ABSTRACT

THE DEVELOPMENT OF EDUCATIONAL CRITERIA
FOR NEW ELEMENTARY SCHOOLS IN CHICAGO

by John Joseph McNicholas Jr.

The purpose of this study was the development of recommended educational criteria for new elementary school buildings in Chicago. The Board of Education in the city of Chicago has committed itself to the goal of a quality education for all its students. In a period of increasing enrollments, resulting from rising birth rates, plus inmigration of public school patrons to the city, this district must obviously expend large sums of money in order to maintain, improve, and enhance its instructional program. Its ability to provide one of the tools of instruction, an adequate school plant, is further compromised by a number of obsolescent school houses. The problem? How do we plan, design, and construct quality school buildings which will allow and support quality education?

An analysis was made of thirty-seven new elementary schools in Chicago whose contracts were awarded between January 1, 1954 and December 31, 1958. This study examined the educational adequacy and the unit costs of each building.

The literature relating to elementary school plant planning was reviewed, so that the most current and most promising practices in this

field could be evaluated. An independent and experienced school plant specialist visited the school buildings and rated each on an educational adequacy scale specifically designed for this school district.

Educational and architectural planners with experience in urban school districts contributed their suggestions for the improvement of school plant planning procedures. The aid and assistance of knowledgeable educational and administrative staff members was enlisted.

A report, Elementary Education in the Chicago Public Schools,[1] was used as a guideline statement in this study's view of the elementary school program and its objectives.

When the collection of these data was completed, demonstrable differences in unit costs among the buildings were noted. Significant variations in the total educational adequacy ratings of the various buildings were cited. The consensus reached by consultants to the study centered upon provision of fuller and more detailed educational specifications. These criteria should aid the district in enhancing the adequacy of school plants to be constructed, while controlling the cost in a more systematic, objective fashion. The development of recommended educational criteria for planning new elementary school buildings in Chicago ensued.

The recommendations of the study focused upon ways in which Chicago and other urban school districts might utilize the data and criteria of this study. The methodology and materials of such a study should be

useful to any school district in its evaluation of past and future building programs. The collection of data relative to educational adequacy and financial cost suggests an analysis of adequacy-cost relationships. This could be a fruitful area for future research and study.

The final recommendation described a process of planning whereby a school district using the educational criteria developed might improve and enhance the effectiveness of its school plants. This recommendation was based on the premise that better buildings would be constructed if those people who are most intimately involved in the teaching-learning situation contributed their ideas as part of the school plant planning process.

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[1]Chicago Board of Education, Elementary Education in the Chicago Public Schools, A Report Prepared by the Elementary Committee (Chicago: Chicago Board of Education, 1959).

THE DEVELOPMENT OF EDUCATIONAL CRITERIA FOR NEW ELEMENTARY SCHOOLS IN CHICAGO

by

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STATEMENT OF THE PROBLEM

Introduction

School plant planning in America today is big business. Millions of dollars are being expended annually to provide adequate educational facilities for children and youth. This school construction is heavily concentrated in the burgeoning standard metropolitan areas of our country. Demographers have identified these as the loci of increasing concentrations of population.

The Board of Education in the city of Chicago invested a total of $104,396,256.00 in site acquisition, modernization of obsolete facilities, and construction of badly needed new schools during the years 1954 through 1958. The following table indicates the upward trend of these expenditures:

Table One[1]

Capital Outlay Expenditures

Chicago Board of Education

1954-1958

Year	School Site & Condemnations Expense	New Bldgs. & Additions	Permanent Improvements & Equipment	Total Plant Additions
1954	$ 648,117	$ 7,517,326	$ 3,511,440	$ 11,676,883
1955	935,256	13,280,731	3,771,178	17,987,115
1956	1,895,671	14,648,634	4,242,702	20,787,007
1957	3,078,815	19,843,579	4,150,986	27,073,380
1958	3,167,159	20,069,504	3,635,158	26,871,821
TOTAL	$9,725,018	$75,359,774	$19,311,464	$104,396,256

The Problem

Mushrooming school enrollments are the most dramatic illustration of our reasons for concern. Table Two illustrates the increased public school enrollment for the years 1954 through 1958 in the city of Chicago.

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[1]Chicago Board of Education, Annual Audited Financial Report, (Chicago: Chicago Board of Education, 1958).

Table Two[2]

Public School Enrollments

Chicago Board of Education

1954-1958

Year	Enrollment	Increase
1954	392,501	---
1955	405,078	12,577
1956	417,373	12,295
1957	431,347	13,974
1958	445,373	14,026

This increasing membership in our schools, however, is but a part of the problem. A backlog of needed new facilities due to the hiatus in construction during the depression and World War II magnifies the problem. Obsolescence of buildings erected prior to 1900, highly mobile populations, and continuing efforts to improve educational programs for Chicago's children and youth guarantee that the dollar volume of school construction will increase during the years ahead.

Because of the unprecedented magnitude of its present and proposed building program the Chicago Board of Education

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[2]Chicago Board of Education, Annual Audited Financial Reports, (Chicago: Chicago Board of Education, 1954-1958).

has recently initiated the employment of private architects for selected school projects to augment its own Bureau of Architecture. The results of this change in policy have been quickly apparent in the upgrading of new buildings constructed. However, inspection of these schools also reveals inadequacies and inconsistencies in school plant planning.

There are demonstrable differences in quality and unit costs between buildings of similar size or like budgets. These differences will be detailed in a later chapter of this study. It is the writer's firm conviction that educational criteria can be developed for a large city school district such as the Board of Education of the city of Chicago; it is also his considered opinion that the use of such criteria will help to remedy the inadequacies and resolve the inconsistencies now present in school plant planning practices in Chicago. These specifications might then serve as guidelines for Bureau of Architecture personnel as well as private architects who are commissioned to design buildings for Chicago's elementary school population.

Delimitations of the Study

The validity of any study is dependent upon the removal of as many variables as is possible. The following delimitations of this study will make it easier to focus our attention sharply

on the problem to be considered. These delimitations will also help us to avoid the random study approach which has a tendency to blur conclusions and to blunt recommendations.

We propose to develop educational criteria for the elementary school buildings which the Board of Education in the city of Chicago will construct. We are not interested in secondary schools or institutions of higher education at this time. Our efforts will be concentrated on the complex urban aggregate known as Chicago. Our conclusions and recommendations may have applicability for other large metropolitan areas, but we do not seek this.

Definition of Terms

The terms which should be defined for the purposes of this study are the following:

1) educational criteria

2) elementary school

3) educational adequacy

The term, educational criteria, refers to performance standards or specifications which are developed by a school plant planner. These educational criteria provide an architect with the essential educational information concerning a school building he must have to understand the architectural problem to be solved. These specifications should enable the architect to gain a sound understanding of the activities to be carried

on in the building as a whole and in each part.

The second term, elementary school, is used here to describe the administrative organization in our instructional system which includes kindergarten plus grades one through eight--or less. The organizational pattern in Chicago's schools is KG-8, 9-12, and 13-14. Some upper grade centers, serving seventh and eighth graders only, have been established in the last few years. Obviously the contributing schools to these centers are organized from kindergarten through the sixth grade. This applies to new buildings as well as old. Occasionally the Chicago Board of Education has authorized the construction of neighborhood primary units (KG-2, KG-3, KG-4). All of the above mentioned organizations (KG-8, KG-6, KG-2, KG-3, KG-4) are present in the elementary schools under consideration.

The last term, educational adequacy, is here defined as a school building's potential in facilitating the following:

1. present instructional activities
2. the attainment of desirable goals in instruction
3. changes or innovations in the educational program
4. the enhancement of instructional quality through the provision of appropriate spaces

Review of the Literature

Since this study proposes to develop educational criteria

for new elementary schools in the city of Chicago, the writer has focused his attention on current books, periodicals, and publications concerned with effective school plant planning. The wellsprings of this literature have resided in two disciplines -- architecture and education. Alexander[3] illustrates the architectural planner's point of view. He asserts that cooperative planning of a school facility is "the systematic seed from which good buildings grow". Herrick, McLeary, Clapp, and Bogner[4] delineate the educational planner's position in this important area as follows:

> Careful and thorough educational planning, as well as good architectural planning is essential if the completed structure is to be a helpful tool, rather than a hindrance, to the many generations of teachers and pupils who will use it.

The planning principle, that form should follow function, is firmly established in the school plant planning literature. Dave Chapman[5] remarks: "The design of a school, its spaces and its facilities must permit and support the educational function."

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[3]Robert E. Alexander, "An Architect Views the Client's Role in School Building Planning," American School and University (Vol. 27), pp. 145-148.

[4]John H. Herrick, Ralph D. McLeary, Wilfred S. Clapp and Walter J. Bogner, From School Program to School Plant (New York: Henry Holt and Company, 1956), p. 104.

[5]Educational Facilities Laboratories, Inc., Design for ETV Planning for Schools with Television (New York: Educational Facilities Laboratories, Inc., 1960), p. 5.

And yet many times architects receive little or no information concerning the activities that will take place in a building they are asked to design. Most architects are not educational philosophers. Some architects are not aware of the differences between communities which dictate adjustments and modifications of the educational program for diverse school districts. Educational criteria given to architects range from very limited documents of one or two pages, which merely enumerate the educational spaces required, to comprehensive and detailed statements which set forth fully the objectives sought, enumerate the functions to be housed, state how many and what kind of accommodations are needed for these functions, and describe all necessary relationships among them.

The AASA School Building Commission[6] has stated its belief concerning educational specifications as follows:

> There appears to be a growing feeling on the part of both educators and architects alike that the educational specifications should be a complete and precise statement of the educational program in terms understandable to all. It should represent a point of departure from which the architect can develop his design, working drawings, specifications, and other technical documents with full assurance that no essential requirement will be overlooked.

A statement of the educational criteria is one of the three major steps in the creation of a new school building

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[6]AASA School Building Commission, Planning America's School Buildings (Washington: American Association of School Administrators, 1960), p. 171.

according to N. L. Engelhardt, N. L. Engelhardt, Jr., and Stanton Leggett.[7] The other two important steps are the plans and specifications of the architect, and the construction of the building.

Good educational planning should promote economy. Herrick, et. al.[8] maintain this without equivocation.

> The maximum educational return for each dollar spent (which is a sound definition of economy) can best be assured by designing a building which fits the needs of the school program. If this is done, there will be the maximum educational benefit from each constructional dollar spent and from each dollar devoted to staffing and operating the building throughout its years of service.

If educational criteria are inadequately stated, the wisest expenditure of the public dollar will be difficult to achieve. Herrick et. al.[9] have suggested another forceful reason for educational criteria.

> Quite apart from the need for a written record, the volume of detailed information and its interrelatedness make it highly desirable, if not essential, that the major educational planning decisions be reduced to writing.

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[7]N. L. Engelhardt, N. L. Engelhardt Jr., and Stanton Leggett, School Planning and Building Handbook (New York: F. W. Dodge Corp., 1956), p. 73.

[8]John H. Herrick, Ralph D. McLeary, Wilfred J. Clapp, and Walter J. Bogner, From School Program to School Plant (New York: Henry Holt and Company, 1956), p. 107.

[9]Ibid., p. 127.

The National Council on Schoolhouse Construction,[10] the professional association of school plant planners in this hemisphere, have taken the position that development of educational criteria are the sine qua non of prudent educational planning.

> The educational specifications should be in written form, should include a description of the program and its underlying philosophy, a list of the facilities needed including equipment, statements with respect to any special needs as to locations of different types of facilities, and descriptions of any special features required in each. It is also helpful to the architect if the educational specifications describe the nature of the activities to be accommodated by the plant as a whole as well as each type of facility, since such descriptions enable him to explore more fully the various ways of achieving the desired results.

If we believe, as the writer does, that cooperative planning is necessary and that written specifications facilitate such planning, we may then move to a consideration of that portion of the literature which concerns itself with some of the major and many of the minor facets of educational planning. The term, educational planning, is limited to planning "which is done to produce a statement of the facilities and qualities that a particular building should include."[11] This planning

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[10]National Council on Schoolhouse Construction, Guide for Planning School Plants (Nashville: National Council on Schoolhouse Construction, 1958), pp. 8-9.

[11]John H. Herrick, Ralph D. McLeary, Wilfred J. Clapp, and Walter Bogner, From School Program to School Plant (New York: Henry Holt and Company, 1956), p. 104.

may be done by one or more people. Archibald B. Shaw and Lawrence B. Perkins[12] have critically examined a school in which they were, respectively, educational planner and architectural planner; they believe this building (Heathcote Elementary School in Scarsdale, New York) may be as forward-looking as Crow Island Elementary School was in the forties.

The "Educational Specifications for Elementary Schools"[13] of the Denver Public Schools, Denver, Colorado, have been reviewed. This is a very detailed statement of the desires of this school district in relation to the elementary school plant. It is interesting to note in this document that standard floor plans are provided for such spaces as the kindergarten, the library, the administrative unit, et. al.

The "Report of the Educational Program Planning Workshop[14] (Elementary Committee) of the Detroit Board of Education, Detroit, Michigan, has been studied. This workshop produced a definitive, professional statement of what the Detroit educational philosophy and program should be for the years ahead.

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[12]Archibald B. Shaw and Lawrence B. Perkins, "Planning an Elementary School," School Executive (July, 1954), p. 58.

[13]Denver Public Schools, "Educational Specifications for Elementary Schools" (Denver, Colorado: mimeographed), Dec., 1955.

[14]Detroit Board of Education, "Reports of the Educational Program Planning Workshop (Elementary Committee)" (Detroit, Michigan: mimeographed), Summer, 1959.

As a contrast to the Denver standards we discover here an emphasis on performance specifications for spaces in Detroit's elementary schools.

Planning Elementary Schools

James J. Redmond,[15] Superintendent of Schools, New Orleans, Louisiana, has suggested an ingenious design to cope with an urban school district's problem of space. He describes an elementary school building which was constructed on stilts in order that valuable play area might be conserved on a very small site.

John G. Fischer[16] has written a very thought-provoking article on the school plant planning problems of a large metropolis. He combines this with some fruitful suggestions for their solution. N. L. Engelhardt, Jr.[17] has suggested that we enlarge certain academic spaces in order to effect better learning situations. John Lyon Reid[18] has suggested that function, economy, and maintenance should not be the sole

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[15]James J. Redmond, "Thomy Lafou--The School on Stilts" American School and University (Vol. 27), pp. 161-164.

[16]John G. Fischer, "Challenge of the Big City," American School and University (Vol. 1, 1956-57), pp. 57-62.

[17]N. L. Engelhardt, Jr., "Laboratories for Learning," School Executive (Nov. 1954), pp. 63-66.

[18]John Lyon Reid, "Human Values in School Architecture," American School and University (Vol. 27), pp. 113-116.

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criteria in school building design. He believes that our schools should provide the learning environment to help students cope with the problems of every day life.

Planning Aids

Karl T. Hereford[19] and Donald J. Leu have analyzed the part educational consultants have taken in school plant planning. This study was based upon a national survey. The staff[20] of Architectural Record has initiated a statement that illustrates the improved quality in both installations when school districts work cooperatively with park districts. The purpose of long range school building and site programs has been examined by W. W. Theisen.[21] He maintains that the objective is not solely to indicate what will be needed in the form of facilities, but also to develop public understanding and willingness to support the program.

Maintenance and Operation

John M. Hickey[22] and Arthur P. Logan have described how

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[19]Karl. T. Hereford and Donald J. Leu, "The Role of the Educational Consultant," School Executive (January, 1956), pp. 99-100.

[20]Staff, "School Board and Park Board Cooperate," Architectural Record (July, 1954), pp. 123-127.

[21]W. W. Theisen, "Long Range Planning for School Plant," Nation's Schools (July, 1956), pp. 64-69.

[22]John M. Hickey and Arthur P. Logan, "A Trouble-Free School," American School Board Journal (Dec., 1957), pp. 39-40.

the careful selection of durable and maintenance free materials has eased the problems of repair and maintenance for the school administrator. Robert J. Quinn,[23] fire commissioner of Chicago, has made the following suggestions to school plant planners:

1. All new buildings should be fire resistive.
2. All new buildings should have fire wall and door cut-offs.

He has particularly emphasized in this article the importance of good housekeeping practices.

Physical Education

Dana P. Whitmer[24] and C. Henry Haberkorn have emphasized the varied and different ways in which children and adults are benefited through the erection of a sizable activity area in every school. However, the National Council on Schoolhouse Construction[25] has warned school planners that

> an unfortunate self-deception has been indulged in the design of multipurpose facilities in that certain activities are short-changed.

They have further stated,

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[23]Robert J. Quinn, "What Must Be Done for Fire Safety?" American School Board Journal (March, 1959), pp. 32-34.

[24]Dana P. Whitmer and C. Henry Haberkorn, "Multipurpose Room in Every School," Nation's Schools (March, 1959), pp. 90-93.

[25]National Council on Schoolhouse Construction, Guide for Planning School Plants (Nashville, Tennessee: Peabody College, 1958), p. 56.

> The omission of certain activities should be the result of deliberate decision, not an unhappy discovery after it is too late to do anything about it.[26]

Construction Techniques

John J. Delaney[27] has reviewed the dynamic school building program of Chicago's Board of Education. Dan S. Martin[28] has described a comprehensive approach to planning which has paid off handsomely in New Orleans in speedier and more economical school construction. The staff[29] of Architectural Record has submitted a resume of those cumulative economies possible in school plant construction. It is based on the research report of the State Education Department, the University of the State of New York, Albany, 1958. Pictorial presentations of economical school buildings are included.

Decoration and Color

Faber Birren[30] has stated that color can be a happy

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[26] Ibid., p. 56.

[27] John J. Delaney, "A Multi-Million Dollar School Building Program," American School Board Journal (August, 1955), pp. 21 and 63.

[28] Dan S. Martin, "Schoolhouse Planning in New Orleans," School Executive (October, 1954), pp. 73-76.

[29] Staff, "Schools--A Realistic Approach to Economy True," Architectural Record (May, 1959), pp. 219-242.

[30] Faber, Birren, "The Psychology of Color for the Classroom," Nation's Schools (April, 1954), pp. 92-94.

thing, but it may also be distracting. He argues vigorously that it must have purpose, place, and be controlled. Dwight B. Ireland[31] has emphasized that the school must provide a warm, receptive atmosphere for children. Lawrence B. Perkins[32] and Walter Cocking have asked school plant planners to remember the following instructions:

1) Use color.

2) Use color carefully to conserve good seeing.

3) Use color fitted to the lighting, the size, the job, the atmosphere of the space and the activities in it.

4) Use light colors to spread the area of light and cheerfulness in usable space throughout a building.

5) Use bright colors to liven and punch home the concept of a school as a cheerful, constructive place.

Libraries

Mary J. McManus[33] has described how Chicago has dealt with certain physical inadequacies to achieve attractive and

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[31]Dwight B. Ireland, "Color, Courts and a Child-Size Scale Make This a Homelike School," Nation's Schools (October, 1956), pp. 66-70.

[32]Lawrence B. Perkins and Walter D. Cocking, Schools (New York: Reinhold Publishing Co., 1949), p. 179.

[33]Mary J. McManus, "School Library Quarters in Chicago", American School and University (Vol. 1, 1956-57), pp. 157-164.

functional library facilities. She has also presented some challenging concepts of what library facilities might include in the future. Audrey Newman[34] has analyzed the function of the instructional materials center with particular attention to the variety of services provided for the educational program in such a space.

Heating and Ventilating

Henry Wright[35] has made a comparative analysis of the same school engineered with and without air conditioning. His estimates of the price differential approximate seventy-five cents per square foot for heating and ventilating costs. Neal B. Smith[36] has presented an interesting discussion concerning the effect of heating systems on school design. In a specific case he outlines the strengths and weaknesses of an electrical heating system which was installed in an elementary school.

Lighting

Harold V. Webb[37] has proposed for our consideration a

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[34]Audrey Newman, "School and Multi-Instructional Materials Center," American School and University (Vol. 1, 1958-59), pp. 262-270.

[35]Henry Wright, "What Does School Air Conditioning Cost?" American School Board Journal (January, 1958), pp. 33-34.

[36]Neal B. Smith, "Electric Heating and School Design," American School Board Journal (February, 1959), pp. 48-49.

[37]Harold V. Webb, "Light and Color," American School Board Journal (August, 1957), pp. 42-44.

plan whereby proper light and color can contribute substantially toward improving the learning process. R. I. Burnham[38] has declared that it is better economics to use better paint, better lighting equipment, and better lighting controls than to invest the school dollar in unproductive footcandles. The report of the AASA School Building Commission[39] has pointed out that a good visual environment is not alone a matter of foot candles.

Summary

The foregoing review of the literature has attempted to pinpoint some of the relevant and meaningful statements that have been made in the area of school plant planning. Various facets of this procedure have been highlighted. Not all have been considered.

An appropriate closing remark for this section might be the following:

> Let the educator outline for the architect what items of educational significance are sought in each situation, and buildings more closely related to educational needs will result.[40]

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[38]R. I. Burnham, "New Lighting Concepts for New Schools," American School Board Journal (December, 1956), pp. 31-32.

[39]American Association of School Administrators, Planning America's School Buildings, (Washington:AASA, 1960), p. 121.

[40]N. L. Engelhardt Sr., N. L. Engelhardt Jr., and Stanton Leggett. School Planning and Building Handbook (New York: J. W. Dodge Corp., 1956), p. 73.

Overview

Chapter Two will concern itself with the need for educational criteria in the school plant planning practices of the Chicago Board of Education. A report on the differences in educational adequacy of the buildings surveyed will be presented. This evaluation was effected by an independent educational consultant from the Michigan State University Staff. Observations of urban school plant planners will be cited. Suggestions from knowledgeable members of the Board of Education's administrative staff will be discussed.

Chapter Three will be the statement of educational criteria for new elementary school buildings in Chicago. These specifications will be a distillation of the review of the literature, the thoughtful suggestions of knowledgeable staff members, the contributions of curriculum committee members, and the critical comments of the following experts:

1. Anthony G. Adinolphi
   Director of School Housing Division
   Detroit Public Schools
   Detroit, Michigan

2. Evelyn M. Carlson
   Assistant Superintendent
   in charge of
   Curriculum Development
   Chicago Board of Education
   Chicago, Illinois

3. Thomas J. Higgins
Director, Bureau of School
Population and Facilities Survey
Chicago Board of Education
Chicago, Illinois
(Also Past President, National Council on
Schoolhouse Construction)

4. Frederick W. Hill
Assistant Superintendent in charge of
Business Affairs
Minneapolis Public Schools
Minneapolis, Minnesota

5. Stanton Leggett
Educational Consultant
Engelhardt, Engelhardt, Leggett, and Cornell
New York, New York

6. Donald J. Leu
Associate Professor
Michigan State University
East Lansing, Michigan

7. Floyd G. Parker
Associate Professor
Michigan State University
East Lansing, Michigan
(Also Secretary-Treasurer, National Council
on School House Construction)

8. John Lyon Reid, A. I. A.
Reid, Rockwell, Banwell, and Taries
San Francisco, California

9. Linn Smith, A. I. A.
Linn Smith Associates, Incorporated
Birmingham, Michigan

10. Lloyd L. Waite
Building Coordinator
Caddo Parish School Board
Shreveport, Louisiana
(Also Past President, National Council on Schoolhouse
Construction)

Chapter Four will summarize the study and suggest certain next steps that might be taken by the Chicago Board of Education to incorporate the proposed methodology and materials in its planning procedures for new school construction.

A bibliography and appendix will complete the contents of this study.

CHAPTER TWO

THE NEED FOR EDUCATIONAL CRITERIA IN CHICAGO

Chicago's Board of Education for a period of many years has maintained its own Bureau of Architecture. All of its new buildings and additions were designed by this staff. In 1953 when Dr. Benjamin C. Willis was appointed General Superintendent of Schools, he realized that an increased pace in the school building program was indicated. In order to do the work quickly and effectively he had two choices:

1. Expand the Bureau of Architecture.
2. Employ private architects.

He chose the latter.

Educational specifications of a somewhat general and limited nature had been used in the past. These continued to be the written expression of educational planning by the Chicago Board of Education.

