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ABSTRACT

Issues surrounding Minnesota's public school facilities, such as rapid student enrollment numbers in many areas, the energy crisis, asbestos removal, access for handicapped, and safety and modernization needs, are creating the need for school facility improvement programs. This guide addresses the need for school facility improvement that meets changing educational needs of pupils and requirements for safe and sound physical plants. Essential information is outlined for persons concerned with school facility improvement programs, including modernization, additions, and new school construction. Chapter I identifies the basic legal responsibilities, procedures, and recommended standards for approval of school facility improvement plans. Chapter II discusses planning for school facility improvements. Chapter III examines general space and square footage guidelines for school facility spaces. Chapter IV identifies school environment-related topics school officials should be aware of and concerned about in terms of the adequacy of present schools or when planning new or improved school facilities. Appendices include selected Minnesota statutes and other selected references relating to school facilities, a checklist for planning for school facility improvements, and forms for collecting data on school facility inventory. (GR)

# GUIDE FOR PLANNING

# NEW AND IMPROVED SCHOOL FACILITIES

# IN MINNESOTA

REVISED

JULY, 1988



STATE OF MINNESOTA [1]

DEPARTMENT OF EDUCATION

MANAGEMENT EFFECTIVENESS DIVISION

# Suggested Modifications to 1988 School Facilities Guide Recommendations

Note: these modified figures are a result of surveying two leading school architect firms, and interaction with architects at the 11/96 School Architects' Conference. These modifications are an unofficial revision of Facilities Guide recommendations, subject to further study.

## Square Foot Recommendations

****Modified figures are *in italics***

Elementary Schools

*110-135 square feet per pupil* p. 39

The increase in square footage per pupil may be due to the increase in educational programs housed in elementary schools such as ECFE and special education, and the increased demand for school and community use of areas such as the gymnasium.

**Elementary School Spaces** p. 40

| | | |
|---|---|---|
| Pre-School | 1,200 | |
| Kindergarten | 1,200 | |
| *Grades 1-6 Classrooms* | *900-950* | *computers/accessibility space needs* |
| *Special Education* | *450-1,200* | *depending upon program* |
| *Computer Lab* | *750-900* | *depending upon program* |
| *Science Lab* | *1,000-1,200* | *depending upon program* |
| *Art* | *1,000-1,200* | *depending upon program* |
| *Music: General* | *900-1,200* | *depending upon program* |
| *Instrumental* | *1,500* | *depending upon program* |
| *Vocal* | *1,000* | *depending upon program* |
| *Physical Education* | *3,600* | *per station* |
| *Library/Media Center* | *4,000-6,000* | |
| *Reading/Tutorial* | *450-900* | |
| *Gifted and Talented* | *600-900* | |

# Suggested Modifications to 1988 School Facilities Guide Recommendations

## Secondary Schools

| | | |
|---|---|---|
| *Middle School* | *150-200 square feet per pupil* | *p.57* |
| *Junior High School* | *150-200 square feet per pupil* | |
| *High School, Grades 7-12* | *160-180 square feet per pupil* | |
| *Senior High School* | *150-225 square feet per pupil* | |
| **Secondary School Spaces** | p. 58 | |
| *Classrooms* | *800-850* | *computers/accessibility space needs* |
| Science Lab | 1,350-1,575 | |
| Multipurpose | 1,500-1,750 | |
| *Computer Lab* | *800-1,100* | |
| Reading Lab | 900 | |
| *Special Education* | *450-1,200* | *depending upon program* |
| *Art* | *1,000-1,500* | |
| *Music* | | |
| *Instrumental* | *1,800-2,400* | |
| *Vocal* | *1,200-2,000* | |
| *Combination* | *1,500-2,400* | |
| *Physical Education* | | |
| *Gymnasium* | *6,000-7,500* | |
| *Auxiliary Gym* | *3,200* | |
| *Library/Media Center* | *6,000-10,000* | |
| *Business/Office Education* | | |
| *Keyboarding* | *1,400* | |
| Multipurpose | 1,200 | |
| Office Procedures, Other | 1,000-1,200 | |
| *Family and Consumer Science* | | |
| *Foods/Nutrition Lab* | | |
| *or* | | |
| *Multipurpose* | *1,500* | |
| *Technical Education* | | |
| *Tech Lab* | *1,800-2,400* | |
| *General Shop* | *2,000-3,000* | |
| *CADD/Graphics* | *1,400-1,800* | |

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GUIDE FOR PLANNING NEW AND IMPROVED
SCHOOL FACILITIES IN MINNESOTA

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## INTRODUCTION AND PURPOSE

The condition of Minnesota's public school facilities has changed much since the 1971 publication of the "Guide for Educational Planning of School Buildings and Sites in Minnesota." The 1971 Guide reflected the increasing pupil enrollments of the 1960's and the boom in new school construction and building additions to accommodate those pupils. In the 1970's and 1980's most school districts went through periods of declining pupil enrollments and reduced resources and budgets, forcing many of them to close schools in the process.

Presently, an enrollment bulge is proceeding through the elementary schools in many districts, creating the need for additional school spaces. A few areas of the State are experiencing rapid pupil enrollment growth, while others are continuing to decline sharply because of deteriorating local economic conditions. Substantially more school districts are cooperating, sharing programs and facilities in the process. Other issues and events which have impacted school facilities include the energy crisis, asbestos removal, access for handicapped, occupational, safety, and health requirements and the continuing additions of programs (e.g., computers, special education, weight training) which require school facility modifications.

These issues and events, in addition to aging facilities in school districts, necessitate school facility improvement programs in all Minnesota school districts. The 1988 "Guide For Planning New and Improved School Facilities in Minnesota" (hereafter the Guide, which replaces the 1971 Guide), will reflect the continuing attention that must be paid to improving school facilities to meet the ever changing educational needs of pupils and requirements for safe and sound physical plants.

The purpose of the 1988 Guide is to provide and outline essential information for persons concerned with school facility improvement programs, including facility modernization, additions, and new school construction. Every opportunity will be taken in this Guide to be brief, and to paraphrase laws, codes and rules rather than quoting these at length. In 1988 legislation affecting school facilities improvement planning was passed, and this legislation will be cited where appropriate. The Guide is designed to be an initial reference source for identifying basic legal responsibilities, procedures and recommended standards for approval of school facility improvement plans (Chapter I), important elements and procedures involved in planning for school facility improvements (Chapter II), and some other important considerations (Chapter IV). The most detailed attention will be given to discussing guidelines for specific facility areas (Chapter III). Major contacts and sources for further information that school persons must or should consult will be identified throughout the Guide.

For further information and assistance, contact the Minnesota Department of Education at (612) 296-2288.

## CHAPTER I

## BASIC LEGAL RESPONSIBILITIES, PROCEDURES

A large variety of state and local government agencies and officials have legislated authority or responsibilities which involve them in the process of, or issues related to school facility improvement projects. This chapter will provide an overview of basic legal responsibilities and procedures as outlined in law or rules, and discuss the roles of the local board of education, Minnesota Department of Education, and numerous other federal, state, or local agencies. Chapter IV will provide more detail on selected topics related to school facility improvements or requirements. Appendix A references selected Minnesota statutes cited throughout this Guide.

### 1.0 Local Board of Education

In fulfilling its constitutional responsibility for education, the State Legislature has established independent school districts. School districts' legal responsibilities, powers, and duties are delineated in statutes, rules, and regulations relating to those statutes. Discussions of key portions of these statutes follow.

#### 1.01 General Powers

Through Minnesota Statutes (M.S.) 123.35, school boards are given the general charge of the business of the school district, including school buildings. Boards must furnish adequate, safe school facilities for every child residing in the district, and the voters of the district may authorize bonds for the acquisition or improvement of school facilities, including gymnasiums, athletic fields, school garages, and all other facilities for administration, academic instruction, and vocational education (see also M.S. 475.52).

In providing or improving such school facilities, boards may acquire sites for such purposes by lease, purchase, or condemnation under the power of eminent domain (M.S. 123.63). For school purposes boards shall also furnish facilities with furniture, equipment, sanitary facilities, and improve the school site (M.S. 123.36).

Boards have the duty to make proper ordinary repairs, and provide for the heating and care of schools and bus garages. Schools may if necessary, lease or sell a school facility, and close a facility after a public hearing (M.S. 123.36). If a school building is declared to be hazardous by a governing municipal authority such as the city, the school board must correct the hazardous condition or remove the building (M.S. 463.16).

#### 1.02 Funding Facility Improvements

Under M.S. 124.243 and 275.125 school boards, by a resolution adopted by two-thirds of its members, preceded by a notice and hearing, shall adopt a capital expenditure facilities program. The program shall include plans for repair and restoration of existing facilities, specific provisions to correct any health and safety hazards, and new construction. The program may schedule work up to five years from adoption of the program, and must be reviewed biennially before July 1 of each odd-numbered year, after notice and hearing.

Revenue for the program will come from a local levy and state aid as determined by statute. The revenue may be used only for specific purposes outlined in M.S. 124.243, subd. 5, including school site or building acquisition, building construction, renting or leasing buildings, to equip, improve and repair school sites and buildings for improving access for handicapped persons, to bring schools into compliance with the uniform fire code, to remove, encapsulate, or make asbestos-related repairs, make energy improvements, and to purchase or lease interactive telecommunications equipment.

### 1.1 State Board of Education

"The State Board of Education may adopt rules for public school buildings" (M.S. 121.15, subd. 5). The State Board has established rules on school buildings and sites in Rules of the State Board of Education, Parts 3500.3900-4400.

In selecting a school site and developing preliminary and final facility improvement project plans, the school district shall reasonably conform to the recommendations of the State Board as stated in the Guide. Upon completion of a project, the school board shall certify to the Department of Education that the project was completed in accordance with the approved plans and specifications.

C) Final plans shall be approved or disapproved by the commissioner of education within 60 calendar days after receipt of such plans.

D) Approval of final plans by the commissioner of education shall be based on reasonable conformance to the recommended standards contained in the Guide. If no construction contract has been awarded within two years of commissioner approval, the approval shall not be valid. Commissioner approval is also contingent upon compliance with all laws, rules, and codes relating to public buildings. Required inspections (e.g., electrical) must be conducted accordingly.

E) The final project shall be in conformance with approved plans and specifications; any significant changes in the plans or specifications described must be submitted to the commissioner of education or other state agency for review and/or approval as originally required.

F) Cost and other information shall be submitted on prescribed forms to the department of education as required. Following the completion of the project, the school board shall certify to the department that the project was completed according to the approved plans.

Approval of school facility improvement plans and specifications or review and comment by the commissioner of education (see below) is limited to the provisions or intent of the plans and specifications which provide for the health, safety, and welfare of students, adequacy of sites and facility spaces planned, and intent of the school district to comply with all applicable laws, codes, and rules. Approval does not mean commissioner endorsement of architectural or structural design of the building, its mechanical, electrical, plumbing, or ventilation systems, materials or equipment used, or commissioner responsibility for design and construction. Nor does approval assure that the cost of construction will not exceed the funds allotted for such purposes.

Approval of plans and specifications for a school building project must not be considered a binding precedent in reviewing future plans. As laws, codes, rules, and standards change, so must commissioner of education criteria for approval.

1.22 Review and Comment Requirements

Requirements for review and comment by the commissioner of education also apply to school facility improvement projects where capital expenditures exceed $400,000 per school site. A school board may not separate portions of a single project in order to avoid these requirements, nor may it hold a bond referendum or solicit bids for the project prior to review and comment by the commissioner. School boards shall submit to the department of education at least following information regarding the proposed project (M.S. 121.15, subd. 7):

a) the geographic area proposed to be served, whether within or outside the boundaries of the school district;

b) the people proposed to be served including census findings and projections for the next ten years of the number of preschool and school-aged people in the area;

c) the reasonably anticipated need for the facility or service to be provided;

d) a description of the construction in reasonable detail, including: the capital expenditures contemplated; the estimated annual operating cost, including the anticipated salary and number of new staff necessitated by the proposal; and an evaluation of the energy efficiency and effectiveness of the construction, including estimated annual energy costs;

## 1.25 Health and Safety

To receive health and safety revenue under M.S. 124.83, an application must be submitted to the Department of Education by August 15 of the previous school year for approval. Funds (levy or state aid) may be used for hazardous substance removal, fire code compliance, or life safety repairs. A health and safety program plan must be adopted by the school board to describe the use of the revenue. For more information on this program, call (612) 296-2288.

The department also acts as the coordinating agency for asbestos abatement programs mandated by Environmental Protection Agency (EPA) rules authorized under the Asbestos Hazard Emergency Response Act. All public and nonpublic schools must comply.

The rules require:

1) Accreditation of all asbestos inspectors, planners (Department of Education), contractors and workers (Department of Health).

2) Inspection of all public and nonpublic schools by an accredited inspector to identify the location of all asbestos containing materials (ACM) - both friable (easily crumbled) and non-friable. Previous inspections of schools, such as those done by EPA before 1983, are considered not adequate under the proposed rule. Exempted are the schools built after October 12, 1988 and schools with inspection and abatement records indicating that all ACM was removed.

3) Re-inspection of all buildings is required every three years by an accredited inspector.

4) Local education agencies and private schools (LEAs) are required to develop and maintain an asbestos management plan for each school under their administrative control with the help of an accredited asbestos management planner. Submittal of plans to the department is also required.

5) Each public and non-public school must implement its plan on or before July 9, 1989.

Response actions include operations and maintenance, repair, encapsulation, enclosure, and removal. Appropriate steps to ensure worker and occupany protection must also be taken. For further information, contact the Department of Education at (612) 296-5032 or the Department of Health at (612) 623-5380.

