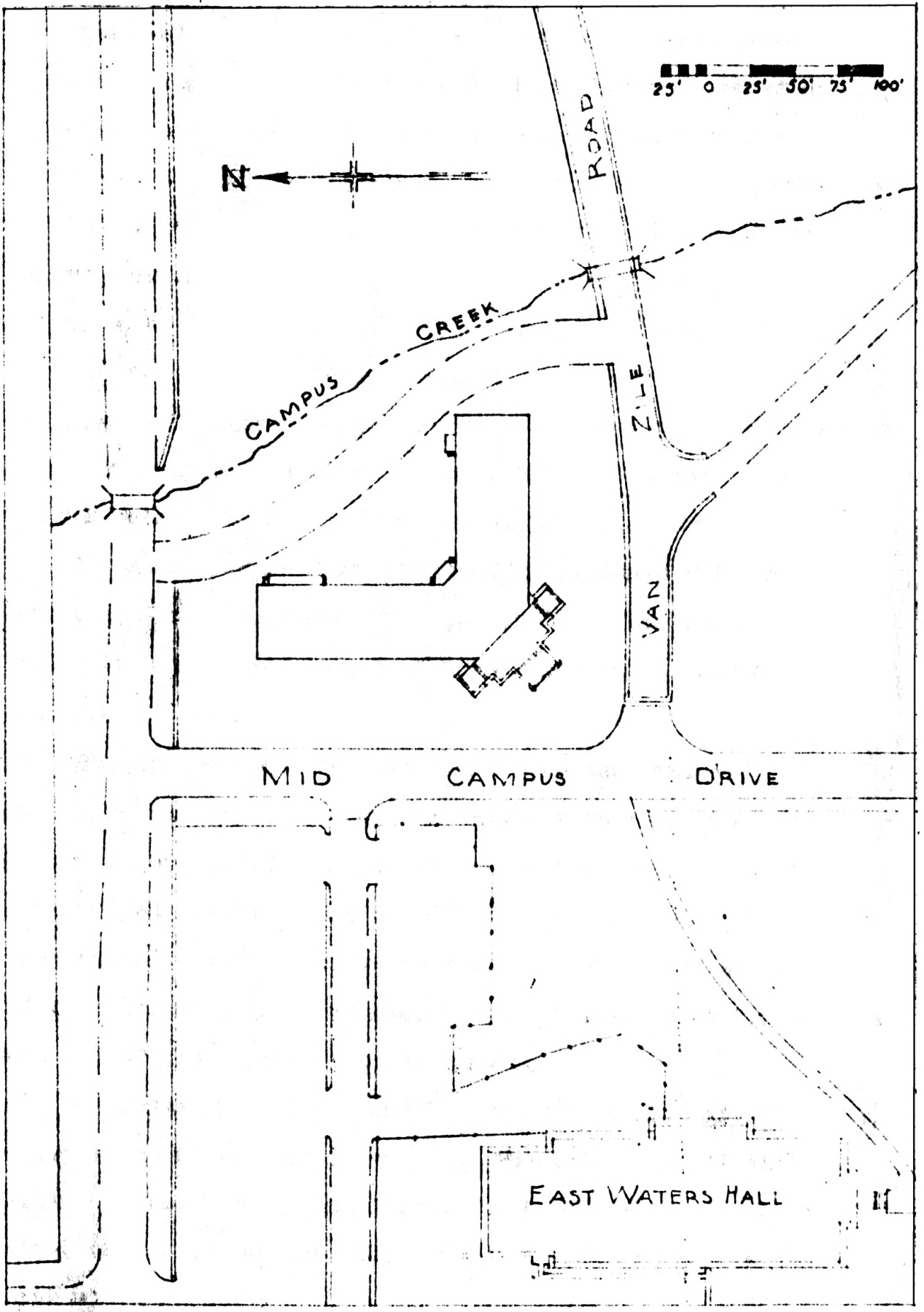
The possibility of Campus Creek flooding the basement during a flash flood is quite remote, as the top of the basement floor is approximately six feet above the bed of the creek.

A stone abutment wall might be built along the west side of the creek, then the area to the rear of the hospital would be enlarged sufficiently to allow a service and ambulance drive and parking area for members of the hospital staff. Storm tile could also be placed in the creek bed and filled over, which would give the same results as the abutment wall.

Plate 1 shows the plot plan in detail.

ARCHITECTURAL PLANS

The north wing of the basement floor is primarily for food preparation and dining rooms. The storage rooms are to the north of the kitchen, just inside the door from the north loading dock. The cold storage is divided into four separate rooms, one for vegetables, another for dairy products and the other two for meat and frozen products. The inside cold storage room for meat is to have a temperature of sub-zero, so that meats and frozen products may be purchased in large quantities. One of the dining rooms south of the kitchen is for doctors, nurses, laboratory technicians and office help. They are to be served by the kitchen help and their hours of eating will be staggered so that at least a partial staff will be on duty at all times.



The dining room across the hall is for dietary students. There are students who can not attend college because of dietary difficulties. These could be treated as outpatients and would of course pay for their meals just the same as if they ate at a boarding house, restaurant or private home. It is assumed that the purpose of a Student Health Center is not only to cure a patient but also to maintain student health at a high level.

At the intersection of the north and east wings is the ambulance and delivery entrance, with a receiving room to the right for temporary storage and unpacking. The incinerator which services the entire building is in this room.

The emergency room is for treating patients with minor injuries or preparing emergency patients for the operating room. It is also to be used to put on plaster casts in case of bone fracture.

The laundry receiving room is in the east end of the east wing. The laundry chute empties into a room where the soiled linens may be sorted and made ready for delivery to a laundry. As the clean linens are returned from the laundry, they are first sorted, then stored until needed. Sewing tables for repairing linens are located near the large windows at the extreme east end of the laundry receiving room.

As the health records and X-rays must be kept indefinitely, a very large store room is needed. There is a spiral stairway leading to the business office on the first floor. A similar situation exists for the pharmacy and the dispensary in the north wing.

Locker and dressing rooms are provided on the basement floor for both the men and women employees.

The first floor is used primarily for outpatient treatments and physical examinations at the beginning of each semester. The office is to the right as one enters through the main entrance, and where needed information can be secured. The health charts are on this floor and the office help has direct access to the files in the basement by means of the spiral stairway.

The general waiting room for visitors, salesmen, etc, is to the left of the main entrance while the larger outpatient waiting room is on the opposite side of the hall at the intersection of the two wings. An attendant on duty will direct the outpatients to the proper office or treatment room as soon as possible.

The doctors have their offices and examination rooms in the north wing and are close to each other for consultation purposes. A small dressing room is in each examination room for the convenience of the patient. In the outer office the doctor has ample room for his personal library and any current literature that he may wish to keep.

The reception room for the dentist and the eye, ear, nose and throat doctor is combined at the north end of the north wing. Each of these examination rooms has north light while the dentist also has east light. The dark vision tunnel has a standard clear distance of 20 feet.

The outpatient may get his prescription filled at the pharmacy dispensary as he leaves the building. The preparation

and supply room is directly underneath in the basement and may be conveniently reached by means of the spiral stairway.

The outpatient treatment rooms in the east wing are to insure the patient of the proper treatment. A student away from home does not have access to lamp treatments, foot and hand soak, etc., unless it is done at a health center. The student may come for an hour of supervised treatment between classes and the doctor then knows when it may be discontinued.

The laboratory is conveniently located for testing samples, making blood counts, etc., a necessity in any hospital. The radiographic section is so arranged that when making mass examinations, as at the beginning of a semester, the students may prepare themselves in the physical therapy room and then have their X-rays taken by going through the door connecting the treatment room and the X-ray reading room. The developing room has a light lock to insure complete darkness. The control room is completely lead lined with leaded glass in the window and door.

Access to the wards on the second and third floors may be reached by a stairway in each wing or the centrally located elevator. Each semi-private room or ward has a clothes closet to maintain a clean and neat room. A lavatory and water closet room is placed between each two wards. The several closets, in the corridors between the bed rooms in addition to the linen storage room, serve as ample storage space on these two floors.

A general bath room with tub and shower is located on each floor. A lounge and reading room with the large south west

windows looking toward the center of the campus is provided on each of the upper two floors for convalescents. It is also an ideal place for friends or parents to visit with those who are confined.

The nurse's station on each floor is at the intersection of the two wings, and she has good vision of each wing. The men are to occupy the second floor and the women the third.

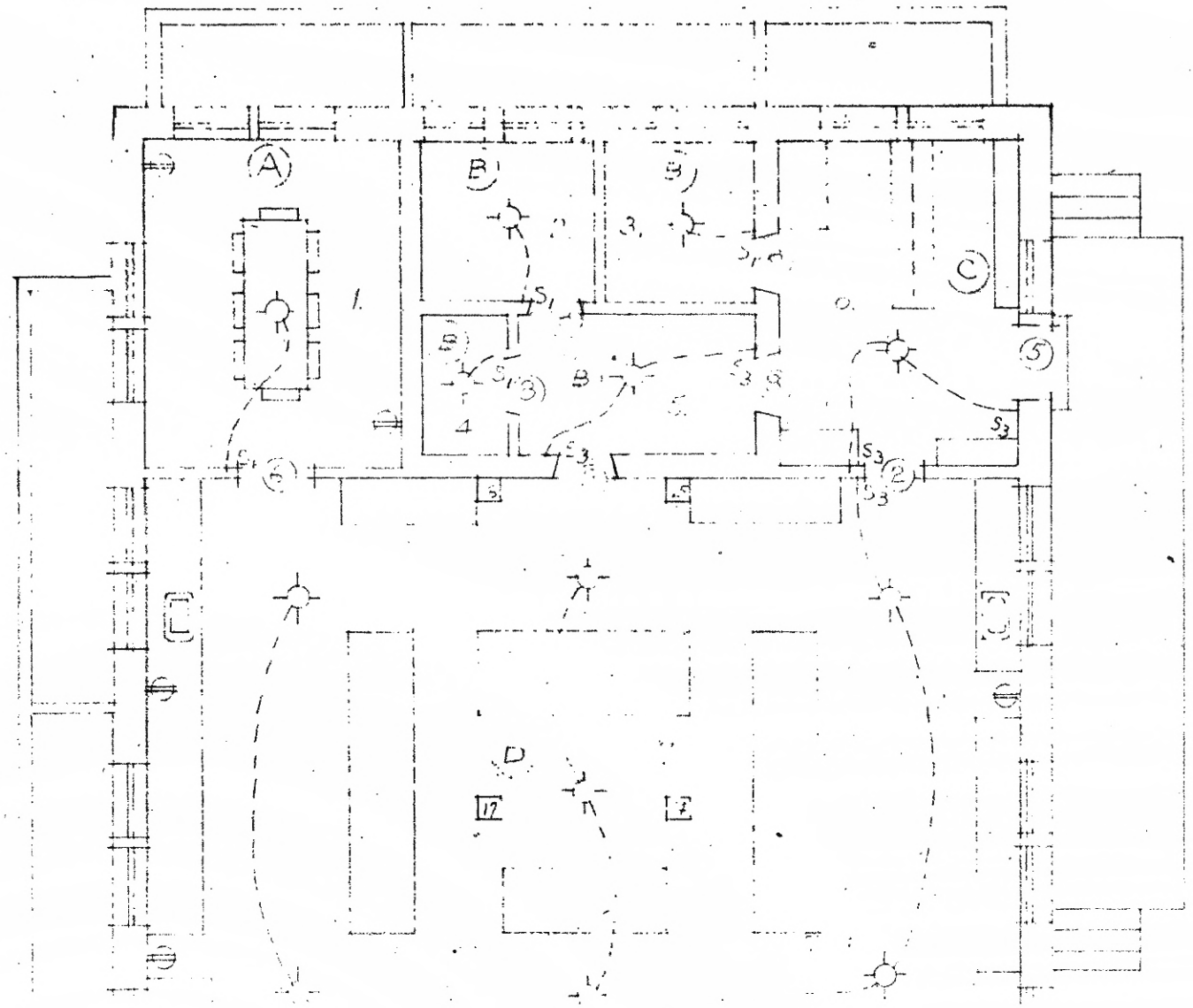
Prepared bulk food is sent to the diet kitchen on these two floors by means of a dumb waiter. The steam tables will keep it warm until all the patients have been served. A complete dish washing unit is provided in each kitchen and storage of clean dishes is in the built-in cupboards. The refrigerator and gas range in each kitchen will permit the preparation of special foods for the patients.

The operating suite is at the north end of the north wing. It consists of the large operating room with all north light, a doctor's dressing and locker room and scrub-up room adjoining it on the west side. To the east is the autoclave, space for preparing dressing drums and packs and their storage.

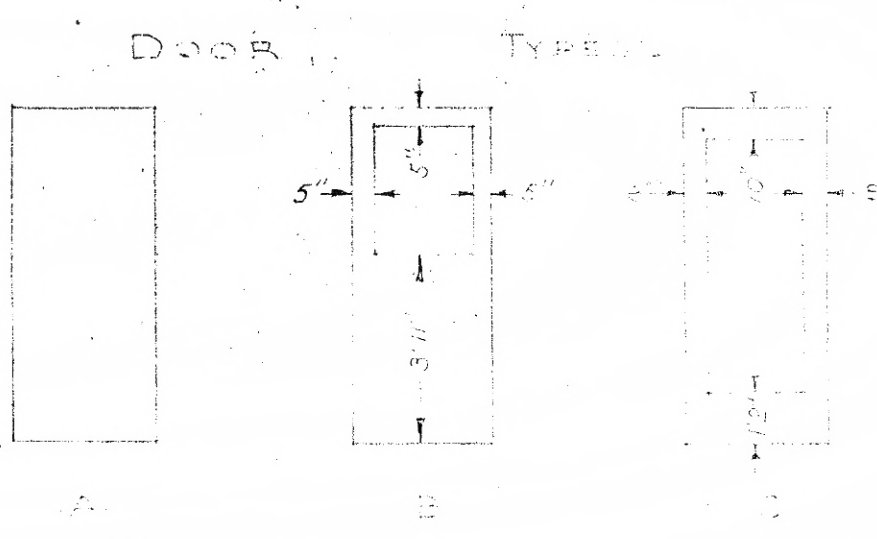
The nurse's lounge, with bathroom and shower, is conveniently located near the operating room for use before and after operations.