An analysis of educational features and cost figures in selected new elementary school buildings in Chicago has now been completed. For purposes of this analysis thirty-seven new elementary school buildings whose contracts were awarded by the Chicago Board of Education between January 1, 1954 and

December 31, 1958 were chosen. All change orders within this period affecting the cost of each building were included in the total of expenditures. All of these buildings are now in use. Some have gained for their architects local and national awards.

It should be noted that eighteen (18) of the projects were designed by the Bureau of Architecture and nineteen (19) of the schools were designed by thirteen (13) private architectural firms. The buildings included in this study represent a tax dollar expenditure of $19,995,660.00 or 19.1% of the total capital outlay during the years 1954-1958.

Demonstrable differences between buildings of similar size or like budgets were found in the following categories:

1. educational adequacy
2. size of classrooms
3. square feet per pupil
4. design efficiency

These inadequacies and inconsistencies in school buildings would seem to suggest the need for providing more detailed information to the architects employed. With this statement of educational criteria for elementary schools in Chicago the architect would be better able to design a "form" that would permit and allow the "function" desired.

Educational Adequacy Rating of School Plants

The educational adequacy of each building was determined by means of a rating form developed specifically for the Chicago elementary schools. This rating form provides a method for evaluating the following five sections of a school plant:

I. Regular Classrooms

II. Kindergartens

III. Special Rooms

IV. Administrative Areas

V. General Areas

Consideration of both the individual scores and the total score for each building provides a basis upon which to appraise the adequacy of the plant for educational purposes. A hypothetically perfect school plant would receive 100.0 points or 100 per cent on the rating form. However, since compromises with the ideal are often made during planning and construction because of financial reasons, few buildings would receive over 80.0 points. Buildings receiving more than 70.0 points, in terms of present practices, are very good school buildings; buildings receiving 60.0 to 70.0 points should be considered above the average school building in use today. Buildings receiving 50.0 to 60.0 points may be considered as average school buildings. Buildings receiving less than 50.0 points are below average and normally require considerable modernization and rehabilitation. Buildings

receiving less than 40.0 points are severely substandard and ordinarily should be abandoned for school purposes.

An independent and experienced school plant specialist was employed to rate each building. This specialist had no knowledge of the planning personnel involved in the individual building programs.

A copy of the Rating Form is included. See Appendix 1.

Educational Adequacy Rating-Total Score

The school buildings that were rated, varied from a high total score of 75.8 points to a low of 48.6 points. This represents a range of 27.2 points. The median score was 62.2 points.

It is significant to note that the median score for the five highest buildings was 71.0 points as contrasted with a median score of 52.5 for the five lowest buildings or a difference of 18.5 points. Another way of expressing this difference is to say that in terms of educational adequacy, as expressed by the rating form, the five highest buildings scored 35.2% higher than the five lowest buildings.

The educational adequacy rating score has increased slightly during the past five years. The first five buildings constructed had a mean score of 61.2 while the last five buildings constructed had a mean educational adequacy score of 63.8, an increase of 2.6.

Chart 1 visually summarizes the above information.

Educational Adequacy Rating

Classrooms

The regular classrooms in each elementary school varied from a high educational adequacy score of 74.7 to a low of 42.5. This represents a range of 32.2. The median score was 58.0.

The educational adequacy rating score of the classrooms has decreased during the past five years. The first five buildings constructed had a median classroom score of 74.2 while the last five buildings had a median classroom score of 66.0 for a reduction of 8.2.

Chart 2 visually summarizes the above information.

Educational Adequacy Rating

Kindergartens

The Kindergarten rooms varied from a high educational adequacy rating score of 88.0 to a low of 56.0. This represents a range of 32.0.

It is significant to note that the median for the five highest scoring Kindergartens was 86.0 as contrasted with a median score of 62.0 for the five lowest scoring Kindergartens or a difference of 24.0.

The educational adequacy score of the Kindergartens has increased during the past five years. The first five buildings

CHART 1

EDUCATIONAL ADEQUACY RATING
(TOTAL SCORE)

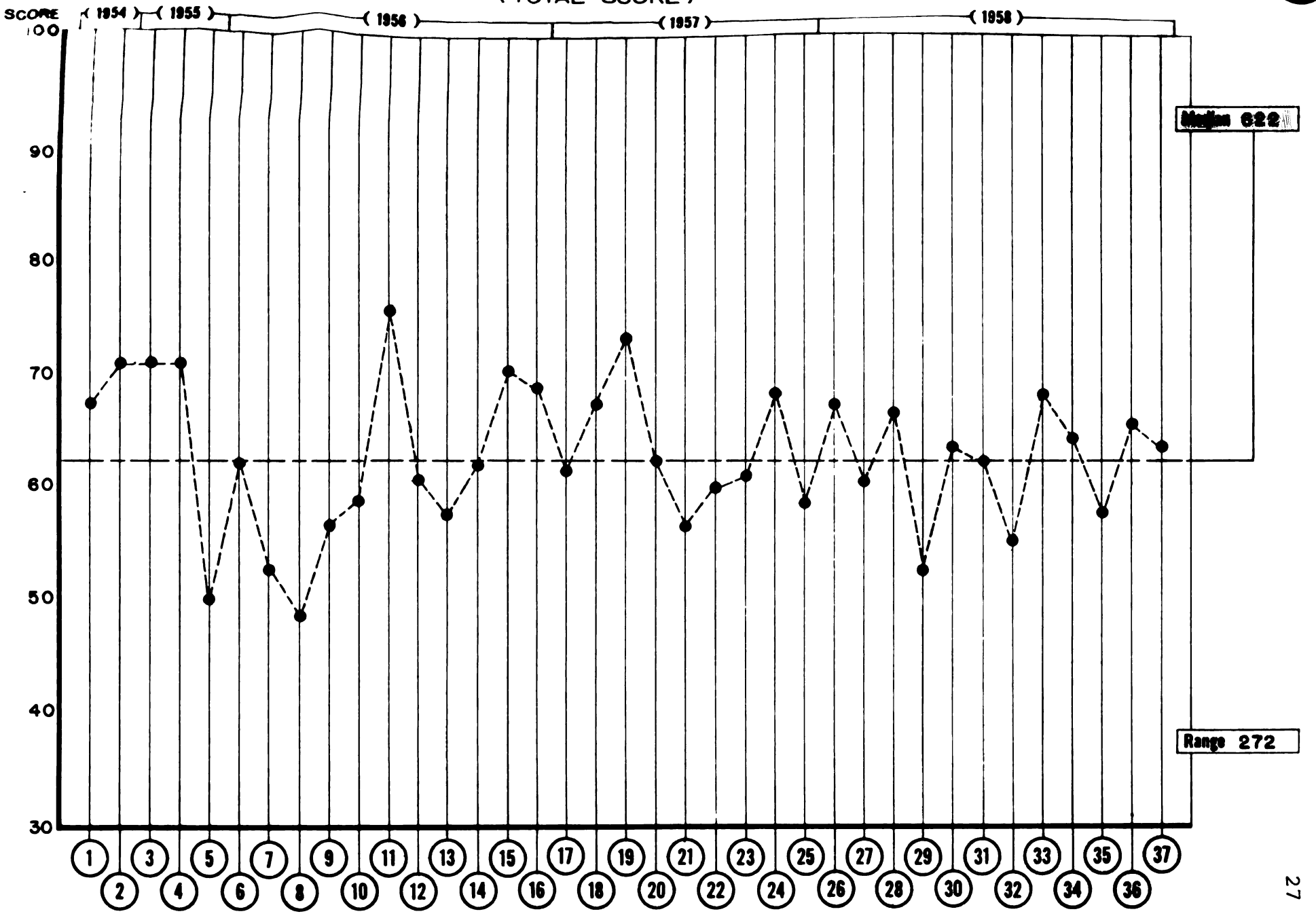
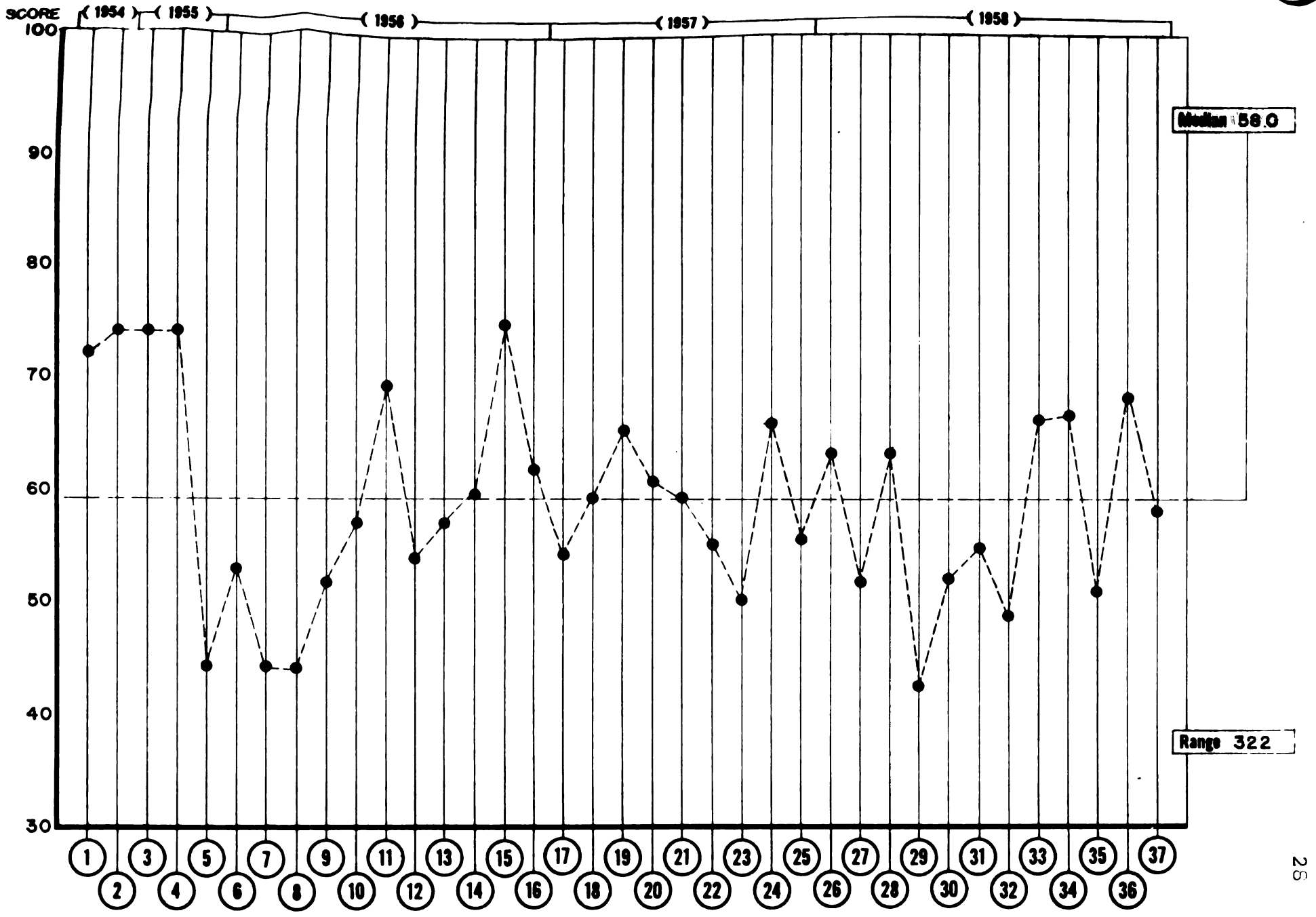


CHART 2

EDUCATIONAL ADEQUACY RATING
CLASSROOM SCORE



constructed had a median Kindergarten score of 70.0 while the last five buildings had a median Kindergarten score of 72.0 for an increase of 2.0.

Chart 3 visually summarizes the above data.

Educational Adequacy Rating

Special Rooms

Special rooms include the playroom or multi-purpose room, cafeteria, auditorium, library and special education areas.

The special rooms in each elementary school varied from a high educational adequacy score of 100.0 to a low of 40.0. This represents a range of 60.0. The median score was 66.0.

It is significant to note that the median score for the five highest special rooms was 100.0 as contrasted with a median score of 56.0 for the five lowest scoring special rooms for a difference of 44.0.

The educational adequacy score of the special rooms has decreased during the past five years. The first five buildings constructed had a median special room score of 71.0 while the last five buildings constructed had a median special room score of 64.0 for a reduction of 7.0.

Chart 4 visually summarizes the above information.

CHART 3

EDUCATIONAL ADEQUACY RATING
KINDERGARTENS

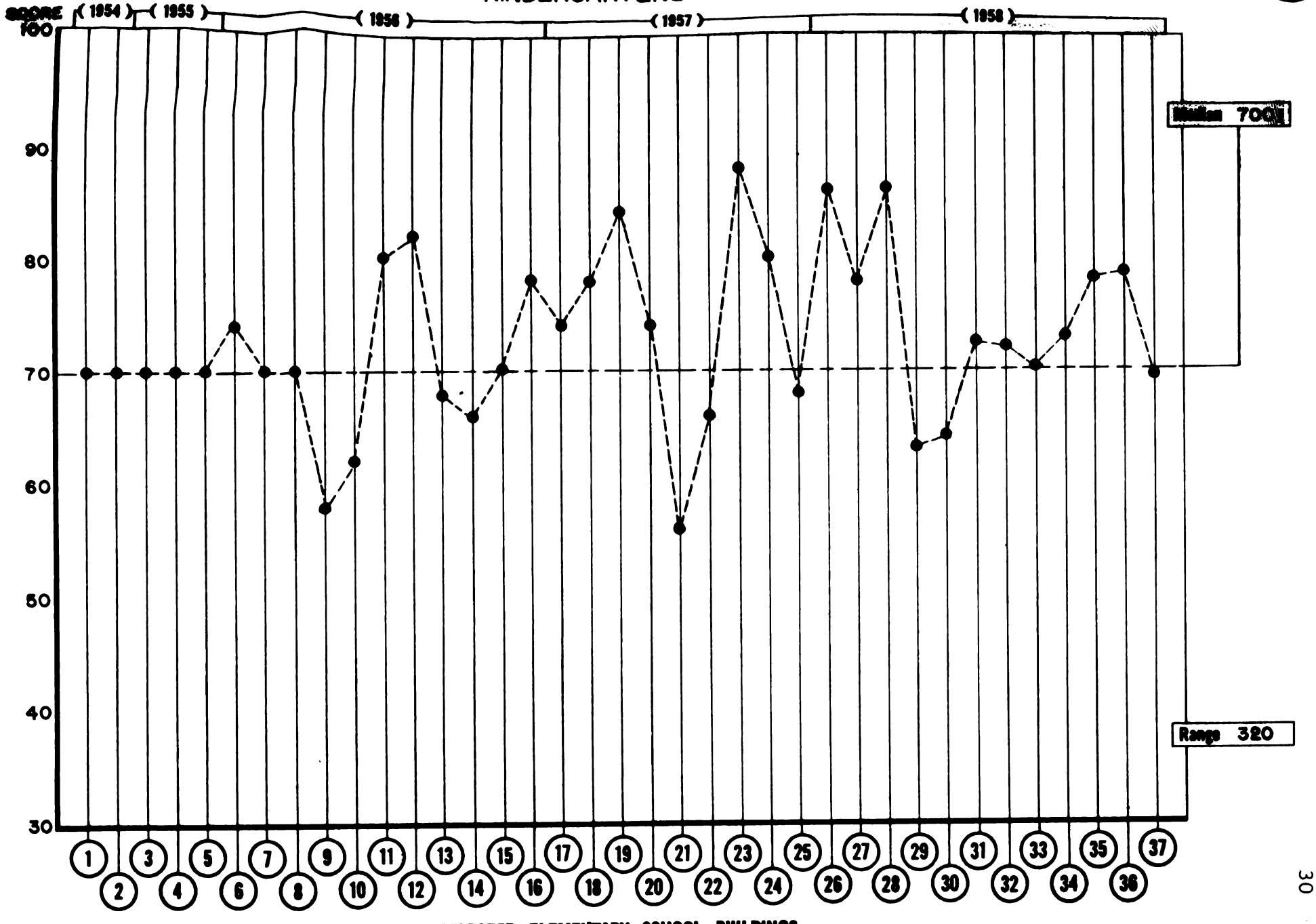
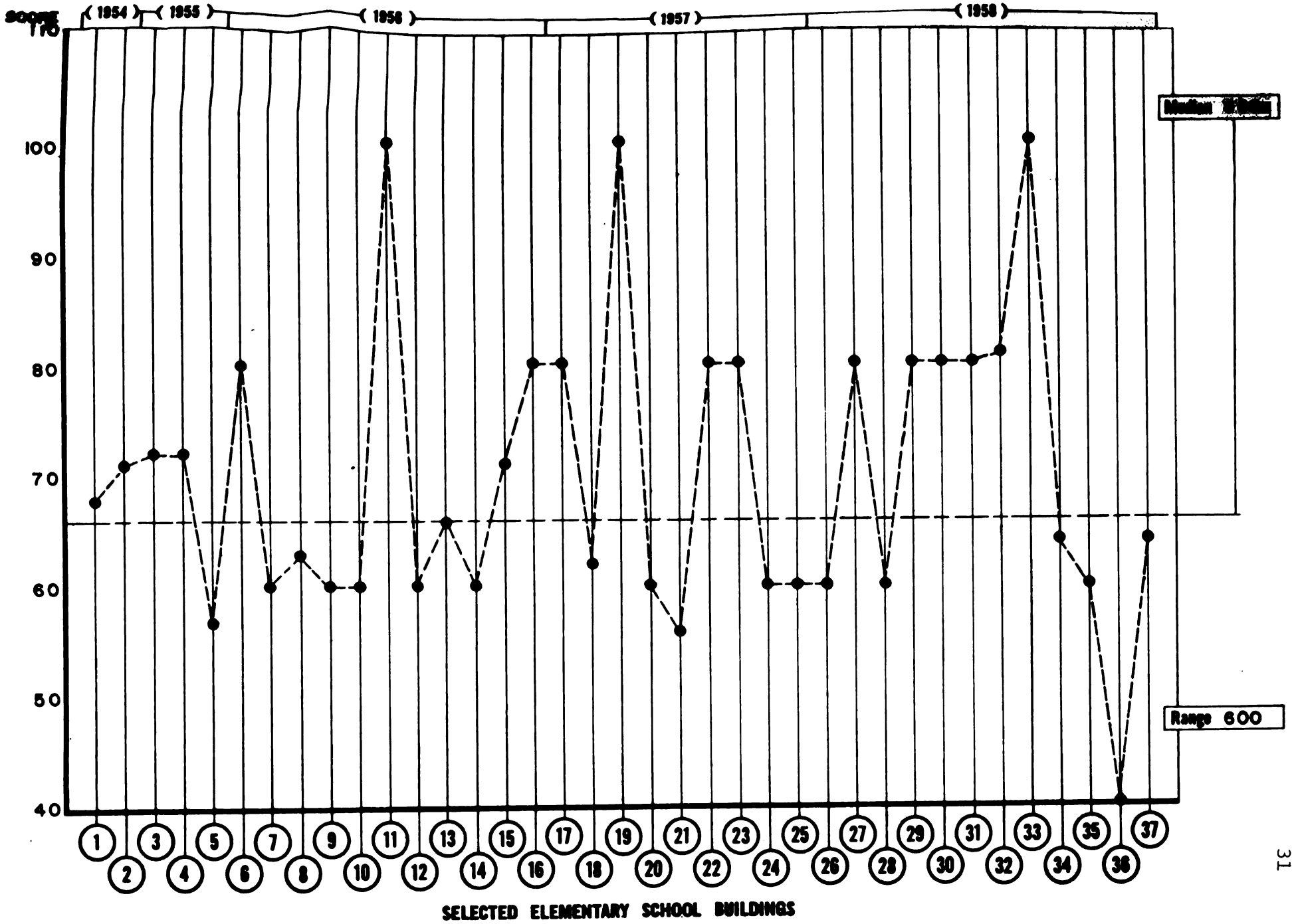


CHART 4

EDUCATIONAL ADEQUACY RATING
SPECIAL ROOMS



Educational Adequacy Rating

Administrative Areas

Administrative areas include the general office, principal's office, adjustment room, teachers' room, instructional and custodial storage areas.

The administrative areas in each elementary school varied from a high educational adequacy score of 86.0 to a low of 44.0. This represents a range of 42.0. The median score was 64.0.

It is significant to note that the median score for the five highest administrative areas was 80.0 as contrasted with a median score of 52.0 for the five lowest scoring administrative areas for a difference of 28.0.

The educational adequacy score of the administrative areas has increased during the past five years. The first five buildings constructed had a median administrative area score of 58.0 while the last five buildings constructed had a median administrative area score of 62.0 for an increase of 4.0.

Chart 5 visually summarizes this data.

Educational Adequacy Rating

General Areas

In the general areas are included corridors, sanitary facilities, and such design features as circulation, flexibility, expansibility, safety, and design.