## 1.26 Disaster Aid

Under this program the U.S. Department of Education provides financial assistance to local educational agencies (LEAs) that have been afflicted by certain disasters authorized by section 7 of Public Law 81-874 and by section 16 of Public Law 81-815. These two laws are the basic statutes governing the program often referred to as "Federal Impact Aid".

Assistance is limited to a reasonable amount of an LEA's expenses resulting from the disaster and may include:

1) Replacement of instructional and maintenance supplies, equipment, and materials;
2) Payment for minor repairs;
3) Provision of needed temporary facilities not including the acquisition of land or the erection of facilities;
4) Additional assistance necessary to provide free public education, such as payment of increased current operating expenses and replacement of lost revenues; and
5) Restoration or replacement of seriously damaged or destroyed school facilities.

## 1.3 Other Regulatory Agencies

A variety of federal, state, and local agencies have areas of responsibility under law which impact school facility improvement projects. Those involved in school facility improvement projects must be aware of the laws, rules, and codes these agencies oversee. An overview of selected responsibilities of these selected agencies follows; for further information, each agency should be contacted at the listed number.

### 1.31 State Department of Administration, Building Codes and Standards Division

The Building Codes and Standards Division, Department of Administration, through authority granted in M.S. 16B.59, 16B.60, subd. 6 and 8, 16B.61, subd. 2 and 4 and 16B.66, reviews plans and specifications for public school facility improvement projects. This includes new buildings, additions to existing buildings, and remodeling work. Local building inspectors as authorized by law are also involved in review and approval of ongoing project work.

When final plans and specifications (complete construction documents) are submitted for review, a completed "Application for Plan Review" is also required. A plan review fee based on the total construction valuation of the building or work being done, not including site work, must also be paid. The fees are listed in the current State Building Code, Section 1300.1700.

Estimated construction valuation per square foot should be consistent with the latest published square foot valuation for that type of construction and occupancy classification listed in the Building Valuation Data published annually by the Building Code Division. The completed application form, final plans and specifications, and review fee should be submitted to:

Supervisor
Plan Review Section
Building Codes and Standards Division
Department of Administration
(612) 296-4630

When all items on the plan review report and comments verify that the construction documents are or will be in compliance with building code requirements, a copy of the plan review application form signed by the State Building Inspector, authorizing construction of the project, will be sent to the architect, the local building official, and the school district. The local building official may not authorize construction to begin until receipt of the Construction Authorization form signed by the State Building Inspector.

Virtually all remodeling work and all new construction requires the services of a registered architect or engineer (see 1.37), as well as the plan review of the Building Code Division. This includes manufactured or temporary buildings placed on school property used for classroom or other purposes.

Without the services of a registered architect or engineer there is a greater likelihood of problems resulting from any school improvement project construction.

When such substandard work problems involving the health, safety, and welfare of students, employees, and citizens do occur as the result of the lack of architectural or engineering services, the liability of the school district, school board members, and responsible officials significantly increases (see 1.05).

A) NFPA #101 (Life Safety Code - 1981 edition). Chapter 10 sets forth fire code requirements that apply to all school facility improvement projects started after April 11, 1983.

B) NFPA #101 (Life Safety Code - 1981 edition). Chapter 11 sets forth fire code requirements that schools constructed prior to April 11, 1983, must meet.

The Building Code Division (see 1.31) reviews school facility improvement project plans and specifications. The Fire Marshal Division does not review school improvement project plans directly, but will answer general questions on life safety at (612) 296-7641. Please keep in mind that the fire/life safety codes are being updated on a regular basis, and new and/or existing school facility construction must meet the old and new requirements as appropriate.

Inspections of schools for fire/life safety problems will be made through the Fire Marshal Division upon written request by citizens, school districts, and other state agencies (e.g., Minnesota Department of Education). The major problem areas most commonly encountered during general fire/life safety inspections are:

1) inadequate protection of hazardous areas (e.g., shops, laboratories, janitor closets, storage rooms, boiler and equipment rooms).

2) unprotected vertical openings (e.g., stairways, shafts).

3) insufficient number of school fire drills.

4) rooms used for preschool, kindergarten, and first grade pupils are located above or below the level of exit discharge. Such usage is not permitted by the fire code.

5) the improper construction, exposure, and separation of temporary classroom buildings. All fire and building code provisions apply.

6) the lack of escape windows in schools. The lack of emergency lighting in windowless areas and assembly areas.

7) storage and other obstructions in corridors.

8) the lack of proper automatic fire detection equipment in hazardous areas.

9) locked or obstructed exits and doors, and panic hardware being chained or equipped with dogging devices. Snow and ice blocking outside exits. Inside firedoors improperly held open.

10) overcrowding in assembly areas (e.g., gymnasiums, auditoriums).

1.34 State Department of Labor and Industry, OSHA Division

Under both federal and state laws and rules, employers have responsibilities for providing safe and healthy workplace or occupational conditions. OSHA standards implementing the 1973 Minnesota Occupational Safety and Health Act include (CFR = Code of Federal Regulation):

A) 29 CFR Part 1910 (OSHA Standards for General Industry). These are Federal OSHA Standards which have been adopted by reference to apply to all places of employment except construction worksites.

B) M.S. 326.242 requires that an electrical contractor must be licensed and such license must be covered by insurance and surety bond. No individual firm, co-partnership or corporation may engage in work as an electrical contractor unless it has a licensed master electrician in its employ. All bidders of electrical work must be properly licensed in Minnesota.

All electrical installations and maintenance done on school buildings after they are completed must be done by a licensed electrical contractor or a properly licensed electrician employed by the school district. This is a frequent problem area in school buildings.

The electrical safety standards used are in the most recently published edition of the National Electrical Code. General questions may be directed to the State Board of Electricity at (612) 642-0800.

1.36 Minnesota Pollution Control Agency

Among the Pollution Control Agency's (PCA) concerns are hazardous substances, including asbestos and PCB's. Building owners and contractors are responsible for complying with state rules and federal regulations which impact schools in these areas. Relevant rules and statutes include:

Asbestos

A) Minnesota Rules Part 7005.1580, Emission Standard for Asbestos. Requires written notification of the demolition project twenty (20) days prior to commencement of removal of any asbestos-containing material, and proper removal and disposal of the asbestos-containing material.

B) 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutant. Sets standards regarding proper written notification, removal, and disposal of asbestos-containing materials for renovation and demolition projects.

For further information regarding asbestos removal, please contact the MPCA at (612) 296-7513 or 296-7653.

PCB's (Polychlorinated Biphenyls)

A) 40 CFR 761 and subsequent Rules: PCB Ban Rule, Electric Equipment Rule, Fire Rule, etc., by U.S. Environmental Protection Agency (EPA) under Toxic Substances Control Act, 1976. Focus on visual inspections, recordkeeping, cleanup of releases, and disposal by PCB concentration class: over 500 parts per million (ppm), 50 - 500 ppm and under 50 ppm PCB. Includes equipment in use as well as in storage. Excludes Small PCB Capacitors, i.e., under three pounds fluid per unit, unless leaking.

More extensive than Minnesota Rules Chapter 7100.0300. Call Region V, EPA for assistance at 312/886-6832.

B) Minnesota Rules Parts 7100.0300-.0360. Requires Certificate of Exemption for transformers and capacitors if they contain at least 2.2 pounds liquid PCB per unit and the concentration exceeds 500 ppm. Identification assistance and application materials available at 612/296-8454.

C) Minnesota Rules Part 7045 controls WASTE PCB over 50 ppm as Hazardous Waste. Includes collections of light ballasts. Focuses on labeling, proper storage and disposal. Requires Disclosure and EPA Identification Number prior to out shipment. Contact the County Hazardous Waste Coordinator if in the seven-county metropolitan area. All others call 612/296-6637.

A copy of current rules and statutes, a roster of licensed architects or other related information is available from:

Executive Secretary
Board of Architecture, Engineering,
Land Surveying and Landscape Architecture
402 Metro Square
St. Paul, MN 55101
(612) 296-2388

1.38 Metropolitan Council, Municipal Planning Commissions

In addition to submitting plans and specifications to the Minnesota Department of Education, Health, and other agencies as appropriate, metropolitan school districts must also submit plans to the Metropolitan Council or local or municipal planning and/or zoning commissions as required.

A) M.S. 473.175 & .863. The Metropolitan Land Planning Act requires metropolitan area school districts (those districts with administrative offices located within the metropolitan area as of April 3, 1976) who are preparing capital improvement programs to submit these to the Metropolitan Council for review and comment. The capital program description is to inciude: 1) a description of existing facilities; 2) projected population and facility needs and objectives; 3) proposed new school sites, buildings and building additions of more than $200,000; and 4) a discussion of the effect of the program on adjacent school districts and affected local units of government.

B) M.S. 473.854. The Metropolitan Land Planning Act also requires that amendments to school district capital improvement programs be submitted and reviewed in the same manner as the initial plan. The Act gives the Council the authority to prepare guidelines for the submission of such amendments.

At the present time, the Council does not have guidelines covering Council review of amendments to school district capital improvement programs. The Council encourages school districts to submit amended programs to adjacent districts and to affected local governments to support coordinated planning of facilities. The Council also is interested in receiving copies of amended school district capital improvement programs for its files but does not presently have a formal review process in place.

For further information contact:

Manager of Planning and Technical Assistance
Metropolitan Council
300 Metro Square Building
St. Paul, MN 55101
(612) 291-6407

Under M.S. 462.351-.365 Municipal Planning, municipalities have the authority to guide local development plans, including a "community facilities plan." Planning and/or zoning commission reviewed approval of school site purchase and/or land development may be necessary.

## CHAPTER II

## PLANNING FOR SCHOOL FACILITY IMPROVEMENTS

### 2.0 Participants in the Planning Process

The planning process, the persons involved in the process, and their precise role(s) will vary significantly depending upon the nature of the school facility improvement question, and the size of the school and school district. In a smaller school district and/or in the case of a smaller school facility improvement question, the persons involved will likely be fewer in number and their roles broader. In a question concerning extensive improvements in a larger facility, more persons will likely be involved and their roles more specialized. Larger districts will be able to involve more in-house specialists; smaller districts will have to procure more outside resource personnel assistance or fewer persons will have to assume broader roles.

The intent of this section is not to go into a detailed discussion on the roles of the possible participants in a school facility improvement planning process. Subsequent sections in this chapter will overview and detail selected steps in the school facility improvement planning process through the completion of a building project. Suffice to say, the tasks/roles required in the school facility improvement planning process will be assumed to a greater or lesser degree by the following participants:

- school board
- superintendent
- business manager
- specialized district staff
- building administrators
- teachers
- support staff
- students
- parents
- citizens
- senior citizens
- architect
- engineer
- educational facilities planning consultant
- specialized consultants
- fiscal agent
- legal counsel
- local governmental officials
- Minnesota Department of Education staff
- regulatory agency staff

The school board and superintendent have the primary roles in shaping the school facility improvement planning process through their decisions and delegations of responsibilities to the participants. Therein lies the final responsibility and accountability for the overall success of planning for school facility improvements.

Preliminary Planning

G) Initiate or continue efforts to develop a public information and support program for school facility improvements. Superintendent, staff, and citizens.

H) Consider and assess alternative new school sites or school site expansion areas. Consult with the commissioner of education on adequacy of site if required. Select a site. School board, superintendent, architect, and citizens.

I) Review or develop a philosophy of instruction which influences school facility improvement planning. School board, superintendent, staff, and citizens.

J) Develop educational specifications for school facility improvements. Coordinator, staff, architect, and citizens.

K) Review and finalize preliminary plans and specifications, projected costs. Superintendent, staff, architect, and citizens.

L) Submit preliminary plans and specifications to school board and other local governmental agencies (e.g., planning or zoning commission) for review and/or approval. Superintendent and architect.

M) If required (see 1.21), submit preliminary plans and specifications to commissioner of education for review. If the proposed building project is over $400,000, the commissioner's review and comment is required. Allow 60 days for review and comment and/or review of plans. Superintendent and architect.

Final Planning

N) Analyze funding sources for facility improvement project. Develop funding package including funds needed through capital expenditure levy, down payment levy referendum, and/or school bond referendum. If bond referendum levy funds are not needed, proceed to step P). Assess tax impact of school bond referendum levy. Business manager and fiscal agent.

O) Plan school bond referendum information campaign. Set questions for submission to voters (M.S. 475.59, 124.82). Allow 20 days before referendum to publish commissioner's review and comment. If the proposed facility project receives a negative review and comment, the referendum for the project (down payment and/or facilities project) must receive the approval of 60 percent of the voters. Special elections may not be held during the 20 days before and the 30 days after any regularly scheduled statewide or municipal election wholly or partially within the school district (M.S. 205A.05). If a school bond referendum fails, the same question(s) for the same amount(s) may not be submitted to the voters again for at least 180 days (M.S. 475.58, subd. 1a). School board, superintendent, staff, and citizens.

P) Draft final plans and specifications. Plan for timely securing of funds and expenditures for school facility improvement project. Secure school board approval subject to other local agency review and approval. Superintendent, architect, and fiscal agent.

Q) Submit "Application For Plan Review" and required fee with final plans and specifications to the Building Code Division, and also to the Minnesota Department of Health for review as required (see 1.31, 1.32). Forward final set of plans and specifications to the commissioner of education for final review and approval if required. No project construction may begin until authorization is received from the State Building Inspector. Superintendent and architect.

