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An Inventory and Analysis of the Instructional Space at Central Washington College of Education

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AN INVENTORY AND ANALYSIS OF THE INSTRUCTIONAL SPACE AT CENTRAL WASHINGTON COLLEGE OF EDUCATION

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CHAPTER I

INTRODUCTION TO THE PROBLEM AND PROCEDURES USED IN THE STUDY

With rising college enrollments, the general trend throughout the United States, the problem of providing instructional space is becoming acute. This is also true at Central Washington College of Education, where enrollments have jumped three hundred per cent since 1930, two hundred per cent since 1937, fifty per cent since 1947, twenty-three and three-tenths per cent since 1955 and sixteen and eight-tenths per cent during the year of 1956-1957.

The instructional building most recently constructed at Central Washington College of Education was in 1947, and the most recent construction of instructional space preceding the 1947 building was in 1937, with the exception of a temporary building housing the Reserve Officers Training Corps moved to the campus in 1946. This brings out very clearly the disproportionate increase of instructional space in relation to the greatly increased enrollment.

The increased requirements for certification of teachers have meant keeping the students in the institution for a longer period of time. These certification requirements have jumped from two to three to four and finally

to five years. This is just one more factor that puts emphasis on the need for better utilization of available instructional space.

Other factors that are putting emphasis on space utilization and space per student needed are increased enrollments causing larger classes, instruction through the medium of closed circuit television, and more audio-visual materials. These factors require either specially adapted rooms or at least larger rooms.

Detailed master plans of available and assignable instructional space are sadly lacking in many colleges and public school districts. This is particularly true of Central Washington College of Education. This master plan or instructional space inventory is a must for the school administration in all types of school planning where the plant facilities must be known.

I. THE PROBLEM

Statement of the problem. It was the purpose of this study (1) to make a detailed inventory of the present instructional space at Central Washington College of Education with detailed floor plans of each instructional building; (2) to compute the total assignable space per student in all instructional buildings with a breakdown of this assignable space per student into classrooms,

laboratories, shops, faculty offices, administrative offices, gymnasium and library space; (3) to compute the percentage of assignable space devoted to each area (that is, classrooms, laboratories, et cetera) of the total assignable space; (4) to show the space utilization in each instructional building as to the amount and percentage of space devoted to classrooms, faculty and administrative offices, laboratories, shops, gymnasium and library space; (5) to compare the net assignable or usable floor space per student in all instructional buildings, and a breakdown of this net usable space into classrooms, laboratories, shops, faculty and administrative offices, gymnasium and library space, with the 1949 report of the Federal Security Agency[1] on national averages for teachers' colleges, square feet per student; (6) to compute the needs per division at Central Washington College of Education, square footage per full-time equivalent student in classrooms and offices, using standards set forth by the Federal Security Agency report of 1949,[2] national average for square feet per student in teachers' colleges; and (7) to show the percentage

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[1]Ernest V. Hollis and Associates, College Building Needs, Federal Security Agency, United States Department of Health, Education, and Welfare, Special Series No. 1 (Washington, D. C.: Government Printing Office, 1949), pp. 12-21.

[2]Ibid.

and amount of instructional and non-instructional space in each instructional building.

Importance of the study. The school administration must have an intimate knowledge of the school plant. The total square footage and the amount of space devoted to instruction, office, storage and other functions must be known. Normally, blueprints would provide these details, but with many older buildings in use and the remodeling of others, the accurate specifications including the most recent changes were not available at the time this study was made.

Many problems can be answered by having detailed plant plans available. Questions concerning future building needs, per pupil space used, janitorial service needed, maintenance cost of painting, cleaning, and repairing, and such other expenses as lighting and heating are quickly answered. These are only a few of the many questions that can be answered more efficiently with a detailed analysis and inventory of instructional space available.

II. DEFINITIONS OF TERMS

Instructional buildings. Throughout the report of this investigation, "instructional buildings" referred to any building devoted primarily to instructional purposes.

The buildings specifically mentioned in this study as instructional buildings were the Science Building, Business Education Building, Gymnasium, Industrial Arts Building, Library, Administration Building, Music Building, Classroom Building, and the Training School Building.

Full-time equivalent student. In this study the use of the term "full-time equivalent student" meant the equivalent of fifteen quarter hours of credit. The number of full-time students in a given division or department was computed by finding the average number of credits given per quarter of work for three quarters: autumn, 1955; winter, 1956; and spring, 1956. This average number of credits per quarter was then divided by fifteen, the normal class hour load per quarter, to arrive at the number of full-time equivalent students in a given division and for all divisions.

Classroom space. As used in this report the term "classroom space" meant any space used as a general classroom, lecture room, or for a seminar.

Office space. The term "office space" denoted space used as an office by faculty or administration.

Gymnasium space. Space referred to in this investigation as "gymnasium space" was defined as all space used for instructional purposes in physical activities.

Library space. In this study "library space" referred to all space in library facilities used by or serving students.

Shop space. This term was defined as all areas used for industrial arts instruction utilizing industrial arts materials or machines such as lathes, pottery wheels, or saws.

Laboratory space. In this survey and analysis all space referred to as "laboratory space" was defined as laboratory space devoted to instruction such as chemistry, biology, physics, geology, botany, and photography.

Assignable space. Space referred to in this study as "assignable space" was defined as classroom, office, gymnasium, library, shop, and laboratory space.

Instructional space. As used in this study the term "instructional space" meant all space used primarily for instructional purposes, such as classrooms, laboratories, shops, and gymnasium space.

Non-instructional space. This term was defined as all space in a building not devoted to instruction such as hallways, storage and library space, equipment rooms, offices, and museums.

III. THE PROCEDURES

Procedures used. In making this study, the following procedures were used: (1) from available blueprints, floor plans of Central Washington College buildings were drawn to scale to show square footage and space per student in buildings and rooms; (2) measurements were taken of the buildings for which blueprints were not available, and from these measurements scale plans were drawn and square footage per student determined; (3) literature was explored to find averages for square footage per student for total instructional space and square footage per student in classrooms, laboratories, shops, offices, gymnasium, and library space; and (4) these averages were then compared to the findings of the analysis of the square footage per student at Central Washington College of Education.

CHAPTER II

REVIEW OF RELATED INFORMATION

The colleges and universities across the United States are reaching a real crisis brought forth by greatly increasing enrollments. The literature abounds with problems of increased enrollment and predictions for even greater enrollments in years to come.

O. C. Carmichael, President of the University of Alabama, has this prediction to make concerning college enrollments:

> In 1933, 2,081,000 babies were born in the United States; in 1954, 4,073,000 new Americans arrived on the scene. Thus, twenty years from now there will be approximately twice as many college-age youth as now. But every decade since 1900 has shown a marked increase in the proportion of youth entering college. There is no reason to believe that this trend will not continue.
>
> On the basis of these facts it has been predicted that 9,000,000 will be clamoring for admission to college by 1975 instead of the 2,500,000 currently in attendance. How shall we in twenty years prepare to house, finance, and staff a college population three and one-half times larger than we now have?[1]

To point up even further this factor of increased enrollment and the problems it involves, Ellis makes this statement about enrollment increases:

> The growth of higher education in the United States during the years 1900 to 1950 has been phenomenal.

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[1] O. C. Carmichael, "Some College Presidents Discuss the Rising Tide," The Educational Record, XXXVI (July, 1955), p. 205.

> During the last fifty years the number of students enrolled in private colleges has multiplied more than seven times, while the number enrolled in public colleges and universities has multiplied seventeen times.[2]

It will be helpful to look for a moment at some figures that are more meaningful as they concern the enrollment increases at Central Washington College of Education and prediction of increases at this institution. The Newsletter of Central Washington College of Education has this to say about future growth:

> Projections of Central's future enrollments have been made at various times. Almost without exception it has been found that these projections were too conservative. A projection which was made as late as March, 1956, predicted the enrollment for 1956 at 1552, whereas the actual enrollment for autumn quarter 1956 is 1685. The figures below indicate the latest projections for the future growth of Central Washington College of Education. Judging from current enrollments it would appear that the "High" projections will more nearly approximate Central's future growth.

	1957	1958	1959	1960	1961	1962	1963	1964	1965
High....	1750	1850	2000	2200	2500	2700	2850	3100	3500
Medium..	1650	1650	1750	1900	2100	2250	2400	2550	2900
Low.....	1550	1500	1550	1650	1800	1900	1950	2050	2350[3]

The problem of increased enrollment as evidenced by the preceding statements are actually being felt by the colleges and universities already. Central Washington

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[2]Elmer Ellis, "More College Presidents Discuss the Rising Tide," The Educational Record, XXXVI (October, 1955), pp. 266-67.

[3]Robert Slingland (Ed.), "C.W.C.E. Faces Crucial Legislative Session, Future Growth," Newsletter, Central Washington College of Education, X (January, 1957), p. 3.

College of Education has already taken steps to alleviate some problems brought on by the enrollment of more and more students. At this writing, classes were being held at noon, some evening classes were scheduled, and more classes were being scheduled at later hours in the afternoon and early hours in the morning.

Even with this stepped up program of utilization there are problems of overcrowding and lack of sufficient space. How then is the college and university administration going to take care of these problems?

One source of information the college administrator can use in trying to alleviate problems caused by increased enrollment is published research and literature by other institutions and research organizations. This literature was examined to find what information was available on such problems as space per student recommended for different areas of college instruction, and space utilization in colleges and universities.

It was surprising to find that the amount of published research in the field of space utilization, space requirements per student in departments, and related areas for colleges and universities was very meager. William E. Arnold had this to say about the lack of research by the higher institutions in this field of endeavor:

> It seems a paradox that institutions which are the chief promoters of research into almost every conceivable area have done so little research on their own problems. Little scientific study has been made of such problems as laboratory arrangement, space needs, library layout, instruction and lecture room requirements, dormitory arrangements, heating and ventilating, and many other problems. In any search into published literature on the subject of educational buildings, one finds a very considerable amount which is available on the problem of elementary and secondary school design but a surprisingly small amount on buildings for higher education.
>
> In order to secure the maximum use of the limited building funds available to most colleges, it is essential that the greatest care be taken to assure that waste and extravagance be avoided and that the facilities of each building be so carefully planned that maximum utilization and service will result.[4]

I. LITERATURE ON SPACE PER STUDENT IN COLLEGES AND UNIVERSITIES

Smith has set up a preliminary report of building space per person for nearly all teaching departments in the University of California and other reasonably typical colleges or universities. He, however, qualifies the report in this way:

> The present report is preliminary in character, and does not necessarily represent an accepted policy of the University of California. It is not known, as yet, how well the recommendations will work out in practice. They are guides for the future rather than conclusions

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[4]William E. Arnold, "Improving and Extending the Institutional Plant," Current Trends in Higher Education, Official Group Reports of the Fourth Annual National Conference on Higher Education (Washington, D. C.: National Education Association, 1949), p. 161.

> drawn entirely from past tested experience. It is published as much to generate criticism and stimulate comment as to offer advice.[5]

Smith breaks down the space requirements per full-time equivalent student into graduate, upper division, and lower division students. The space requirements are then related to each teaching department as space per full-time student needed.

The needs per full-time equivalent student are also broken down into the number of full-time equivalent students per full-time faculty member. Thus, the larger number of students per faculty member, the smaller the amount of space needed.[6] Smith's recommendations are presented in Table I.

In trying to establish college building needs, Ernest Hollis and Associates sent questionnaires to 1,386 colleges and universities. They found in teachers' colleges and normal schools the average amount of space per student devoted to classrooms was forty-four square feet; laboratories, thirteen square feet; gymnasium space, nineteen square feet; administrative and faculty offices, nine

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[5]Donovan E. Smith, "College and University Space Requirements," American School and University, XXVI (New York: American School Publishing Corp., 1954-55), p. 287.

[6]Ibid., pp. 289-90.

TABLE I

TOTAL PROPOSED UNIT FLOOR AREAS FOR TEACHING DEPARTMENTS IN COLLEGES AND UNIVERSITIES[7]

ARTS	LANGUAGES AND LITERATURE	SOCIAL SCIENCES	BIOLOGICAL SCIENCES	MATHEMATICS	OTHER PROFESSIONS	MILITARY SCIENCE	PHYSICAL EDUC.	PHYSICAL SCIENCES
1	2	3	4	5	6	7	8	9
A. Assuming one FTE* faculty member or teacher assistant for every 15 FTE lower division students, one for every 10 FTE upper division students, and one for every 5 FTE graduate students:								
Net square feet per FTE lower division student:								
122	33	33	111	34	51	128	1,138	111
Net square feet per FTE upper division student:								
155	45	45	149	47	75	161	139	149
Net square feet per FTE graduate student:								
218	76	76	271	90	145	---	251	271

*Full-Time Equivalent

[7]Smith, op. cit., p. 293.

TABLE I (continued)

ARTS	LANGUAGES AND LITERATURE	SOCIAL SCIENCES	BIOLOG-ICAL SCIENCES	MATHE-MATICS	OTHER PROFES-SIONS	MILITARY SCIENCE	PHYSI-CAL EDUC.	PHYSICAL SCIENCES
1	2	3	4	5	6	7	8	9
B. Assuming one FTE faculty member or teaching assistant for every 30 FTE lower division students, one for every 20 FTE upper division students, and one for every 10 FTE graduate students:								
Net square feet per FTE lower division student:								
112	25	25	95	26	37	116	1,125	95
Net square feet per FTE upper division student:								
140	35	35	125	36	55	145	120	125
Net square feet per FTE graduate student:								
186	54	54	223	66	106	---	213	223
C. Assuming one FTE faculty member or teaching assistant for every 45 FTE lower division students, one for every 30 FTE upper division students, and one for every 15 FTE graduate students:								
Net square feet per FTE lower division student:								
108	23	23	90	23	33	113	1,122	90
Net square feet per FTE upper division student:								
134	30	30	117	31	48	139	113	117
Net square feet per FTE graduate student:								
175	46	46	208	58	92	---	201	208

square feet; library and study, ten square feet; and instructional shop space, seven square feet.[8]

II. LITERATURE ON UTILIZATION OF COLLEGE AND UNIVERSITY BUILDINGS

Holy and Thompson define utilization in this manner:

> Utilization as commonly defined falls under two headings - room and student-station, and capacity use. In the case of the first, if a room which seats fifty students has a class of twenty-five in it, so far as the room is concerned it is completely utilized, since it is not feasible to have two classes going on in the same room at the same time. However, in terms of student capacity, it is only 50 per cent used.[9]

Holy and Thompson recommend and have helped to put into effect at Ohio State University a council or committee on class size and room usage with powers to study and negotiate issues in respect to class size, hourly schedule, and room usage.[10]

Holy and Thompson recommend that for room use in lecture rooms in colleges and universities, seventy-five

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[8]Ernest V. Hollis and Associates, College Building Needs, Federal Security Agency, United States Department of Health, Education, and Welfare, Special Series No. 1 (Washington, D. C.: Government Printing Office, 1949), p. 14.

[9]T. C. Holy and R. B. Thompson, "Utilization of College and University Buildings," American School and University, XX (New York: American School Publishing Corp., 1948-49), p. 42.

[10]Holy and Thompson, loc. cit.

per cent is feasible to expect, and that room use for laboratories and other highly specialized rooms will probably not exceed sixty per cent of usage.[11]

Paul Bulger has this to say about space utilization:

> Opinion has been expressed by some authorities in the field of space utilization that 75 per cent to 76 per cent of room period use of lecture rooms is a high percentage of utilization. The authorities point out that 60 per cent utilization of the room periods of laboratories is to be considered high.[12]

Hermann H. Field has set forth his studies of the space utilization at Cleveland College, downtown center of Western Reserve University, and these have been worked out graphically.

> The study was made to discover facts such as: how much overcrowding, how much underuse, specific rooms showing the greatest dislocations and why; when the worst dislocations occur in regard to time of day and part of the week; what observable patterns characterize the situation and can be used as a guide in reducing overcrowding and increasing utilization.[13]

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[11]Holy and Thompson, op. cit., p. 45.

[12]Paul G. Bulger, Administering the Use of Academic Space in Teachers College, Columbia University, unpublished doctoral project, Columbia University, 1951, cited by American Association of Colleges for Teacher Education, Institutional Administrative Problems (Laramie: University of Wyoming, 1956), p. 4. (Mimeographed.)

[13]Hermann H. Field, "A Graphic Method of University Space Analysis," American School and University, XXI (New York: American School Publishing Corp., 1949-50), p. 75.

The preceding reviews of literature represent a cross section of the type and kinds of literature available in this field. These cannot be taken as complete answers to specific problems of individual colleges or universities but should serve as guide lines in developing answers for a specific institution.

CHAPTER III

PRESENTATION AND ANALYSIS OF THE FINDINGS

The purpose of this study was to make an analysis and inventory of the instructional space at Central Washington College of Education, to ascertain the amount of space available and how this space was used.

The data used in this study was obtained from available blueprints and actual measurements of buildings for which blueprints were not available.

For the purpose of showing the results of the inventory and analysis, this chapter will be organized by (1) summary of space utilization building by building; (2) the percentage of total assignable space per full-time equivalent student; (3) comparison of findings to Federal Security Agency report recommendations of 1949; and (4) square footage needs per student, by divisions, at Central Washington College of Education.

I. SUMMARY OF SPACE UTILIZATION, BUILDING BY BUILDING

Science Building. The Science Building had a total floor area of 33,622 square feet. Breaking this total floor space into instructional and non-instructional space, the findings show that of the 33,622 square feet, 17,749

square feet or fifty-three per cent of the space was devoted primarily to instructional purposes. The remaining space, 15,873 square feet or forty-seven per cent of the total, was devoted to non-instructional purposes such as offices, hallways, storage, and equipment rooms. A summary of these figures may be seen in Table II.

The building has a total assignable space of 19,178 square feet or fifty-seven per cent of the total space. This is also shown in Table II. Of the assignable space, the Science Building had 6,375 square feet of classroom space which is thirty-three per cent of the total assignable space; 1,429 square feet or eight per cent devoted to offices, and 11,374 square feet or fifty-nine per cent of the space devoted to laboratories.

Business Education Building. The Business Education Building had a total floor area of 2,296 square feet. Of this area, 1,586 square feet or sixty-nine per cent of the total was used as instructional space. The remaining area, 710 square feet or thirty-one per cent of the total, was devoted to non-instructional areas such as hallways, lavatories, and storage.

This building, as shown in Table II, had a total assignable area of 1,818 square feet which is seventy-nine per cent of the total area. Inspecting the totals for the

assignable space, the findings reveal for the Business Education Building that 234 square feet or thirteen per cent of the total assignable area was used as office space. The classroom space in the Business Education Building had an area of 1,584 square feet, which is eighty-seven per cent of the total assignable space.

Reserve Officers Training Corps Building. This building contained a total of 5,159 square feet of floor space. Of this total, 1,456 square feet or twenty-eight per cent was devoted to instructional space. The non-instructional space had a total of 3,703 square feet or seventy-two per cent of the total floor area in the building. A summary of the above space analysis is shown in Table II.

The Reserve Officers Training Corps Building had a total of 2,969 square feet of assignable space, which is fifty-eight per cent of the total space. This total included 1,513 square feet or fifty-one per cent devoted to office space and 1,456 square feet or forty-nine per cent of the total assignable space used as classrooms.

Industrial Arts Building. The total floor area in the Industrial Arts Building was 15,468 square feet. Of this total floor area, 10,113 square feet, which is sixty-five per cent of the total, was devoted to

instructional area. The non-instructional area was 5,355 square feet, or thirty-five per cent of the total.