CHART 5

EDUCATIONAL ADEQUACY RATING
ADMINISTRATIVE AREAS

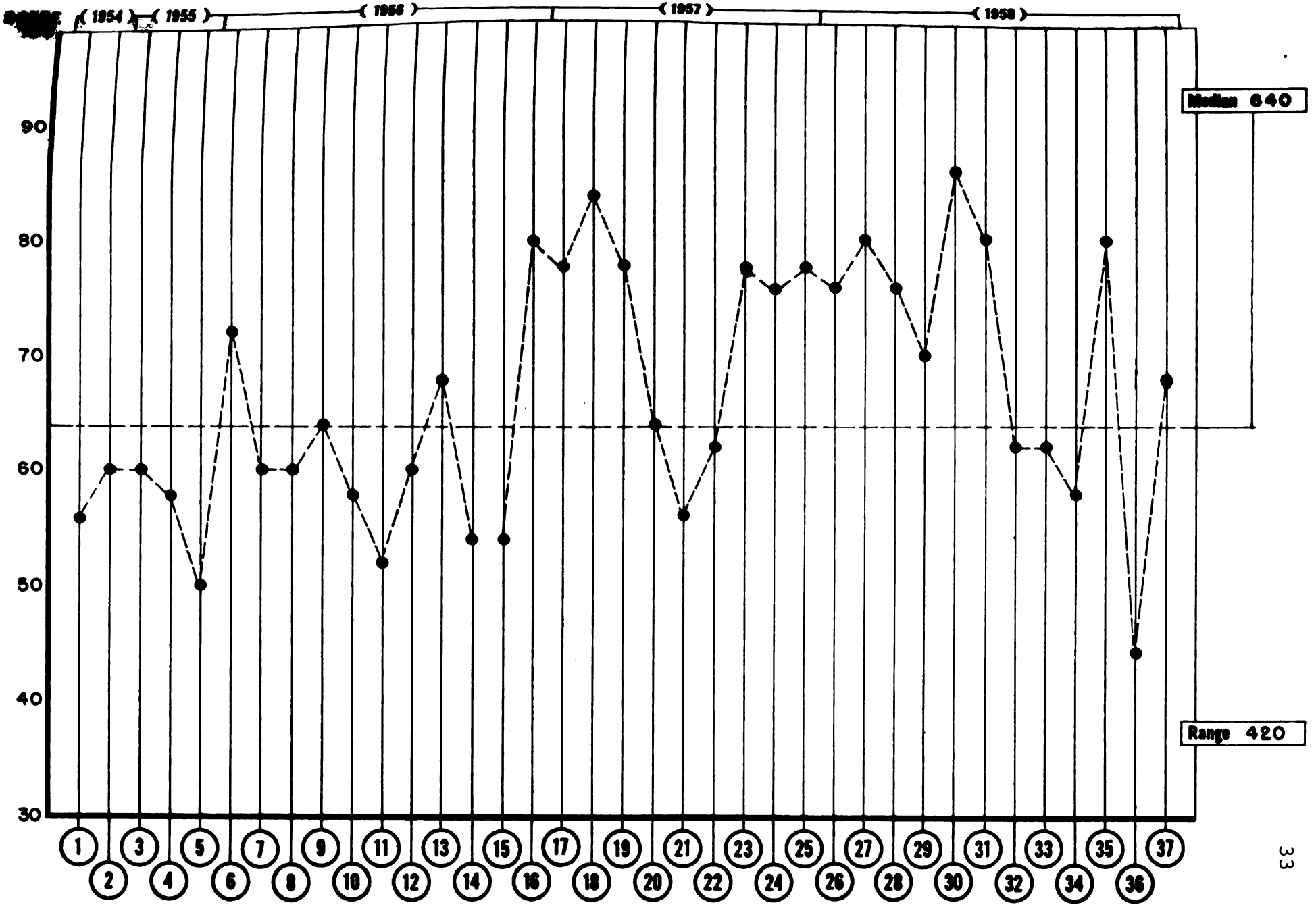
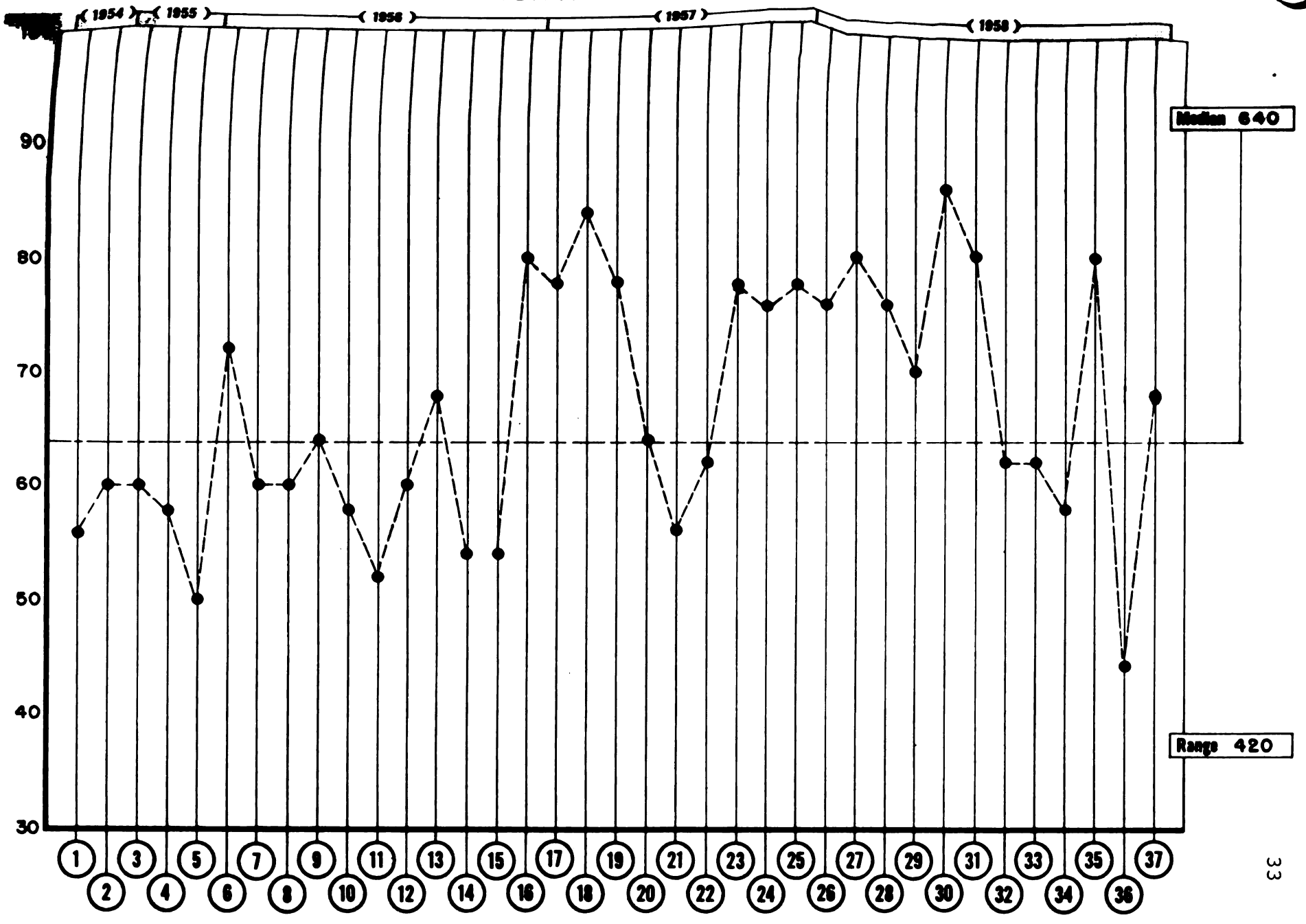


CHART 5

EDUCATIONAL ADEQUACY RATING
ADMINISTRATIVE AREAS



The general areas rated varied from a high of 88.5 to a low of 46.5. This represents a range of 42.0. The median score was 66.0.

It is significant to note that the median score for the five highest scoring general areas was 82.5 as contrasted with a median score of 49.0 for the five lowest scoring general areas for a difference of 33.5.

The educational adequacy score has increased during the past five years. The first five buildings constructed had a general area median score of 64.0 while the last five buildings constructed had a median educational adequacy score of 66.0 for an increase of 2.0.

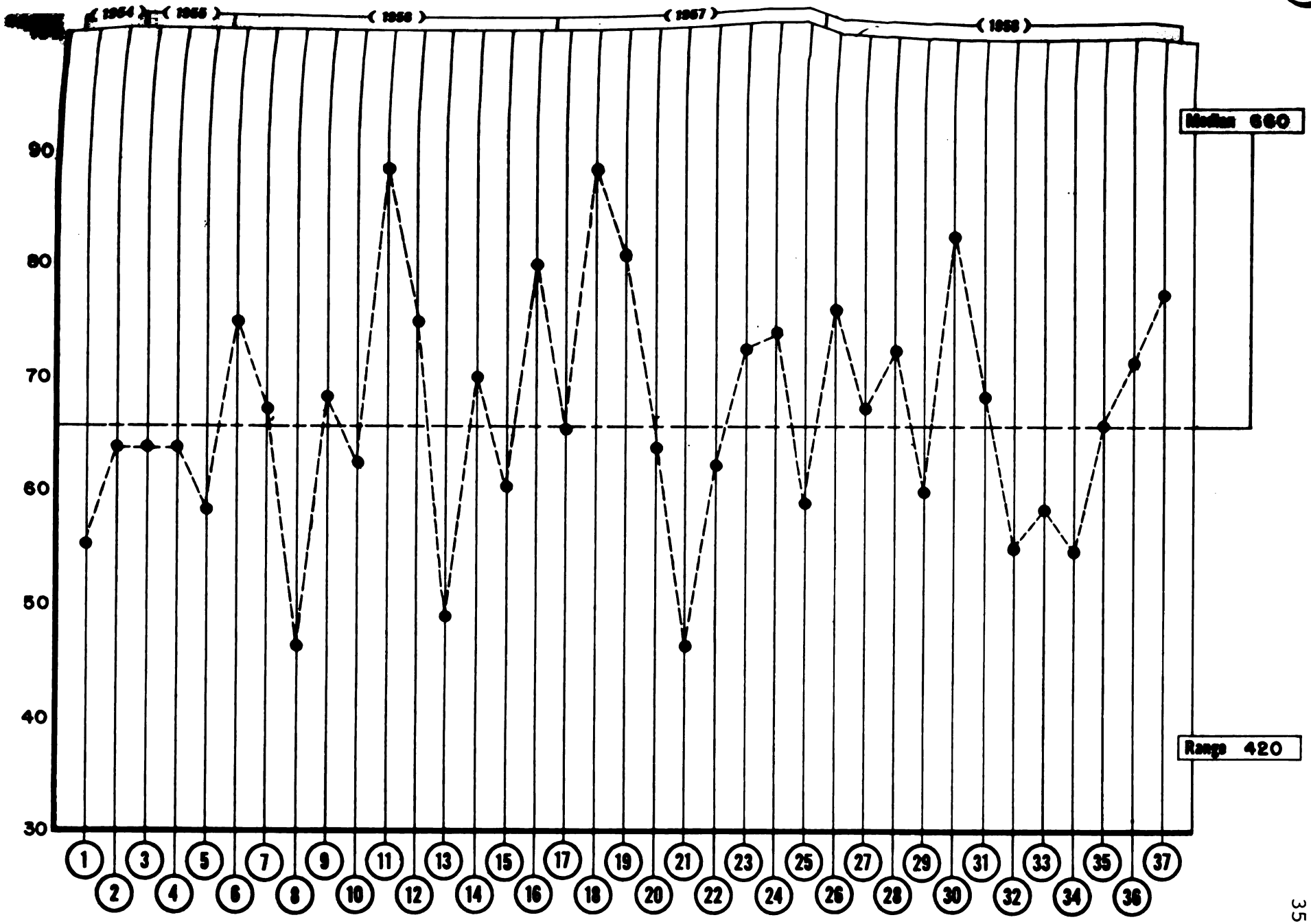
Chart 6 visually summarizes the above information.

Percentage of Building Area Utilized for Educational Purposes

One measurement of design efficiency is the percentage of the total building space allocated for educational purposes. Such comparisons should be the resultant of a carefully stated definition of educational space. Recognizing that all parts of a building, site, and community have educational values to varying degrees, the writer has deliberately and narrowly defined educational space in order to make such comparisons as objective as possible. The following statements clarify the terms, educational efficiency and educational space.

CHART 6

EDUCATIONAL ADEQUACY RATING
GENERAL AREAS



Educational Efficiency[1]

Educational efficiency is measured in accordance with certain definitions. The first definition, total gross area, is one which applies to all architects designing school buildings for the Chicago Board of Education. Total gross area is the sum of all floor areas enclosed within the outer surfaces of the enclosing walls, whether these areas lie on, below, or above the grade. It includes unfinished basements, pits, vaults, mezzanines, and penthouses, as well as each floor including stairways. It also includes open-sided-but-roofed porches, loggias, passageways, and loading docks computed at one-half of the area, and eyebrows and overhangs in excess of twenty-four inches at one-third of the area.

The second is the definition of educational area. Educational areas are those which provide space for the instruction of students, for the storage of essential tools for that instruction, and those areas necessary for the administration of educational functions. Net educational area is the sum of all educational areas measured from the inside surfaces of the enclosing walls.

Educational area includes classrooms, locker and/or wardrobe area, kindergartens, home-economic classrooms, art

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[1]This measurement was first advanced by N. L. Engelhardt, Jr. and F. G. Lopez in an article, "School Building Costs" in the September, 1958 issue of School Management.

rooms, music rooms, shops, gymnasiums, gym locker and shower rooms, auditoriums, cafeteria seating, libraries, and administration offices.

The classroom educational area includes sink and counter area as well as the seating and instructional space. However, the area of the lockers or wardrobes (interior or exterior) is not included in our measurement of classroom educational space. Wardrobes and individual toilets are counted as educational area only in the case of kindergarten rooms.

The gymnasium floor and all additional spaces such as equipment rooms, storage rooms, and gymnasium offices are included in educational area.

The educational area of an auditorium includes the seating area, the stage (including steps and passages leading to it), and the dressing rooms. The lobby and checkroom are not included in the educational area of a building.

The cafeterias (both student and faculty) are included as educational areas; however, the kitchen and kitchen storage areas are not included. Some of the schools measured have a multi-purpose room. It serves as a combination assembly hall, gymnasium, and/or cafeteria. In some of these rooms the stage is over a chair storage area; consequently, to avoid double-counting, only the stage is included.

The administration areas include the principal's office,

health and guidance rooms, clerical offices, book and supply rooms, teacher conference rooms, office storage, and the vault. If a teachers' conference room is not provided, then one of the teachers' rest rooms is included as a substitute.

The area analysis is concluded by dividing the net educational area by the total gross area to obtain the design efficiency. The quotient is one measure of design efficiency and is expressed in terms of the percentage of the building area utilized for educational purposes. A copy of the form used is included. See Appendix 2.

Percentage of Building Area Utilized for Educational Purposes

The percentage of the building area utilized for educational purposes has varied from a high of 70.9% to a low of 52.7%. This represents a range of 18.2%. The median percentage was 62.6%.

It is significant to note that the median percentage for the five highest buildings was 70.0% as contrasted with a median percentage of 53.7% for the five lowest buildings, or a difference of 16.3%. Another way of expressing this difference is to say that in terms of design efficiency in providing educational space, the five highest buildings utilized 16.3% more of their total area for educational purposes than the five lowest buildings.

The percentage of space provided for educational areas has been reduced during the past five years. The first five buildings had a median educational area of 61.6% while the last five buildings constructed had a median educational area of 58.9% for a reduction in educational space of 2.7%.

Chart 7 visually summarizes the above information.

Square Foot Per Pupil

Total Building Area

The total square footage of a building divided by its capacity gives a square foot per pupil figure. The square foot per pupil varied from a high of 74.5 square feet to a low of 37.3 square feet. This represents a range of 37.2 square feet. The median square footage per pupil was 57.1 square feet.

It is significant to note that the median space allotment for the five highest buildings was 70.5 square feet as contrasted with a median size of 45.1 square feet for the five lowest schools for a difference of 25.4 square feet. Another way of expressing this difference is to say that in terms of space allotment per pupil the five highest buildings provided 56% more space per pupil than the five lowest buildings.

There has been an increase during the last five years in the amount of space provided per pupil. The first five buildings constructed had a median space allotment of 52.5 square feet. The last five schools completed had a median space

CHART 7

PERCENTAGE OF BUILDING AREA UTILIZED FOR EDUCATIONAL PURPOSES

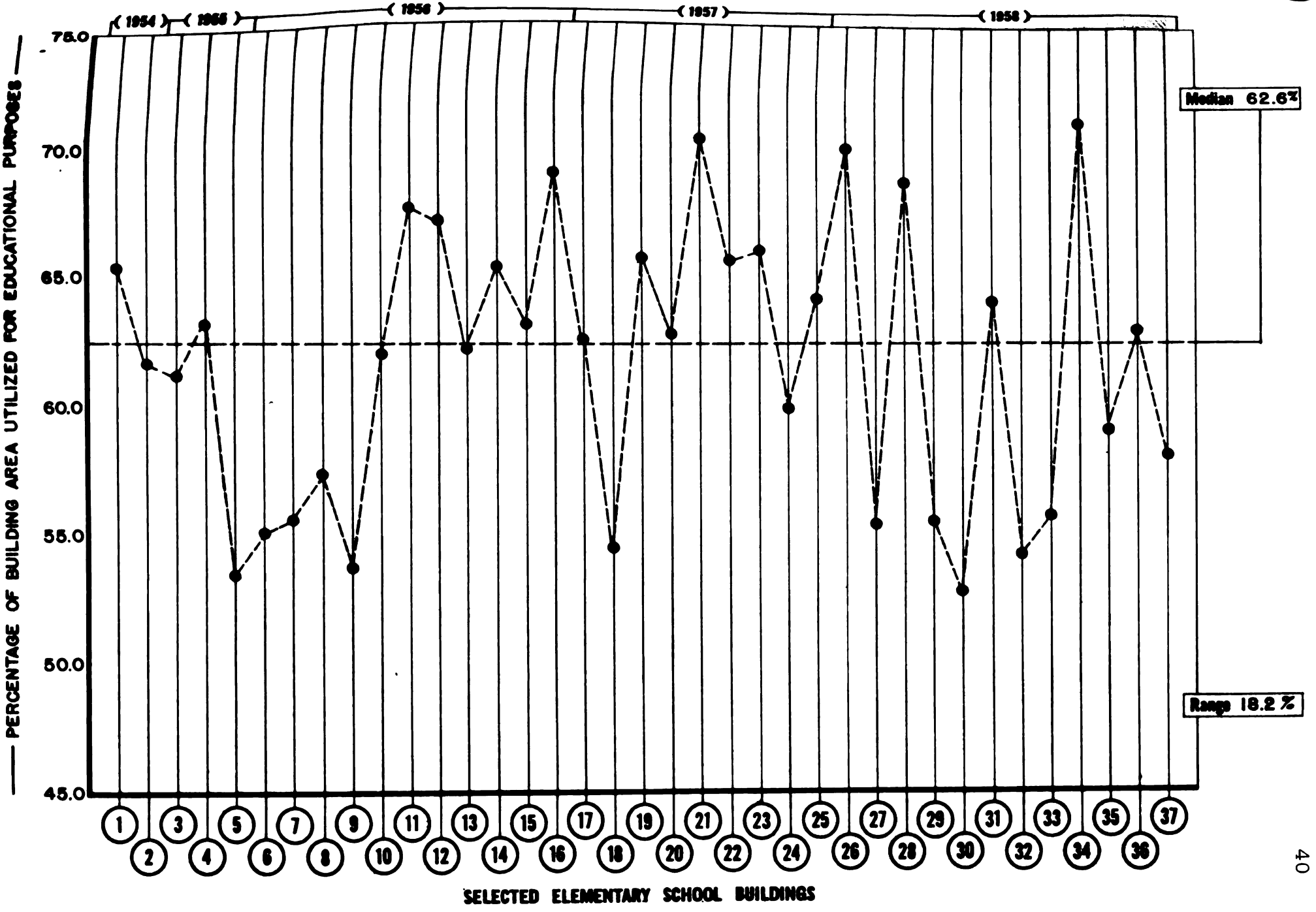
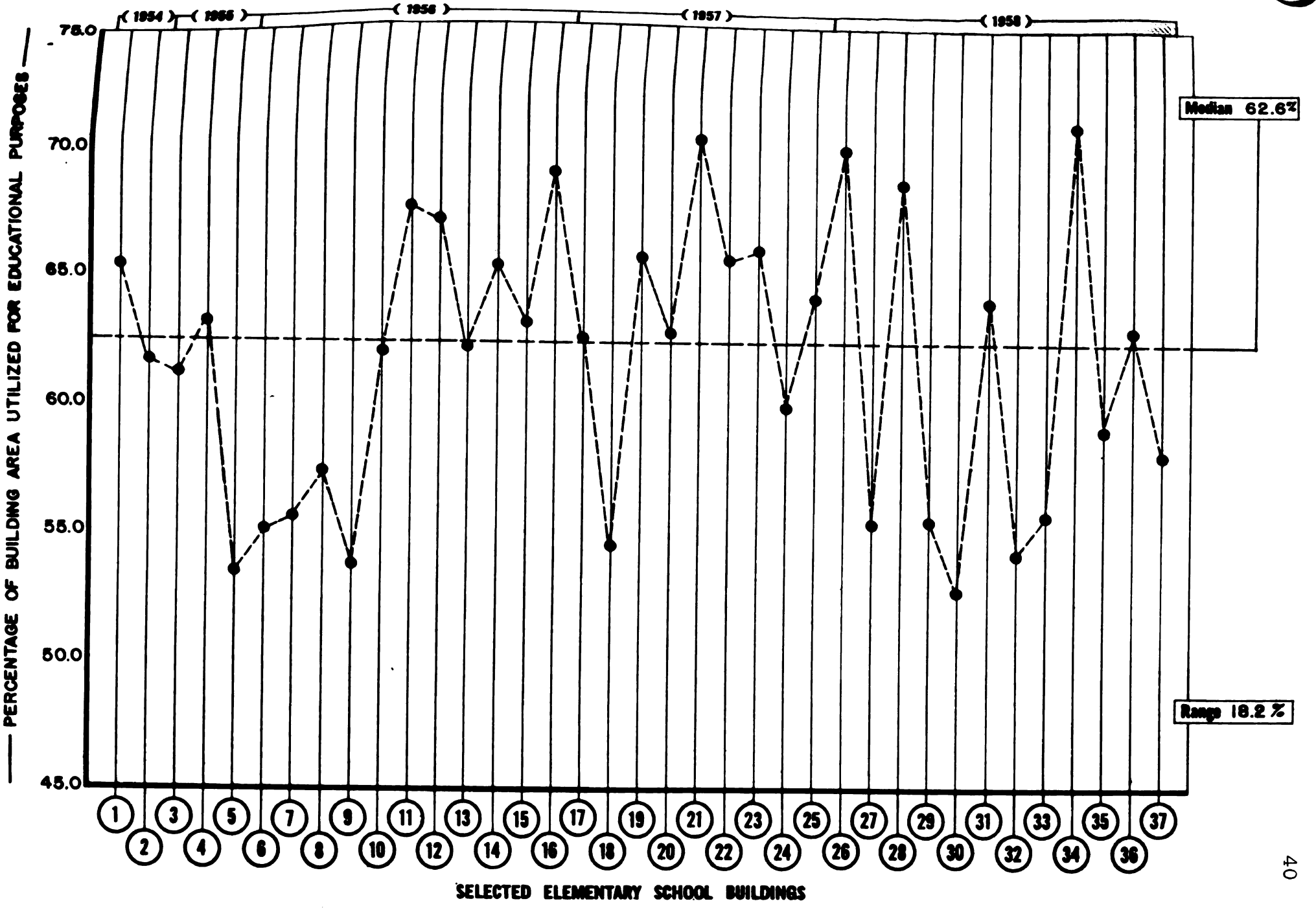


CHART 7

PERCENTAGE OF BUILDING AREA UTILIZED FOR EDUCATIONAL PURPOSES



allotment of 58.8 square feet for an increase of 6.3 square feet or 12.0%.

Chart 8 visually summarizes the above information

Size of Classrooms

The size of a typical classroom in each elementary school building varied from a high of 982 square feet or 32.7 square feet per pupil to a low of 682 feet or 22.7 square feet per pupil. This represents a range of 300 square feet.

It is significant to note that the median size for the five largest classrooms was 950 square feet as contrasted to a median size of 693 square feet for the five smallest buildings for a difference of 257 square feet. Another way of expressing this difference is to say that in terms of educational classroom space, the five largest classrooms were 37% larger than the five smallest classrooms.

There has been a significant reduction in classroom size during the past five years. The first five buildings constructed had a median classroom size of 950 square feet. The last five schools completed had a median classroom site of 774 square feet for a reduction of 176 square feet (18.5%).

