# Guide for Planning School Construction Projects in Minnesota

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# Section I: Legal Responsibilities, Funding, Procedures

The purpose of Section I is to provide summary information on the basic legal responsibilities of the state of Minnesota and school districts concerning school facilities, financing options for school construction projects, and highlight Minnesota Department of Education and other state, regional, and local agency procedural requirements for school construction project review. School districts and school facilities planning committees are encouraged to utilize this information to help understand the basic legal requirements and funding options for school construction project proposals.

## Part 1.01 State of Minnesota and School District Responsibilities

### *(a) School Sites and Facilities*

The state of Minnesota has the constitutional responsibility for education and the equality of opportunity for students to learn and that includes the physical environment that school facilities provide for learning and teaching. Decisions on school construction projects in Minnesota are a state and local school district matter and there have been and are laws, rules, codes, standards, and guidelines governing the school construction process that go back to the 1800s. Similarly, there are laws, rules, codes, standards, and guidelines governing the construction of homes and commercial buildings, health hospital and nursing home practices, food preparation in restaurants, purification of water, road improvements, and practices by doctors, lawyers, government agencies, and businesses.

Minnesota Statutes, section 123B.02, subdivisions 1-2 and 7-8, give school boards of independent school districts the authority to conduct school district business that relates to school facilities. The school district must provide school facilities for all resident students and, as authorized by voters or statute, may issue bonds and levy to pay for school facilities. Minnesota Statutes, section 475.52, subdivision 5, authorizes school districts to issue bonds for the acquisition or improvement of school facilities, including gymnasiums, athletic fields, stadiums, garages, academic instruction, physical and vocational education, and administration. A school district may acquire sites for school buildings or garages using the power of eminent domain if necessary (Minn. Stat. § 123B.51, subd. 1, and § 123B.74). The school district may also authorize the use or lease of school facilities for other purposes (subdivisions 2-4).

Sources: Minnesota Statutes, section 123B.02, subdivisions 1-2, 7-8
Minnesota Statutes, section 123B.51, subdivisions 1-4
Minnesota Statutes, section 123B.74
Minnesota Statutes, section 475.52, subdivision 5

### *(b) Compliance Responsibilities*

Decisions on school construction projects in Minnesota are a local school district and state matter. Laws, rules, codes, standards and guidelines governing the school construction process go back to the 1800s. Similarly, there are laws, rules, codes, standards, and guidelines governing the construction of homes and commercial buildings, health, hospital and nursing home practices, food preparation in restaurants, purification of water, road improvements, and practices by doctors, lawyers, government agencies and businesses.

In planning, developing, and implementing school construction projects, school districts must comply with a complex variety of state, federal, and local laws, rules, and codes. It is very important that school boards employ licensed, knowledgeable, and competent persons (administrators, architects, engineers, contractors and construction managers, fiscal consultants, attorneys) to represent the school district throughout this process. The highlights of many of the laws, rules, and codes that school districts must comply with are discussed throughout this guide. Responsible persons representing the school district must further consult building code, fire safety, indoor air quality, and other laws, rules, ordinances, and codes as appropriate.

In proceeding with school construction projects, school board members must be aware of the responsibility they have to make sure that all the orders that they sign are legal; i.e., comply with all laws, rules, and codes affecting school construction projects.

## Part 1.02 Financing School Construction Projects

Pursuant to the requirements of Minnesota Statutes, section 126C.55, Minnesota school districts are able to issue bonded debt using the state of Minnesota's credit rating through the Credit Enhancement Program. The state of Minnesota also provides funding to eligible school districts through debt service equalization payments and other state aid programs.

School districts have access to a variety of financing options for school construction projects. Determining what financing option is best for any project will depend on a variety of factors and will vary from project to project and school district to school district. This part of the guide will provide a brief overview of project financing options, subject to change each legislative session. For further information about any of these options, unless otherwise noted, please contact:

Minnesota Department of Education
Division of School Finance
1500 Highway 36 West
Roseville, MN 55113-4266
651-582-8779

### *(a) General Obligation Bonds*

Under Minnesota Statutes, section 475.52, subdivision 5, school districts, with voter approval, may issue general obligation bonds to finance school construction projects. This includes new schools, school additions, renovations, related purchases of equipment and software, technology infrastructure, energy improvements and staff planning / development. Any school construction project in excess of $500,000 per school site for districts with capital loans outstanding, or $2,000,000 per school site without an outstanding capital loan, requires commissioner review and comment under Minnesota Statutes, section 123B.71, subdivision 8.

Sources: Minnesota Statutes, section 475.52, subdivision 5
Minnesota Statutes, section 123B.71, subdivision 8
Minnesota Statutes, section 123B.53

**Building Bonds for Calamities/Emergency Management**

School districts may issue general obligation bonds without voter approval under Minnesota Statutes, section 123B.60 to finance the construction or repair of a school building(s) damaged by an act of God or other calamities beyond the control of the district. The commissioner must approve an application for the use of other revenues with review and comment approval.

In the event of a declared disaster or emergency under Minnesota Statutes, section 12.03, financial aid and other assistance may be available from the state or federal emergency management agencies. During such a declared disaster or emergency, under Minnesota Statutes, section 2.37, school districts may enter into contracts, incur obligations, and exercise powers without complying with laws relating to contracts, bidding, purchasing, etc.

Minnesota Statutes, section 12A.06, provides authorization for the commissioner to make the following aid and grants to school districts in the event of a disaster:

**Disaster enrollment impact aid**. The commissioner may pay disaster enrollment impact aid to a school district in an amount set in law times the number of pupils lost as a result of the disaster.

**Disaster relief facilities grant**. The commissioner may make grants to an eligible district or the costs of facilities cleanup, repair, and replacement that are related to the disaster and are not covered by the district's insurance settlement or through federal agency payments.

**Disaster relief operating grant**. The commissioner may make grants to an eligible district for additional school operating costs related to the disaster that are not covered by the district's insurance settlement or through Federal Emergency Management Agency payments.

**Pupil transportation aid**. The commissioner may make grants to eligible districts for the increased costs associated with transporting students as a result of the disaster.

Before aid or grants are awarded under Minnesota Statutes, section 12A.06, a state appropriation is required and the eligible school district must provide the commissioner with information as requested.

Sources: Minnesota Statutes, section 123B.60
Minnesota Statutes, section 123B.71
Minnesota Statutes, section 12.03
Minnesota Statutes, section 12.37
Minnesota Statutes, section 12A.06

### *(b) Bonds for Certain Capital Facilities*

Under Minnesota Statutes, section 123B.62, school districts may issue general obligation bonds without voter approval for a period up to 15 years to finance capital improvements, including school facility repairs and improvements, disabled access, security, fire, life, and safety code compliance, and other cleanup and energy modifications. The annual debt service levy for bonds issued under this authority must not exceed the school district’s total operating capital revenue in the prior year.

Use of bonds requires commissioner approval and the bonds must be paid off using school district operating capital revenues and community education fund revenues. The school district is not eligible for any additional levy authority or debt service equalization aid from the state. A petition by 15 percent of the registered voters of the school district necessitates an election on the proposed issuance of the capital facility bonds.

Source: Minnesota Statutes, section 123B.62

### *(c) Debt Service Equalization*

To help finance authorized capital facility improvements (unless otherwise excluded), Minnesota Statutes, section 123B.53 provides for state debt service equalization aid to qualifying school districts that exceed 15.74 percent of their adjusted net tax capacity in annual debt service payments. The two-tiered formula determines

the precise dollar amount of debt service equalization aid and is recalculated annually. The primary purpose of a facility that is part of a school district construction project must be to serve students in kindergarten through grade 12.

Sources: Minnesota Statutes, section 123B.53, subdivision 2
Minnesota Statutes, section 123B.71
Minnesota Statutes, section 126C.69, subdivision 3

### *(d) Disabled Access and Fire Safety Improvements*

School districts may levy up to $300,000 over eight or fewer years to remove architectural barriers to access a school building and to make other required fire safety improvements. The levy requires commissioner approval. Disabled access levies are unequalized.

Source: Minnesota Statutes, section 123B.58

### *(e) Capital Projects Referendum*

School districts, with voter approval, may make a capital project referendum levy for future school construction costs under Minnesota Statutes, section 123B.63. There are no limits as to the amount of the levy and the proceeds must be placed in a separate account. Authorization is for a maximum of ten years. The levy requires commissioner review and comment under Minnesota Statutes, section 123B.71, unless the projects address only technology. Capital project referendum levies are unequalized.

Sources: Minnesota Statutes, section 123B.63
Minnesota Statutes, section 123B.71

### *(f) Lease-Purchase Agreement and Lease-Levy*

Under Minnesota Statutes, section 465.71, school districts may enter into a lease-purchase agreement to acquire a building, site, or equipment over a period of years. Payments are made using school district general or operating capital revenues. However, if certain conditions are met, lease-purchase agreements can qualify for debt service aid. Desegregation lease levies are limited to districts located in cities of the first class.

School districts may levy taxes to raise revenues to rent or lease land or a building for instructional purposes under Minnesota Statutes, section 26C.40, or for school storage or furniture repair. The levy requires meeting criteria for approval by the commissioner. School districts may not levy for newly constructed K-12 school facilities, sports stadiums, or additions that contain more than 20 percent of the square footage of the K-12 facility. A district's annual levy is limited to no more than $212 per resident pupil unit.

Sources: Minnesota Statutes, section 465.71
Minnesota Statutes, section 126C.40

### *(g) Operating Referendum*

Minnesota Statutes, section 126C.17, authorizes school districts to increase general fund revenues through voter approval of an operating referendum. There is a per pupil unit amount limit to total operating referendum revenues and the state provides equalization aid through a three-tier formula.

Property taxes for new referendum levies are spread on the basis of referendum market value. Seasonal recreational property and agricultural land and buildings will pay no taxes for operating referendums.

Source: Minnesota Statutes, section 126C.17

### *(h) Natural Disaster Debt Service Equalization*

Under Minnesota Statutes, section 123B.535, qualifying districts may receive natural disaster debt service equalization revenue. Qualifications included a federal disaster declaration, and $500,000 or more of damage to school district buildings whose repair and replacement costs are not covered by insurance or The Federal Emergency Management Agency (FEMA) payments. Aid is equalized in the basis of value per pupil unit.