## 2.2 Selecting an Architect

The importance of the careful selection of staff, outside resource persons or firms and contractors for a school facility improvement project team can not be stressed enough. The architect is a key member of the project team and represents the school district. An overview of the process of selecting an architect will be discussed in this section.

An architect should be selected and involved in planning early on. The architect's involvement in the assessment of needs phase can be valuable for both the architect and the school district. The architect will acquire a good understanding of the scope of the project and the educational program philosophies behind it; the project team may learn from the architect alternative ways or solutions to the district's facility problems. Architectural expertise and services should complement and supplement staff and community efforts, but not replace them. A team effort is needed.

Major steps involved in the selection of an architect normally would include the following:

A) Form a selection committee. This often is the school board assisted by the superintendent and staff. If broader involvement is sought, more school district staff, citizens and a person(s) capable of judging an architects' performance may be appropriate.

B) Invite applications from interested architects. This involves publishing a description of the project, time lines, selection criteria and procedures, and notifying architects through the legal press and other appropriate media.

C) Review and screen applications. Examples of criteria for selection are personal qualifications and experience (architect and supporting staff), ability to complete project within budget and timelines, creativity, understanding of project, ability to relate to project team, and adequacy of construction phase administration. These and other criteria may be examined through an application form, interviews, visitations to the architect's similar projects and the architect's offices, examination of sample plans and specifications, and the like. Determine whom in the architectural firm will work most intensively with district; i.e., the project architect.

D) Interview final candidates. Three or more candidates should be given structured interviews and/or a chance to make a presentation to the interview committee or the school board if desired. Rank candidates, check references.

E) Finalize selection of architect through negotation of the terms of a contract, including all conditions, services and compensation. The contract should be reviewed carefully so that the responsibilities and duties of the architect, contractor(s), and school board are clearly understood. Secure final school board approval after review by legal counsel.

Methods of compensation and services to be performed are negotiable and include a set sum, percentage of construction cost, hourly rates, or a combination of these methods. Qualifications, experience, and level of services vary with each firm. Long term considerations such as operational and maintenance costs, aesthetics and educational environment should be an integral part of the selection process considerations which "low fees" may adversely impact. Direct appointment of the architect is appropriate only if a long and satisfactory working relationship has been established through previous building projects. Work incentives for coming in at or under project budget may also be developed.

## 2.3 Projecting Educational Program and Service Space Needs

Accurately projecting new, required, or needed programs and services is a difficult task. In school facility improvement programs, facilities are built or improved to last up to 40 years or more. Providing adequate spaces for future programs and services is critical. To illustrate, since the last Guide was published in 1971 many or all of the following programs/services have been added or expanded:

learning disabled
emotional/behavioral disorders
severely/profoundly handicapped
Chapter I reading
computer instruction
model office
health occupations
building trades
food occupations
family living
magnet
gifted
alternative
summer enrichment
co-educational classes in home economics, physical education, industrial education
girls athletics
weight training
fitness and aerobics
specialized vocal and instrumental performance groups
all-day kindergarten
child care
extended day care
preschool handicapped
community and adult education
work study
counseling, social and health services
English as a second language
handicapped accessibility requirements
media centers
office automation
interactive communications
drug education

How possible would it have been to predict these new or modified programs and services in 1971? To say nothing of the space, mechanical, and environmental requirements these programs and services place upon a building, particularly older, less flexible facilities? Will there be a similar "program explosion" in the next 15 or 20 years?

The need to plan for the new, unanticipated program must be stressed in the public information program. Flexible (movable or demountable walls e.g.), convertible, or expandable spaces should be an integral part of any school facility improvement program plan. Whereas new or modified programs and services can not always be predicted, the fact that there will be such additional programs and space demands on a facility is a safe prediction.

To look at it in another way, it has been estimated that the initial cost of a building with a 40 year life cycle is one-seventh of its life cycle cost. The remaining six-sevenths represent operations and maintenance costs. This illustrates again why school facility improvement projects must be carefully planned with adequacy and adaptability considerations foremost in mind.

Utilization may be figured at the number of class periods minus 1 (for teacher preparation) or at 80% or whatever scheduling experience proves to be the percentage utilization of a classroom or instructional area. For example:

$$\frac{\text{200 student enrollment}}{\text{24 students per class}} = \frac{\text{8.3 sections}}{\text{6 periods per day}} = \text{1.4 classrooms needed}$$

The School Facilities Inventory forms in Appendix C are both an inventory and assessment tool. They are designed to help school districts identify what they have (inventory), its condition (adequacy) and what school facility improvements (remodeling, replacement, additions, modernization) are needed.

The following adequacy key is suggested for each form illustrated in Appendix C:

2 Meets or exceeds State standards and/or recent building codes. Adequate
1 Below State standards and/or recent building codes. Less than adequate
X Missing or not able to assess

This adequacy key is suggested to keep arithmetical averaging to a minimum, and to force assessors to make overall judgments. It should be recognized that one important variable (e.g., room size or boiler condition) might make an otherwise adequate classroom or heating system less than adequate. In other instances, a variety of strengths and weaknesses of a particular area will have to be weighed accordingly. School districts may substitute their own adequacy key or ranking scale as desired. Space is also left to add other criteria not listed. Smaller enrollment schools in particular should combine classrooms so that partially used classrooms are reduced to a minimum. For discussions of criteria in each form or area, other sections of the Guide or specialized sources should be consulted. See Appendix C for suggested inventory forms.

## 2.52 Site Selection Considerations

New school site selection considerations will vary in emphasis and detail from those used in assessing existing school sites as listed in section 2.4. Physical features of potential school sites assume much more importance; space for the development of a school site must be allowed and locations of the facility, outdoor activity and service areas must be well planned accordingly. A school site selection form or checklist may be put together using new school site considerations, such as the following:

A. Size. Allowance must be made for the type of school programs, community uses, and future uses. Spaces for bus loading, parking, outdoor activities, buffer and service zones, and expansion areas must all be allowed. Experience in Minnesota, the recommendations of the Council of Educational Facility Planners, International, and other states and national norms are the basis for the following minimum school site size recommendations:

| School Site | Minimum Recommended Size |
|---|---|
| Elementary Schools | 10 acres |
| Middle Schools | 20 acres |
| Junior High Schools | 25 acres |
| Senior High Schools | 30 acres |
| Junior-Senior High Schools | 40 acres |
| Large Enrollment Campus (Elementary-Junior High or Junior High-Senior High) | 40-60 acres<br>**PLUS**<br>one additional acre for each 100 students of estimated capacity including possible additions |

For example, a 500 student elementary school should have 15 acres; a 1200 student junior high, 37 acres; a 2500 student junior-senior high campus, 85 acres; and a 400 student K-12 combination, 24 acres. Special local circumstances (unusually high cost of land, lack of availability of land) may have to be taken into consideration.

B. Location. The school site should be located near one or more of the following:

1) center of community or school district;
2) student population center or growth area (may be different than 1);
3) community resources;
4) major and accessible roads, highways;
5) site expandable areas (preferably include in site purchase);
6) where bus routes are limited to 30 minutes (elementary) and 60 minutes (secondary), one way, when possible.

C. Health and Life Safety. Avoid noisy, congested, environmentally hazardous areas (e.g., near heavy industry, sewage or chemical run-off basins, power and gas lines, railroads). Provide safe, accessible entrance, loading and unloading areas, and egress to school for student walkers, busses, service vehicles, and automobiles.

aside for setbacks, bus loading and turnarounds, parking (student and visitor), loading and unloading of equipment and supplies, landscaping, and buffer zones between these areas. A master site plan for the location of the school building and these various area is essential in the original planning of a school site.

The safe and convenient access to the school for students walking to and from school or loading and unloading from buses or cars must be a priority. Walks, driveways, and parking and unloading areas for buses and cars should be separate and distinct areas. Areas should be clearly marked, and auto and bus traffic flow separated from the school bus loading and unloading areas. One way traffic flow is advised wherever possible. A separate unloading area for handicapped students is necessary. If a school site is tight, it is best to locate some of the above buildings (e.g., bus garage) off site to avoid such problems as buses backing up onto school sites and student walking areas.

In planning vehicle, student and pedestrian access to a school site, the Minnesota Department of Transportation will assist school districts. Department District Offices will act as coordinating agencies for local comments regarding use of county and/or local streets. Such assistance and review of site plans by Department of Transportation and other local officials is an important part of school site selection and site plan development. For further information contact your District Office or call:

Director
Office of Traffic Engineering
(612) 296-6164

The latest edition of Standards For School Buses and Operations available from the National Safety Council contains more detailed guidelines and an evaluation and checklist for school bus driveway areas. The "Survey Form For Handicapped Access" (see Appendix A) also deals with school site access planning concerns.

## 2.7 Sharing School Facilities

The sharing of school facilities among and between school districts, municipal or other governmental agencies, cooperative educational centers (e.g., vocational or special education), and private concerns (e.g., day care) is an increasingly common occurence in Minnesota. Under M.S. 121.15 Review and Comment examination of such possibilities is required, and it is encouraged for a variety of reasons, including increased educational programs, services, and cost efficiencies.

Sharing of school facilities between school districts is possible under M.S. 471.59 Joint Powers or through school district reorganization plans under M.S. 122.541 Interdistrict Cooperation and 122.535 Agreements For Secondary Education. The realities of declining enrollment, increased educational program standards, and aging and outmoded facilities makes investigation and pursuance of such an alternative highly advisable. Large differences in educational services provided exist between smaller school districts that cooperate extensively versus those which cooperate minimally. Where program and facility sharing arrangements have been pursued, results have generally been positive.

Contact the Minnesota Department of Education, at (612) 296-2400 for further information. You may also wish to ask for the Shared School Facilities Guide, Minnesota Department of Education, 1985.

B) Regularly communicate results of facility assessment and facility needs to community through media, district publications and larger public information program. Establish need for improved facilities in the minds of parents, citizens, and community.

C) Relate and focus facility improvement needs on primary themes related to student learning, teaching, health and life safety, program development, learning environments, community, and cost efficiency needs.

D) Research the history of previous bond referendums (including precinct voting patterns), identify the community decision-making style, and relate to present conditions (e.g., economics of area). Identify community opinion leaders, groups, and sources of possible opposition. Consider a voter profile survey to help determine level of understanding, issues, and support. Develop appropriate strategies, action plans, and timelines.

E) Maximize school board and staff support of proposed bond referendum. If board and staff are divided, reassess proposal and/or the advisability of proceeding with a referendum. The school board should be in unanimous support of the proposal.

F) Encourage citizen participation and "ownership" through a citizens committee. Determine best selection process for committee; i.e., one that is acceptable and supported locally. Most importantly, influential opinion leaders, all sectors of a community, and prominent community groups should be well represented on the committee. Work with the community power structure. Ensure campaign financing.

G) Organize a school district staff and/or school district staff-citizens steering committee involving district and building level administrators, staff, school board, citizens, and possibly student members. The chairperson(s) of the group should devote a sizable portion of his/her time to coordinating committee efforts. Determine the proper relationship of the steering committee to the citizens committee, if the committees are separate.

H) The campaign should be short in length (2-4 months), positive, and low key. Occasionally, circumstances may require a longer, more highly visible campaign in which case planning for such a campaign will take considerably longer (6-12 months).

I) Study local or state-wide voting patterns to help identify better months and days for election (e.g., may want to avoid last several days of month, 15th, end of school year, general election).

J) Plan communications to community. Use printed material, mailings, regular school news channels, and the public media. Develop a list of speakers for community meetings. Hold smaller versus larger public meetings to enhance communication. Establish an information or call-in center to provide immediate, accurate responses to questions. Keep materials short, factual, and informative. Use opinion leader testimonials or endorsements.

Prepare slide-tape or video show(s), emphasizing positive possibilities and/or liabilities of the present facilities. Avoid a letter-to-editor dialogue, controversy, or a public, overly technical discussion of costs or taxes. Do not stir up the opposition.

K) Identify "yes voters" through phone surveys, coffee parties, and person-to-person contacts. Establish "yes vote" target. Concentrate on getting out "yes voters" versus trying to pursuade "no voters." Contact "yes voters" shortly before election, reminding them to vote. Typical "yes voters": ages 18-29, parents of school children, absentee voters, staff and staff contacts, women and housewives living in area for 2-5 years, minority groups, college graduates, business and professional people, and other selected groups (including senior citizens) as the local situation prescribes.

## 2.9 Financing and Construction Management

In developing alternatives for planning improvements of school facilities as discussed in section 2.1, estimates of the cost of remodeling, adding on, or building new facilities are necessary. The importance of adequately assessing existing school sites and facilities so that the need(s) are specifically identified is preliminary to seeking cost estimates.

Engaging the services of a fiscal agent, financial advisor, or bond consultant (consider the terms synonymous) early on is well advised. Cost figures for recent projects may also be available from the Minnesota Department of Education. The latter figures should only be used as rough estimates, and not as a substitute for precise estimates worked out by an architect and the fiscal agent after preliminary plans and specifications have been developed.

In estimating building costs, it is important that the first dollar amount presented to the public be accurate in terms of needs, that cost estimates not be raised or changed often in public, and that the estimates are not excessively higher or lower than the referendum amount or the actual project costs. An ill-advised scaling down of the proposed project and/or adverse public reaction could be the result.

### 2.91 Financial Planning Process

At all times financial planning should be an integral part of the overall planning process as outlined in section 2.1. A suggested process of financial planning should contain the following steps:

A) Determine the net debt limits of the school district--not in excess of 10 percent of actual market value of taxable and exempt property in the school district (M.S. 475.53, subd. 4).

