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ABSTRACT

Areas covered by this guide are--(1) ten steps for preparing a building program, from the determination of needs to the purchasing of insurance, (2) recommendations for elementary school sites and criteria for site selection, and (3) facility recommendations, which deal with classroom size and special facilities. (RH)

PRELIMINARY GUIDE
FOR
PLANNING
AN ELEMENTARY SCHOOL
BUILDING PROGRAM

SCHOOL PLANT SECTION
DIVISION OF ADMINISTRATIVE SERVICES
TEXAS EDUCATION AGENCY
AUSTIN, TEXAS

I N T R O D U C T I O N

In response to numerous requests from school boards, superintendents, architects and others for recommendations on planning elementary schools, the School Plant Section, Division of Administrative Services, Texas Education Agency, has compiled the following information.

In many states throughout the nation laws have been passed giving the State Department of Education authority to establish detailed standards of construction and design for school construction within that state. In Texas such is not the case. The Texas Education Agency, School Plant Section, does not have the authority to establish nor to enforce compliance with set standards. Rather, the function of the School Plant Section is to cooperate with other divisions of the Agency in formulating recommendations and suggestions to assist local school boards, superintendents and architects to provide additional or improved school plant facilities for the children of the community. In addition, the School Plant Section conducts surveys of existing school facilities and makes projections of probable student population to assist in determining the future school plant needs of the district.

Most citizens recognize that one of the major concerns of their community is the educational program provided for their children and that all children are entitled to an equal opportunity. Educators cannot do the job alone. The entire community must take an active part in helping to solve the problems of their schools by providing the necessary funds, and by cooperating with their elected school board members and the superintendent in an effort to meet the ever increasing demands on the educational program.

The community must also recognize that if their children are to be "Do-ers" in the classroom and if teachers are to do the best job of teaching, then it is imperative that the community furnish school plant facilities adequate for the instructional program being offered.

One weakness of human nature is the tendency of people to judge the contents of a book by its cover, so it is with schools. Visitors in a community tend to judge the quality of the local educational program by the physical appearance of the school buildings. This can be a very deciding factor in the decision of many people on whether or not they move into a community.

As might logically be expected, the following recommendations will probably be considered as idealistic. However, it is the intent of the School Plant Section, in its attempt to up-grade the quality of all schools in the State of Texas, to make available the latest thinking on adequate sizes and areas of needed or desired spaces. This information will provide a basis from which to start for those inexperienced in school plant planning. Furthermore, it is recognized that not all school districts will be able to include all items contained herein. However, in the belief that all communities desire to have the best educational program and school facilities possible, the following has been prepared to serve as a guide for those who must decide what they can provide in school facilities.

Suggested Procedure of Preparation For A Building Program

1. Determine Needs

Determine what your school is trying to accomplish and what facilities are needed to meet this goal. Do this early enough to avoid putting the school district or any others involved in a "crash" program to meet an impossible deadline.

There has been widespread use of the term "flexibility" in discussing schoolhouse planning with no positive idea of what is meant. It is very important that the administrators have a definite meaning in mind when they ask for flexibility. What kind of flexibility? For what purpose?

2. Develop Educational Program

Develop a detailed and itemized educational program for the new building. This should be as all-inclusive and detailed as possible.

3. Select Architect

Select and make an agreement with an architect. Architects realize that their help is needed long before bond election time and that the board cannot pay for services rendered except from bond money. Most are willing to make an agreement contingent upon passage of the bond issue. Details of the agreement will vary with the community.

4. Select Site

Select a site with the assistance and advice of the architect. Options can save the district money. Do not become tied to a site simply because it has been donated if it does not meet the criteria listed below.

5. Prepare Preliminaries

Give the architect a copy of the detailed educational program so that he can prepare preliminary sketches and estimates for the information and guidance of the board. During this stage the architect should be called upon to explain his sketches and estimates in detail so that all members of the board and the superintendent are fully informed on all elements of design and construction. The architect is not an educator so he needs to be furnished a detailed program on which to establish a design. Most board members are not builders so they need to have the architect fully explain his plans.

6. Inform the Public

Inform the public of the proposed program. With the help of sketches, etc., inform the voting public what is proposed and what is needed to accomplish it. Get as many citizens of the community as possible aware of the problems involved. Form citizens' committees to help solve various problems and to inform the community.

7. Consider Employment of a Bondsman

If members of the administration are not familiar with the requirements of conducting a bond election it is suggested that a professional Bondsman be employed. He is trained to handle all details relating to the calling of a bond election. He can determine the district's bond rating, take care of election details, arrange for printing of bonds, etc., all for a predetermined fee. This service does not give him an advantage in any way when it is time for bonding companies to bid on the bonds.