The assignable space in the Industrial Arts Building had a total of 10,531 square feet, which is sixty-eight per cent of the total area. Of this total 418 square feet or four per cent was devoted to offices, 3,546 square feet or thirty-four per cent was used as classrooms, 5,697 square feet or fifty-four per cent was devoted to shops, and 870 square feet or eight per cent was devoted to laboratories which are used for photography work. A summary of this assignable area is shown in Table II.

Classroom Building. The Classroom Building had a total of 18,713 square feet of floor area. This building had 11,273 square feet, sixty per cent of the total area, devoted to instructional space. The remaining 7,444 square feet, forty per cent of the total, was devoted to non-instructional usage such as hallways, storage, and offices. A summary of this data is presented in Table II.

The total assignable area in the Classroom Building was 12,997 square feet, which is sixty-nine per cent of the total floor area. This assignable area breaks down into 1,724 square feet devoted to offices, or thirteen per cent of the total assignable area. The remaining assignable area was used as classrooms including 11,273

square feet of space or eighty-seven per cent of the total assignable space.

Administration Building. The Administration Building had a total floor area of 43,057 square feet. Of this area, 16,645 square feet of floor space was devoted to instruction, or thirty-nine per cent of the total. The remainder of the floor area was devoted to non-instructional usage and had an area of 26,412 square feet or sixty-one per cent of the total area.

The total assignable area in the Administration Building was 25,497 square feet, fifty-nine per cent of the total floor area. Of this total assignable space, 13,878 square feet or fifty-four per cent was devoted to classrooms. The office space had a total of 8,852 square feet or thirty-five per cent of the total, and there was a gymnasium area of 2,767 square feet, eleven per cent of the total assignable area. Table II shows a summary of this data.

Gymnasium. The Gymnasium had a total of 9,050 square feet of assignable space. Of this total assignable space, 285 square feet or three per cent were devoted to classroom space. The space devoted to offices was 1,448 square feet, sixteen per cent of the total; and 7,317 square feet were devoted to actual gymnasium or activity

space, eighty-one per cent of the total activity space. A summary of this data is presented in Table II.

The Gymnasium, as shown in Figure I, had a total floor area of 15,785 square feet. This building had 7,602 square feet, forty-eight per cent of the total area, devoted to instructional space. The remaining 8,183 square feet, fifty-two per cent of the total, was devoted to non-instructional usage. A summary of this data is presented in Table II.

Music Building. The total floor area in the Music Building was 21,507 square feet. Of this total space, 9,892 square feet were used for instruction; this is forty-six per cent of the total. The remaining space, 11,615 square feet or fifty-four per cent, was devoted to non-instructional purposes. A summary of these figures is presented in Table II.

The assignable space in the Music Building had a total of 12,057 square feet or fifty-six per cent of the total area. Of this total assignable area, 3,342 square feet or twenty-eight per cent of the space was used for offices. The area devoted to classroom space was 8,040 square feet or sixty-seven per cent of the total. The area devoted to library space in this building was 675 square feet or five per cent of the total assignable space.

Practice rooms were not included in the above figures for classroom space as they did not fit the definition of classrooms, but the total area of the practice rooms for computational purposes was included in the totals for instructional space.

Library Building. The Library had a total of 11,201 square feet of assignable space. Of this total assignable space, 8,923 square feet or eighty per cent of the total was devoted to library space, as defined earlier in this study. Office space had a total of 1,356 square feet or twelve per cent of the total, and 922 square feet or eight per cent of the total, was used for classroom space.

No attempt was made in this building to show the total amount of space and the amount and percentage of space devoted to instructional and non-instructional areas. These figures were not shown because of the type and kind of usage this building provided. However, floor plans of this building may be consulted in the appendix.

Training School Building. This building was peculiar in that only a small amount of space in the building was utilized by the college for college instruction or as office space for college instructors. The following figures are limited to the space used directly by the college for instruction or for use as offices for college instructors.

The total amount of college assignable space in the Training School Building was 3,441 square feet. Of this total, 2,249 square feet or sixty-five per cent was used as classroom space and 1,192 square feet or thirty-five per cent of all college used space was devoted to college faculty offices.

This building was usually referred to as the College Elementary School and was used primarily as a laboratory school. Available blueprints refer to it as the Training School Building and thus it was called that in this study.

II. TOTAL ASSIGNABLE SPACE PER FULL-TIME EQUIVALENT STUDENT

As was defined earlier in this paper, a full-time equivalent student was considered equal to fifteen quarter credits. Thus the total number of full-time equivalent students enrolled at Central Washington College of Education for the year 1955-1956 was arrived at by adding the total credits given for autumn, 1955, winter, 1956, and spring quarter, 1956; this number was then divided by forty-five, which would be equal to three fifteen-quarter credits, thus giving the average full-time equivalent student enrollment for one quarter.

The average full-time equivalent student enrollment at Central Washington College of Education for the year 1955-1956 was 1,468. When the number of student teachers

TABLE II

SUMMARY OF SPACE UTILIZATION BY BUILDINGS

Building	Total Space	Instructional Space	%	Non-instructional Space	%	Assignable Space	%
Science	33,622	17,749	53	15,873	47	19,178	57
Business Education	2,296	1,586	69	710	31	1,818	79
Reserve Officers Training Corps	5,159	1,456	28	3,703	72	2,969	58
Industrial Arts	15,468	10,113	65	5,355	35	10,531	68
Classroom	18,713	11,273	60	7,444	40	12,997	69
Administration	43,057	16,645	39	26,412	61	25,497	59
Gymnasium	15,785	7,602	48	8,183	52	9,050	57
Music	21,507	9,892	46	11,615	54	12,057	56
Library	13,317					11,201	84
Training School	3,441					3,441	

was deducted, the full-time equivalent students numbered 1,375. The enrollment of 1,375 will be used in this study as the total enrollment figure where applicable.

Office space. There was a total of 21,508 square feet, which was twenty per cent of the total assignable space, devoted to administrative and faculty offices. Using 1,468 as the full-time equivalent student enrollment of the college since faculty and administrative offices serve student teachers as well as regular students, it can be shown that 13.97 square feet of office space per full-time equivalent student was provided at Central Washington College of Education.

Classroom space. The space devoted to classrooms was 49,610 square feet or forty-six per cent of the total assignable space. With an enrollment of 1,375 students and the above amount of classroom space, it can be seen that there was an average of 36.08 square feet per student devoted to classrooms. The enrollment figure of 1,375 was used since classrooms do not serve student teachers.

Library space. There was a total floor area of 9,598 square feet that was devoted to library usage at Central Washington College of Education, which was nine per cent of the total assignable area on the campus. Thus

it may be seen that there was 6.54 square feet of library space per full-time equivalent student at this institution. The full-time equivalent students used to compute the square footage was 1,468 because student teachers utilized college library facilities.

Shop space. The 5,697 square feet of floor area that was devoted to shop space was five per cent of the total assignable area at Central Washington College of Education. With 5,697 square feet of shop space and 1,375 full-time equivalent students, it may be seen that 4.14 square feet of shop space per student was available at this institution.

Laboratory space. The amount of space devoted to laboratory usage at Central Washington College was 12,244 square feet. This was eleven per cent of the total square footage of assignable floor area. With the above amount of space and 1,375 full-time equivalent students enrolled at the college, this space provided 8.90 square feet per full-time equivalent student.

Gymnasium space. There were 10,084 square feet of floor area devoted to gymnasium space at Central Washington College of Education. This represented nine per cent of the total assignable space on the school campus. Thus

the amount of gymnasium space per full-time equivalent student was 7.33 square feet.

III. COMPARISON OF FINDINGS TO THE FEDERAL SECURITY AGENCY REPORT OF 1949

In 1947 a survey of 176 teachers' colleges and normal schools was undertaken by the Federal Security Agency to find the amount of space per student that was devoted to non-residential space.[1] The term non-residential space as used in the study meant classrooms, laboratory, gymnasium, administrative and faculty offices, library, and shop space. This report was published in 1949.

Table III shows the comparison of the national averages for teachers' colleges for different areas of instruction to the amount of like space provided per student at Central Washington College of Education.

It may be noted that the amount of classroom space provided on a national average per pupil was forty-four square feet. At Central Washington College of Education there were 49,610 square feet of space devoted to classrooms

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[1]Ernest V. Hollis and Associates, College Building Needs, Federal Security Agency, United States Department of Health, Education, and Welfare, Special Series No. 1 (Washington, D. C.: Government Printing Office, 1949), p. 14.

which provided 36.08 square feet of space per student, 7.92 square feet less than was provided for classroom space per student on a national average for teachers' colleges.

Proceeding down the table, it should be noted that in only one area did Central Washington College of Education provide more space per student than does the national average for that area. The area that was above the national average was office space; the national average was nine square feet per student, and at this institution 13.97 square feet of office space per student was provided.

Also presented in Table III is the total national average space per student in all the areas of classroom, laboratory, shop, gymnasium, office, and library. This total was 102 square feet while at Central Washington College of Education the amount of space per student for the similar areas was only 76.96 square feet, or 25.04 square feet under the national average.

Thus it can be seen that to bring the space per student in all areas up to national averages, 34,430 square feet of additional floor areas of classrooms, laboratories, shops, offices, library, and gymnasium would have had to have been provided on the campus of Central Washington College of Education. The above figure was arrived at by using 1,375 full-time equivalent students as the enrollment

TABLE III

COMPARISON OF ASSIGNABLE AREAS AT CENTRAL WASHINGTON COLLEGE OF EDUCATION TO NATIONAL AVERAGES FOR TEACHERS' COLLEGES

Assignable Areas	National Average for Teachers' Colleges, Square Feet Per Student	Central Washington College of Education	
		Square Feet Per Student	Total Space
Classroom	44	36.08	49,610
Laboratory	13	8.90	12,244
Shop	7	4.14	5,697
Office	9	13.97	21,508
Library	10	6.54	9,598
Gymnasium	19	7.33	10,084
Totals	102	76.96	108,741

at the college. For the predicted enrollment of 1,750 full-time students for the autumn of 1957, the institutional space needed to come up to the national average to furnish adequate instructional space would be an additional 72,670 square feet.

IV. SQUARE FOOTAGE NEEDS PER STUDENT BY DIVISIONS

The purpose of this portion of the chapter was to show the amount of square footage needed by each division per full-time equivalent student so that the amount of space would be comparable to national averages for the same type of area. Since all divisions did not have similar area needs--for instance, the Social Sciences Division had no need for gymnasium space--the writer selected two areas of assignable space to show the needs by divisions. These two areas which applied to all divisions were classroom space and office space.

It is impossible to show the amount of space to which each division had access on a full-time basis since more than one division used the same space. An example of this might be a classroom in the Classroom Building which in the course of a day was used by the Division of Education and Psychology, the Division of Language, Literature and Speech, and the Division of Health and Physical Education.

The Federal Security Agency found in its survey of the teachers' colleges that the average amount of space devoted to classroom space per pupil was forty-four square feet. It was also found in the study that the average amount of space per student devoted to offices was nine square feet.[2] With these figures in mind, Table IV shows that for the Division of Home Economics, which had 59.68 full-time equivalent students, 2,625.92 square feet of classroom space should be available for division use to bring the amount of classroom space up to national averages for teachers' colleges. For the same division, 537.12 square feet of office space would be needed to bring the space per pupil up to national averages.

For the Division of Education and Psychology, it will be noted in Table IV that two figures are given for the number of full-time students in the division. The first row of figures indicates the division needs without including student teachers in the count of students. The second row of figures shows the number of full-time equivalent students with the number of student teachers included. Thus without counting student teachers, the Division of Education and Psychology needs for classroom space would be 10,503.68 square feet and for office space

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[2] Ibid., p. 14.

2,148.48 square feet. Using 331.80 students, which includes student teachers, the classroom space needed would be 14,599.20 square feet and the area needed for office space would be 2,986.20 square feet.

The last row of figures in Table IV shows the totals for number of students and for square footage needs for classroom and office space. With 1,374.55 full-time equivalent students enrolled in all divisions, a total of 60,480.20 square feet of classroom space and 12,370.95 square feet of office space was needed to bring Central Washington College of Education up to the national averages for teachers' colleges.

TABLE IV

SPACE NEEDS FOR CLASSROOMS AND OFFICES BY DIVISIONS AT CENTRAL WASHINGTON COLLEGE OF EDUCATION USING NATIONAL AVERAGES FOR TEACHERS' COLLEGES

Division	Number of Full-time Equivalent Students	Classroom Space Needed	Office Space Needed
Education and Psychology	238.72	10,503.68	2,148.48
(plus student teachers)	331.80	14,599.20	2,986.20
Fine and Industrial Arts	79.72	3,507.68	717.48
Health, Physical Education, and Recreation	107.46	4,728.24	967.14
Home Economics	59.68	2,625.92	537.12
Language, Literature and Speech	181.71	7,995.24	1,635.39
Music	85.20	3,748.80	766.80
Science and Mathematics	218.13	9,597.72	1,963.17
Social Sciences	358.62	15,779.28	3,227.58
Air Science	45.31	1,993.64	407.79
Totals	1,374.55	60,480.20	12,370.95

NOTE: The above square footage needs per division were figured using forty-four square feet per student and nine square feet per student for classroom and office space, respectively. These figures are national averages for teachers' colleges, square feet per student.[3]

[3] Ibid.

TABLE IV (continued)

For the Education and Psychology Division it should be noted that figures are shown for the division both exclusive and inclusive of student teachers. The totals do not have student teachers included.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

I. SUMMARY

The purpose of this study was to make an analysis and inventory of the instructional space at Central Washington College of Education, and to compare the findings of the analysis and inventory to the 1949 report of the Federal Security Agency on square footage needs per student in teachers' colleges.

Central Washington College of Education had many older instructional buildings for which floor plans and thus measurements for the buildings were not available. For those instructional buildings for which blueprints were not available, measurements of the buildings were taken. From these, floor plans were drawn to scale. These floor plans are included in the appendix of this paper.

Enrollments are on the rise at colleges across the United States, and Central Washington College of Education is no exception. In May, 1957, enrollment at Central Washington College of Education had risen three hundred per cent since 1930, two hundred per cent since 1937, fifty per cent since 1947, twenty-three and three-tenths per cent since 1955, and sixteen and eight-tenths per cent

during the year of 1956-1957. With larger enrollments and other factors such as increased requirements for certification and proportionately more college-age youth enrolling, the emphasis on utilization of available space was becoming more acute.

There has been very little research in such areas as space utilization and problems concerning the amount of space per student that should be provided in different areas for colleges and universities. The lack of research in the latter area may be explained by the fact that each institution does its own research to fit its individual needs so that the space will fit the curriculum rather than the curriculum fitting the space. It has been found, however, that teachers' colleges on the average provide forty-four square feet of classroom space per student, thirteen square feet for laboratories, nineteen square feet for gymnasium, nine square feet for offices, ten square feet for library, and seven square feet for shops per student.[1]

The Federal Security Agency report of 1949 is not a true or good criteria with which to compare college space

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[1]Ernest V. Hollis and Associates, College Building Needs, Federal Security Agency, United States Department of Health, Education, and Welfare, Special Series No. 1 (Washington, D. C.: Government Printing Office, 1949), p. 14.

needs. At the time of the Federal Security Agency's study, which was begun in 1947, college enrollments were swelled by incoming World War II veterans. Many undesirable areas of housing, food service, and instruction were forced into use.

The averages of space per student for teachers' colleges should not be taken as ideal space standards. The figures set forth by the Federal Security Agency, it should be remembered, are averages and not criteria for judging space requirement standards. The writer feels that standard of space per student is an individual institutional problem. The curriculum should dictate the space requirement; under no circumstance should the assignable space be allowed to dictate the curriculum.

Central Washington College of Education had an enrollment of 1,685 students for autumn quarter of 1956. This number was an increase of 16.8 per cent over the year of 1955-1956 for which enrollment figures for this study were used. Using the autumn quarter of 1956 enrollments, this means that the space per student for classrooms would be 29.44 square feet; laboratories, 7.26 square feet; shop, 3.38 square feet; offices, 12.76 square feet; library, 5.69 square feet; and 5.98 square feet of gymnasium space per student.

The predicted enrollment for Central Washington College of Education for the year of 1957-1958 was 1,750 students. Using this enrollment figure and the space provided at the time this paper was written, the space per student in classrooms would be 28.34 square feet; laboratories, 6.99 square feet; shop, 3.25 square feet; offices, 12.29 square feet; library space, 5.48 square feet; and space per student of gymnasium area, 5.76 square feet.

In the area of space utilization, utilization is usually defined as room utilization and pupil station utilization. Most authorities agree that for a college or university, seventy-five per cent of room period use of lecture rooms is a high percentage of utilization. The authorities also point out that sixty per cent utilization of the room periods of laboratories and other special rooms is to be considered high.[2]

This study has shown that the percentage of space in each instructional building devoted to instruction ranged from 28.22 per cent in the Reserve Officers Training

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[2]Paul G. Bulger, Administering the Use of Academic Space in Teachers College, Columbia University, unpublished doctoral project, Columbia University, 1951, cited by American Association of Colleges for Teacher Education, Institutional Administrative Problems (Laramie: University of Wyoming, 1956), p. 4. (Mimeographed.)

Corps Building to 69.07 per cent in the Business Education Building. The Industrial Arts Building had 65.38 per cent of the total area devoted to instruction; the Classroom Building, 60.24 per cent; the Science Building, 52.78 per cent; the Music Building, 45.99 per cent; and the Administration Building, 38.65 per cent of the total area in the building devoted to instructional purposes.

Central Washington College of Education was found to be lacking in space per student in all assignable areas but office space. The national average space per student devoted to offices was nine square feet, while at Central Washington College of Education 13.97 square feet of office space per full-time equivalent student was provided.

The total amount of assignable space per student at Central Washington College of Education was 76.96 square feet. The total national average assignable space per student was 102 square feet. If Central Washington College of Education were to provide enough space per student of assignable area to meet national averages, a total of 34,430 square feet of assignable area would have to be added.

As was stated earlier in this study, it is impossible to show the amount of space that a division had available for full-time use. The reason for the inability to show this space is the fact that more than one division was

using the same space during a day of classes. However, it may be noted that the total needs to meet national averages for all divisions for classroom space exceeded the amount of space that was available at the time of this study. On the other hand, the amount of office space that was then in use at Central Washington College of Education exceeded the needs of all divisions to meet national averages.

II. RECOMMENDATIONS

There is a lack of research concerning many facets of space utilization, space per student needed, and other related areas. If colleges and universities are to get full utilization from already overcrowded facilities, evidence of this utilization should be provided to show areas of over and under utilization.

A study of the room utilization and the pupil station utilization of the instructional areas of Central Washington College of Education would be a valuable and useful study.

Perhaps another study would be of class scheduling, determining the heaviest and lightest hours of class scheduling. It may show that scheduling classes at different hours would be helpful in alleviating overcrowded conditions.

The actual amounts of instructional space needed to conduct superior teaching on the college level have not

been definitely determined. Also there seems to be a lack of evidence as to the practicable amount of floor space that should be devoted to instruction in a building that is built primarily for instructional purposes. Research into these areas would be of great benefit to American colleges and universities. These institutions are being faced with increased enrollments and building programs that must be carried out to meet these enrollment increases.

BIBLIOGRAPHY

BIBLIOGRAPHY

Arnold, William E. "Improving and Extending the Institutional Plant," Current Trends in Higher Education, pp. 159-61. Official Group Reports of the Fourth Annual National Conference on Higher Education. Washington, D. C.: National Education Association, 1949.

