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ABSTRACT

THE PLANNING PROCEDURE SUGGESTED IN THIS HANDBOOK CONSISTS OF AN EVALUATION OF THE EXISTING EDUCATIONAL PROGRAM AND A COMPREHENSIVE SURVEY OF THE SCHOOL PLANT. RESULTING RECOMMENDATIONS WILL INVOLVE RENOVATION OF, OR ADDITIONS TO, PRESENT BUILDINGS, OR NEW BUILDING ON EXISTING SITES. A SUMMARY OF RECOMMENDATIONS ON SCHOOL CONSTRUCTION ECONOMIES IS GIVEN. THE BUILDING BUDGET IS DISCUSSED, INCLUDING LOANS AND BONDS, AND THE SELECTION OF AN EDUCATIONAL CONSULTANT AND ARCHITECT. APPENDICES OFFER INFORMATION ON SCHOOL SITES, LIGHTING, AND FINISHES, AND IN SOME DETAIL ON SPACE GUIDELINES. A BIBLIOGRAPHY OF PLANNING MANUALS FROM OTHER STATE DEPARTMENTS OF EDUCATION IS APPENDED. (FPO)

Handbook For School Plant Planning For Arkansas Public Schools 1967

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Foreword

The responsibility for operating the public schools in the State of Arkansas is delegated to the local boards of education. In addition to policy-making, the board of education employs a superintendent who is charged by law to administer all phases of the school program.

In order for the superintendent to be successful, he must have a knowledge of the changes that are taking place in education.

Planning for the future involves evaluation of existing programs and facilities. This publication is to assist the administrator with long-range planning so that better school facilities for our students may be provided.

The State Department of Education will be pleased to provide consultative services as may be requested by the local school officials to assist with educational planning.

A. W. Ford
Commissioner of Education

Preface

This publication has been prepared for use by local school officials in planning school facilities. An attempt has been made to provide local school boards and administrators with information that will develop an awareness of the need for educational planning. One of its purposes is to encourage the development of all phases of school plant planning.

This publication was prepared by the School Plant Planning Service. The Service wishes to give special recognition to the consultants of other Divisions of the State Department of Education, various administrators over the State, Arkansas Chapter of the American Institute of Architects, Arkansas State University, and the University of Arkansas.

Introduction

There has been much progress in school plant planning in Arkansas over the past several years. This has been partly due to the cooperation of local school officials, the architects, and representatives of the State Department of Education.

This publication should always be considered as a guide and not a set of rules for schoolhouse construction. This is especially true in the areas of space recommendations. Space guidelines that are contained in this handbook should always be considered as minimums. Space requirements should be established by the educational specifications which have been developed by the local school officials. The responsibility of developing the educational program and specifications belongs at the local level. With this in mind, this publication should be very useful.

TABLE OF CONTENTS

I. EDUCATIONAL PLANNING

Educational planning is the total planning process of evaluating the present educational program, determining needed improvements, and implementing a plan of action that should be undertaken.

Educational planning usually starts with a self-evaluation under the leadership of the school administration and the local school board. Some school districts employ professional educational consultants who take the information gained from the self-study, make a comprehensive survey, and recommend future action. Other school districts make the survey by the use of a committee composed of school staff members, board members, citizens, and educational consultants from the State Department of Education and an institution of higher learning.

A. The Community And The Instructional Program

The first phase of the survey usually is a study of the community, the instructional program, and related services. Suggested areas of this part of the study are as follows:

THE COMMUNITY	Population Per capita income Educational level of adults Attitudes toward education Civic pride Local government Civic organizations Cultural and religious organizations Economy of the area Referral agencies Housing Streets, highways, and rural roads
THE SCHOOL BOARD	Responsible leadership Workable board policies Board-superintendent relationship Board-community relationship
SCHOOL POPULATION	Numbers Ages Location Trends Composition
SCHOOL ORGANIZATION	Administrative organization Grade organization Maximum and minimum sizes of schools

	Needs
	Offerings Demands
	Trends
	Class size
INSTRUCTIONAL PROGRAM	Teacher-pupil ratio
	Methods of instruction
	Teacher qualification
	Instructional services
	Related activities
	Maintenance and custodial service
	Transportation service
AUXILIARY SERVICES	Health service
	Attendance service
	Food service
	Sources of revenue
	Millage
FINANCIAL SUPPORT	Assessed valuation
	Indebtedness
	Reserves

B. The School Plant

The first phase of the study concerns the community and the present school program and recommended changes or improvements for the future. This brings the school plant into focus as something is known about the program to be housed. The second phase of the study is a comprehensive survey of the present school plant. Recommendations, as a result of this study, usually call for renovation of present buildings, additions to present buildings or new buildings on present sites or on new sites.

Areas of this part of the study usually are as follows:

	Size
	Location
	Elevation
SCHOOL SITES	Drainage
	Accessibility
	Utilities
	Location
	Number of teaching stations
	Size of teaching stations
BUILDINGS	Conditions of teaching stations
	Size and condition of related areas
	Renovation possibilities
	Expansion possibilities

II. SCHOOL CONSTRUCTION ECONOMIES

Since supplying adequate school facilities is an important problem, school board members and administrators are concerned with achieving economy in building programs. A summary of the recommendations of many authorities on school building construction economy is as follows:

1. Secure competent professional help in planning the program
2. Insist on complete, accurate, and clear plans and specifications
3. Allow ample time for bidders to figure the costs
4. Use competitive bidding on the project
5. Time the bidding to secure desirable prices
6. Consider carefully fire insurance rates in planning the structure
7. Use performance type building codes
8. Avoid over design in the structural framing
9. Use short and simple exterior walls
10. Keep ceiling heights low and consistent
11. Use repetitive modular designs
12. Leave off the fancy decorations
13. Use large building material units
14. Use simple designs
15. Remember that size affects the project costs
16. Use simple finishes
17. Reduce the amount of glass areas
18. Reduce the amount of hand cabinet work
19. Reduce the toilet facilities to actual needs
20. Locate rooms back to back with exterior walkways
21. Purchase equipment outside the building contract

Recent research has shown that five most important factors that affect the cost of a school building are:

1. Size of the project
2. Compactness of the building
3. Whether inside corridors are used
4. Type of interior walls used
5. Amount of finishes used, such as wainscoting and baseboards

People are inclined to confuse cheapness of the initial cost of a structure with lifetime economy. Construction economy means getting a functional and a safe building that requires minimal costs for building, operating, and maintaining over a twenty to thirty year period of use.

The two most noticeable areas of a school building that are short changed in cost cutting are the classroom lighting and the type of floor materials used. From a health and safety viewpoint, the lighting is not an area for economizing. Also, cheapness in the initial floor covering may result in lifetime maintenance costs considerably above the initial cost of the floor material.

Remember that economy in schoolhouse construction implies a wise and carefully managed expenditure of school funds in providing facilities which are adequate in terms of the educational program at the most reasonable cost. In the search for economy, the underlying principle should be the quality of service provided by the school plant in relation to its total cost over its lifetime.

III. ADMINISTRATION OF THE BUILDING PROGRAM AT THE LOCAL LEVEL

A. The Building Budget

Once the program to be housed is determined the school board can estimate the amount of funds needed. The School Plant Service, State Department of Education, can be of service in helping to estimate the building costs.

Building programs in Arkansas are usually financed by the sale of bonds. A few fortunate school districts may be able to build with the use of surplus funds. Permanent school revolving loans are sometimes used on small projects. The Division of Budgets and Loans, State Department of Education, should be consulted well in advance in case a loan from the revolving loan fund or a bond issue is needed.

Regulations for securing loans and permits to issue bonds are as follows:

REGULATIONS FOR SECURING A LOAN FROM THE REVOLVING LOAN FUND (Adopted by the State Board of Education Sept. 12, 1955)

1. Basic educational needs will determine the eligibility of a district to borrow money from the revolving loan fund. It should be remembered that it is never wise to borrow to the extent that the future operation of the basic educational program is endangered. Local revenue pledged for debt service or payment on short-term revolving loans may become a charge against future funds needed for teachers' salaries. For this reason proposed indebtedness should be discussed with the Director of Budgets before any definite plans are made.
2. A district may legally borrow up to 15% of its latest assessed valuation. (In emergencies loans up to 18% may be approved.) However, serious consideration should be given to a building program or to other purposes for which a district may borrow, when indebtedness is increased up to the legal limit.
3. Proposed loans should be checked with the Bond Service to ascertain borrowing power, millage required to service the loan, and average maturities. Application forms are secured from the Bond Service.