8. Call a Bond Election

When the board is satisfied with the sketch plans and estimates, knows the district's bonding ability, has determined what funds are available and whether they desire to use them and are convinced that the community has been fully informed and appear to be in favor of the issuance of the bonds, proceed to call the election.

9. Proceed with Plans

After passage of the bond issue, the board should complete a contract with the architect and instruct him to proceed with plans for the building. These plans should be developed in cooperation with the superintendent and such other consultants as deemed necessary. The architect should meet frequently with the school board to keep them informed of the progress of the plans and to advise them of the various details contained in the plans. When all planning problems have been cleared, the architect should complete the "working drawings" and specifications. (Note Paragraph 10 below). The board should then advertise for and receive bids and award the construction contract.

Caution

Do not place limitations on the architect by requiring that the building face the street or that it must be a certain style or shape. This can be detrimental to good school design for the particular site on which the school is to be erected.

10. Get Preliminary Building Insurance Rate

Many school districts have been unnecessarily penalized because the State Board of Insurance gave their new building a lower rate, with the resulting higher premium, than was expected. This situation often happens when the administration depends one hundred per cent upon the architect to know all aspects of insurance rating or when the building is not rated until after it is completed.

To avoid this unnecessary expense, which will continue for the life of the building, the following procedure is recommended:

a. The Administration should be explicit in their instructions to the architect concerning the type of insurance classification under which they want the new building to qualify.

b. The administration should contact the State Board of Insurance for specific classification information and especially for those things which cause penalties.

c. When the final working drawings have been completed the administration should instruct the architect to submit them to the State Board of Insurance for preliminary rating. If possible, the architect should "hand carry" the plans to the State Board. This will enable him to assist the rating department in going through the plans, locating pertinent details, answering questions, etc. It will also make it possible for him to learn, first-hand, what points, if any, are causing penalties and what changes might be made to bring about a better insurance rate.

d. Upon completion of subparagraph c above the administration should proceed with the advertising and bidding procedures.

Additional savings in insurance premium costs can be realized by (a) carrying coinsurance for all buildings; (b) purchasing insurance on a deviated schedule; and (c) insuring all buildings under one master policy.

Recommendations for Elementary School Sites

1. Size of Elementary School

Past experience shows that the most efficient elementary schools have a maximum of 540 to 600 pupils. In other words, elementary school plants should not exceed 18 to 20 classrooms on one site.

2. Site Size

To provide sufficient area for proper orientation of the building(s) and playgrounds for the different age groups the following is the recommended basis for determining the size of site needed:

A minimum of 5 acres plus 1 acre per 100 students to be accommodated. (Example: 300 students calls for an 8 acre site). Suggested maximum site 11 to 15 acres.

3. Criteria for Site Selection

A. Characteristics of the environment.
   a. Freedom from: business areas, railroads, airfields, airstrips, factories, through highways, odors, etc.
   b. In good housing area.
   c. Free from future contamination.

B. In harmony with community plan.
   a. Remote from churches and hospitals.
   b. Accessible to adult use.
   c. Fits pattern of other school locations.

C. Accessibility.
   a. The building should be located in an area where most of the students live, preferably within $\frac{1}{2}$ mile for elementary students.
   b. A safe approach for all modes of travel -- walking, bicycling, motoring.

D. Site Characteristics.
   a. Shape -- as near square as possible.
   b. Good drainage.
   c. Free from hazards or unsightly structures.
   d. Aesthetic value - good views at close range and at a distance.
   e. Surface easily adapted for various uses.
   f. Abundance of natural resources such as trees, water and elevation.
   g. No excessive fill, rock, or subsurface water condition.
   h. Good foundation base.

E. Utility services.
   a. Near to accessible water, gas, electricity, sewage, etc.

F. Costs.
   a. Comparable to other adjacent land costs.
   b. A minimum amount of grading and filling.
   c. Salvaged buildings at values to reduce costs.
   d. Minimum need for street paving and sidewalk installations.

4. Building Orientation and Daylighting

Size and shape of site must permit proper orientation of building.

Classroom buildings should be oriented for best ventilation and daylighting conditions and not by locations of streets or land topography.

The classroom windows should be shielded on the East and South from direct sunlight and on the North from sky glare. Classroom windows on the West should be avoided. It is most important that glare spots be reduced and eliminated if possible. Some type of tinted, glare reducing glass in windows is recommended.