B) With architect and fiscal agent assistance, determine cost estimate of desired building project(s). Include legal, fiscal, administrative, and interest costs in estimates.

C) Review alternative means of financing project, including use of facilities capital expenditure revenue, school bond referendum, capital or debt service loans, (M.S. 124.42-.43) and other sources of funds (e.g., Farmers Home Administrators loan).

D) If a school bond referendum is proposed, part of the public information campaign should include carefully explaining the tax impact to district property owners.

E) After a successful bond referendum, bonds must be issued. Assistance from legal counsel and the fiscal agent is necessary to facilitate bond rating (if desired), advertisement for and sale of bonds, bidding procedures and delivery of bonds and funds. See M.S. 475.58-.66 and 124.82 for more information on sale of bonds, tax levies, use of surplus funds, and the like.

F) advertise for bids, accept lowest responsible bidders, and receive contractor performance bonds. See M.S. 123.37 and M.S. 471.345 for information on contracts and bidding procedures.

G) through business manager or fiscal agent, reinvest bond referendum levy proceeds until funds are needed to pay contractors.

### 2.92 Construction Administration

Most schools in the state are constructed using separate general, mechanical, and electrical contractors selected in competitive bidding of construction documents developed by an architect and engineers.

## CHAPTER III

## SCHOOL FACILITY SPACES

Specifications for desirable school spaces will be subject to continuous changes in the future. New laws, codes, regulations (e.g., hazardous substances, fire and life safety, handicapped), changes in curriculum philosophy (e.g., open space vs. self-contained, small group vs. large group, computer-assisted instruction), and technology (e.g., language and computer labs, office automation, video and media services) will impact instructional and support area design specifications from one year to the next.

In this chapter the emphasis will be on outlining basic space and square footage guidelines, and listing essential considerations that must or should go into planning facility spaces. Detail on specific spaces will be minimized. School officials must develop detailed educational specifications working with staff, curriculum specialists, engineers, and the architect.

### 3.0 General Space, Square Footage Guidelines

Once a school facility has been assessed and/or new areas or additions to an existing facility identified, space and square footage requirements for specific facility areas must be figured and totaled. The process and forms outlined in Section 2.4 and Appendix C should assist school officials in this process.

This chapter will review overall space and square footage requirements in elementary and secondary schools. Where facility spaces are minimally variable (e.g., general classrooms), more precise space standards are set forth; where facility areas are more variable (e.g., science laboratories), sets or ranges of space standards are set forth. Identifying what a local school district needs in each instructional area depends in part upon what curriculum or learning activities will be included (see local educational specifications). Other assumptions regarding space and square footage guidelines include:

a) general classrooms will accommodate a minimum of 20-25 students, with capacity at 28-30 students.

b) specialized classrooms feature more variable amounts of students and space due to curriculum or health and life safety standards.

c) accessibility and usability for handicapped students must be provided in new construction and/or remodeled facility areas as required in M.S. 471.467.

d) though no ongoing distinction will be made between smaller (less than 325 students or one section per grade) and larger enrollment schools, normally the larger the enrollment of the school, the greater the number of specialized instructional and supportive spaces needed, while as enrollment decreases fewer of these spaces are needed.

e) flexible, expandable spaces or areas are encouraged. "Open school" space requirements will not receive separate treatment in terms of square footage for learning activities.

f) elementary facilities generally are able to schedule teaching stations at up to 100 percent capacity, and secondary at up to 80 percent capacity in general classroom areas.

### 3.1-3.2 Elementary School Spaces

### 3.11 Square Footage Recommendations

For elementary school space square footage recommendations, the general rationale is as follows:

A) **The total space of 100-110 square feet per pupil assumes at least three sections per grade level, or 525 pupils K-6. Smaller enrollment schools will likely average considerably more than 100 square feet per pupil.**

B) **For each elementary instructional space, square footage is based upon the number of pupils (e.g., 25) using the space at any one time as indicated. If there will be more pupils in the classroom than indicated (e.g., 75 instead of 50-60 in music), square footage will have to be increased. If there will be fewer pupils (e.g., 15 instead of 25 in a grade six classroom), the classroom must still be 900 square feet unless otherwise noted (e.g., smaller general music space).**

## Elementary School Spaces

### 3.12 Organization, Programs

Planning facilities for programs pre-school through grade six is based in part on Rules of the State Board of Education 3500.1150 regarding required curriculum offerings for the elementary schools, as well as local school board policies.

School organizational designs for delivering curriculum offerings range from those emphasizing traditional self-contained classrooms to designs stressing non-graded open school settings. Most designs allow for team teaching and other grouping arrangements as well. The basis for these design decisions is the school philosophy as reflected in the educational specifications. Emphasis should be on a design which will stand the test of time, with flexibility built in wherever possible.

Elementary school spaces may be "clustered" together in a variety of ways, grouping or integrating instructional or supportive areas as desired. Instructional spaces could be clustered in a variety of ways, including:

1) pre-school and kindergarten, primary, intermediate, or upper grades;

2) intermittent instructional areas, including science and computer labs, art, music, physical education;

3) special education and instructional support areas (speech/vision/hearing, social/psychological);

4) library/media/audio-visual area;

5) administration and building support areas;

6) multipurpose rooms including food service, physical education, assembly.

Curriculum consultants and the architect should be continually consulted to provide alternative designs for the consideration of local school officials and staff.

In the following sections covering elementary school instructional spaces, the essential elements of each space will be identified. Through the development of comprehensive educational specifications, school staff will provide important details for architects to include in their plans and specifications. The following essential elements will provide the framework for discussion of each space:

a) necessary square footage, including storage, and other areas unless otherwise noted;

b) location of space, relationship and accessibility to other spaces;

c) learning activities;

d) necessary learning aids, equipment and furniture;

e) storage space, other special needs.

## Elementary School Spaces

### 3.14 Classrooms, Grades 1-6

Essential elements for classroom spaces in elementary grades 1-6 include:

a) square footage: a minimum of 900 square feet for up to 25 pupils. Team teaching and/or future use needs may require demountable walls between rooms. The open classroom space design may require increased square footage to allow for pupil movement, as well as portable room dividers.

b) location: first floor for first grade classrooms. Ready access to clothing storage, toilets, and exit.

c) learning activities: learning activities for which spaces should be provided include reading and general study, arts and crafts, science and environmental education, and music (if not in separate spaces), creative play, as well as individual and small group work. Optional spaces for computers or tutorial assistance may also be provided through additional square footage.

d) learning aids, equipment: necessary learning aids and equipment include plentiful chalk/markerboard, display/tackboard, AC power and TV outlets, work counters, movable furniture and work units, and carpet if desired. All classroom chalkboard and counter height lower edges should be of similar height to facilitate the reassignment of classrooms to different age groups.

e) storage, other needs: ample and movable storage space for pupil and teacher materials and work space for teachers is vital. Toilets in early primary rooms are worth considering; a sink and a drinking fountain should be included in all rooms. Clothing storage may be in an alcove or hall lockers or within classrooms.

## Elementary School Spaces

e) storage, other needs: ample and movable, adjustable storage spaces for pupil materials and equipment, and storage and work space for teachers and teacher aids are vital. Toilets and changing areas in physically handicapped or TMR areas, as well as sinks and a drinking fountain in all special education main instructional spaces should be provided. Adapted learning spaces, as well as equipment in mainstream classrooms (e.g., science lab, industrial arts) or adjacent to these areas (e.g., adaptive physical education, pool) are necessary. Rooms should have carpeting, rounded corners, and lockers for clothing storage nearby. An elevator in a multi-story building is required. One-way glass in an observation room and other specialized equipment will also be necessary.

The latest edition of the State Building Code and/or State Fire Code needs to be consulted for specific rules and regulations on providing for handicapped accessibility.

## 3.17 Science

Science labs in elementary schools are necessary if the experimental approach to learning and scientific literacy are to be most effectively taught. If specialized staff are lacking, the lab assumes more importance in terms of facilitating the coordinated instructional efforts of an elementary teaching staff. Essential elements for a science lab include:

a) square footage: 1,200 square feet for 25 pupils. Spaces for deskwork and lab stations must be provided, as well as for specialty areas (e.g., plant-growing). The room may be divided with portable walls or dividers to facilitate working with two student groups, one at desks or tables, the other at lab stations.

b) location: first floor, central location, near library/media center and computer lab. Access to an outside or environmental education area is desirable.

c) learning activities: learning activities for which space should be provided include: desk or table work, lab stations with wet and dry work areas, observing demonstrations, plants and animals, working with microscopes, and viewing media presentations. If special education students are serviced, accessible work and lab stations must be provided.

d) learning aids, equipment: necessary learning aids and equipment must be tailored for a variety of learning activities and pupils serviced. If younger pupils are serviced, adjustable/portable furniture is required. Appropriately designed lab stations with electrical, heat and water capabilities are required. Microscopes, plant growing lights, and other age-appropriate tools and equipment should be identified and provided. Chalk/ markerboard, display/tackboard, space for the display of experiments and student work, and a viewing area with TV and AC power outlets will also be necessary.

e) storage, other needs: ample and secure storage space for equipment, chemicals or flamable materials, specimens, experiments, as well as pupil work, textbooks, and teacher materials must be provided. Visible, accessible fire extinguisher(s), eyewash, and blankets are necessary. Teacher work and demonstration space is essential.

## 3.19 Music

Planning for music space(s) demands precise educational specifications identifying programs to be offered, anticipated enrollments, and learning activities envisioned.

For a smaller enrollment elementary school (e.g., two sections or less), an all-purpose general music room to be used for instrumental as well as vocal activities, with accompanying ample storage and practice rooms, may be adequate. Larger enrollments necessitate separate rooms for instrumental and vocal, as well as storage, practice, and office areas. Essential elements for music rooms include:

a) square footage: 1,700 square feet in a general music room for up to 50 pupils; 2,000 square feet in a separate instrumental music room and 1,200 square feet in a separate vocal room. For a smaller enrollment elementary school, a general music room of 1,000 square feet for up to 25 pupils may suffice. All of these music areas may be divided with portable room dividers or walls to separate spaces for practice rooms, storage, and office space.

b) location: first floor, near a large group performance/assembly area, as well as double doors for movement of a piano. An isolated and sound insulated location is necessary to prevent disturbance of learning activities in other areas.

c) learning activities: spaces for individual, small and large group learning activities need to be provided. Learning activities include singing, listening, playing instruments, learning notations, rhythms, and movement. Accessibility for handicapped pupils must be planned.

d) learning aids, equipment: necessary learning aids and equipment include a stereo system with recording equipment, music stands, records, tapes, chalk/markerboard, and display/tackboard. AC outlets for electrical instruments and/or a computer with printer may be necessary. Chairs, district-purchased instruments, portable sound shells, special lights, and risers may also be necessary.

e) storage, other needs: ample, specialized, and in some cases secure storage spaces must be provided for a great variety of musical instruments, equipment and learning materials. This would include shelving, cabinets, and lockers where appropriate. The shape of the room (e.g., trapezoidal), ceiling height, acoustical treatment, heating, ventilation and humidity control, lighting, sound system and other related requirements are most complex; music staff/consultant assistance in detailing specifications is essential.

There should be adequate separation of performance from storage and practice areas for sound control and ease of flow-through traffic. Practice rooms need to have observation windows. It may be desirable to carpet the instrumental room. A drinking fountain should be convenient to the music area.

## Elementary School Spaces

A breakdown of spaces needed in a 3 or 4 section school:

| Area | Recommended Dimensions (in feet) | Space Required Sq. Ft. | Number Required | Total Required Sq. Ft. |
|---|---|---|---|---|
| Apparatus | 75 x 120 | 9,000 | 1 | 9,000 |
| Multi-purpose | 100 x 120 | 12,000 | 2 | 24,000 |
| Track and Field | 80 x 120 | 9,600 | 2 | 19,200 |
| General Purpose | 125 x 150 | 18,750 | 1 | 18,750 |
| Softball | 250 x 250 | 62,500 | 2 | 125,000 |
| Field Games | 180 x 140 | 25,200 | 2 | 50,400 |
| | | | | 246,350 |
| | | | Total: | 5.66 Acres |

Smaller enrollment schools may need somewhat less space. Larger enrollment schools or those schools anticipating community use of facilities (e.g., softball, soccer, tennis) may well need additional acreage. See section 3.37 for dimensions of specialized areas (e.g., tennis courts).

b) location: the gymnasium should be located for easy access by pupils and community, next to the cafeteria and instrumental music spaces for multipurpose use (e.g., performance or assembly programs). Handicapped accessibility is important. If locker rooms are provided, easy access to the gym and outdoor activity areas is desirable. Outdoor activity areas need enough separation from outdoor classroom walls so as not to disrupt classroom learning activities. The playground apparatus area should be located near the building, and, if possible, in a shady spot. Apparatus for younger pupils should be separated from that for older pupils. Ample space around the various apparatus should be provided. Safety must be a primary concern for locating and spacing apparatus.

c) learning activities: spaces for individual and group physical education learning activities need to be provided. Outdoors, space for playground equipment as well as activity and open play space is needed. Indoor learning activities include basketball, volleyball, badminton, floor hockey, dancing, gymnastics, exercise conditioning, as well as individual, dual, and team activities. Outdoor learning activities include free play, field games such as softball, soccer and track, blacktop marker games, as well as some of the indoor activities. Developmental or adaptive spaces appropriate for handicapped pupils must also be provided.