4. Applications must meet all legal requirements.

5. The plans and estimated cost of construction must be approved by the Supervisor of School Plant Service before the loan will be made.

6. Plans for a vocational agriculture building, home economics cottage, and lunch room must be approved by the Assistant Commissioner in charge of the Vocational Division as well as supervisors of these programs on the state level.

7. All applications for loans must be filed with the Bond Service, Division of Budgets and Bonds, THIRTY DAYS PRIOR TO THE MEETING OF THE STATE BOARD. (The State Board meets the second Monday in March, June, September, and December.)

8. Applications will be carefully screened by the loan committee of the State Department of Education to determine the district's need and eligibility to borrow.

9. Loans from the revolving loan fund, for which specific millage is voted to meet maturities cannot legally exceed twenty years. Loans from the revolving loan fund, evidenced by certificates of indebtedness, cannot legally exceed six years from the date of approval by the State Board.

All revolving loan fund loans bear interest at a rate established by the State Board of Education, but not to exceed six per cent per annum. The County School Supervisor and State Department of Education will render any assistance needed in the execution of application forms for loans. Act 384 of 1953 prohibits fees of any nature, fiscal agents, legal and otherwise, for any service performed with respect to a loan from the revolving loan fund.

Forms Required for a Proposed Loan Maturing Within Six Years To be Retired with Operating or Other Surplus Funds

1. Formal Application—Part I. All information requested pertaining to the loan must be furnished in detail.

2. County Clerk's Certificate (Exhibit A)—the most recent assessed valuation of the district.

3. Notice of Intention to Borrow Funds (Exhibit B)—Notice of Resolution of the Board must be published ONE time in a newspaper having general circulation within the district. PROOF OF PUBLICATION of such Notice will be secured from the printer and made a part of the transcript filed with the State Department of Education.

4. County Clerk's Certificate (Exhibit C)—stating that no petition has been filed objecting to the loan. Certificate is executed on the fifteenth day AFTER publication of Notice.

5. Certificate of Indebtedness—to be executed in duplicate by the chairman and secretary of the school board and the county treasurer and filed with the State Department of Education for deposit with the state treasurer.

Forms Required for a Proposed Loan Maturing Over a Period Of Time not to Exceed 20 Years, to be Retired With Specific Millage Voted by the Electors of The District

1. Formal Application—Part I. All information requested pertaining to the loan must be furnished in detail.
2. County Clerk's Certificate (Exhibit A)—listing the most recent assessed valuation of the district.
3. Proof of Publication of the Budget (Form to be furnished by the Printer.)—Act 403 of the Acts of 1951 provides that the school budget shall be published in some newspaper in the county in which the district lies, or, if in more than one county, in the county where it is administered, such publication to be not less than sixty days before the annual school election.
4. Notice of Election (Exhibit A, Part II)—PROOF OF PUBLICATION (furnished by the printer) must accompany Part II of the application.
5. Ballot must accompany Part II of the application as Exhibit B.
6. Result of Election by President and Secretary; Result of Election by County Judge; and Record of Formation of the District shall be properly certified as requested in Part II of the application forms.
7. Revolving loan bond executed by the president and secretary of the school board.

REGULATIONS FOR SECURING A PERMIT TO ISSUE BONDS (Adopted by the State Board of Education September 12, 1955)

1. Basic educational needs of the district will determine the eligibility of a district to issue bonds. It should be remembered that it is never wise to incur bonded indebtedness to the extent that the future operation of the basic educational program is endangered. Local revenue pledged for debt service may become a charge against future funds needed for teachers' salaries. For this reason proposed indebtedness should be discussed with the Director of Budgets before any definite plans are made.
2. A district may legally borrow up to 15% of its latest assessed valuation. (In emergencies loans up to 18% may be approved.) However, serious consideration should be given to a building program or to other purposes for which a district may issue bonds, when indebtedness is increased up to the legal limit.
3. Proposed bond issues should be checked with the Bond Service to ascertain borrowing power and other pertinent information needed in the sale of commercial bonds. Application forms are secured from the Bond Service.
4. Applications must meet all legal requirements.
5. The plans and estimated cost of construction must be approved by the Supervisor of School Plant Service. Such approval should be secured prior to delivery of the bonds.

6. Plans for a vocational agriculture building, home economics cottage, and lunch room must be approved by the Assistant Commissioner in charge of the Vocational Services as well as supervisors of these programs on the state level.

7. All applications for permits to issue bonds must be filed with the Bond Service, Division of Budgets and Bonds, THIRTY DAYS PRIOR TO THE MEETING OF THE STATE BOARD. (The State Board meets the second Monday in March, June, September, and December.)

8. Applications will be carefully screened by the loan committee of the State Department of Education to determine the district's need and eligibility to issue bonds.

PROCEDURE FOR SECURING A PERMIT TO ISSUE BONDS

1. Request is made to the Bond Service of the State Department of Education for application forms.

2. All information requested in the application must be furnished or the application will not be considered by the State Board of Education.

3. County Clerk's Certificate (Exhibit A), showing the most recent assessed valuation of the district, must be filed with the application.

4. No district has authority to publish Notice of Sale of Bonds without first filing with the State Department of Education complete application for permit to issue bonds, and securing authorization to advertise sale of bonds (Exhibit B), executed by the Commissioner of Education.

5. Conversion of the bond issue to bonds bearing lower rate(s) of interest must be approved by the Commissioner of Education in accordance with the provisions of Acts 95 and 393 of 1941. Such approval will be given on forms provided and will become a part of the transcript of proceedings as Exhibit C.

6. Brokerage or commission for sale of bonds must be approved by the Commissioner of Education on forms provided and will become a part of the transcript as Exhibit D.

7. In addition to the signatures of the president and secretary of the school board, all bonds must be signed by the county treasurer of the county in which the district is administered and the county treasurer must certify that such bonds have been registered in his office before the issue may be signed by the Commissioner of Education.

8. Copy of the legal opinion of the attorney approving the bond issue, circulars offering the bonds of a district for sale, and an official copy of the ballot shall be filed with the Bond Service, State Department of Education, at the time bonds are presented for signature of the Commissioner of Education.

B. The Educational Consultant

Professional educational consultant services will be needed throughout the planning process. This service is especially needed in

evaluating the educational program, the plant survey, developing the educational specifications, choosing equipment, and orientation of the staff. Consultants should have professional training and experience in modern educational theory, the latest teaching methods, school plant planning, and should be familiar with the latest developments in the school curriculum. A written contract should be executed for his service.

C. The Architect

The architect is of much importance to the building program. He should be employed in time to serve as a consultant in planning the educational specifications. A contract should be negotiated between the school board and the architect which clearly defines the obligations of both parties. The architect must have creative skill and should be experienced in designing educational spaces. Supervision, by the architect, to see that plans and specifications are followed is very important.

The following are suggested considerations in selecting the architect:

BACKGROUND OF THE ARCHITECT	Personal integrity Professional training School design experience Relationship with other school boards Size of staff Location of his office
MAKING SELECTION	School administrator and board interview each interested architect Narrow the field down to a few firms Visit and observe schools designed by architects being considered Check references and interview each architect now on the list Make final selection by official board action Be certain all parties concerned understand terms of contract