Source: Minnesota Statutes, section 123B.535

### *(i) Long-Term Maintenance Revenue*

The 2015 legislature passed a new long-term maintenance program beginning in Fiscal Year (FY) 2017. This program replaces most components of Minnesota Statutes, section123B.591 Deferred Maintenance aid, Minnesota Statutes, section 123B.59 Alternative Facilities aid, and Minnesota Statutes, section 123B.57 Health and Safety aid. The formula revenue for maintenance of facilities is based on age of buildings and number of pupil units. A hold harmless provision will prevent revenue decreases for FY 2017-2019. Aid is equalized on the basis of value per pupil unit, where the value excludes 50 percent of the district's farmland market value.

Source: Minnesota Statutes, section 123B.595

## Part 1.03 Loans, Grants, and Cooperative Agreements for School Construction Projects

### *(a) Capital Loan*

Under Minnesota Statutes, section 126C.69, subdivision 1, capital loans may be used by eligible school districts to acquire, construct, and improve school sites and facilities, but not to construct swimming pools, ice arenas, athletic facilities, auditoriums, bus garages, or make heating system improvements. School districts are eligible to apply for a capital loan after January 1, 2001, if their debt service equalization payments after equalization aid are greater than 41.98 percent of their adjusted net tax capacity (32 percent if granted before January 1, 2001).

School districts (or joint powers districts) applying for a capital loan must submit to the commissioner the information required for a review and comment under Minnesota Statutes, section 123B.71, a pre-design package to the commissioner of finance as stipulated in Minnesota Statutes, section 16B.335 and other information as required on or before July 1 of an odd-numbered year.

After commissioner and school district voter approval, the commissioner reports capital loan applications to the education committees of the legislature by January 1 of each even-numbered year. Each capital loan must be approved in law and requires a contract between the school district and the state.

For further information about a capital loan, please contact the Division of School Finance at 651-582-8779.

Sources: Minnesota Statutes, section 126C.69, subdivisions 1-3
Minnesota Statutes, section 123B.71
Minnesota Statutes, section 16B.335
Minnesota Statutes, section 126C.69, subdivisions 3-6, 8, 10-12

### *(b) Cooperative Secondary Facilities Grant*

Under Minnesota Statutes, section123A.44-446, a school district that has consolidated with another school district since July 1, 1980 is eligible for a cooperative facility grant. Any group of districts or a consolidated district may apply for a grant not to exceed the lesser of $20 million or 75% of the cost of a new cooperative facility. A grant for remodeling and improving an existing facility must not exceed the lesser of $10 million or 75 percent of the approved remodeling costs.

The school district(s) must submit a review and comment to the commissioner not later than May 2, of an odd-number year. The commissioner must issue a positive review and comment under Minnesota Statutes, section 123B.71 by July 1 of an odd-numbered year. The school district(s) must submit a grant application and education plan, and meet all other requirements. After approval by the commissioner, legislature, and governor, a referendum authorizing the borrowing of funds for the cooperative facility must receive local voter approval. The cooperating districts must also fulfill the requirements of consolidation under Minnesota Statutes, section 123A.48.

Note that no funding is currently available for this grant. A new grant would require a legislative appropriation.

For further information on the cooperative facility grant, please contact the Division of School Finance at 651-582-8779.

Sources: Minnesota Statutes, sections 123A.44-446
Minnesota Statutes, section 123B.71
Minnesota Statutes, section 123A.37
Minnesota Statutes, section 123A.48

### *(c) Minnesota Department of Commerce Energy Programs Grants/Subsidized Lease Purchase Financing*

The Energy Division at the Minnesota Department of Commerce administers a variety of grants and subsidized loan / lease purchase financing options for funding energy efficiency projects. Additional information can be found on their website: Minnesota Department of Commerce Energy Division (https://mn.gov/commerce/industries/energy/financial-assistance/).

**Guaranteed Energy Savings Contracts**

Minnesota Statutes, section 123B.65 governs the use of guaranteed energy savings contracts by school districts. The statute lays out requirements for selecting a provider, term limits and other pertinent factors. Upon school district request, the Energy Division at the Minnesota Department of Commerce will evaluate proposed contract language to determine the reasonableness of proposed energy savings. The Minnesota Department of Education (MDE) encourages school districts to take advantage of the contract review service and other related expertise available from Energy Division staff, including assistance with master contract development, financing and other pertinent information. For further information on these programs, please contact:

Minnesota Department of Commerce Energy Division
Energy Savings Programs
85 – 7th Place East, Suite 500
Saint Paul, MN 55101
651-539-1886

### *(d) Joint Powers Agreements for Facilities*

Under Minnesota Statutes, section 123A.78, groups of school districts or governmental units may form a joint powers agreement under Minnesota Statutes, section 471.59 to build or acquire a school facility. The school districts must receive a positive review and comment from the commissioner under Minnesota Statutes, section 123B.71 and local voter approval, if required, as well as meet all other relevant requirements.

Sources: Minnesota Statutes, section 123A.78
Minnesota Statutes, section 471.59
Minnesota Statutes, section 123B.71

### *(e) Early Childhood Learning and Child Protection Facilities Grants*

This program allows grants to construct or rehabilitate facilities for early childhood programs, crisis nurseries, or parenting centers. A grant for an individual facility must not exceed $500,000 for each program that is housed in

the facility, up to a maximum of $2,000,000 for a facility that houses three programs or more. State appropriations must be matched by non-state funds. For further information contact:

Minnesota Department of Human Services
Office of Economic Opportunity
651-431-3814

Source: Minnesota Statutes, section 256E.37

## Part 1.04 Department of Education School Construction Project Review Requirements

### *(a) Projects Requiring Review and Comment and Exemptions from Review and Comment*

Minnesota Statutes, section 123B.71 requires school districts to submit a package of information on school construction project proposals to the commissioner of the Minnesota Department of Education. Projects exceeding $2,000,000 per school site ($500,000 for school districts with outstanding capital loans) require a review and comment unless exempted under subdivision 8 of the review and comment statute, which exempts additions, remodeling and maintenance if they are funded by the following revenue sources:

- general education
- health and safety
- capital projects levy (if technology only)
- alternative facilities
- deferred maintenance
- lease levy
- capital facilities bonds

Projects exceeding $2 million per site and financed under other statutory authority still require a review and comment. Examples include:

- voter-approved bond elections
- capital projects levy elections (if non-technology projects are included)
- lease purchase agreements without levy authority
- foundation funding / private donations
- state grants
- Iron Range Resources and Rehabilitation Board (IRRRB) funding

Division of School Finance staff represent the commissioner in this process. For further information or if there are questions as to whether or not a review and comment is required, please contact the Division of School Finance at 651-582-8779.

If a construction contract has not been awarded within two years of approval, the review and comment becomes invalid. If substantial changes are made to the approved plans, documents reflecting the changes shall be submitted to the commissioner for approval. Upon completing a project, the school board shall certify to the commissioner that the project was completed according to the approved plans.

### *(b) Review and Comment Document*

Minnesota Statutes, section 123B.71, subdivision 8 states: “A school district, a special education cooperative, or a cooperative unit of government, as defined in section 123A.24, subdivisions 1-2, paragraph (d), must not initiate an installment contract for purchase or a lease agreement, hold a referendum for bonds, nor solicit bids for new construction, expansion, or remodeling of an educational facility that requires an expenditure in excess of $500,000 per school site if it has a capital loan outstanding, or $2,000,000 per school site if it does not have a capital loan outstanding” prior to review and comment by the commissioner.

Projects planned together at multiple sites over one or more years, if work at any site exceeds $2,000,000, are considered one project for review and comment purposes.

Voter-approved elections, regardless of project purpose require a review and comment if project costs exceed $2 million per site. The one exception is capital projects levy referendums that fund only technology-related projects. If a project is funded with both exempt and non-exempt funding sources and the non-exempt portion of a project exceeds $2,000,000 per site, a review and comment is required.

School districts are responsible for assuring that the proposed project meets the requirements as provided in the Guide for Planning School Construction Projects in Minnesota. If the project does not meet the minimum standards, the school board should provide information as to why a variance from the guideline should be considered.

The review and comment information provided below has been reformatted with clarification to assist school boards and their staff in the development of a review and comment document that meets statutory requirements. Minnesota Statutes, section 123B.71, subdivision 9 requires that school districts submit, for the purpose of a review and comment, a package of information as specified below.

**Required Cover Letter and the Review and Comment Document**

**Cover Letter**

A cover letter on district letterhead signed by the superintendent is required. Included in the letter should be:

- A very brief description of the project.
- The total cost of the construction project including bond issuance and related financing costs.
- A statement that the school board has approved the review and comment document that is being submitted to the commissioner of Education.
- A brief description of how the project will be financed.
- If the proposed financing requires voter approval, the following information is required:
    - is the election for a single or multiple question(s)
    - wording of question(s)
    - order of questions
- The date of election or school board action.

**Document**

A school board proposing projects requiring review and comment shall submit to the commissioner a proposal containing the following information:

1. The geographic area and population to be served
    a. Preschool through grade 12 student enrollment for the past five years.
    b. Student enrollment projections for the next five years.
2. A list of existing school facilities

   a. By year constructed.
   b. Their uses.
   c. An assessment of the extent to which alternate facilities are available within school district boundaries and in adjacent school districts.

3. A list of specific deficiencies of the facility

   a. Demonstrating the need for a new or renovated facility to be provided.
   b. The process used to determine the deficiencies.
   c. A list of those deficiencies that will and will not be addressed by the proposed projects.
   d. A list of specific benefits that the new or renovated facility will provide to students, teachers, and community users served by the facility.

4. A description of the project including:

   a. Specifications of site and outdoor space acreage.
   b. Square footage allocations for classrooms, laboratories and support spaces.
   c. Estimated expenditures for major portions of the project.
   d. Estimated changes in facility operating costs.
   e. Dates the project will begin and be completed.

5. A specification of the source of project financing including:

   a. Applicable statutory citations.
   b. The scheduled date for a bond issue or school board action.
   c. A schedule of payments, including debt service equalization aid, and
   d. The effect of a bond issue on local property taxes by property class and valuation.

6. Documentation obligating the school district and contractors to comply with the following items:

   a. Section 471.345 governing municipal contracts.
   b. Sustainable design.
   c. School facility commissioning under section 123B.72, certifying the plans and designs for heating, ventilating, air conditioning and air filtration for an extensively renovated or new facility meet or exceed current code standards, including ASHRAE air filtration standard 52.1, and ANSI acoustical performance criteria, design requirements and guidelines for schools on maximum background noise levels and reverberation times.
   d. State fire code.
   e. Chapter 326B governing building codes.
   f. Consultation with affected government units about the impact of the project on utilities, roads, sewers, sidewalks, retention ponds, school bus and automobile traffic, access to mass transit and safe access for pedestrians and cyclists.