Allowing 60 cents per cubic foot, the cost of the building and equipment, exclusive of the service tunnel, is \$337,000.00. By studying Plates 2 to 5 a better idea of the workability of the Student Health Center is accomplished. Plate 6 shows the north and east elevations and a perspective view from the south

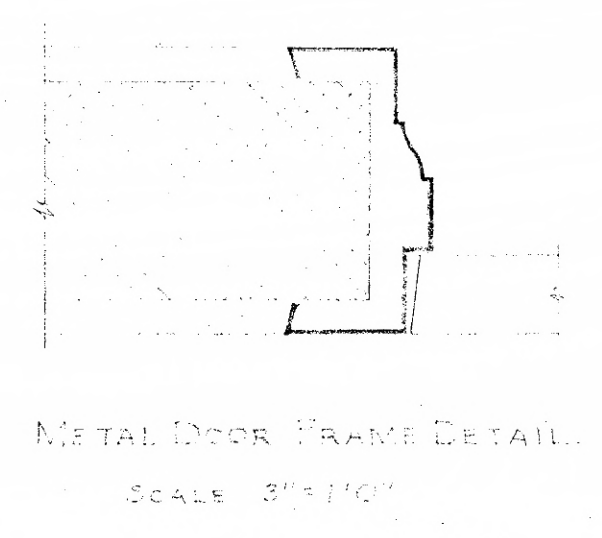
PLATE 2



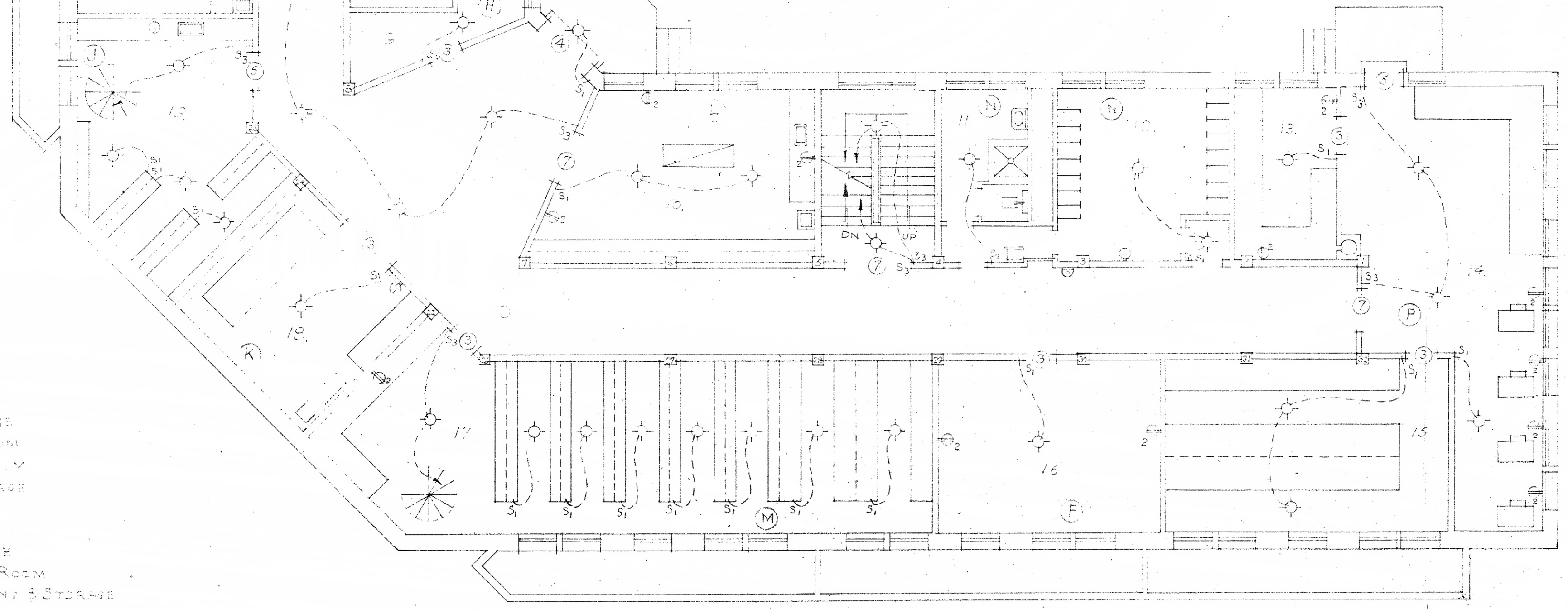
BASEMENT FLOOR FINISH SCHEDULE																
Room Numbers	FLOOR			BASE			WALL			CEILING						
	CEMENT	TILE	TERRAZZO	LINOLEUM	CEMENT	TILE	TERRAZZO	LINOLEUM	PLASTERED	NOT PLASTERED	PAINTED	TILE 4" HIGH	PLASTERED	NOT PLASTERED	PAINTED	ACOUSTICAL TREATMENT
1-7-8-13-14-15-22-23				X				X	X		X		X		X	
2-3-4-5	X				X				INSULATED			INSULATED				
6-9-11-12-16-17-18-19-20-21	X				X				X				X			
10	X				X				X		X		X		X	
19	X				X					X				X		
CORRIDOR				X			X		X		X					X
STAIRWAY				X			X		X		X		X		X	



DOOR SCHEDULE												
DOOR NUMBER	WIDTH	HEIGHT	THICKNESS	TYPE	DOOR MATERIAL			FRAME & TRIM				
					BIRCH VENEER	CLEAR GLASS	OPACIFIED GLASS	METAL	TRANSOM			
1	3'0" x 7'0"	1 3/4"	A	X				X	X			
2	3'0" x 7'0"	1 3/4"	A	X				X				
3	3'0" x 7'0"	1 3/4"	B	X		X		X	X			
4	3'0" x 7'0"	2 1/4"	C	X	X			A				
5	3'0" x 7'0"	1 3/4"	B	X				X				
6	3'0" x 7'0"	1 3/4"	B	X		X		X	X			
7	3'0" x 7'0"	1 3/4"	B	X		X		X	X			
8	3'0" x 7'0"	4 1/2"	INSULATED FOR COLD STORAGE									

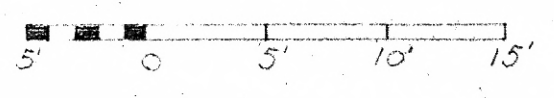


- ROOM DESIGNATIONS
- (A) DINING ROOM
 - (B) COLD STORAGE
 - (C) FOOD STORAGE
 - (D) KITCHEN
 - (E) DETICIAN'S OFFICE
 - (F) GENERAL STORAGE
 - (G) MEN'S LOCKER ROOM
 - (H) INCINERATOR ROOM
 - (I) PHARMACY STORAGE
 - (J) UTILITIES ROOM
 - (K) EMERGENCY ROOM
 - (L) RECORDS STORAGE
 - (M) WOMEN'S LOCKER ROOM
 - (N) LAUNDRY REWIND & STORAGE



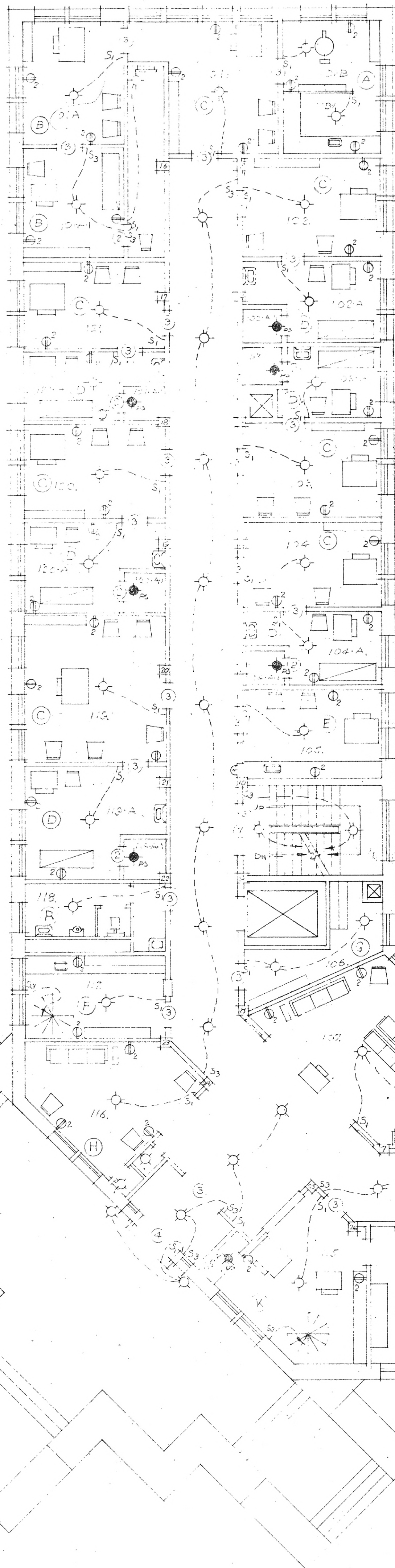
BASEMENT FLOOR PLAN

SCALE 1/8" = 1'0"



A STUDENT HEALTH CENTER
FOR
KANSAS STATE COLLEGE
JAMES H. HENNINGER, ARCHT. 1947

PLATE 3



FIRST FLOOR FINISH SCHEDULE																
ROOM NUMBERS	FLOOR				BASE				WALL			CEILING				
	CEMENT	TILE	TERRAZZO	LINOLEUM	CEMENT	TILE	TERRAZZO	LINOLEUM	PLASTERED	NOT PLASTERED	PAINTED	TILE 4'0" HIGH	PLASTERED	NOT PLASTERED	PAINTED	ACoustICAL TREATMENT
101-102-103-104-105-107-108-111-112-113-114-115-116-117-119-120-121-				X				X	X		X		X		X	
106	X				X				X				X			
109-110-118-		X				X			X		X	X	X		X	
CORRIDOR			X				X		X		X					X
STAIRWAY			X				X		X		X		X		X	

NOTE: ALL INNER ROOMS HAVE SAME FINISH AS ITS OUTER ROOM.

ROOM DESIGNATIONS.

- (A) DENTAL SUITE
- (B) EYE, EAR, NOSE & THROAT
- (C) OFFICE
- (D) EXAMINATION
- (E) HEAD NURSE'S TREATMENT ROOM
- (F) PHARMACY
- (G) INCINERATOR ROOM
- (H) GENERAL WAITING ROOM
- (I) OUTPATIENT WAITING ROOM
- (K) GENERAL OFFICE
- (L) SECRETARY'S OFFICE
- (M) BUSINESS OFFICE
- (N) OUTPATIENT TREATMENT ROOM
- (P) RADIO GRAPHIC SUITE
- (Q) WOMEN'S REST ROOM
- (R) MEN'S REST ROOM
- (S) LABORATORY
- (T) PHYSICAL THERAPY SUITE

FIRST FLOOR PLAN

SCALE $\frac{1}{8}'' = 1'0''$

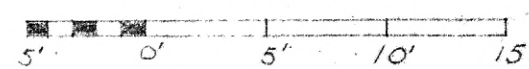
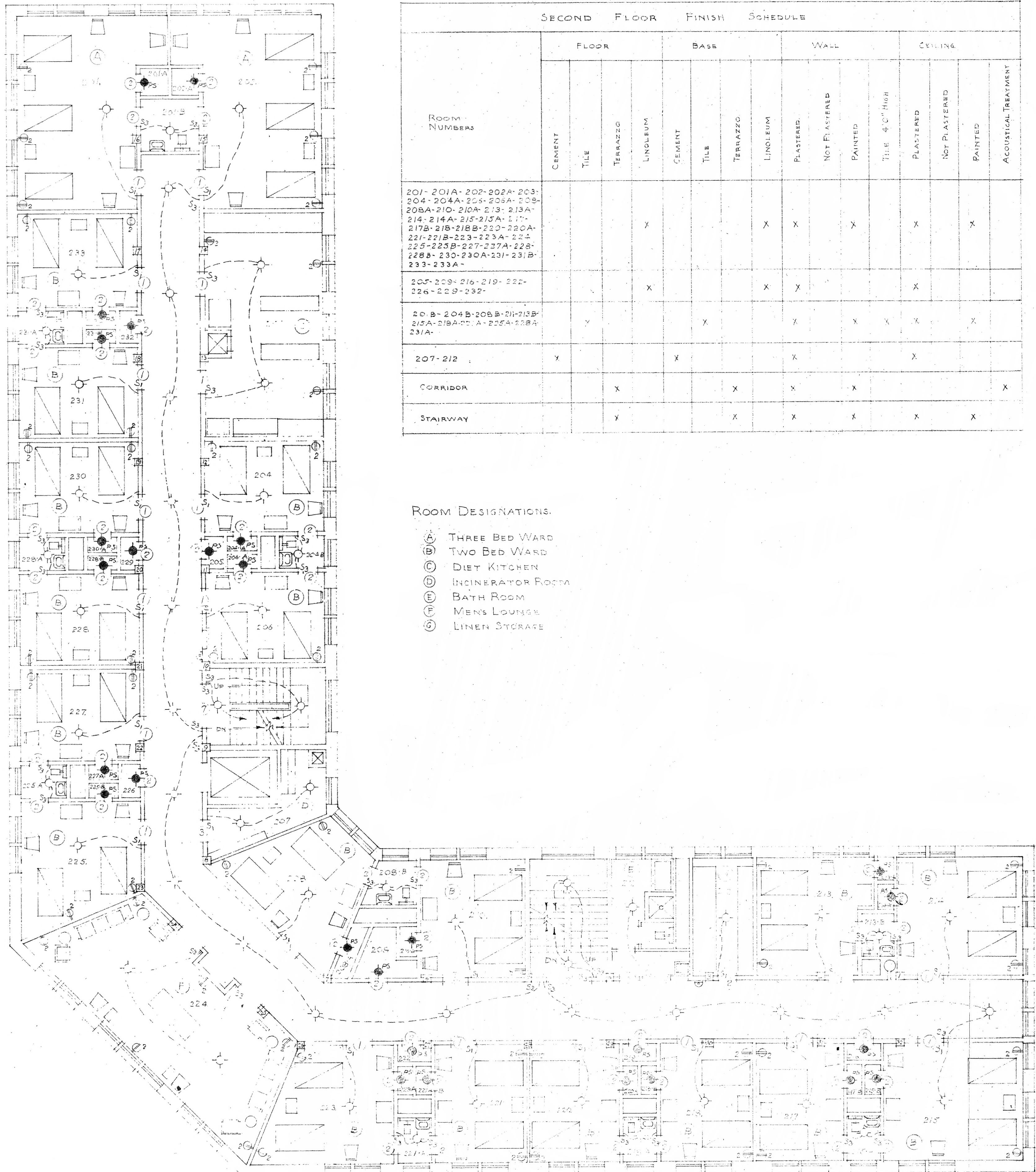




PLATE 4



SECOND FLOOR FINISH SCHEDULE																
ROOM NUMBERS	FLOOR				BASE			WALL			CEILING					
	CEMENT	TILE	TERRAZZO	LINOLEUM	CEMENT	TILE	TERRAZZO	LINOLEUM	PLASTERED	NOT PLASTERED	PAINTED	TILE 4'0" HIGH	PLASTERED	NOT PLASTERED	PAINTED	ACOUSTICAL TREATMENT
201- 201A- 202- 202A- 203- 204- 204A- 205- 205A- 208- 208A- 210- 210A- 213- 213A- 214- 214A- 215- 215A- 217- 217A- 218- 218B- 220- 220A- 221- 221B- 223- 223A- 224- 225- 225B- 227- 227A- 228- 228B- 230- 230A- 231- 231B- 233- 233A				X				X	X		X		X		X	
205- 209- 216- 219- 222- 226- 229- 232				X				X	X				X			
204B- 204B- 208B- 211- 212B- 215A- 218A- 221A- 225A- 228A- 231A		Y				X			X		X	X	X		X	
207- 212	X				X				X				X			
CORRIDOR			X			X	X	X	X							X
STAIRWAY			X			X	X	X	X			X	X			

ROOM DESIGNATIONS.