D. The School Attorney

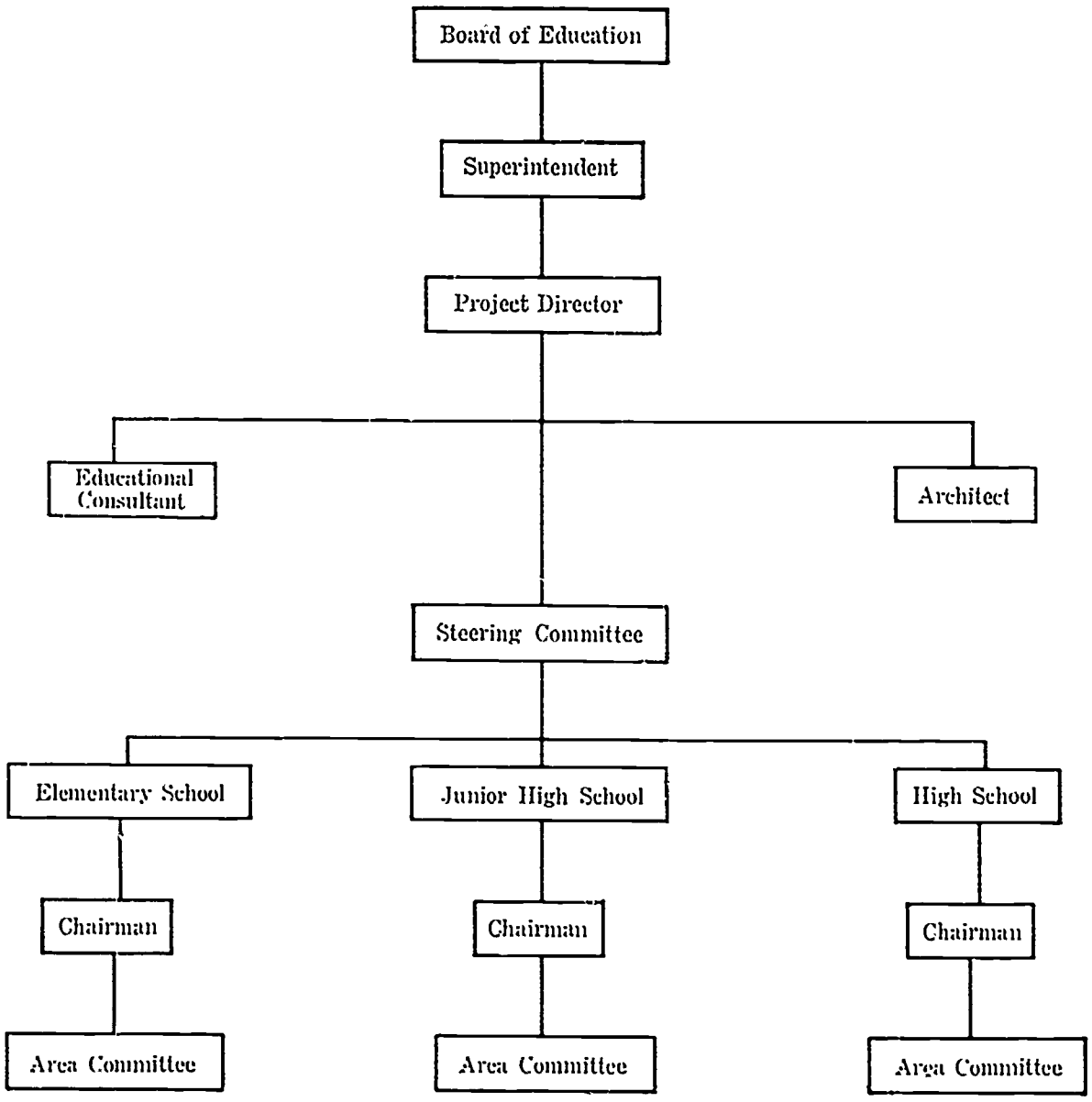
Most school districts have the services of a legal consultant. The attorney will be needed many times during the building program. Legal advice will be needed on bond elections, selling school bonds, validating land titles, reviewing contracts, and many other legal matters. A written contract should be executed for his service.

E. Educational Specifications

1. Organization And Planning

A major aspect of any school building program is the preparation of the educational specifications. Educational specifications may be described as the educator's written description of what is to be housed in the new school plant. All phases of the educational program, including related activities, should be included. These specifications are used by the architect as a base to design an adequate school plant.

The board of education and the school administrator are responsible for the preparation of the educational specifications. Importance should be placed upon the fact that each community and school have special needs and aspirations. The cooperative committee approach seems to produce good results. The educational consultant, the architect, administrative staff members, teachers, lay citizens, and students should take part in the study. The following chart is one example of an organization for making this study:


Board of Education
Superintendent
Project Director
Educational Consultant
Architect
Steering Committee
Elementary School
Junior High School
High School
Chairman
Chairman
Chairman
Area Committee
Area Committee
Area Committee

The project director and the chairman for each school should be experienced educators and forceful organizers. The project director should be provided with an adequate clerical staff. The majority of the steering committee should be educators with broad knowledge in public education. Area committees should include experienced teachers in the area.

The following topics may help in determining elementary area committees:

Primary
Intermediate
Food services
Assembly - multi-purpose
Administrative
Art
Music
Physical education
Guidance
Special education
Site planning - play areas, pupil transportation, parking, service drives, and relationship of spaces
Storage and work space for custodians and maintenance personnel
Teacher planning and work space
Library and materials center

A junior high planning group may include committees working in the following areas:

Administration
Art
Assembly - dramatics and language group instruction
Food services
Language arts
Social studies
Mathematics
Science
Foreign languages
Teacher planning and work space
Guidance
Industrial arts
Library and materials center
Homemaking
Music
Physical education
Special education
Student activities
Site planning - pupil transportation, parking, service drives, and relationship of spaces
Storage and work space for custodians and maintenance personnel

A high school planning organization may find need for considering the following areas:

Administration
Agriculture
Art
Assembly - dramatics and large group instruction
Business education
Food services
Guidance
Language arts
Health, physical education, and driver education
Homemaking
Industrial arts
Foreign languages
Social studies
Mathematics
Science
Library and materials center
Music
Site planning - pupil transportation, parking, service drives, and relationship of spaces
Special education
Student activities

Storage and work space for custodians and maintenance personnel

Teacher planning and work space

Vocational and technical

2. Suggested Outline For Educational Specifications

The following outline of educational specifications may offer suggestions in organizing the document:

I. Introduction

A. Philosophy and Objectives of The School Program
B. Administrative Organization of The School
C. Number and Nature of Pupils
D. Accreditation Information
E. Building Budget

II. School Site

III. Administrative And Related Areas

IV. General Educational Areas

V. Special Educational Areas

VI. Multi-Purpose Areas

VII. Auxiliary And Service Areas

VIII. Total Estimated Space And Special Relationships

IX. Suggested Construction Materials And Types Of Construction

C. Writing The Educational Specifications

The following is an example of an outline which an area committee might follow in writing its report.

I. Philosophy, Objectives, And Trends Of The Area

II. Students And Activities

A. Students

1. Class size and trends
2. Ages
3. Other

B. Activities

1. Student activities
2. Teacher activities
3. Methods of teaching

III. Educational Materials And Furnishings

A. Materials

1. Reading
2. Audio-visual
3. Other

B. Furniture

1. Regular
2. Special
3. Built-in

IV. Equipment, Utilities, And Storage

A. Equipment

1. Audio-visual
2. Built-in
3. Other

B. Utilities

1. Electrical
2. Fuel
3. Communications
4. Water
5. Sewage

C. Storage

1. Room storage
2. Central storage

V. Environment

A. Visual

B. Sonic

C. Climatic Control

D. Perceptual

VI. Safety Factors

A. Warning System

B. Exits

C. Fire Prevention

D. Traffic

E. Other

VII. Space

A. Estimated Space in Each Area

B. Special Spaces

C. Flexibility

D. Number of Spaces Needed

E. Relationship to Other Areas

F. Suggested Construction Materials

F. Building Plans And Specifications

The educational specifications and other information gained in the planning process will give the architect much needed information. Preliminary drawings may be used to determine the general style of architecture and will also give the board of education a realistic estimate of cost. All personnel concerned in the planning process should review these plans. Preliminary and final plans should be submitted to the School Plant Service, State Department of Education, for suggestions.

Final plans and specifications are very technical in nature and are the responsibility of the architect. However, the architect will need the cooperation of all educators involved in designing all areas. The board of education will approve the final plans and specifications after a thorough review. The following outline is suggested for making this review:

SITE	Grading and landscaping Location of buildings Location of walkways and driveways Location of parking areas Location of outdoor instructional areas Location of future expansion areas
CONSTRUCTION	Types of design Types and quality of materials Processes and quality of construction Fire rating Safety control Utilities
INSTRUCTION AND RELATED AREAS	Sizes Built-in equipment Types and quality of finishes Lighting Climatic control Acoustic control Types of openings and hardware Space relationship

G. Codes, Laws, And Regulations

The board of education should require the school attorney and the architect to certify that all codes, laws, and regulations are being followed before construction starts on a school building.

City building codes must be followed. In areas where there are no building codes, it is common procedure for the architect to follow the **Southern Standard Building Code.**

Codes, laws, and regulations related to school buildings are as follows:

Codes

Southern Standard Building Code, Southern Building Code Congress, 1116 Brown-Marx Building, Birmingham, Alabama 35203.