Chart 9 visually summarizes the above information,

Staff Suggestions

All of the school buildings in this study were visited

CHART B

SQUARE FOOT PER PUPIL TOTAL BUILDING AREA

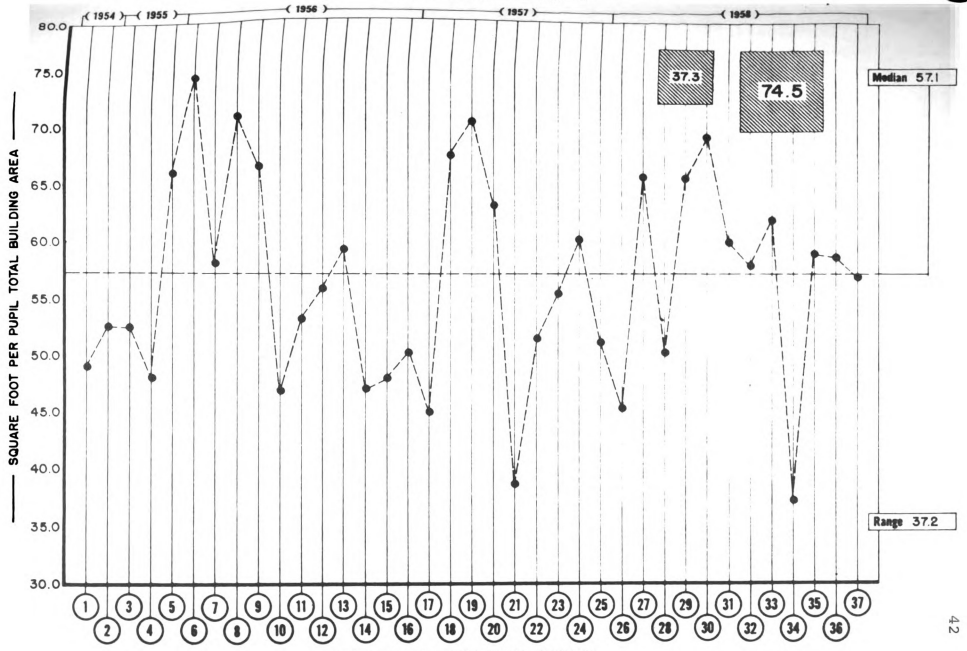
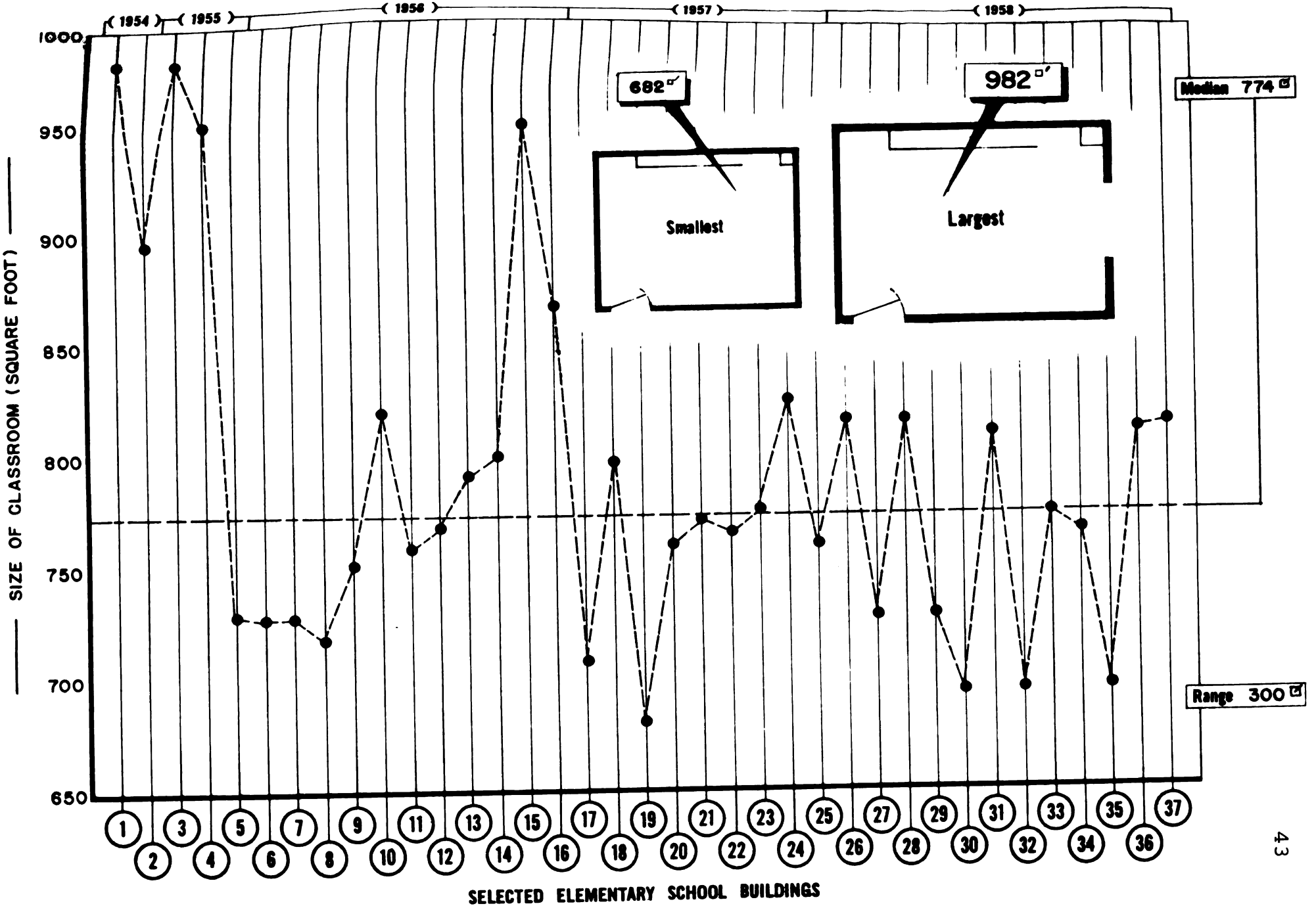


CHART 9

SIZE OF CLASSROOM (SQUARE FOOT)



by the writer. Questionaires were submitted to the principals and staff members in order to obtain their reactions. They were invited (in fact, urged) to discuss the strengths and weaknesses of their newest tool for instruction. The fundamental reason for our inquiry was the hope that staff observations would aid future school plant planning. The comments of principals, teachers, custodians, even a few pupils, were incisive, insightful, and frequently critical. To illustrate:

"Larger primary classrooms are needed for our instructional program."

"We should have sinks in every classroom."

"I believe we should have a library in every elementary school."

"The triple-purpose room (gym, assembly, and lunchroom) is an administrative abomination!"

"Maintenance of these floors is a problem."

"Storage is inadequate in my room."

"Couldn't we have a multi-purpose room?"

The above quotations stemmed from the experiences of teachers, principals, and custodians who have been using the elementary school buildings under consideration. As is obvious from their remarks, they feel strongly about certain educational features of Chicago's newest schools. Much of their concern seems to focus on the absence of systematic educational planning.

They believe very definitely that the professional personnel in a school system should be involved in its school plant planning. They are aware of the fact that budgetary limitations may curtail implementation of the ideal building proposed, but the responsibility for this decision devolves upon the superintendent and the school board.

A copy of the questionnaire used is included. See Appendix 3.

Consultants' Comments

This study enlisted the aid and assistance of some outstanding planners of elementary schools, both educators and architects. These people from all over America participated actively in the evaluation of the schools in this study; they contributed generously from their experience, advice and counsel which would help effectuate strengthened school plant planning procedures in Chicago.

It was generally agreed by the consultants that a fuller statement of educational criteria for new elementary school buildings in Chicago was needed. The approach to such specifications was debated. One point of view proposed that performance standards be established, and then, let the architect whir away! At the opposite extreme to this laissez-faire attitude was the opinion that detailed descriptions of spaces, furniture, and equipment should be delivered to the architect.

A concern for human values was expressed most emphatically by one of the consultants. He feels that beauty should be an integral part of any building; and he documented the fact that this need not cost more money.

Another argued vigorously for more generous allocations of space for the type of educational program desired. He maintained that 1000 square feet of space in a classroom is not too much to provide for the teacher who understands the uses of the following areas:

1. general work
2. library (or study)
3. block
4. art
5. nature and science
6. woodwork
7. motion picture projection
8. phonograph
9. storage
10. guidance
11. clean-up
12. personal hygiene

Cost Data for School Plants

In addition to the educational adequacy ratings of these elementary schools, data on the total expenditure of money for

these buildings was collected. Analysis of this information revealed wide differences between buildings of similar size and like budgets. In the following paragraphs the method of analysis is described and the costs per square foot, per cubic foot, and per pupil are presented.

Cost figures were adjusted for comparative purposes through the use of the Building Cost Index for the city of Chicago, published by the Engineering News-Record. The year 1958 was selected as the base year in developing the following comparative cost index figures:

Year	Cost Index
1958	100.0%
1957	94.9%
1956	91.8%
1955	87.9%
1954	83.7%

The square foot and cubic foot figures for each building were computed by an independent architect who used the current American Institute of Architects' standard formulae. Per pupil capacities for each building were based on thirty (30) pupils for each regular classroom and sixty (60) pupils for each regular kindergarten.

Total Contracts

Adjusted Cost per Square Foot

The adjusted costs per square foot of the buildings in this study have varied from a high of $23.79 to a low of $13.68. This represents a range of $10.11 per square foot. The median cost was $17.88.

It is significant to note that the median cost for the five highest cost buildings was $22.50 as contrasted to a median cost of $14.19 for the five lowest priced buildings or a difference of $8.31 per square foot. Another way of expressing this difference is to say that in terms of adjusted square foot costs, the five most expensive buildings were 58.6% more expensive than the five least expensive buildings.

Adjusted square foot costs have decreased significantly during the past five years. The first five buildings constructed had a median cost of $20.85 per square foot while the last five buildings constructed had a median cost of $17.13 for a reduction of $3.72 per square foot or 17.8%.

Total Contracts

Adjusted Cost per Cubic Foot

Adjusted costs per cubic foot have varied from a high of $1.79 to a low of $1.09. This represents a range of 70 cents per cubic foot. The median cost was $1.46.

It is significant to note that the median cost for the five highest cost buildings was $1.66 as contrasted to a median

cost of $1.10 for the five lowest priced buildings or a difference of 56 cents per cubic foot. Another way of expressing this difference would be to say that in terms of adjusted cubic foot costs, the five most expensive buildings were 50.9% more expensive than the five least expensive buildings.

Adjusted cubic foot costs have decreased during the past five years. The first five buildings constructed had a median cost of $1.54 per cubic foot while the last five buildings constructed had a median cost of $1.47 for a decrease of $.07 per cubic foot or 4.5%.

Total Contracts

Adjusted Cost per Pupil

Adjusted costs per pupil have varied from a high of $1,333.53 to a low of $646.62. This represents a range of $686.91 per pupil. The median cost was $1,037.00.

It is significant to note that the median cost for the five highest cost buildings was $1,287.12 as contrasted to a median cost of $713.83 for the five lowest priced buildings or a difference of $573.29 per pupil. Another way of expressing the difference is to say that in terms of adjusted per pupil costs, the five most expensive buildings were 80.3% more expensive than the five least expensive buildings.

Adjusted per pupil costs decreased significantly during the past five years. The first five buildings constructed had

a median cost of $1,098.33 per pupil while the last five buildings constructed had a median cost of $973.92 for a reduction of $124.41 per pupil or 11.3%.

SUMMARY

The objective data reported in this chapter concerning the educational adequacy and unit costs of each of the thirty-seven new elementary school buildings have suggested the need for a fuller and more detailed statement of educational criteria. Statistical evidence of inconsistencies in planning among the school plants analyzed has been presented. Demonstrable differences in educational adequacy and unit costs have been cited. Consultants, faculty members, and administrative personnel participating in a review of these findings have unanimously agreed that more illuminative and descriptive information should be provided by the educational planner for the benefit of the architectural planner.

In the next chapter educational criteria for new elementary school buildings in Chicago have been developed. These specifications are not a panacea for all the school plant planning problems of the district. They do, however, furnish more information to the architect concerning the instructional program and the activities stemming therefrom. Imaginative and creative architects will utilize this statement as a launching pad toward more effective school buildings. The resultant will be better learning situations for children.

CHAPTER THREE

RECOMMENDED EDUCATIONAL CRITERIA

There is empirical evidence to show a direct relationship between the design of a building and the design of the education of a child. The educational program in Chicago demands a wide variety of learning experiences which allow for flexibility, for creativity, and for large and small group activities. The Committee[1] which drafted the report, Elementary Education in the Chicago Public Schools, made the following observations:

> School buildings must provide flexible use of space and facilities for class and individuals to observe, to experiment, to do independent study, to analyze, and to evaluate. It further means that the rooms must be large enough to accommodate at least thirty pupil units and have enough space to allow for the furniture to be arranged differently for different types of learning activities, to provide for a work corner and a science center, and to have space for a room library table and book shelves. To facilitate the study of science, art, and crafts, and the use of audio-visual equipment, each room must have adequate storage space to care for the wide variety of necessary instructional materials of different sizes and shapes, running water, and electrical outlets. Adequate chalkboards and bulletin and display boards are necessary

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[1]Chicago Board of Education, Elementary Education in the Chicago Public Schools, A Report Prepared by the Elementary Committee (Chicago: Chicago Board of Education, 1959), pp. 57-58.

> for teaching and motivation purposes. The rooms should reflect the atmosphere of a house, a schoolroom, and a workshop.

Anyone peering into the future would be quick to agree that change in times and consequent change in needs are factors which must be considered in realistic planning. There is no one "best" school building for an entire elementary school system -- for today or for the future.

The Committee,[2] cited above stated it this way:

> Each educational program has specific needs; each building should offer specific opportunities to provide for these needs. Yet our buildings, as with other aspects of a program for quality education, must provide flexibility and adaptability in design to meet changing programs and changing space needs.

With this in mind the writer has developed the following set of recommended educational criteria. These criteria for planning are not expected to be the final word; they are not considered to be the answer to a specific community's school building problem. Rather they are an attempt to construct a sound foundation upon which an educational program could be erected. Changes, modifications, adaptations of these suggested guidelines? Most assuredly. Only in this way will a large city ever solve its problem of providing the "best" school plant to serve the school program needs of

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[2] Ibid., p. 59.

a particular community in time and space.

Some of the outstanding experts in the fields of educational and architectural planning have contributed their time, energy, and experience to the formulation of these criteria. (Their names have been mentioned previously). The comments, suggestions, and criticisms of staff members and consultants have helped to refine this study. The rating of the school buildings by an outstanding school plant specialist has provided an objective evaluation. This factor has also served to strengthen the specifications.

The statement of educational criteria which follows has numeral and literal designations. The primary reason for this type of organization in traditional educational specifications is utility in reference. The writer is certain that interested persons who consult this study will find this enumeration system helpful and efficient.

1.01

INTRODUCTION

There is no question about the most important element in the education of the child -- it is the teacher. What and how the child learns and the quality of his learning -- these matter most. The interaction between the mind of the teacher and that of the child is the essence of education -- it is the heart of the teaching and learning process.

Many kinds of facilities can be of assistance, however, in implementing quality teaching and quality learning. The most important of these is the school building and its equipment. Our goal is to provide more than classroom space; it is to provide that kind of space which will be a positive force in improving educational opportunities. Our objective is to provide buildings that in themselves are of educational value as tools.

To achieve this goal, the architect needs much more than the obvious information, such as the size and location of the site, the budget appropriation, and the numbers of children for whom he is to provide rooms. It is also necessary that the architect know the kind of learning experience in which the children will engage.

Fundamental to designing a building as an instructional tool is an understanding of the goals and beliefs served by the

educational program and a knowledge of the "how" of teaching. If our objective is solely to impart information and the only sources are the teacher and a single textbook; then, rooms with fixed seats, textbooks, a chalkboard and chalk, and a teacher's desk and chair will constitute all that is necessary to facilitate the teaching-learning process. But if we accept the fact of individual differences, if it is our belief that each child should be educated to his maximum potential, and if in addition to the acquisition of knowledge the utilization of knowledge is our objective; then, the school building should be designed to provide the facilities for many kinds of learning experiences.

Opportunities should be available for the child to work as a member of a small group and as a member of a class. There should be opportunities for the child to do things himself: to observe, to experiment, to do independent study, to work on actual problems and to develop constructive solutions, to evaluate -- to think critically. Such experiences necessitate, among other things, the use of many books rather than a single text; flexible use of space; facilities for demonstration and experimentation in science. Written descriptions of some processes and events are either inadequate or subject to bias; often first-hand experiences are not practical or possible; in these instances, outlets for electronic devices are essential to observation via audio-visual means.

In addition, if we are really to have a building that is an instructional tool, information for the architect must be specific to the needs of the children and those of the community in which the school is to be built. The teaching-learning process should be tailored to the individual pupil needs and the objectives of the specific situation. Since the quality of the school building is related to how well it facilitates the educational program of the specific school, and since a program of education is designed for the needs of the pupils in a specific school, there can be no one best school building or best program of education for the 500 or more locations in the city of Chicago.

If this were the total task, there would be more than sufficient cause for saying that the design of school buildings as laboratories for learning requires no less than the creative genius of architects in association with creative teachers. But this is not all. The life of a school building is often more than 50 years. During that time, the educational program will need to undergo occasional revision if it is to serve a population that varies from time to time in its educational goals and in its anticipation of tomorrow. The quality of a building certainly is related to the degree to which it can facilitate the teaching and learning of each group that will follow for the next fifty or more years.

Change in our times is coming at such an accelerated pace that a degree of flexibility and adaptability in school buildings is demanded beyond anything we have ever known. Man explored the continents, pioneered in settling them, and eventually witnessed the "last frontier" disappear. In the last few decades, man has conquered the atmosphere. Now, again, we are in an "Explorer" age -- only this time it is with rockets, satellites, and space ships. This time it is outer space. What kind of school building will meet the needs of 50 or even 10 years from now? We can not be sure of details, but we do know that much more is required than a design which facilitates an addition to an existing building to provide for increasing enrollments. Much more is needed than standard-sized unit equipment that can be exchanged for other units and thus change the nature of a room. As we look ahead, it may be that provision must be made for possible class sizes as large as 100 for some purposes and as small as 10 or 12 for others. As teaching is modified to take advantage of the electronic age, school facilities must keep pace. The "health team" and the "research team" are here; the "teaching team" may be closer than we realize.

To design our educational program and the school buildings to facilitate it, we can never have less than creative leadership with its sights on the mountain peaks. Good facilities, good educational fare, good teachers -- day in and day out --

herein lies the strength of America for the years ahead.[3]

The criteria which follow are considered general performance specifications which will require modification and adaptation to fit the needs and desires of a particular school community. It will be necessary to evaluate each project carefully upon completion with a view toward continual improvement and refinement of the written specifications. Experience should be a valuable teacher. The writer firmly believes that departures from these criteria for good reasons should be encouraged in order that better teaching-learning situations might be provided.

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[3]Benjamin C. Willis, We Build, a Progress Report, Annual Report Prepared by the General Superintendent of Schools (Chicago Board of Education), 1958), pp. 4-7.

1.02

THE OBJECTIVES AND GOALS OF ELEMENTARY SCHOOL EDUCATION[4]

Program Objective

The fundamental purpose of education, as developed by the citizens of our country, is to help boys and girls develop their full potential so they may become increasingly more effective members of our American society and enjoy the personal satisfactions of a full life. Within this general purpose, the role of elementary education is to initiate with children the processes of education, to guide and direct them in mastering the tools of learning; to develop in them an understanding of ethical human relations; and to teach them the meanings and responsibilities of good citizenship within their capabilities and the limits of their youth so that secondary education may develop them further.

This presents a two-fold responsibility for our schools. There is, first of all, the responsibility to the individual's need to realize his potential, whereby he will achieve at his highest level, with due attention given to his individual needs, interests, abilities, and talents. Second, the elementary school, along with other agencies, has a major responsibility to society

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[4]Chicago Board of Education, Elementary Education in the Chicago Public Schools, A Report Prepared by the Elementary Committee (Chicago: Chicago Board of Education, 1959), pp. 9-11.

in that the development of the individual's understandings, skills, and attitudes will contribute to the individual's social usefulness as he takes his place in the world. These functions are not in opposition to each other, but rather are complementary, and at some times even are identical. For example, each child needs to express himself well, not only to serve his individual wants, but also to make him a more capable member of his home, his community, his nation.

These purposes of education and these responsibilities of schools have been accepted for a long time in Chicago. They were basic to the thinking and implicit in the written statements of the groups of school and lay people who in 1948-49 helped to formulate the guiding principles of the educational program of the Chicago public schools. They were explicit in the statement of the program of education for the secondary schools recommended by the General Superintendent of Schools and approved by the Board of Education, City of Chicago, in 1957.

In an effort to provide a constantly improving program of education, common and essential desired abilities and important understandings and appreciations have been stated explicitly herein as the objectives of the elementary school educational program. These objectives are implied in the major functions, or areas of living, that have constituted the scope of the educational program in Chicago since 1949. To help

further in judging when the objectives have been attained, behavioral goals or the descriptions of the kind of behavior to be expected are described below for each of the objectives.

At their highest level and fullest attainment, these objectives become the characteristics of the educated, mature adult. As the child progresses toward them, his progress may be pictured as a spiral rising from a point through a narrow but widening channel until the full arc is attained. These objectives, then, serve as the common and continuing responsibilities of all administrators, teachers, and children engaged in the educational process. To give clarity of direction and purpose, then, the following objectives are stated:

The Common and Essential Desired Abilities Derived from a Quality Education

ABILITY TO COMMUNICATE EFFECTIVELY

ABILITY TO THINK EFFICIENTLY

ABILITY TO REASON QUANTITATIVELY

ABILITY TO WORK WELL WITH OTHERS

ABILITY TO EVALUATE ONESELF

The Important Understandings and Appreciations Derived from a Quality Education

APPRECIATION OF OUR AMERICAN HERITAGE

UNDERSTANDING OF THE WORLD OF SCIENCE

APPRECIATION OF BEAUTY

PROTECTION OF PHYSICAL AND MENTAL HEALTH

UNDERSTANDING OF ETHICAL AND SPIRITUAL VALUES

Appendix A[5]

Philosophy and Aims of Education

Education serves all people in a democracy.
Education develops democratic ideals.
Education changes behavior.
Education deals with all aspects of life.
Education functions through many agencies.
Education continues throughout life.
Education aims at self-direction.
Education provides for intelligent adjustment to social change.

Appendix B[5]

Major Functions of Living

Practicing American Citizenship.
Using the Tools of Communication Effectively.
Developing Economic Competence.
Improving Family Living.
Protecting Life and Health.
Building Human Relationships.
Enjoying Wholesome Leisure.
Satisfying Spiritual and Aesthetic Needs.
Meeting Vocational Responsibilities.

Appendix C[5]

Guiding Principles of Learning

Learning is an activity.
Effective learning is meaningful.
Satisfactions accompany effective learning.
Motivation vitalizes learning.
The social group affects the learning process.
Teacher-pupil relations influence learning.

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[5]Chicago Board of Education, A Tentative Statement of Philosophy and Aims, A Report Prepared by the Committee of the Curriculum Council (Chicago: Chicago Board of Education, 1950), p. 73.

Important learnings take time to acquire.
Learning produces varied responses.
Emotionally charged experiences may result in rapid learning.
Practice makes learning permanent.
Learning is transferable.

1.03

GENERAL PRINCIPLES OF DESIGN

Introduction

Worth of a completed school building will be judged by a number of standards, many of which reflect the background and interests of the individuals making the evaluation. Parents, teachers, and other citizens of the community generally agree that the primary purpose of the school building is to house the educational program. Beyond this point of general agreement, however, individuals decide in their own minds whether the building is good or bad by comparing the various facilities with some standard or value. For example, all parents are concerned with having their children housed in safe, comfortable buildings; many taxpayers in the community consider economy of construction and operation as an important factor; other citizens will be interested in the external appearance of the building; educators will want to emphasize adequacy for housing the instructional program. Constructing a building which might rate high in terms of all of these criteria, as well as many others not mentioned, may be impossible in a practical situation because of limitations usually imposed by the amount of money available for school plant construction.

In spite of the wide range of criteria by which a building is judged, persons concerned with the important task of

providing adequate housing for the school program need to develop a set of principles which will guide their activities and by which the completed building may be judged. Although the list of principles suggested below could be expanded, experience with school construction during recent years has convinced educators and architects that genuine consideration of these objectives will result in acceptable school buildings. The design principles usually agreed upon as being important are:

1. Safety
2. Health
3. Educational Adequacy
4. Economy
5. Flexibility
6. Expansibility
7. Aesthetics

Obviously, the architect cannot observe each of these principles in all of its implications. As was pointed out previously, economy may be a determining factor in the practical situation where flexibility might seem more important to those planning the school building. Because of the importance of achieving a balance of many factors involved in providing the best school building possible, cooperative planning by teachers, pupils, custodial staff, administrators, and architects will bring a variety of skills, kinds of knowledge, and insights to bear upon each decision as it needs to be made.

A brief mention of each of the design principles will be made in the succeeding paragraphs in order that those

concerned with planning may develop their thinking around certain common ideas.

Safety

The principle of safety is mentioned first since, in the minds of parents at least, the safety of their children transcends all other considerations. It has been said that parents prefer an uneducated child to one who is injured or killed in an unsafe school building. Although safety is of basic importance as a design principle, it should always be considered along with educational adequacy. A school which does not adequately serve the educational program may be entirely safe; however, the goal should always be a safe and educationally adequate structure.

Safety is the concern of parents, teachers, and the children themselves; building design embodying requirements of building codes properly interpreted by the architect and contractor can result in safe buildings.

For example:

> Basic materials of construction should be fire resistive and of sufficient strength to insure structural soundness.
>
> Corridors and exits should be well arranged, strategically located, and of sufficient width to care for children in case of emergency. Exits should be clearly marked by an emergency lighting system.

Stairs should be designed to minimize slipping or tripping hazards.

Exit doors should be provided with panic fixtures.

Doors should be secure against intruders.

Site planning should minimize accident hazards connected with service driveways and parking areas near buildings or play areas.

Sufficient illumination needs to be provided for every space in the building. Outside lighting to minimize vandalism must also be considered.

In general, those charged with providing adequate schools must make use of all available information and techniques so that the lives of children are safeguarded.

Health

The school building should provide space in which teachers and children can work together in surroundings which are conducive to physical, mental, and emotional health. Teachers find it difficult to establish acceptable health habits and skills in surroundings which themselves do not meet recognized standards of health and comfort.

Attention to such items as the following will help in providing a school building which meets the criterion of health:

Toilet and water supplies should be ample with proper regard for the requirements of children and employees as well as those fixed by the building code.

The heating and ventilating system, automatically controlled should supply adequate amounts of tempered fresh air to all instructional spaces.