- (A) THREE BED WARD
- (B) TWO BED WARD
- (C) DIET KITCHEN
- (D) INCINERATOR ROOM
- (E) BATH ROOM
- (F) MEN'S LOUNGE
- (G) LINEN STORAGE

SECOND FLOOR PLAN

SCALE 1/8" = 1'-0"

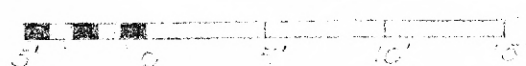
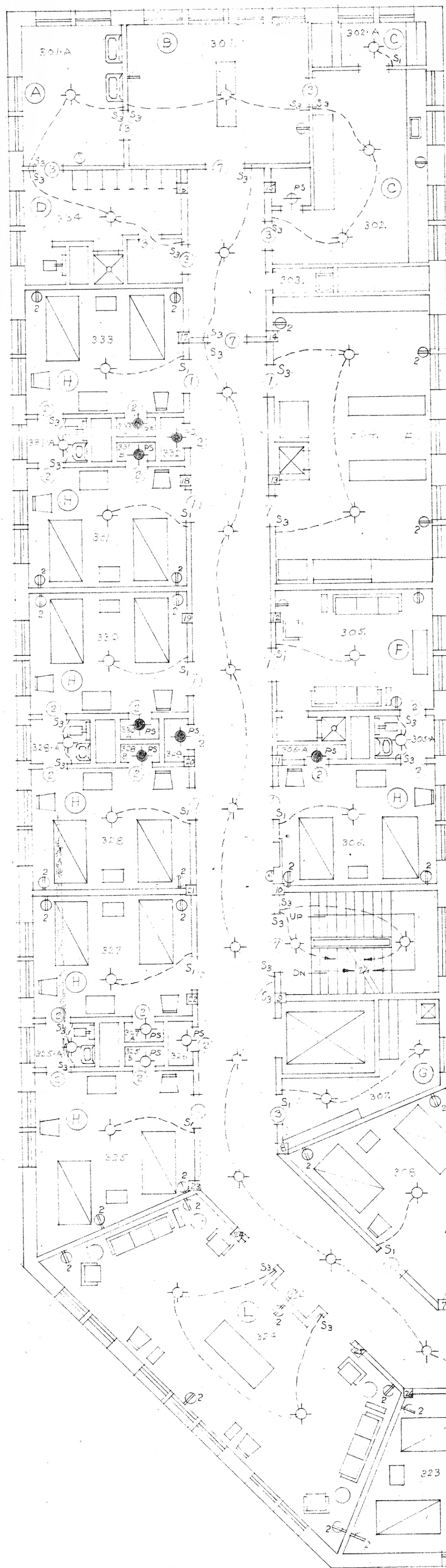


PLATE 5



ROOM NUMBERS	THIRD FLOOR FINISH SCHEDULE															
	FLOOR				BASE				WALL				CEILING			
	CEMENT	TILE	TERRAZZO	LINOLEUM	CEMENT	TILE	TERRAZZO	LINOLEUM	PLASTERED	NOT PLASTERED	PAINTED	TILE 4'-0" High	PLASTERED	NOT PLASTERED	PAINTED	ACOUSTICAL TREATMENT
301A-301-305A-308A-311-313A-315A-318A-321A-325A-328A-331A-334		X				X			X		Y	X	X		X	
302A-312				Y				X	X				X			
302-304-305-306-306A-308-308B-310-310A-313-313B-314-314A-315-315B-317-317A-318-318B-321-320A-321-321A-321B-322A-322B-323-323A-323B-324-325-325B-327-327A-328-328B-330-330A-331-331B-333-333A				Y				Y	X		Y		X		X	
307	X				X				X				X			
CORRIDOR			X				X		X		X					X
STAIRWAY			X				X		X		X		X		X	

ROOM DESIGNATIONS.

- (A) SCRUB UP ROOM
- (B) OPERATING ROOM
- (C) NURSE'S WORK ROOM & STORAGE
- (D) DOCTOR'S LOCKER ROOM
- (E) DIET KITCHEN
- (F) NURSE'S LOUNGE
- (G) INCINERATOR ROOM
- (H) TWO BED WARD
- (J) BATH ROOM
- (X) LINEN STORAGE
- (L) WOMEN'S LOUNGE

THIRD FLOOR PLAN

SCALE 1/8" = 1'-0"





EAST ELEVATION



PERSPECTIVE FROM SOUTH WEST



NORTH ELEVATION



△ STUDENT HEALTH CENTER
FROM
KANSAS STATE COLLEGE
JOHN J. HENNINGER AUG. 1942

west. Plates 7 to 10 show diagrammatic drawings for the plumbing.

STRUCTURAL FRAMING

One of the prime factors in the design of any hospital is that it be fire-proof, and that one requirement means reinforced concrete or steel frame construction.

The author first considered slab-beam-girder construction, but that in turn means some kind of furring for a ceiling, which is expensive. Steel framework encased with terra cotta or some such fire-proof material is very desirable but is also quite expensive in this locality. Tile and joist slab was the final decision. It is not only fire-proof but the forming is very simple, the ceiling is immediately ready for plastering and to some extent it is sound proof. The tile also acts as a good insulation in the attic floor.

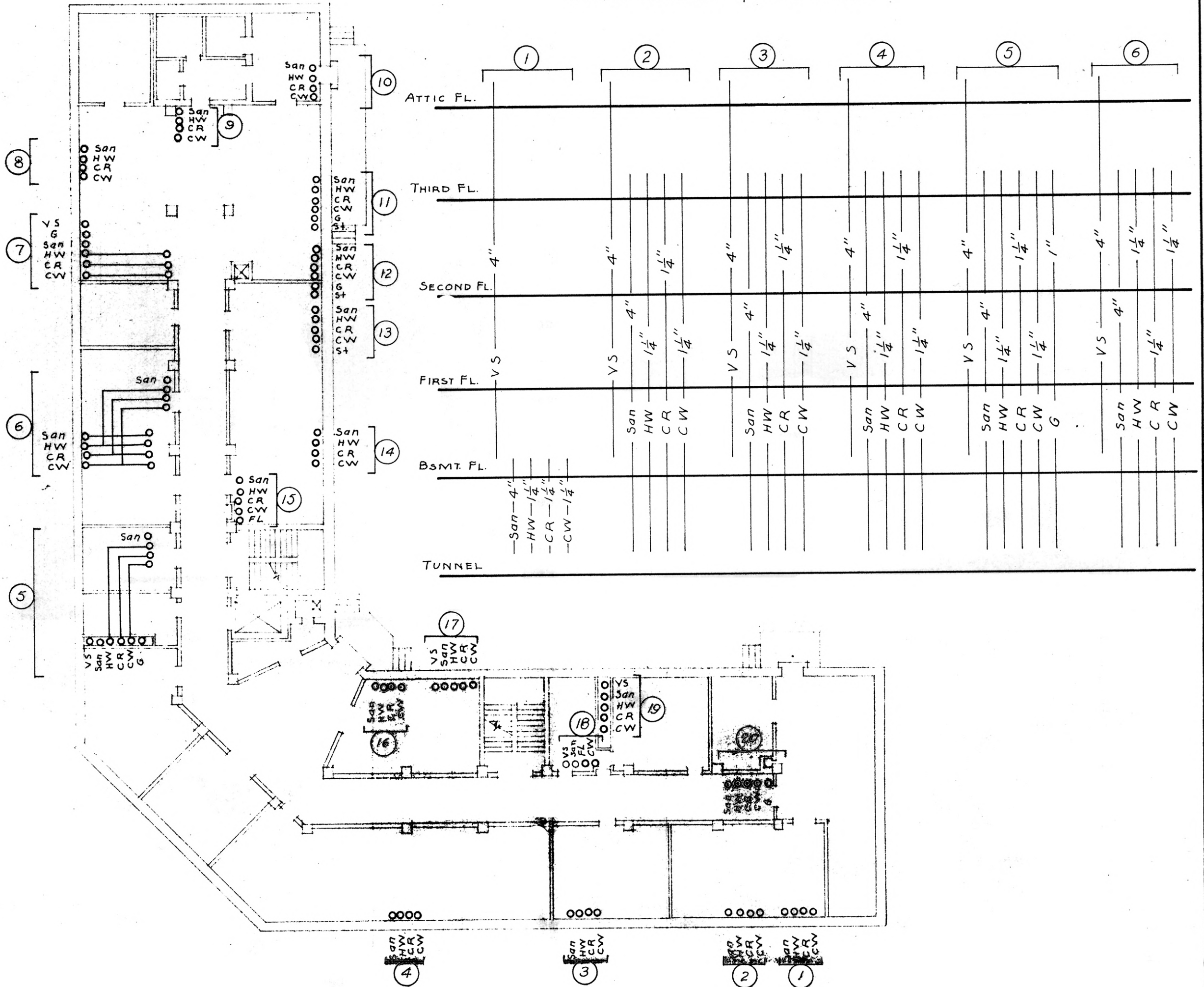
The ceilings in a few rooms may need to be furred to allow for the plumbing, but that expense would be no greater than the furring in a slab-beam-girder type of construction.

Beams on either side of the corridor together with the outside wall support the slab. The columns, which are continuous from the basement to the attic, support the beams. The few different groups of beams and columns mean easy, yet good, construction and inspection.

The author has used timber in the attic, which is not fire-proof because it is so much cheaper than steel trusses. The attic floor is reinforced concrete, which is fire-proof and that will protect the floor below from a fire hazard. The two stair-

PLATE 7

STACK NUMBERS & PIPE SIZES

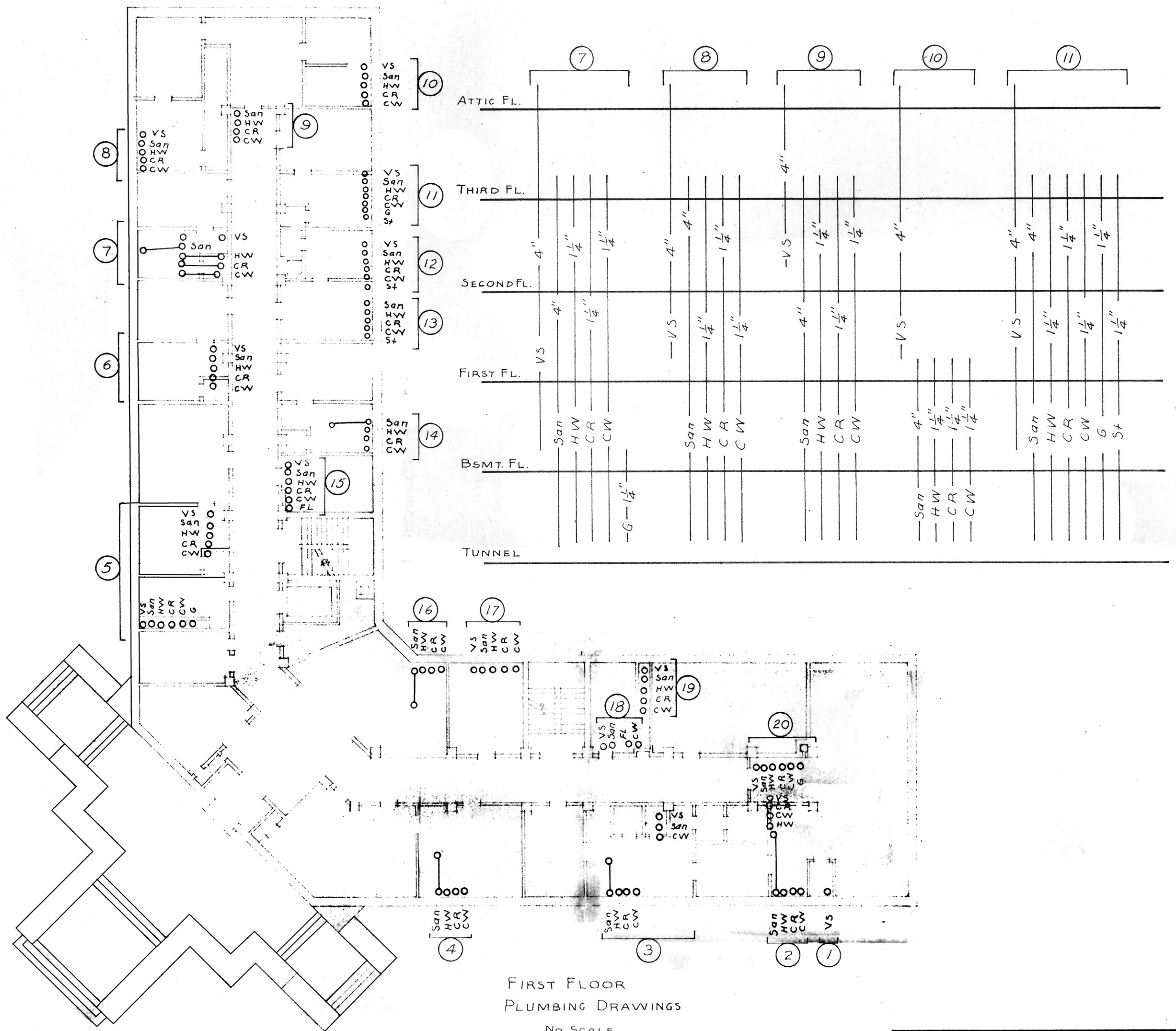


BASEMENT FLOOR
PLUMBING DRAWINGS
NO SCALE

A STUDENT HEALTH CENTER
FOR
KANSAS STATE COLLEGE
JOHN J. HEIMERICH Aug. 1, 1945

PLATE 8

STACK NUMBERS & PIPE SIZES

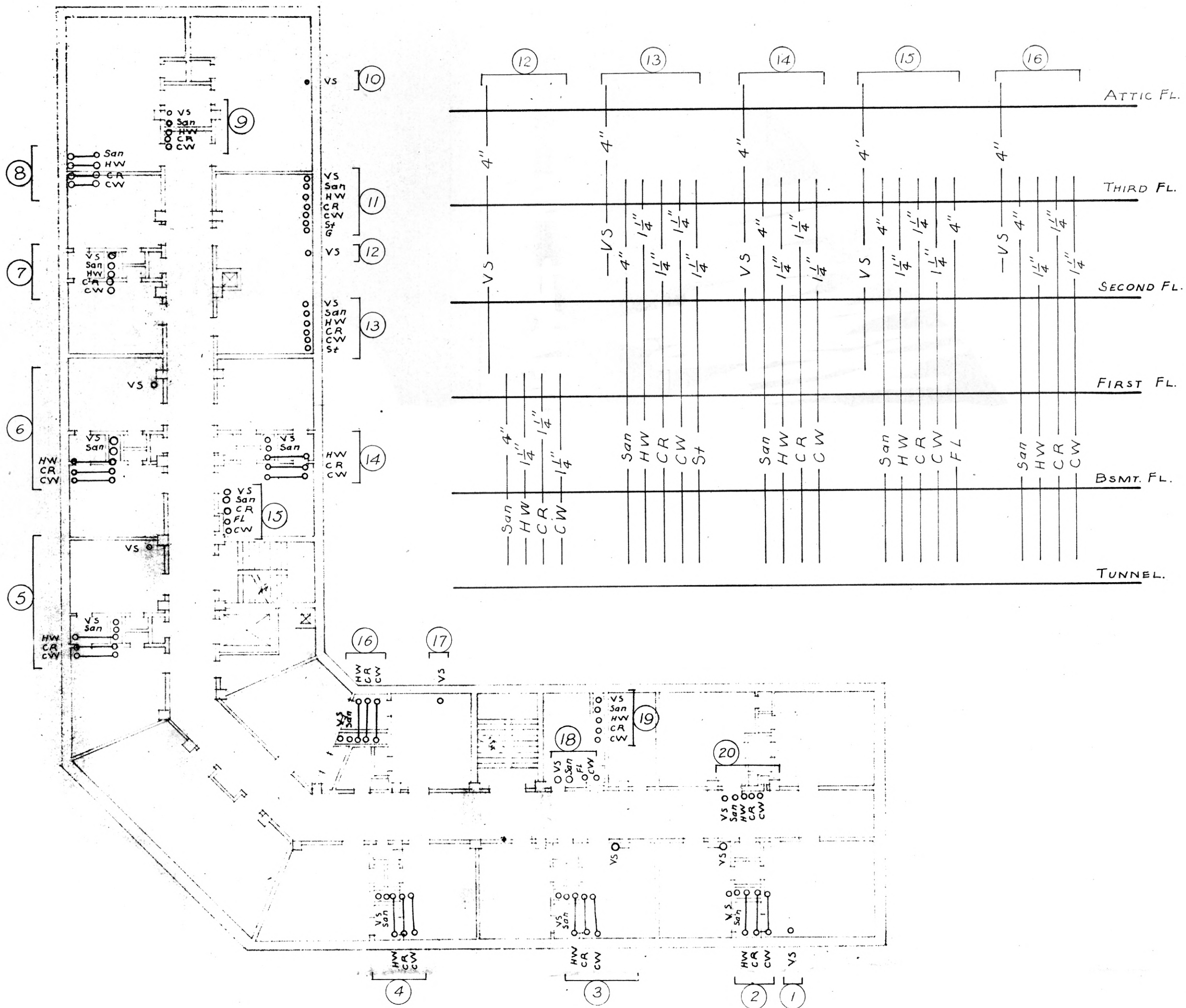


FIRST FLOOR
PLUMBING DRAWINGS
NO SCALE

A STUDENT HEALTH CENTER
FOR
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JOHN J. HEIMERICH AUG. 1, 1945

PLATE 9

STACK NUMBERS & PIPE SIZES.