National Building Code, American Insurance Association, 120 South LaSalle Street, Chicago, Illinois 60603.

Arkansas State Plumbing Code, Arkansas State Board of Health, Little Rock, Arkansas 72201.

Arkansas Fire Prevention Code, Fire Marshal Section, Arkansas State Police, Little Rock, Arkansas 72204.

National Electrical Code, National Fire Protection Association, 60 Batterymarch Street, Boston, Massachusetts 02109.

State Laws

The School Laws Of Arkansas, 1962 Edition, State Department of Education, Little Rock, Arkansas 72201.

Supplement To The School Laws Of Arkansas, 1963, 1965, 1967, State Department of Education, Little Rock, Arkansas 72201.

Rules and Regulations

Rules And Regulations Pertaining To Private, Public, And Parochial Schools, Arkansas State Board of Health, Little Rock, Arkansas 72201.

Rules And Regulations For Food Service Establishments, Arkansas State Board of Health, Little Rock, Arkansas 72201.

Rules And Regulations Governing Boilers, Arkansas State Department of Labor, Little Rock, Arkansas 72201.

H. Bids And Contracts

Advance planning should be accomplished by the school attorney, the architect, and the school board to insure that legal requirements are complied with on such matters as advertising for bids, insurance carried by all parties concerned, bid and performance bonds, contracts, building codes, laws, and regulations.

Advertising should be of such coverage that all competent contractors are advised of the impending construction. Ample time should be allowed for contractors to study plans and specifications.

Bids are opened at a school board meeting with a quorum of the board present. The architect will consult with bidders and the board on the plans and specifications. The decision of awarding the contract is a school board responsibility. This decision is based upon what the board considers to be the best bid, not necessarily the lowest bid. Ability, experience, and financial responsibility of the bidder should be considered. A contract, meeting legal requirements, should be signed after terms are explained to all parties concerned.

I. Local Supervision Of The Building Program

A school building program of much size is a complicated undertaking. Supervision by the architect does not mean that he will be on the site at all times. Some supervision and many administrative details should be taken care of by the school administrator to protect the interest of the school district. The school maintenance supervisor or school engineer is sometimes used as a representative of the school administration. A clerk-of-the-works, with special construction knowledge, is sometimes employed. The school representative should deal directly with the architect.

J. Payment For Services And Construction

Payment for the services of the architect, attorney, and the educational consultant should be made according to the written contract. The architect should guide the board of education and school administrator in making payment for construction or remodeling.

IV. COMPLETION AND OCCUPANCY OF THE NEW PLANT

A. Selection Of Furniture And Equipment

The school administrator is responsible for seeing that proper furniture and equipment are selected. Advanced planning must be accomplished as information will be needed for the building budget and the architect will need information on fixed equipment in preparing building plans and specifications.

The committee approach is good for choosing the type of furniture and equipment. Each committee should review the written description of the educational program and the educational specifications. Advice from the educational consultant should be available. The committees should see displays of modern furniture and equipment and consult with other educators who have had the experience of choosing and using school furniture and equipment in recent years.

The type of furniture and equipment should be chosen and specifications written. Care should be taken in writing specifications so that competitive bids will not be restricted. The date for letting bids should be planned so that delivery may be scheduled when needed.

B. Final Inspection And Acceptance

A preliminary inspection should be made by the architect and the contractor, well in advance of the final inspection, so the contractor will have time to correct any defects noted. The contractor should be responsible for removing rubble and unused materials from the site. Furniture should not be moved into the building or any use made of the plant before the final inspection.

The final inspection should be made by the architect, the contractor, members of the board of education, the school administrator and the school maintenance supervisor. A detailed inspection should be made by using a check-list based upon final plans and specifica-

tions. If defects are found, final payment and acceptance should be delayed until corrections are made. Operational instructions and warranties on all mechanical equipment should be delivered to the school administrator. The date and time of the final inspection and acceptance should be recorded in the minutes of an official meeting of the board of education.

C. Inservice Orientation Of Staff

An inservice orientation program is desirable for all personnel who will use the new plant in order to get maximum use. Planning specialists and representatives from companies furnishing equipment should be used in this training program.

Staff members who have taken part in preparing the educational specifications will have many advantages in the initial use of the building. Faculty members and employees not familiar with the new plans will need some training to become familiar with the new program. All personnel who operate or maintain machinery or equipment will need to be trained for these duties.

D. Dedication

A good dedication program is a public relations tool that should not be overlooked. Local tax paying citizens will be interested in seeing and hearing how tax funds are being spent. A good improvement program can be presented to the public in such a way that future improvements will meet good reception.

The dedication program should include the personnel involved in planning the new plant. Printed information describing the facility and the cost should be presented to the public. An open house, with guided tours through the new plant, is desirable.

APPENDIX A

SCHOOL SITES

Much planning should go into the selection of the school site. The location, size, and beauty of the school site are of much importance to the educational program of the future. The trend is for larger areas for buildings, outdoor teaching areas, playgrounds, and parking areas. Periodic surveys are advisable so that the school district may project its plans into the future. Real estate near a school is soon occupied, and for this reason it is advisable to acquire enough space for future growth with the initial purchase. Growth trends should be studied in order that sites may be purchased before development is fully accomplished in a given area.

The school site should be near the center and accessible to the population to be served. Utilities needed should be available at reasonable cost. Elevation, drainage, and subsoil should be studied. The environment of the area, future growth of highways, factories, and commercial firms should be considered.

Elementary School Site

The minimum size for the elementary school site is ten acres plus one acre for each one hundred students. The number of students should be based upon projected maximum enrollment. Wise planning might call for additional space added to these minimum figures to provide for community use of school facilities and unforeseen changes in future educational planning.

Junior High School Site

The minimum size for the junior high school site is twenty acres plus one acre for each one hundred students. The number of students should be based upon projected maximum enrollment. Wise planning might call for additional space added to these minimum figures to provide for community use of school facilities and unforeseen changes in future educational planning.

Senior High School Site

The minimum size for the senior high school site is thirty acres plus one acre for each one hundred students. The number of students should be based upon projected maximum enrollment. Wise planning might call for additional space added to these minimum figures to provde for community use of school facilities and unforeseen changes in future educational planning.

Junior-Senior High School Site

Many small and medium sized school districts prefer the combined junior-senior high school organization. The size of the site for such a school should be the same as planned for the senior high school.

APPENDIX B

SPACE GUIDELINES

These minimum space areas are presented only to indicate trends in the various areas of the school. The State Department of Education encourages the local school district to develop educational specifications at the local level. These are suggested **minimums** only. The local school district should develop space areas based upon the local situation.

Administrative Facilities

The office area in a school is of growing importance and much thought should go into the planning. The appearance and efficiency of this area, in many cases, will give the public a good or an unfavorable impression of the school. A central location is important. A look into the future is good, as in many cases, more space will be needed because of expanding services.

The guidance area should be separate from the principal's office but near enough to correlate the guidance activities with the total school program. A location near the flow of student traffic is good.

The following are some suggested minimum space standards for administrative areas:

Elementary School (540 students - 18 teaching stations)

Reception area	140 to 160 square feet
General office	150 to 200 square feet
Principal's office	120 square feet
Conference area	300 square feet
Health clinic	400 square feet
Teachers' lounge	200 square feet
Workroom and storage area	300 square feet
Guidance area	580 square feet (Office 120 sq. ft.; reception 100 sq. ft.; testing 360 sq. ft.) (Testing space may be omitted if another suitable area is located nearby.)

High School (500 students - 20 teaching stations)

Reception area	150 to 200 square feet
General office	200 to 300 square feet
Principal's office	140 square feet
Other administrative personnel	120 square feet per office
Conference area	300 to 400 square feet
Teachers' lounge	200 to 300 square feet
Workroom and storage area	250 to 400 square feet
Health clinic	400 square feet
Guidance area	640 square feet (Office 120 sq. ft.; reception 120 sq. ft.; testing 400 sq. ft.) (Testing space may be omitted if another suitable area is located nearby.)

Board of Education

The trend in building office space for the board of education is to locate away from the busy traffic of the school. Consultant service may be needed as much depends upon the local situation and administrative policies of the school district.