The commissioner shall, within 60 days after receiving all the required and other pertinent information from the school district and/or other sources, submit to the district the review and comment about the educational and the economic advisability of the school construction project proposal (subd. 11). The review and comment will state whether the school district will be eligible for debt service equalization under Minnesota Statutes, section 123B.53, subdivision 2, if the bond issue referendum is successful. A positive or unfavorable review and comment from the commissioner must be published by the school district in the legal newspaper of the district

at least 20 days, but not more than 60 days, prior to any referendum for bonds or the solicitation of bids for the school construction project proposal (subd. 12).

A positive review and comment means that the school district can proceed with the project. An unfavorable review and comment means that the commissioner has questions on the educational and/or economic advisability of the proposed project and the district may proceed with the project after reconsidering it, see (c) below. A negative review and comment means that the proposed project is not judged to be educationally and/or economically advisable and the district cannot proceed with the project, see (d) below.

When a school construction bond referendum is required, 50 or 60 percent voter approval is required to authorize a school district to proceed with a construction project after a positive or unfavorable review and comment respectively. If a construction contract for the project has not been awarded within two years of the date of the commissioner's approval, the approval is no longer valid. Substantial changes to the construction project proposal must also be submitted to the commissioner for approval. The school district shall certify to the commissioner that the project was completed according to the approved plans (subd. 5).

Determining the educational and economic advisability of a proposed project involves reviewing the required information provided by the school district about the proposed project and applying the requirements and guidelines contained in this guide. These include review and comment requirements, school district school construction financing, related state agency requirements (e.g., building codes and fire marshal codes), and guidelines on planning school construction projects, selecting or improving school sites, renovating versus replacing a school, and designing school facility learning, support, and community use/partnership spaces (e.g., square footage). Each project is reviewed individually and must meet relevant requirements and guidelines. School construction project guidelines are flexible and applied consistently and as appropriate.

Economic advisability guidelines used to review project proposals include: (a) the necessity of reducing school district operational costs due to excess buildings, square footage, and declining student enrollments, and (b) there should be a reasonable assurance that the school being constructed or renovated will be serving students for the life of the bond issue.

There are only a few school construction project proposals submitted each year where an unfavorable or negative review and comment is considered. School districts' review and analysis of project options typically leads districts to rule out project options (e.g., renovate an old school on a limited site) that project architects and/or school finance staff advise are likely to receive an unfavorable or negative review and comment.

If a school district demonstrates that it cannot improve existing inadequate school facilities to meet the educational and safety needs of students, the district is encouraged to pursue developing cooperation agreements with neighboring districts to provide a more adequate, healthy, and safe environment that will better promote increased student achievement and quality teaching.

Sources: Minnesota Statutes, section 123B.71, subdivision 8
Minnesota Statutes, section 123A.24, subdivisions 1-2
Minnesota Statutes, section 123B.71, subdivision 9
Minnesota Statutes, section 123B.53, subdivision 2
Minnesota Statutes, section 126C.69, subdivision 3

Minnesota Statutes, section 123B.71, subdivisions 5, 11, 12
Minnesota Statutes, section 123B.72

### *(c) Unfavorable Review and Comment*

The commissioner may issue an unfavorable review and comment if there are reservations about the educational and/or economic advisability of the proposed project. Under Minnesota Statutes, section 123B.70, subdivision 4, if the commissioner submits an unfavorable review and comment on a school construction project proposal submitted under Minnesota Statutes, section 123B.71, the school board, by resolution of the board, must reconsider the project.

If the school board decides to proceed with the proposed project, 60 percent of the voters must approve the project in the bond issue election that authorizes the board to issue the bonds and proceed with the project. With an unfavorable review and comment, a school district is not eligible to receive any debt service equalization aid revenues under Minnesota Statutes, section 123B.63, even if voters approve the project.

Sources: Minnesota Statutes, section 123B.70, subdivision 4
Minnesota Statutes, section 123B.71
Minnesota Statutes, section 123B.63

### *(d) Negative Review and Comment*

The commissioner may issue a negative review and comment if the proposed project is judged to be educationally and/or economically inadvisable. The school district cannot proceed with the project.

Under Minnesota Statutes, section 123B.70, subdivision 3, if the commissioner intends to submit a negative review and comment on a school construction project proposal submitted under Minnesota Statutes, section 123B.71, the school district must be notified and a public meeting scheduled within 60 days to discuss the proposed negative review and comment and the school board must appoint an advisory committee to advise the school board and the commissioner. After attending the meeting, the commissioner must reconsider the proposal and the negative review and comment.

If the commissioner still intends to submit a negative review and comment, the school board may appeal the decision of the commissioner under procedures specified in Minnesota Statutes, chapter 14. If the commissioner's decision is not appealed or is upheld upon appeal, the school district may not proceed with the proposed construction.

Sources: Minnesota Statutes, section 123B.70, subdivision 3
Minnesota Statutes, section 123B.71

### *(e) School Facility Commissioning*

For all school construction projects in excess of $1.4 million where dollars are spent for new heating, ventilation and air-conditioning (HVAC) systems or for major modifications to the existing HVAC systems, a commissioning or system-inspection process of the HVAC system is required. Under Minnesota Statutes, section 123B.72, subdivision 3, prior to occupation or reoccupation of the school facility, a school district must submit a

certification document to the local or state building code official, see Part 1.06 (b) below, and the commissioner prepared by a system inspector certifying that the facility's HVAC system has been installed and operates according to design specifications and code and that the facility's design will provide a system for monitoring of outdoor airflow and total airflow of ventilation systems.

School districts must submit the commissioner's copy of this certification document to the Division of School Finance, MDE. Normally, a temporary occupancy certificate will be issued so that the HVAC and airflow monitoring systems can be certified as working at various times of the year. Districts are allowed up to one year of temporary occupancy while systems are tested and certified as satisfactory (subd. 4).

The following commissioning/system inspection guidelines are excerpted from MDE guidelines referenced below. At a minimum the commissioning/system-inspection process should consist of the following:

- The inspector shall be a licensed architect, licensed engineer, qualified test and balance contractor, or other qualified individual. The system inspector can be an independent third party or the engineering firm of record, if qualified. The school district must check the qualifications, experience, and track record of applicants.
- It is strongly recommended that a system inspector be hired no later than during the construction document phase of a construction project. This will provide adequate time for the system inspector to understand the design-intent, determine which tests and procedures are appropriate for the project, and prepare an inspection plan and the necessary specifications that define contractor involvement in the system-inspection process.
- To assure that the commissioning/system-inspection works properly, it is strongly recommended that the school district notify the architect, engineer, and construction manager before they are hired that their participation in the commissioning/system-inspection process is required in the project, and that fees will be withheld, possibly up to one year after occupancy, until all project work passes the HVAC commissioning/system-inspection process.

If the above recommended system-inspection process is not followed, there is a much greater probability that all parties may not cooperate as needed and that the school district will receive numerous requests for additional fees late in the project.

If, in the opinion of the system inspector, the HVAC systems are not complete and/or operating properly, the letter to the district shall indicate the deficiencies and also state that the overall HVAC system provides the minimum amount of outdoor air as specified by code as indicated in a preliminary testing and balancing report. The building code official may then issue a temporary certificate of occupancy for up to one year.

During this time the HVAC systems must be completed, provide the amount of outdoor air specified by code, and operate at a level considered satisfactory by the system inspector and the school district. When the HVAC system-inspection process has been completed, the system inspector shall issue a second letter to the school district, which in turn submits a letter to the building code official, with a copy to MDE, indicating the HVAC systems are complete and operate as intended. At this point, the building code official issues a final certificate of occupancy.

Since system-inspection activities are linked to the seasons of the year, it is nearly impossible to complete the inspection process prior to occupancy. Therefore, it is absolutely necessary that a school district withhold

adequate dollars from the appropriate contractors and professionals until the system-inspection process has been completed.

If after one year the project is not completed at a level considered satisfactory by the system inspector, the school district must then take steps to utilize the withheld funds as well as the required performance bonds to hire outside parties to complete the work.

For new school construction and extensive remodeling, the system-inspection process is comprehensive, covering all HVAC work. For small remodeling projects, the focus is on determining that the appropriate amount of outdoor air is supplied to the occupants. For example, if classroom renovation requires new distribution ductwork, but no changes are planned to the air-handling unit, the system inspector shall verify that appropriate quantities of outdoor air are delivered to all occupied spaces served by the unit.

Please review the complete commissioning/system-inspection guidelines for further information on the selection and qualifications of a system inspector, roles and responsibilities of commissioning participants, sample checklists and test forms, and the optional full commissioning process.

Source: Minnesota Statutes, section 123B.72, subdivisions 3 and 4

### *(f) School Facility Commissioning*

System Inspection Guidelines for Minnesota PK-12 School Construction Projects, Minnesota Department of Education, 2014 (https://education.mn.gov/MDE/dse/schfin/fac/cons/).

### *(g) Condemning School Buildings and Sites*

The state fire marshal and/or commissioner may determine that a school building is unfit or unsafe for use and condemn the building and close it.

Sources: Minnesota Statutes, section 299F.11
Minnesota State Fire Code Section 110.1.1 Unsafe Conditions and 110.4 Abatement
Minnesota Statutes, section 123B.71, subdivision 6

## Part 1.05 Other State, Regional, and Local Agency Requirements

### *(a) State Board of Architecture, Engineering, Landscape Architecture, and Interior Design*

Minnesota Statutes, sections 326.02-15 authorizes the board to carry out the provisions of law regarding the licensing and practices of architects, engineers, land surveyors, landscape architects, geoscientists, and the certification of interior designers.

(1) Minnesota Statutes, section 326.03 requires the licensing of persons practicing architecture, engineering, land surveying, landscape architecture, or geosciences in the preparation of plans, specifications, reports, or other documents in connection with any school construction project. In the preparation of such documents, reasonable care shall be given to compliance with applicable laws, ordinances, and building codes relating to design.