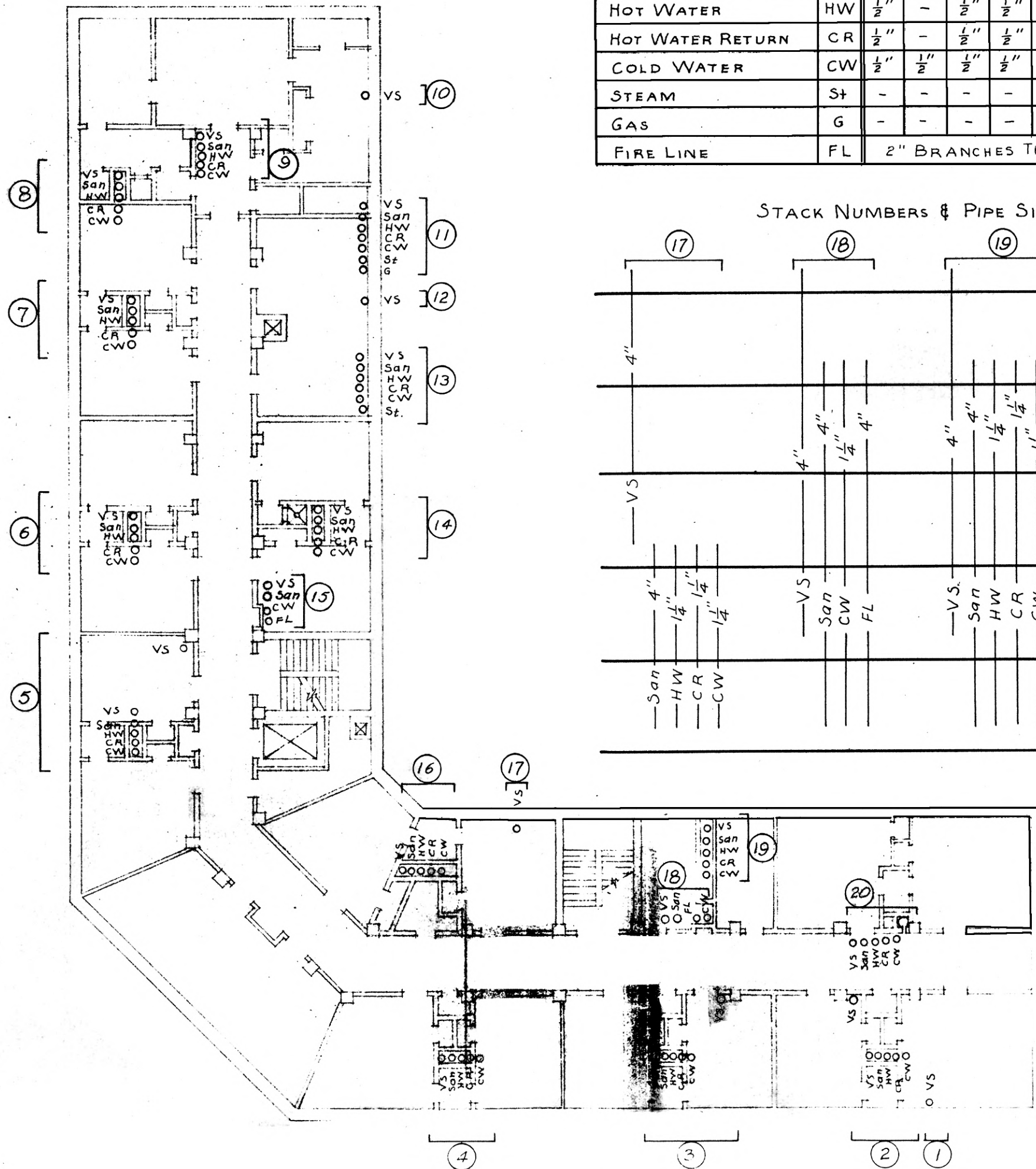
SECOND FLOOR
PLUMBING DRAWINGS
NO SCALE

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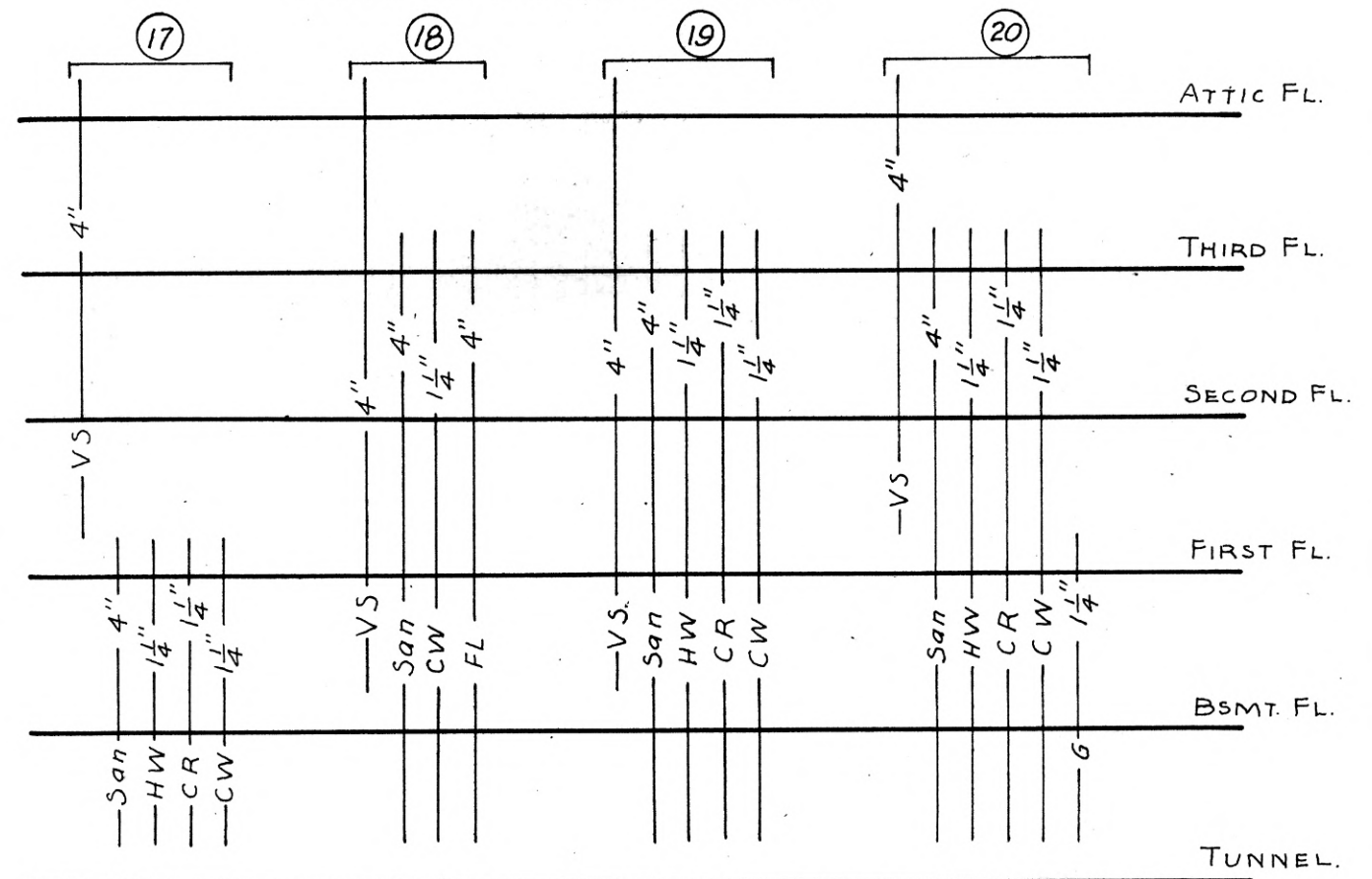
PLATE 10

BRANCH SERVICES & WASTES NOT OTHERWISE
SHALL BE SIZED AS FOLLOWS, WITH A SLOPE OF $\frac{1}{8}$ " IN 1'0".

FIXTURE SERVICE & SYMBOL		LAVATORY	WATER CLOSET	LABORATORY SINK	SHOWER	URINAL	SLOP SINK	DISH WASHER	STEAM TABLE	KITCHEN STOVE	DRINKING FOUNTAIN
		VENT LINE	VS	2"	4"	2"	3"	3"	3"	3"	2"
SANITARY SEWER	San	2"	4"	2"	3"	3"	3"	3"	2"	-	2"
HOT WATER	HW	$\frac{1}{2}$ "	-	$\frac{1}{2}$ "	$\frac{1}{2}$ "	-	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	-	-
HOT WATER RETURN	CR	$\frac{1}{2}$ "	-	$\frac{1}{2}$ "	$\frac{1}{2}$ "	-	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	-	-
COLD WATER	CW	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	-	$\frac{1}{2}$ "
STEAM	St	-	-	-	-	-	-	$\frac{1}{2}$ "	$\frac{1}{2}$ "	-	-
GAS	G	-	-	-	-	-	-	-	-	1"	-
FIRE LINE	FL	2" BRANCHES THROUGHOUT.									



STACK NUMBERS & PIPE SIZES



THIRD FLOOR
PLUMBING DRAWINGS
NO SCALE

A STUDENT HEALTH CENTER
FOR
KANSAS STATE COLLEGE
JOHN J. HEIMERICH
Aug. 1, 1945

ways, one in each wing, go from the top floor to the basement and have an exit to the outside should the furnishings catch fire.

Plates 11 to 16 show the construction details of the Student Health Center.

RADIANT HEATING

Radiant heating was used by the Romans at Bath, England, about 2000 years ago by circulating hot gases from charcoal fires through ducts to warm the floors, walls and ceilings.

The principle of radiant heating was rediscovered about 40 years ago by Mr. A. E. Barker, an English inventor when he discovered that one room in his home was more comfortable than another, even though the air temperatures were the same. It was due to the warming of the wall by furnace flues. Following this discovery, there were a large number of installations made in England and France. As early as 1909, pipes carrying steam were suspended between the floor joists, which were used to heat a small school in Glen Park, Indiana. Now hot water is used as the circulating medium and radiant heating is proving to be a very desirable means of heating.

The author has proposed the use of radiant heating for the Student Health Center and his reasons for so doing are listed below as advantages.

Advantages:

Hygiene. Since the surfaces which warm the room are at lower temperatures there is no stuffy air and the

PLATE 11

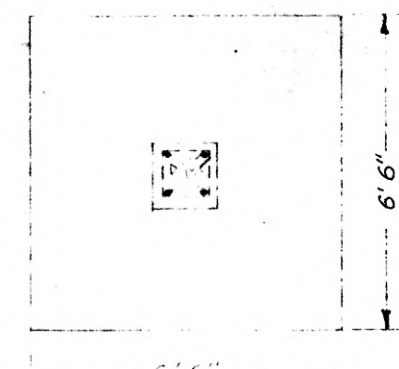
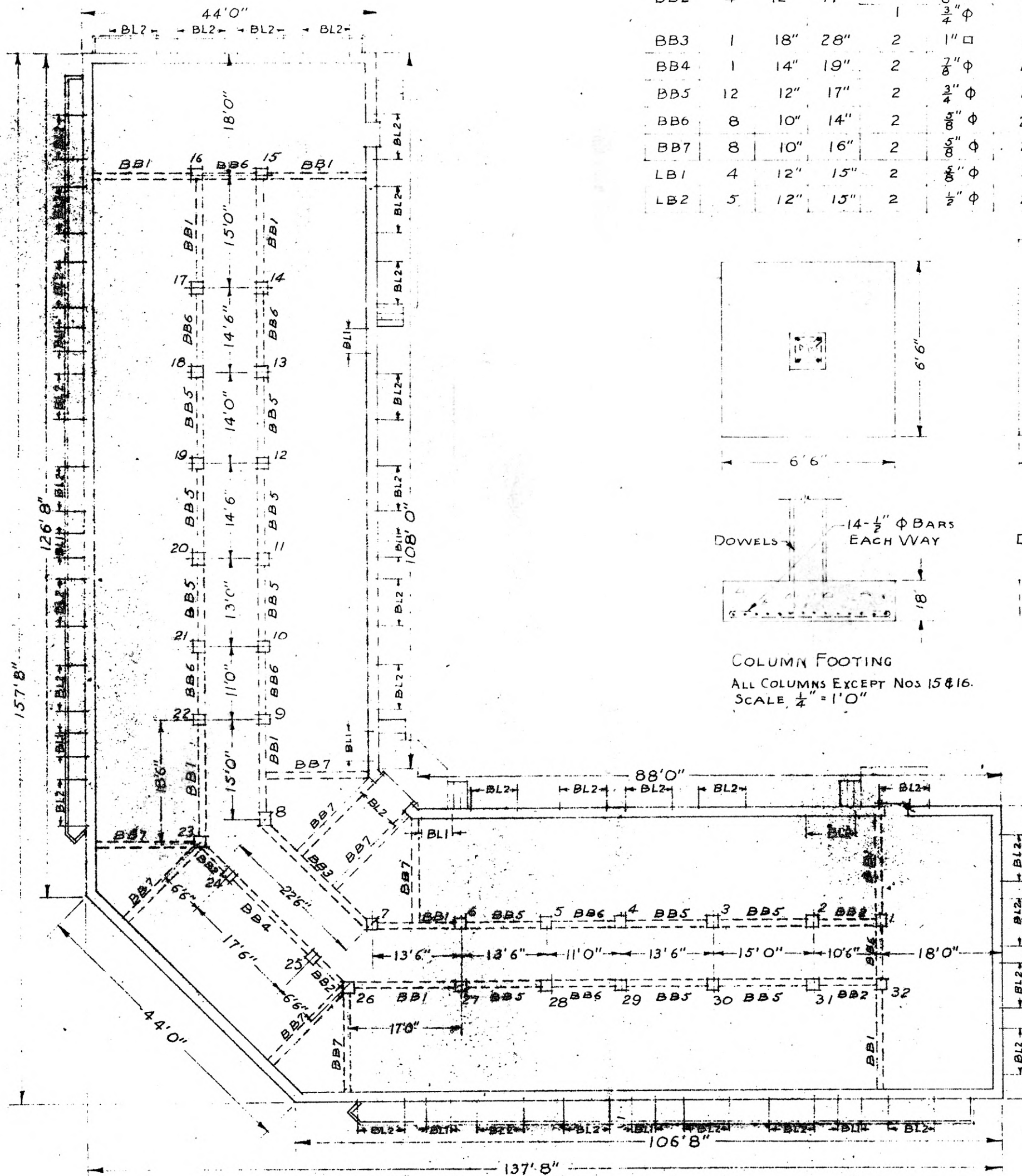


NOTE:

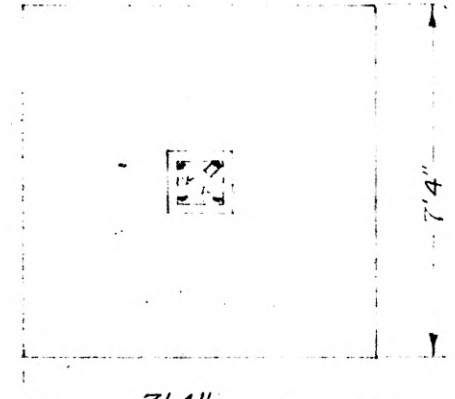
BEAM DESIGN IDENTICAL FOR ALL FLOORS.
 BEND RODS AT 5TH POINT OF SPAN.
 BENT RODS TO CONTINUE OVER SUPPORT TO 4TH POINT.
 PROVIDE HOOKS FOR ALL BENT BARS, AND STRAIGHT
 BARS AT END REACTIONS.
 LINTEL DESIGN IDENTICAL FOR ALL FLOORS.