The areas listed below are suggested minimums:

Reception area	200 to 300 square feet
General office	200 square feet
Superintendent's office	150 square feet
Office for other administrators	140 square feet (as many as needed)
Office for supervisor	140 square feet (as many as needed)
Board room	350 square feet (larger if needed)
Conference room	350 square feet (larger if needed)
Storage	300 square feet (larger if needed)

Auditorium

Every school needs an assembly area, however, school men very often find it necessary not to build auditoriums because of their cost. The usefulness of auditoriums during recent years has been increased by the use of movable, soundproof walls to divide the space into teaching areas. Some auditoriums have been designed to accommodate music programs and dramatics, thus enabling the school to put at least a part of the building into daily use. Others may have the seating area divided into lecture areas to insure greater utilization of space.

Some of the uses of an auditorium are:

1. Large assemblies
2. Large group instruction
3. Music performances by band, orchestra, and choral groups
4. School theatrical productions
5. Large group testing
6. Pep rallies
7. Lectures
8. Various community uses
9. Science fairs, art exhibits, etc.
10. Study halls

It is doubtful if an auditorium seating over 600 people can be justified, however, many times community needs mandate a seating capacity of not less than 1000 people. In planning the space for seating, an allowance of 7 square feet per person should be used. The maximum width of a seating section should not be over 14 seats; no seat should be more than 7 seats from an aisle.

The following suggestions are given for basic consideration in planning an auditorium that will seat approximately 600 people and serve the functions that have been listed.

The facility should be designed so that it can be utilized by the entire school. The size of groups may vary from 50 to 500 or 600 people. The arrangement of space, the acoustical treatment, and sight lines within the space must accommodate the variety of groups that will use the space for the various functions outlined above.

Space Guidelines

Type of Space	No. of Rooms	Unit Size	Total Space
Lecture area	2	1250	2500
Lecture area	1	2500	2500
Gallery and lobby area (with audio-visual cord above)	1	1000	1000
Standard proscenium stage (including off-stage areas)	1	3000	3000
Storage for stage properties	1	600	600
Scenery workshop	1	400	400
Stage dressing rooms	2	200	400
Public toilets	2	150	300
Ticket office	1	100	100
Concessions	1	120	120
General storage	1	150	150
		Net Total Space	11070

Description Of Facilities

The following provides a brief description of the auditorium facilities:

1. Assembly area

   This area should be divided into three spaces, two of which should seat 125 students each and one should seat 250 students. Floors should have minimum slope to provide adequate sight lines to the stage. Seating should be upholstered auditorium chairs with fold-down tablet arms. Public address systems are an essential part of the special requirements of this area.

2. Gallery and lobby area

   This area should be planned to accommodate circulation into the seating areas. Wall areas should be planned to serve as exhibits and display space for science fairs, art exhibits, and similar functions.

3. Standard proscenium stage

   The stage should be about 50 feet wide and 40 feet deep. This will seat a band or orchestra of approximately 110-115 pieces. An additional off-stage area of approximately 1000 feet should be included in the wings of the stage. The off-stage area must accommodate the switchboard and other permanent features as well as the area to handle personnel, scenery and equipment for concerts, operettas, and plays. It should also accommodate stage sets for musical and theatrical performances. Special lighting and ventilation requirements must be considered.

4. Storage for stage properties

   A large room adjacent to the stage is needed for the storage of stage properties. An open, roughly finished room can serve this purpose.

5. Scenery workshop

This area should be a large, roughly finished space for the construction of scenery and stage properties. Electrical outlets are needed on all walls. Such equipment as table saws, band saws, hand saws, hammers, paint brushes, etc. will be used to construct stage scenery and props.

6. Stage dressing rooms

Dressing and toilet facilities should be provided backstage for the benefit of those involved in rehearsal and production-type activities. Dressing rooms should have a sink, counter make-up tables, and running water. Electrical outlets and good lighting are essential.

7. Other rooms

Public toilets should be provided to meet sanitary regulations. A small enclosed ticket office should be installed in the lobby area convenient to the entrance to the auditorium. A concessions stand, equipped with a stainless steel sink, a sales counter, a work counter, electrical outlets, and a pull down enclosure to secure the area, should be provided. A general storage room is also needed to handle miscellaneous storage.

Bus Garage

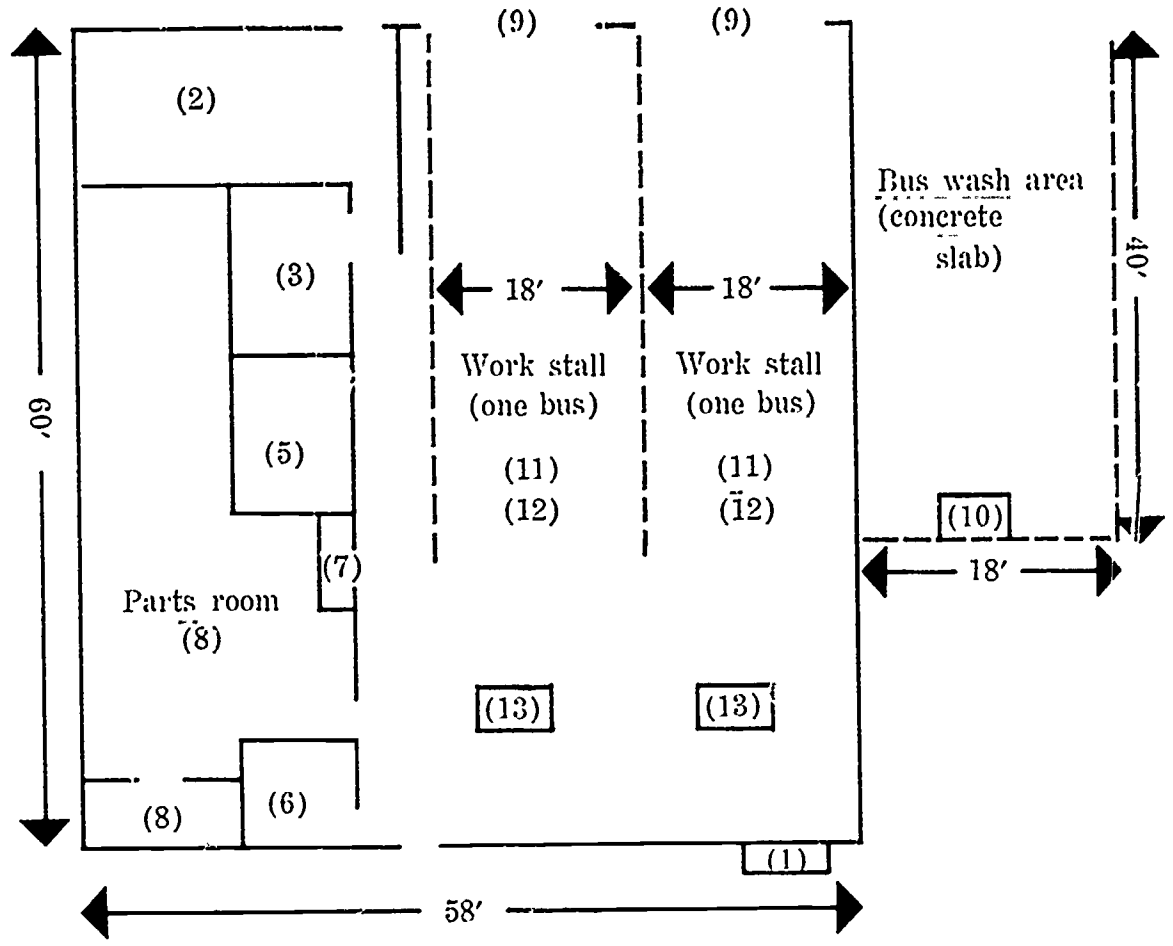
School districts with eight or more school buses will find it profitable to have its own mechanical and maintenance program. One skilled mechanic and one helper can usually maintain up to twenty buses. Larger fleets will require additional mechanics.

The bus garage should be located away from student traffic. The garage area should be fenced with enough enclosure for parking all buses. The gasoline pump, storage tanks, and an air hose need to be located away from the garage for safety and to prevent interference with work in the garage. An outside area is also needed for washing buses. Provisions should be made for hoists and exhaust outlets in work stalls.