d) learning aids, equipment: a great variety of necessary learning aids and equipment are necessary to facilitate learning activities for various age groups as well as handicapped pupils (e.g., adjustable basketball backboards, sandboxes, different size balls, height and size of equipment). Markings in the gymnasium and on the playgrounds and playing fields are needed. Cushioning materials around apparatus and on walls where appropriate is essential for safety purposes. A good public address system with related phono, tape, and microphone equipment is needed in the gymnasium. Adequate built-in microphone inputs and AC electrical outlets must be spaced around the room.

e) storage, other needs: ample storage spaces for indoor and outdoor activities should be provided with large doors for easy movement of equipment. Portable means of hauling and securing equipment are also necessary. The floor, ceiling, wall, ventilation, and lighting requirements need careful consideration. High ceilings (20-25 feet) and special attention to acoustical treatment are necessary for adequate sound insulation. Padding on gymnasium

## Elementary School Spaces

### 3.21 Library/Media Center

Educational specifications for library/media center spaces vary significantly depending upon the services expected as a part of the program. A computer lab, gifted or regular teaching classroom, media or TV production center, teacher library or workroom, darkroom, or other special service spaces, including community use, may be considered as part of the educational specifications for library/media center planning purposes. Requirements for handicapped pupil users must be planned. There are variable standards for the number of pupils using the library/media center at any one time (10 to 15 percent), so without good planning through educational specifications, a library/media center which was meant to be adequate will soon be inadequate for present and future users. Essential elements for library/media center space include:

a) square footage: a minimum of 4,000 square feet for seating a minimum of 50 pupils. This space includes the following areas (square footage in parenthesis): entrance, circulation, distribution (800), pupil seating (1,500 at 30 sq. ft. per pupil), office (150), two conference rooms (300), audio-visual equipment storage (400), materials storage and production (500), and a workroom (350). Servicing greater numbers of pupils in the library at one time requires an additional 30 square feet per pupil for seating. Including any of the above optional areas (e.g., computer lab), or adding more or larger spaces would increase required square footage accordingly. Portable room dividers or walls may be used to separate some of these areas if desired.

b) location: first floor, central location for classroom use, near entrance for community and after school access and contiguous to areas permitting possible expansion. All pupil areas of the library/media center should, if possible, be visible from the circulation desk area for visual control purposes.

c) learning activities: spaces for learning activities involving individual, small group, and a variety of age groups need to be provided. Learning activities include reading, browsing, quiet study, listening and viewing, conference or small group discussion, research, and casual reading. Spaces and appropriate activities for handicapped pupils need to be provided. As other learning spaces are incorporated within or adjacent to the library/media center (e.g., computer lab), space relationships with these areas must also be planned.

d) learning aids, equipment: a great variety of learning aids and equipment are required for a library/media center. Tables, chairs and other furniture suitable for different age groups must be provided. Likewise, books, magazines, newspapers, and audio-visual materials for a wide range of age groups and interests must be supplied. Audio-visual equipment, adjustable and portable shelving, carts, display spaces, computer terminals, chalk/markerboard, display/tackboard and adequate AC hookups for equipment and TV systems are necessary. The impact of new programs (e.g., computers) or systems (e.g., electronic check-out and card catalogs) makes heavy power demands on the library/media center. Sufficient outlets and zone lighting layouts are needed to accommodate the use of audiovisual presentations. A dedicated outside phone line is essential for accessing online database and communication systems.

### 3.22 Reading/Tutorial

Services in this area might include remedial or supplemental reading instruction under Chapter I or an English-as-a-second-language program, or tutorial help in a variety of learning activities as needed. Essential elements for reading/tutorial space include:

a) square footage: for individual or small groups work, 450 square feet per room. For larger enrollment schools servicing more pupils with more staff at one time, larger rooms, perhaps even with a separate resource center, may be needed. Portable room dividers may separate learning stations where appropriate.

b) location: central location, preferably near library/media center for access to materials. The rooms should be in a quiet area with no distractions, with an easy exit to a hallway.

c) learning activities: spaces for individual and small group work for a variety of age groups need to be provided. Learning activities include tutorial assistance, individual study, testing, drills, computer-assisted learning, and listening/viewing.

d) learning aids, equipment: necessary learning aids and equipment include computers, adjustable and portable furniture, audio-visual equipment and AC outlets for equipment use, TV outlets, display/tackboard, and chalk/markerboard.

e) storage, other needs: ample storage space for pupil and teacher/aid materials is needed. The room should be carpeted and acoustically treated. Air conditioning for summer use should be considered.

## 3.3-3.4 Secondary School Spaces

### 3.31 Square Footage Recommendations

**For secondary school space square footage recommendations, the general rationale is as follows:**

A) **The total space of 120-220+ feet per student depends upon 1) school enrollment, 2) grade levels in the school, and 3) specialized areas (e.g., auditorium, pool) desired. As the enrollment, grade levels, or desired specialized spaces increase, so would the required total square feet per pupil. Student enrollment of at least 75 pupils in grades 7-9 and 100 pupils in grades 10-12 (525 pupils 7-12) will be assumed unless otherwise indicated.**

B) **A breakdown of the total square feet per student based on the type of school:**

| | square feet per student |
|---|---|
| Middle School | 120-150 |
| Junior High School | 130-165 |
| High School, Grades 7-12 | 150-200 |
| Senior High School | 160-200 |

**Detailed educational specifications must be completed before the needed total square feet per pupil is accurately determined. The above square footages are for preliminary planning purposes only.**

C) **For each instructional space, square footage is based on the number of students (e.g., 25) indicated. If there will be more students in the classroom than indicated (e.g., 30 instead of 25 in a computer lab), square footage should be increased accordingly. If there will be fewer students (e.g., 15 instead of 25 in classroom), the classroom must still be 800 square feet unless otherwise indicated.**

D) **Space for storage of materials, office and/or conference space is also essential and must be planned for in determining total square footage needs.**

## Secondary School Spaces

### 3.32 Organization, Programs

Organizational designs for secondary school spaces are based in part upon curriculum requirements for middle, junior, and senior high schools as outlined in State Board of Education Rules 3500.1600-.2110. Other state and national laws and rules regarding vocational, special education, and other educational and community services that may be offered through the schools are also relevant.

The diversity and complexity of school organization and programs (curriculum, services) increases from elementary to secondary schools in general, and from middle/junior high school level to the senior high level in particular. This is due to a number of factors affecting secondary schools, among them:

a) a shift in emphasis from basic skills to exploration to post high school preparation programs;

b) larger student enrollments (75-100 per grade level), more specialized staff;

c) a greater range in student interests, skill levels, and attitudes, and the need to provide programs to meet these needs;

d) the increasing importance of extracurricular programs;

e) greater community use of facilities;

f) the greater impact of economic, social, technological, legal, and political changes on programs.

The philosophy of the school district and school regarding these factors can also significantly affect how flexible and adaptable a secondary school must be. An innovative school with a diverse student population will likely demand more flexible facility improvement planning than one which defines its goals narrowly and is resistant to change. Suffice to say, high school graduates must be prepared to enter the job market, take advantage of postsecondary training and educational opportunities, and assume adult roles as homemakers and citizens. Most all young adults will sample a diversity of lifestyles and living locations; competition for jobs in many cases will be on a regional, national, even international basis. In short, the great variety of emerging needs, opportunities, and challenges facing young persons demands comprehensive programs to service secondary students, and flexible facilities which will accommodate this ever-changing panorama of needed programs.

Secondary school organizational designs may encompass any or all of the following concepts: self-contained or open classrooms, small and large group, as well as laboratory classroom areas, main and/or area resource centers, and specialized spaces. Departments or age groupings may be organized by areas or wings; in most schools, spaces are clustered to separate academic from vocational from special interest areas. Examples of "clusters" in secondary schools may include the following areas:

a) academic - English, social studies, foreign language, mathematics, science, computer lab;

b) performing arts - music, art, dramatics, TV production, auditorium;

c) vocational - business/marketing education, home economics, industrial arts, agriculture;

## Secondary School Spaces

### 3.33 Classrooms

Guidelines for classrooms will apply to the academic cluster areas, as well as such areas as health, driver education, and foreign language. Smaller student enrollments may allow for a scheduled sharing of classroom spaces between subject matter areas, and larger student enrollments may necessitate separately scheduled classroom spaces for most all areas. Essential elements for secondary classrooms include the following:

a) square footage: a minimum of 800 square feet for up to 25 students. For additional storage space, teacher office, small group or conference room, or special needs, add 50-150 square feet per space. Demountable walls/dividers are desirable to facilitate small group and team teaching learning activities.

b) location: in quiet areas, near the library/media or resource center areas. Classrooms may be clustered by age groups or departments.

c) learning activities: spaces for individual, small group, and classroom learning activities need to be provided.

d) learning aids, equipment: necessary learning aids and equipment include marker/chalkboard, display/tackboard, ceiling or wall-mounted projection screen, bookcases, portable desks/ tables, and AC outlets for audio-visual equipment and TV outlets. Carpeting and acoustical treatment are advised. For more specialized classrooms (e.g., speech/dramatics, foreign language), additional features (e.g., an elevated presentation stage) are desirable. Handicapped student accessibility must be provided.

e) storage, other needs: ample storage and shelving for student and teacher materials should be provided. Certain areas may need more chalk/markerboard space (e.g., math), while others may need more book storage space (e.g., English) provided. Efforts should be made to make classrooms aesthetically pleasing. Illumination, temperature, and ventilation control need careful planning to maximize classroom comfort in all seasons. Enough classrooms should be air conditioned for possible summer school use. A room to room telephone system with capabilities for computer/data use should be considered.

Above all else, providing sterile, undersized classrooms crammed full of desks in rows, with no spaces for small group work, student movement, handicapped accessibility, or other flexible use or storage should be avoided.

sinks, and counter space must be specified. A refrigerator, oven, or incubator may be required. Chalk/markerboard, display/tackboard, and eyehooks where appropriate are also needed. A viewing area with a ceiling or wall-mounted projection screen for audio-visual presentations should be readily accessible, if not part of the classroom space. Portable labs may be desirable for use in multipurpose classroom and laboratory space. Adequate AC outlets and TV outlets should be provided in each room.

e) storage, other needs: storage, ventilation, and safety requirements for science laboratory areas are critically important. Ventilation for classroom-laboratories are covered by State Building Code regulations. Laboratory air, unlike most inside air, cannot be recirculated because of the possibility of a buildup of toxic fumes. A specially-designed exhaust hood must be provided in any such area (e.g., chemistry). Eye safety fountains, showerheads, and first aid supplies must be readily accessible. Emergency shutoff valves must be provided and be readily accessible in any room where water, gas, and electricity is provided. Provisions for safety goggles, fire extinguisher, and fire blankets must be made.

Storage area requirements for chemicals, flammable liquids, and other hazardous materials are specified through State Building Code and Minnesota Department of Health regulations. These rules cover fire doors, floors, security, ventilation, exhaust and fire protection systems, shelving, cabinets, containers, labeling, and fire resistance requirements. These areas must be secured and inaccessible to students.

General storage areas for student materials, projects, and special equipment (e.g., microscopes) are essential. Chemical storage areas must be secured from students, not be located within a classroom, and near any equipment or items that may corrode. A separate exhaust system for a chemical storage area is also needed.

Work space for the preparation and storage of teacher demonstrations and experiments, complete with sink, counter, and utility services is necessary. Often this space is adjacent to storage as well as conference and general teacher preparation/office areas. An advanced student project work area, for up to six or eight students, similarly equipped, might also be located adjacent to this area or main laboratory where ease of supervision is provided.

Laboratory tables need special wiring and electrical hookups, as well as vacuum breakers and other plumbing fixtures required by the Minnesota plumbing code. Lab surfaces and floors should be nonslippery, as well as fire and acid resistant. Carpet in laboratory areas should be avoided. Large cleanup sinks should be provided. The teacher should be able to have eye contact with all laboratory stations.

Safety as it relates to science laboratory and storage areas is an increasing liability problem. All members of the planning team have a responsibility to assure student and teacher safety. Numerous publications on safety standards are available. Some of these publications include:

Safety in The School Science Laboratory: Instructors Resource Guide (Washington D.C., U.S. Department of Health, Education, and Welfare, 1977)

3.35 Computer Lab

Computer labs are an essential part of a secondary school setting. They relate to both general and specialized instructional programs. Essential elements of computer labs include:

a) square footage: 1,100 square feet for 25 students in a computer lab. It may be designed so that a classroom area with desks is contiguous to the lab area.

b) location: a computer lab should be located near the area of intended use (e.g., near the academic or vocational area, or library/media center), and where light glare from the outside will not create screen vision problems. If community or after hours use is contemplated, location near an entrance where ready access and necessary security can be maintained is desirable.

c) learning activities: in a computer lab, spaces for individual, small group, and demonstration learning activities must be provided. A variety of user purposes (e.g., computer assisted instruction, computer literacy, programming, word processing, simulation) and desired equipment will shape the internal relationship of spaces. Accessible work stations for handicapped students, if not provided elsewhere, must be planned.

d) learning aids, equipment: necessary learning aids and equipment for a computer lab include furniture, hardware, and software. A "perimeter" type lab set-up, with work units or counters on the walls surrounding a central presentation or demonstration area is common. Normally, each student station is equipped with a computer and other necessary hardware and software. Networking centers, lab packs, computers, printers, junction boxes, all must be part of the educational specifications and planned for accordingly. Desks or counters should be at typing height. Chair design for comfort and movement (swivel casters, e.g.) is important. The furniture should be flexible and adjustable. Some computer stations should be portable. Chalk/markerboard and display/tackboard must be provided. If carpeting is used, it must be static-free. A large screen monitor and permanent projection screen should be included for demonstration teaching.

e) storage, other needs: ample and secure storage for student (wall shelving near computer units) and teacher materials is necessary. A security system to ensure the safety of the computers is well advised. Teacher work and demonstration space, in the center or perimeter of the room is essential. The electrical and power setup for computers, printers, monitors, a network system, master control switches, and the like needs careful planning. It is common practice to provide three electric power outlets (computer, monitor, general) at each station, each on a separate circuit that is master switched. Telephone line access to external electronic bulletin boards or other data sources should be provided. Lighting needs special attention so as to avoid screen glare and eye fatigue. Humidity must be controlled. Adjustable work spaces for handicapped and adult users should be planned. Air conditioning for summer use is necessary.