SCHEDULE OF CONCRETE BEAMS - ALL FLOOR IDENTICAL

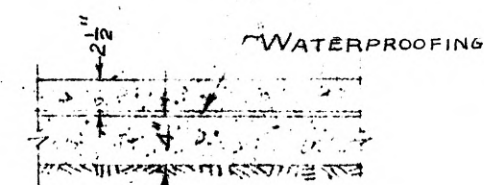
MARK	No	DIMENSIONS	STRAIGHT BARS	BENT BARS	STIRRUPS					
BEAMS	REQ'D	B	D	No.	SIZE	No.	SIZE	No.	SIZE	SPACING
BB1	10	14"	24"	1	$\frac{3}{4}$ " ϕ	1	$\frac{3}{4}$ " ϕ	12	$\frac{3}{8}$ " ϕ	2'-4"
				1	$\frac{1}{8}$ " ϕ	1	$\frac{1}{8}$ " ϕ	8	$\frac{3}{8}$ " ϕ	3'-7"
BB2	4	12"	17"	1	$\frac{5}{8}$ " ϕ	1	$\frac{5}{8}$ " ϕ	6	$\frac{3}{8}$ " ϕ	3'-7"
				1	$\frac{3}{4}$ " ϕ	1	$\frac{3}{4}$ " ϕ	3	$\frac{3}{8}$ " ϕ	5'-11"
BB3	1	18"	28"	2	1" \square	2	1" \square	10	$\frac{3}{8}$ " ϕ	6'-12"
BB4	1	14"	19"	2	$\frac{7}{8}$ " ϕ	2	$\frac{7}{8}$ " ϕ	16	$\frac{3}{8}$ " ϕ	3'-7"
BB5	12	12"	17"	2	$\frac{3}{4}$ " ϕ	2	$\frac{3}{4}$ " ϕ	14	$\frac{3}{8}$ " ϕ	3'-6 $\frac{1}{2}$ "
BB6	8	10"	14"	2	$\frac{5}{8}$ " ϕ	2	$\frac{5}{8}$ " ϕ	12	$\frac{3}{8}$ " ϕ	3'-7"
BB7	8	10"	16"	2	$\frac{5}{8}$ " ϕ	2	$\frac{5}{8}$ " ϕ	14	$\frac{3}{8}$ " ϕ	4'-8"
LB1	4	12"	15"	2	$\frac{5}{8}$ " ϕ	2	$\frac{5}{8}$ " ϕ	6	$\frac{3}{8}$ " ϕ	5'-11"
LB2	5	12"	15"	2	$\frac{1}{2}$ " ϕ	2	$\frac{1}{2}$ " ϕ	6	$\frac{3}{8}$ " ϕ	5'-11"



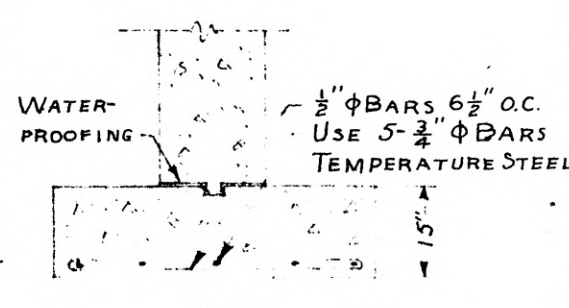
COLUMN FOOTING
 ALL COLUMNS EXCEPT NOS 15 & 16.
 SCALE $\frac{1}{4}$ " = 1'0"



COLUMN FOOTING
 FOR COLUMNS NOS 15 & 16.
 SCALE $\frac{1}{4}$ " = 1'0"



BASEMENT FLOOR SLAB
 SCALE $\frac{3}{4}$ " = 1'0"



WALL FOOTING
 SCALE $\frac{3}{8}$ " = 1'0"

STRUCTURAL DRAWINGS

BASEMENT FLOOR
 SCALE $\frac{1}{16}$ " = 1'0"

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PLATE 12

NOTE: BEAM DESIGN IDENTICAL FOR ALL FLOORS.
LINTEL DESIGN IDENTICAL FOR ALL FLOORS.

SCHEDULE OF CONCRETE BEAMS ... FRONT ENTRANCE

MARK	NO. BEAMS REQ'D	DIMENSIONS		STRAIGHT BARS		BENT BARS		STIRRUPS		
		B	D	NO.	SIZE	NO.	SIZE	NO.	SIZE	SPACING
1B8	3	12"	20"	2	$\frac{7}{8}$ " ϕ	2	$\frac{7}{8}$ " ϕ	6	$\frac{3}{8}$ " ϕ	7 $\frac{1}{2}$ "-15"
1B9	2	12"	20"	2	$\frac{3}{4}$ " ϕ	2	$\frac{3}{4}$ " ϕ	6	$\frac{3}{8}$ " ϕ	7"-14"
1B10	1	10"	18"	2	$\frac{5}{8}$ " ϕ	2	$\frac{5}{8}$ " ϕ	6	$\frac{3}{8}$ " ϕ	6"-12"
1B11	2	12"	20"	2	$\frac{7}{8}$ " ϕ	2	$\frac{7}{8}$ " ϕ	8	$\frac{3}{8}$ " ϕ	7"-14"

SCHEDULE OF CONCRETE SLABS.
FRONT & REAR ENTRANCES.

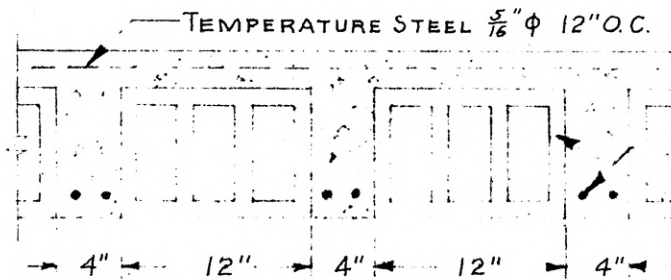
MARK	NO. SLABS REQ'D.	DEPTH OF SLAB	REINFORCING BARS		TEMPERATURE BARS	
			SIZE	SPACING	SIZE	SPACING
BS1	3	4"	$\frac{3}{8}$ " ϕ	5 $\frac{1}{2}$ " O.C.	$\frac{1}{2}$ " ϕ	12" O.C.
IS3	4	5"	$\frac{1}{2}$ " ϕ	6 $\frac{1}{2}$ " O.C.	$\frac{1}{2}$ " ϕ	12" O.C.
IS4	4	4"	$\frac{3}{8}$ " ϕ	4 $\frac{1}{2}$ " O.C.	$\frac{1}{2}$ " ϕ	12" O.C.
IS5	2	4 $\frac{1}{2}$ "	$\frac{1}{2}$ " ϕ	7 $\frac{1}{2}$ " O.C.	$\frac{1}{2}$ " ϕ	12" O.C.
IS6	1	4"	$\frac{3}{8}$ " ϕ	7" O.C.	$\frac{1}{2}$ " ϕ	12" O.C.
IS7	2	4"	$\frac{3}{8}$ " ϕ	7" O.C.	$\frac{1}{2}$ " ϕ	12" O.C.

NOTE: BEND ALTERNATE RODS AT 5TH POINTS.

$\frac{1}{8}$ " ϕ HORIZONTAL RODS 10" O.C.
 $\frac{3}{8}$ " ϕ VERTICAL RODS 10" O.C.
 $\frac{3}{8}$ " ϕ RODS 10" O.C.

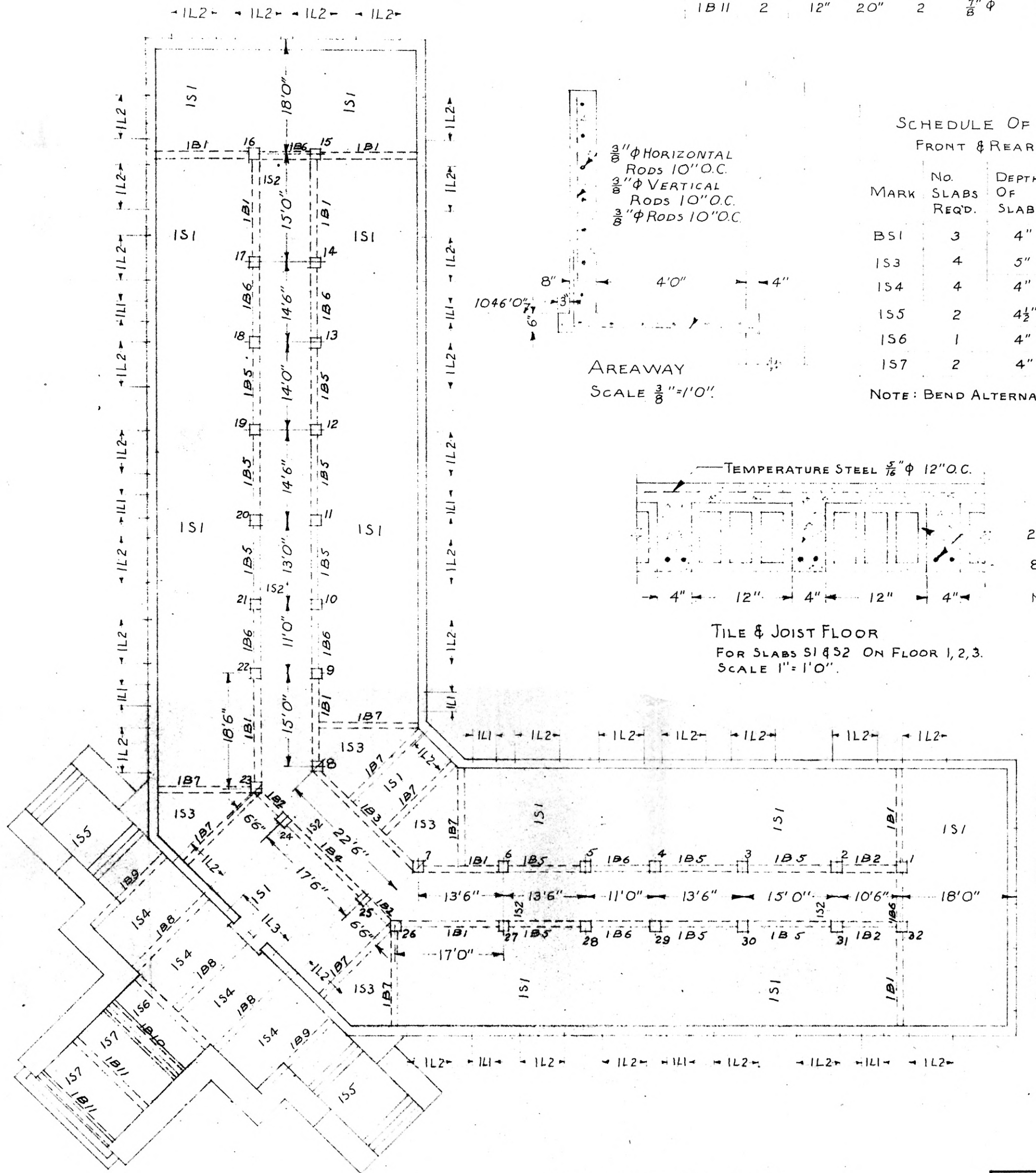


AREAWAY
SCALE $\frac{3}{8}$ " = 1'0"



TILE & JOIST FLOOR
FOR SLABS S1 & S2 ON FLOOR 1, 2, 3.
SCALE 1" = 1'0"

2- $\frac{1}{2}$ " ϕ RODS. BEND ALTERNATE RODS AT 5TH POINTS.
8" x 12" x 12" CLAY TILE. USE 2-8" WIDE TILE AT EACH END OR UNTIL SPAN < 12'
NOTE: UNDER PARTITIONS: USE 8" x 8" x 12" CLAY TILE USE 4- $\frac{1}{2}$ " ϕ RODS.