The following are suggested areas for a garage that will accommodate up to twenty buses:

Mechanic's stalls (2) (doors 12′ x 12′)	2160	square feet
Parts room	796	square feet
Conference and driver waiting room	234	square feet
Machine shop	100	square feet
Toilets (2) (both men and women)	96	square feet
Office	80	square feet
Lubrication storage	14	square feet
Total	3480	square feet

A suggested garage plan:



(1) Air compressor
(2) Drivers' waiting room and meeting room, 13′ x 18′
(3) Toilet, 6′ x 16′ (This area may be divided if women bus drivers are employed.)
(4) Portable work bench
(5) Enclosed machine shop, 10′ x 10′
(6) Office, 8′ x 10′
(7) Lubrication storage, 2′ x 7′
(8) Heating plant and parts room, 796 square feet
(9) Garage doors, 12′ x 12′
(10) Special drain in work area with dirt trap
(11) Ceiling in work stall area should be 16 feet in height.
(12) Provisions should be made for hoist in work stalls and exhaust outlet system.
(13) Gasoline pump and storage tanks should be located away from the garage.
(14) Area should be fenced with enough enclosure for parking all buses.

Food Services

Space for food services should be located on the ground floor with access for delivery and pick-up separate from playground areas.

Since kitchens do not lend themselves to expansion, the food preparation area should be planned with the ultimate participation in mind. School

policies should also be studied. For example: Is a closed campus contemplated in the future? Such policies influence participation.

The final arrangement of equipment should be provided in the layout for future equipment in order that space may permit expansion. The necessary utility outlets need to be provided in the original plan.

Food service committees, in planning with architects, should give thought to the important considerations listed below:

KITCHEN AREA	Flow of work Aisle allowances Ventilation Prevention of odors in classes and corridors Floor finishes Wall finishes Adequate hot water
STORAGE SPACE	Dry storage Refrigerator Frozen food
DINING AREA	Flow of traffic Acoustical treatment Aisle allowances Ventilation Need for two serving lines Use of dining area for other purposes Floor finishes Wall finishes

The use of consultative services should be used in planning the food service department.

	Total Lunches Served Daily			
	100-200 Sq. Ft.	200-350 Sq. Ft.	350-500 Sq. Ft.	500-750 Sq. Ft.
Receiving area:				
Loading platform	60	60	100	160
Receiving area inside building	48	60	60	80
Dry food storage area*	100	175	250	375
Nonfood storage area	24	40	60	80
Kitchen area	500	875	1250	1875
Serving area	200	350	500	750
Dishwashing area	180	180	210	210
Maintenance area:				
Garbage area	48	48	60	75
Trash area	--	--	30	40
Mop area	24	24	40	40
Office area	60	60	60	60
Locker and toilet area for employees	33	48	60	76
Kitchen and service areas	1277	1920	2680	3821
Dining area, based on two seatings daily	1200	2100	3000	4500
Gross recommended areas	2477	4020	5680	8321
Area per lunch served	12.4	11.5	11.4	11.1

Maintenance And Custodial Storage And Service Areas

These areas are inadequate in many schools. Much better service is usually rendered when adequate workroom and storage space is available.

Central Maintenance And Storage

Central maintenance and storage areas in many Arkansas school districts are located on the high school site. Some larger school districts have these areas, as well as the central administrative area, located away from the school campus. The size and location of these areas depend upon the size of the school district and its policies on purchasing supplies and building maintenance. The following areas are suggested for school districts with enrollments of one thousand to fifteen hundred students where plant maintenance is under the supervision of school employees:

Central storage and receiving	600 square feet
Central maintenance workshop	700 square feet
Office	120 square feet
Toilet and shower	150 square feet
Total	1570 square feet

* Based upon two weeks supply of food. This space will need to be increased if larger quantities are purchased.

Larger school districts might need to increase these areas and consider other areas for the following:

Storage for furniture and books
Storage for paint and lumber
Garage and fuel for school trucks
Storage for lawn mowers and other equipment
Parking area for employees

Custodial Storage And Work Areas For Elementary Schools

The following areas are suggested for elementary schools of four hundred to six hundred students:

Central storage and work area	350 square feet
Custodial service rooms (one room for each 8000 to 10,000 sq. ft. of building space)	60 square feet

Custodial Storage And Work Areas For High Schools

Much depends upon the size of the school, policies on buying and maintenance, and the location of the central storage and maintenance areas. The following areas are suggested for a high school of five hundred to one thousand students:

Central custodial storage and work area	400 square feet
Custodial service room (one room for each 8000 to 10,000 sq. ft. of building space)	60 square feet

Art

Elementary School

The special art room is ideal for elementary school art, however, it is a general practice in Arkansas elementary schools for art to be taught in the regular classroom. A good art program will call for more tackboards than are usually installed in the regular elementary classroom. The sink and counter, as installed in the contemporary classroom, are needed. A central art service room is needed. This room should be 200 to 400 square feet in area and should be equipped with a sink, work counter, storage shelves, drying area, and art carts for transporting supplies to the classrooms.

High School

Art instruction on the secondary level suggests a special room of 1800 square feet in area. The room should be located on the ground floor and should have an outside entrance. The room should face north to take advantage of natural light and preferably should be near the auditorium. A storage area of not less than 100 square feet is needed for expendable supplies. Another storage area of similar size is needed to store unfinish-

ed art projects. Sinks, a clay working area, work counters, and display areas are also needed. Furniture and equipment should be chosen with care and a mechanical exhaust system is desirable.

Consultative services should be used in planning this area.

Business Education

Developments in the field of business cause educators to be aware of the need to change the approach of presenting business skills in the high school. It seems that consideration should be given to job opportunities that are available in the community and the need for a general background in business courses for students who plan further study in this field.

The following spaces are recommended for business education:

Typing	1200 square feet
Office practice	1200 square feet
Bookkeeping	900 square feet
Storage area (each teaching area)	60 square feet

In a small high school, a combination room for typing, bookkeeping, and shorthand might be more functional. A partial partition might be installed to separate the space devoted to typing instruction from the other areas. If this procedure is followed, 900 square feet of space is recommended for typing and 600 square feet of space is recommend for bookkeeping and shorthand instruction.

Elementary

Some school authorities think that primary classrooms should be self-contained. If this is desirable, the classroom should be approximately 1000 to 1100 square feet in area to accommodate the toilets. If central toilets are provided, the classroom may be 900 square feet in area. A storage space of 60 to 100 square feet, equipped with a sink and work counter, should be provided. A drinking fountain may be desirable. Special attention should be given to chalkboard, tackboard, and provisions for audio-visual aids.

Upper elementary rooms should be at least 900 square feet in area. In common practice these rooms are not self-contained but should have a sink and drinking facilities. Folding or movable partitions between some areas should be considered in order to combine groups for team teaching, semi-departmentalization, or other large group activities. Sixty to 100 square feet of space will be needed for storage. Special attention should be given to chalkboard, tackboard, and provisions for audio-visual aids.

Gymnasium

The high school gymnasium should be planned for a good health and physical education program as well as for interscholastic sports. Equipment such as roll-away bleachers and folding partitions or dividers is suggested in order to have more space for physical education. The classroom area may be reduced in size if proper provisions are made for health

instruction in another area of the school. (See section on Health, below). Forced ventilation is recommended for the dressing rooms and the playing area.

The areas listed below are suggested minimums to be considered in planning the new gymnasium:

Basketball court (court 50′ x 84′ with 8′ on each end and 6′ on each side for safety)	6200 square feet
Seating (500 spectators - for additional seats add 4 sq. ft. per seat)	2000 square feet
Lobby (ticket office, concession, toilets - more space needed for larger seating)	600 square feet
Physical education dressing rooms (20 sq. ft. per student in largest class) 2 @1000 sq. ft.	2000 square feet
Dressing rooms for sports	1000 square feet
Physical education health classroom (40 sq. ft. per student in largest class)	1200 square feet
Physical education activity room	1200 square feet
Office and storage	700 square feet
Total	14900 square feet

Health

Elementary School

The self-contained room for primary grades is acceptable for health instruction. Intermediate classrooms are acceptable but should have drinking and hand washing facilities in each room. Portable teaching laboratories should be available. Storage space should be available for adequate teaching aids for health instruction.

High School

The health instruction room should be based upon 40 square feet per student in the largest class. The room needs to be larger than the regular classroom in order to accommodate a laboratory-demonstration table and a regular teacher's desk for flexible teaching situations. Provisions should be made for the use of audio-visual aids as well as storage for teaching aids and materials. An area will also be needed for displays and exhibits. This classroom may be located in the gymnasium.