Bulger, Paul G. Administering the Use of Academic Space in Teachers College, Columbia University. Unpublished doctoral project, Columbia University, 1951, cited by American Association of Colleges for Teacher Education, Institutional Administrative Problems, p. 4. Laramie: University of Wyoming, 1956.

Carmichael, O. C. "Some College Presidents Discuss the Rising Tide," The Educational Record, XXXVI (July, 1955), pp. 205-10.

Ellis, Elmer. "More College Presidents Discuss the Rising Tide," The Educational Record, XXXVI (October, 1955), pp. 265-90.

Field, Hermann H. "A Graphic Method of University Space Analysis," American School and University, XXI (New York: American School Publishing Corp., 1949-50), pp. 75-80.

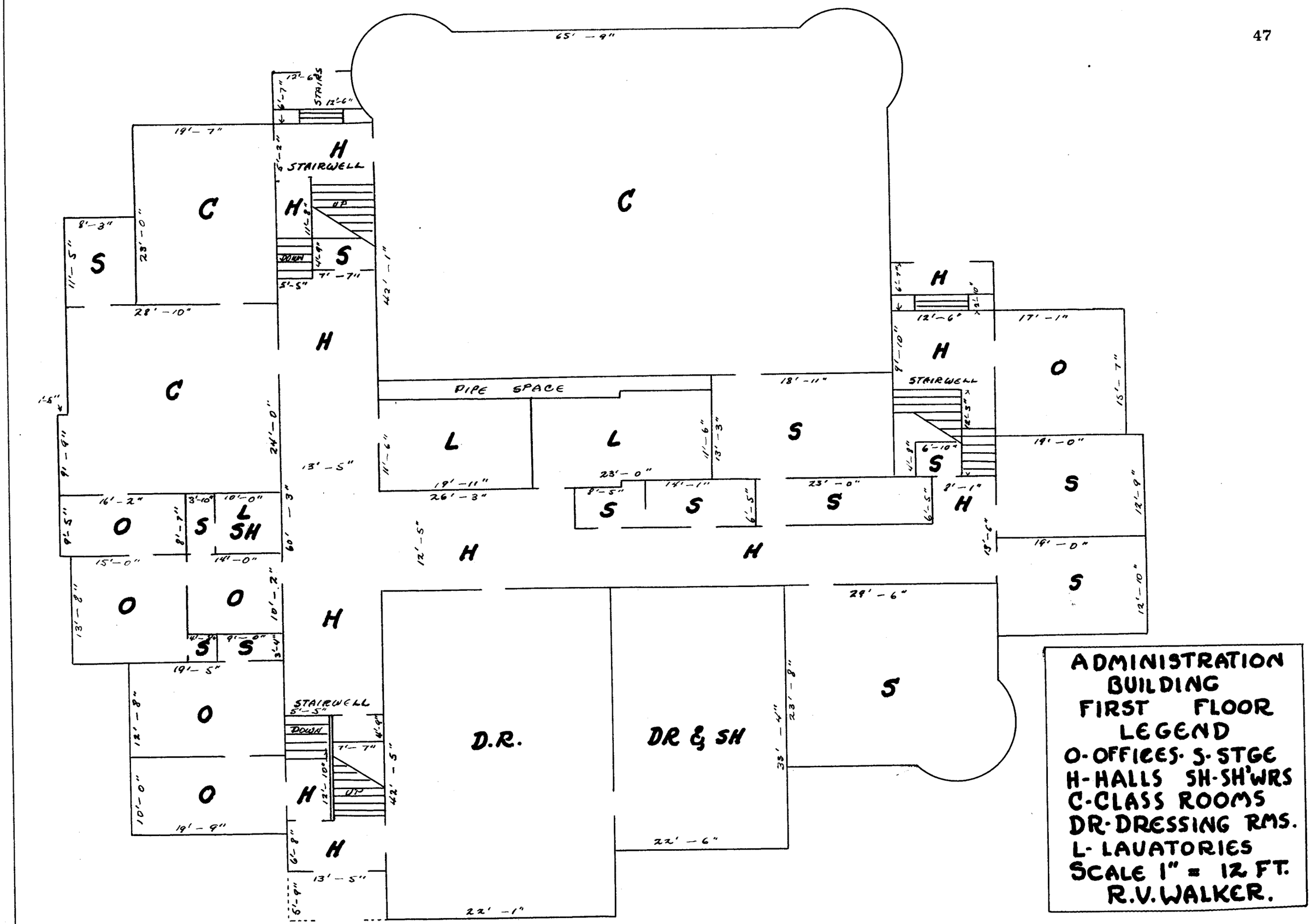
Hollis, Ernest V. and Associates. College Building Needs. Federal Security Agency, United States Department of Health, Education, and Welfare, Special Series No. 1. Washington, D. C.: Government Printing Office, 1949.

Holy, T. C., and R. B. Thompson. "Utilization of College and University Buildings," American School and University, XX (New York: American School Publishing Corp., 1948-49), pp. 41-5.

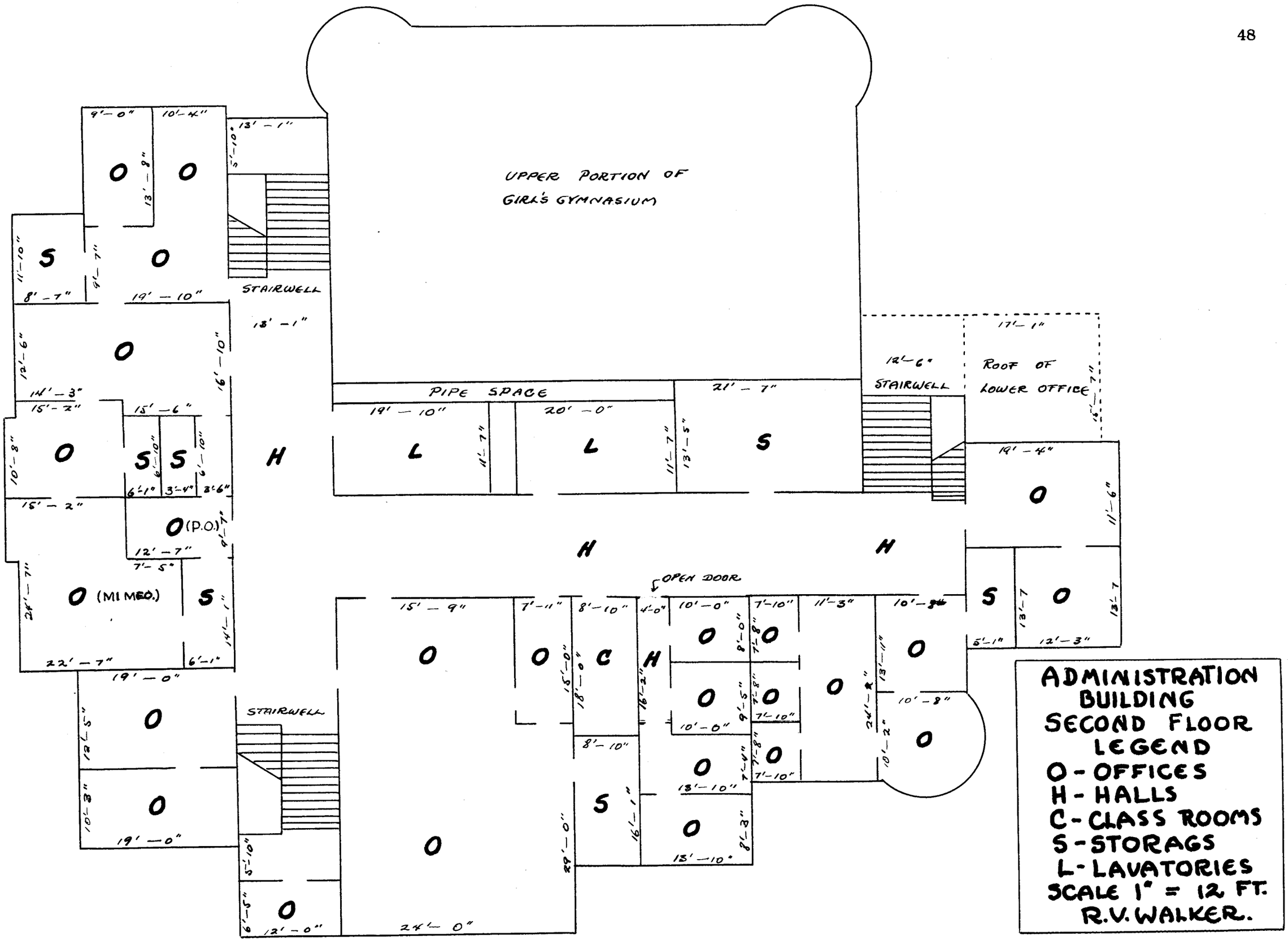
Slingland, Robert (ed.). "C.W.C.E. Faces Crucial Legislative Session, Future Growth," Newsletter, Central Washington College of Education, X (January, 1957), p. 3.

Smith, Donovan E. "College and University Space Requirements," American School and University, XXVI (New York: American School Publishing Corp., 1954-55), pp. 287-96.

APPENDIX



ADMINISTRATION BUILDING
FIRST FLOOR
LEGEND
O-OFFICES· S-STGE
H-HALLS SH-SH'WRS
C-CLASS ROOMS
DR-DRESSING RMS.
L-LAVATORIES
SCALE 1" = 12 FT.
R.V. WALKER.



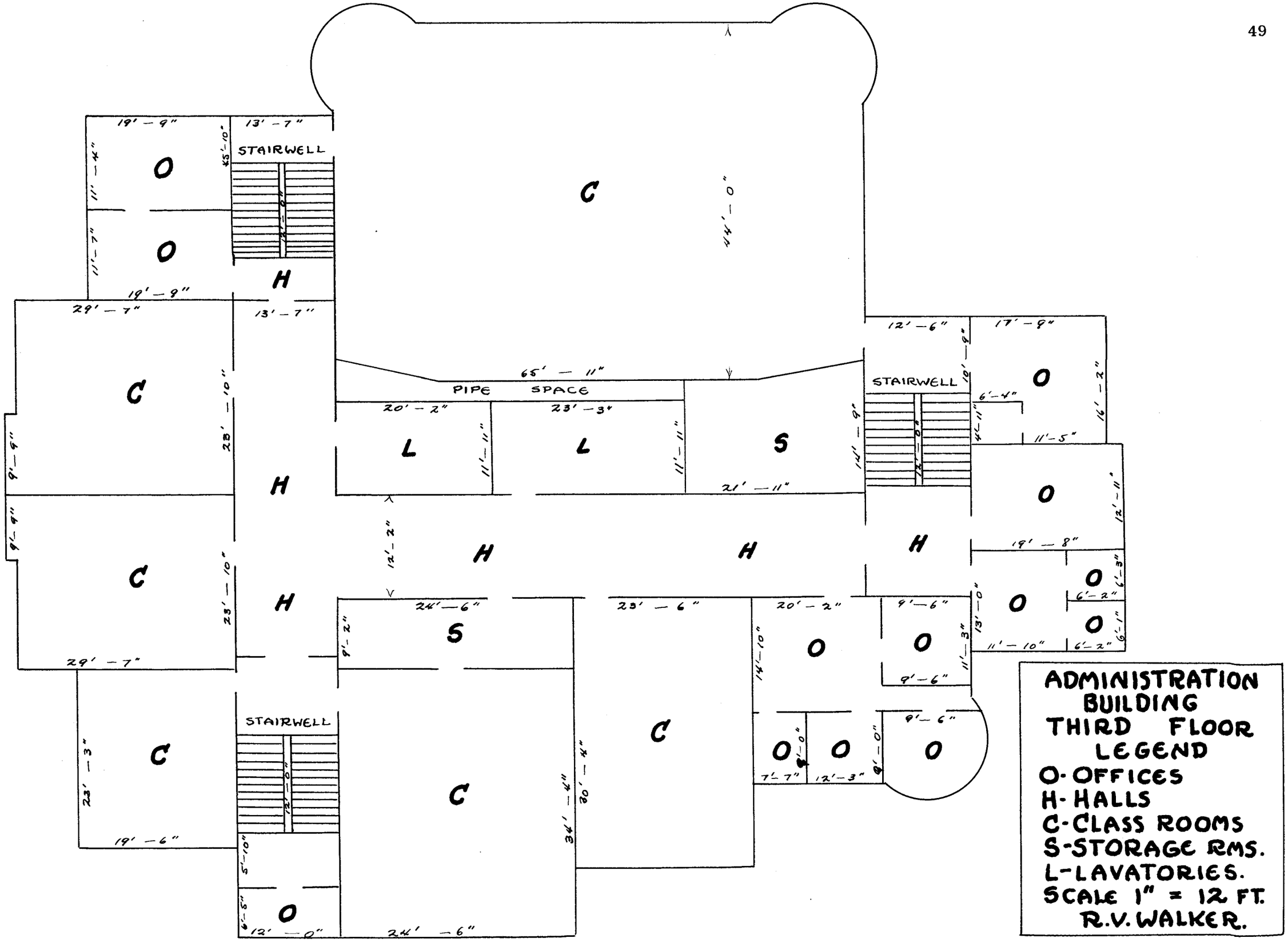
ADMINISTRATION BUILDING SECOND FLOOR

LEGEND

O - OFFICES
H - HALLS
C - CLASS ROOMS
S - STORAGS
L - LAVATORIES

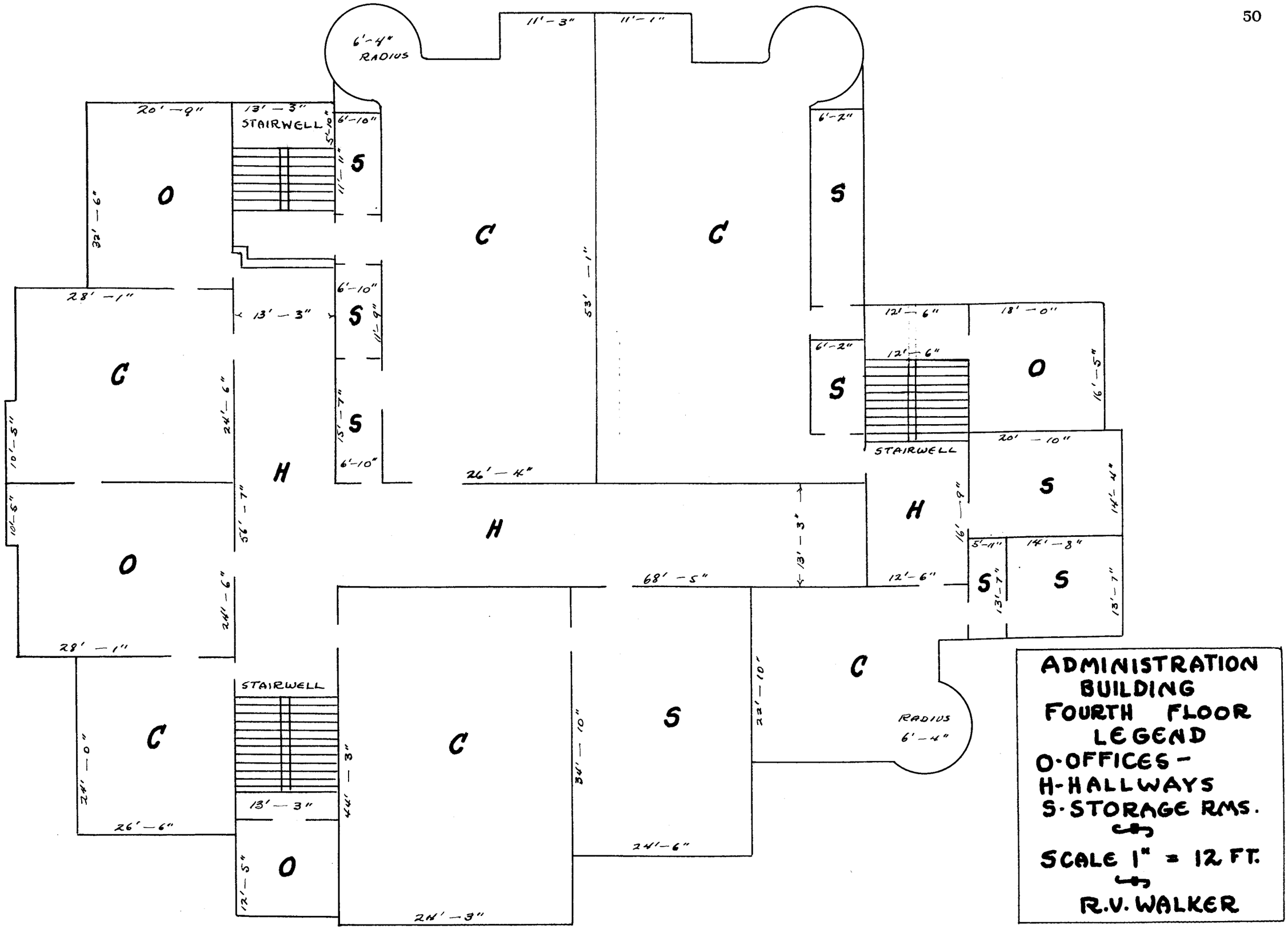
SCALE 1" = 12 FT.

R.V. WALKER.



ADMINISTRATION BUILDING THIRD FLOOR LEGEND

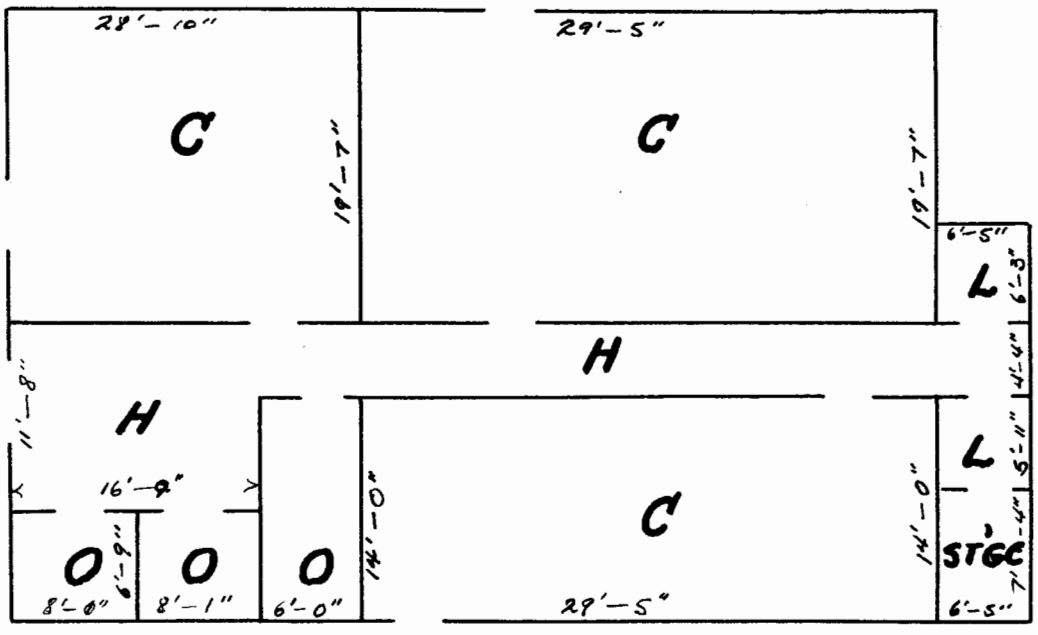
O- OFFICES
H- HALLS
C- CLASS ROOMS
S- STORAGE RMS.
L- LAVATORIES.
SCALE 1" = 12 FT.
R.V. WALKER.