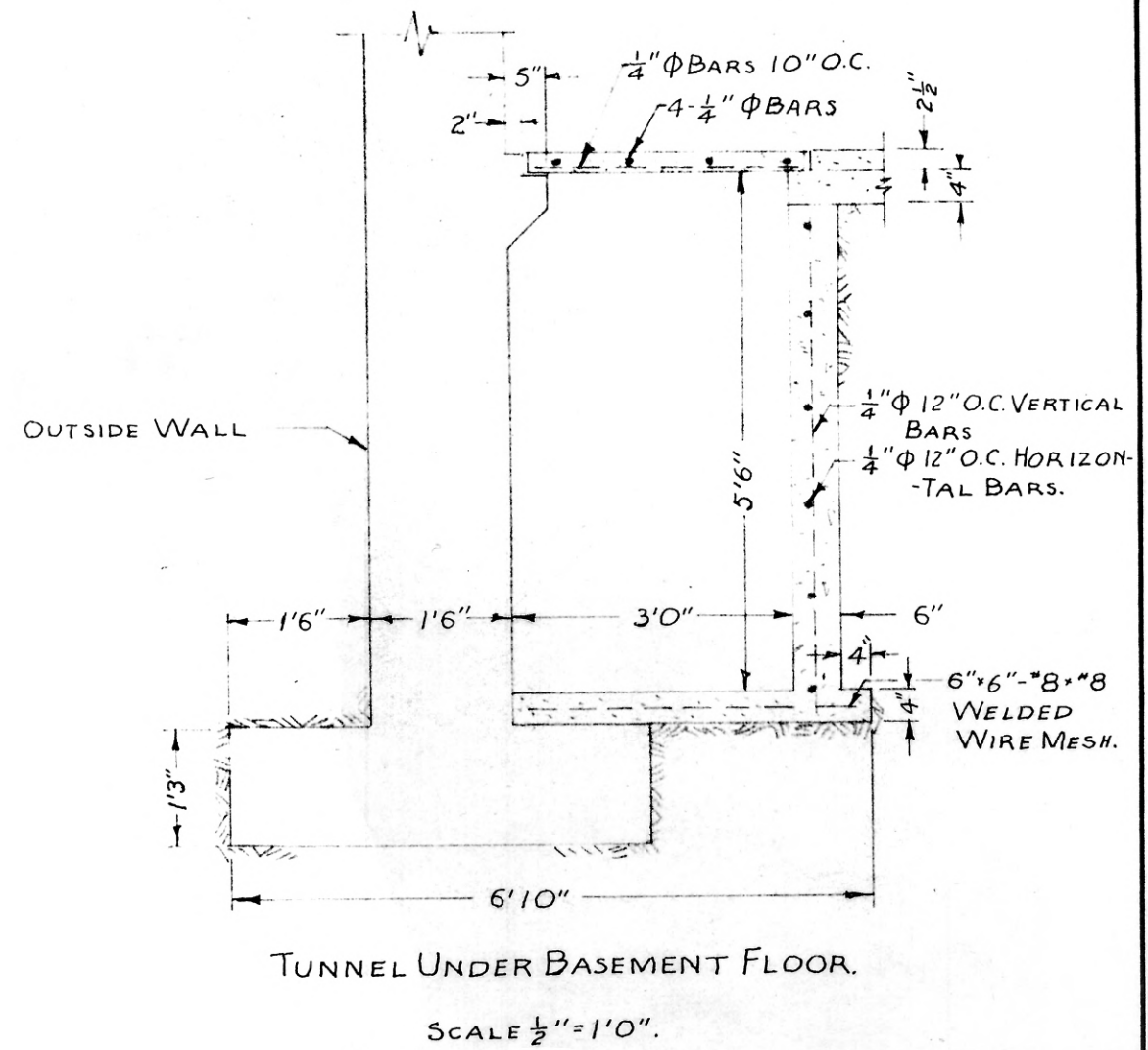
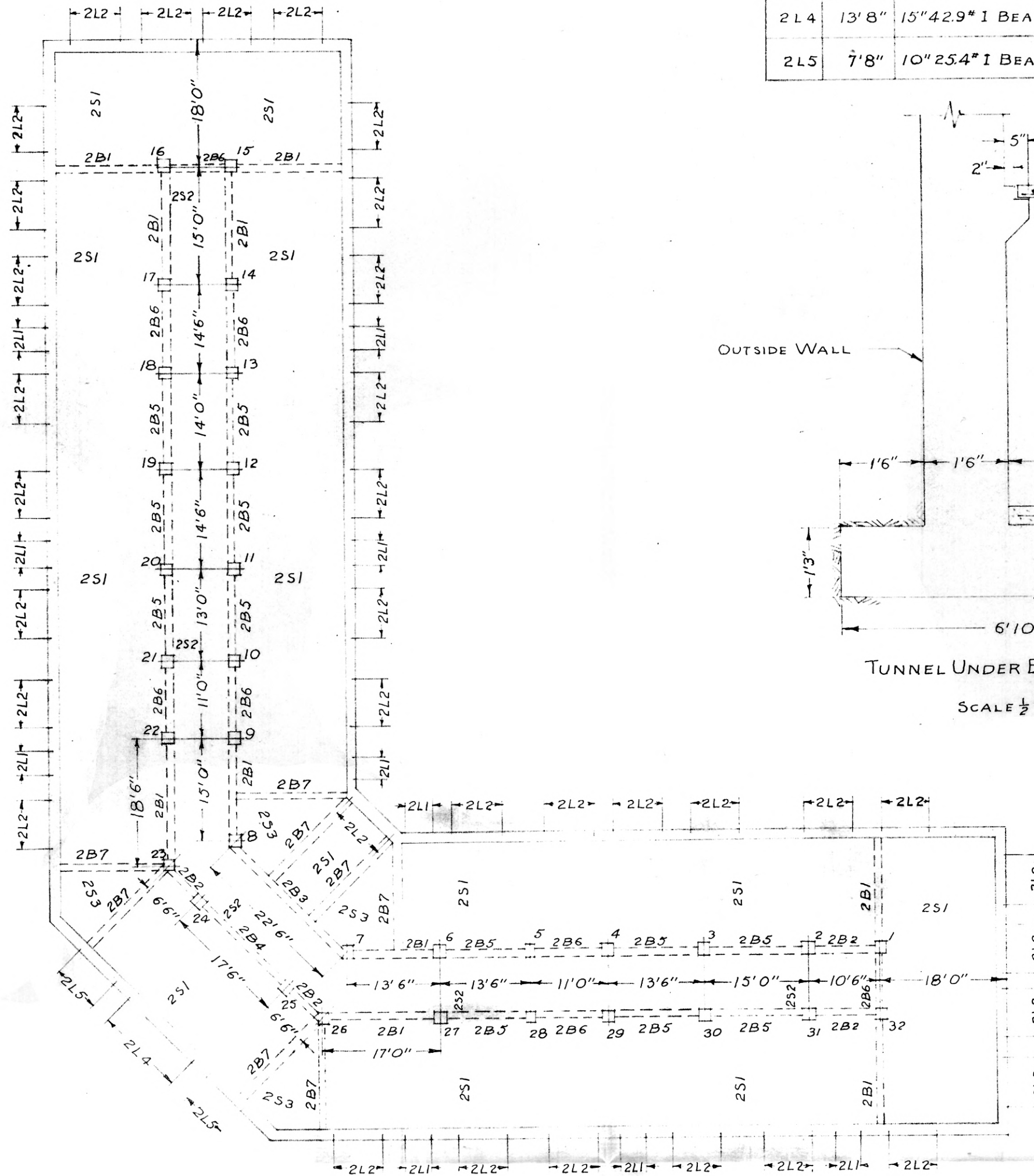
STRUCTURAL DRAWINGS
FIRST FLOOR
SCALE $\frac{1}{16}$ " = 1'0"

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PLATE 13

NOTE: BEAM DESIGN IDENTICAL FOR ALL FLOORS.
 LINTEL DESIGN IDENTICAL FOR ALL FLOORS.
 SLAB DESIGN IDENTICAL FOR FLOORS 1, 2, 3.

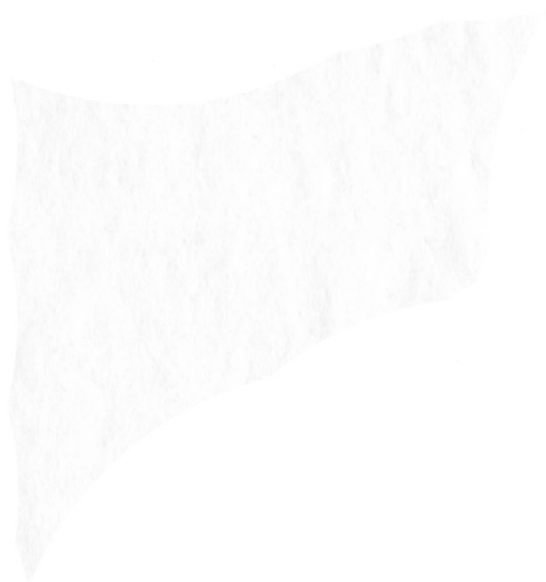
SCHEDULE OF STEEL LINTELS.			
MARK	LENGTH	SIZE AND DESCRIPTION	REMARKS
2L1	4'2"	2-6" x 4" x $\frac{5}{8}$ " L _S	SHORT LEGS BACK TO BACK.
2L2	7'8"	2-8" x 6" x $\frac{5}{8}$ " L _S	LONG LEGS BACK TO BACK.
2L3	10'8"	12" 31.8" I BEAM	$\frac{1}{2}$ " x 12" PLATE WELDED TO BOTTOM.
2L4	13'8"	15" 42.9" I BEAM	$\frac{1}{2}$ " x 12" PLATE WELDED TO BOTTOM.
2L5	7'8"	10" 25.4" I BEAM	$\frac{1}{2}$ " x 12" PLATE WELDED TO BOTTOM.



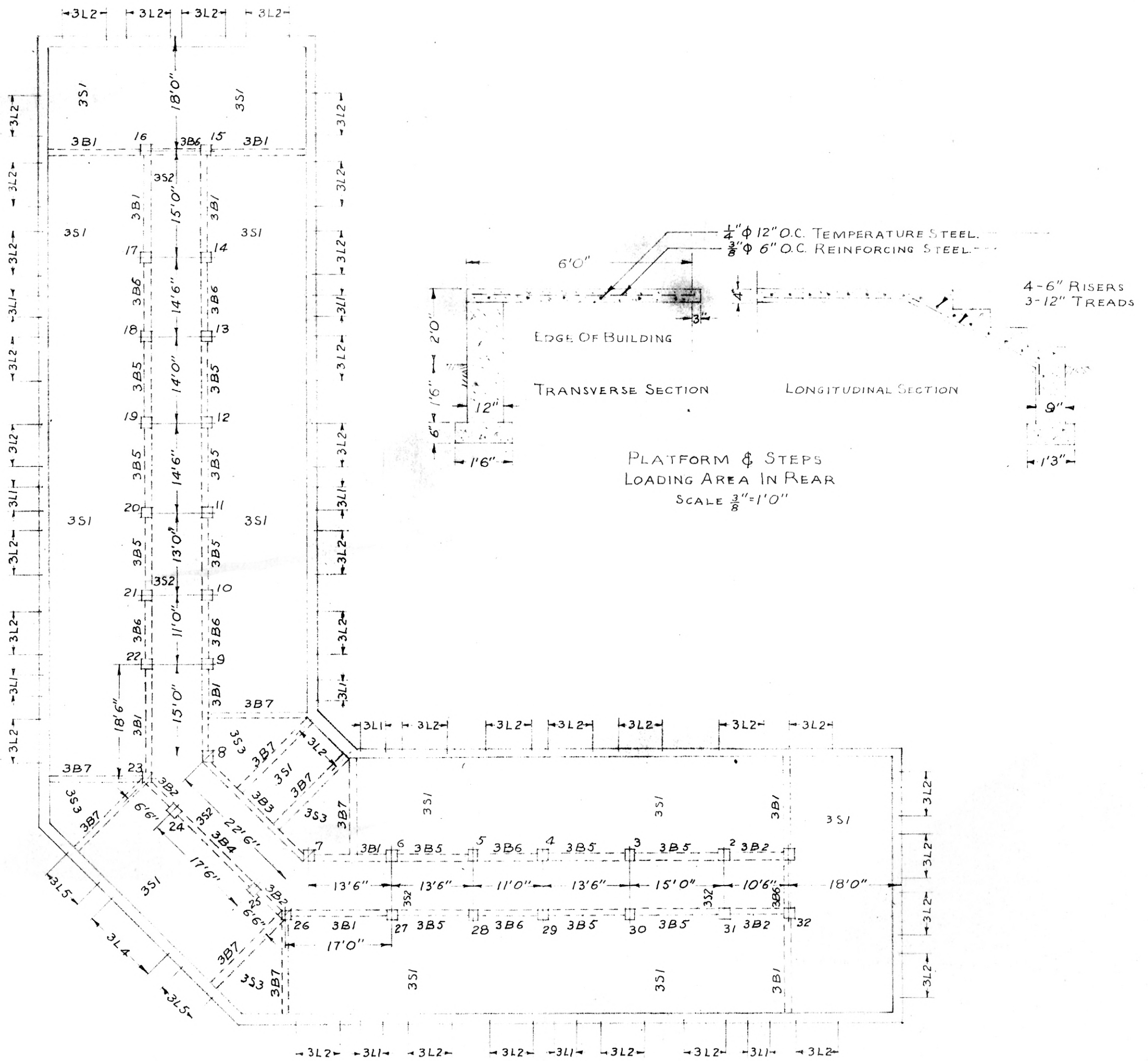
STRUCTURAL DRAWINGS
 SECOND FLOOR
 SCALE $\frac{1}{16}$ " = 1'0"

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PLATE 14



NOTE: BEAM DESIGN IDENTICAL FOR ALL FLOORS.
 LINTEL DESIGN IDENTICAL FOR ALL FLOORS.
 SLAB DESIGN IDENTICAL FOR FLOORS 1, 2, 3.