Home Economics

One-teacher units should have a minimum of 2400 square feet in area. Consultative services should be used in planning the department. The trend is for this department to be located in the main building but accessible to the playground, adult classes, and for delivery of supplies and equipment.

The following are suggestions on kitchen units:

Each unit should be 100 to 120 square feet in area.

Diversification needs to be used in cabinets, appliances, utilities, storage, and arrangements. Provisions should be made for exhaust fans, electrical outlets, and hot water supply. Four kitchen units are needed if the largest class is sixteen students; five units are needed if the largest class is twenty students; and six units are needed if the largest class is twenty-four students.

The following information concerns the laboratory and living areas:

Open arrangements for the laboratory and living areas provide for flexible use. The washer and dryer should be located in the laboratory. Special attention should be given to lighting, electrical outlets, chalkboard, tackboard, bookshelves, and display areas.

Other areas needed are as follows:

Office	100 square feet
Powder and fitting room	100 square feet
Tote tray area	10 to 24 square feet
Hanging space for garments (2 areas)	50 square feet
Shelves for books and magazines	8 square feet
Storage for brooms and mops	10 square feet
Storage for other equipment	60 square feet

Industrial Arts

The following space allotments are recommended as a guide in establishing total work and auxiliary service areas for one teacher to accommodate a class of 25 students.

The space recommendations are general. The space requirements will vary according to subjects taught, size of class, shape of shop, size of equipment, etc.

Work area	1200 square feet
Planning area and classroom	750 square feet
Storage (supplies)	270 square feet
Storage (projects)	210 square feet
Finishing area	220 square feet
Toilet and lavatory	150 square feet
Total	2800 square feet

Other space recommendations for shop training:

Facility	Minimum Sq. Ft.	Sq. Ft. Per Student
Automechanics, advanced	3000	150 to 180
Automechanics, elementary	2000	100 to 120
Cabinet making	2000	100 to 120
Carpentry, advanced	2500	125 to 150
Carpentry, elementary	2200	110 to 125
Electrical science room	800	40 to 50
Electricity, trade	2400	120 to 140
Industrial electronics	2000	100 to 120
Plumbing	2000	100 to 120
Practical nursing	2000	100 to 120
Radio and television mechanics	2000	100 to 120
Refrigeration, air conditioning	2000	100 to 120
Sheet metal	2000	100 to 120
Trade drawing	800	40 to 50
Trowel trades	2500	125 to 150
Upholstery	2000	100 to 120
Welding	2000	100 to 120

Language Arts

The general objectives of the language arts program fall into at least two inter-related categories, the skills area and the content area. The skills area includes reading, writing, speaking, and listening. Spelling and penmanship may be considered as a part of writing. The content of the language arts program is defined as language study, composition, and literature.

The purpose of training students in language arts is to assist them to do reflective thinking and to communicate effectively as well as to appreciate the humanistic values of our literary heritage.

The following spaces are recommended for language arts:

English, speech, and drama (includes a small stage)	1000 square feet
Journalism (includes 250 sq. ft. of publication work space)	1000 square feet
Storage space (each teaching area)	50 square feet

Library

Elementary School

Minimum space areas for the elementary school library should be as follows:

Reading room	900 square feet
Office, workroom, and storage	300 square feet

The area devoted to the reading room should be increased to 1200 square feet whenever the elementary school enrollment approaches 18

teaching stations. Schools planning to convert other areas into library space should consult with the library consultant and the School Plant Service of the State Department of Education.

High School

Minimum space areas for libraries on the secondary level should be as follows for schools with enrollments up to 400:

Reading room	1200 square feet
Office area	120 square feet
Conference room	120 square feet
Workroom	200 square feet
Storage	200 square feet
Total	1840 square feet

Schools with enrollments in excess of 400 should increase the size of the reading room by 300 square feet for each 100 additional students and spaces for auxiliary services will need to be increased accordingly. The size of the storage room may also need to be increased depending upon the school district's policy on instructional equipment and materials.

A more functional library will include one or more rooms or space for each of the following:

1. A library classroom; in elementary schools, a room for story telling
2. Teachers' professional materials library, with accommodations for seating
3. Listening and viewing room
4. A center for preparing instructional materials
5. Textbook storage
6. Printed materials storage
7. Department libraries
8. Storage for library materials in classrooms
9. Storage for library materials in special service areas
10. Study carrels

Furniture and equipment in the library should accommodate the program of library service, suit the physical stature of the people who use the library, and fit the space available.

Mathematics

A comprehensive program of mathematics instruction may require facilities of a laboratory in addition to regular classrooms with the usual type of equipment. The laboratory is usually described as a special classroom of approximately 1000 square feet supplied with an abundance of specialized materials and equipment for teaching mathematics. The following suggestions may be helpful in planning a mathematics laboratory:

1. Teaching space

a. Furniture and equipment

(1) Movable furniture of the table-type desk to accommodate a maximum of 30 students should be provided. The student table should be approximately 20 inches by 40 inches with a tilted top and three shelves on one side. The desk should be equipped with the "flop-top" desk top with the log and trigonometry tables on one side and the metric and polar grids on the other. The non-tilted part of the desk top should have painted on it squares, square roots, cubes, cube roots, and formulas.

(2) The portable demonstration table should contain a sink and water supply. It should be 24 inches by 48 inches by 30 inches and should contain a four-shelf cabinet with sliding doors.

(3) A teacher's desk, 30 inches by 60 inches by 29 inches high, equipped with a deluxe overhead projector complete with polarizing spinner, two straight back chairs, and one four-drawer legal size filing cabinet should be provided.

b. Teaching aids

(1) A maximum of slate chalkboard. The students should face the longest wall of the room and a wall-length chalkboard should be mounted there. A rectangular-grid, 42 inches by 48 inches, with one inch squares, should be painted on one end of this chalkboard and a polar-grid, also 42 inches, with two inches between circles should be painted on the other end. If the length of the chalkboard doesn't justify this arrangement, each type of grid may be painted on two separate chalkboards.

(2) A tackboard, 42 inches by 84 inches, should be available.

(3) A permanent screen, 60 inches by 60 inches, tilted at an angle 25° with the vertical, should be mounted above the longest chalkboard in the center of the longest wall.

c. Storage

(1) A closed locked storage cabinet, 7 feet by 5 feet by 2 feet, should be provided. The bottom shelf should have a two-foot clearance and the remaining shelves should be movable. It should have a vertical space on one side fifteen inches wide and the height of the cabinet.

(2) Sixteen feet of movable, open bookshelves, 12 inches high and 12 inches deep, should be provided.

Modern Foreign Languages

The trend is for more modern foreign languages to be taught in public schools. A classroom of 1000 square feet will meet the needs of most schools. Much depends upon teacher preference and the number of students involved. Special care needs to be taken in selecting equipment, especially if the room is to be used for other classes. Special attention should be given to storage and utilities needed.

The following information is provided as a basis for planning a language laboratory:

1. Teaching space

   a. Furniture and equipment

      (1) Provision should be made for thirty student positions (electronic listen-respond language laboratory booths). Booths should measure approximately 30 inches wide and 26 inches deep with dividing side walls approximately 24 inches high and glass fronts 18 inches high. Booths should be constructed of acoustical material. Each booth . ould contain one set of earphones, one audio-active microphone, one selector switch and one volume control dial. Each booth should contain a flat desk-like surface for writing and a chair.

      (2) Teacher's equipment should include a complete console for an electronic language laboratory. The console should contain a minimum of four 4-track tape decks and one disc record player. The entire console should be mounted on a raised platform approximately 24 inches high and 8 feet deep and should run the width of the laboratory.

      (3) A soundproof recording booth is needed for making original tape recordings for use in the language laboratory. The recording booth should measure approximately 5 feet by 5 feet and should be equipped with a 4-track tape recorder, a ribbon microphone, a reading easel, and a wall clock. Not over two people will be in the booth at one time.

      (4) Wiring for electronic equipment can be 110-115 volts.

   b. Teaching aids

      Teaching aids for the laboratory should include commercially produced pre-recorded tapes, teacher recorded tapes, phonograph recordings, films, filmstrips, foreign language texts, maps, globe, photographs, and objects of realia.

   c. Storage

      The laboratory should have storage cabinets in which teaching aids can be locked. Shelving in storage cabinets should be

approximately 30 inches wide, 16 inches deep, and 12 inches high. Four shelves of this size are recommended. In addition, there should be two enclosed shelves which measure approximately 30 inches wide, 16 inches deep, and 15 inches high for storing larger materials.