ADMINISTRATION BUILDING
FOURTH FLOOR
LEGEND
O-OFFICES-
H-HALLWAYS
S-STORAGE RMS.

SCALE 1" = 12 FT.

R.V. WALKER

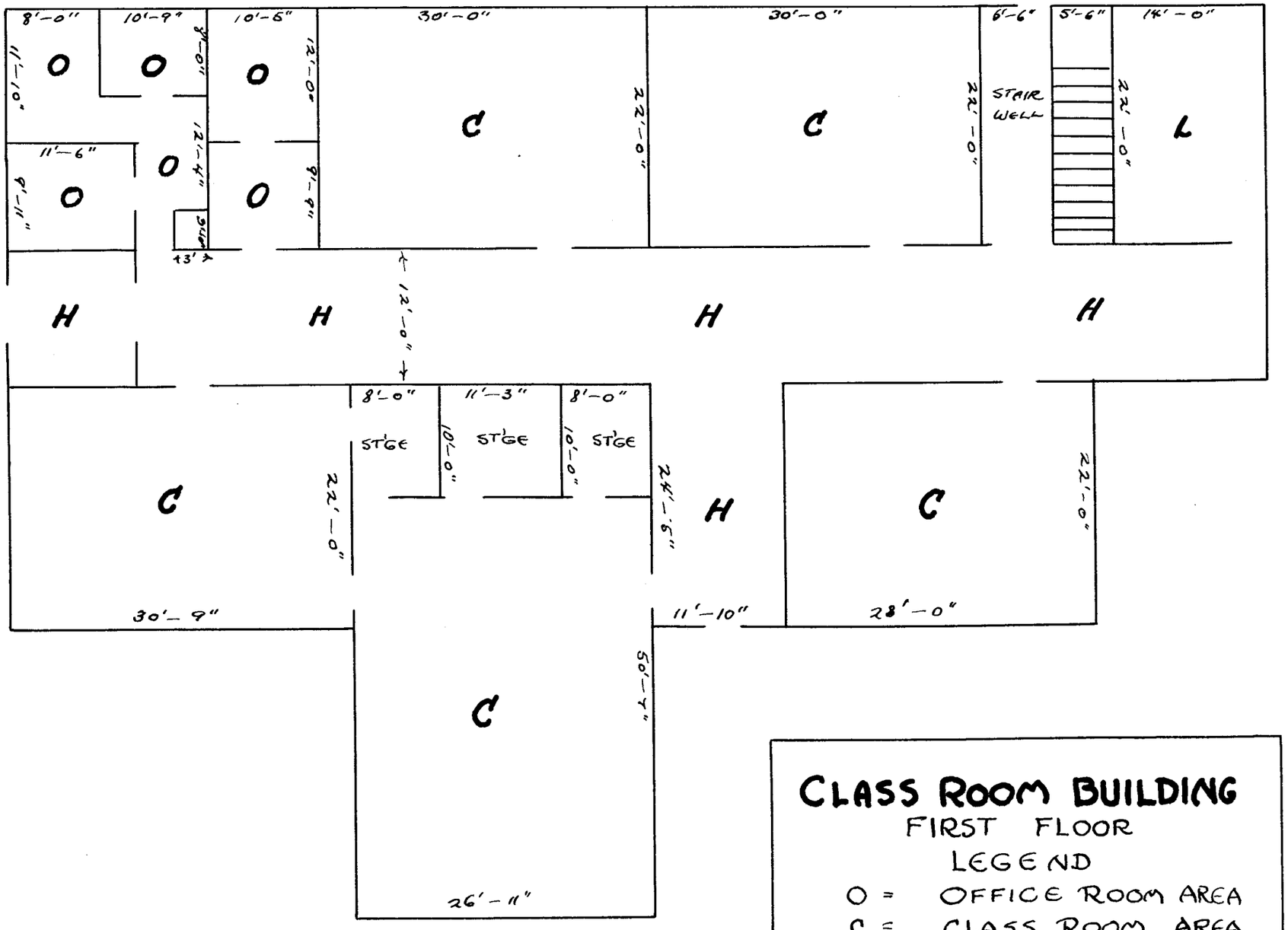


BUSINESS ED. BUILDING

LEGEND

O - OFFICE AREA
C - CLASS ROOM AREA
H - HALLWAY AREA
L - LAVATORY AREA

SCALE 1" = 12' R.V. WALKER



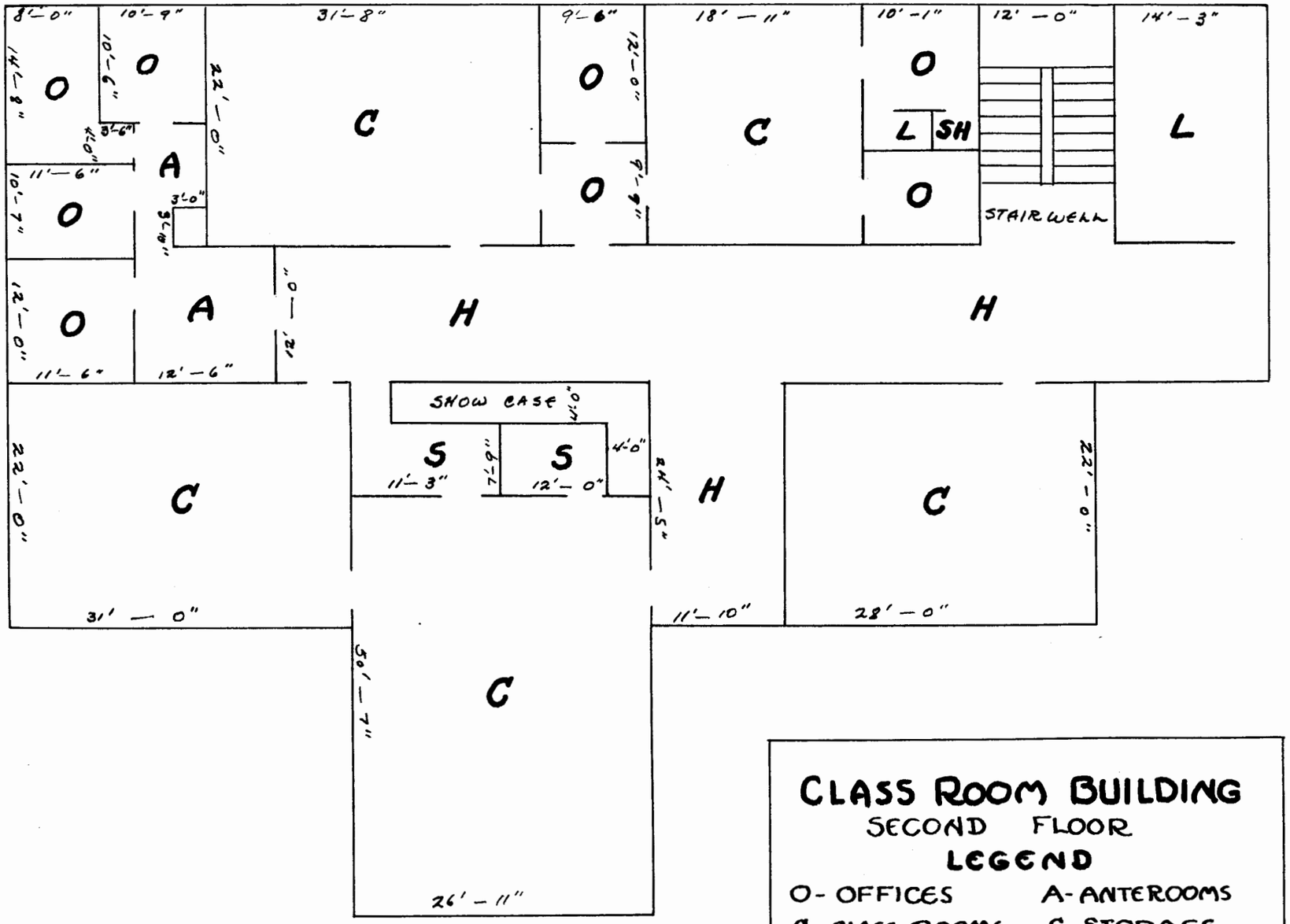
CLASS ROOM BUILDING

FIRST FLOOR

LEGEND

O = OFFICE ROOM AREA
C = CLASS ROOM AREA
H = HALLWAY AREA
L = LAVATORY AREA

SCALE 1" = 12' R.V. WALKER.



CLASS ROOM BUILDING

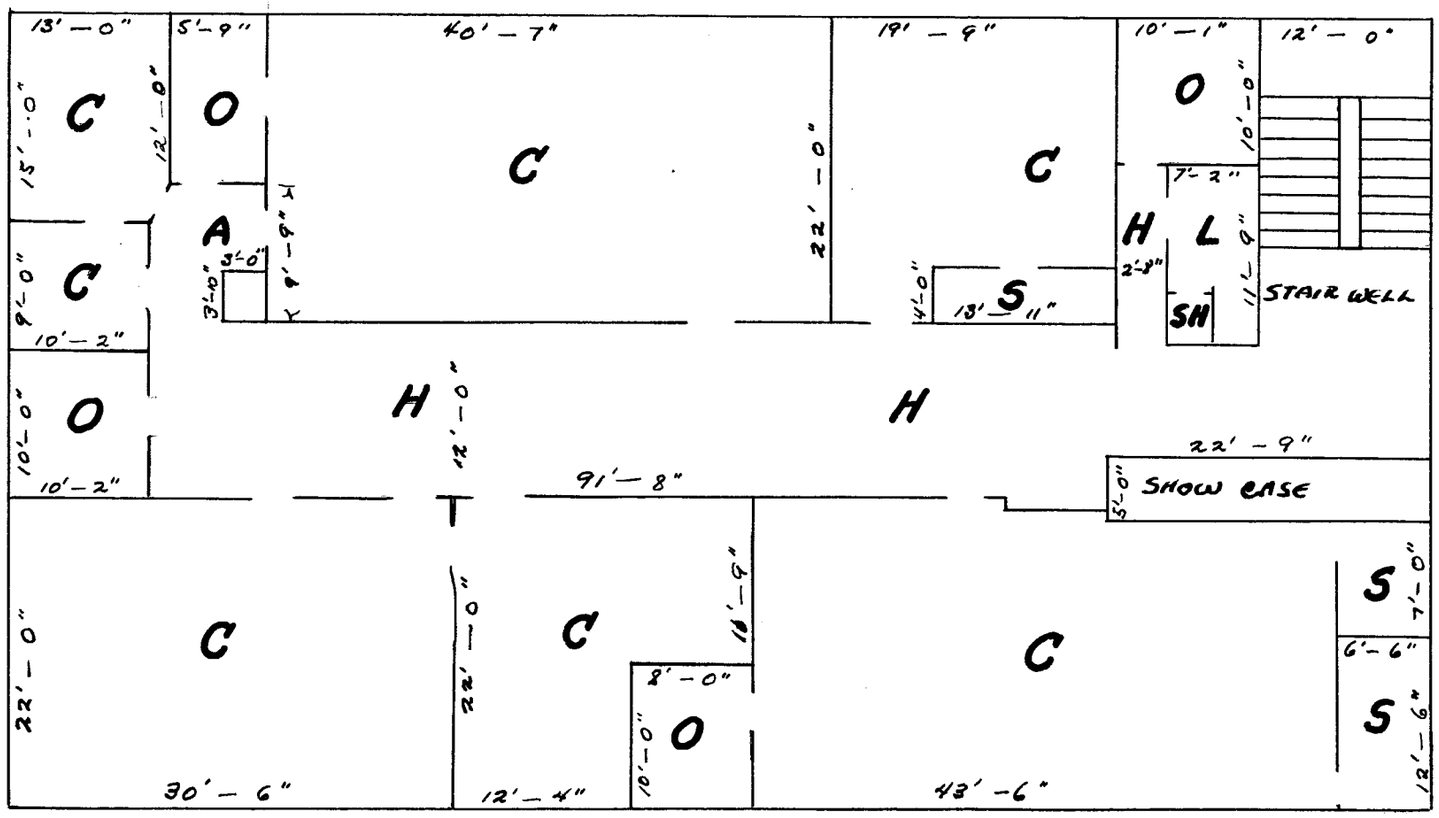
SECOND FLOOR

LEGEND

O - OFFICES	A - ANTEROOMS
C - CLASS ROOMS	S - STORAGE
H - HALLWAYS	SH - SHOWERS
L - LAVATORIES	

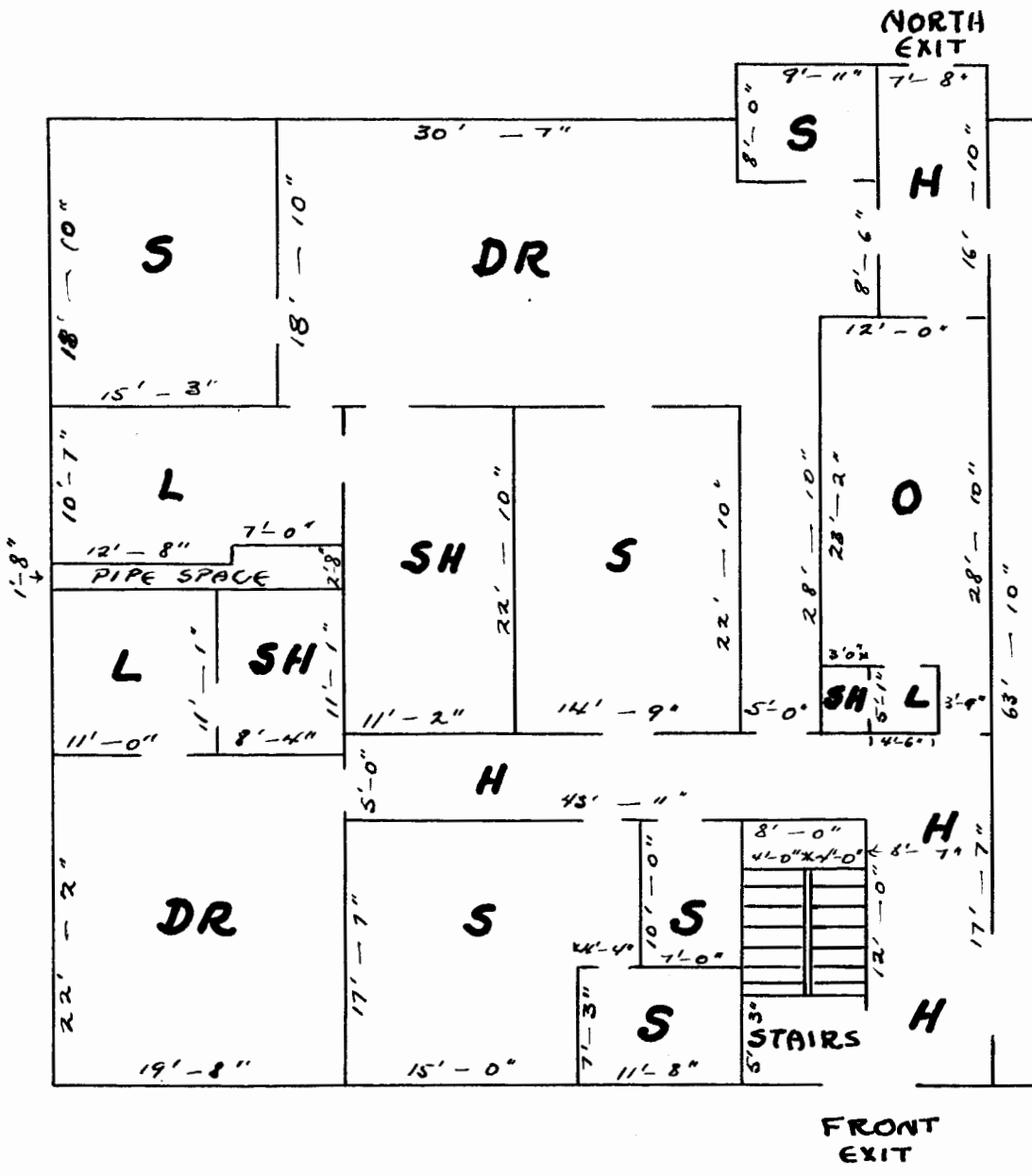
SCALE 1" = 12'

R.V. WALKER.



CLASS ROOM BUILDING
THIRD FLOOR
LEGEND

O-OFFICES A-ANTEROOM
C-CLASS ROOMS S-STORAGE
H-HALLWAYS SH-SHOWERS
L-LAVATORIES
SCALE 1" = 12' R.V. WALKER.