(2) Minnesota Rules, parts 1800.5000-5800 exempts certain projects from requiring the services of a licensed architect or engineer pursuant to Minnesota Statutes, sections 326.02-15. Regarding school construction projects, only cold storage facilities of less than 5,000 square feet are exempt from this requirement. As specified in statute or rule, certain remodeling projects which do not change structural loads, the loads on mechanical (HVAC) and electrical distribution systems, occupancy, or fire and life safety requirements may also be undertaken without professional design services, provided the square footage maximums as specified in 1800.5200 or Minnesota Statutes, sections 326.02-03 are not exceeded.

(3) Minnesota Statutes, section 326.12 requires the signature of the appropriate licensed person(s) in applicable profession(s) on all plans, specifications, or reports which are required to be prepared or submitted for review. A certification that the signer is licensed shall also accompany the signature(s).

Printed rosters of licensed persons are available at the Minnesota Bookstore. A copy of the current rules and statutes or verification of licensure or other related information is available from:

Executive Secretary
Board of Architecture, Engineering, Land Surveying,
Landscape Architecture, Geoscience and Interior Design
85 East 7th Place, Suite 160
Saint Paul, MN 55101
651-296-2388
Minnesota Board of Architecture, Engineering, Land Surveying
(http://mn.gov/aelslagid/)

Sources: Minnesota Statutes, section 326.02.15
Minnesota Rules, chapter 1800, parts 5000-5800

### *(b) Minnesota Department of Labor and Industry, Construction Codes and Licensing Division (CCLD), Plan- Review and Regional Service Section*

**Building Code**

The Department of Labor and Industry, Construction Codes and Licensing Division (CCLD), Plan Review and Regional Service section, through authority granted in Minnesota Statutes, sections 16B.59, 16B.60, subdivisions 6 and 8, and 16B.61, subdivision 1a, enforces the State Building Code for public school construction projects valued over $100,000. This includes new construction, additions and remodeling work, and the construction and set up of temporary or re-locatable buildings.

A school district must have their architect firm submit an "Initial Application" to CCLD to determine who will do the plan review, issue the building permit, and complete the inspections. CCLD will then notify the school district on who will be doing the enforcement, send the proper forms, and direct you how to proceed. To summarize:

(1) If the local municipality is properly certified and contracted to do plan review and inspections, local plan review and permit procedures must be followed;
(2) If the local municipality is contracted to do inspections only, a "Plan Review Application" with a fee must be submitted to CCLD for plan review, and the local building permit requirements must be followed; or
(3) If CCLD will do the plan review and inspections, the "Plan Review Application" and the "Building Permit Application" must be submitted with fees to CCLD and CCLD will provide construction inspections.

The CCLD plan review staff will meet with design professionals and school staff for preliminary plan reviews and at any stage of the project, free of charge, to help the school districts' architect firm achieve building code compliance in order to prevent costly surprises in the later stages of construction project.

CCLD and local building officials enforce the laws and rules that require the involvement of licensed architects, engineers, and other design professionals in almost all school district construction projects.

For information on building code issues, how the code will apply to your school construction project planning, or to receive an initial application form for an upcoming project, please call the Department of Labor and Industry, Construction Codes and Licensing Division (CCLD), Plan Review and Regional Service section (651-284-5336).

Additional building code compliance information can be found on the Minnesota Department of Labor and Industry (http://www.dli.mn.gov/about-department/our-areas-service/construction-codes-and-licensing).

**Plumbing**

The Department of Labor and Industry has the responsibility to review plans and specifications for school construction projects and conduct certain inspections. School districts must submit plans for review and approval before related construction or remodeling begins. In some cases, reviews or inspections may be done by local jurisdictions or other inspectors. The correct jurisdiction may be determined by contacting the Department of Labor and Industry at the number listed below.

Minnesota Rules, chapter 4715, prescribe the methods and materials acceptable for plumbing installations.

The Reduction in Lead Drinking Water Act requires all drinking water system materials and products including plumbing pipes, fittings and fixtures introduced into commerce or for use must meet the new "lead-free" definition. This definition has been revised from not more than 8 percent to mean "not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings and fixtures." Alternative plumbing materials such as approved plastics or stainless steel may be installed where appropriate. If elevated lead levels are identified in school drinking water, routine flushing of pipes and fixtures should be initiated. Questions on plumbing materials should be addressed to the CCLD Plumbing Program at 651-284-5067 or via the web on Minnesota Department of Labor and Industry website (http://www.dli.mn.gov/business/plumbing-contractors/2015-minnesota-plumbing-code).

**Occupational Safety and Health Administration (OSHA):**

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

(1) 29 CFR, part 1910, are federal OSHA standards that have been adopted by reference to apply to all places of employment except construction worksites. This includes, for example, worker exposure to asbestos.

(2) 29 CFR, part 1926, are federal OSHA standards that apply to all phases and types of school construction projects, including remodeling, renovating, and new construction. The standards govern the safety and health of the employees involved in the actual construction work, not the safety or stability of the structure.

(3) Minnesota Rules, chapter 5205, are local general industry standards adopted by Minnesota OSHA that apply to hazards not covered by federal OSHA standards.

(4) Minnesota Rules, chapter 5206, contains standards that apply to all employers in Minnesota and require that employees be provided with information about the hazardous substances and harmful physical agents with which they work.

(5) Minnesota Rules, chapter 5207, are local construction standards adopted by Minnesota OSHA that apply to hazards not covered by Federal OSHA Standards.

(6) Minnesota Rules, chapter 5210, are administrative rules governing contestations, abatement verification, variance procedures, and employee discrimination.

(7) 29 CFR, part 1910.1001, and 29 CFR part 1926.1101, are standards that provide guidelines for workplaces where employees are exposed to asbestos, including guidelines for the removal of asbestos. Special concern exists for school construction projects where older buildings are being remodeled.

(8) 29 CFR, part 1904, are standards governing record keeping requirements. The standards apply to all employers with the exception of those employers with ten or fewer employees. Part 1904 replaced the record keeping requirements previously found in Minnesota Rules, part 5210.

Referrals may be made on inquiries concerning OSHA standards to one of the OSHA offices listed below or online on the Minnesota Department of Labor and Industry Locations website (http://www.dli.mn.gov/business/workplace-safety-and-health/mnosha-compliance-contacts).

**OSHA St. Paul location**
OSHA Division-St. Paul
Saint Paul, MN 55155
651-284-5050

**OSHA Duluth Division**
OSHA Division-Duluth
525 Lake Avenue South
Suite 330
Duluth, MN 55802
218-733-7830

**OSHA Mankato Division**
OSHA Division-Mankato
12 Civic Center Plaza
Suite 1650
Mankato, MN 56001
507-304-6262

Sources: Minnesota Statutes, section 16B.59
Minnesota Statutes, section 16B.60, subdivisions 6 and 8
Minnesota Statutes, section 16B.61, subdivision 1a
Minnesota Department of Labor and Industry, CCLD
CFR 29, part 1910
CFR 29, part 1926
CFR 29, part 1910.1001
CFR 29, part 1926.1101
CFR 29, part 1904
Minnesota Rules, chapter 5205
Minnesota Rules, chapter 5206
Minnesota Rules, chapter 5207
Minnesota Rules, chapter 5210

### *(c) Minnesota Department of Health*

The Environmental Health Services section of the Environmental Health Division, has the responsibility to review plans and specifications for school construction projects and conduct certain inspections. School districts must submit plans for review and approval before related construction or remodeling begins. In some cases, reviews or inspections may be done by local jurisdictions or other inspectors. The correct jurisdiction may be determined by contacting the Minnesota Department of Health at the appropriate numbers listed below. The applicable rules, their scope, and a phone number contact for each area of responsibility are listed below:

(1) Minnesota Rules, chapter 4717, prescribe construction standards and operating criteria for public swimming pools. 651-201-4503
(2) Minnesota Rules, chapters 4626.0010-1870, govern the design and operation of food service establishments, including school cafeterias. 651-201-4500
(3) Minnesota Rules, chapter 7080, govern the construction of individual sewage treatment systems (septic tank/drain field). 651-201-4600

In addition, school districts and contractors must comply with other health related rules, including:

(4) Minnesota Rules, chapters 4620.3000-3724, prescribe requirements for asbestos abatement. 651-201-4620 (federal regulations also apply at a lower level in schools)
(5) Minnesota Rules, parts 4761.1000-1220, prescribe the requirements for lead poisoning prevention in child occupied facilities. 651-201-4620
(6) Minnesota Rules, chapter 4725, govern the construction of all water wells in Minnesota. 651-201-4700

(7) Minnesota Rules, chapter 4720, relate to testing required of schools that are on their own water system, not on a municipal water system. 651-201-4700

Questions related to sampling for lead in school drinking water and flushing programs should be addressed to the MDH Drinking Water Protection Section at 651-201-4700.

Information is also available to help school districts develop the mandated Indoor Air Quality Management Plan on the Minnesota Department of Health website (http://www.health.state.mn.us/).

*The U.S. Environmental Protection agency has a draft of a document relating to school construction available on the* United States Environmental Protection Agency website (https://www.epa.gov/).

Sources: Minnesota Rules, part 4715
Minnesota Rules, part 4717
Minnesota Rules, chapter 4626, parts 0010-1870
Minnesota Rules, chapter 7080
Minnesota Rules, chapter 4620, parts 3000-3724
Minnesota Rules, chapter 4761, parts 1000-1220
Minnesota Rules, chapter 4725
Minnesota Rules, chapter 4720
Introduction to the Indoor Air Quality Management Plan Development Package; Minnesota Department of Health
Design Tools for Schools; U.S. Environmental Protection Agency

### *(d) Minnesota Department of Natural Resources*

Legislation enables the Department of Natural Resources (DNR) to establish statewide development standards and criteria for shore land, floodplain, and wild and scenic river areas. Local units of government must adopt these or stricter standards through their local zoning or land use ordinances.

(1) Minnesota Rules, parts 6120.0500-3900, provides for the orderly development of shore land and protects lakes and rivers from pollution by individual sewage treatment systems and other non-point sources. The intent of the program is to encourage the development of shore lands in such a way that enhances water quality and preserves scenic resources.
(2) Minnesota Rules, parts 6120.5000-6200, intends to minimize the threat to life and property resulting from flooding. This program restricts development in flood plains by preventing structures from being built at low elevations in areas with a high risk of flooding and controls encroachment that would reduce the floodplain's capacity to hold floodwater and cause flooding in properly located structures.
(3) Minnesota Rules, parts 6105.0010-0650, intends to preserve and protect rivers with outstanding scenic, recreational, natural, historical, and scientific value by preventing damage caused by intensive development and recreational use.