Music

Elementary School

A special music room should be provided if the elementary school is to have a good music program. This room should be at least the size of a regular elementary classroom and possibly larger. Special attention should be given to location of the room, soundproofing, acoustics, storage, furnishings, and equipment.

High School

A special room is needed for high school vocal music. In some cases, depending upon school size and local interest, this room is also used for general music classes. Space will be needed for seating all members of the largest class, plus about 10 square feet per student for rehearsal area. Special attention is needed in locating the room, soundproofing, acoustics, height of ceiling, ducts for heating and ventilation, and special equipment.

Other areas should be provided as follows:

Music library	80 square feet
Practice room (one or more as needed)	80 square feet
Office and toilet	180 square feet
Storage	150 square feet
Total	490 square feet

Space requirements for the band rehearsal room is about 20 square feet per student enrolled in the band. A high school with 500 students can usually depend upon fifteen percent of the student body to participate in the band program. In larger schools, this percentage drops slightly. In some cases, the band room is also used for vocal music but is usually not satisfactory. In constructing the band room, special attention should be given to the location of the room, utilities needed, special storage problems, soundproofing, acoustics, heating, ventilation, height of ceiling, and furnishings.

The areas listed above are suggested for a high school with 500 students. If the area is to be used for both band and vocal music, more office and library space may need to be added.

Rehearsal room (20 sq. ft. per student)	1500	square feet
Practice room	80	square feet
Practice room (4 @50 sq. ft.)	200	square feet
Instrument storage	200	square feet
Instrument repair room	120	square feet
Music library	80	square feet
Office and toilet	180	square feet
Uniform storage	100	square feet
Total	2460	square feet

Remedial Education

In recent years remedial education has become a part of the school's instructional program, especially in the field of reading.

Some schools provide a laboratory with special equipment and materials for remedial reading. Flexibility is a factor that should not be overlooked in planning this facility.

The amount of space to be devoted to a remedial education classroom will depend upon the school's instructional program. Some schools prefer the type of program that involves only six or eight students at one time. If this should be the case, a teaching area of approximately 240 square feet is large enough. Others prefer a large room which contains about 900 to 1000 square feet of space that will accommodate about 30 students.

Following are some suggestions that may be useful in planning a reading laboratory:

1. Teaching space

   a. Space and equipment

      This space will be divided into two areas. One of these areas will contain 20 study carrels equipped with individual tape recorders, control readers, controlled reader junior, and skimmers. Another area will be equipped with a reading-eye camera, control reader, tachistoscope, a teacher's desk complete with overhead projector, projection screen, desk chair, and six two-student tables with chairs. There should also be a demonstration table, 6′ x 3′, with six chairs, six bookshelves approximately 80 inches long, 10 inches high, and 12 inches deep, two standard four-drawer file cabinets, (one for student folders and one for class records), and a magazine rack to hold twelve magazines the size of **Life Magazine.** Space for a testing station should also be provided.

   b. Teaching aids

      A minimum of two chalkboards (minimum of 16 feet or as much as wall space will permit) and a tackboard (10 linear feet) should be installed.

c. Storage

Fixed, closed cabinet space with lock approximately 10 feet by 6 feet with shelves 21 inches deep and 21 inches high should be provided.

d. Utilities

Four to six duplex electrical outlets should be placed to provide electrical service to any part of the room.

Science

More space is needed in this area than in the past. A minimum of 50 square feet per student in the largest class is needed. Space must be allowed for seating, experimentation, demonstration, display, work, and storage. In general, the same amount of floor space should be planned for all science courses on the high school level. A good plan is to have storage areas located between two teaching areas. Special attention should be given to the location of science areas in the building. Special attention should also be given to problems pertaining to science instruction in the following areas: utilities needed, storage, venting, provisions for the use of audio-visual aids and selection, and quality and location of laboratory equipment.

Science Guidelines For The Secondary Schools Of Arkansas and **A Basic Outline Of Science For Elementary Schools,** published by the State Department of Education, Little Rock, Arkansas, are good sources of information on planning science areas.

Social Studies

The purpose of the social studies program is to assist the student in developing attitudes, understandings, and skills for the citizen in a changing democratic society. A teaching station of about 1000 square feet is recommended. Included in this space should be one or two areas for consultation and planning of 50 square feet each and one area of 60 square feet for creative projects. Team teaching is the trend in social studies and a large group instructional area will be needed if this trend is followed.

The following information may be helpful in planning this area:

1. Teaching space

a. Furniture

Provision should be made for 25 to 30 student stations. Single student desks or tables and chairs may be used depending upon teacher preference.

A conventional teacher's desk, a lectern, and a large display table should be provided. Tables and chairs for the planning areas and a sink and work counter will be needed for the project area.

b. Equipment and teaching aids

Provisions should be made for the following:

(1) Twenty linear feet of chalkboard, a small pegboard area, and maximum tackboard area

(2) Portable chalkboard for planning areas

(3) Maps, globes, charts, and felt board

(4) Projection equipment

(5) Tape recorder, radio, and television

(6) Shelving and display racks for newspapers and magazines

(7) Display racks for projects

c. Storage

Provisions should be made for the following:

(1) At least one five-drawer filing cabinet

(2) Storage for maps, charts, and other equipment

(3) Shelving for reference books

Special Education

The special education room should be at least 1200 square feet in area as a variety of arrangements and furnishings are needed. The nature of the students should be considered in locating the room. The area should be a self-contained classroom with toilet areas larger than usual. There is a need for a work counter and sink with hot and cold water. More tackboard area is needed than in the normal classroom. There should be a minimum of 100 square feet of storage space, part of which needs to be enclosed. High windows are suggested to prevent outside distractions.

School districts planning facilities of this type should refer to **Guidebook For Classes In Special Education,** a publication of the State Department of Education, Little Rock, Arkansas. All available consultative services should be used in planning this area.

Vocational Agriculture

A vocational agriculture department with one teacher needs approximately 3000 square feet in area. Two-teacher units should be approximately twice this size including two classrooms, two offices, and one large shop area. Consultant service should be used in planning these facilities.

Vocational Agriculture Mechanic Specifications, published by the State Department of Education, Little Rock, Arkansas, is a good source of information.

Areas for the one-teacher unit are as follows:

Classroom	750 square feet
Shop	1800 square feet
Storage, toilet, and corridors	370 square feet
Office	80 square feet
Total	3000 square feet

Minimum work areas in the shop are as follows:

Welding — 12 feet by 12 feet
Plumbing — 6 feet by 10 feet
Soldering — 4 feet by 6 feet
Cold metal — 6 feet by 6 feet
Concrete — 4 feet by 4 feet
Woodworking — 9 feet by 16 feet
Tool sharpening — 4 feet by 4 feet
Painting and finishing — 10 feet by 14 feet
Electricity — 4 feet by 10 feet
Power machine (woodwork) — 8 feet by 10 feet
Small gasoline engines — 8 feet by 8 feet
Lumber storage rack — 3 feet by 16 feet
Metal storage rack — 3 feet by 16 feet

APPENDIX C

LIGHTING AND FINISHES

Recommended Levels Of School Lighting

Area	Footcandles On Tasks*
Tasks	
Reading printed material	30
Reading pencil writing	70
Spirit duplicated material	
Good	30
Poor	100
Drafting, benchwork	100
Lip reading, chalkboards, sewing	150
Classrooms	
Art rooms	70
Drafting rooms	100
Home economics rooms	
Sewing	150
Cooking	50
Ironing	50
Sink activities	70
Note-taking areas	70
Laboratories	100
Lecture rooms	
Audience area	70
Demonstration area	150
Music rooms	
Simple scores	30
Advanced scores	70
Shops	100
Sight-saving rooms	150
Study halls	70
Typing	70
Corridors and stairways	20
Dormitories	
General	10
Reading books, magazines, newspapers	30
Study desk	70

Recommended Interior Finishes

Lighting

The level of illumination should be in accordance with the latest **I.E.S. Standards.**

* Minimum on the task at any time.

Finishes

Interior finishes should have the following **minimum** reflectance values:

Ceiling	80 percent
Window wall	70 percent
Other walls	60 percent
Wainscot	40 percent
Floors	30 percent
Tackboard	30 percent
Chalkboard	20 percent (maximum)

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