NORTH EXIT
9'-11"
7'-8"
8'-0"
S
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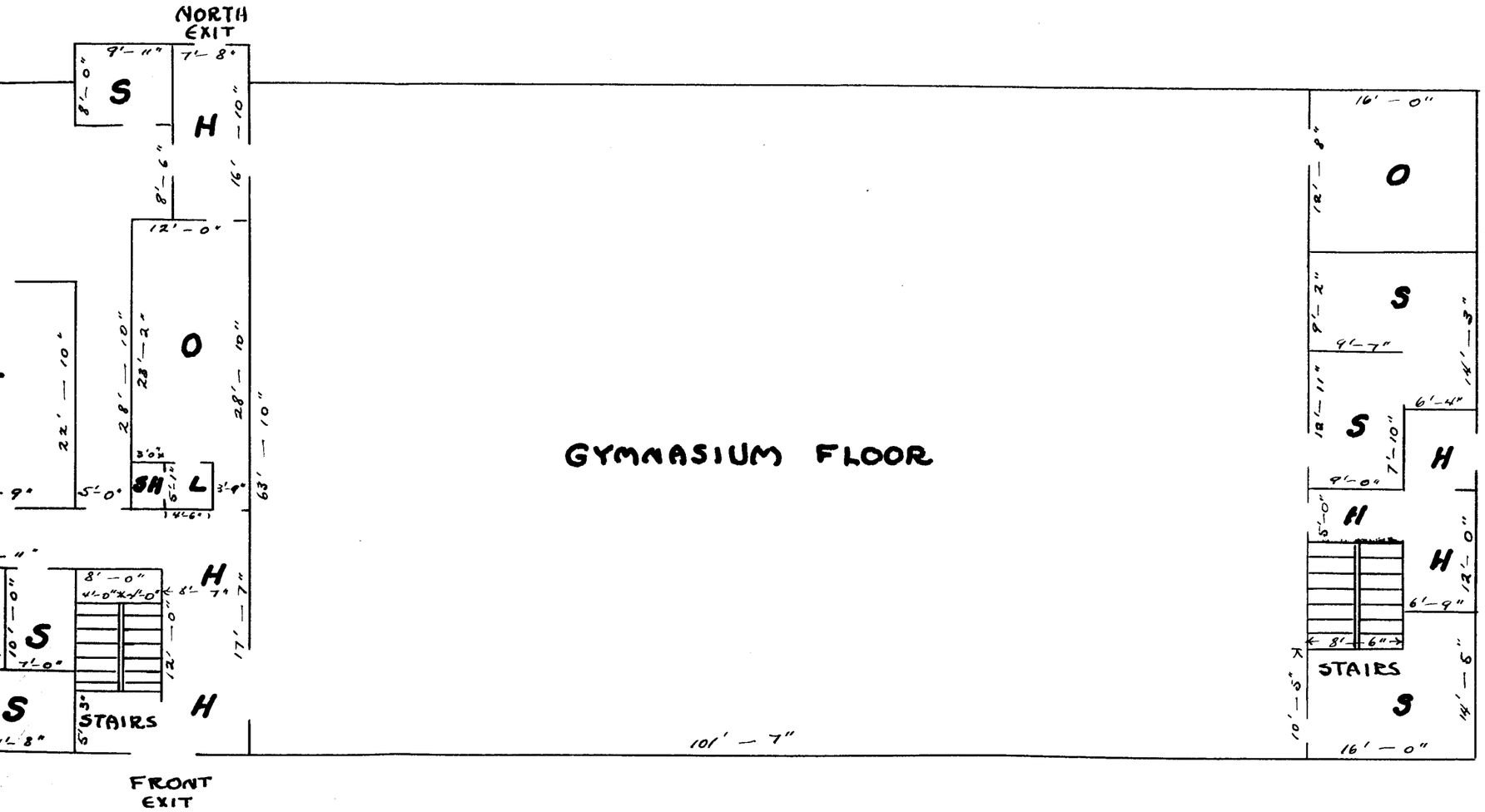
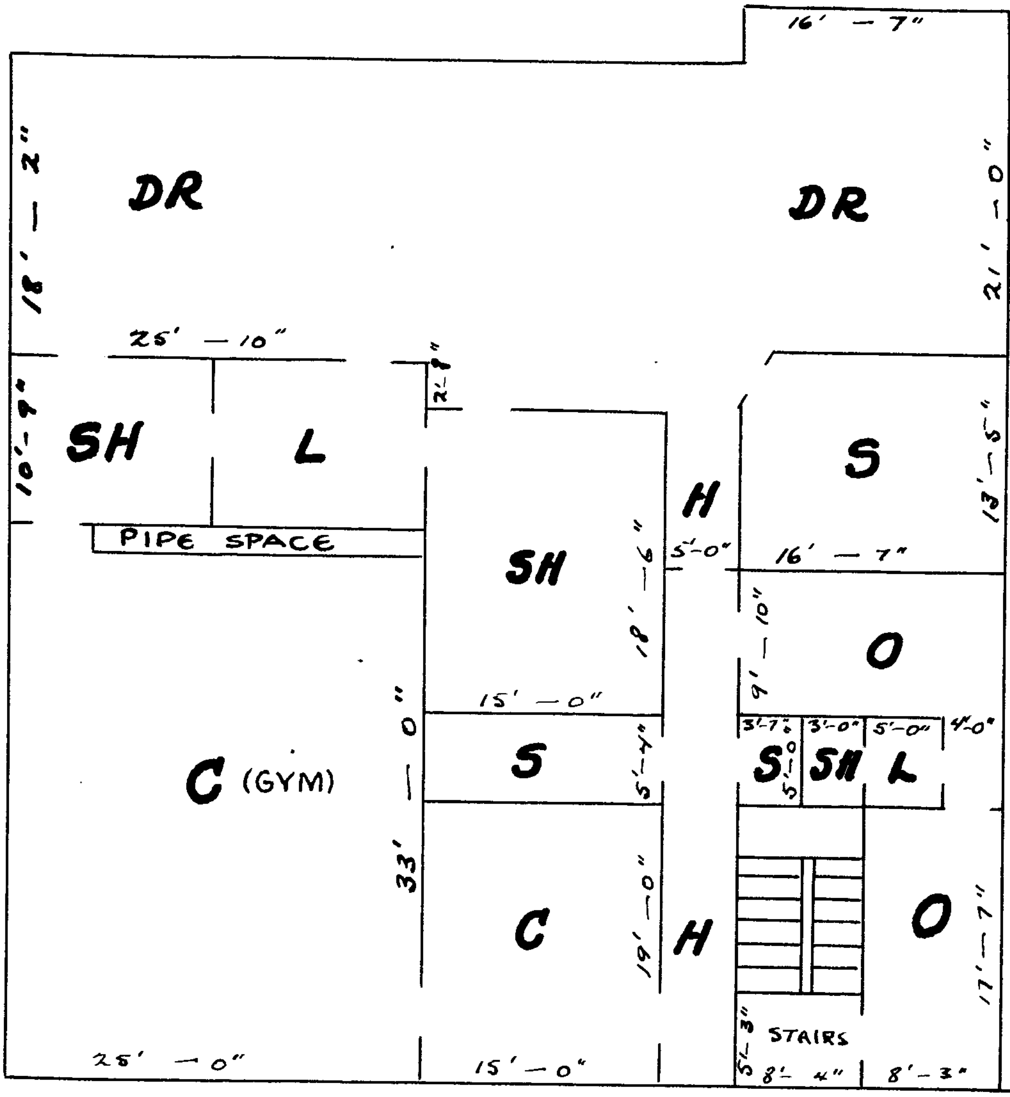
30'-7"
18'-10"
S
18'-10"
DR
8'-6"
16'-10"
12'-0"
15'-3"
10'-7"
L
12'-8"
7'-0"
PIPE SPACE
2'-8"
1'-8"
SH
S
22'-10"
22'-10"
28'-10"
28'-2"
O
28'-10"
63'-10"
3'0"x
L
SH
11'-1"
11'-1"
11'-0"
8'-4"
11'-2"
14'-9"
5'-0"
5'-1"
3'-9"
14'-6"
5'-0"
H
43'-11"
8'-0"
4'-0"x4'-0"
8'-7"
H
22'-2"
DR
17'-7"
S
10'-0"
S
44'-4"
7'-0"
12'-0"
17'-7"
7'-3"
S
STAIRS
H
5'-3"
19'-8"
15'-0"
11'-8"
FRONT EXIT



LEGEND	
O - OFFICES	L - LAVATORIES
H - HALLS	S - STORAGES
SH - SHOWERS	DR-DRESS'G RM'S

GYMNASIUM BLDG.
FIRST FLOOR
SCALE 1 IN = 12 FT.
R.V. WALKER.


16' — 7"
DR
DR
18' — 2"
21' — 0"
25' — 10"
2'-8"
10'-9"
SH
L
S
13' — 5"
H
PIPE SPACE
SH
18' — 6"
5'-0"
16' — 7"
9' — 10"
O
15' — 0"
3'-7½
3'-0"
5'-0"
4'-0"
C (GYM)
33' — 0"
S
5'-4"
S
5'-0
SH
L
C
19' — 0"
H
O
17' — 7"
5'-3"
STAIRS
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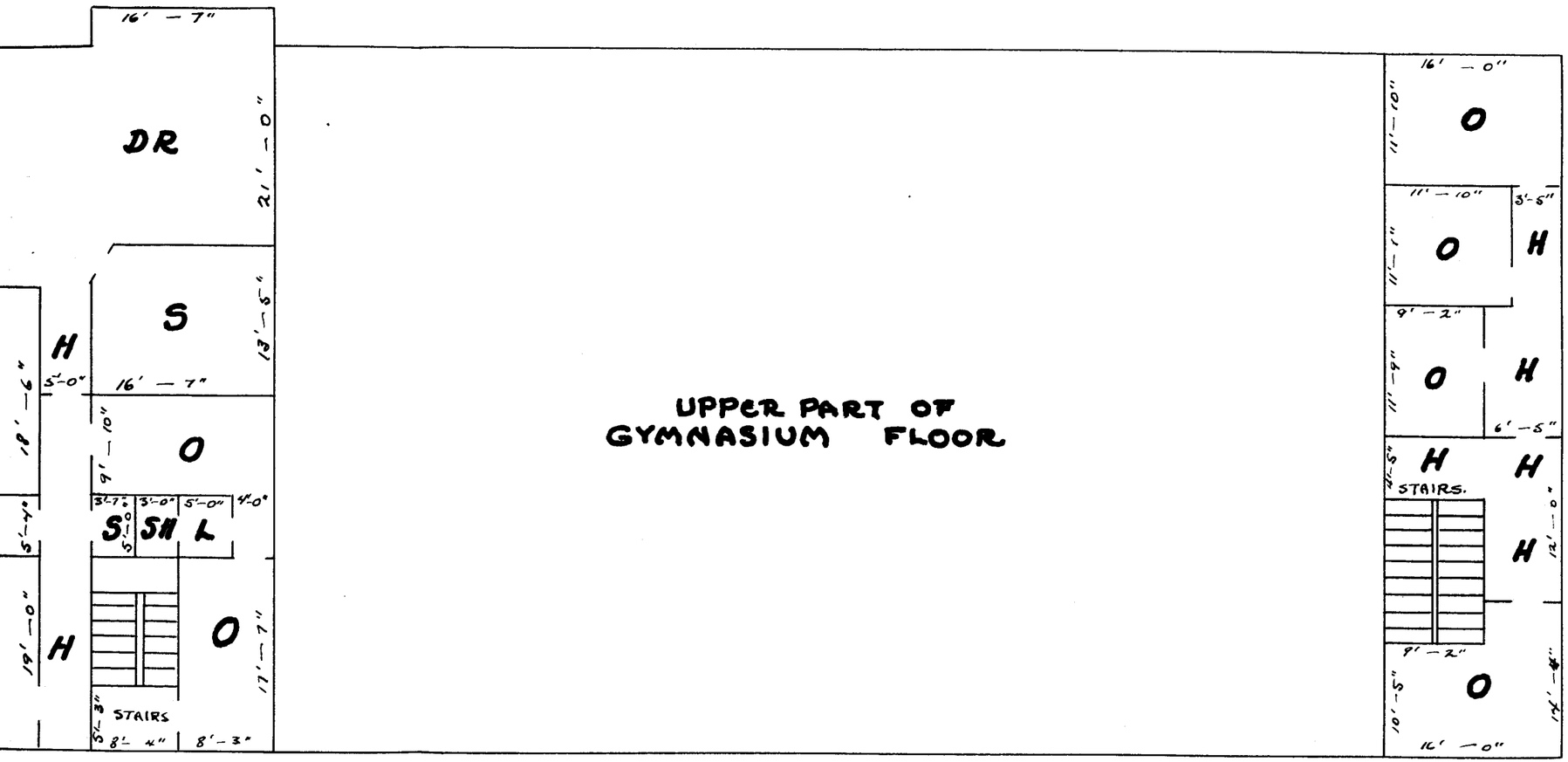
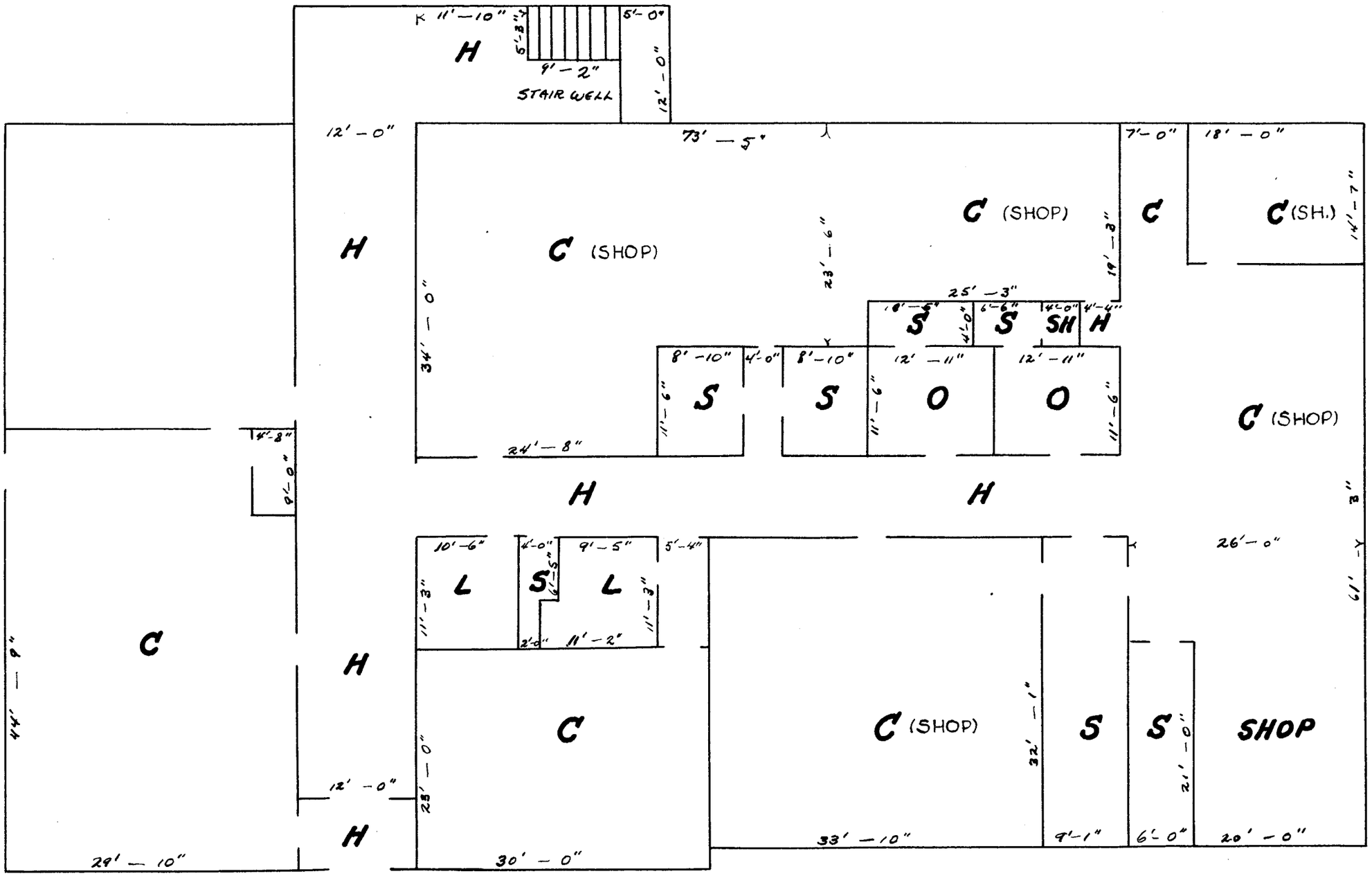
8'- 4"
8' - 3"



LEGEND	
O - OFFICES	L - LAVATORIES
H - HALLS	S - STORAGES
SH - SHOWERS	DR - DRESS'G RM's

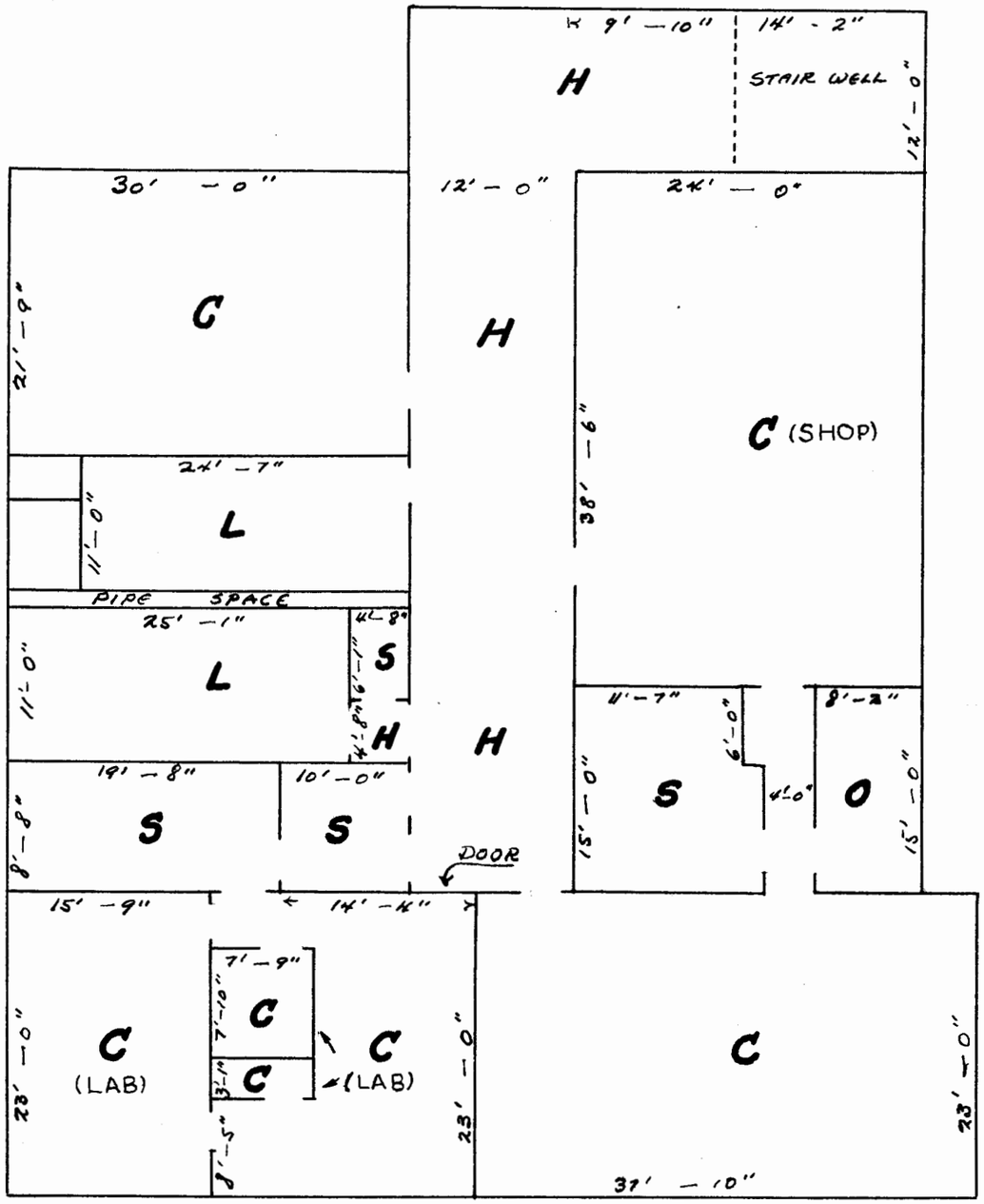
GYMNASIUM BLDG
SECOND FLOOR
SCALE 1 IN = 12 FT.
R.V. WALKER.