3.38 Art

Essential elements for art room spaces include:

a) square footage: 2,000 square feet for up to 25 students, including storage (500 sq. ft.) and a teacher's office (150 sq. ft.). If enrollment necessitates more and/or specialized art rooms,storage/office areas may be shared, and the size of each specialized space (e.g., drawing and printing, pottery, photography) may vary somewhat (800-1400 sq. ft.). Portable room dividers or demountable walls may separate work areas, particularly in a multi-purpose art room. A kiln room would require an additional 300-400 square feet.

b) location: first floor, near service entrance for ease of delivery and transfer of art materials and possible community use. The room should also be located close to the industrial arts, home economics, and dramatics performance areas to facilitate cooperation among these areas. Natural light, through a northern exposure or sky lights controlled for glare and blackout is preferred. A conveniently located lighted display area, indoors or outdoors, is also desirable.

c) learning activities: spaces for learning activities involving reading, listening, viewing, and working in a variety of 2 or 3 dimensional media, wet and dry, need to be provided. Painting, clay, printmaking, plaster, paper-mache, jewelry and metal craft, fibers and weaving, plastics, woodworking, sculpture, and photography are common activities in art rooms. Flexible arrangements within a room are a must to accommodate varying student and program needs.

d) learning aids, equipment: work areas which share tools and equipment should be near each other. Provisions should be made for screens and darkening of the room for showing slides, films, and spotlighting. Accessibility to working and teaching stations needs to be provided for all students, most especially those with handicaps. Movable work surfaces such as easels and stools, art horses, wood working or ceramic benches, potters wheels, model stands, and single, double, or four-student art tables are essential. Work counters with adequate sinks, electrical outlets, drying racks, and tool panels, art metal craft counters with vises, clay carts, and a work area with a large mirror for modeling should be considered. The kiln should be in a separate, fire protected and well ventilated room. Chalk/markerboard in the room, and display/tackboard areas in and outside the room are necessary. A room ceiling grid system, as well as deep, adjustable display cases off the corridor or in other areas of the school (e.g., library, lobby) are desirable. Flooring which is resistant to water, cleaning solvents, oil, and easily maintained (rubber or vinyl tile) are advised. Concrete is best for heavy duty work areas (e.g., clay), complete with the appropriate floor drains.

e) storage, other needs: adequate storage space in the art area is crucial. Storage space must be provided for bulk supplies of materials and equipment, tools, paints, acids, solvents and cleaners reference materials, and materials, equipment, and students projects in progress. A variety of storage areas with adjustable shelving, drawers, and cabinets, some secure and fireproof, need to be located near or away from student work areas as appropriate. Ceilings should be from 10-14 feet high, with ventilation designed to circulate air quickly and harmlessly. Special attention must be given to exhaust hoods in any area where contaminant vapors will be present (refer to State Building Code). Sinks with strainers and sediment interceptor traps should be well distributed in the art room and easily accessible to groups of students for fast cleanup. Two sinks mounted on a peninsular base cabinet are the minimum needed. Emergency washing facilities, as well as a fire extinguisher, should be readily accessible. Electrical and gas supply outlets must be carefully planned, including master and emergency shutoff switches/valves for safety. Sound-absorbing materials should be used to reduce noise.

## Secondary School Spaces

### 3.39 Music

Music spaces are a frequent component of additions to secondary schools, replacing undersized, outmoded spaces currently used. Again, care must be taken not to scrimp or cut space, as without adequate space, the ability to modify the existing space is very limited. Detailed educational specifications are desirable. Essential elements for music room spaces include:

a) square footage: the variety of offerings and group sizes requires a more specific breakdown of music spaces. Space need determination should be based on maximum estimated enrollments, not minimum.

| Area | Students 60 | 90 |
|---|---|---|
| Instrumental | 1,500 sq. ft. | 2,000 sq. ft. |
| Vocal | 1,100 sq. ft. | 1,500 sq. ft. |
| Combination | 1,300 sq. ft. | 1,750 sq. ft. |
| General Music | 800 sq. ft. for 25 students | |
| Practice Rooms | 48 sq. ft. each, 80 sq. ft. with piano<br>120 sq. ft. ensemble group | |
| Office and Library | 200 sq. ft. | |
| Uniform Storage | 175-250 sq. ft. | |
| Instrument Storage | 250-500 sq. ft. | |

Other auxiliary facilities, such as instrument repair, a recording room, or rooms for specialized medium-sized groups (jazz, madrigals, glee club, swing choir) may require additional space.

b) location: adjacent to the auditorium or gym stage, with same level or ramp areas, with locking double doors to control circulation and noise and to prevent security problems. Being self-contained, storage, office and practice room areas should be shared whenever possible. The senior high level instrumental area should be convenient to the athletic field for ease of coordination of field activities. Avoid locating practice rooms so that they open directly into main music rooms.

c) learning activities: as the total number and grade level of music students increase, so does the demand for a variety of spaces to accommodate individual, small, and large group instruction. Listening, singing, performing, and expressing are goals of the music program. Handicapped students are increasingly becoming involved in musical activities, and must be provided for accordingly.

d) learning aids, equipment: portable or fixed semi-circular risers are often part of instrumental and vocal rooms. Orchestra rooms generally prefer flat floors. Space needs to be provided in front of the room for a podium, piano, audio equipment, display/ tackboard, and chalk/markerboard. Alternately, an elevated podium and semi-permanent or portable risers may be provided. Ceilings should be 14-18 feet high in the instrumental room, 12-14 feet high in the vocal room. Lighting needs special attention because of the close reading of music by students. Walls should be angled and treated acoustically (e.g., drapes), as well as the ceiling. Music playing and recording machines, and a suitable

## Secondary School Spaces

### 3.40 Physical Education

Demands on physical education and sports facilities have increased significantly through expanded programs (e.g., girl's athletics) and the emphasis on community use of facilities for physical fitness purposes. Adequate space, both indoors and outdoors, is most important. The lack of such space is often a prime consideration in school additions or purchases of additional land. Indoor and outdoor space should be based on the maximum utilization of facilities, enrollment potential, and any anticipated building expansion. Thorough site planning will prevent the loss of outdoor space when the need for it is increasing, and will forestall expensive additions in the physical education area. A split school site with overlapping areas and outdoor spaces several blocks away across traffic and residential areas, should be avoided. Meeting the acreage requirements outlined in section 2.52 is critical.

Detailed specifications for the number and type of indoor teaching stations and outdoor spaces are needed. Ensuring an adequate number of teaching stations through careful planning is important (see Section 2.3). The advice of staff, consultants, architects, and information from professional associations should be sought. It should be pointed out that school districts planning swimming pools should consult the State Department of Health early on regarding requirements for swimming pools. Essential elements of indoor and outdoor physical education spaces include:

a) square footage: for 50-60 students in a two teaching station gymnasium, a minimum of 5,600 square feet (65' x 86') is required in a junior high, and 7,500 square feet (78' x 96') in a senior high. This would provide space for physical education and extracurricular activities (e.g., basketball, volleyball). Space for spectator seating would require additional square footage. A second or auxiliary gym should be a minimum of 2,400 square feet (40' x 60') for two additional teaching stations. Ceilings should be at least 22' high in the main gymnasium, and 14-18' in auxiliary spaces. Smaller spaces for use at times in adaptive physical education, dance, or other specialized activities may be as small as 450 square feet (30' x 15'). Specialized spaces for wrestling, gymnastics, weight training, swimming, if needed or desired, should be planned individually. Flat wall space for rebound game of fitness activities should not be overlooked. Partitions or curtains to separate teaching stations are desirable.

   Space guidelines for locker rooms, storage areas, and related spaces are listed below. Space must be provided for physical education students and after school hours users (inter-scholastic, intramurals, community). The largest groups of users at any one time should have access to both locker and shower head space.

| Related Areas | Space Required |
|---|---|
| Locker-dressing room | 24 sq. ft. per student |
| Lockers | one per user + 10-15% |
| Showers | one head per 3-4 students |
| Floor area | 12 sq. ft. per shower head |
| Towel storage | 80-100 sq. ft. |
| Laundry room | 200 sq. ft. |
| Storage areas | |
| Indoor | 300 sq. ft. per teaching station |
| Outdoor | adjacent to fields |
| Athletic supply | 200 sq. ft. |
| Athletic drying room | 200 sq. ft. |
| Training room | 200 sq. ft. |
| Athletic equipment | as needed per activity |

outdoor facilities with minimal use of school corridors. Teacher/coach offices should be located to provide good supervision of the shower and locker room area. Indoor spaces should be capable of being locked off from the rest of the school to provide for after school hours use with a minimum of security problems. Outdoor spaces should be located in relationship to their intensity and compatibility of use (e.g., general purpose areas nearest building). Outdoor spectator seating should consider the direction of the sun for viewing purposes.

c) learning activities: through the activities listed in (b) and many others, the development of motor skills, conditioning, and lifetime leisure interests is central to physical education programs. Extracurricular programs concentrate on more specific skills, and emphasize individual and group competition to a greater degree. Developmental or adaptive physical education activities provide for handicapped student needs.

d) learning aids, equipment: besides the appropriately designed learning stations for basketball, volleyball, softball, track and field, and the like, a great variety of equipment must be provided for student use. Balls, clubs, ropes, mats, floor plates and anchors, standards, parallel bars, weights, arrows, racquets, uniforms, protective gear, benches, shot puts, etc., in appropriate sizes and/or adjustable for students of varying ages, sizes, and developmental levels. Chalkboard (portable and permanent), display/ tackboard, first aid and emergency equipment, and portable as well as permanent public address sound system must be provided where appropriate.

e) storage, other needs: ample storage space is critical for physical education as well as extracurricular programs, both for ease of program coordination and security purposes. Portable means of hauling and securing equipment are also necessary. Heating and ventilation needs of various physical education spaces (gymnasium, wrestling room, pool) vary considerably and must be well planned. Adequate AC outlets should be provided in each gym area and consideration given for TV outlets that would enable athletic events to be carried to other parts of the school or to outside cable sources.

Floors should be resilient and have a nonslip surface. Space must be allowed for expansion and contraction of floors. Padding on walls needs to be provided where appropriate. Acoustics (especially echos) needs should not be overlooked. All of these factors should be considered from the start and be part of the specification and bidding process for each indoor and outdoor space. Showers, toilets, mirrors, drying rooms, drinking fountains, drainage, and locker room ventilation need special attention. Locker units of various sizes which are durable and secure must be provided for a variety of users and extracurricular activities. Girls' locker room spaces, service areas, and spaces for activities must be equitable in size and quality. A plan of management and maintenance of these spaces is important for long-range use. Ramping and access for handicapped students and spectators is required. Planning pools, stadiums, hockey arenas, concession and public lobby areas, will require input from staff and resource and planning documents from regulatory agencies, the high school league, and specialized consultants.

b) location: the center of the school, near academic classrooms, accessible before, during, and after normal school hours. Space for possible expansion should be considered. The circulation and distribution area should be located close to a single entrance. Visual control of all pupil areas of the library/media center should be possible from a central location.

Additional resource centers may be located in other areas (e.g., science resource center), especially in larger enrollment schools. The workroom, office, and audio-visual storage and maintenance areas should have ready access to a corridor and elevator if available.

c) learning activities: reading, browsing, listening and viewing, study and learning, conferring, research and information retrieval. Individuals, small groups, and classroom-sized groups may simultaneously be involved in these and other learning activities in a library/media center. There needs to be a classroom sized area equipped for all types of audiovisual and/or computer presentations that will not distrub students in the reading/listening/viewing area. A library/media center program supports the ongoing instructional program, and must be flexible to meet the changing needs of the curriculum, students, and staff. Provisions for handicapped students must be an integral part of the library/media center.

d) learning aids, equipment: staff and consultants need to develop detailed lists of necessary learning aids and equipment for a library/media center. Basic resources include the following:

1) printed materials - books (minimum 8-12,000 titles), magazines and newspapers, pamphlets, catalogues, and clippings
2) audio-visual and electronic materials - filmstrips, films and videocassettes, computer software, slides, tapes, graphic materials, transparencies, microforms, programmed instructional materials, realia, kits, and resource files
3) audio-visual and electronic equipment - television or radio receivers and record or tape players with headphones, video recorders, slide filmstrip and motion picture projectors, cameras, microform readers, screens, carts, typewriters, computers, printers, modems, video and compact disc players
4) shelving - both open and closed is needed. Most shelving should be integrated into the reading, browsing, listening, and viewing areas. From 90-95 percent of shelving should be 8 inches wide (ten normal- sized books per lineal foot) 10 percent, 10 to 12 inches wide (six oversized books per lineal foot). All shelving should be adjustable. The shelving height should not exceed 5 feet to accommodate handicapped students, with 3 feet of space between rows of shelving.
5) furniture - includes card catalogs, index tables, a circulation desk, paperback book racks, book trucks, reference book stands and newspaper racks, filing cabinets, exhibit cases, computer cards, tables, printer stands, and other equipment. Student study or viewing carrels, tables, and chairs must allow for physical differences of students, as well as handicapped student use.