Facility Recommendations for Elementary School Buildings

1. Recommended Elements of the Elementary School

   A. Primary classrooms (Grades 1 to 3)
   B. Elementary classrooms (Grades 4 to 6)
   C. Administrative Areas
   D. Special Facilities

2. Recommended Classroom Sizes

   All classrooms should be designed to accommodate 30 students. Rooms approximating a square seem to provide more appropriate teaching space than rectangular rooms limited in width.

   a. Primary rooms (Grades 1 to 3) should have a minimum of 30 square feet per student (900 sq. ft.) and should include sink with work counter, chilled water drinking fountain, stationary and movable storage for supplies and records, movable furniture to permit group teaching, and a place for children's wraps. These rooms should be served by adjoining toilet facilities.

   b. Elementary classrooms should have a minimum of 25 square feet per student (30 square feet is preferable) or a minimum of 750 square feet and should include sink with work counter, stationary and movable storage for supplies and records, movable furniture, and a place for children's wraps. Centrally located gang-toilet facilities and chilled water drinking fountains may be used for students of these grades.

   Note: All primary and elementary classrooms should contain a science center where students can observe and study the phenomenon of the earth sciences.

3. Administrative Areas

   The administrative area should be located near the main entrance to the building and should provide suitable space for the Principal's office, Secretary, Bookroom, Clinic, Supervisor or Counsellor's office, and Teachers' Workroom and Lounge, all with suitable storage for necessary supplies.

   a. The Principal's office should contain 120 to 200 square feet and be adequately equipped to properly conduct the business of the school.

   b. The Secretary's office should be of sufficient size to house the necessary desks, chairs, files, etc., to efficiently assist the Principal and should be located adjacent to the Principal's office.

   c. The Bookroom should be large enough and contain sufficient shelving to store all textbooks issued to the school. This room should be located convenient to the Principal's office.

d. The Clinic should be located in the administrative area but should be self-contained. It should have a private entrance with waiting room or area, private toilet room and should be large enough to contain at least one cot.

e. Most elementary schools' counselling and guidance program is conducted by the teachers and the principal. However, nearly all school systems have visiting supervisors to meet with members of the faculty or with students and it is desirable that a small office of 100 to 120 square feet be provided for their use. This area can also serve as a place for teacher-parent conferences. For psychological reasons, it is advisable to have the entrance to this space separated from the entrance to the Principal's office.

f. An area should be provided to serve as a Teachers' Workroom and Lounge. This will give the teachers an opportunity to get together to discuss ideas and problems of mutual interest and will provide a place where they can prepare mimeographed or other teaching materials. Restroom facilities for both men and women should be nearby but should not open directly into this room.

4. Special Facilities

The Special Facility elements include library, cafeteria, auditorium or multipurpose room, central toilet rooms.

a. Library

The elementary school may have either the classroom library system or a central library. If a central library is provided it should have:

1. A reading area to accommodate a minimum of 35 students (1 class plus 5), allowing 30 - 35 square feet per student. This area should contain the shelving for at least 75% of the book collection which should be located along the perimeter walls. Other necessary equipment can be freestanding and located as desired.

2. A workroom and storage space of from 150 to 200 square feet with work counter and sink and adequate storage cabinets and shelving for the processing, repair and storage of books and periodicals. An area for the Librarian's desk and files should be provided in this room.

3. An audio-visual storage and previewing room of 120 square feet or more with shelving and cabinets to store projectors, film, maps, world globes, etc. Items in this area should be under the control of and issued by the Librarian.

4. An instructional materials center of 120 square feet or more to contain professional materials for the teachers and to provide a place for teachers to discuss common problems, etc. (For detailed information and equipment recommendations, write the Texas Education Agency Consultant in Library Services).

b. Cafeteria

1. The size of the various elements of the cafeteria will be determined by the size of the school and the per cent of participation by the students. Planners should bear in mind that 6 to 7 lunches per minute is the most that can be served and should plan serving facilities accordingly.

2. The size of the dining area is determined by the maximum number of lunches served per shift. Allow 10 to 12 square feet per student. Provide chilled drinking water and plan so as to avoid cross traffic of serving line(s) and exit from dishwashing station.

3. The kitchen and service areas should contain 5 to 6 square feet per lunch served per day.

4. The total cafeteria area recommended, based on the total number of lunches served per day is:

   a. For 100 to 500 lunches per day provide 11.5 to 12.5 square feet per lunch.

   b. For 500 or more lunches per day provide 10 square feet minimum to 11.5 square feet per lunch.

5. In the interest of better health habits and in keeping with the teachings of the health program it is recommended that a 2 or 3 spigot hand washing station be located at the entrance of the food serving line. This will permit the teacher to supervise and make certain that all children in the class wash their hands before receiving their food.