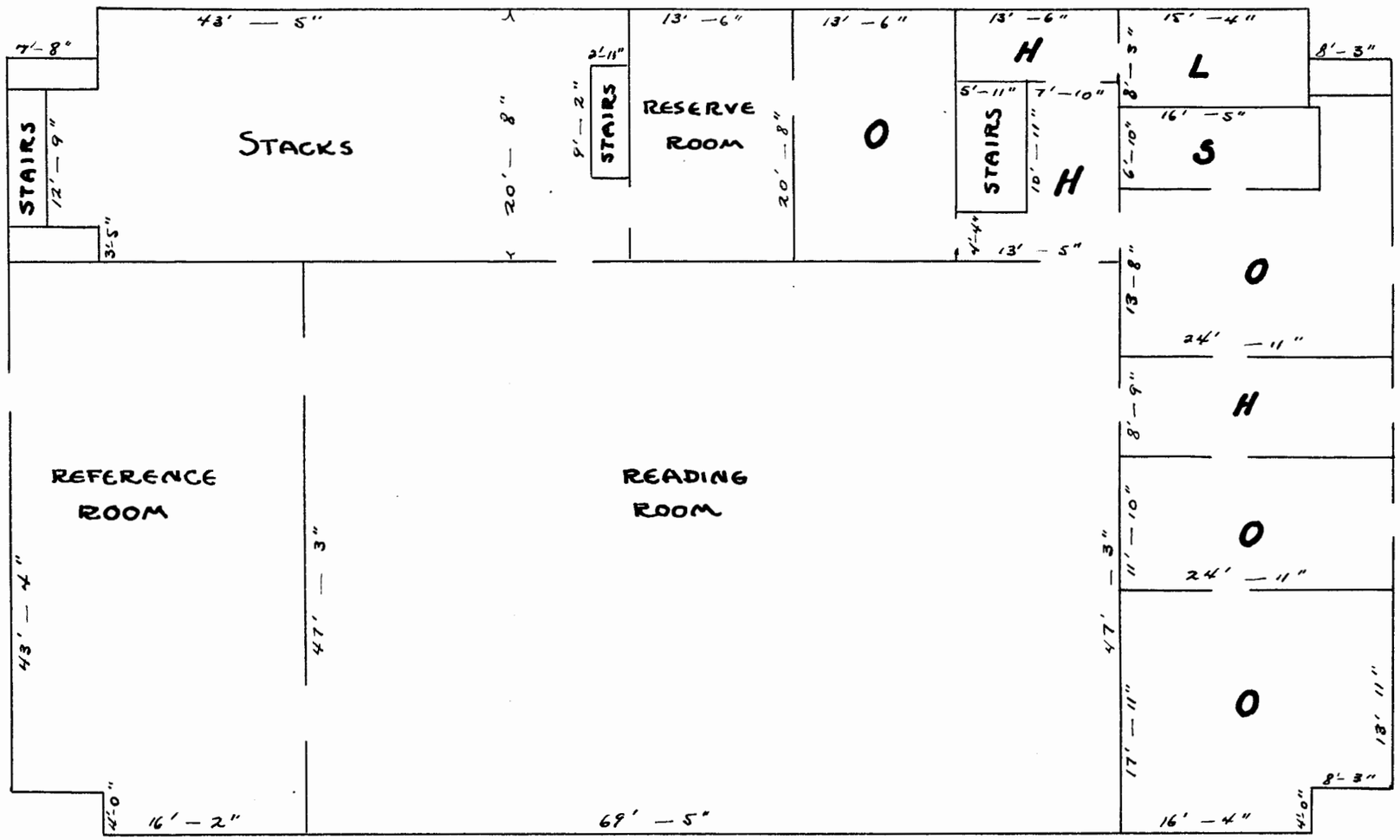
LEGEND

O- OFFICES	S- STORAGE
C- CLASS R'MS	SH- SHOWERS
H- HALLWAYS	L- LAVATORIES

INDUSTRIAL ARTS BLDG.
FIRST FLOOR
SCALE 1"-12'. R.V. WALKER.



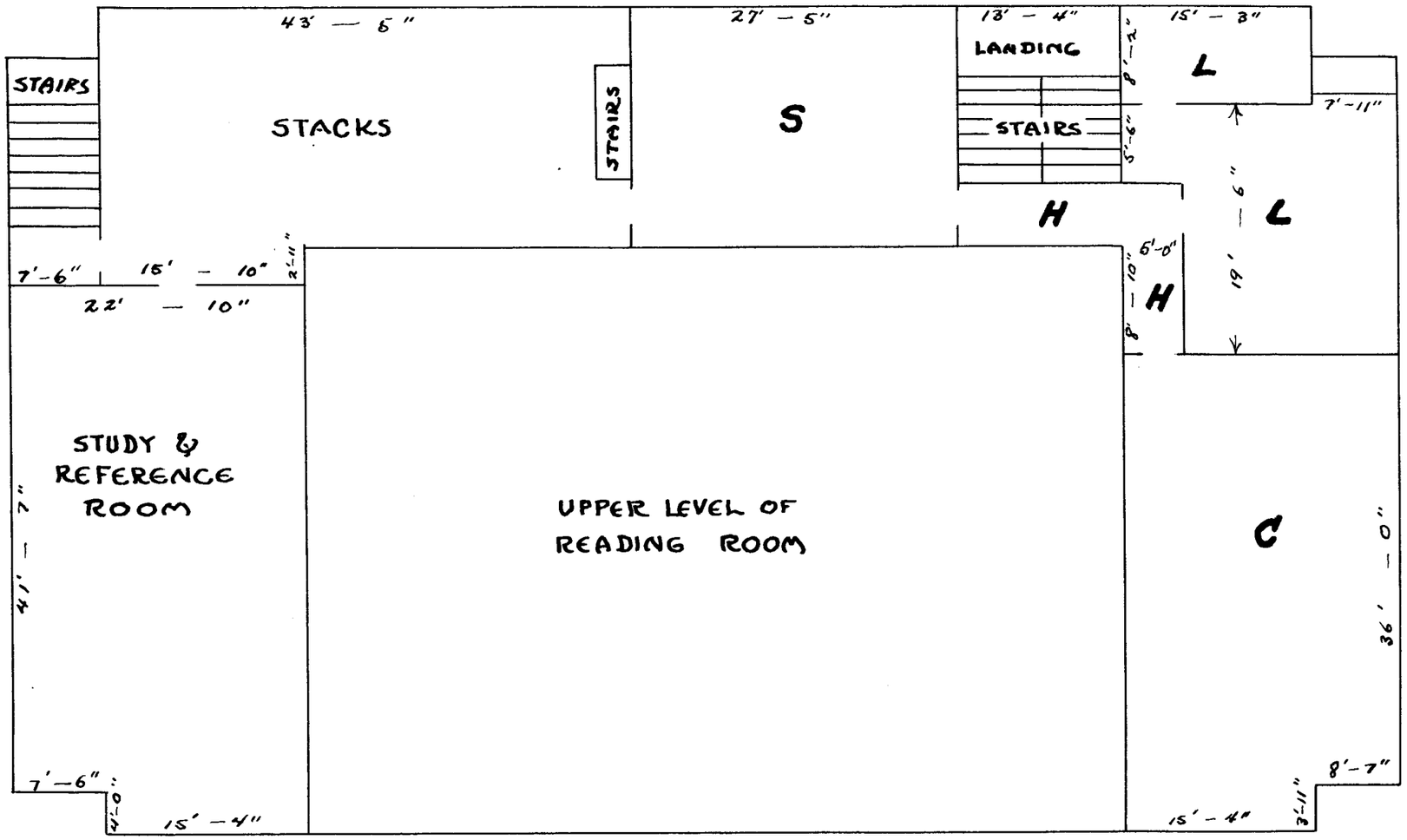
INDUSTRIAL ARTS BLDG
SECOND FLOOR
LEGEND
O - OFFICES S - STORAGE
C - CLASS RMS. H - HALLWAYS
L - LAVATORIES
SCALE 1"-12'-R.V. WALKER



LEGEND
O-OFFICES L-LAVATORIES
H-HALLS S-STORAGES
C-CLASS ROOMS

LIBRARY
FIRST FLOOR
SCALE 1IN-12FT.
R.V. WALKER.

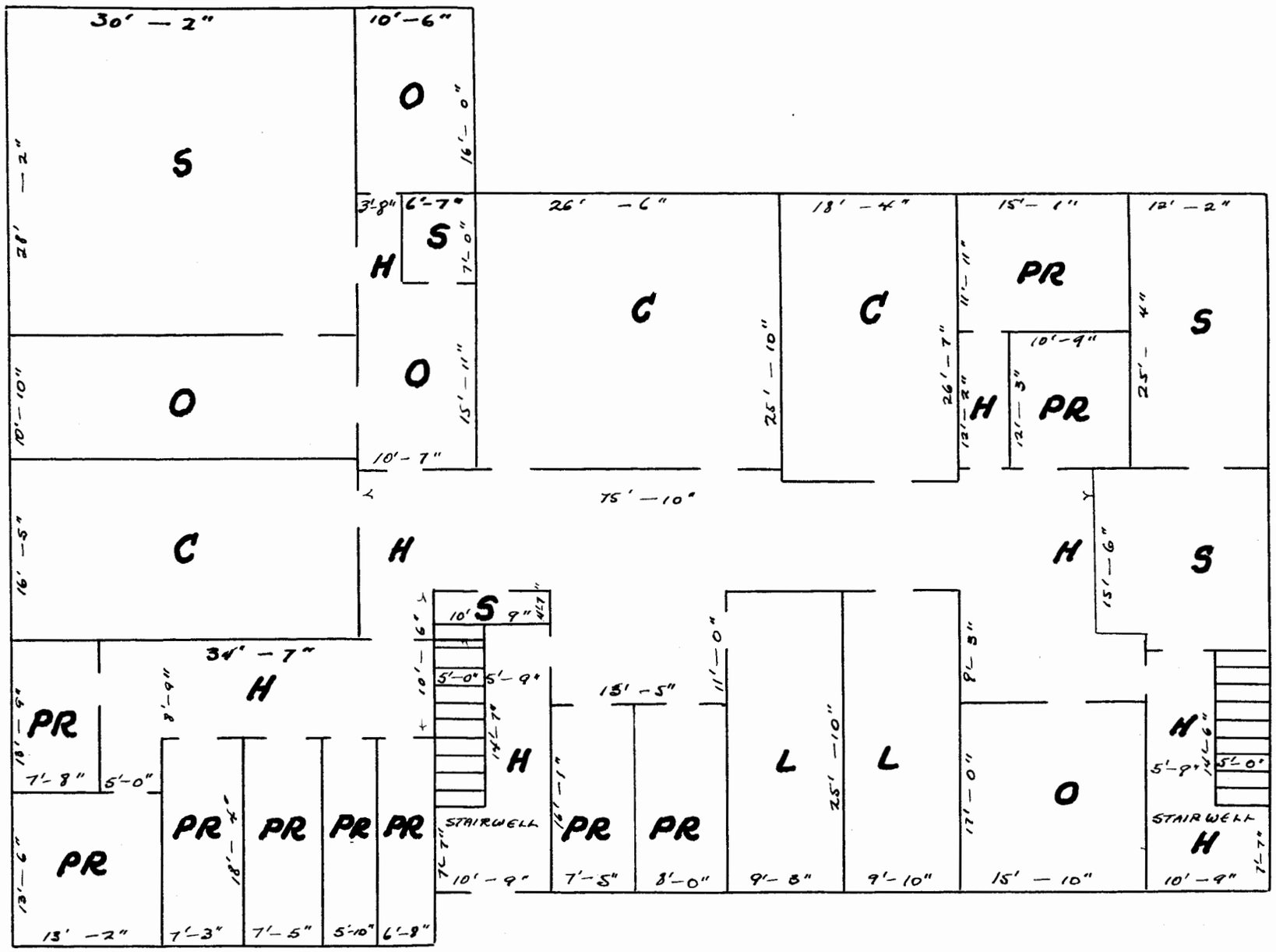
NOTE: The stacks on the second floor are not shown on the floor plans as there are four floors of stacks one-half floor in height while the rest of the building has two full floors. However, the second floor of stacks has the same dimensions as shown for the floor of stacks on this drawing.



LEGEND
O-OFFICES L-LAVATORIES
H-HALLS S-STORAGES
C-CLASS ROOMS

LIBRARY
SECOND FLOOR
SCALE 1 IN = 12 FT.
R.V. WALKER.

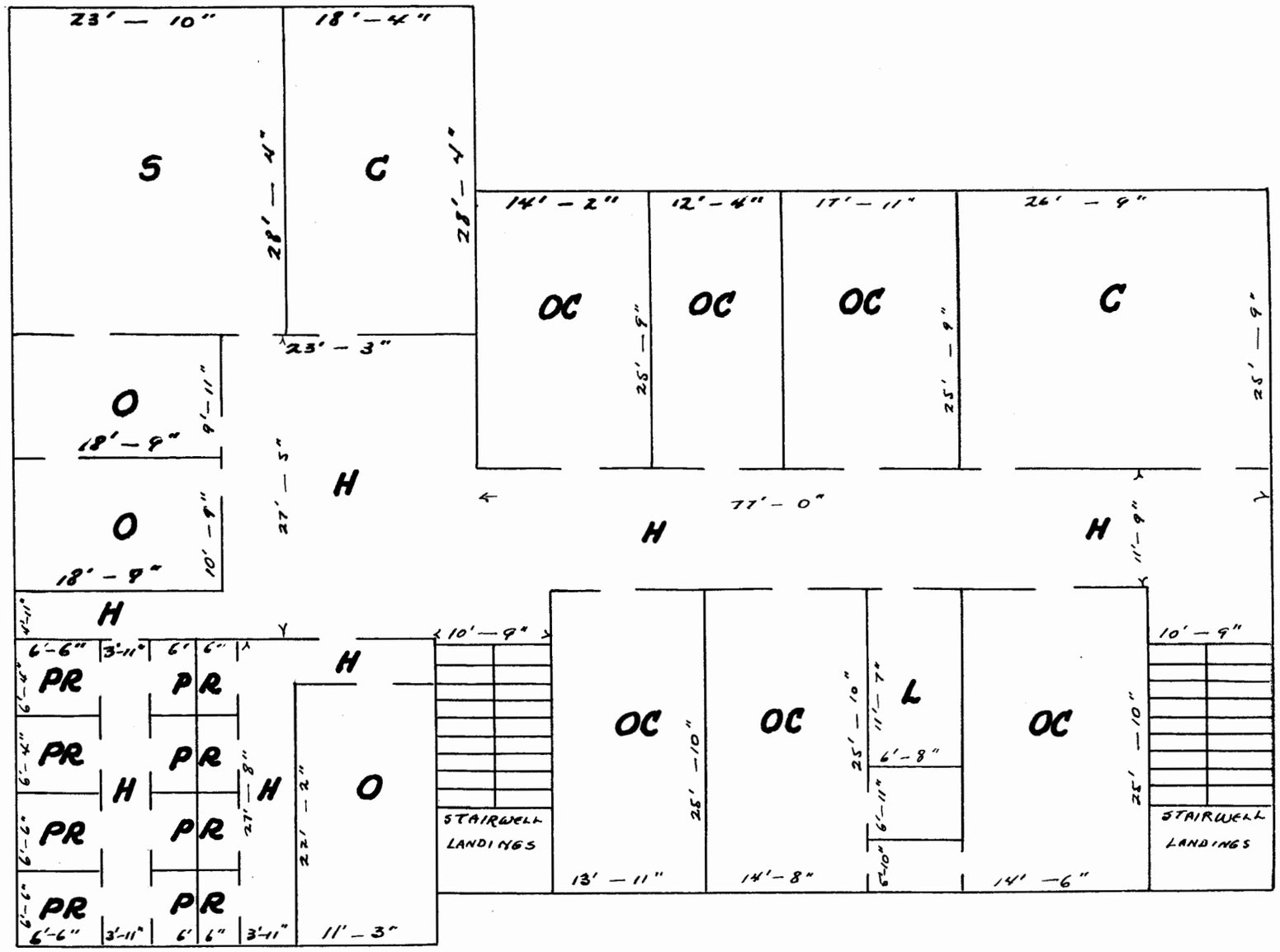
NOTE: The stacks on the fourth floor are not shown on the floor plans as there are four floors of stacks one-half floor in height while the rest of the building has two full floors. However, the fourth floor of stacks has the same dimensions as shown for the floor of stacks on this drawing.



MUSIC BUILDING
FIRST FLOOR
SCALE 1" = 12 FEET
R.V. WALKER

LEGEND

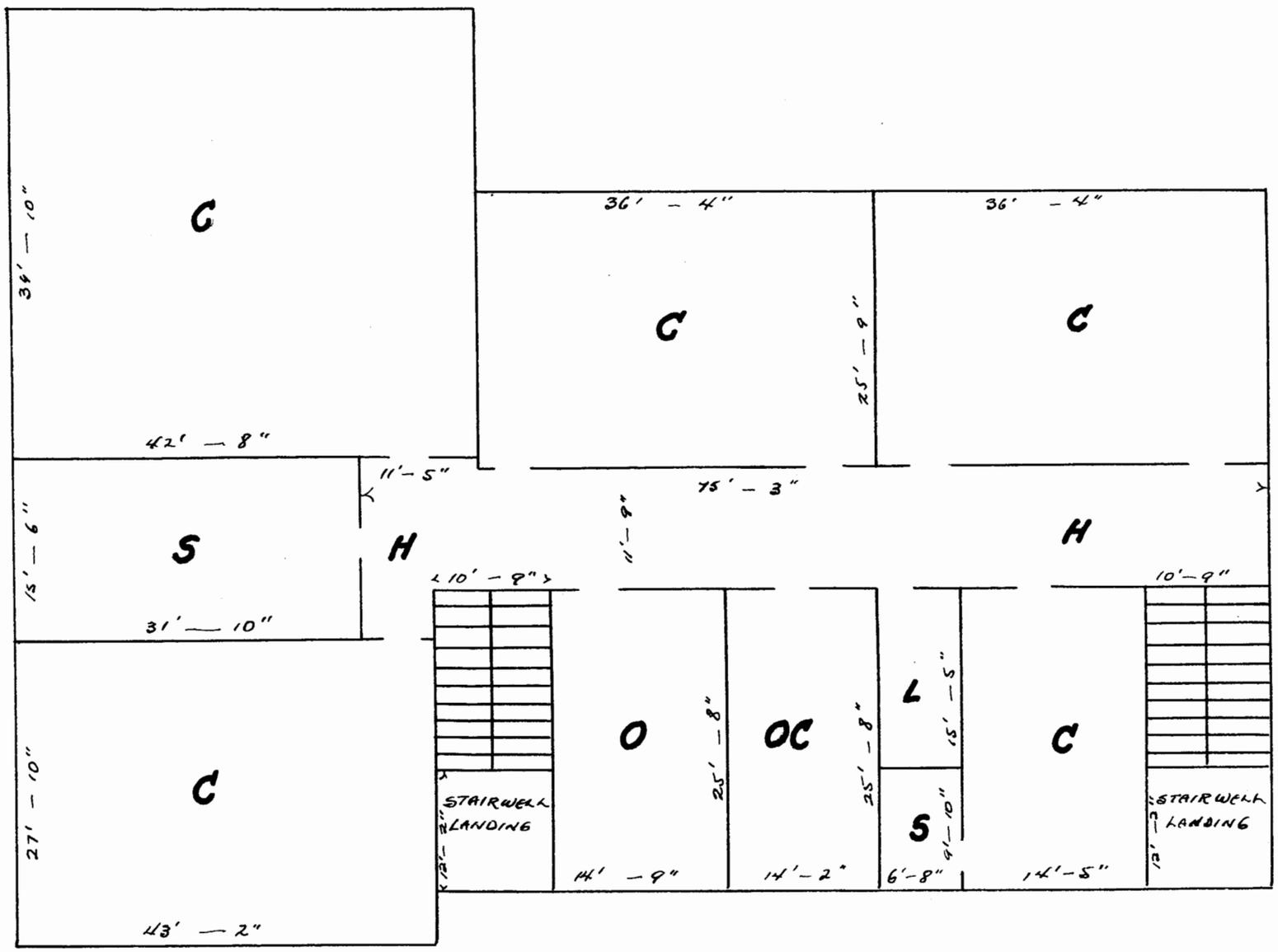
O = OFFICES	PR = PPACTICE R'MS
S = STORAGE	C = CLASS R'MS
H = HALLS	L = LAVATORIES



MUSIC BUILDING
SECOND FLOOR
SCALE 1" = 12 FEET
R.V. WALKER.