School districts need to contact their local units of government to determine how these rules or local ordinances may affect the planning of school construction projects on existing or new sites.

Sources: Minnesota Statutes, section 103F

Minnesota Rules, chapter 6120, parts 0500-3900
Minnesota Rules, chapter 6120, parts 5000-6200
Minnesota Rules, chapter 6105, parts 0010-0650

### *(e) Minnesota Department of Public Safety, State Fire Marshal Division*

The Minnesota Uniform Fire Code (MUFC), adopted pursuant to authority granted in Minnesota Statutes, section 299F.011, subdivision 1, contains the fire/life safety requirements for school construction projects. The MUFC, as amended by Minnesota Rules, parts 7510.3510-3710, references Minnesota State Building Code provisions instead of the life safety code to help eliminate conflicts between the state building and fire codes. Sprinkler installation standards have been updated to reflect International Fire Code standards. The International Fire Code (IFC) along with State amendments is available on the State Fire Marshall website (https://dps.mn.gov/divisions/sfm/programs-services/Pages/fire-Sprinkler.aspx).

School districts must submit school construction project plans and specifications for review to the Department of Labor and Industry, Construction Codes and Licensing Division (CCLD), Plan Review and Regional Service section (651-284-5336). School districts must also submit some school construction plans to the state fire marshal for review, including the following:

(1) Remodeling projects in existing buildings that involve the expenditure of Minnesota Statutes, section 123B.57 Health and Safety funds in excess of $10,000.
(2) Automatic sprinkler system plans not reviewed by State Building Code officials or local building/fire officials. Preliminary sprinkler design drawings (including hazard type designations and the locations of risers, control valves, and fire department connections) are required to be submitted for all projects.
(3) Fire alarm system plans.
(4) Site plans showing a) fire department access roads, and b) water supply and hydrant locations for fire protection.

In addition to the above, MUFC requires that a fire protection plan be submitted to the State Fire Marshal for any school construction project involving major remodeling of, or an addition to, an existing building (including the installation of temporary or re-locatable buildings). School districts and architects should review the publication “Existing School Buildings: Additions and Remodeling Considerations.”

The State Fire Marshal welcomes consultation with school districts and their project architects/engineers during the preliminary planning and design processes to address applicable fire code requirements. Please direct any questions regarding plan requirements, fire/life safety requirements applicable to new and existing school buildings to the State Fire Marshal Division’s school plan reviewer at 651-334-3217. Mail plans and/or correspondence to:

State Fire Marshal Division
School Plan Review
445 Minnesota Street, Suite 145
Saint Paul, MN 55101-5145

Minnesota Statutes, section 123B.73 requires the State Fire Marshal to conduct periodic inspections of all public school buildings in the state. Some local fire departments also conduct routine fire/life safety inspections and

additional State Fire Marshal inspections are conducted upon request of school district officials, citizens, local officials or MDE. The most common problems the State Fire Marshal encounters during these inspections include obstructed corridors and exit ways, overcrowded assembly areas, unprotected corridors, vertical openings (e.g., stairways, shafts), and hazardous areas such as shops, labs, and boiler and equipment rooms, improperly constructed and separated storage and portable/re-locatable classroom buildings, and the use of school building levels above and below grade by preschool, daycare/latchkey, kindergarten, first, and second grade students.

Minnesota Statutes, section123B.51, subdivision 7, and the MUFC and MSBC have restrictions and requirements for such usage in both new and existing buildings. Classrooms and programs for students in grades PK-2 (with some exceptions for second graders) "may be located on any floor level below the fourth story of a school building if the building is protected throughout by a complete automatic sprinkler system and a complete automatic fire alarm system consisting of automatic smoke detection throughout the exit system and approved smoke detection in all rooms and areas other than classrooms and offices… and must be located on the story of exit discharge… independent from the existing system used by older students…," subdivision 7 (1) (2). See the statute for complete details.

The State Fire Marshal issues orders to school districts for work that must be done to comply with applicable fire/life safety codes, and, if conditions warrant, may close portions of a school building for fire/life safety reasons. It is expected that school districts will correct any outstanding State Fire Marshal orders in any school construction project proposal subject to review and comment.

Additional Minnesota State Fire Marshal, School Inspections Programs can be found on the Minnesota Department of Public Safety website (https://dps.mn.gov/Pages/default.aspx).

Sources: Minnesota Statutes, section 299F.001, subdivision 1
Minnesota Statutes, section 123B.57
Minnesota Statutes, section 123B.73
Minnesota Statutes, section 123B.51
Minnesota Rules, chapter 7510, parts 3510-3710
Minnesota Uniform Fire Code; State Fire Marshal Division
Minnesota State Building Code; Building Codes and Standards Division
Existing School Buildings: Additions and Remodeling Considerations; State Fire Marshal Division; 1998
Capital Expenditure: Health and Safety Revenue Application; Minnesota Department of Education

### *(f) Minnesota Pollution Control Agency*

Building owners and contractors are responsible for complying with state and federal regulations on hazardous substances that impact school construction and schools. Hazardous substances of concern in new school construction and/or renovation projects include the following:

(1) **Asbestos:** Minnesota Rules, part 7011.9920, governs renovation and demolition projects, including written notifications and the proper removal, handling, and disposal of asbestos-containing materials.

(2) **Mercury:** Minnesota Statutes, section 115A.932 prohibits the placing of mercury or mercury containing devices into the solid waste stream and Minnesota Statutes, section 116.92 regulates the sale or purchasing of mercury-containing devices, handling of the material, proper labeling, removing devices from service, and thermostat manufacturing and purchase.

(3) **Lead:** Minnesota Statutes, section 144 establishes lead hazard reduction programs and requires lead surveillance. Minnesota Rules, chapter 4761 provides standards for lead in paint dust, bare soil, and drinking water, and establishes methods for lead abatement and lead hazard reduction. Minnesota Rules, chapter 7025 establishes the procedures that a contractor shall follow to test for and remove lead paint from the exterior of any childcare building or school building. Minnesota Rules, chapter 7045 requires the testing and disposal of lead waste generated from school buildings.

(4) **Liquid Storage Tanks:** Minnesota Statutes, section 116.46-.50 requires underground and aboveground storage tanks to be registered with the Minnesota Pollution Control Agency (MPCA). Minnesota Statutes, section 115.061 requires the notification of MPCA of any SPILL that may cause water pollution. The MPCA number to call for spills, 24 hours a day, is 1-800-422-0798 in greater Minnesota and 651-649-5451 in the Twin Cities area.

Minnesota Rules, chapter 7150, provides technical standards for underground storage tanks and chapter 7105 requires that regulated underground storage tanks be installed, removed, and replaced by an MPCA certified contractor. Call 651-296-6300 with questions about underground storage tank rules and regulations.

Minnesota Rules, chapter 7100, requires that aboveground liquid storage tanks have adequate safeguards and an MPCA permit. Chapter 7151 provides standards and technical requirements for aboveground storage of liquid substances. If you have questions about aboveground storage tanks, call 651-296-6300.

(5) **PCBs (Polychlorinated Biphenyls):** Minnesota Rules, part 7045, regulates the labeling, proper storage, and disposal of hazardous waste PCB over 50 parts per million, including light ballasts.

For more information please call the MPCA at: 651-296-6300 or 1-800-657-3864: Minnesota Pollution Control Agency website (https://www.pca.state.mn.us/).

Sources:
Minnesota Statutes, section 115A.932
Minnesota Statutes, section 116.92
Minnesota Statutes, section 144
Minnesota Statutes, sections 116.46-50
Minnesota Statutes, section 115.061
Minnesota Rules, chapter 7011, part 9920
Minnesota Rules, chapter 4761
Minnesota Rules, chapter 7025
Minnesota Rules, chapter 7045
Minnesota Rules, chapter 7150
Minnesota Rules, chapter 7105
Minnesota Rules, chapter 7100
Minnesota Rules, chapter 7151

### *(g) Minnesota Environmental Quality Board, Environmental Review Program Board*

Minnesota Statutes, section 116D.04 Environmental Impact Statements requires the review of major development projects, including school construction projects, which have or may have significant effects on the environment in order to minimize or avoid those effects. When a review is mandatory or when a petition is filed, no final governmental unit decisions can be made to approve the project or grant any necessary permits until the review process is completed.

(1) Minnesota Rules, chapter 4410, specifies what projects must be reviewed and what are the review procedures. These rules may require the review of new school construction or building additions or facilities such as athletic fields.

(2) There are two types of review documents that can be required under this program. The most common is the Environmental Assessment Worksheet (EAW), which is based on a six-page questionnaire issued by the Minnesota Environmental Quality Board (EQB). The purpose of an EAW is to disclose sufficient information about the project, its setting, and its potential environmental effects to allow the RGU to decide if the second, more rigorous, analysis, the Environmental Impact Statement (EIS), is needed. An EIS can also be mandatory for very large projects.

(3) Minnesota Rules, parts 4410.4300-4400, contains lists of "mandatory categories;" i.e., projects which because of their type, magnitude, or location require the preparation of an EAW or an EIS. A school construction project would most likely fit under the industrial, commercial, institutional facilities categories. The thresholds for a mandatory EAW and EIS in these categories are measured in square feet of gross floor space and vary according to the size of the city where the project would be located. Gross floor space includes the total area of all floors of all structures on the site, not including any space used for parking. Thresholds for project reviews are as follows:

| City Population | EAW Threshold (square feet) | EIS Threshold (square feet) |
|---|---|---|
| Over 100,000 | 400,000 square feet | 1,000,000 square feet |
| 20,000-100,000 | 300,000 square feet | 750,000 square feet |
| Under 20,000 | 200,000 square feet | 250,000 square feet |

A second EAW mandatory category that could potentially apply to a school construction project is the conversion of 80 or more acres of agricultural or naturally vegetated land (forest, prairie, natural vegetation) to more intensive land uses. This would include athletic fields and other "landscaped" areas at a school site. This category does not include the conversion of agricultural land within a Metropolitan Urban Service Area boundary. There are other mandatory categories that could apply to school construction projects under certain circumstances; a school district should review the total list under parts 4410.4300-4400 to make sure that none of the other categories fit their project. The most convenient way to review all of the categories is to use the table of categories printed in the "Guide to the Minnesota Environmental Review Rules," available from the EQB or from the Minnesota Environmental Quality Board website (https://www.eqb.state.mn.us/).