(For detailed information and equipment recommendations, write Texas Education Agency School Lunch Supervisor).

c. Auditorium or Multipurpose Room

The auditorium or multipurpose room houses many and varied activities, such as children's games, physical education classes, school plays, P.T.A. meetings and programs, community meetings, etc. It may be a separate area but is often combined with the cafeteria dining area to increase its size for special occasions. Most areas of this type are equipped with a stage or platform and suitable storage areas for storing chairs and such other equipment as may be used. The size of this area, if included in the plan, must be determined by the local administration based on its planned uses.

d. Central Toilet Facilities

1. Toilet facilities for grades 4, 5, and 6 should be centrally located to serve the classrooms and other activity areas. Separate facilities should be provided for the teachers.

2. The following fixture count (1958 Edition of Guide for Planning School Plants, published by the National Council on Schoolhouse Construction) is recommended:

1 water closet per 35 girls	1 water closet per 60 boys
1 lavatory per 30 girls	1 lavatory per 60 boys
	1 urinal per 30 boys

3. Fixtures should be so located that lavatories are nearest to the toilet room exit and water closets are the fartherest from the exit. To avoid congestion, toilet rooms should not contain more than 5 of each fixture.

4. Drinking fountains -- one drinking fountain, preferably cool water chiller, for each 50 students located near teacher work stations. Exterior drinking fountains should be located near the outdoor physical education teacher stations.

5. Miscellaneous Service Areas

All areas within the proposed school plant plan should be thoroughly studied for adequacy. This applies with equal importance to the non-educational or service areas as with the educational areas. Areas considered under this category should include corridors, lobbies or vestibules, exits, custodian workshop and supply storage, facilities for trash disposal, and mechanical equipment room.

a. Corridors

All corridors should be designed to adequately handle all potential traffic from the rooms served. Corridors should be of sufficient width to permit the rapid and orderly exit of all rooms served in the event of an emergency. In general, major interior corridors should have a minimum width of 8 feet clear traffic space free of projecting doors or other objects. Other corridors should be designed according to the number of students to be served and the distance to the nearest exit. No corridor should be allowed which reduces in width in the direction of traffic flow toward the exits.

b. Lobbies or Vestibules

All lobbies or vestibules should be designed to adequately receive the traffic from converging corridors or other areas served and to discharge this traffic to the outside with a minimum of congestion or confusion.

c. Exits

In many areas of the state the size, number and location or maximum travel distance is established by local building codes. In those areas which do not have a building code it would be advisable to use the code of the nearest major city as a guide. It is also essential that the requirements of the state law governing fire escapes from school buildings be met.

d. Custodian's Workshop and Supply Storage

With the high cost of construction and the large sums of money which the community has invested in school buildings it is a matter of major importance that they be well maintained. To accomplish this it is necessary to provide the custodian with a suitable work space to perform minor repairs of many different types and to store all the various items required for a proper maintenance program. In addition, service sink stations should be conveniently located throughout the plant as dictated by the plan.

e. Facilities for Trash Disposal

In a great many schools the disposition of paper trash and other debris collected by the custodians poses a definite problem. In planning a new school this should be considered and some means provided to handle this material. There are several types of incinerators, balers, or other means available for this purpose.

f. Mechanical Equipment Room

The size of this room or rooms will be dependent upon the size and type equipment to be installed. It is important, however, that this area be of such size and shape to allow for the proper installation of equipment with sufficient "clear space" to permit efficient operation and maintenance.

6. Lighting Values

a. Listed below are the "foot-candle" lighting levels recommended at the working surface for various tasks:

1. Classrooms -- general, 50 foot candles
2. Library -- study and note taking, 70 foot candles;
   ordinary reading, 30 foot candles;
   card files, 70 foot candles
3. Auditorium -- 15 foot candles
4. Lunchroom and kitchen -- 30 foot candles
5. Stairs and corridors -- 20 foot candles

b. To maintain good brightness ratios the following list of reflective values for various surfaces are recommended:

Floors -- 30%
Walls -- 50% to 70%
Chalkboard -- 15%
Furniture -- 25% to 40%
Ceiling -- 85% to 95%
Window Walls -- 75% to 85%
Tackboard -- 40%
Desk Tops -- 40%

Since many of the difficulties in good visual conditions result from glare and brightness problems, particular attention should be paid to the glossy surfaces on the desks, furniture and other equipment and to the prevention of a bright light spot within the visual field. Therefore, all lights in the 60^{o} visual field should be shielded and window wall glare should be controlled with venetian blinds, glare-reducing glass, wide overhangs or exterior louvers.