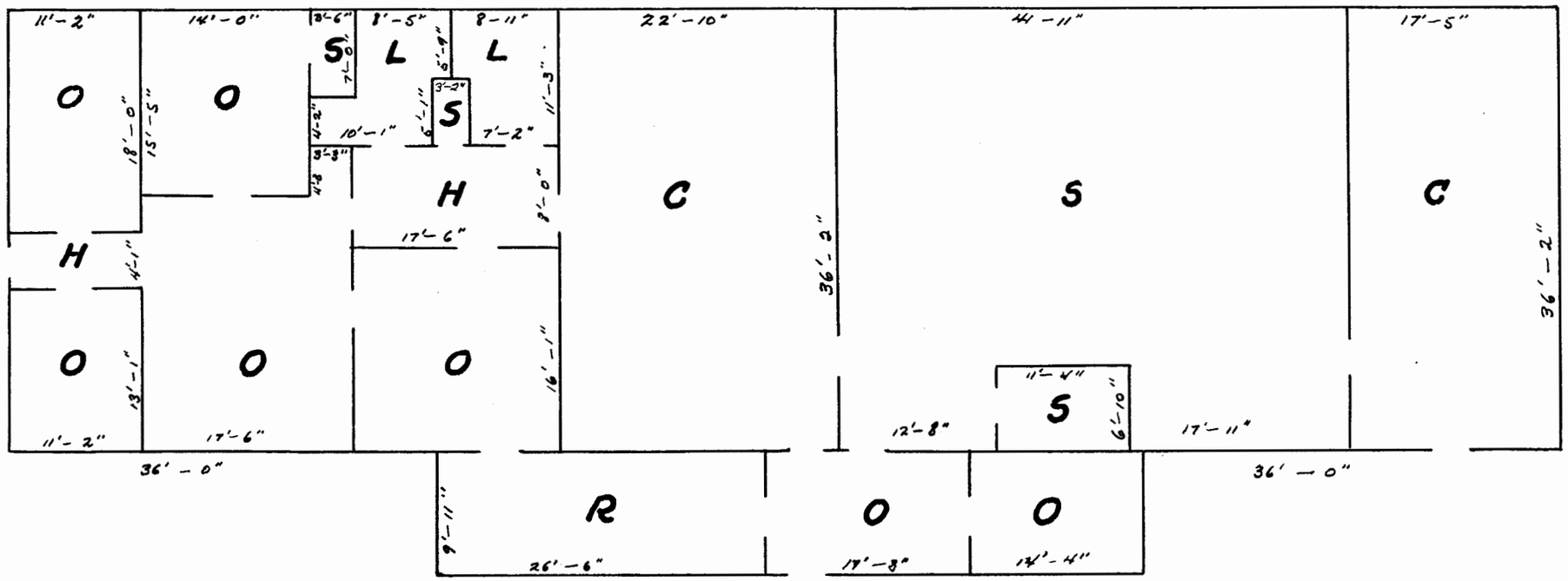
LEGEND

S= STORAGE RMS
O= OFFICES
H= HALLWAYS
L= LAVATORIES
PR- PRACTICE RMS
CO= COMBINATION OFCE & CLASS RM.



MUSIC BUILDING
THIRD FLOOR
SCALE 1" = 12 FEET
R. V. WALKER

LEGEND
C = CLASS ROOMS
S = STORAGE R'MS
O = OFFICES
H = HALLWAYS
CO = COMBINATION OF'CE & CLASS R'M.



R.O.T.C. BUILDING

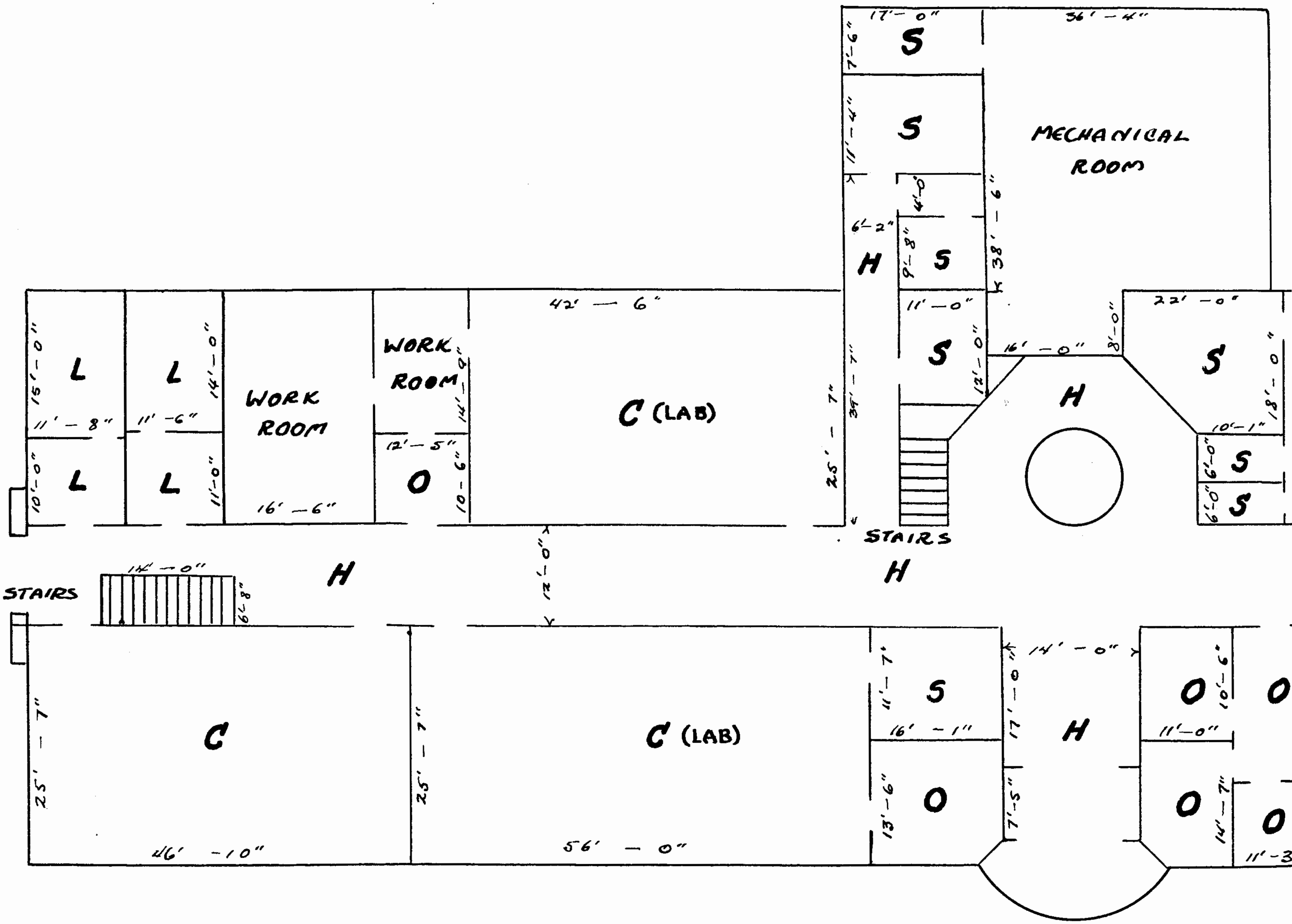
LEGEND

O - OFFICES L - LAVATORIES

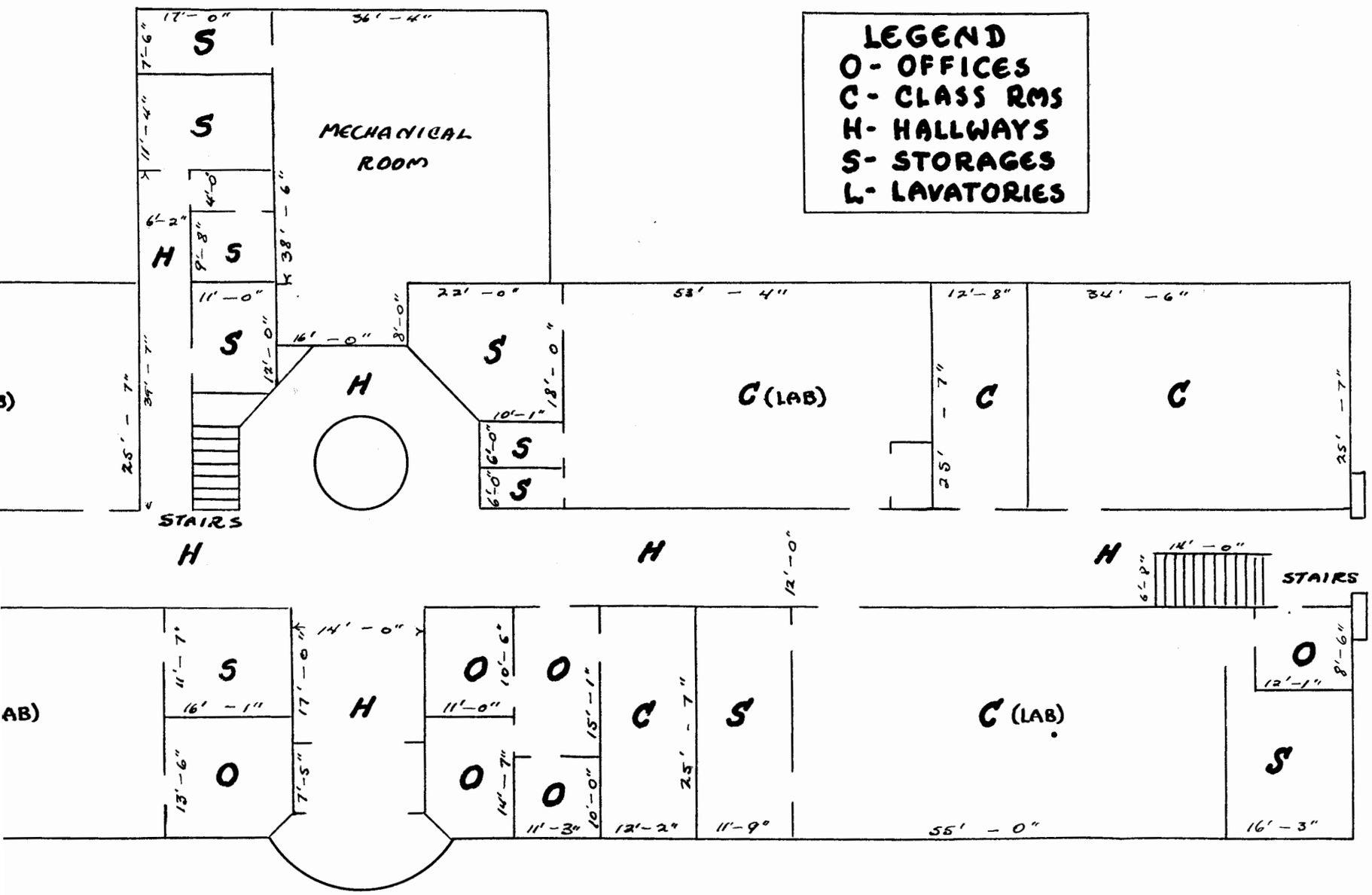
C - CLASS ROOMS R - RECREATION

H - HALLWAYS S - STORAGE

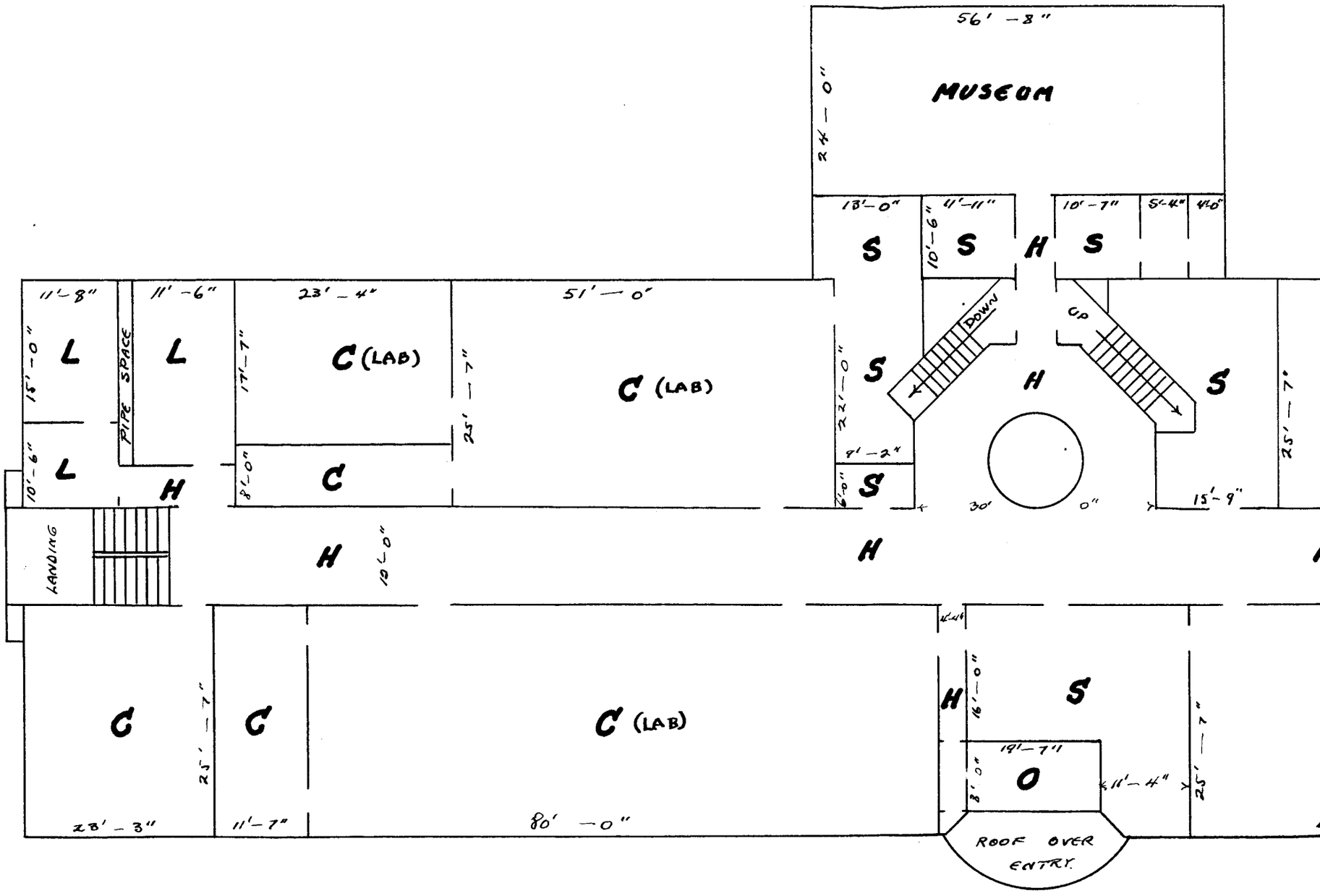
SCALE 1" = 12' ⟿ R.V. WALKER.

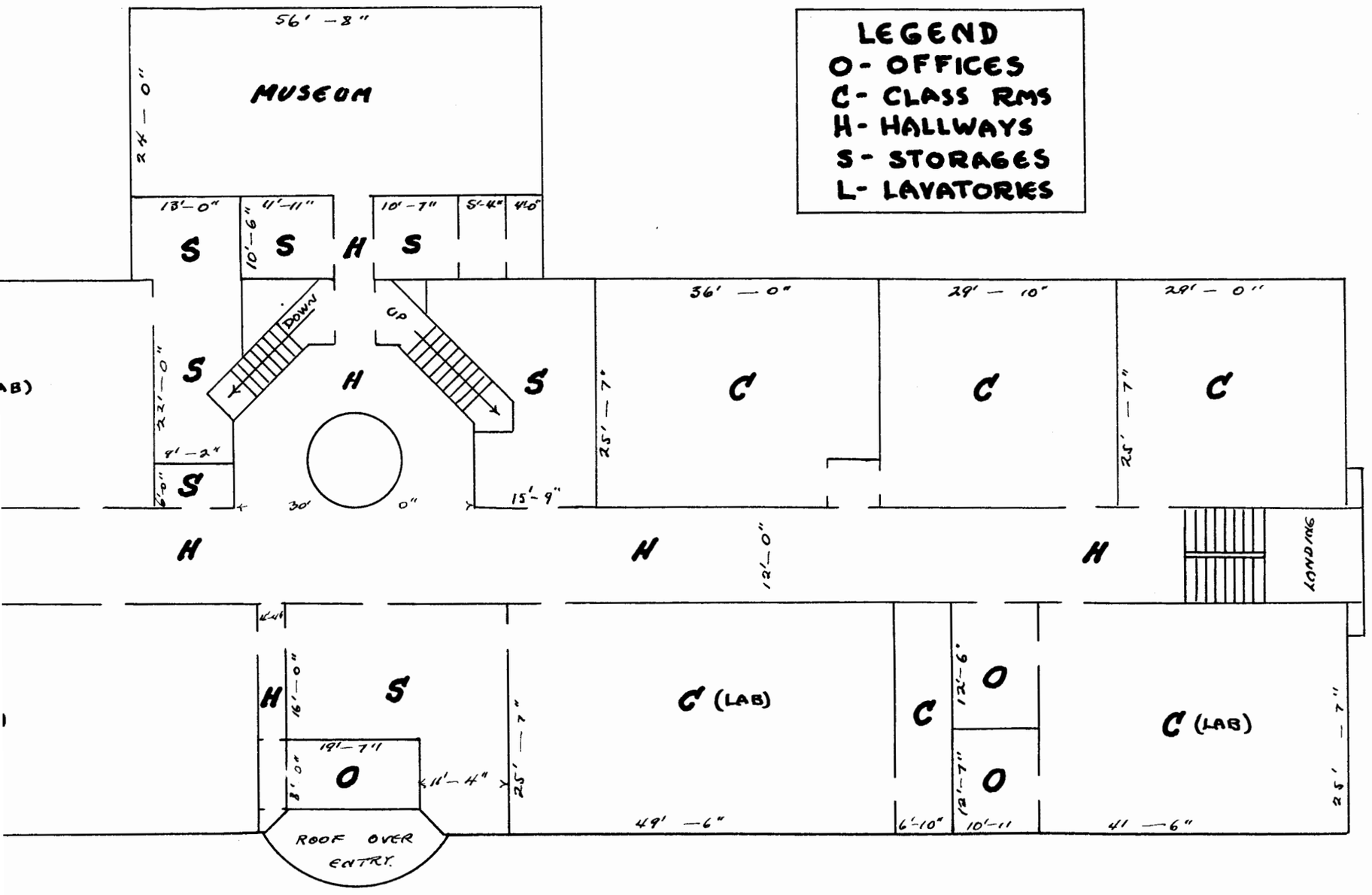


MECHANICAL ROOM
WORK ROOM
WORK ROOM
C (LAB)
C
C (LAB)
STAIRS
STAIRS
L
L
L
L
O
S
H
42' — 6"
56' — 0"
46' — 10"
36' — 4"
17' — 0"
22' — 0"