(4) The rules require that review be initiated and conducted by a "Responsible Governmental Unit" (RGU), assigned by the EQB's rules based on the type of project. For school construction projects, the RGU would be the local unit of government that has planning and zoning jurisdiction at the project site (city, county, or township). The EQB's rules do not allow a school district to serve as an RGU.
If a review is required, the school district should contact the local governmental unit as soon as possible to initiate the review. Review can begin as soon as the project is sufficiently well defined to supply the information required by the EAW form. An EAW review typically takes about three to four months to complete, an EIS about a year. In either case, the process normally begins with the proposer (e.g., a school district) supplying the "data portions" of the EAW to the RGU.

(5) An EAW review can also be initiated through the citizen petition process. The law allows 25 or more citizens to petition for the preparation of an EAW if it is not mandatory. Petitions must be filed with the EQB, which then screens the petition for completeness and assigns it to the appropriate RGU. The RGU must decide within 30 working days of the receipt of the petition from EQB whether an EAW is warranted or not based on the evidence contained in the petition and otherwise known to the RGU.

The EQB staff provides information and assistance in determining if an EAW or an EIS is needed and in properly completing the steps of the process. For information and assistance please contact staff at:

Environmental Quality Board
Environmental Review Program
520 Lafayette Road
Saint Paul, MN 55155
651-757-2873

Sources: Minnesota Statutes, section 116D.04
Minnesota Rules, chapter 4410
Minnesota Rules, chapter 4410, parts 4300-4400
Guide to the Minnesota Environmental Review Rules; Environmental Quality Board

### *(h) Office of the Secretary of State*

School district referendums to authorize bonding are "special" elections (sometimes called "ballot questions") that are subject to Minnesota election laws. School boards are responsible for the conduct of these elections and the school district clerk (or their designee) is the election administrator for the district. The Office of the Secretary of State provides reference materials to help school districts conduct their elections according to law.

School district clerks who serve as the local election administrator must meet election training and certification requirements before administering a school election. Initial certification requires five hours of training. Training content is specified in state law and either provided or approved by the county auditor in the county where school district offices are located. School district clerks coordinate their efforts with their municipal counterparts when school and city elections coincide. School clerks also work closely with county auditors who are the chief voter registration and head election officials for their counties.

The Office of the Secretary of State publishes the Minnesota School District Elections Guide to provide a summary of the "must do" tasks involved in conducting an election. Also available is the Minnesota Campaign Manual that summarizes campaign finance and campaign practice law that applies to committees advocating for or against a referendum. Each section of these guides cites governing statutes and rules. School district election calendar is also published each year.

Election reference materials should be requested by contacting the Office of the Secretary of State or are available on the Office of the Minnesota Secretary of State website (http://www.sos.state.mn.us/).

Office of the Secretary of State
180 State Office Building
100 Rev. Dr. Martin Luther King Jr, Blvd
St. Paul, MN 55155
651-215-1440

Sources: Minnesota Statutes, section 201.021
Minnesota Statutes, section 204B.21/40
Minnesota Statutes, section 205A
Minnesota Rules, chapter 8240, part 2700
Minnesota School District Election Guide; Minnesota Secretary of State
Minnesota Campaign Manual; Minnesota Secretary of State
Minnesota School Districts Election Calendar; Minnesota Secretary of State

### *(i) Municipal and Other Local Authorities*

Under Minnesota Statutes, section 462.352, subdivision 8, municipalities have the authority to guide the future development of public facilities, including educational facilities and under Minnesota Statutes, section 471.468, the authority to approve local building project plans. School districts must check with and fulfill the review and approval requirements of any applicable municipal or other local authority (township, county, or regional) as appropriate.

Sources: Minnesota Statutes, section 462.352, subdivision 8
Minnesota Statutes, section 471.468

## Part 1.06 School District Bond Referendums

### *(a) Question(s)*

Minnesota Statutes, section 475.52, subdivision 5 authorizes school districts to issue bonds for school construction projects. Minnesota Statutes, section 475.59 provides school districts with the discretion to submit a single question or two or more separate questions to voters on school construction or school site improvement project proposals.

Sources: Minnesota Statutes, section 475.52, subdivision 5
Minnesota Statutes, section 475-59

### *(b) Referendum Timelines*

School bond issue referendums are considered special elections under Minnesota Statutes, section 205A.05, subdivision 1. Bond issue referendums may be held on the school district general election day. If not then, "a special election may not be held during the 30 days before and the 30 days after the state primary or during the 30 days before and the 40 days after the state general election. In addition, a special election may not be held during the 20 days before and the 20 days after any regularly scheduled election of a municipality wholly or partially within the school district." A school district should work closely with municipal and county officials to coordinate election and public notice dates.

Source: Minnesota Statutes, section 205A.05

### *(c) Resubmission of Question(s)*

If a bond issue referendum is defeated by voters, Minnesota Statutes, section 475.58, subdivision 1A provides that a school district may not submit the same referendum question for the same purpose in the same amount to voters for at least 180 days from the date the previous referendum was held. If the same bond issue referendum question is again defeated by the voters, a school district may not submit an identical question to voters for at least one year from the date of the previous referendum.

Past practice has been that a school district is not bound by these timelines if the bond issue referendum question(s) dollar amount is at least 5 percent different than the previous referendum.

Source: Minnesota Statutes, section 475.58, subdivision 1A

### *(d) Use of Bond Proceeds*

Minnesota Statutes, section 475.65 authorizes school districts to use bond issue referendum proceeds to pay all expenses reasonably necessary and incidental to the school construction or school site improvement project approved by voters. School districts may not use the bond issue proceeds or any leftover proceeds after the completion of the project for any other purpose that was not a part of the project approved by voters, without a separate approval by voters.

For example, if bond issue proceeds are left over from a new elementary school construction project, a school district may not use the proceeds to construct or improve other school district facilities unless those uses were specified in review and comment and bond issue referendum information made available to voters prior to the bond issue referendum. Otherwise, the leftover bond issue proceeds must become part of the debt service fund of the school district.

Source: Minnesota Statutes, section 475.65

## Part 1.07 School District Contract Requirements

Minnesota school districts are required to follow the contracting provisions in Minnesota Statutes, section 471.345 Uniform Municipal Contracting Law. The major provisions of law include:

Contracts over $100,000
Contracts over $100,000; best value alternative
Contracts exceeding $25,000 but not $100,000
Contracts exceeding $25,000 but not $100,000; best value alternative
Contracts $25,000 or less
Energy efficiency projects

Source: Minnesota Statutes, section 471.345

## Part 1.08 School District Energy-Efficiency Projects

Districts planning energy efficiency projects should also review the Minnesota Statutes, section 123B.65, Energy Efficiency Projects and Minnesota Statutes, section 471.345, Uniform Municipal Contracting Law, subdivision 13, Energy Efficiency Projects.

The Minnesota Department of Commerce (MDC), Energy Division administers two programs school districts interested in reducing energy consumption may want to consider. The first is the Local Energy Efficiency Program (LEEP). This program assists school districts in selecting contractors to perform energy audits through a standard State RFP process. Expertise and technical assistance are also available to help districts develop and administer contracts with audit providers.

The second MDC program is for districts interested in guaranteed energy savings programs. Energy efficiency projects means a training program and/or facility alteration designed to reduce energy consumption or operating costs. Minnesota school districts are required to follow the provisions in Minnesota Statutes, section 123B.65 for guaranteed energy savings contracts. The statute defines the term "guaranteed energy-savings contract" and provides districts the option of having the commissioner of commerce, through the energy division, evaluate proposed contracts to determine if the detailed calculations of costs, energy and operating savings are accurate and reasonable. This provision provides a neutral and knowledgeable third-party to review the savings assumptions and other provisions of the contract in a quick and economical manner prior to contract approval by the school board.

Subdivision 5 (of 123B.65) also requires the school board to provide to the commissioner of commerce a copy of any guaranteed energy savings contract entered into under Minnesota Statutes, section 123B.65 within 30 days of the effective date of the contract.

Minnesota Department of Commerce
Energy Division
LEEP/Guaranteed Energy Savings Program
85 7th Place East, Suite 500
St. Paul, MN 55105
651-539-1886

Sources: Minnesota Statutes, section 123B.65
Minnesota Statutes, section 471.345, subdivision 13

## Part 1.09 Review and Comment for Project Funded with Voter-Approved Bond Proceeds and LTFM Revenue

Facility projects funded by both voter-approved bond proceeds and Long-Term Facilities Maintenance (LTFM) revenue require project detail for both funding streams as part of the review and comment submission. LTFM projects must meet program requirements under Minnesota Statutes, section 123B.595 and the LTFM Guidance (https://education.mn.gov/MDE/dse/schfin/fac/ltfm/) posted on the MDE website. Districts must assure that all documentation submitted for projects and costs in the review and comment correspond with the current, approved LTFM 10-year revenue and expenditure plan and, if applicable, Health and Safety (H&S) project detail.

Districts should review the LTFM and H&S program requirements and data submission timelines to assure that adequate time is provided for the project approval process, review and comment, levy timelines, and bonding issuance dates. Additional information on the H&S, LTFM bonding and levy programs are located on the MDE website under Health and Safety (https://education.mn.gov/MDE/dse/schfin/fac/hs/) and Long-Term Facilities Maintenance (https://education.mn.gov/MDE/dse/schfin/fac/ltfm/.

## Part 1.10 Review and Comment for Facility Acquisitions by Charter School Affiliated Building Companies

Pursuant to Minnesota Statutes, section 124E.13, charter schools may lease building space from an independent, third-party landlord or an affiliated building company (ABC) established to specifically lease a facility to their affiliated charter school. Subdivision 4 of Minnesota Statutes, section 123E.13 requires a review and comment prior to the acquisition of facilities and/or construction by the ABC on behalf of the affiliated charter school. In addition, charter schools must meet all federal, state and local requirements relating to facilities.

# Section II: Planning School Construction Projects

The purpose of Section II is to provide an overview of the process for planning school construction projects and detail selected parts of this process. School districts and school facilities planning committees may use this information to help understand the steps and time involved in the school construction project planning process and the need to work out the details of the planning process in cooperation with project architects, construction managers, fiscal/other consultants, local and state officials, and other interested persons.