> Any other area of the building which is to be occupied by faculty or public (such as administration, adjustment, and health rooms) should be adequately heated and ventilated.
>
> A variety of pleasing colors, appropriate acoustical treatment, and comfortable seating will contribute materially to mental and emotional health of children and teachers.
>
> A balanced visual environment should be provided by means of artificial and natural light of the proper amount and quality.
>
> Building design should be such that the various rooms can be kept clean and in a good state of repair with a minimum of effort on the part of the maintenance and custodial staff.

Educational Adequacy

As has been mentioned previously, there is general agreement upon the fact that the primary purpose of the school building is to house the educational program. Therefore, educational adequacy is an important principle of design to be observed in constructing a school building. In fact, educational adequacy is of such importance that any thought of its subordination to other considerations must be carefully analyzed. Further evidence of its significance is borne out by a consideration of its meaning in terms of the learning process.

Educational adequacy suggests appropriate space in which children, guided by competent teachers, will live and learn together and grow as individuals, physically, mentally, and socially.

> To grow physically, children need ample indoor and outdoor facilities suited to their varying ages and sizes.
>
> To grow mentally, children need to work and study in large, well lighted, well ventilated, attractively decorated classrooms and libraries with a variety of equipment and instructional materials suited to their maturity levels.
>
> To grow socially, developing whosesome personalities and learning to live democratically, children need large spaces for group activities, small spaces where noisy work can go on without disturbing others, and appropriate facilities for developing creative expression.

Though indirectly affecting the growth of children, but just as critical, are the needs of school staff members.

Conference rooms for meetings with parents and other staff members, storage space for instructional materials, filing facilities for records and reference materials, space for preparation of materials, and rooms for relaxing at meals and at appropriate moments during the school day all contribute to staff efficiency and subsequently to a better instructional program.

Still another contribution which a well-planned school building can make, though not directly connected with the instructional program for children, is the provision for community use of the building. With decreased working hours and increased use of labor saving machinery, the general population enjoys unprecedented hours of leisure time. The

community can, therefore, utilize the school facilities to an extent greater than ever before for evening educational, recreational, and cultural activities. The planning of the building should reflect this development in American life and encourage the community use of the school plant by design which facilitates these activities although always protecting its primary use for education.

Consideration of the preceding requirements for an adequate school building makes clear the fact that those people who plan and construct a school building can contribute significantly to the instructional program by providing the necessary facilities.

Economy

Like some of the other criteria, economy has many connotations. The writer believes that true economy is the maximum educational return for each dollar spent. To some people economy means buying everything at the lowest price without regard for the purpose to be served. Applying the principle on these terms will undoubtedly result in the sacrifice of quality in important phases of the program. On the other hand, it is common knowledge that high price and high quality are not synonymous. The problem of educators and architects in planning school buildings, therefore, is to provide facilities of the proper quality and quantity for the specific

job to be done. To accomplish this, materials must be judged for durability, function, appearance, and cost. Design should eliminate as much waste space as possible since on the basis of economy the worth of a school building is judged by the amount of instructional space provided for the money spent. In the long term view, flexibility and expansibility (discussed in succeeding sections) are important determiners of economy.

Omission of needed space or facilities which curtail the educational program or reduce staff efficiency is not real economy. Since the largest portion of the educational budget goes for instruction (teachers' salaries and supplies), the annual loss in staff efficiency in the long term view can more than outweigh money saved in skimping on needed facilities.

The architect should consider the following items in planning a building for economy:

> Before deciding upon single or multi-story construction, all factors such as building size, site size and topography, structural materials, and educational philosophy must be carefully considered.
>
> Simple building layouts usually serve the educational program better than more complicated ones.
>
> Ceiling heights should be as low as practicable.
>
> Use of standard equipment is encouraged. It should be movable. Built-in units should be avoided wherever possible.
>
> Easy access should be provided for service lines which may require maintenance.

Void spaces in walls can be utilized for built-in storage facilities.

A minimum of ornamentation is necessary.

Ease of maintenance and operation is an important consideration.

Overdesign of structural, heating, ventilating, plumbing and electrical systems results in increased costs.

Competent supervision of the construction work is essential.

In the final analysis, teachers, citizens and children must feel that the school building adequately serves their varied needs and, at the same time, has not cost an unreasonable amount of money for construction.

Flexibility

Since education is a dynamic force, changes in its character are continually taking place. Thus, methods and materials which today are integral parts of the educational program may become obsolete as scientific research develops new and better ways of teaching children. Changing educational objectives and methods may, therefore, dictate modifications in the original design of the building. If the school is constructed with the principle of flexibility in mind, it may be changed economically and efficiently.

Walls and partitions which may be moved at a later time should not contain heating, ventilating, plumbing, or main

electrical lines which will be difficult to relocate. A minimum of built-in cupboards or other equipment should be placed in these walls.

Structural design of floor slabs as well as fenestration should permit the location of partitions at any convenient point.

Expansibility

Future expansion of the school plant may become necessary because of anticipated increases in school enrollments which are considered in the planning of the original building; but unforeseen contingencies, being less easily defined, may be overlooked. Obviously, if the type of facilities which may be needed later can be outlined, even vaguely, somewhat more specific provision can be made in the initial construction.

Certain design features incorporated in the school building will make future expansion easy of accomplishment:

> Plumbing, electrical, and heating lines should be extended to points which will require these services at a later time.
>
> Stairs placed at corridor sides rather than in ends make expansion easier.
>
> Classrooms across ends of building wings prevent easy expansion.
>
> Sufficient extra capacity should be allowed in electrical panels and conduits and plumbing and

heating lines to meet reasonable future needs.

Boiler room space should be sufficient for additional boiler installation if an addition is needed at some future date.

Aesthetics

Modern school buildings with their emphasis upon function should add architectural beauty to a community. Current thinking concerning the appearance of buildings of all types places emphasis upon simplicity of form and line, and utility. The school building is no longer conceived as a monument. The varieties of shape and mass required by the difference in educational needs provide the architect with many opportunities to design an interesting and beautiful school building. But let us remember it is being provided for children. Rooms, furniture, everything should be scaled for children. And let's use lots of color -- vivid, primary ones that make the classroom a friendly, workable place. Honest, functional architecture can produce a building which is attractive in appearance to both adults and children. Useless pillars, towers, cupolas, and other ornamentation do not necessarily aid in providing an appropriate atmosphere for a school building.

Citizens in the community who live near the school building will want its design to be consistent with but not limited by prevailing architecture of other structures in the immediate vicinity. Thus, the criterion of aesthetics challenges

the artistic ability of the architect as he synthesizes the educational elements of the school building and site into a functional unit.

Conclusion

Although strict observance of the foregoing seven design principles alone will not insure a completely acceptable school building, they do serve as an important basis for critically evaluating many of the considerations on which specific decisions will be made during the course of planning and construction.

Section 1.04 which follows states a program of requirements for a hypothetical elementary school building project. This statement is supplied so that a frame of reference is available for the enumeration and description of spaces and activities in sections 1.05 through 1.18. Parentheses are used to indicate those parts of the statements which would be specified for a particular school building project.

1.04

PROGRAM OF REQUIREMENTS FOR ELEMENTARY SCHOOL PROJECT NO. 1 (LOCATION)

1. Planning Committee - (Members)

2. General Information - Site: (Statement)

3. General Characteristics of School District - (Statement)

4. Budget for Construction - (Amount)

5. Organization of School: (KG-6A)
   KG - 30 children (two divisions daily)
   Grades - 1-3 - 30 pupils
   Grades - 4-6 - 30 pupils

6. Optimum Capacity: 660

7. Space Requirements

   a. Kindergartens - 2

   b. Primary classrooms - 10

   c. Intermediate classrooms - 8

   d. Instructional Materials Center - 1

   e. Administrative Center - 1

   f. Adjustment Room - 1

   g. Health Room - 1

   h. Multi-purpose Room - 1

   i. Elementary Playroom - 1

   j. Educational Storage Space

   k. Teachers' Room(s)

   l. Toilet Rooms - City of Chicago Building Code should be consulted for minimal standards.

m. Custodial Areas - one boiler room and sufficient custodial service closets.

n. Circulation Spaces - sufficient in quantity and adequate in size.

8. General Observations

a. Adequate heat and ventilation must be provided at all times. The City of Chicago Building Code should be consulted for minimal standards. Provision of air conditioning should be studied.

b. Artificial illumination will be considered the primary source of light in the kindergartens and classrooms. It should not be less than 35 foot candles of brightness at the visual task level. Every effort should be made to achieve a comfortable brightness balance without the use of adjustable window area devices.

c. Decoration of the building should be light, varied, and gay. Instructional areas should be psychologically pleasant places for pupils in terms of colors.

d. Non-instructional space should be held to a minimum.

e. Provision for expansibility should be indicated on preliminary plans.

1.05 Kindergarten Room

1.05 a. Specific activities engaged in by pupils and teachers

1. Activity program. There is a need for adequate space to provide varied project areas. For example, paint easels, work bench, and table are needed in addition to a number of other tables for coloring, pasting, and working with clay.
2. Dramatic play activities. Room for a playhouse and for block building is needed.
3. Rhythmic activities. Floor space is required for large muscle activities such as skipping and galloping. Children customarily sit in a large circle for this part of their program, using the space in the middle for their rhythmic interpretations. A piano is used with these activities.
4. Noise. Some activities will necessitate a certain amount of noise. For example, the rhythm band and block play are examples of this type of noisy activity. When two kindergarten rooms adjoin, they should be separated by doors. An open hallway is unsatisfactory.
5. Use of the floor. Children often sit or lie on the floor for rest periods. Radiant heat should be provided in the kindergarten floors.

6. Audio-visual aids. An important part of the kindergarten program is the use of audio visual aids, e.g. film projectors, filmstrip and slide projector combinations, television, etc.

7. Material preparation. The teacher needs work space and sink for washing paint jars, mixing paint, and other jobs connected with preparation of materials.

1.05 b. Rooms, spaces, and sizes.

1. Classroom - 1,000 sq. ft., approximately.

2. Student clothing area, storage room, and toilet room - 250 - 300 sq.. ft. (adjacent to classroom).

1.05 c. Location of unit with respect to other facilities.

1. The kindergarten should be located on the first floor of the school.

2. The desirability for adequate day lighting suggests a southern or eastern exposure and fenestration.

3. A separate entrance from the outside directly to the student clothing area is desirable. This door should lead to a separate outdoor play area. Some provision should be made so that children may wipe their shoes before entering the instructional area.

1.05 d. In-room storage facilities.

1. Classroom, storage space, and student clothing area should provide for the following uses:

a. Teacher wardrobe (including door mirror) with lock.
   1) Shelf above coat rod.
b. Adjustable open shelves for toys and manipulative materials.
c. Enclosed cabinets above and below the sink for storage of soap, current supplies of powder paint, paste, and towels.
d. Storage shelves or bins for pupil work projects.
e. Enclosed storage for wood near work bench.
f. Designed space for record player and records.
g. Storage space for floor block set.
h. Adjustable closed shelves for the storage of teacher materials and seasonal decorations.
i. Shelves and cupboards for storage of supplies of powder paint, paste, crayons, and other art materials near art area.
j. Toilet and lavatory require storage for extra soap, towels, toilet paper, and cleaning materials.
k. Enclosed storage for outdoor play materials and garden equipment.
l. Storage for wraps which also makes provision for boots in winter weather. Hooks or pegs are preferable to lockers. Provide enough hooks for maximum membership (42).

1.05 e. Chalkboard, tackboard, and map rail.

1. Chalkboard - 12-15 linear feet.
2. Tackboard - 24-30 linear feet, located strategically for use by children as well as the teacher.
3. Map rail above chalkboard (or tackboard) in front of room.

1.05 f. Plumbing facilities.

1. One sink (in children's work counter) with hot and cold water supply and mixing faucet. Island type is preferable.
2. One drinking fountain in each kindergarten (mounted at children's height).
3. Toilet rooms (two rooms between two kindergartens are suggested).
   a. One water closet in each room.
   b. One lavatory just outside toilet room (mounted at children's height).
   c. One mirror in each room (mounted at children's height).
   d. Wall mounted fixtures are suggested for ease of maintenance.

1.05 g. Heating and ventilating.

1. Radiant heating required in floor of classroom.
2. Sufficient mechanical ventilation to maintain normal temperatures and to provide fresh air must be

furnished because of the unusual amount of activity in this room.

1.05 h. Electrical provisions.

1. Level of illumination provided by fluorescent fixtures:
   a. Classroom - 35-40 foot candles.
   b. Storage rooms, toilet room, and student clothing area - 10-15 foot candles.
2. Lighting should be directionless so that a student may work with equal comfort facing in any direction in any room.
3. The quality of the lighting is more important than the quantity. Factors such as brightness differences and ratios, intensity, diffusion, and color of light add or subtract from desired comfort and efficiency.
4. Duplex outlets - front of room, rear of room, and over work counters.
5. Electric clock - one, hung at low level so that it may be used by the teachers as an instructional device.

1.05 i. Suggested finishes.

1. Floor - asphalt tile, vinyl tile, or linoleum. Floor covering should be light (without patterns) and easily cleaned.
2. Base and cove - glazed tile.
3. Wainscot - glazed tile, epoxy enamel, i.e. some protective finish.

4. Walls - painted concrete, cinder, or similar type block. Colors should be light attractive pastels.
5. Ceiling - tile, acoustically treated and fireproof. Coloring should be white.
6. Wood trim (if used) - light finish (natural or limed), non-glossy.

1.05 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. Classroom chairs which children can move easily.
2. Classroom tables with easily cleaned and non-staining surfaces.
3. Round library table.
4. Art easels.
5. Movable book shelves.
6. Low piano and bench.
7. Several 3' x 4' movable dividers for housekeeping areas.
8. Exhibit or display table (low).
9. Outdoor benches or seats.
10. Teacher's desk and chair.
11. Adult rocking chair.
12. File cabinet.

a. File cabinet for large cumulative records.

b. File cabinet for instructional materials and aids.

13. Felt board, low enough for children to use.

14. Movable work bench.

15. Movable clay cart.

16. Movable sand table and sand.

17. Movable cart for general use.

18. Aquariums - large and small.

19. Terrariums.

20. Maps.

21. Large globe(s).

22. Shop hand tools.

23. Record play and records.

24. Filmstrip and slide projector combination.

25. Radio.

26. Television.

27. Typewriter (primary).

28. Tape recorder.

29. Playhouse equipment (child-sized).

a. stove

b. sink

c. refrigerator

d. cupboard

e. table and chair set

f. rocking chair

g. doll buggy

30. Set of floor blocks.

31. Wheel toys.

32. Slide.

33. Rhythm instruments.

34. Large, lightweight container for water play.

35. Gravity rack holder with cutter for 36" roll paper.

36. Pencil sharpener.

37. Chairs for adult visitors.

The architect will provide the following items:

1. Chalkboard, low enough for children to use.

2. Tackboard (in harmonizing color with the rest of the room and with self-healing properties).

3. Peg board for display purposes.

4. Sink - stainproof, with a work surface which does not show wear easily. A sink which would enable more than two children to clean up at one time; attached towel racks.

5. Drinking fountain.

6. Pull down screen in a roller case, mounted on the wall.

1.05 k. General.

1. Each kindergarten classroom must be large enough to accommodate 30 pupils. In buildings having two or more such rooms, these rooms should be approximately

the same size.

2. Window sills should be low enough and wide enough so that children can use them for display purposes. Protective covering, e.g. formica, tile, marble, etc., is suggested.
3. A fire place is not necessary.
4. Window seats are not necessary.
5. Ceiling not to exceed 10' in the clear.
6. Rectangular or square rooms lend themselves to more efficient utilization.
7. Some plain wall space is needed. There must be room to put a playhouse and piano without blocking closet space, window, doorways, chalkboards, and tackboards.
8. Natural light should be controllable for use of visual aids.
9. Provide a card holder at classroom entrance for teacher's name.
10. Provide a holder for small American flag at front of classroom.
11. Children like color; children are accustomed to color. And being children, they respond to color psychology more readily than their elders. If color can help the pupil to like his school and learn better in it, use it.

1.06 Primary Classrooms (1st, 2nd, and 3rd grades)

1.06 a. Specific activities engaged in by teacher and pupils.

1. Reading activities in large and small groups.
2. Language activities such as writing, speaking, and listening in large and small groups.
3. Arithmetic activities in which children work at their seats or the chalkboard.
4. Activities in which children perform experiments in science.
5. Activities in which children arrange displays, care for aquariums, terrariums, and individual plantings.
6. Art activities involving painting, drawing, working with clay, construction, arranging of exhibits, storing of unfinished projects, and clean-up work. Sink with water should be nearby.
7. Activities in which children work at paint easels, benches, library table, and tables in cutting center.
8. Activities in which children dramatize and participate in visual aids experience.
9. Activities in which children work in large and small groups with maps and globes.
10. Activities in which parents visit the room.

1.06 b. Rooms, spaces, and sizes.

1. Classroom - 900 sq. ft. approximately.

1.06 c. Location of unit with respect to other facilities.

1. These classrooms should be grouped together.
2. These classrooms should be located near the administrative facilities, if possible.
3. East-west orientation of these rooms is desirable so that each room receives some natural light during the day.

1.06 d. In-room Storage Facilities.

1. One filing cabinet for large cumulative records.
2. One legal size filing cabinet for instructional materials and aids.
3. Teacher's wardrobe (including door mirror) with lock.
   a. Shelf above coat rod.
4. Movable adjustable shelving, (open).
5. Movable adjustable shelving, closed.
6. Movable cabinets, adjustable shelving.
7. Movable closet for map storage and other large projects.
8. Cabinets for paper and supply storage. Cabinets must be of various sizes to store the different kinds of paper. All cabinets should have adjustable shelving. One should be at least 28" deep.
9. Cabinet under sink for storage, e.g. soap, paper towels, etc.
10. Cabinets for children's work in progress.

11. Movable magazine racks.

12. Semi-enclosed area for children's wraps, with provisions for hats, boots, umbrellas, etc.

1.06 e. Chalkboard, tackboard, and maprail

1. Chalkboard, 24-30 linear feet.

2. Tackboard, 18-24 linear feet.

a. panel 1' wide over chalkboard and tackboard in front of room.

3. Map rail mounted above chalkboard (or tackboard) in front of room.

1.06 f. Plumbing facilities.

1. Sink with hot and cold water supply and mixing faucet.

2. Drinking fountain.

3. Toilet and lavatory within classroom. We recommend this installation in primary rooms as an element of education with positive gains in discipline, time-saving, and convenience.

1.06 g. Heating and ventilating.

1. Adequate heat and ventilation in all areas, especially the wardrobe area.

2. Special attention must be given to ventilation because of the amount of activity which takes place.

3. Heating should take into consideration the fact that children sometimes sit or work on the floor.

4. Controls which operate automatically should be installed. Special attention should be given to vibration and freedom from noise.

1.06 h. Electrical provisions.

1. Level of illumination provided by fluorescent fixtures should be 35-40 foot candles.
2. Lighting should be directionless so that a student may work with equal comfort facing in any direction in any room.
3. The quality of the lighting is more important than the quantity. Factors such as brightness differences and ratios, intensity, diffusion, and color of light add or subtract from desired comfort and efficiency.
4. Duplex outlets - front of room, rear of room, and over work counter.
5. Electric clock - one.
6. Electrical circuits should permit selected patterns of lighting.

1.06 i. Suggested finishes.

1. Floor - asphalt or vinyl tile. No patterns or borders. Light color.
2. Base and cove - glazed tile.
3. Wainscot - glazed tile, epoxy enamel, i.e. some protective finish.

4. Walls - painted concrete, cinder, or similar type block. Colors should be light pastels.
5. Ceiling - tile, acoustically treated and fireproof. Coloring should be white.
6. Wood trim (if used) - light finish (natural or limed) non-glossy.

1.06 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. Classroom chairs of appropriate size(s).
2. Classroom tables.
3. Round table(s).
4. Open bookshelves with adjustable shelves.
5. Chart stands.
6. Art easels.
7. Movable book truck.
8. Teacher desk and chair (not fixed).
9. File cabinets.
   a. File cabinet for large cumulative records.
   b. File cabinet for instructional materials and aids.
10. Felt board, low enough for children to use.
11. Workbench.
12. Aquariums, large and small.
13. Terrariums.

14. Maps.
15. Globes.
16. Shop hand tools.
17. Record player and records.
18. Filmstrip and slide projector combination.
19. Radio.
20. Television.
21. Movable tackboard - usable as space dividers.
22. Clay cart.
23. Movable demonstration abacus.
24. Typewriter.
25. Tape recorder.
26. Gravity rack holder with cutter for paper, 36' size.
27. Pencil sharpener.
28. Chairs for adult visitors.

The architect will provide the following items:

1. Chalkboard, low enough for children to use.
2. Tackboard (in harmonizing color with the rest of the room and with self-healing properties).
3. Peg board for display purposes.
4. Sink - stainproof, with a work surface which does not show wear easily. A sink which would enable more than two children to clean up at one time; attached towel racks.
5. Drinking fountain.

6. Pull down screen in a roller case, mounted on the wall.

1.06 k. General.

1. Window sills should be low enough and wide enough for displays by pupils, e.g. plants, small handwork, etc. Protective covering e.g. formica, tile, marble, etc., is suggested.
2. Ceilings should not exceed 10' in the clear.
3. Rectangular or square rooms lend themselves to more efficient utilization.
4. Natural light should be controllable for use of visual aids.
5. In terms of future use, these rooms should be adaptable for older children or for laboratory space.
6. One primary classroom should have radiant heat in the floor so that it could be used as a kindergarten.
7. Provide a card holder at classroom entrance for teacher's name.
8. Provide a holder for small American flag at front of classroom.
9. Children move with more ease and peace of mind when the spaces of the school, the equipment, and the furniture are all scaled to their size.

1.07 Classrooms for the Intermediate Grades (4-6).

1.07 a. Specific activities engaged in by pupils and teacher.

1. Reading activities in large and small groups.
2. Language activities such as writing at seats and chalkboards; speaking to small groups individually or the total group; informal dramatic presentations or panel discussions; listening in small or large groups; individual listening to recordings; individual or group recordings of presentations.
3. Arithmetic activities in which children work at their desks; use concrete aids in a work area; work at the chalkboard, or work in small groups; use arithmetic aids (a special work area would be helpful).
4. Science activities in which children arrange displays, exhibits; care for aquariums, terrariums, individual plantings; conduct simple science demonstrations.
5. Social studies activities in which children explore maps of various types and sizes, globes; arrange displays, exhibits.
6. Art activities involving construction, making models, drawing, painting, working with clay, weaving; arranging of displays and exhibits; storing unfinished activities, and cleaning up.

7. Sedentary activities in which a child may retire from the group for his own purposes (completion of tardy assignment, research, recreational reading).
8. Activities in which children participate in visual and auditory aids - television, radio, film, filmstrips, tapes, record players.
9. Social activities where children may want to prepare and serve simple refreshments - for themselves or for visitors.
10. Activities in which parents visit the room.

1.07 b. Rooms, spaces, and sizes.

1. Classroom - 800 sq. ft., approximately.

1.07 c. Location of unit with respect to other facilities.

1. These classrooms should be near the instructional materials center. They should be in close proximity to specialized areas such as physical education.
2. East-west orientation of these rooms is desirable so that each room receives some natural light during the day.

1.07 d. In-room Storage Facilities.

1. One filing cabinet for large cumulative records.
2. One legal size filing cabinet for instructional materials and aids.

3. Teacher's wardrobe (including door mirror) with lock.
   a. shelf above coat rod.
4. Movable adjustable shelving, open.
5. Movable adjustable shelving, closed.
6. Movable cabinets, adjustable shelving.
7. Movable closet for map storage and other long projects.
8. Cabinets for paper and supply storage. Cabinets must be of various sizes to store different kinds of paper. All cabinets should have adjustable shelving.
9. Cabinets under sink for storage, e.g. soap, paper towels, etc.
10. Cabinets for pupils' work in progress.
11. Movable magazine racks.
12. Semi-enclosed area for children's coats, with provisions for hats, boots, and umbrellas.

1.07 e. Chalkboard, tackboard, and maprail.

1. Chalkboard, 24-30 linear feet.
2. Tackboard, 18-24 linear feet.
   a. panel 1' wide over chalkboard and tackboard in front of room.
3. Maprail above chalkboard in front of room.