A variety of specialized materials, equipment, and furniture are necessary for audio-visual repair areas, media production laboratories, television or radio studios, storage and control centers, as well as for general offices, workroom, and professional library spaces. Professional publications put out by the American Library Association and the Association for Educational Communications and Technology are good sources for types and amounts of materials, equipment, and furniture needed.

## Secondary School Spaces

### 3.42 Business/Office Education

Business/office education programs are offered primarily at the senior high level. Typing and word processing may be offered at the junior high and/or elementary level. Spaces for basic business/office education classes will be the focus of this section; specialized, vocationally oriented programs may demand more space and equipment as present in a vocational center or technical institute. Essential elements of business/office education spaces include:

a) square footage: for 25-35 students in a typewriting/keyboarding room, 1,000-1,400 square feet. For up to 25 students in a multipurpose room, 1,200 square feet; in a office procedures or other separate, specialized room 1,000-1,200 square feet. Course offerings appropriate for a multipurpose or specialized room include general or basic business, accounting, business machines, shorthand and stenography, as well as advanced courses in these areas. The appropriate size for each room depends upon anticipated enrollment as well as the desired furnishings and equipment for each room, which can be quite extensive. Detailed educational specifications are essential. Portable walls or room dividers should separate rooms or work areas in specialized or multipurpose rooms where appropriate. Teacher offices and storage areas would require additional space, and should be shared when possible.

b) location: business/office education classrooms should be located in one area, preferably near other vocational education spaces. Numerous layouts are possible; flexibility to accomodate changing program needs is essential. A typewriting room should be located next to an office procedures and/or shorthand room. An office machines room should be adjacent to the accounting, typewriting, and/or office procedures rooms. Ready access to an exit for evening and community use should be considered.

c) learning activities: a variety of learning activities teach students about business, practice skills for personal or educational use (e.g., typing), and help prepare students for employment or more specialized training in business/office education related fields. Work stations for handicapped students must be planned accordingly.

d) necessary learning aids, equipment: appropriately designed desks, chairs, tables, files, and a variety of machines are necessary in most all business/office education rooms. Ample chalk/markerboard display/tackboard space is important. Furniture and equipment should be adjustable and portable whenever possible. Counter work space may be necessary. Computer work stations may be part of a lab classroom set up or may be placed individually where needed. A wall stop clock is needed for typing exercises and timed tests. Carefully designed AC power and computer networking systems should be included in the computer area.

e) storage, other needs: the great variety of equipment, especially in multipurpose rooms, demands much storage space when not in regular use. Space for a teacher demonstration stand or area is important. A small practice room visible from the main classroom area is desirable for student use. Power outlets located on the perimeter and in the floor are essential. A master circuit control switch is important for safety and ease of turning off all equipment. Lighting for close work is necessary; acoustical treatment for noise control is desirable.

the child care and clothing area. Accoustics, temperature and humidity control, lighting, noise, and ventilation control (kitchen fumes) must all be well planned. Plumbing is very important in the foods area, where a hot water and gas supply is essential. Electrical service demands are heavy in consumer-homemaking, and outlets and control panel locations must be planned to afford both permanent and flexible arrangements of equipment. Floor coverings should be selected with ease of maintenance in mind, especially in the foods/nutrition area. Code requirements as they relate to separation of kitchen areas, child care facilities, and the like must be complied with, as in all areas. Space for teacher planning and storage of materials is also necessary.

c) learning activities: a wide variety of learning activities are appropriate for general background, occupational exploration, or job entry preparation objectives. Classroom, shop, or lab settings emphasize individual, small, and occasionally large group (e.g., building a garage) project work. Students will use and apply tools, materials, and equipment at various work stations in courses emphasizing communications (drafting), construction (woods), manufacturing (welding), transportation (small engines), and agriculture (farm machinery). Work stations for handicapped students must also be provided.

d) necessary learning aids, equipment: a variety of hand and power tools, machines, equipment, and work stations must be provided in general or unit shops and related classroom areas as appropriate. Flexibility, safety, work procedures, flow of materials, and efficiency are important considerations in planning the arrangement of equipment, machines, and student work stations. Adequate work space is essential, especially around hazardous machines. Operation guards for saws, jointers, planers, and other high speed machinery are required; ample chalkboard and display/tackboards should be provided. Walls, floors, partitions, windows, and doors all need special design consideration. Sound absorption materials in walls and ceilings are desirable.

e) storage space, other needs: lack of adequate storage space is a common problem in shop spaces. Adequate storage space for student projects, small and large, tools, materials and equipment in use and not in use, is essential if student safety and the learning environment are to be maintained. These spaces should be included in original construction plans.

Exhaust systems, ventilation, and dust collecting equipment must be installed where needed, such as in a welding area. Electrical demands are heavy in shops and special consideration is necessary. Numerous power outlets and a master shut off switch are necessary. Electrical troughs along the walls or overhead as appropriate will ease relocation of equipment. Gas outlets may be needed. Refer to the State Building Code for mechanical and electrical requirements. Wash and drinking fountain facilities should be conveniently located for student use. Lighting needs will vary with the work station. First aid equipment and fire extinguishers must be readily accessible. Floors should have non-skid preparation. Danger areas should be outlined with painted lines. The teacher should have clear vision over all work areas in the shop.

## Supportive Spaces

The health room may also be located near the guidance office, with a separate entrance provided. The health room area may be used for health care of students, health screening, and records storage. A waiting area, examination space, observable rest areas with cots, toilets, storage space, and offices for the nurse and/or health workers should be provided. Scales, tables and chairs, a counter and sink. a mirror, and necessary health supplies are essential.

## Supportive Spaces

### 3.53 Student Services, Activities, Conference

Reference to space needs for occasional student services (preschool screening, testing) or specialized staff (chemical dependency, community education, work-study, psychologist, social worker) has been made in the last two sections. These spaces may be an integral part of the administration/health, guidance/career, or other areas as appropriate (library/media center, special education).

Student activities such as student council, newspaper, yearbook, debate, and dramatics need space to effectively function. Use of teacher rooms or other assigned areas is not always possible, and creates scheduling problems between competing groups at times. Several small rooms (150-300 square feet) should be set aside for such student activity purposes. Rooms should be designed and equipped with flexible or multiple uses in mind. It is also advisable to have at least one general conference room (200 or 300 square feet) besides those in the administrative, guidance, or other areas. This conference room will provide space for department meetings and teacher-student-parent conferences when privacy is needed.

A student commons area, which could double as an dining, study hall, student activity, or community meeting area is also a possibility. The space should be flexible or convertible to other uses, including additional classrooms.

## Supportive Spaces

### 3.55 Food Service

The food service area includes space for food preparation, meal service, dining, and storage. The kitchen should be located near an outside loading platform so that food and supplies can be easily moved from the platform to the inside receiving area through storage to the preparation areas and then to the serving area.

The space needed for food preparation, meal service and dining depends upon type of food service system planned, number of menus offered, number of serving periods, and percent of participation. Serving arrangements and dining facilities for handicapped students must be provided. Dining spaces should also be provided for students who bring their own lunch. The recommended space needed for the food service area when preparing and serving meals to 350 elementary students and staff or 550 secondary students and staff follows. For student seating in the dining area, plan for 12 square feet per student per one half hour shift. A staff dining area would require additional square footage (see section 3.54).

| Area | Square Feet | |
|---|---|---|
| | 350 meals | 550 meals |
| Food preparation | 640 | 740 |
| Serving line (2) | 300 | 400 |
| Refrigerator and freezer | 200 | 250 |
| Dry storage | 265 | 350 |
| Dishwasher | 235 | 285 |
| Office | 75 | 75 |
| Employee room, toilet (1) | 60 | 60 |
| Receiving dock, waste, holding area | 110 | 140 |
| Student seating (2 meal periods) | 1400-2100 | 3300-3850 |
| TOTALS | 2285-3985 | 5525-6075 |

Layout of equipment, beginning and end of serving line(s) and location of the dishroom require special consideration. Student traffic lanes in an out of the serving and dining areas should be planned in order to avoid any cross traffic and to allow for an end of serving (line(s) accountability system. The dishwashing area should be located in a separate room, close to/adjacent to the kitchen, near an exit from the dining area and accessed without crossing incoming traffic.

The design and atmosphere of the dining area should be conducive to good eating: attractive, bright colored, cheerful, noninstitutional in atmosphere, interesting and with windows if possible. Dining space may be used for study hall, large group instruction, educational television, student commons, or community meetings.

Food service staff who will use the facility should be involved throughout the planning. For recommendations on the kind and size of equipment needed, see the latest United States Department of Agriculture Equipment Guide for On-Site School Kitchens. "Rules for Food and Beverage Establishments," Minnesota Department of Health, provides guidelines on sanitation, cleaning, water supply, disposal, floors, walls, ceilings, lighting and ventilation. These recommendations and rules should be studied carefully.

## Supportive Spaces

### 3.57 School Age Child Care

An increasing number of public school districts are now providing School Age Child Care or Extended Day Programs for children from kindergarten through the sixth grade. Most participating districts provide after school programs; others provide both before and after school programs and at least half of the districts provide summer school and vacation day programs.

Some districts provide separate space in community education buildings or separate classrooms. Others have a shared space arrangement where classrooms and other rooms are shared with the regular K-12 program. These usually include the gymnasium, playground space, cafeteria, art rooms, computer rooms and other specialized rooms.

Areas for a variety of activities and age groups with clear boundaries should be provided. Storage areas for children and adults, as well as appropriate equipment also need to be provided.

The most desirable program area is space exclusively dedicated to child care and not shared. Where shared space is the reality, creative use of shared space will be a challenge. It is recommended, therefore, that at least some portion of the space be designated as exclusive even if it means only a "check in" and outdoor clothing area. The space should have access to as many optional activities or resources as possible, e.g., gyms, media center, playgrounds, lunch room, etc.

## CHAPTER IV

## OTHER CONSIDERATIONS

Portions of chapters I-III have dealt with the physical and school environment. The intent of this chapter is to identify school environment-related topics school officials should be aware of and concerned about in terms of the adequacy of present schools or when planning new or improved school facilities. It is important that persons seeking further, more detailed information on these topics seek out the consulting architects or engineers working with their local school district, or the building code officials, other state or federal agency personnel, or pursue the reference sources cited in this Guide. How these considerations are dealt with in planning new or improved school facilities may make the difference between a less than adequate and a quality facility for many years to come.

### 4.0 Health and Life Safety

That school facilities provide a healthful and safe environment for pupils is of utmost importance. From school board members to professional staff to custodians, all share the responsibilities that go with their status as school district employees.

Liability for intentional, unintentional, or negligent conduct is also part of this responsibility. Over the years the courts have ruled more in favor of pupil rights for a safe school environment when accidents occur, and school officials are no longer protected from individual and collective liability through governmental immunity.

Ongoing concerns in the area of health and life safety include the following:

- insurance
- duties of school district personnel
- safety practices in general and in specific curricular areas
- safety checks and inspections
- safety hazards
- accident reporting
- safety equipment
- first aid, emergency procedures

A publication such as Safety: Preparation, Promotion, and Practice in Minnesota Schools (Minnesota Department of Education), should be the basis of careful review of existing as well as new facilities plans, policies, and procedures. Chapter III in that publication identifies many items of concern in each curricular area.

When planning for new or improved school facilities, as the following areas as they relate to health and safety issues need to be addressed:

- electrical wiring
- separation of hazardous areas
- air and water quality
- handicapped accessibility
- general housekeeping
- places of assembly
- evacuation procedures
- stairways
- corridors
- exits, exit lighting
- escape windows
- firewalls
- firealarm system

School district officials are responsible to meet current standards and codes in all of these areas working with and through the architects and engineers in their employ as well as local, state, and federal officials (see 1.04, 1.3)

Air conditioning of all inside rooms with no windows is strongly recommended. Air conditioning of all school buildings is recommended because of warm weather use.

Heating and ventilation conditions and standards should be reviewed by school officials with the engineers area by area. Staff should make their desires known through the educational specifications for their areas of concern and subsequent review of design standards. The greater the special need (e.g., science exhaust hoods, shop and locker room ventilation, kitchen hoods), the greater the need for staff involvement in the details of the design.

Initial cost, availability of fuel, annual cost of fuel, maintenance requirements, location and landscaping of building, extent of windows, and open space, climate, energy efficient systems - all these considerations and more enter into the design of an adequate thermal environment. It should not be taken for granted by school officials.

Acoustic problems include both controlling sound within a space so that sound can be heard well and preventing intrusion of unwanted sounds (noise) from outside the space. Acoustic factors include the use of the space, its size, shape, location, and relationship to other spaces and sound producing objects within or outside the school building. It is common to not place academic classrooms adjacent to more sound/noise producing areas such as shops, gym, business education or music areas. Some typical room acoustic problems include the following:

| Room | Environmental Consideration |
|---|---|
| Auditorium | Enhancing useful sounds |
| Classroom | Listening to teachers and other students |
| Library | An environment for study |
| Recording Studio | Control of reflections and reverberation |
| Band Room | Enhance blend and reduce sound level, echos |
| Gymnasium | Hearing instructions and announcements clearly, reduce echos |
| Shops | Reduce reflections and reverberations, quiet ventilation systems |
| Laboratories | Listening to teacher and other students |
| Corridors | Absorption of "people noise" |
| Cafeteria | Reduce reverberation |
| Kitchen | Reduce reverberation |
| Offices | Reduce reverberation |
| Conference Rooms | Speech clarity |

Engineers and school planners should also be aware of typical noise control problems, such as:

Disturbances from adjacent activities
Disturbances from mechanical equipment
Disturbances from lighting hum
Disturbances from heat registers
Disturbances from outside traffic, airplanes
Disturbances from impact noises
Disturbances through walls, floors, ceilings, roofs
Disturbances through doors, windows, etc.
Disturbances through ductwork
Disturbances through cracks and penetrations
Vibrations in structure, piping, etc.
Room echos

Minimizing acoustic problems in a school facility with a variety of acoustic needs and settings requires the expertise of an acoustical engineer. The acoustics for each area (corridors, music, media center, auditorium, classrooms) must be thoroughly and carefully planned.