## Part 2.01 Participants in the Planning Process

The participants involved in the planning process and their role(s) will vary significantly based upon the size and type of the school construction project and the school district. In a smaller project and/or smaller school district, the process will likely involve fewer persons and their roles will be broader. In a larger project and/or larger school district, the process will likely involve more persons and their roles will be more specialized. Smaller districts, or any district in a larger project, may have to procure more resources outside the school district (e.g., consultants, construction managers), or fewer district persons will have to assume broader roles. Participants in the planning process may include the following persons:

- School board member
- Superintendent
- Business manager
- Specialized district staff
- Principals
- Teachers
- Support staff
- Students
- Parents
- Citizens
- Architect, engineer
- Construction manager, contractor
- Commissioning agent
- Educational consultant
- Community survey consultant
- Fiscal consultant
- Legal counsel
- Local or regional government officials
- Minnesota Department of Education staff
- State or local regulatory agency staff

The school board and superintendent have the primary roles in shaping the school construction project planning process and the final responsibility for the overall success of the project. The timely delegation of planning responsibilities and the careful oversight of the project are critical to project success. It is important to have an experienced educational facilities planner/designer on board early on to help lead the planning process (see Part 2.03).

## Part 2.02 Planning a School Construction Project

The phases and steps listed below summarize major tasks in planning a school construction project. Each school district must determine the details of each step in the planning process, including the roles of the possible participants, and the desirable or necessary preliminary (e.g., strategic plan) follow-up work for each phase/step. Project timelines will vary depending upon the size and scope of the project, the steps that overlap and tasks that are done separately or concurrently, and the time taken for each step. The assessment of needs and preliminary planning phases may take up to several years for larger projects such as a high school or multi-school campus, with up to an additional three years for construction. It is possible to plan small additions or remodeling/renovation projects in less than a year and complete construction the following year.

To establish and maintain quality school facilities and a desirable learning environment for students, staff, and community users, an ongoing assessment of school facility needs and a program of public information about those needs are essential. A school facilities program will make it much less problematic for a school district to present and justify school facility improvement needs to the public and to generate voter support for bond issues. Without such a program, school facility problems will likely increase and the school district community may become conditioned to a lower standard of school facilities, a less than desirable learning environment, and an overall lower level of community use and support.

### *Phases and Steps of Planning a Major Construction Project*

The school construction project planning steps are placed in the following phases: (a) assessment of needs; (b) preliminary planning; and (c) final planning. Subsequent parts in this section provide more detail on selected steps in this process. For each step, possible responsible persons are identified.

**(a) Assessment of Needs**

(1) Identify possible construction project issues such as the following:

- School site
- School facility
- Program
- Student enrollment
- Technology
- Building code
- Accessibility
- Health and safety
- Community use/partnership
- School restructuring
- School district reorganization
- Land acquisition

Obtain school board approval to form a school facilities planning committee with strong representation from parents/citizens, community users/partners, and school district staff. The committee needs to identify issues and related questions, and develop, discuss, review, and recommend school facility improvements and school

construction project options. *Superintendent, school board, community users/partners, parents/citizens, students, and school district staff.*

(2) Gather data while assessing existing school facilities and programs. Project building, program, and technology improvement needs for students, staff, and community users/partners. Consider school/community survey and/or management assistance study of programs and facilities. Use architects and consultant(s) to help identify school program and facility improvement needs, and school construction project options. *Committee, school district staff, consultant(s), and architect.*

(3) Discuss construction project delivery options. Interview and select architect, construction management firm, if desired, and other fiscal/consultants as appropriate. Establish planning process goals, public information program, timelines, and criteria. School board, superintendent, and committee.

Timeframe: Three to nine months+

**(b) Preliminary Planning**

(1) After presenting and reviewing data with committee, school district community, staff, and school board, develop educational, community user, and partnership program facility design options which meet educational community learning/program needs and the goals of the school, school district, community users, and partnership programs. Involve local, regional, or state road/highway officials to assess any site access or safety issues. Committee, school board, architect, and school district staff.

(2) Incorporate program designs into preliminary plan(s). Review preliminary plan(s) and cost estimates, financing plan (including debt service equalization, if any), tax impact, construction delivery method, move management, and ballot question(s). Secure school board and partnership program approvals. Committee, architect, commissioning agent, fiscal consultant, superintendent, business manager, and school board.

(3) If school construction project proposal exceeds $2,000,000, prepare and submit package of information to MDE for commissioner review and comment at least 60-90 days before the scheduled bond referendums. *Superintendent or designate.*

Timeframe: Three to nine months+

**(c) Final Planning**

(1) Plan and develop bond issue referendum information materials, schedule building tours, public meetings, etc. Finalize ballot questions and bond issue referendum date. Coordinate election date with local officials. *Committee, superintendent, architect, other consultants, and school board.*

(2) Publish commissioner review and comment 20 to 60 days before bond referendum. *Superintendent or designate.*

(3) If referendum passes, coordinate architect, committee, staff, and administrative development and review of detailed plans, specifications, and project budget. If referendum fails, consider options for resubmission. *Architect, committee, superintendent, business manager, fiscal consultant, and school board.*

(4) Develop, review, and secure school board approval of final plans, specifications, and construction documents. Submit final plans to Building Code Division, Health Department, MDE (optional), and other state, regional, and local agencies as required. Secure written approvals and agreements. *Superintendent or designate, architect.*

(5) Plan for the timely sale of bonds, reinvestment of proceeds, and securing of proceeds for project payments. Advertise for bids and award contracts. Set construction project schedule. *Business manager, fiscal consultant, architect, superintendent, and school board.*

(6) Project construction. Supervise, monitor change orders, budget. *Architect, contractor, and/or construction manager, business manager, and superintendent or designate.*

(7) Move management. Fine tune "move-in" management process to facilitate move to new or renovated facility. Prepare bid documents for movable equipment, furniture, custodial equipment and supplies, and general building supplies. Allow time for receiving bids, awarding contracts, delivery, and set-up before building goes into full operational mode. *Architect, contractor, and/or construction manager, business manager, committee, and superintendent or designate.*

(8) Complete construction. Complete and submit final reports to school board, MDE, and other state, regional, and local agencies as necessary. Conduct final inspections, payments, and secure occupancy certificate. Move to and/or occupy facility. Fulfill commissioning requirements. Conduct post-occupancy evaluation. Correct building deficiencies before expiration of warranties. Verify extended warranties. *Architect and/or construction manager, commissioning agent, business manager, committee, and superintendent or designate.*

Timeframe: Twelve to twenty-six months+

### *Implementation of a Major Construction Project*

While all projects have unique characteristics and demands, there are five basic implementation phases in a construction project that all projects experience:

1. Pre-bid
2. Contract procurement
3. Contract award
4. Construction
5. Operations and maintenance

## 1. Pre-Bid Phase

In construction of school facilities this phase has two sub-phases, the conceptual planning and approval process and the design phase.

### (a) Conceptual Planning and Approval Process

This phase begins with recognition of the board that a new facility is needed. In the process the board and the district complete extensive analysis to determine if a new facility is needed, and considers factors such as future school district enrollment, type of structure required, size, possible locations, sources of funding, community and external factors, and community preferences. If the school board wishes to continue in the construction of a new facility and if the cost exceeds $2,000,000, the district must submit a review and comment documents to the commissioner for approval. The requirements for the review and comment are covered in Part 1.04 in this

document. The planning phase of the project is usually includes the school board, district staff, district facility advisory committee members, principals, teachers, parents, financial/bonding consultants, and architectural/engineering consultants. Only conceptual design requirements are determined at this time. Because of cost considerations, architectural drawings are not completed at this time. If voter approval is required for the financing of the project, an election is held at this time.

**(b) Design Phase**

Upon commissioner approval of the review and comment and, if necessary, voter approval, the final design of the facility is completed. This is where the needs, ideas and dreams of the school board, administration, teachers and parents/community members are transformed into detailed facility plans and specifications. The design phase is a very complicated process and a variety of professionals, in addition to the architects, are involved such as:

- Interior designers to handle the design of floor and wall coverings, painting scheme, colors and furnishings,
- Landscape architects to design site layout of trees, parking lots, roadways, and such,
- Structural engineers to design structural elements,
- Civil engineers to design required roads, curbs, drainage systems, and underground utilities,
- Mechanical engineers to design plumbing, fire protection, heating, cooling and ventilation systems, and
- Electrical engineers to design electrical systems.

Typically, the architectural/engineering firm has the overall responsibility for the design function. This includes ensuring that the project is designed within the budget, and meets design and construction codes and regulations. It is important that the great care and diligence is paid to the design process so that once the construction project starts, that school district initiated change items are kept to the minimum.

### 2. Contract Procurement Phase

School districts are required to follow Minnesota Statutes, section 471.345 Municipal Uniform Contracting Law. The law defines a "municipality" means a county, town, city, school district or other municipal corporation or political subdivision of the state authorized by law to enter into contracts. The laws also defines a "contract" as an agreement entered into by a municipality for the sale or purchase of supplies, materials, equipment or the rental thereof, or the construction, alteration, repair or maintenance of real or personal property.

In a competitive bid process, contract procurement begins with development of bid documents, specifications, and requirements. The requirements for competitive bids are advertised. This is a legal process. Great care and diligence is required in this area.

### 3. Award Phase

The school board, or the school board’s representative, finalizes administrative matters such as contractor’s references, surety bonds, insurance and proposed schedules. Upon completion of a formal contract, most contractors begin working with subcontractors and suppliers to assure that work and material are received in a timely manner to meet the construction schedule. This includes ordering materials and supplies that must meet specific specifications and require significant lead time.

**Pre-Construction Conference**

A pre-construction conference between the school district, architect/engineers, owner representatives, the general contractor, and major subcontractors take place. The purpose of the meeting is to clarify possible questions regarding technical and administrative aspects of the project. Responsibilities for the portions of the projects are assigned and the construction schedules are reviewed and agreed upon.

## 4. Construction Phase

The construction of the project begins and is completed in this phase. The key players in this phase are the owner representative, the architects/engineers, the general contractor management team, sub-contractors, consultants, and inspectors.

The district should develop a method for change item tracking and addressing associated costs before the construction process begins. Change items occur when an unexpected design or construction change occurs. This can include items such as design changes, changes in equipment specifications, code compliance, and correction of errors. Change items that occur once construction begins can become very expensive and can cause major budgetary problems if not managed properly. Districts should be extremely vigilant and must actively manage change items throughout all stages of construction.

Inspection typically takes place throughout the construction project. When the passage of all required inspections and the project is essentially complete, the representatives of the district and the contractor conducts a pre-final inspection to determine deficiencies and create a punch list of items for corrections.