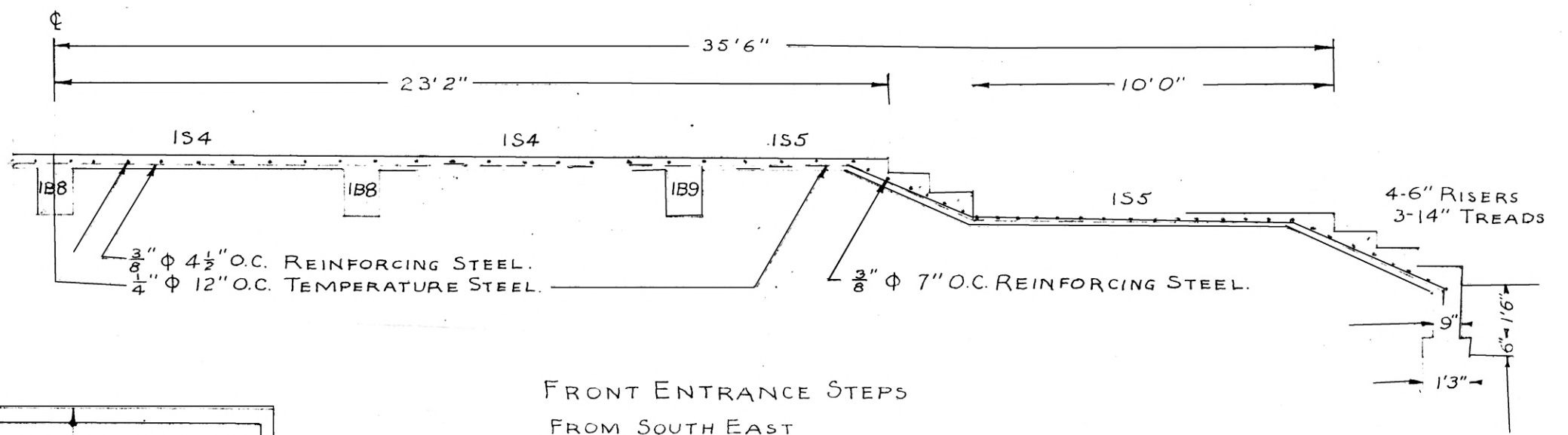


STRUCTURAL DRAWINGS
 THIRD FLOOR
 SCALE $\frac{1}{16}'' = 1'0''$

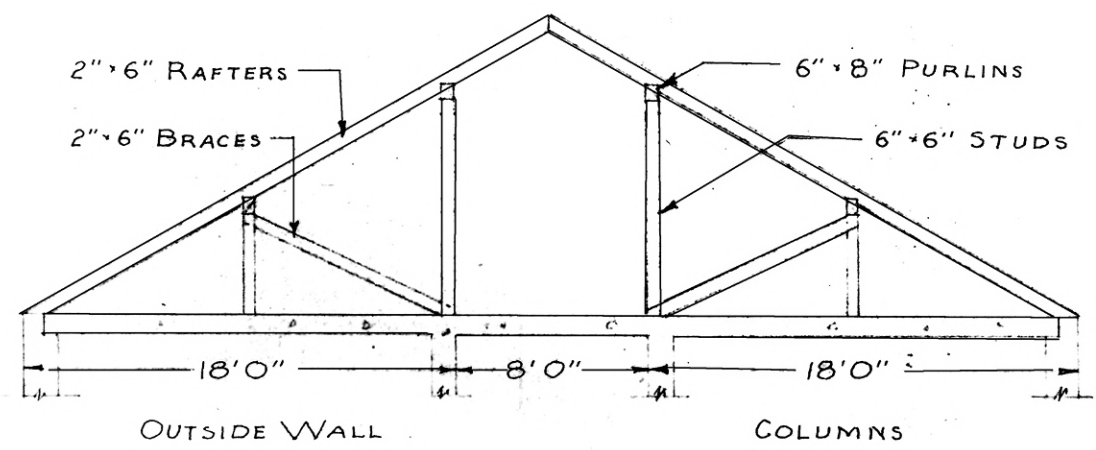
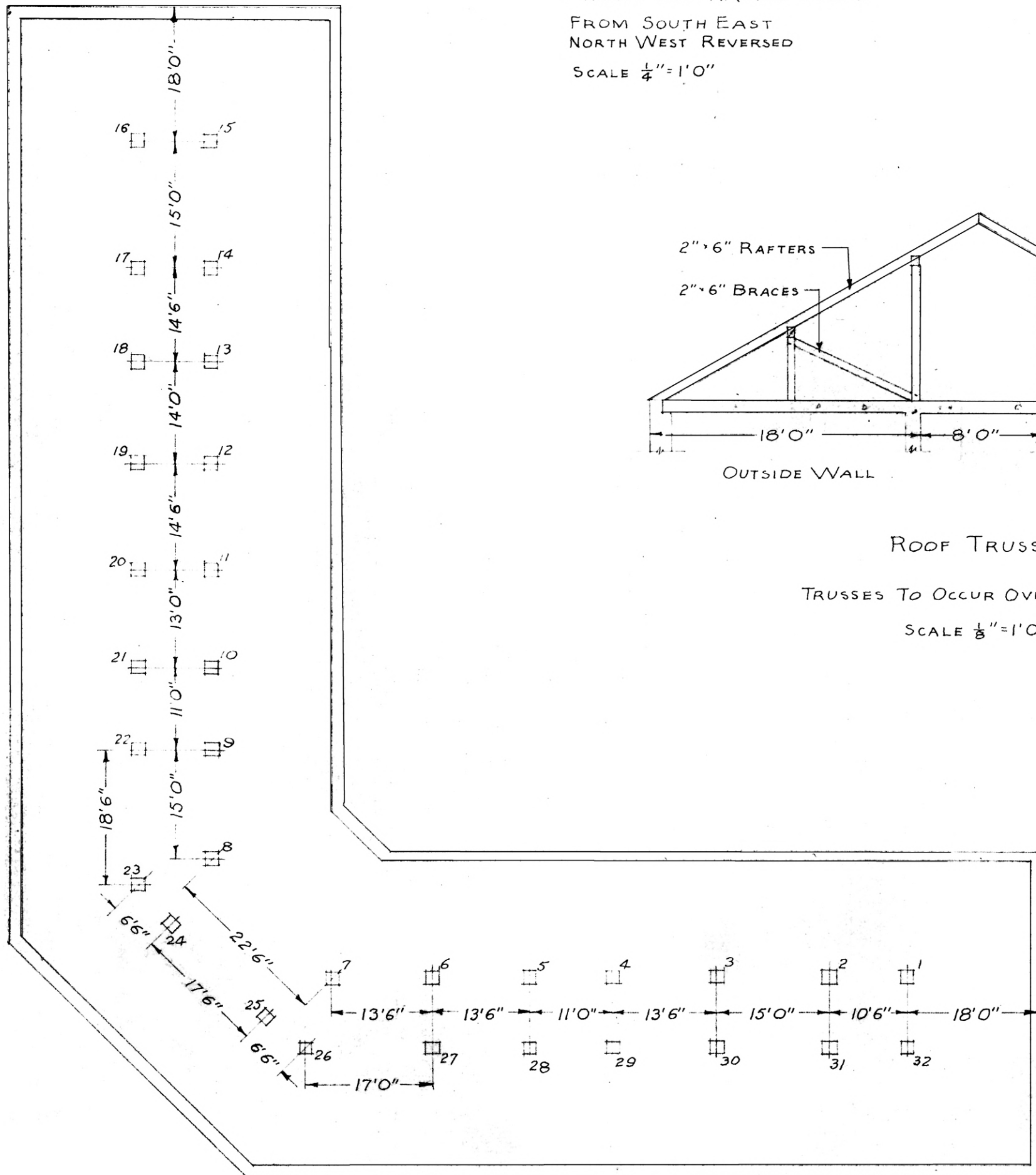
A STUDENT HEALTH CENTER
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 JOHN J. HEIMERICH Aug. 1, 1945

PLATE 15

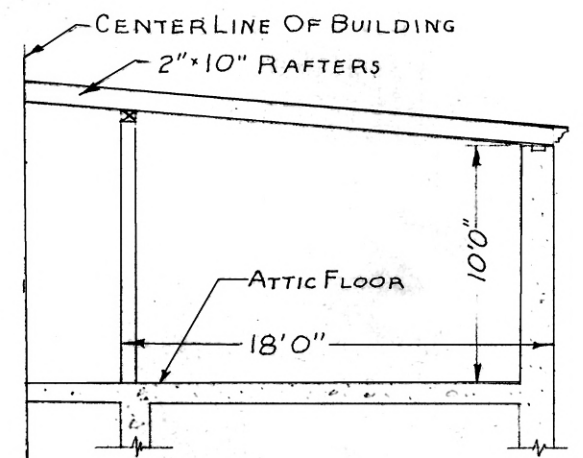




FRONT ENTRANCE STEPS
FROM SOUTH EAST
NORTH WEST REVERSED
SCALE $\frac{1}{4}$ " = 1'0"



ROOF TRUSS
TRUSSES TO OCCUR OVER EACH COLUMN.
SCALE $\frac{1}{8}$ " = 1'0"

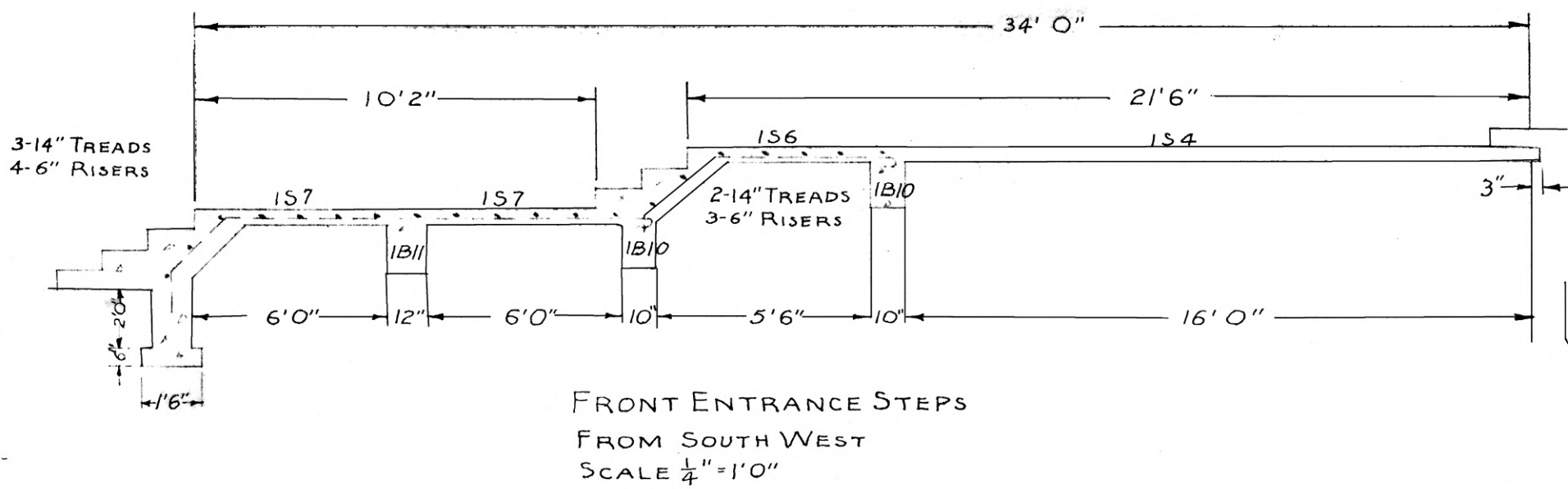


PENT HOUSE
FROM COLUMNS 8 TO 10.
SCALE $\frac{1}{8}$ " = 1'0"

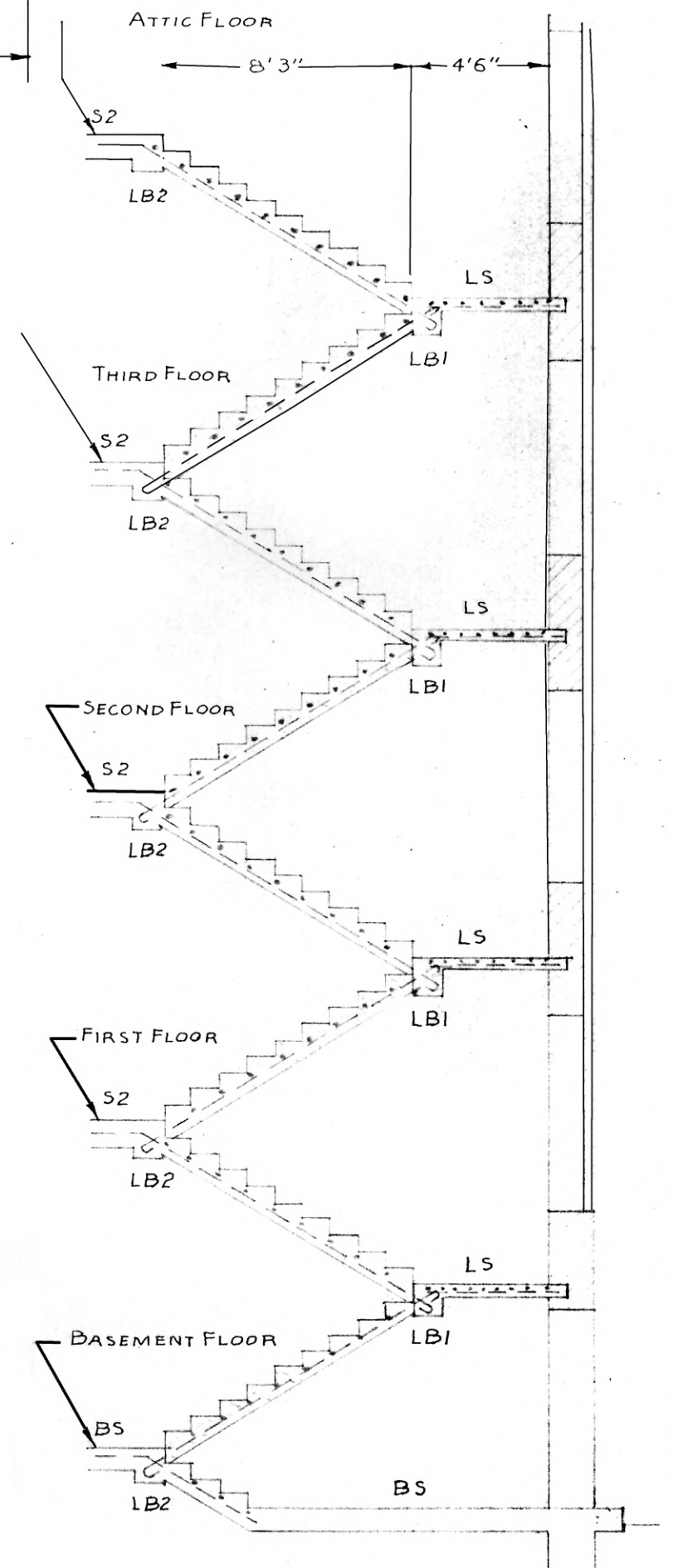
STRUCTURAL DRAWINGS
ATTIC FLOOR
SCALE $\frac{1}{16}$ " = 1'0"

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PLATE 16



NOTE:
 L.S. LANDING SLAB - 4" SLAB $\frac{3}{8}$ " ϕ 4 $\frac{1}{2}$ " O.C.
 $\frac{1}{4}$ " ϕ 12" O.C. TEMPERATURE STEEL.
 STAIR SLAB - 5 $\frac{1}{2}$ " SLAB $\frac{1}{2}$ " ϕ 6 $\frac{1}{2}$ " O.C.
 $\frac{1}{4}$ " ϕ TEMPERATURE STEEL EACH STEP.



COLUMN SCHEDULE

COLUMN No.	1, 32.	2, 4, 5, 21, 28, 29, 31.	3, 6, 11, 12, 13, 18, 19, 20, 23, 26, 30.	7, 14, 17, 27	8.	9.	10.	15, 16.	22.	24, 25.
FLOOR										
ATTIC FL. EL. 1088' 4"					12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.			
THIRD FL. EL. 1077' 4"	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.
SECOND FL. EL. 1066' 4"	12" x 12" 4 $\frac{3}{4}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{3}{4}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{3}{4}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{3}{4}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{5}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.
FIRST FL. EL. 1055' 4"	14" x 14" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{3}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	12" x 12" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{3}{8}$ " ϕ $\frac{1}{4}$ " ϕ 10" O.C.	14" x 14" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	12" x 12" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.
BASEMENT FL. EL. 1044' 4"	16" x 16" 6 $\frac{1}{8}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 6 $\frac{1}{8}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 6 $\frac{1}{8}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 4 $\frac{1}{2}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	16" x 16" 4 $\frac{1}{4}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	16" x 16" 4 $\frac{1}{8}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.	14" x 14" 6 $\frac{1}{8}$ " ϕ $\frac{1}{4}$ " ϕ 12" O.C.
TOP FOOTING EL. 1040' $\frac{1}{2}$ "	SEE	FOOTING			DETAILS					

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respiratory organs need not cope with overheated air. Dust particles are not circulated about the room as is the case in convection heating.

Cleanliness. There are no pipes or radiators which collect dirt and dust which in turn contain germs, and a Health Center by all means should be as free from such health hazards as possible.

Even Temperature. The temperature in a room which is heated by hidden coils is very uniform. The variance is not over three or four degrees from floor to ceiling, unless the coils are in the floor, then the floor is warmer, which is desirable.

Permanence. It is an integral part of the building. Water pipes cut out of a building which stood for 30 years were just as good as new.

Strength. These pipes also serve as reinforcement to the floor system. The expansion of the pipe is very nearly the same as concrete.

Flexibility. When used in a building that might need some of the partitions changed, the matter of radiators need not be considered. Undesirable tenants can not harm the heating system.

Cost. The operating cost has proven to be 25 to 30 percent less. The installation cost will depend largely on labor costs and will not vary much from ordinary heating systems.

Early completion. The invisible panel system can be

completed at an early stage in the construction of the building and heat applied while the construction is being completed, thus permitting earlier completion and elimination of risk or injury due to dampness or frost.

A disadvantage might be the initial cost but it is said by Zamenhoff (1940) that the cost will not exceed eight to ten percent of total cost. After the coils or grids have been welded and set, careless workmen may injure the pipes when pouring the concrete, but a good contractor will employ only efficient mechanics.

Plates 17 to 20 are diagramatic drawings of the location and pipe sizes for heating the Student Health Center.