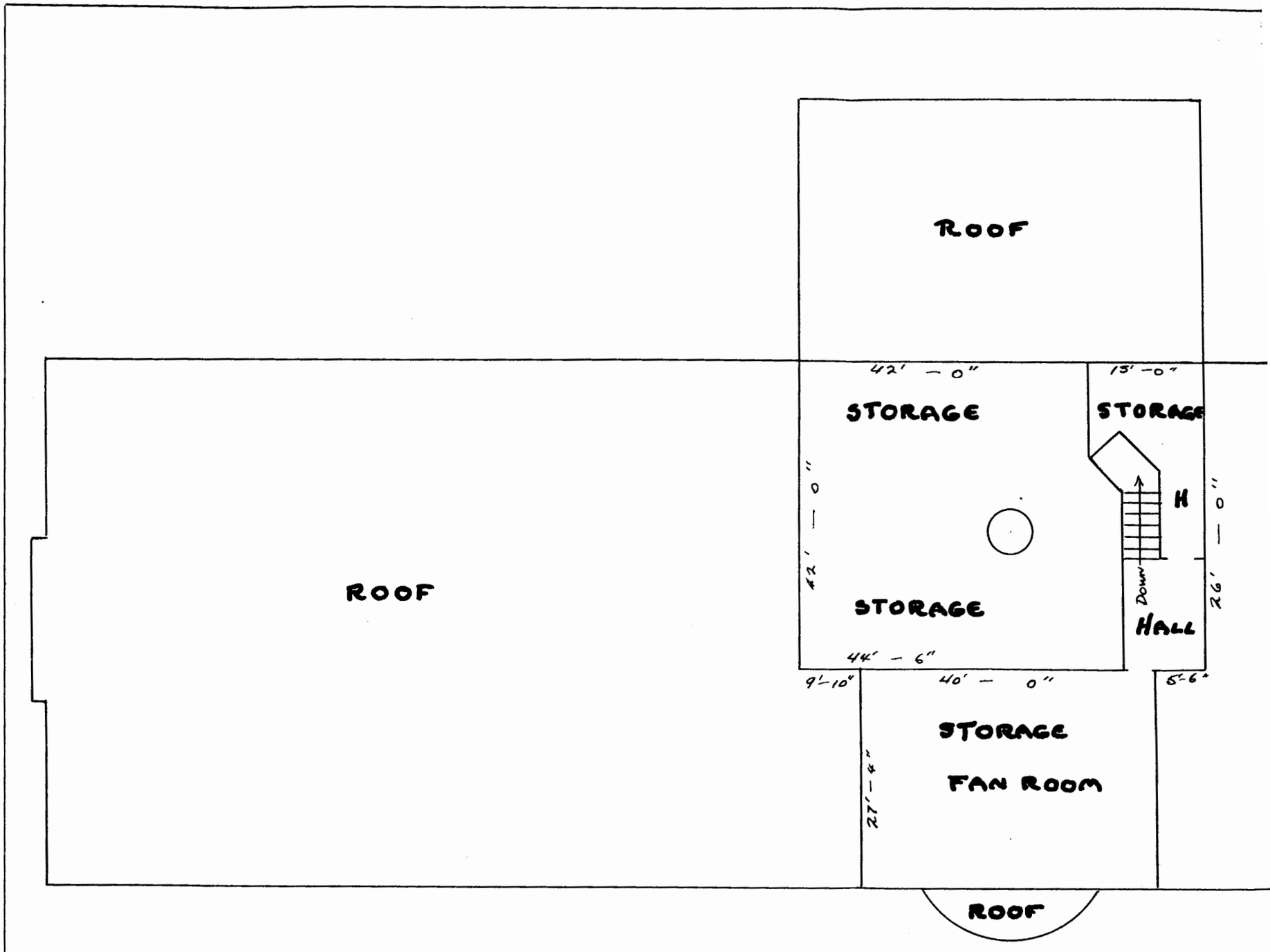


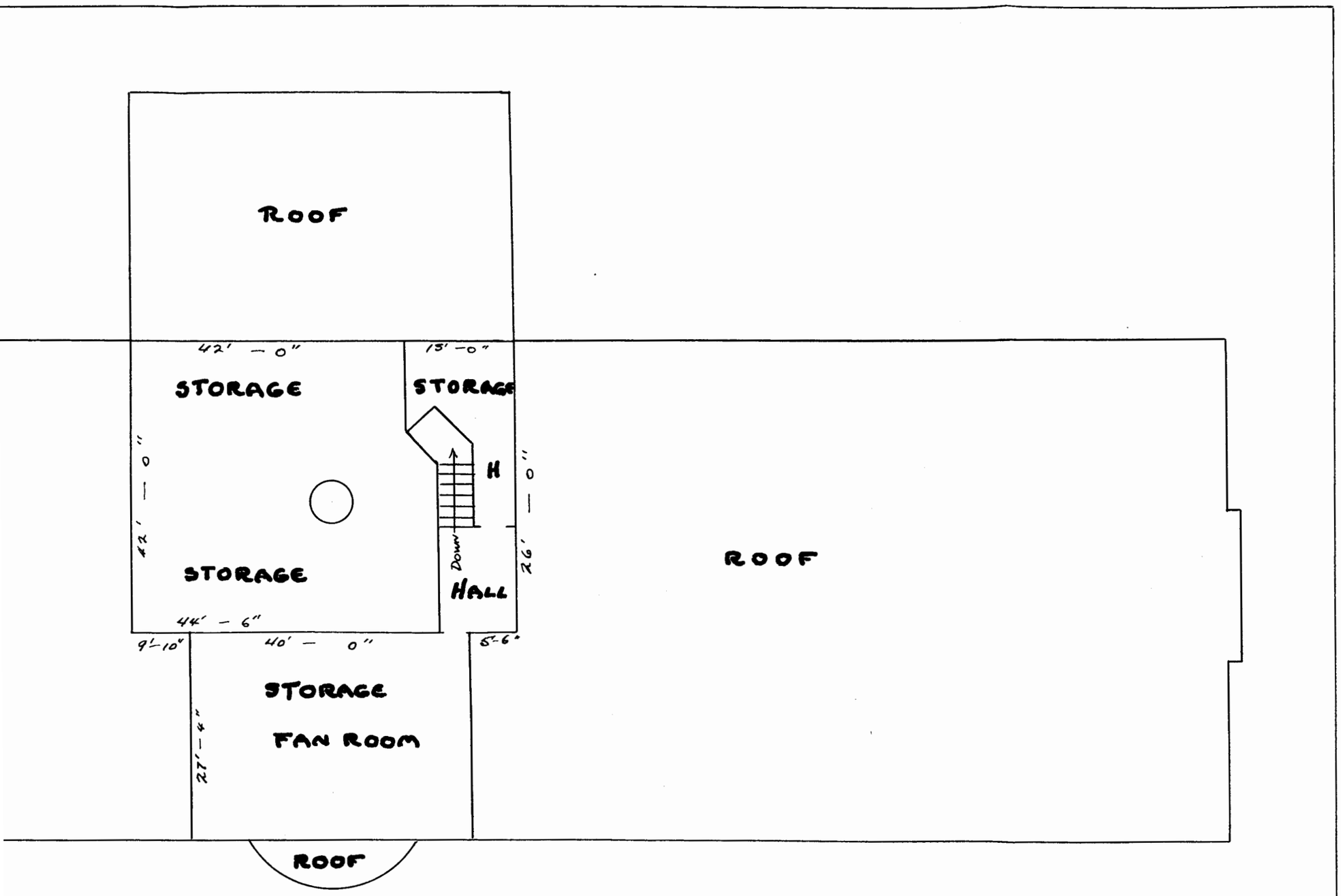
SCIENCE BUILDING
FIRST FLOOR
SCALE — 1"-16FT.
R.V. WALKER.


56' - 8"
MUSEUM
24' - 0"
18' - 0"
41' - 11"
10' - 7"
5' - 4"
4' - 6"
10' - 6"
S
S
H
S
11' - 8"
11' - 6"
23' - 4"
51' - 0"
15' - 0"
L
L
PIPE SPACE
17' - 7"
C (LAB)
C (LAB)
25' - 7"
DOWN
UP
22' - 0"
S
H
S
10' - 6"
L
H
8' - 0"
C
9' - 2"
1' - 0"
S
30' 0"
15' - 9"
25' - 7"
LANDING
H
19' - 0"
H
C
C
C (LAB)
25' - 7"
28' - 3"
11' - 7"
80' - 0"
H
S
16' - 0"
19' - 7"
8' - 0"
O
11' - 4"
25' - 7"
ROOF OVER ENTRY



SCIENCE BUILDING
SECOND FLOOR
SCALE — 1"=16FT.
R.V. WALKER.

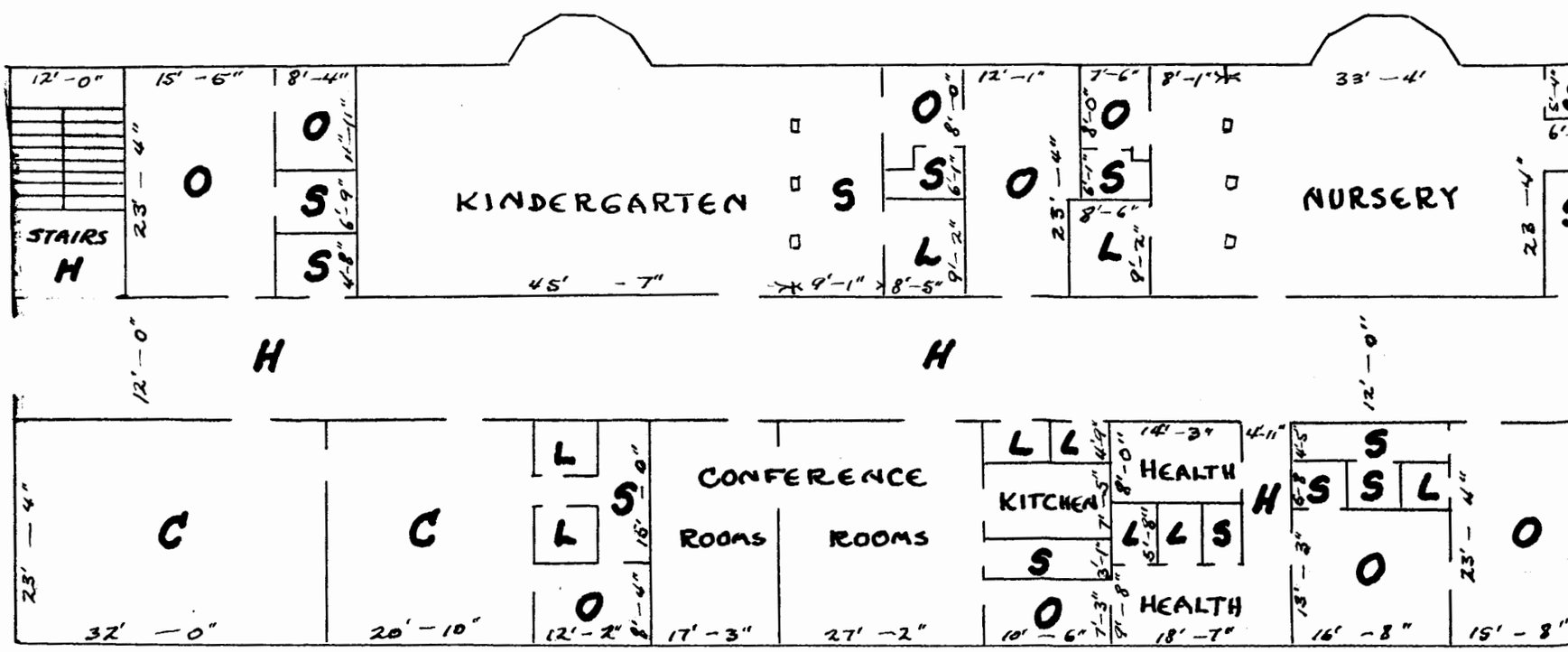

ROOF
42' — 0"
15' — 0"
STORAGE
STORAGE
42' — 0"
H
ROOF
STORAGE
Down
HALL
26' — 0"
44' — 6"
9'-10"
40' — 0"
5'-6"
STORAGE
FAN ROOM
27'-4"
ROOF



SCIENCE BUILDING
THIRD FLOOR
SCALE — 1" = 16 FT.
R.V. WALKER.

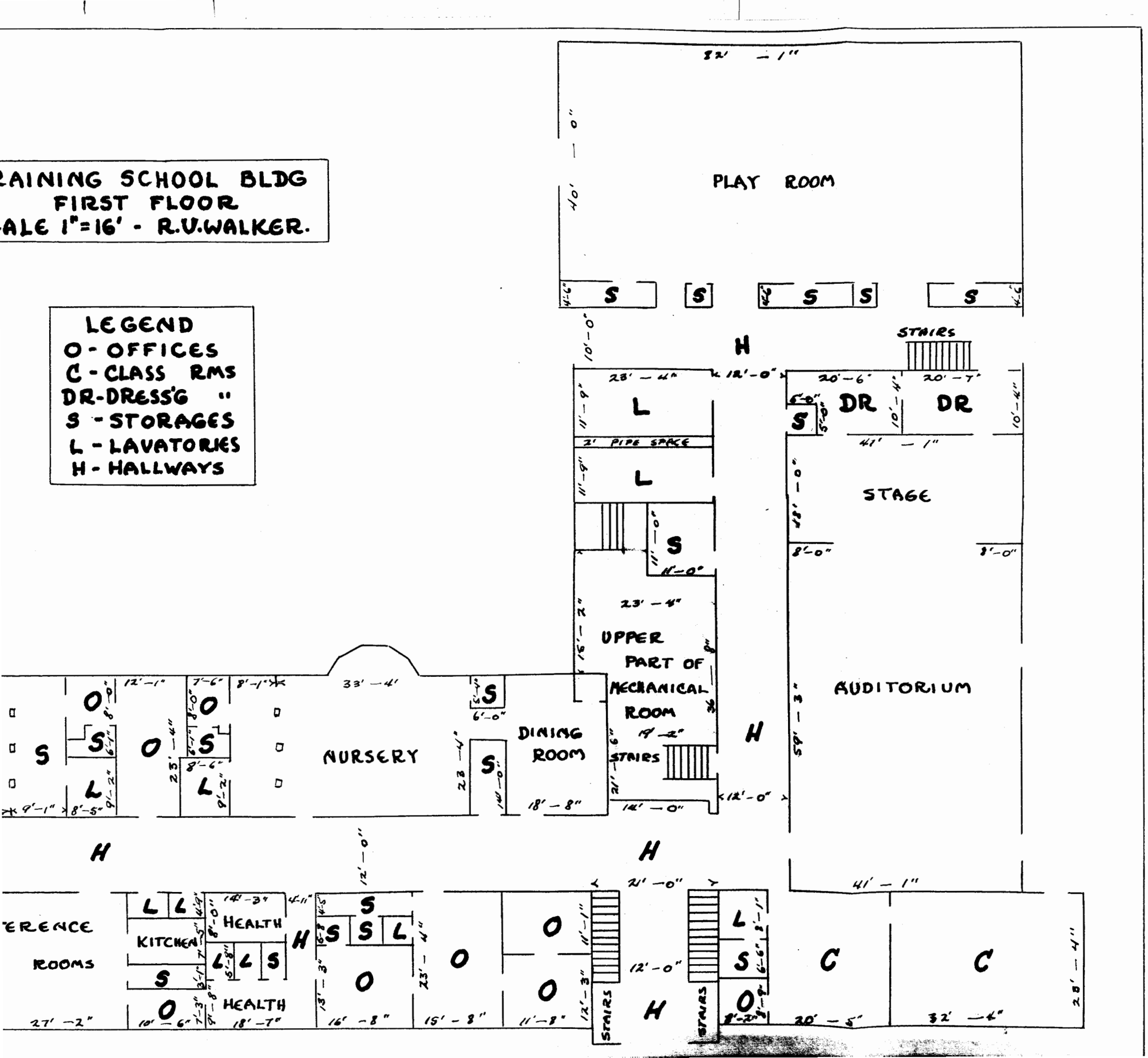
TRAINING SCHOOL BLDG
FIRST FLOOR
SCALE 1"=16' - R.U.WALKER.

LEGEND
O - OFFICES
C - CLASS RMS
DR - DRESS'G "
S - STORAGES
L - LAVATORIES
H - HALLWAYS



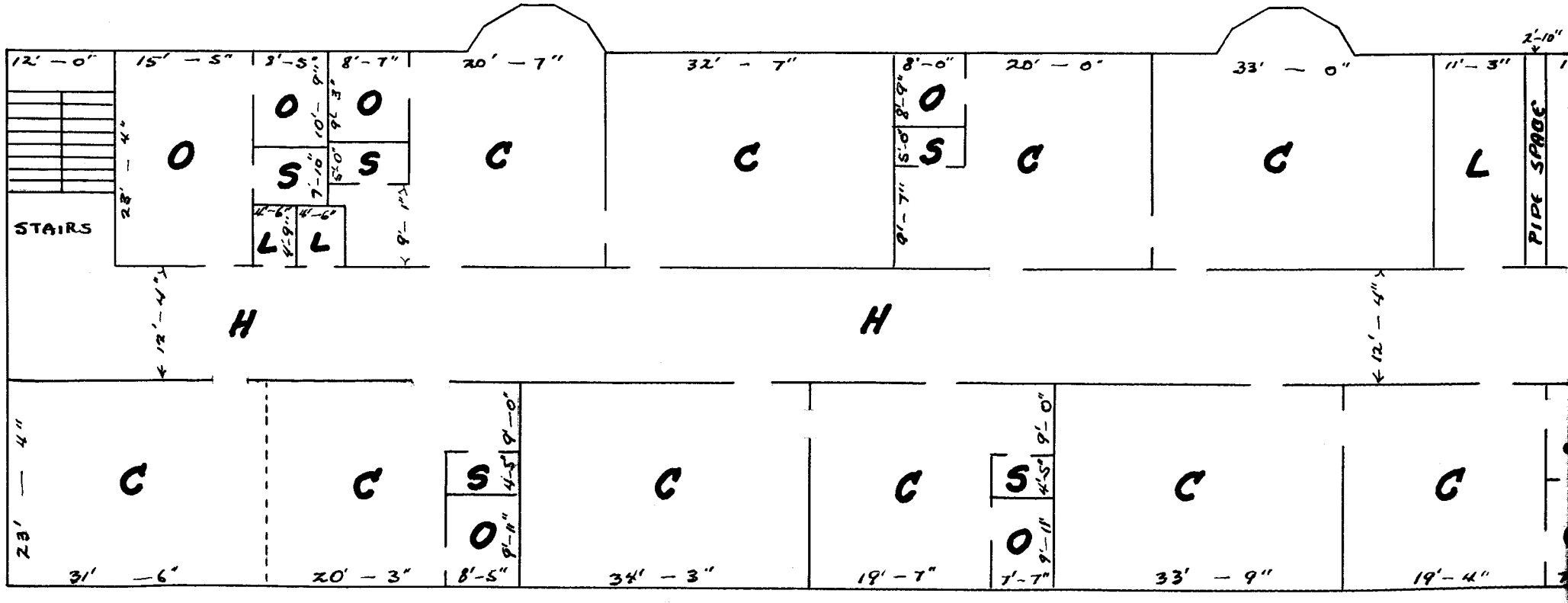
RAINING SCHOOL BLDG
FIRST FLOOR
ALE 1"=16' - R.V.WALKER.

LEGEND
O - OFFICES
C - CLASS RMS
DR - DRESS'G "
S - STORAGES
L - LAVATORIES
H - HALLWAYS



TRAINING SCHOOL BLDG
SECOND FLOOR
SCALE 1"=16' - R.V. WALKER

LEGEND
O - OFFICES
C - CLASS RMS
H - HALLWAYS
S - STORAGES
L - LAVATORIES



INING SCHOOL BLDG
SECOND FLOOR
LE 1"=16' - R.V. WALKER

LEGEND
O - OFFICES
C - CLASS RMS
H - HALLWAYS
S - STORAGES
L - LAVATORIES