## APPENDIX A

### Selected Minnesota Statutes and Other Selected References Relating To School Facilities

#### Minnesota Statutes

| Guide Reference | Source | |
|---|---|---|
| 1.01 | 123.35 | GENERAL POWERS OF INDEPENDENT SCHOOL DISTRICTS |
| 1.01 | 475.52, 53 | Bond Issues - Purposes, Submission, |
| 2.1 | .58, .59 | Notice, Debt Limit, Sale, etc. |
| 2.91 | | |
| 1.01 | 123.63 | EMINENT DOMAIN |
| 1.01 | 123.36 | SCHOOLHOUSE AND SITES.... |
| 1.24 | | |
| 1.01 | 463.16 | REPAIR OR REMOVAL OF HAZARDOUS BUILDINGS |
| 1.02 | 275.125 | TAX LEVY, SCHOOL DISTRICTS |
| 1.21 | | |
| 1.02 | 124.243 | CAPITAL EXPENDITURE; FACILITIES |
| 1.24 | | |
| 2.1 | | |
| 2.91 | | |
| 1.02 | 124.82 | BUILDING CONSTRUCTION DOWN PAYMENT PROGRAM |
| 2.1 | | |
| 2.91 | | |
| 1.03 | 471.59 | JOINT EXERCISE OF POWERS |
| 2.7 | | |
| 1.03 | 124.491 | COOPERATIVE SECONDARY FACILITIES GRANT ACT |
| 1.03 | 122.91 | EDUCATION DISTRICTS |
| 1.03 | 471.19 | RECREATION PROGRAM TO BE FOR EDUCATION PURPOSES |
| 1.03 | 129.11 | AGREEMENTS WITH DISTRICTS IN OTHER STATES |
| 1.03 | 123.351 | COOPERATIVE SECONDARY FACILITIES GRANT ACT |
| 1.05 | 127.11 | DRAWING ILLEGAL ORDER |
| 1.1 | 121.15 | REVIEW AND COMMENT FOR SCHOOL DISTRICT |
| 1.2 | | CONSTRUCTION |
| 1.22- | | |
| 1.24 | | |
| 1.25 | | |
| 2.1 | | |
| 2.7 | | |
| 1.22 | 121.148 | EDUCATION FACILITIES |
| 1.25 | 124.83 | CAPITAL EXPENDITURE; HEALTH AND SAFETY |
| 2.1 | | |
| 1.31 | 16B.59- | STATE BUILDING CODE... |
| 3.41 | .61, .66 | |
| 3.14 | | |
| 3.40 | | |
| 1.31 | 471.457 | BUILDING REQUIREMENTS: CONFORMITY |
| 3.0 | 471.467 | |
| 1.33 | 299F.011 | UNIFORM FIRE CODE: ADOPTION |
| 3.14 | | |
| 1.35 | 326.241- | MINNESOTA ELECTRICAL ACT |
| | .248 | |
| 1.36 | 115.061 | DUTY TO NOTIFY AND AVOID WATER POLLUTION |
| 1.36 | 116.46-.50 | UNDERGROUND LIQUID STORAGE TANKS |

## Other Selected References

| Guide Reference | Source | |
|---|---|---|
| 1.34<br>3.33 | 29 CFR Parts 1910, 1926<br>Minnesota Rules, Parts 5205,5206,5210 | Federal and State OSHA Standards |
| 1.35 | National Electrical Code | Electrical Safety Standards |
| 1.36 | 40 CFR Parts 61, 761.<br>Minnesota Rules Parts 7005.1580, 7045, 7100.0300-.0360 | Federal and State Asbestos Standards, PCB's, Hazardous Materials |
| 1.37 | Minnesota Rules, Parts 1800.5000-.5700 | Projects Exempt from Licensed Architect or Engineer Requirements |
| 2.4<br>3.14<br>3.57 | Minnesota Department of Education | "Survey Form For Handicapped Access"<br>Simple Solutions To Difficult Problems ot Handicapped Access<br>"Barriers to Opportunity and Independence" |
| 2.54 | National Safety Council | Standards for School Buses and Operations |
| 3.11<br>3.31 | Rules of the State Board of Education, Parts 3500.1150, .1600-.2110 | Elementary and Secondary Curriculum Requirements |
| 3.33 | U.S. Department of Health, Education and Welfare | Safety in the School Science Laboratory: Instructors Resource Guide |
| | Consumer Product Safety Commission | A Guide To Some Hazardous Substances |
| 3.55 | U.S. Department of Agriculture | Equipment Guide for On-Site School Kitchens |
| | Minnesota Department of Health | Rules for Food and Beverage Establishments |
| 4.0 | Minnesota Department of Education | Safety: Preparation, Promotion and Practice in Minnesota Schools |
| 4.2 | Illumination Engineering Society | IES Lighting Handbook |
| 4.3 | Minnesota Department of Energy and Economic Development | Identifying Low-Cost Energy Improvements for School Buildings |
| 4.3 | Energy Information Center, Minnesota Department of Energy and Economic Development | State Energy Code |

## APPENDIX B

### Planning For School Facility Improvements Checklist

| Phase/Steps | | | Designated Responsible Person(s) |
|---|---|---|---|
| **Assessment of Needs** | | | |
| ___ | A) | Identify facility improvement question. Appoint staff coordinator. | _____ |
| ___ | B) | Plan staff and community involvement. Set-up and appoint task forces. | _____ |
| ___ | C) | Consult with Minnesota Department of Education (MDE) if cost estimates exceed $100,000 | _____ |
| ___ | D) | Select architect, fiscal agent, legal counsel, and other consultants | _____ |
| ___ | E) | Gather data, assess existing sites, facilities, and project needs alternatives. | _____ |
| ___ | F) | Review and recommend facility improvement alternatives. | _____ |
| **Preliminary Planning** | | | |
| ___ | G) | Develop public information and support program. | _____ |
| ___ | H) | Consider alternative school sites/expansion areas. Consult with MDE. Select site. | _____ |
| ___ | I) | Review philosophy of instruction for facility improvement. | _____ |
| ___ | J) | Develop educational specifications. | _____ |
| ___ | K) | Review and finalize preliminary plans and specifications, projected costs. | _____ |
| ___ | L) | Submit preliminary plans to school board, other local government agencies. | _____ |
| ___ | M) | Submit preliminary plans to MDE if required. If over $400,000, allow 60 days for commissioner's review and comment. | |
| **Final Planning** | | | |
| ___ | N) | Develop funding package, assess tax impact of bond referendum levy. If bond referendum levy funds are not needed, proceed to step P). | |
| ___ | O) | Plan school bond referendum information campaign. Set ballot questions. Allow 20 days before referendum to publish commissioner's review and comment. If issue fails, return to step F) resubmit, or change proposal. | _____ |
| ___ | P) | Draft final plans, plan for securing of funds, expenditures. Secure school board, other local agency review and/or approval. | _____ |
| ___ | Q) | Submit final plans to Building Code Division, Department of Health, MDE for review and/or approval. Construction Contracts may not be awarded until after MDE approval. | _____ |

## APPENDIX C

### School Facilities Inventory...Forms

School Facilities Inventory:

School Sites

Physical and Environmental Characteristics

Elementary School Instructional and Supportive Spaces

Secondary School Instructional and Supportive Spaces

School District

# SCHOOL FACILITIES INVENTORY: PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Date

School Name

Dates of Construction, Additions

Adequacy Key: 2 = Adequate
1 = Less than adequate
0 = Not able to assess

| Physical Structure Exterior | Yr. Addn. | Adequacy |
|---|---|---|
| 1. Walls | | |
| 2. Foundation | | |
| 3. Structural Frame | | |
| 4. Roof | | |
| 5. Lighting | | |
| 6. Doors | | |
| 7. Soffits, Eaves | | |
| TOTALS | | |

| Mechanical Systems | Yr. Addn. | Adequacy |
|---|---|---|
| 1. Heating | | |
| 2. Ventilation | | |
| 3. Air Conditioning | | |
| 4. Electrical | | |
| 5. Plumbing | | |
| TOTALS | | |
| Learning Environment | | |
| 1. Space Relationships | | |
| 2. Space Adaptability | | |
| 3. Visual | | |
| 4. Audible | | |
| 5. Thermal | | |
| 6. Aesthetics | | |
| 7. Community Use | | |
| TOTALS | | |

| Interior | | |
|---|---|---|
| 1. Walls | | |
| 2. Floors | | |
| 3. Ceilings | | |
| 4. Doors | | |
| 5. Stairs, Ramps | | |
| 6. Hallways | | |
| 7. Windows | | |
| 8. Energy Improvements | | |
| TOTALS | | |

| Safety & Health | | |
|---|---|---|
| 1. Fire | | |
| 2. Storm | | |
| 3. Building | | |
| 4. Safety Equipment | | |
| 5. Handicapped Accessible | | |
| 6. Communications | | |
| 7. Hazardous Materials | | |
| TOTALS | | |

| Space | # Stations | Required | Available | Adequacy | Stations Needed | Square Feet Needed | Comments |
|---|---|---|---|---|---|---|---|
| Reading/Tutorial 450 sq. ft. | | | | | | | |
| Gifted and Talented 450 sq. ft. | | | | | | | |
| Administration, Health sq. ft. | | | | | | | |
| Social/Psy. Services sq. ft. | | | | | | | |
| Speech/Vision/ Hearing sq. ft. | | | | | | | |
| Teachers' Room/Prep sq. ft. | | | | | | | |
| Food Service/ Multipurpose sq. ft. | | | | | | | |
| Custodial Services, Equipment sq. ft. | | | | | | | |
| Other Spaces sq. ft. sq. ft. sq. ft. | | | | | | | |
| TOTALS | | | | | | | |
| | # Stations | Required | Available | Adequacy | Stations Needed | Square Feet Needed | |

School District _____ Date _____

## SCHOOL FACILITIES INVENTORY:
## SECONDARY SCHOOL INSTRUCTIONAL AND SUPPORTIVE SPACES

School Name _____ Grades _____ Enrollment _____ Capacity _____ % Use _____ Gross Sq. Ft. _____

| Space | # Stations Required | # Stations Available | Adequacy | # Stations Needed | Square Feet Needed | Comments |
|---|---|---|---|---|---|---|
| Classrooms<br>800 sq. ft. | | | | | | |
| Science<br>1,350–1,575 sq. ft.<br><br>Multipurpose<br>1,500–1,750 sq. ft. | | | | | | |
| Computer Lab<br>1,100 sq. ft. | | | | | | |
| Reading Lab<br>900 sq. ft. | | | | | | |
| Special Education<br>900 sq. ft. | | | | | | |
| Art<br>800–1,400 sq. ft.<br><br>Multipurpose<br>2,000 sq. ft. | | | | | | |
| Music<br><br>Inst. 1,500–<br>2,000 sq. ft.<br><br>Vocal 1,100–<br>1,500 sq. ft.<br><br>Combination 1,300–<br>1,750 sq. ft. | | | | | | |

| Space | # Stations | Required | Available | Adequacy | Stations Needed | Square Feet Needed | Comments |
|---|---|---|---|---|---|---|---|
| Other Spaces<br>sq. ft.<br>sq. ft.<br>sq. ft.<br>sq. ft. | | | | | | | |
| Administration, Health<br>sq. ft. | | | | | | | |
| Guidance/Career<br>sq. ft. | | | | | | | |
| Student Services, Activities, Conference<br>sq. ft. | | | | | | | |
| Teachers' Room/Prep<br>sq. ft. | | | | | | | |
| Food Service<br>sq. ft. | | | | | | | |
| Custodial Services, Equipment<br>sq. ft. | | | | | | | |
| Other Spaces<br>sq. ft.<br>sq. ft.<br>sq. ft.<br>sq. ft.<br>sq. ft. | | | | | | | |
| TOTALS | | | | | | | |
| | # Stations | Required | Available | Adequacy | Stations Needed | Square Feet Needed | |

## APPENDIX D

### Educational Specifications

A) Background Information
   1) project rationale
   2) community
   3) educational program needs, philosophy

B) Site Considerations
   1) physical features
   2) development features

C) Physical and Environmental Characteristics
   1) physical structure - exterior
   2) physical structure - interior
   3) mechanical systems
   4) learning environment
   5) safety and health

D) Instructional Areas
   1) space needs
   2) location, spatial relationships, accessibility
   3) learning activities
   4) learning aids, equipment, and furniture
   5) storage, other needs

E) Supportive Areas
   1) administration, health
   2) auditorium
   3) community and future use
   4) guidance/career
   5) social/psychological, speech/vision/hearing
   6) conference, student activity
   7) teachers' room/prep
   8) food service/multipurpose
   9) custodial, equipment
   10) receiving, storage
   11) halls, lockers, restrooms

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