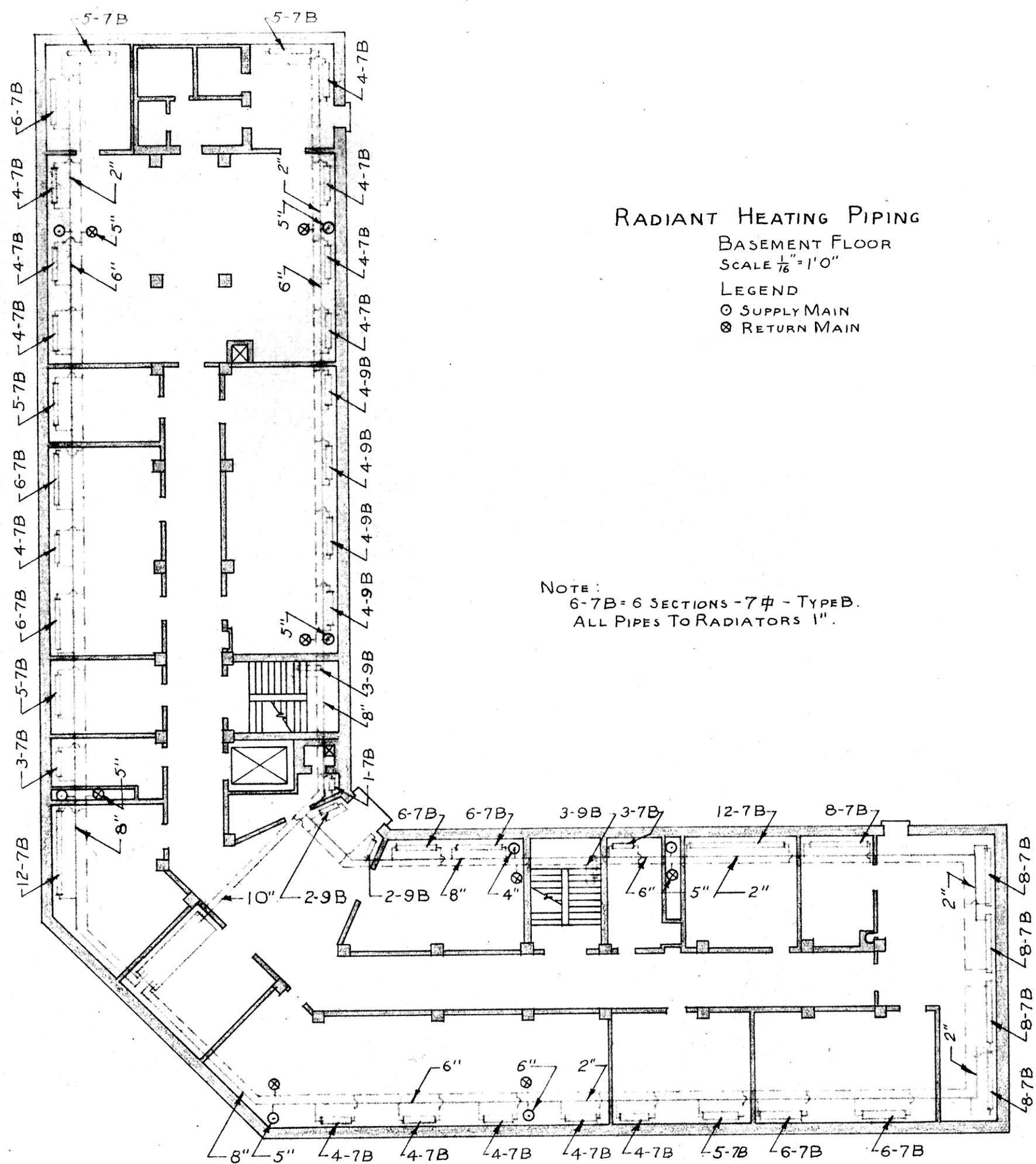
CONCLUSION

From the results of this study it appears that the design suggested is practical and would make an economical and worthwhile addition to the campus. The fact, that the present conditions are inadequate and out-of-date, makes this a study of prime importance.

Upon completion of the construction of this building it would bring together the hospital and dispensary and eliminate duplication. The space now occupied by the dispensary in Anderson Hall would be available for needed class room space.

The sloping ground is very desirable because the basement floor level and loading level are about the same height. Either of the dining rooms in the basement would be large enough to entertain the local and county medical associations, something the two city hospitals are unable to do.

PLATE 17



RADIANT HEATING PIPING

BASEMENT FLOOR

SCALE $\frac{1}{16}'' = 1'0''$

LEGEND

○ SUPPLY MAIN

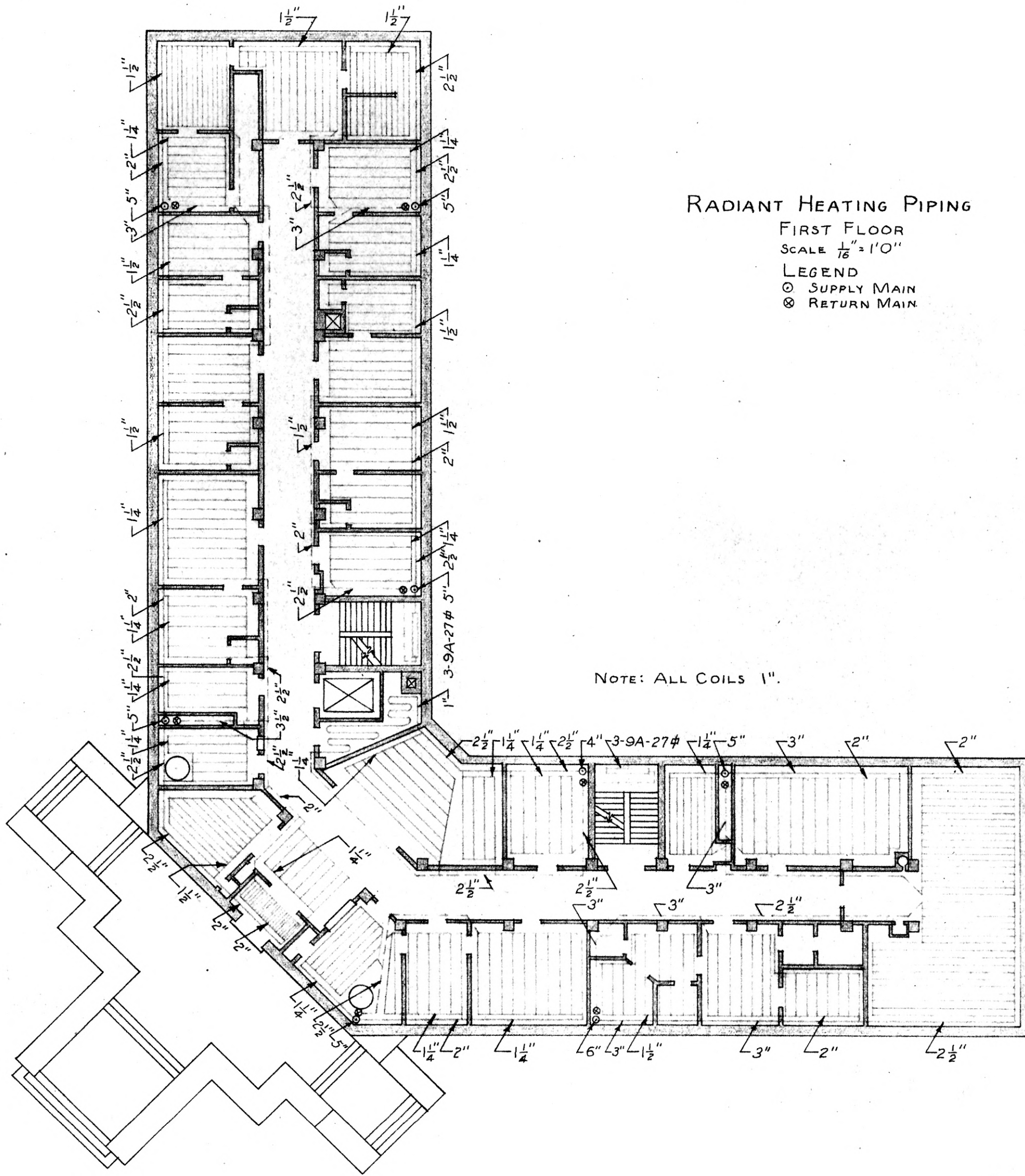
⊗ RETURN MAIN

NOTE:

6-7B = 6 SECTIONS - 7# - TYPE B.
ALL PIPES TO RADIATORS 1".

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PLATE 18

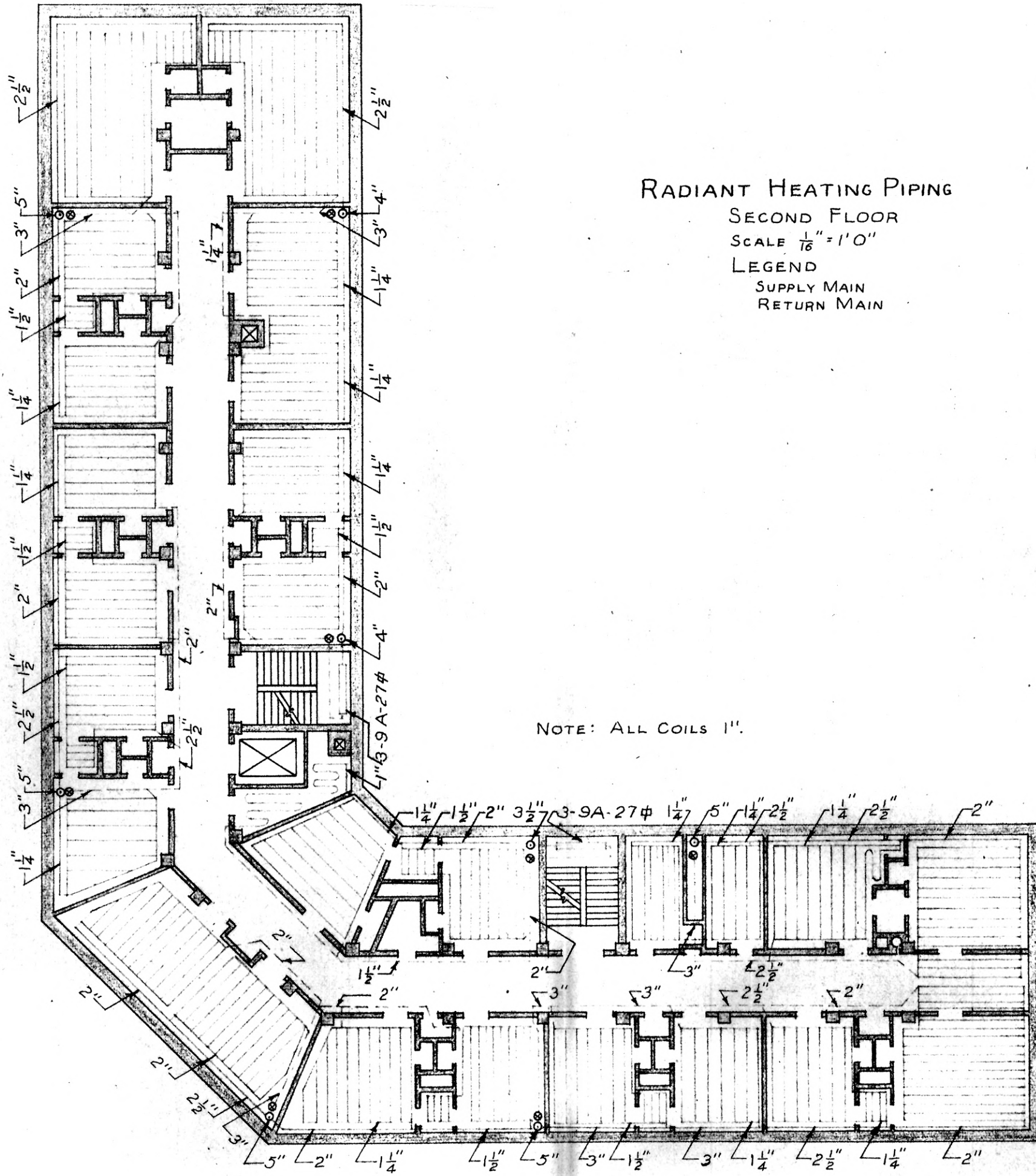


RADIANT HEATING PIPING
 FIRST FLOOR
 SCALE $\frac{1}{16}'' = 1'0''$
 LEGEND
 ⊙ SUPPLY MAIN
 ⊗ RETURN MAIN

NOTE: ALL COILS 1".

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PLATE 19

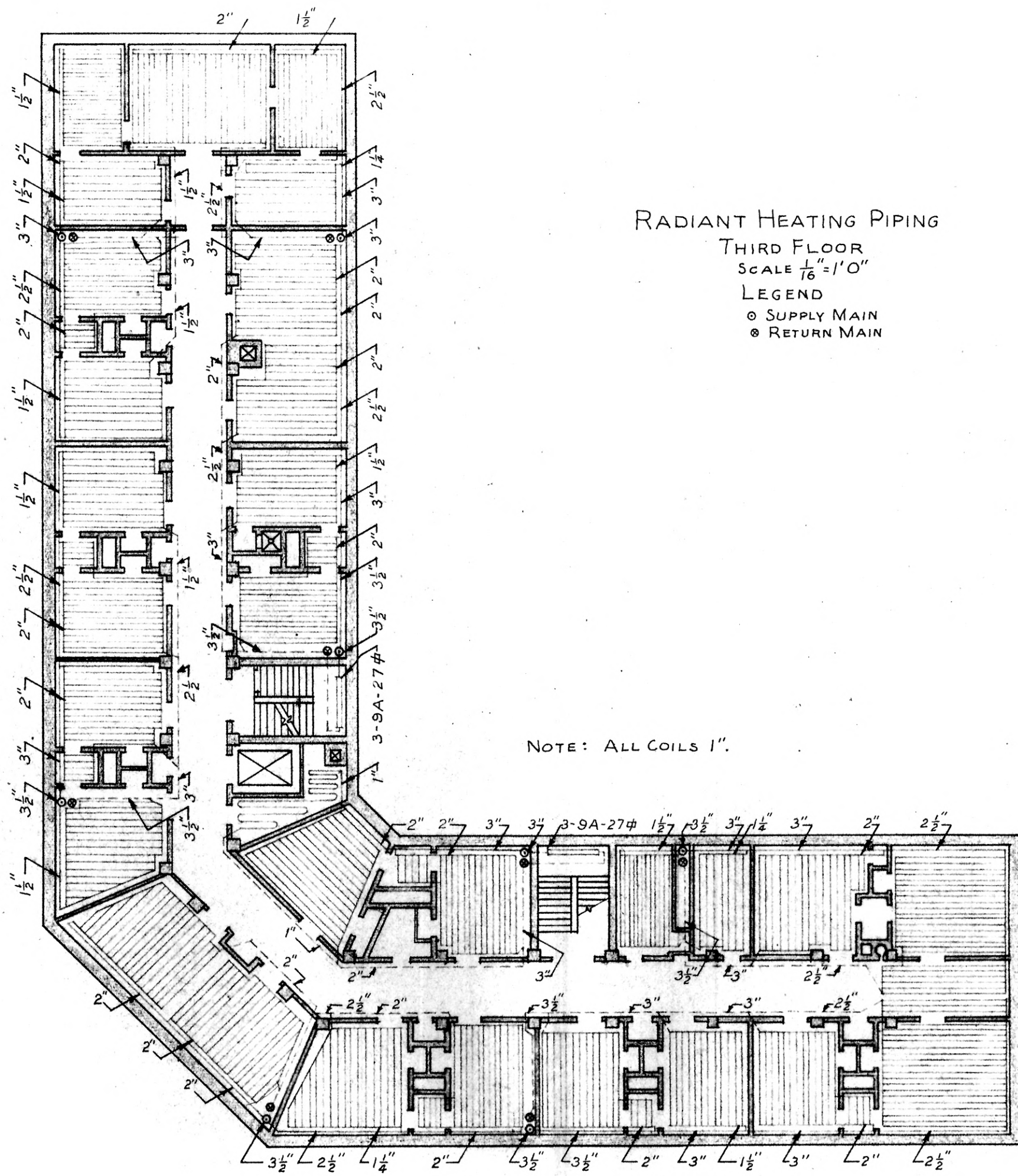


RADIANT HEATING PIPING
 SECOND FLOOR
 SCALE $\frac{1}{16}'' = 1'0''$
 LEGEND
 SUPPLY MAIN
 RETURN MAIN

NOTE: ALL COILS 1"

A STUDENT HEALTH CENTER
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PLATE 20



RADIANT HEATING PIPING
 THIRD FLOOR
 SCALE $\frac{1}{16}'' = 1'0''$
 LEGEND
 ○ SUPPLY MAIN
 ⊙ RETURN MAIN

NOTE: ALL COILS 1".

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ACKNOWLEDGMENT

I wish to express my appreciation to Doctor Robert R. Snook and his staff of the Student Health Service for their time and helpful suggestions; and to Professor Paul Weigel of the Department of Architecture for his assistance in the development of the design.

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