1.07 f. Plumbing facilities.

1. Sink with hot and cold water supply and mixing faucet. Sink should be stain resistant, suitable

for washing paint materials.

2. Drinking fountain.

1.07 g. Heating and ventilating.

1. Adequate heat and mechanical ventilation in all areas, especially the wardrobe area.

2. Controls which operate automatically should be installed. Special attention should be given to vibration and freedom from noise.

1.07 h. Electrical provisions.

1. Level of illumination provided by fluorescent fixtures should be 35-40 foot candles.

2. Lighting should be directionless so that a student may work with equal comfort facing in any direction in any room.

3. The quality of the lighting is more important than the quantity. Factors such as brightness differences and ratios, intensity, diffusion, and color of light add or subtract from desired comfort and efficiency.

4. Duplex outlets - front of room, rear of room, and over work counter.

5. Electric clock - one.

6. Electrical circuits should permit selected patterns of lighting.

1.07 i. Suggested finishes.

1. Floor - asphalt or vinyl tile. No pattern or borders. Light color.

2. Base and cove - glazed tile.

3. Wainscot - glazed tile, epoxy enamel i.e. some protective finish.

4. Walls - painted concrete, cinder, or similar type block. Colors should be light pastels.

5. Ceiling - tile, acoustically treated and fireproof. Coloring should be white.

6. Wood trim (if used) - light finish (natural or limed), non-glossy.

1.07 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. Classroom desks with separate chairs, comfortable and conducive to good posture. Desks should be large, light in color, stain resistant, and light weight for easy moving. Chairs should be stackable.

2. Round library table(s) and comfortable, movable chairs.

3. Open bookshelves with adjustable shelves.

4. Chart stands.

5. Art easels.

6. Movable book truck.

7. Movable science truck.

8. Movable work benches.

9. Teacher desk and chair (not fixed).
10. File cabinets.
    a. File cabinet for large cumulative records.
    b. File cabinet for instructional materials and aids.
11. Felt board, low enough for children to use.
12. Aquariums, large and small.
13. Terrariums.
14. Maps.
15. Globes.
16. Shop hand tools.
17. Record player and records.
18. Filmstrip and slide projector combination.
19. Opaque Projector.
20. Radio.
21. Television.
22. Movable tackboard - usable as space dividers.
23. Typewriter.
24. Tape recorder.
25. Gravity rack holder with cutter for paper, 36" size.
26. Pencil sharpener.
27. Chairs for adult visitors.

The architect will provide the following items:

1. Chalkboard, low enough for children to use.
2. Tackboard (in harmonizing color with the rest of the room and with self-healing properties).

3. Peg board for display purposes.

4. Sink - with a work surface which is stain and heat resistant and does not show wear easily. Water-proof work counter should be so arranged that more than two children can clean up at the same time. There should be attached towel racks.

5. Drinking fountain.

6. Pull down screen in a roller case, mounted on wall.

1.07 k. General.

1. Window sills should be low enough and wide enough for displays by students, e.g. plants, small hand-work, etc. Protective covering, e.g. formica, tile, marble, etc., is suggested.

2. Ceiling should not exceed 10' in the clear.

3. Rectangular or square rooms lend themselves to more efficient utilization.

4. Natural light should be controllable for use of visual aids.

5. In terms of future use, these rooms should be adaptable for younger children if necessary or for laboratory space.

6. Provide a card holder at classroom entrance for teacher's name.

7. Provide a holder for small American flag at front of classroom.
8. A friendly, restful, and secure atmosphere enhances the learning situation for children.

1.08 Instructional Materials Center.

1.08 a. Specific activities engaged in by pupils and teacher.

1. Instruction of large and small groups by the librarian in the techniques of library use.
2. Discussions with use of the chalk board by large and small groups.
3. Reading and studying activities by small groups and individuals.
4. Utilization of books, periodicals, and audio-visual materials by children and faculty members. Pre-viewing of audio-visual materials by teachers.
5. Lending activities whereby pupils withdraw books, periodicals, etc. and return them through an accounting procedure.
6. Display or promotional activities of library materials in order to attract the interest of pupils and stimulate their use.
7. Administrative activities such as conferences and group work, even such routine duties as classification and repair.
8. Utilization of curriculum aids by teachers.

1.08 b. Rooms, spaces and sizes.

1. Main reading room - 900 sq. ft.
2. Office space

3. Workroom - Storage Room (with separate entrance to corridor).

(Approximately 350-400 sq. ft. is suggested for spaces 2 and 3).

1.08 c. Location of unit with respect to other facilities.

1. The instructional materials center should be located so as to be convenient to the greatest number of its users (use by the community may be one of the considerations).
2. Location near intermediate grade classrooms is desirable.
3. It should be so situated that pupils are disturbed least by noises arising either from within the building or without.
4. Northern exposure is preferable.
5. Strong, direct sunlight is undesirable for a reading room.

1.08 d. In-room Storage Facilities.

1. One four drawer legal size filing cabinet.
2. Teacher's wardrobe (including door mirror) with lock.
   a. Shelf above coat rod.
3. Storage area within the instructional materials center should provide spaces for books, rolls of poster paper, bulletin board decorations, construction paper (large), visual aid catalogs, references

recordings, charts, maps, filmstrips, tape recordings, slides, models, etc. Provision should be made for this room to be darkened so that film and filmstrips may be previewed.

1.08 e. Chalkboard and Tackboard.

(See 108 j., furniture and equipment).

1.08 f. Plumbing facilities.

1. Sink with hot and cold water supply and mixing faucet should be provided in workroom. Sink should be stain resistant.

1.08 g. Heating and ventilating.

1. Adequate heat and ventilation in all areas, taking into consideration the fact that the space should be comfortable for those who are working and others who are reading.
2. Controls which operate automatically should be installed. Special attention should be given to vibration and freedom from noise.

1.08 h. Electrical provisions.

1. The level of illumination provided by fluorescent fixtures in the reading room should be 35-40 foot candles. Other spaces should be adequately lighted.
2. Lighting should be directionless so that a student may work with equal comfort facing in any direction.

3. The quality of the lighting is more important than the quantity. Factors such as brightness differences and ratios, intensity, diffusion, and color of light add or subtract from desired comfort and efficiency.
4. Duplex outlets - front and back wall of reading room, one in office, one in work room - storage room.
5. Electric clock - one, non-ticking.

1.08 i. Suggested finishes.

1. Floor - linoleum, asphalt or vinyl tile. No pattern or borders. Light in color and resilient.
2. Base and cove - glazed tile.
3. Wainscot - glazed tile, epoxy enamel, i.e. some protective finish.
4. Walls - painted concrete, cinder, or similar type block. Colors should be light pastels.
5. Ceiling - tile, acoustically treated and fireproof. Coloring should be white.
6. Wood trim (if used) - light finish (natural or limed) non-glossy.

1.08 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. Tables and chairs appropriately sized for pupils in grades Kg-6.
2. Open bookshelves (adjustable) along two walls with closed cabinets.
3. Work table and chairs for workroom.
4. Card catalog case - twelve drawer unit, with two pull-out trays.
5. Vertical file - consisting of three files.
6. Teacher desk and chair or circulation desk and chair.
7. Dictionary and atlas stand.
8. Magazine rack should occupy the space equivalent to two sections of bookshelf space. The front surface should be sufficiently tilted so that magazines do not fall off. There should be three additional shelves with four drawers underneath for storage of magazines.
9. Two book trucks - one for the reading room and one for use in taking books back and forth to classrooms.
10. Typewriter.
11. Maps.
12. Large world globe.
13. Record player and records.
14. Tape recorder.
15. Slide projector and filmstrip combination.
16. Two sound film projectors.

17. Radio.

18. Television.

19. Opaque projector.

20. Viewing screen.

(Note: Numbers 11-20 should all be portable).

21. Gravity rack holder with cutter for paper, 36" size.

22. Pencil sharpener.

23. Chairs for adult visitors.

The architect will provide the following items:

1. Sink with a formica topped sink board.

2. Two bulletin boards, one that may be seen from the corridor if possible. One small standard chalkboard with a swing leaf bulletin board in front.

3. Perimeter shelving - movable shelves that are deep enough to accommodate picture books and encyclopedias. Lower shelves should be slanted downward to the rear so that the books may be easily identified from a standing position. Shelves should be within children's reach.

1.08 k. General.

1. Window sills should be low enough and wide enough for small display purposes, e.g. books, plants, etc. Protective covering, e.g. formica, tile, marble, etc. is suggested.

2. Ceiling should not exceed 10' in the clear.

3. Natural light should be controllable for use of visual aids.
4. A half-glass partition between the reading room and the office space is suggested.
5. There should be a distinct emphasis in design upon this space's role as a materials center for the elementary school.
6. Room should be adaptable for such activities as book fairs, teas, faculty meetings, etc.
7. The facility should be so designed as to be open, attractive and appealing to the children, teachers, and parents using the building.

1.09 Administrative Center.

1.09 a. Specific activities engaged in by administrative personnel, teachers, pupils, and parents.

1. Administrative activities: Consultations with parents, staff members, pupils, community and school system representatives. Study, writing, telephoning, and communicating with all personnel in all parts of the building. Small conference and planning sessions with school personnel, study groups, organizational groups, and pupils.
2. Clerical-secretarial activities: Typing, filing, telephoning, and communicating with all personnel in all parts of the building.
3. Teacher work-planning activities: Reading, typing, duplicating, writing, preparing audio-visual aids, and research.

1.09 b. Rooms, spaces, and sizes.

1. Reception area.
2. Clerical office.
3. Principal's office.
4. Toilet and lavatory facilities.
5. Storage room - workroom.
6. Vault.

(Administrative Center should approximate 1200 sq. ft.)

1.09 c. Location of unit with respect to other facilities.

1. The administrative center should be located on the first floor of the school. It should have a central location in relation to the whole plant, and be adjacent to the principal entrance.
2. Spaces should be arranged to provide necessary privacy for administrative personnel, and at the same time give ready access to records. The arrangements should permit the principal to work without interruption by persons in the outer office, and enable him to enter and leave by a private entrance as well as through the outer office.
3. The reception room for parents, visitors, and pupils should be adequate and comfortable for those using it.
4. The clerical staff should be in a position to see parents or other visitors when they enter the building.
5. Toilet and lavatory facilities for adults should be provided in the administrative suite.
6. Adequate filing space and storage adjacent to or accessible from space used by clerical staff must be considered.
7. Adequate wardrobe areas for all personnel working in the administrative center plus some space for visitors' apparel are necessary.

8. Some provision of space should be made for small staff meetings and work activities which would be carried on without interference with other administrative functions.

1.09 d. In-room Storage Facilities.

1. Adequate filing cabinets (of appropriate sizes) for school records which accumulate over the years.
2. Adequate and appropriate shelving in storage room - workroom for writing paper, construction paper, scissors, paste, glue, paint, brushes, pens, rulers, inks, tape, and stencils.
3. Adequate wardrobe closets for administrative personnel and visitors.
   a. shelf above coat rod.
   b. hooks.

1.09 e. Chalkboard and tackboard.

1. Portable chalkboard-tackboard for administrative use.
2. Tackboards, strategically located, in waiting area and office area.

1.09 f. Plumbing facilities.

1. Toilet and lavatory facilities accessible from all parts of administrative center.

1.09 g. Heating and ventilating.

1. Adequate heat and ventilation in all areas.
2. Controls which operate automatically should be installed.

Special attention should be given to vibration and freedom from noise.

1.09 h. Electrical provisions.

1. Level of illumination provided by fluorescent fixtures in office areas should be 35-40 foot candles.
2. Level of illumination provided by fluorescent fixtures in storage room - work room and vault should be 35-40 foot candles.
3. Lighting should be directionless so that administrative personnel may work with equal comfort facing in any direction.
4. The quality of the lighting is more important than the quantity. Factors such as brightness differences and ratios, intensity, diffusion, and color of light add or subtract from desired comfort and efficiency.
5. Duplex outlets on each wall.
6. Electric clocks in each area.
   a. master control clock in clerical area.
7. Buzzer, inter-office for principal and clerk.
8. Intercommunication system.

1.09 i. Suggested finishes.

1. Floor - asphalt or vinyl tile. Light color.
2. Base and cove - glazed tile.
3. Walls - painted concrete, cinder, or similar type block. Colors should be light pastels.

4. Ceiling - tile, acoustically treated and fireproof. Coloring should be white.
5. Wood trim (if used) - light finish (natural or limed) non-glossy.

1.09 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. Executive size desks (larger than standard teacher's desk) and swivel type chairs for secretary and principal.
2. Comfortable, attractive furniture for reception area and principal's office.
3. Two work tables in general office area.
4. Work table in principal's office.
5. Adequate bookshelves in all areas of administrative center.
6. Filing facilities for office records, school records, and clerical operations.
7. Magazine and pamphlet racks in reception area and principal's office.
8. One two-drawer legal size cabinet in principal's office.
9. Telephone and extensions for secretary and principal.
10. Two or more typewriters and stands in general office area.

11. Duplicating equipment in general office area or storage room - work room.
12. Dictaphone.
13. Pencil sharpener(s).
14. Gravity rack holder with cutter for paper, 36" size.
15. Two sound film projectors.
16. One adding machine.

The architect will provide the following items:

1. Signal system for fire and air raid drills.
2. Inter-communication system with control panel near secretarial area.
3. Automatic bell-signal system.
4. Counter between reception area and clerical area. It should be low enough so that a primary grade child can be seen from the clerical area.
5. Sufficient mailboxes for educational and custodial personnel. Suggested dimensions: 10" x 15" x 3". Number: 30. A locking device is <u>not</u> needed.
6. Keyboard, portable so that it may be locked in the vault.

1.09 k. <u>General</u>.

1. Experience has shown that administrative offices should adjoin the main corridor or be otherwise centrally located, for ease in supervision. The main entrance should "point" visitors toward the office.

2. An atmosphere of warmth, spaciousness, and friendliness in a framework of efficiency should be cultivated in the administrative center.
3. The whole function of this space is offset and sometimes defeated by too precise and cold and formidable an atmosphere.
4. The use of a glass wall with colorful accents between the corridor and clerical area is most helpful in achieving the desired atmosphere.

1.10 Adjustment Room

1.10 a. Specific activities engaged in by teacher, psychologist, and pupils.

1. Individual and small group conference activities.
2. Individual and small group testing activities.
3. Reading activities for individuals and small groups.
4. Language activities such as writing at desks or chalkboard by individuals and small groups.
5. Arithmetic activities in which individuals or small groups work at their desks or the chalkboard; use concrete aids in a work area.
6. Parent conference activities with involvement of principal, psychologist, adjustment teacher, and perhaps the pupil.

1.10 b. Rooms, spaces, and sizes.

1. Conference area.
2. Testing and instructional area for 12-15 pupils (approximately 400-500 sq. ft. is suggested for these two spaces).

1.10 c. Location of unit with respect to other facilities.

1. The adjustment room should be adjacent to the administrative center, primarily because of the extensive use of school records by the adjustment teacher and the psychologist.

1.10 d. In-room Storage Facilities.

1. One filing cabinet for large cumulative records.
2. One legal size filing cabinet for testing materials, instructional materials, and aids.
3. Teacher's wardrobe (including door mirror) with lock.
   a. shelf above coat rod.
4. Movable adjustable shelving, open.
5. Movable adjustable shelving, closed.
6. Cabinets for paper and supply storage. Cabinets must be of various sizes to store different kinds of paper. All cabinets should have adjustable shelving and locks.
7. Cabinets under sink for storage, e.g. soap, paper towels, etc.
8. Cabinets for pupils' work in progress.
9. Movable magazine racks.

1.10 e. Chalkboard, tackboard, and maprail.

1. Chalkboard, 18-24 linear feet.
2. Tackboard, 12-15 linear feet.
   a. panel 1' wide above chalkboard and tackboard.
3. Map rail above chalkboard.

1.10 f. Plumbing facilities.

None

1.10 g. Heating and ventilating.

1. Adequate heat and ventilating.
2. Controls which operate automatically should be installed. Special attention should be given to vibration and freedom from noise.

1.10 h. Electrical provisions.

1. Level of illumination provided by fluorescent fixtures should be 35-40 foot candles.
2. Lighting should be directionless so that a student may work with equal comfort facing in any direction in any room.
3. The quality of the lighting is more important than the quantity. Factors such as brightness differences and ratios, intensity, diffusion, and color of light add or subtract from desire comfort and efficiency.
4. Duplex outlets - front and rear of room.
5. Electric clock - one.

1.10 i. Suggested finishes.

1. Floor - asphalt or vinyl tile. No pattern or borders. Light color.
2. Base and cove - glazed tile.
3. Walls - painted concrete, cinder, or similar type block. Colors should be light pastels.
4. Ceiling - tile acoustically treated and fireproof. Coloring should be white.

5. Wood trim (if used) - light finish (natural or limed) non-glossy.

1.10 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. Classroom desks with separate chairs, comfortable, and conducive to good posture. Desks should be large, light in color, stain resistant, and light weight for easy moving. Chairs should be stackable.
2. Open bookshelves with adjustable shelves.
3. Movable book truck.
4. File cabinets.
   a. one for large cumulative records.
   b. one for testing materials, instructional materials, and aids.
5. Felt board, low enough for children to use.
6. Record player and records.
7. Filmstrip and slide projector combination.
8. Opaque projector.
9. Radio.
10. Television.
11. Typewriter.
12. Tape recorder.

13. Pencil sharpener.

14. Chairs for adult visitors.

The architect will provide the following items:

1. Chalkboard, low enough for children to use.

2. Tackboard (in harmonizing color with the rest of the room and with self-healing properties).

7. Peg board for display purposes.

1.10 k. General.

1. Window sills should be low enough and wide enough for displays by pupils, e.g. plants, small hand-work, etc. Protective covering, e.g. formica, tile, marble, etc., is suggested.

2. Ceiling should not exceed 10' in the clear.

3. It is suggested that the conference room be a separate space within the adjustment room. A glass partition between the conference area and the testing and instructional area should be installed for ease of supervision.

1.11 Health Room

1.11a. Specific activities engaged in by teacher and pupils.

1. Care of sick and injured children.
2. Conferences between health service personnel, teachers, children, and parents.
3. Preliminary screening tests of pupils for vision, hearing, and dental defects.
4. Examination of pupils by physicians.
5. Inspection of pupils for pediculosis, scalp ringworm (requires dark room), and skin conditions.
6. Weighing and measuring of pupils.
7. Immunization of pupils.
8. Maintenance of pupil health records.

These records should be portable.

1.11 b. Rooms, spaces, and sizes.

1. Examination room. One dimension should be at least ten feet in order to facilitate vision testing.
2. Waiting room.
3. Rest room.
4. Toilet room.
5. Storage closet.

(Approximately 400-500 sq. ft. is suggested for the above spaces).

1.11 c. Location of unit with respect to other facilities.

1. This room should be adjacent to the administrative center so that an administrative staff member can supervise care for a pupil who is ill. A connecting door between the health room and the administrative center is suggested for supervisory purposes. This door might also facilitate circulation of students during health examinations.

1.11 d. In-room Storage Facilities.

1. Work counter in examination room with closed storage shelves below.
2. Cupboards with adjustable shelves over work counter.
3. Storage closet to accommodate hats and coats of nurse and doctor as well as blankets, pamphlets, and medical supplies.

1.11 e. Chalkboard and tackboard.

1. Chalkboard - none required.
2. Tackboard - one panel 3' x 4' in examination room.

1.11 f. Plumbing facilities.

1. Lavatory and water closet in toilet room.
2. Sink with mixing faucet and hot and cold water supply mounted in work counter in examination room.

1.11 g. Heating and ventilation.

1. Adequate heat and mechanical ventilation are necessary in all areas of health room.

2. Ventilating grilles should not be installed in doors in this area in order that complete privacy can be maintained.

1.11 h. Electrical provisions.

1. Level of illumination provided by fluorescent fixtures should be 35-40 foot candles. Lighting in rest room should be installed so that no direct light shines into the faces of pupils who are lying down.

2. The quality of the lighting is more important than the quantity, Factors such as brightness differences and ratios, intensity diffusion, and color of light add or subtract from desire comfort and efficiency.

3. Duplex electrical outlets.

   a. Two outlets in examination room. These outlets should be on separate circuits in order that the sterilizer or other equipment requiring a large amount of current can be accommodated.

4. Telephone.

   a. One outlet over the nurse's desk.

5. Electric clock - one.

1.11 i. Suggested finishes.

1. Floor - asphalt or vinyl tile. No pattern or borders. Light color.

2. Base and cove - glazed tile.

3. Walls - painted concrete, cinder, or similar type block. Colors should be light pastels.

4. Wainscot - glazed tile to door heads.

5. Ceiling - tile, acoustically treated and fire-proof. Coloring should be white.

6. Wood trim (if used) - light finish (natural or limed) non-glossy.

1.11 j. Furniture, equipment and materials.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. Nurse's desk and chair (swivel).

2. Weighing scale.

3. Eye chart.

4. Adequate chairs for pupils and adult visitors.

5. Examining table.

6. Small table on casters.

7. Two cots.

8. Paper cup container.

9. Paper towel rack.

10. Refuse container, with pedal.

11. Soap container.

12. Wastebasket.

13. First aid cabinet.

14. Filing cabinet, two drawer, legal size.

15. Folding screen.

1.11 k. General.

1. Circulation is needed for groups of children with entrance to the clinic from the office waiting area.

2. Privacy is required during medical examinations and conferences with parents and pupils.

3. Recessed clothing hooks (or clothes rack) are needed in examination room for pupils' clothing.

4. The room in which the cots are placed should have glass panels so that the room may be supervised by either the school clerk or the nurse.

5. The examination room should be sound-treated for hearing tests.

6. As in a hospital or doctor's examination room, the school health room should be light, bright, and airy. It should be easily cleanable.

7. This space, when it is not being used for health purposes, will probably serve as a multi-purpose administrative area, e.g. psychologist, speech teacher, master and special service teachers.

1.12 Multi-Purpose Room

1.12 a. Specific activities engaged in by pupils and teachers.

1. Assemblies for pupils.
2. Dining facilities for pupils when community is unable to provide same.
3. Community group meetings, e.g. speakers, plays, study groups, square dancing, etc.
4. Presentation of P.T.A. programs.
5. Movies and film strips.
6. Music, both instrumental and vocal.
7. Serving refreshments for pupils' groups or P.T.A.
8. After school games, crafts, dancing, etc.
9. Small club groups after school or in evening, e.g. adult serving club, Boy Scouts, etc.
10. Noon recreation during bad weather.

1.12 b. Rooms, spaces, and sizes.

1. Multi-purpose room with space for the following:
   a. Seating of 175-200 children on folding chairs for assembly purposes.
   b. Seating of 150 children for dining.
2. Storage Room.
3. Kitchenette - for combined use of carry-in lunch program and community groups.

(Approximately 2400 square feet is suggested for these spaces).

1.12 c. Location of unit with respect to other facilities.

1. Near main entrance of building.

2. Some natural light is desirable.

1.12 d. Storage facilities.

1. Locked storage space for visual aids, piano, portable stage tables, and folding chairs.

2. Some shelving space in kitchenette for dish storage.

1.12 e. Chalkboard and tackboard.

1. Portable chalkboard - 4-6 linear feet.

2. Tackboard - 8-10 linear feet, near entrance.

1.12 f. Plumbing facilities.

1. A drinking fountain and toilet facilities should be provided adjacent to this room. This is necessary because multi-purpose room may be used outside normal school hours.

2. Kitchenette.

a. One pot sink of stain-proof material, equipped with hot and cold water, and large enough for use by several persons at one time, is necessary. There should be a work counter adjacent to the sink.

b. Lavatory.

1.12 g. Heating and ventilating.

1. Zoned heating should be available for this room.

2. A separate mechanical ventilation system should be provided.

3. Vent hood over pot sink in kitchenette.

1.12 h. Electrical provisions.

1. Level of illumination provided by fluorescent fixtures should be 35-40 foot candles.

2. The quality of the lighting is more important than the quantity. Factors such as brightness differences and ratios, intensity, diffusion, and color of light add or subtract from desired comfort and efficiency.

3. Duplex outlets should be provided at approximately 30' intervals on periphery of dining area.

4. Kitchenette.

a. Duplex outlet on each wall.

b. Appliance outlets near sink and work areas.

1.12 i. Suggested finishes.

1. Multi-purpose room.

a. Floors - asphalt or vinyl tile.

b. Base and cove - glazed tile.

c. Wainscot - glazed tile to height of door head.

d. Walls - painted concrete, cinder, or similar type block. Colors should be light attractive pastels.

e. Ceiling - fireproof acoustical tile. Coloring should be white.

2. Kitchenette.

a. Floor - quarry tile.

b. Base and cove - see 1.12, i, 1, b.

c. Wainscot - see 1.12, i, 1, c.

d. Walls - see 1.12, i, 1, d.

e. Ceiling - metal acoustical tile.

f. Any overhead pipes should be grouped and enclosed.

1.12 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. 175-200 folding chairs.

2. Storage cards for moving chairs (and tables).

3. Piano.

4. Chalkboard (portable).

5. Chart stand (or easel).

6. Pencil sharpener.

7. Two four drawer, legal size filing cabinets.

8. Portable stage.

The architect will provide the following items:

1. Tackboard (some near main entrance).

2. Assembly hall screen.

3. Window covering so that visual aids can be utilized.

1.12 k. General.

1. The open space of the room should be preserved in planning furniture and equipment.
2. Floor covering should be resilient and stain resistant.
3. Light must be easily and effectively controlled for audio-visual purposes.
4. The possibility of dividing the room by flexible partitions and working with small groups should be considered in lighting plans.
5. Exit lighting must be provided.
6. Audio-visual facilities should provide for closed circuit TV, multi-circuit radio, and public address system outlets.
7. Flexibility should be the keynote of this space to afford maximum effectiveness in meeting school program requirements.
8. Facilities for storage of wraps should be provided either within this room (recessed hooks or eyes) or adjacent to it (lockers).

1.13 Elementary Playroom.

1.13 a. Specific activities engaged in by pupils and teachers.

1. Rhythmic activities including walking, running, skipping, galloping, sliding, jumping, and hopping.
2. Games utilizing the fundamental activities of running, jumping, throwing, catching, dodging, and chasing.
3. Free play activities and relays.
4. A variety of self-testing activities, such as stunts and physical fitness events.
5. Dancing, including creative dance, mixers, folk dances, novelty dances, and square dancing.
6. Team games such as volleyball and soccer among others. Although the K-6 physical education program does not include basketball, facilities should be provided for community use.

1.13 b. Rooms, spaces, and sizes.

1. Playroom.
2. Storage space.

(Approximately 4000 sq. ft. is suggested for these spaces).

1.13 c. Location of unit with respect to other facilities.

1. On ground floor.
2. Near multi-purpose room.
3. Direct access to the playground is essential.

1.13 d. In-room storage facilities.

1. Storage space.

a. adequate area for all playroom equipment, e.g. mats, records, record player, bats, balls, shuffleboard sets, etc.

b. open shelving.

c. shoe storage.

d. 5' doors.

2. Wardrobe closet for instructor.

1.13 e. Chalkboard and tackboard.

1. Chalkboard - 3' x 6' portable panel.

2. Tackboard - 6-8 linear feet, some of it near exit.

1.13 f. Plumbing facilities.

1. Boys' and girls' toilets should be located close to the playroom.

2. These toilets should be accessible from the outdoor activity area, as well as the playroom.

3. Two drinking fountains, recessed, should be provided.

4. Shower facilities should be considered in terms of community use.

1.13 g. Heating and ventilating.

1. Adequate heat and ventilation is necessary in all areas.

2. The temperature in the playroom should be slightly lower than the temperature throughout the rest of the building because of the unusual amount of physical activity which takes place.

3. Special consideration must be given to ventilation also.

4. Mechanical ventilation should be provided in the storage room if it does not have exterior windows.

1.13 h. Electrical provisions.

1. Level of illumination, provided by the lighting fixtures, should be 20 foot candles. These fixtures should be recessed and protected.

2. The quality of the lighting is more important than the quantity. Factors such as brightness differences and ratios, intensity, diffusion, and color of light add or subtract from desired comfort and efficiency.

3. Duplex outlets should be provided on each wall of the playroom.

4. At least one outlet should be provided and one in the storage room.

5. A clock, properly protected, should be recessed in the side wall of the playroom.

1.13 i. Suggested finishes.

1. Floor - maple on subfloor.

2. Base and cove - glazed tile.

3. Wainscot - glazed tile to height of door heads. All corners and projections to be bullnosed.

4. Walls - painted concrete, cinder, or similar type blocks. Colors should be light pastels.

5. Ceiling - acoustical tile. Coloring should be white.

1.13 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. One desk, double pedestal.
2. One chair, swivel.
3. Four chairs, straight.
4. One four drawer file case, legal size.
5. Sufficient playroom equipment for school population to be served, e.g. softballs, bats, volleyballs, mats, etc.
6. One volleyball standard, with attachment to fasten it to the center of the playroom floor.
7. One piano and bench with protective storage.
8. One record player (speed and volume control) with microphone attachments.
9. One record cabinet.
10. One portable chalkboard.
11. One clock.

The architect will provide the following items:

1. Eyes in end walls and side walls for volleyball net.

2. Two basketball backboards (ten foot height) with rings and nets.
3. One vertical mat rack.
4. One mirror.
5. One cupboard with lock for small equipment.
6. Some tackboard near main entrance.
7. Folding partition so that the space may be divided.

1.13 k. General.

1. The playroom should have an area large enough so that it not only provides adequate space for the many activities of the elementary physical education program, but also serves community needs.
2. Floor covering should be light in color and resilient. Court markings should be made under the finish.
3. Overhead anchors are necessary for net games and climbing ropes.
4. Basketball backboards should be adjustable.
5. Obstructions such as doors swinging into the activity space, columns, pipes, ducts, or radiators should be eliminated.
6. All hardware on doors, cupboards, etc., in the playroom should be recessed.
7. Windows, clock, thermostat, etc., should be protected.
8. Provision of natural light by means of windows with north exposure is suggested.

9. Court limit lines should be in accordance with standard rules.
10. Ceiling height should not be excessive. 18'0" is suggested with structural ceiling numbers fireproofed.

1.14 Educational Storage Spaces

1.14 a. Specific activities engaged in by teacher and pupils.

1. Receiving, storing, and dispensing of educational supplies.

1.14 b. Rooms, spaces, and sizes.

1. Educational supply room.
2. Text-book storage room(s).

(A minimum of 450-500 square feet should be provided in these areas).

1.14 c. Location of unit with respect to other facilities.

1. An educational supply room should be near the administrative center so that the school clerk can control receiving and dispensing of such materials.
2. Text-book storage rooms should be located near the teachers using them. One room might be near the primary rooms; the other in the vicinity of the intermediate grade students. In a two story building, one on each floor is recommended.

1.14 d. In-room storage facilities.

1. Sufficient and suitable adjustable shelving, bins, etc. designed for the particular items, e.g. 8 1/2" x 11" paper, textbooks, etc. to be stored in them. Proper attention must be given to sizes as well as quantities.

1.14 e. Chalkboard and tackboard - none required.

1.14 f. Plumbing facilities - none required.

1.14 g. Heating and ventilating.

1. Adequate heat and ventilation is necessary in all areas. Storage spaces should be well-ventilated and kept as warm or as cool as required by materials stored.

1.14 h. Electrical provisions.

1. Level of illumination provided by fluorescent fixtures should be 35-40 foot chandles.

1.14 i. Suggested finishes.

1. Floor - treated concrete.
2. Base and cove - no finish required.
3. Walls - concrete, cinder, or similar type block.
4. Ceiling - exposed beams.
5. Wood trim - none required.

1.14 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. One cart with large rubber tired wheels in each store room for moving supplies and equipment around the building.
2. One small, safe, step stool in each store room.

The architect will provide the following item:

1. Sufficient and suitable shelving, etc. (see 1.14 d.1.)

1.14 k. General.

1. Authorities in the area of school storage facilities recommend that these spaces be assigned generous floor area (or provision for future expansion) because storage demands will increase with years of school occupancy.
2. Safety should be the prime consideration in the design, use, and maintenance of storage rooms.
3. Built-in shelving should be part of original general contract.
4. Doors should be sturdy - with locks. No windows are necessary or desired.

1.15 Teachers' Rooms

1.15 a. Specific activities engaged in by teachers.

1. Reading.
2. Preparation of lessons.
3. Group conferences.
4. Rest and relaxation.
5. Preparation and consumption of coffee, light snacks, etc.

1.15 b. Rooms, spaces, and sizes.

1. Teachers' lounge for both men and women - at least 400 sq. ft. This room should be large enough for all members of the faculty to use at the same time.
2. Women teachers' room - 100 sq. ft. approximately.
3. Men teachers' room - 100 sq. ft. approximately.

1.15 c. Location of unit with respect to other facilities.

1. The teachers' lounge should be located on first floor.
2. In a two-story building, separate women teachers' room and men teachers' room should be located on the second floor.
3. Toilets should be nearby.

1.15 d. In-room storage facilities.

1. Wardrobe closet in teachers' lounge.
2. Sink counter with cabinets below and cupboards above should be installed in teachers' lounge.

1.15 e. Chalkboard and tackboard.

1. Chalkboard - none required.

2. Tackboard - one panel (perhaps 2' x 3') in teachers' lounge, women teachers' room, and men teachers' room.

1.15 f. Plumbing facilities.

1. Teachers' lounge.

a. double sink with mixing faucet in counter.

b. two toilet rooms (one for each sex) near, but not opening into the main room. lavatories should be part of the installation.

2. Women teachers' room - toilet and lavatory facilities adjacent.

3. Men teachers' room - toilet and lavatory facilities adjacent.

1.15 g. Heating and ventilating.

1. Adequate heat and ventilation is necessary in all areas.

2. Teachers' lounge will require mechanical ventilation sufficient to remove smoke and cooking odors.

1.15 h. Electrical provisions.

1. Level of illumination provided by fluorescent fixtures should be 35-40 foot candles.

2. Teachers' lounge should have a duplex outlet in each wall and one over the counter.

3. Women and men teachers' rooms should have a duplex outlet on one wall.

4. Toilet rooms should have separate light switches from rest rooms.

1.15 i. Suggested finishes.

1. Floors - asphalt or vinyl tile. Coloring should be light.
2. Base and cove - glazed tile.
3. Walls - painted concrete, cinder, or similar type block. Colors should be light pastels.
4. Ceiling - tile, acoustically treated and fireproof. Coloring should be white.
5. Wood trim (if used) - light finish (natural or limed) non-glossy.

1.15 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. Comfortable chairs and tables (to be selected by individual faculties),
2. Magazine and newspaper racks.
3. Book shelves.
4. Pencil sharpener.
5. Adequate china for light refreshments.
6. Stove.
7. Refrigerator.

1.15 k. General.

1. One toilet room (with lavatory) for each sex should be available on each floor.
2. A lock should be installed on the door of the women's toilet room.
3. These rooms should be conveniently located, but more important are privacy, quietness, and furnishings that are conducive to relaxation.

1.16 Toilet rooms.

1.16 a. Specific activities engaged in by pupils.

1. washing.

2. elimination.

3. grooming.

1.16 b. Rooms, spaces, and sizes.

1. A minimum of one pupil toilet for each sex should be provided on each floor of the building. The total number of water closets, urinals, and lavatories provided in a building should conform to the requirements of the Building Code of the City of Chicago.

2. At least one water closet and lavatory for each kindergarten room.

3. One water closet and lavatory for women teachers on each floor.

4. One water closet and lavatory for men teachers on each floor.

5. One water closet and lavatory for custodial personnel.

6. One water closet and lavatory for lunchroom personnel.

7. One water closet and lavatory near the principal's office in the administrative center.

8. One water closet and lavatory in the health room.

1.16 c. Location of unit with respect to other facilities.

1. One boys' toilet and one girls' toilet should be provided near the lobby, the multi-purpose room, and the playroom in order to provide for community use of the building. A toilet room near the playground exit facilitates toilet recess.
2. Any other toilets needed should be centrally located in terms of the classroom areas of the building.

1.16 d. Storage facilities.

1. One custodial service closet with a slop sink at low level is required for each pair of gang toilets. This closet should be located as near as possible to the toilets.

1.16 e. Chalkboard and tackboard.

None required.

1.16 f. Plumbing facilities.

1. The Building Code of the City of Chicago should be consulted in order to satisfy the plumbing requirements of the building's enrollment.

1.16 g. Heating and ventilating.

1. The Building Code of the City of Chicago should be consulted in order to satisfy the heating and ventilating requirements of the building's toilet rooms.
2. Adequate heat and ventilation should be provided. It should be possible to maintain the temperature at a level below the classrooms.

3. It is suggested that positive mechanical exhaust ventilation with ducts separate from other rooms be provided.

1.16 h. Electrical provisions.

1. Level of illumination should be 10-15 foot candles.

1.16 i. Suggested finishes.

1. Floor - ceramic tile (or similar impervious masonry material). The use of terrezzo or soft tiles is not recommended.

3. Wainscot - glazed tile to door heads.

4. Walls - painted concrete, cinder, or similar type block. Colors should be light pastels.

5. Ceiling - plaster.

1.16 j. Furniture and equipment.

Architect will provide the following items:

1. Mirrors should be installed in all toilet rooms, but in pupil toilets the mirrors should not be placed above the lavatories.

2. Below each mirror a shelf should be installed for books and purses.

3. Lavatories should be so located in the toilet room that children pass them as they leave.

4. Low-level partitions are suggested for more effective supervision.

a. Girls' toilets should be provided with partitions and doors.

b. Boys' toilets should be provided with partitions - no doors are necessary. All partitions should be rigidly anchored.

5. Floor drains and hose bibs should be provided in gang toilet rooms, wall hung fixtures are recommended.

6. Soap dispenser, hand drying facilities, and waste containers are essential.

7. Sturdy toilet paper holders should be provided.

1.16 k. General.

1. Drinking fountains should be located so as to be easily accessible for pupils using toilet rooms. They should not be installed in toilet rooms.

2. Economy may be achieved if gang toilet rooms are located adjacent to each other with a common utility space between them for servicing; the same is true in multi-story buildings if the toilets are located one above the other.

3. Automatic temperature control for the heating system is desirable, but the thermostatic device should be installed in a manner to minimize vandalism.

4. The temperature of the domestic hot water supply should be thermostatically controlled.

5. The design of toilet rooms should minimize student control problems.
6. Wall-mounted toilet facilities minimize maintenance.
7. Sensitive planning of these spaces can foster constructive mental and sex hygiene attitudes.

1.17 Custodial Areas and Mechanical Areas

1.17 a. Specific activities engaged in by custodial personnel.

1. Operation and maintenance of the school plant.

1.17 b. Rooms, spaces, and sizes.

1. Boiler room.
   a. incinerator area.
   b. waste removal area.
2. Custodian's area.
   a. locker(s).
   b. toilet with lavatory.
   c. shower.
3. Minor repair area.
4. Storage space.
   a. storage at grade level should be provided for ground equipment, e.g. power mowers, snow removal apparatus, etc.
5. Receiving area with dock for truck delivery.
6. Custodial service closets with slop sink at low level - one required for each pair of gang toilets.

1.17 c. Location of unit with respect to other facilities.

1. Incinerator area (or room) should be part of boiler room. Trash chutes from corridors on other floors are not required because of safety hazards.
2. Waste removal area (for ashes, broken glass, and other noninflammable materials) should be located as

near as possible to the receiving area.

3. Custodian's area should be in the boiler room.

   a. Water closet with lavatory adjacent.

   b. Locker(s) should be near shower.

4. Minor repair area should be in the boiler room.

5. Storage space for bulky items should be part of the boiler room area, and it should also have easy access to the receiving area.

   a. Ground equipment storage must be at grade level with outside entrance.

6. Receiving area should be provided at service entrance on ground floor.

7. Custodial service closets should be located on each floor as near as possible to pairs of pupil toilets.

1.17 d. Storage facilities.

1. Waste storage area.

2. General custodial supply.

3. Storage for bulky items, e.g. toilet paper.

4. Glass storage.

5. Ground equipment storage.

6. Receiving area storage.

7. Custodial service closets.

8. Enclosed metal container (with lock) for flammable materials.

1.17 e. Chalkboard and tackboard.

1. Chalkboard - none required.

2. Tackboard - one small board (perhaps 2' x 3') near entrance to boiler room.

1.17 f. Plumbing facilities.

1. Toilet room.

   a. water closet.

   b. lavatory.

2. Shower.

3. Service sink with hot and cold water on each floor plus storage space for supplies and equipment.

1.17 g. Heating and ventilating.

1. Heat required in all custodial areas except ground equipment storage area.

2. Mechanical ventilation required in boiler room, particularly in toilet room and shower.

1.17 h. Electrical provisions.

1. Adequate illumination must be provided in all areas.

2. Level of illumination in minor repair area should be higher than in other areas. Duplex outlets are required here also.

1.17 i. Suggested finishes.

1. Floor - concrete.

2. Walls - concrete block.

3. Ceiling - none.

1.17 j. Furniture and equipment.

The architect should be aware that the following items will be used in this space: (They will be provided by the owner).

1. Appropriate equipment and tools for operation, maintenance, and repair of school plant facilities.
2. One double pedestal desk.
3. One swivel chair.
4. One work bench with vise.
5. Locker(s).

1.17 k. General.

1. If women are employed for building service, separate quarters should be provided for them.
2. If a telephone is not provided in the custodian's area, the intercom system connected with the school central office will prove useful.
3. Doors from the receiving area, both to the interior and exterior, preferably should be wide or double leaf with a removable mullion.
4. The incinerator and the space it is to occupy should be designed with special consideration to fire hazards.
5. Built-in shelving in storage areas should be part of original general contract.
6. Provision of adequate room for servicing boilers, e.g. punching tubes, is necessary.

1.18 Circulation Spaces.

1.18 a. Specific activities engaged in by pupils and teachers.

1. For circulation of school and community personnel throughout the building.

1.18 b. Rooms, spaces, and sizes.

1. Corridors and stairs should be adequate to handle the flow of traffic at all times.

2. A lobby should be provided.

1.18 c. Location of unit with respect to other facilities.

1. Stairs should be placed at sides, not ends, of corridors in order to provide for possible expansion of the building.

2. Lobby should provide easy access to administrative unit and community use sections of the building.

1.18 d. Storage facilities.

1. A display case may be mounted in the lobby area. All sections should be accessible from the front, and it should be equipped with locked doors of tempered glass. Display lights should be provided.

1.18 e. Chalkboard and tackboard.

1. Chalkboard - none required.

2. Tackboard should be strategically placed in various sections of building. Special attention should be

given to its placement in the lobby and near classrooms for individual class work display.

1.18 f. Plumbing facilities.

1. Drinking fountains should be provided.
   a. Two on each floor, located near gang toilet rooms, but not in them.
   b. All fixtures should be set in niches for ease of repair.
2. Toilet rooms should be arranged so they will be available to the community use sections of the building even though educational facilities are not in use.

1.18 g. Heating and ventilating.

1. Adequate heat and ventilation are required.

1.18 h. Electrical provisions.

1. Level of illumination in all circulation spaces should approximate 10-15 foot candles.
2. An adequate number of duplex outlets should be provided in the corridor area for operation of floor cleaning equipment.

1.18 i. Suggested finishes.

1. Floors - terrazzo or vinyl tile.
2. Base and cove - glazed tile.
3. Wainscot - glazed tile (four-five feet).

4. Walls - painted concrete, cinder, or similar type block.

5. Ceiling - tile, acoustically treated and fireproof. Coloring should be white.

1.18 j. Furniture and equipment.

Architect will provide the following:

1. Recessed fire extinguishers in adequate numbers.

2. Electric clocks.

1.18 k. General.

1. Control gates to the ceiling should be installed, where necessary, so as to isolate the community use areas from the rest of the building.

2. All radiators, drinking fountains, fire extinguishers, or other equipment placed on corridor walls should be recessed or set in niches.

3. Corridors should be wide enough for safety, emergency evacuations, and panic-exciting conditions.

4. Doors opening into the corridor should not project in excess of 8 inches.

5. Each end of every corridor should terminate on an egress or at a stairway.

6. All corners of all walls or projections should be well-rounded.

7. No building of two or more stories should have fewer than two main stairways remote from each other.
8. Main stairways should be located so that there is a direct exit from the ground floor.
9. A minimum of two lanes, preferably three, are recommended for stairways.
10. Rigidly attached handrails should be provided, designed so as to discourage sliding and climbing.
11. Closet or storage spaces should not be permitted under or over stairways.
12. Exterior doors should be fitted with anti-panic hardware, checks, stops, and closers.
13. There should be adequate depth between the double doors at entrances to the building.
14. Stairwells and staircases should be so designed that the smallest child could not slip through a hole in the railing.
15. Exterior security lights should be provided to illuminate all exterior areas on all sides of the building.
16. Although <u>adequate</u> circulation space has been recommended, it should not be expansive.
17. The circulation space should lead the student visually to the building's life. They should invite him to go on and take part. They should be warm and hospitable.

1.19

RECOMMENDED ILLUMINATION CRITERIA

INTRODUCTION

The Chicago Board of Education is extremely interested in the research presently being done in the area of school lighting. Because of our concern, we present the following section of our specifications for the benefit and study of architects and illuminating engineers.

PURPOSE

One of the contributing factors to good pupil performance is proper school lighting. Careful attention to illumination is also necessary for maintaining good health. Learning processes are enhanced and facilitated when the visual fatigue and restlessness induced by poor lighting is eliminated. It is a striking fact that diagnosis reveals 20 per cent of our pupil population has subnormal vision. A visual environment, which makes seeing quicker, surer, and easier, is especially beneficial to this group.

In modern classrooms, pupils undertake a wide variety of learning experiences and, with the extensive use of movable seating, may face in any direction for their group activities. To establish lighting criteria for such classrooms involves complex judgments. Control of illumination is further complicated

by the introduction of daylighting into our classrooms. The architect, aided by the illuminating engineer, must consider the effects of both natural and artifical sources when designing to meet the recommended lighting criteria. The utilization of both sources is suggested so as to achieve satisfactory light. However, because of the directional characteristics and the variability of daylight, it cannot be regarded as a primary source.

Reliable criteria for lighting performance are necessary for all instructional spaces. To aid school plant planners in achieving satisfactory lighting, the following comments and recommendations are made.

GENERAL COMMENTS

The basic prerequisite for good lighting performance is the provision of illumination adequate in quantity for building occupants to perform their tasks effectively. This quantitative aspect is measurable in foot candles by a photocell light meter. The other primary characteristic of illumination is quality, which has several aspects; but the basic one is brightness, which is expressed by the formula: Foot candles times reflection factor of a surface equals foot-Lamberts. A Luckiesh-Taylor, Spectra, or equivalent brightness meter will measure brightness in foot-Lamberts.

RECOMMENDATIONS REGARDING QUANTITY OF LIGHT

Amount of light in instructional space is measured at

"task level," which is assumed to be the writing surface of a normally-positioned desk. It is recognized that, in the typical classroom, less light falls on vertical surfaces than horizontal; and the surface of a chalkboard may constitute a more critical visual task than a desk top. However, the desk top is the location of the most sustained viewing, and is used here as s standard of evaluation.

Research has indicated that for viewers to achieve maximum practical accuracy (99 per cent accuracy at five assimilations per second) widely variant intensities of illumination are required for various tasks.[6] Poor handwriting with a No. 2 pencil on poor quality paper by an average sixth grade pupil required 63.0 foot candles, and good quality spirit-duplicated material required 14.5 foot candles. However, ink writing or printed type required less than 3.0 foot candles. This research indicates that much more attention should be given to the nature of the visual tasks required of students. Most school planning authorities now believe that, although the intensity of illumination is basic to the achievement of satisfactory visual conditions, once a level of 20 foot candles has been reached, qualitative factors become of primary importance.

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[6]H. R. Blackwell, "Developments and Use of a Generalized Method for Specification of Interior Illumination Levels on the Basis of Performance Data," Illuminating Engineering Research Symposium, Dearborn, Michigan, 1958.

For the proposed new Chicago schools, the general maintained illumination in typical classrooms is recommended to average 35 to 40 foot candles at task level. The word "maintained" implies that regular cleaning and replacement procedures are adequate to insure that average foot candle levels will not fall below 35 foot candles.

In general, equalized distribution of light is desirable to reduce excessive shadows and contrast. For new school buildings, the recommended permissable variation in quantity of light shall not exceed 30 per cent of the recommended maximum. Thus, in a classroom designed to average 35 to 40 foot candles, the illumination of the least well-lighted corner should not fall below 28 foot candles at task level. Distribution of light can be improved by suitable light reflectances of the principal surfaces. For ceilings of classrooms, 85 per cent reflectance is recommended; for walls, 50 to 70 per cent.

The foot candle figures stated above are for typical classrooms. For certain special use rooms where visual tasks are more critical, the quantity of light should be increased accordingly. Generally, corridors should be provided with 10 foot candles; gymnasiums, 20 foot candles. Office space should meet standards of typical classrooms.

RECOMMENDATIONS REGARDING QUALITY OF LIGHT

In indicating quality of light, it is necessary for the

architect and illuminating engineer to think in terms of brightness, for this is what the eye actually sees and the brain registers. Because the human eye is a highly adaptable optical instrument, it can adjust to a wide range of brightness levels. However, research shows that the eye is not adaptable to sharp contrasts in brightness levels, as between large adjacent light and dark surfaces. The eye continues to function under such conditions only with impaired vision and physical strain.

For the new Chicago school buildings, it is recommended that the brightness of any artificial light source viewed continuously not exceed 225 foot-Lamberts. Furthermore, it is recommended that any area that appears in the visual field by casual observation not exceed 500 foot-Lamberts. In defining "visual field," it has been determined that this includes all areas below and around the viewer and upwards at a 45-degree angle.

It is recognized that sky-brightness may exceed 1000 foot-Lamberts and still be comfortable visually, because large areas of high brightness are usually less objectionable than small areas that are contrasted with their contiguous surfaces. Despite the greater tolerances permissable with sky-brightness, it should be controllable within the classroom either by permanent or temporary methods.

The quality of light and its consequent effect on the eye

can be appraised principally by comparing the contrast pattern of light and dark of adjacent surfaces. Excessive contrast may result in an interior, which, though, "easy on the eyes," is bland and dull in feeling. In many modern classrooms, with sizeable glass areas, there is considerable variation in direction and intensity of natural light. Therefore, the appearance of "flatness" caused by insufficient contrast is seldom of concern to school planners. (It is much more likely to be a problem in regard to night time use of instructional space). Of much more concern -- and, in fact the most critical problem in classroom lighting -- is excessive contrast in the brightness of surfaces.

In all instructional spaces where there is sustained occupancy, as in classrooms, the following standards of brightness balance should be met. They will apply to the normal field of vision, which includes all areas below and around the viewer and upwards at a 45-degree angle. In determining brightness performance, the visual task may be assumed to be at desk or chalkboard. Naturally, these standards apply outside the task itself. Within the task, some brightness contrast is needed to sharpen perception.

A. The brightness of any surface viewed from any normal standing or sitting positions should not be excessively greater (10 times is usually recommended as the

maximum) than the brightness of the visual task.

B. The brightness of any surface viewed from any normal standing or sitting position should not be greater than five times the brightness of an immediately adjacent surface.

C. The brightness of any surface viewed from any normal standing or sitting position should not be excessively less (one-third is the recommended minimum) than the brightness of the visual task.

D. The brightness of a surface immediately adjacent to the visual task should be no greater (and, preferably, less) than the brightness of the visual task.

In a classroom well illuminated, as recommended, with 35 to 40 foot candles, the brightness created on a piece of white paper at desk height might be 28 to 32 foot-Lamberts. Under the standards recommended above, the appropriate kind of desk top might provide a brightness of 16 foot-Lamberts. Although it may help to gain good distribution by use of surfaces of high reflectance, it is essential to guard against dazzle or specular reflection caused by shiny surfaces.

Specular reflection caused by the reflected image of the light source in the work surface or in the task itself is especially damaging to visual acuity. This glare effect is particularly bad with such materials as glossy papers, but even

the best matte finish papers create some of this effect. The effect varies with the position and brightness of the light source, as well as the orientation and surface texture of the task.

Research indicates that, with a typical classroom lighting installation, there is an average loss of contrast in the task of 15 per cent due to specular reflection.[7] In many classrooms, the loss would be far higher. It is possible to increase the illumination to compensate for this loss of contrast. However, to give the equivalent no-glare visibility provided by 60 foot candles requires 185 foot candles under average conditions.[8] A more practical way of improving visibility is to reduce specular reflection by a lighting technique which achieves a satisfactory intensity with as low a value of uniform brightness as possible at the lighting source.

CONCLUSION

Architects and illuminating engineers participating in the Chicago building program are encouraged to refer to the following publications:

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[7] J. J. Chorlton and H. J. Davidson, "Measurement of Contrast Losses of School Tasks", Illuminating Engineering Research Symposium, Dearborn, Michigan, 1958.

[8] D. M. Finch, "Visibility Measurements on Several Schoolroom Visual Tasks Under Different Lighting Conditions", Illuminating Engineering Research Symposium, Dearborn, Michigan, 1958.

(1) Common Sense in School Lighting

Published by the American Association of School Administrators;

National Education Association of the United States; 1201 Sixteenth Street, N.W.; Washington, D.C.

(2) Planning Together for Better School Buildings

Bulletin No. 412 (Rev.), published by the Department of Public Instruction; State of Michigan; Lansing, Michigan.

Recommendations pertaining to lighting in these bulletins, while not identical with those here proposed, are similar in principle.

1.20

CONCERNING BEAUTY IN BUILDING

The architect who designs a school building cannot think only in terms of shelter, or blueprints, or brick and stone and steel. He must think about the individuals who will use the building. He must think about the job the building should help to do: the full development of all of each student's potentials.

If the architect keeps these things in mind, he may be able to contribute in some small way to the achievement of the educator's goals. . . by creating a building that is a tool for the teacher and an expression of the school's educational approach. . . by creating an atmosphere, a mood, to aid the student in every learning task set before him. . . by making the school a place the student looks forward to entering, and one he regrets leaving. . . by helping the student feel the unity of his classroom with other classrooms, and with the world.

And if he does all this successfully, he will have done what every artist -- and educator -- wants. He will have created a beautiful building. For a beautiful building is one that is sensitive to the emotional needs of the humans who use it, one that serves the physical functions set for it, and one that has been designed with an understanding of the materials and building methods it requires.

In terms of years of use and of effectiveness in doing its job, this building would be the most economical that could be designed. Buildings do not fall down; they are torn down. Ugly buildings are torn down long before their physical usefulness has ended. The more beautiful will last longer, be loved and cared for. . . and the beautiful will make the greatest contribution to the job of education. To design for learning is to seek fitness, order and beauty, and to place them in the service of those who learn, as well as of those who teach.[9]

Beauty and economy are not mutually exclusive. Thoughtful use of form or color or material will enhance the design of any building without adding one penny to its cost.

The Chicago Board of Education is quite aware that educational programs will change to meet the challenges of the future. This will necessitate imaginative architectural designing to house such programs. It is certainly not the wish nor the desire of the school district to tie the architect's hands by including details that force him to develop a sterotyped product. One of the purposes of these recommended criteria is the stimulation of the dialogue between the architect and the educational

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[9] Lawrence B. Perkins, Work Place for Learning (New York: Reinhold Publishing Corporation, 1957), p. 62.

planner. When gainful departures from these specifications are suggested by creative designers, they will be freed to provide the best possible space for teaching and learning. This is the desire of the school district.

CHAPTER FOUR

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The Problem. The Board of Education in the City of Chicago has committed itself to the goal of a quality education for all its students. In a period of increasing enrollments, resulting from rising birth rates plus inmigration of public school patrons to the city, this district must obviously expend large sums of money in order to maintain, improve, and enhance its instructional program. Its ability to provide one of the tools of instruction, an adequate school plant, is further compromised by a number of obsolescent schoolhouses. Our problem? How can we plan, design, and construct quality school buildings which will allow and support quality education?

The Methodology. An analysis was made of thirty-seven new elementary schools in Chicago whose contracts were awarded between January 1, 1954, and December 31, 1958. This study examined the educational adequacy and the cost of these buildings. The educational adequacy ratings were performed by an independent and experienced school plant specialist. Cost figures were adjusted for comparative purposes through the use

of the Building Cost Index for the City of Chicago, published by the Engineering News-Record.

The Findings. A careful reading of the previous chapters of this study makes obvious the following findings:

1. During the years 1954-1958, Chicago has invested a total of $104,396,256.00 in capital outlay expenditures. This represents an annual average expenditure of approximately $21,000,000.00.
2. Increasing enrollments combined with obsolescence of many school plant facilities will necessitate even larger amounts of capital outlay expenditures during the years ahead.
3. Significant variations exist in the total educational adequacy ratings of the various buildings. These variations are also present in the individual components of the total rating score.
4. Extreme differences in unit costs of construction exist among the thirty-seven buildings.
5. Although school construction costs have been reduced during the period of this study, the educational adequacy of elementary school buildings has increased slightly.

Conclusions

When the collection of these data was completed, knowledgeable staff members and consultants from outside the district were invited to discuss the findings of the study. Inadequacies and inconsistencies in school plants were cited; demonstrable differences in unit costs among the buildings examined were noted. Again and again the need for some written statement of educational criteria was suggested. The consensus among these participants seemed to center upon fuller and more detailed educational specifications which would aid the district in enhancing the adequacy of school plants to be constructed while controlling cost in a more systematic, objective fashion. In response to these suggestions, educational criteria for new elementary school buildings in Chicago have been developed in Chapter Three of this study. These criteria are not considered the complete solution to all the building problems of the school district. They do, however, identify in some detail the activities which flow from this school system's instructional program. Hopefully, optimistically, -- ideally, creative architects will use these specifications as starting blocks toward flexible, utilitarian, and functional school buildings.

Recommendations

The immediate or short term purpose of this study was

the provision of comparative data on the educational adequacy and cost of the selected elementary school buildings included in this report. Numerous long term purposes are readily apparent. For example, this report could serve as a useful guide to the Chicago Board of Education and its school plant planning personnel in developing and evaluating its future building program. The recommended educational criteria should serve the purpose of providing guidelines for architects employed by the Chicago school district.

Other large urban school districts might well find the methodology and materials useful in evaluating their past and future building programs. A collection of data relative to educational adequacy and financial cost has been accomplished in this study. An analysis of this data, which might lead to the establishment of some adequacy-cost relationships, would be a fruitful area of research.

In The Cost of a Schoolhouse[1] the authors recommend a few ideas for consideration by those educators, architects, and citizens who would plan tomorrow's schools. We believe they are worth repeating here.

1. Think first of what you want the school to produce before you decide what to put into it.

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[1]Educational Facilities Laboratories, Inc., The Cost of A Schoolhouse (New York: Educational Facilities Laboratories, Inc., 1960), pp. 138-9.

2. Plan the building to be a gentle place for children and a machine for learning.
3. Write good educational specifications. If you do not describe what you want to go on in a building, how can the architect put an envelope around it? He'll do the architecture if you do the education.
4. Resist stock plans unless you are too busy to work with the educators and the architects. In the long run it will cost you money to order a school through the mail.
5. Encourage experimentation in your educator and imagination in your architect. Do not evade your responsibility for finding answers to some of the unknown.

As a last recommendation the writer would like to suggest a process of planning whereby any school district, using the educational criteria developed in Chapter Three of this study as a working tool, might improve and enhance its school plants. These specifications would be a basis for beginning a discussion of the particular and peculiar needs of a proposed new school building. We propose a procedure whereby leaders throughout the staff are recognized for the contributions they can make. When this dependence is acknowledged

by the central administration, its role should shift from one of domination and control to one of coordination and synchronization of the efforts of the people on the planning team.

> Educational leadership (is) that action or behavior among individuals and groups which causes both the individual and the group to move toward educational goals that are increasingly acceptable to them.[2]

> Leadership consists of actions by group members as those which aid in setting group goals, improving the quality of interaction among the members, building the cohesiveness of the group, or making resources available to the group. In principle, leadership may be performed by one or many members of the group.[3]

These quotations should set the tone for the discussion to follow. We believe that school buildings in any district will be better planned and better used if the people who live in them for many hours each day participate in the planning. It is the teachers, the principals, the supervisors, and the district superintendent as well as the pupils and non-professional personnel to whom we should turn for aid and assistance. Because of their intimate acquaintance with school buildings they are aware of strengths and weaknesses. An illustration:

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[2]Association for Supervision and Curriculum Development, Leadership for Improving Instruction (Washington, D.C.:NEA, 1960), p. 27.

[3]Dorwin Cartwright and Alvin Zander (Editors), Group Dynamics, Research and Theory (Evanston, Illinois: Row, Peterson, and Co., 1953), p. 539.

an urban district in the author's experience put such heavy doors on the entrances to a kindergarten-primary unit that the little tykes could not get in the building. How are they going to learn?!!!

A new school building is one of the tools in the kit of the imaginative teacher. The quality of each teacher's work is affected by all the tools with which he works. Because he uses these tools daily, he is in a better position to know their advantages and disadvantages. He knows what is necessary to do an effective job of teaching -- and he knows what he does not need, what is superfluous to his tasks. He is able and willing to suggest practical improvements, e.g., "make the doors lighter!!"

If we are to insure the provision of proper tools, the professional (and non-professional) staff should help with the planning. Most of these people are already busy; but they will gladly contribute some of their time, talent, and energy if they know that a better teaching and learning situation will result. And all of them have a contribution to make.

The quality of their contributions will depend to a large extent on the leadership of the school plant planner -- how he coordinates and synchronizes the efforts of staff members. He must hold to the values and principles inherent in the democratic process if, in planning a school building, he would successfully maximize the contributions of his staff.

If he cannot implement these principles in his daily contacts, he should abandon the role of the democratic leader.

In his leadership position, the school plant planner must give evidence in his words and actions of his credo that every staff member has a contribution to make. At times, the group will reject the ideas or suggestions of an individual, but from this interchange of ideas may emerge a valuable new idea or concept from someone else. Therefore, it is imperative that the communicative process be facilitated, and that people be stimulated to participate in the discussion. It is the leader's responsibility to foster an atmosphere of ease and relaxation which will enable the group to propose, formulate, explore, and evaluate new ideas. People should be challenged without being threatened.

Arthur Combs[4] has reminded us that:

> It is important for us to keep in mind that whether or not a person feels challenged or threatened is a question of how it seems from his point of view, not how it seems from the point of view of an outsider.

With this in mind, the sensitive planner demonstrates his belief in the dignity and worth of each individual through

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[4]Arthur W. Combs, "Personality Theory and Its Implications for Curriculum Development," Learning More About Learning. The Third ASCD Research Institute (Washington, D.C.: Association for Supervision and Curriculum Development, 1959), p. 12.

his development, maintenance, and enhancement of the non-threatening climate. With such a climate prevailing in a group every member feels secure enough to participate freely and fully in the deliberations.

Bills[5] has noted that:

> Social climates significantly affect beliefs about self and others and behavior. And of primary importance, climates which free people for self-directed behavior, result in widespread personality changes and other gains in learning. These climates seem to be effective in achieving goals.

Another facet of the process of school plant planning which cannot be ignored is the staff's need to know the extent and limitations of the financial resources assigned to a particular project. If staff members are not provided with sufficient information, they may feel cheated or disillusioned when the final result is something less than they recommended.

At what juncture in the planning process is the work of the professional and non-professional staff completed? Obviously their unique contribution to the planning of a new school is the interpretation of the instructional program to the architect through the educational criteria they develop. These specifications, differing for each project, should be so written that all pertinent information is furnished the architect.

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[5]Robert E. Bills, About People and Teaching (Lexington, Kentucky: University of Kentucky, 1957), p. 63.

With them in hand (and mind) the architect should have all of the essential data to understand the architectural problem to be solved and the limitations under which he must work. Faculty members (or school superintendents) should not cast themselves in the role of amateur architects and attempt to design school facilities; their helpfulness depends upon the clear and precise description of the educational process to be effected with this new teaching tool. In this regard, however, it should be noted that an impending school project might well serve as the triggering device for staff involvement in a study of the curriculum and suggestions for its improvement.

A school system which hopes to achieve the maximal returns from the time, talents, and energy expended in planning a new building should seriously consider the possibility of allowing (if not encouraging) those staff members who participated in a school's planning to work there when it opens. There is no question that special dividends would result if one of the individuals who participated in the school plant planning became the instructional leader in the new school building.

Let us never ignore that group of interested students who would have thoughtful comments to make about a new school building. Their quite different perspective concerning the effects that schools and teachers have on their growth and development should not be overlooked. Their ideas and suggestions often afford us new insights into various aspects of the

instructional program.

The technical knowledge that custodians, engineers, and maintenance people possess with regard to the physical properties of the school plant is often an untouched vein of valuable information. However, their contributions should focus on better ways to meet new problems in the operation and maintenance of plant rather than in vetoing new ideas because they are more comfortable if existing features of buildings are continued. None of us must ever forget in our school plant planning that schools are designed and constructed as tools for teaching, not for the convenience of custodians, principals, teachers, or even students.

Out of the research into group dynamics and democratic ways of working with people have come many helpful suggestions which can be applied to the process of school plant planning. One of the most meaningful statements for the writer was the following:

> A group with a harsh, dominating official leader is characterized by intense competition, lack of acceptance of all members, buckpassing, avoidance of responsibility, unwillingness to cooperate, aggression among members and toward persons outside the group, irritability, and a decrease in work when the supervisor is absent....
>
> A group in which the official leader concentrates his efforts in helping the persons for whom he is responsible to operate as a group is characterized by cooperation, enthusiasm, acceptance of greater responsibility, a sense of importance of

> the work being done, and a recognition among members of the worth of each other.[6]

Let no one be misled -- the process by which a school system arrives at decisions concerning its building program is a vital factor in the kind of instructional program provided the children and youth of that community!

Perhaps Winston Churchill in his own inimitable style has said it best:

"We shape our buildings; thereafter they shape us."

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[6] Kimball Wiles, Supervision for Better Schools (Englewood-Cliffs, N. J.: Prentice-Hall, Inc., 1955), pp. 163-4.

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APPENDIX

Appendix 1

ELEMENTARY SCHOOL RATING FORM
- EDUCATIONAL ADEQUACY -

DONALD J. LEU and JOHN J. McNICHOLAS, JR.

NAME OF BUILDING _____ ADDRESS _____

DATE RATED _____ SURVEYOR _____ PRINCIPAL _____

TYPE STRUCTURE _____ NO. STORIES _____ SITE AREA _____

YEAR ERECTED _____ DATE OF ADDITIONS _____

GRADES HOUSED _____ CURRENT ENROLLMENT _____ CAPACITY _____

FACILITIES			
REGULAR CLASSROOMS		LIBRARY	
KINDERGARTENS		PRINCIPAL'S OFFICE	
SPECIAL ROOMS		ADJUSTMENT ROOM	
PLAYROOM		TEACHERS' ROOM	
CAFETERIA			
AUDITORIUM			

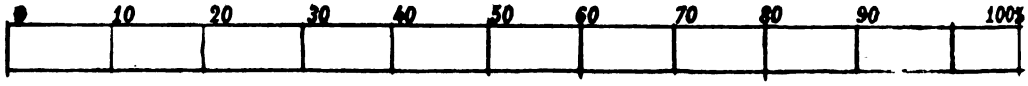
PERCENTAGE RATING OF AREAS

	0	10	20	30	40	50	60	70	80	90	100%
I. REGULAR CLASSROOMS											
II. KINDERGARTENS											
III. SPECIAL ROOMS											
IV. ADMINISTRATIVE AREAS											
V. GENERAL AREAS											
TOTAL											

RATING OF BUILDING					
MAJOR DIVISIONS	IDEAL SCORE	SCORE	ADJUSTED SCORE	%	ADJUSTED %
I. CLASSROOMS	600				
II. KINDERGARTENS	50				
III. SPECIAL ROOMS	100				
IV. ADMINISTRATIVE AREAS	50				
V. GENERAL AREAS	200				
TOTAL	1,000				

Educational Efficienty*

*Net Educational Area / Gross Area



INSTRUCTIONS FOR RATING FORM

Score items as follows: 5 - Very Superior, 4 - Superior, 3 - Average, 2 - Below Average, 1 - Poor, 0 - None. If an area mentioned in the rating form was not included in a particular building's educational specifications, no credit is given in the score column. However, in the adjusted score column we grant an average score to the space. Multiply score times weight and enter results in total, adjusted total, grand total, and adjusted grand total columns.

	Score	Adjusted Score	Weight	Total	Adjusted Total	Grand Total	Adjusted Grand Total
I. CLASSROOMS							
1. Size			40				
2. Decoration			5				
3. Lighting, Quantity			8				
4. Lighting, Quality			12				
5. Chalkboards			5				
6. Display Boards			5				
7. Instructional Storage			10				
8. Floors			5				
9. Heating			5				
10. Ventilation			5				
11. Sanitary Facilities			10				
12. Acoustics			5				
13. Project Areas			5				
II. KINDERGARTEN							
1. Size			4				
2. Decoration			1/2				
3. Lighting, Quantity			1/2				
4. Lighting, Quality			1				
5. Chalkboards			1/4				
6. Display Boards			1/2				
7. Instructional Storage			3/4				
8. Floors			1/2				
9. Heating			1/2				
10. Ventilation			1/2				
11. Sanitary Facilities			1/2				
12. Acoustics			1/2				
III. SPECIAL ROOMS							
1. Playroom			6				
2. Cafeteria			3				
3. Auditorium			2				
4. Library			6				
5. Special Education			3				
IV. ADMINISTRATIVE AREAS							
1. General Office			2				
2. Principal's Office			2				
3. Adjustment Room			2				
4. Teachers' Room			2				
5. Instructional Storage			1				
6. Custodial Storage			1				
V. GENERAL AREAS							
1. Corridors			7				
2. Sanitary Facilities			5				
3. Circulation			5				
4. Flexibility			5				
5. Expansibility			5				
6. Safety			8				
7. Design			5				

COMMENTS

I. CLASSROOMS:

II. KINDERGARTENS:

III. SPECIAL ROOMS:

IV. ADMINISTRATIVE AREAS:

V. GENERAL AREAS:

QUESTIONS BY SURVEYOR

Appendix 2

PERCENTAGE OF BUILDING AREA UTILIZED FOR EDUCATIONAL PURPOSES

SCHOOL NAME _____ LOCATION _____ ARCHITECTS _____

1. Gross Area, Entire Plant

Total sq. ft. area of all floors, measured to outside faces of enclosing walls, including stairways and developed basement areas, plus one-half of the total sq. ft. area - other areas listed below:

Floor areas including stairs:
- Developed basement _____
- First floor _____
- Second floor _____
- Third floor _____
- Additional floors _____

Other areas:
- Porticoes _____
- Bicycle sheds _____
- Porches _____
- Open, covered play _____
- Passages _____
- Sheltered bus platforms _____
- Other _____

Subtotal _____

1/2 Subtotal _____

TOTAL, GROSS AREA _____

2. Gross & Net Areas by Units

Net area = total sq. ft. area, inside dimensions wall to wall, including cabinet space, of following:

	GROSS	NET
Classrooms		
Kindergarten		
Science Labs		
Commercial Ed.		
Home Economics		
Art		
Shops		
Band, chorus		
Gym, playroom		
Swimming Pool		
Gen'l. Ed. Lab. (or Study Hall)		
Auditorium seating area, stage stagecraft, dressing rooms, not lobby		
Music Practice Rooms		
Cafeteria seating-not Kitchen or auxiliary spaces		
Library reading rooms		
Gym locker & shower rooms		
Adm. off., incl. health, guidance, conference teachers', student org. rooms		

TOTAL, NET EDUC. AREA _____

3. Design Efficiency (%)

Appendix 3

QUESTIONNAIRE

An Evaluation of Physical Facilities in
Buildings and Additions Completed Since 1954

1. Name of School_____

2. Name of Person Making Report_____

3. Architect_____

4. Number of Kindergartens_____

5. Number of Classrooms_____

6. What other facilities have been provided in your new building (addition)?

7. What are the outstanding features of your building?

8. What items in your building would you have changed had you been consulted on the plans?

9. What features in the kindergartens enhance the program of education? Which detract?

10. What features in your regular classrooms strengthen the instructional process? Which hinder?

11. What would you like to have added, taken out, or changed in your building which would help you meet the needs of children better?

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