Final Inspection occurs after the completion of the punch list. A final inspection is scheduled for the district representative, the architect/engineer, and the contractor. Upon completion of the project, the following administrative tasks should be followed:

- Affidavit of release of liens. This states that all the labor, materials, equipment, subcontractors and consultants have been paid in full and that all applicable taxes and fees have been paid.
- As-built drawings. This is a set of final drawings for the *project* ***including all the changes made during the construction process.*** These drawings will be critical and invaluable in the future when future modifications/additions are made to the facility.
- Submit operating and maintenance manuals and videos. Instructional materials for operating and maintaining all equipment and systems should be provided to the district. This includes all manufacturers' warranty information. Videos/recordings should be taken of training/operating sessions on mechanical, electrical, and HVAC systems for future reference and training of future district staff.
- Districts must comply with Minnesota Statutes, section 123B.72 School Facility commissioning to assure that the systems have been installed and operating according to design and code and meets ASHRAE filtration standards. In Minnesota, because of the demands of the various seasons, this process should be completed for one complete season cycle or for one year. Certification to the school board is required.
- School districts are strongly encouraged to consider having an independent third party, who reports directly to the district, as a commissioning agent for the entire school facility to assure that all systems, such as structural, mechanical, electrical, and HVAC, have been constructed/installed according to agreed specifications and contracts, and that all systems are operating at design and code specifications.

Commissioning agents should be involved from the beginning of the project to assure that performance criteria and measurement can be met.

### 5. Operating and Maintenance Phase

The facility is completed and all systems have been inspected and verified to be installed and are operating correctly. School districts staff should develop a systematic and periodic maintenance schedule for the systems and facility.

## Part 2.03 Selecting a School Architect and Other Consultants

A school architect, contractor or construction manager, fiscal consultant, and other needed consultants are key members of the school facilities team who will plan and implement a school construction project. The importance of the careful selection of school facilities team members cannot be stressed enough. Though the selection process outlined below is about selecting an architect, a similar process could be used to select other key members of the school facilities team.

A school district first needs to consider when to involve an architect, construction manager, fiscal consultant, and other needed consultants as key resources and advisors in the planning process. There are definite advantages to the early involvement of the architect and other key members in the planning process. A consultant, for example, can help a school district study and review broad questions such as grade or school district reorganization options. An architect and a contractor or construction management firm can provide valuable assistance in helping the school district assess existing school facilities, cost out facility options, and discuss different construction project delivery methods for the school facilities planning committee and/or school board to consider. A financial advisor can help determine the tax impact of facility options under consideration, including the amount of debt service equalization for which the school district may qualify. The architect and other key members can help the school facilities committee identify and realistically assess facility options under consideration.

Major steps in the selection of an architect include the following:

(1) Form a selection committee. This could be the school facilities planning committee and/or the school board assisted by the superintendent and district staff. Consideration should be given to consulting with or adding other persons capable of assessing an architect's capabilities to the selection committee.

(2) Invite applications from interested architects. This involves publishing a description of the proposed school facilities needs and/or construction project proposal, timelines, selection criteria and procedures, and notifying interested architects through the school district newspaper and other appropriate channels.

(3) Review and screen applications. Determine which architect in the firm will be the project architect, i.e., the architect who will work most intensively with the school district and the architect's support team. Selection criteria may include the following: personal qualifications and school construction experience of the architect and the support team; ability to complete a project within the planned budget and timelines; ability to understand project concepts and possible project partnerships; creativity and flexibility in design; ability to relate and work with the committee, district staff, and other project team members; and the architect's role in the construction project phase.

(4) Interview final architect candidates. Interview three to five architect firms and give each a chance to make a presentation to the interview committee. When reviewing and comparing estimated project costs from competing architect firms, caution is advised. Make sure to include all project costs, including architect, fiscal consultant, construction management, consultant fees, furniture, fixtures, and equipment costs, and that the quality of construction materials is the same when comparing project cost estimates. Visit school districts that have worked with the architect on a project and review the architect's designs and specifications as part of the selection process.

(5) Select the architect and negotiate the terms of a contract. Distinguish between basic architectural services and additional services that an architect may perform. Basic services include schematic design and design development, preparing construction documents and participating in bidding/negotiations, and construction contract administration. Additional pre-design services include existing school surveys and site analysis, and post-construction and supplemental services such as an energy survey. Clearly specify the services to be performed by the architect in the contract. Review the contract to see that the responsibilities and relationships of the architect, contractor(s), construction manager, and school district are clearly understood. Secure final school board approval only after a review of the contract by the school district legal counsel.

A direct appointment of an architect may be appropriate if a long and satisfactory working relationship has been developed through previous school construction projects.

The AIA Minnesota has materials from the American Institute of Architects regarding the selection of an architect, AIA owner-architect agreement forms, and related materials. AIA Minnesota annually publishes a list of Minnesota school architects. For further information, please contact:

AIA Minnesota
275 Market Street, Suite 54
Minneapolis, MN 55405
612-338-6763

AIA Guide to Selecting an Architect (http://www.aia-mn.org/).

AIA Guide to Working with an Architect (http://www.aia-mn.org/resources/work-with-an-architect/).

Additional information regarding school districts and construction service contracts are also available from the Minnesota School Boards Association.

Minnesota School Boards Association
1900 West Jefferson Avenue
St. Peter, Minnesota 56082-3015
Local: 507-934-2450
Toll Free: 800-324-4459 (MN Only)
Minnesota School Boards Association (http://www.mnmsba.org/).

## Part 2.04 Assessing Existing School Sites and Facilities

A school district needs an ongoing program of assessment of existing school sites and facilities in order to identify school facility improvement issues, alternative means of addressing those issues, and to maintain a quality educational environment for students, staff, and community/partnership users. Keep the educational community well informed of school facility improvement needs and actions taken to maintain a quality educational environment. This program needs to be a part of a school district's strategic planning process as discussed in Part 2.02.

A school district that does not regularly assess its existing school sites and facilities, take appropriate actions to maintain quality facilities, and keep the educational community informed will likely build up deferred maintenance issues, and the quality of their school facilities will deteriorate. This approach will likely make it more difficult for a school district to successfully implement major facility improvement or replacement projects.

Assessing school facilities involves looking at such areas as the school site, program, support, and community use/partnership spaces. School district staff will need to assist community members in understanding daily school operations and how they impact the needs of program, support, and community use/partnership spaces. A school district will likely need to employ a consulting architect, engineer, or other specialist(s) to properly and thoroughly assess school sites and spaces, technology and equipment, building structure and mechanical/electrical systems, and accessibility and health and life safety issues.

Before beginning a school facilities assessment, a school district needs to determine facility and instructional area enrollment capacities and project individual program enrollments. It is important to make projections based not upon present enrollments, but upon what enrollments will likely be in new/renovated facilities.

A school district may determine the capacity of a facility as follows (classroom = teaching station):

(# of classrooms) x (capacity of classrooms) x (% utilization of classrooms)

In an elementary school, a school district may program general classrooms for a desirable class size (e.g., 15 students at primary level, 20 students other grades) or at their capacity (e.g., 30 students). For a middle or high school, the variety of classrooms or teaching stations (general classrooms, small group and large group areas, science lab, gymnasium, technical education classroom, lab, or shop) is usually greater, necessitating more separate calculations for a wider range of different class size capacities.

**To determine how many classroom spaces or teaching stations are needed for a program or class** (e.g., science or English), **use the following formula:**

$$\frac{\text{Program or class enrollment}}{\text{Class size}} = \frac{\text{\# sections}}{\text{Class periods per day}} = \text{\# of classrooms needed}$$

Figure classroom utilization as the number of class periods minus one (for teacher preparation), or at 80 percent or whatever percentage scheduling experience proves to be the utilization of a classroom or instructional area.

For example:

$$\frac{\text{225 student enrollment}}{\text{27 students per class}} = \frac{\text{8.3 sections}}{\text{6 periods per day utilization}} = \text{1.4 classrooms needed}$$

School districts need to design a school facilities assessment to help them determine what they have (inventory), judge its condition (adequacy), and help decide what facility improvements (new construction, addition, remodeling, or renovation) are needed. An assessment needs to determine whether a school facility meets current building, health and safety, and accessibility codes.

Assessors should understand that one important variable (e.g., poor location, small room size, or inadequate ventilation) might make an otherwise adequate classroom or lab less than adequate. Comments and assistance from building or district maintenance staff, principals, teachers, and architects and engineers is necessary to improve the quality of assessors' judgments.

To assess support spaces, see Table X in Part 3.08 (a) for general support space guidelines. Ask school staff to identify support space needs and consult with an architect before specifying those spaces in the plan for the facility.

## Part 2.05 Projecting Educational Program and Service Space Needs

Projecting what new or expanded programs and services need to be accommodated in school facilities can be a very difficult task. Few school facilities are constructed with space set aside for growth and many lack adequate storage, office, and conference room spaces. Many new or renovated schools report that they are in need of additional spaces within two years of occupying new/renovated facilities.

What is clear is that schools need spaces for program and service as well as student enrollment growth. Listed below are samples of school programs and services that have been added or expanded in scope since publishing the 1988 guide.

- Abused children
- Accessible classrooms, labs
- Adolescent pregnancy
- After-school enrichment program
- All-day kindergarten
- Alternative programs, school-within-a-school
- At-risk students
- Attention deficit disorders
- Autism
- Basic skills tests
- Behavioral intervention
- Block scheduling (3-4 period day)
- Breakfast program
- Career counseling center
- Child care/latchkey program
- Community meeting rooms
- Community nutrition program
- Community recreation
- Coordinated/comprehensive school health
- Decentralized computer labs
- Distance education/television studio
- Drug prevention
- Emotional behavior disorders
- Energy management
- English as a second language
- Family resource center
- Family service collaboratives
- Field house
- Fitness center
- Girls' athletics
- Graduation standards
- Internet technology
- Life-time fitness
- Lifework development
- Limited English proficiency
- Magnet programs

- Mentorships
- Networking, cable lines
- No Child Left Behind Act
- Parent education
- Parent involvement programs
- Preschool/early childhood education
- Public/school library
- Recycling
- Refugee program
- School security
- School-to-work
- Service learning
- Small group area
- Special needs restrooms
- Student commons
- Student houses
- Studio classrooms
- Team learning area
- Technical education labs
- Violence prevention
- Visitor screening

How many school districts were able to adequately plan for these new or expanded programs and services? Provide additional or modified spaces in a timely manner? Meet the added requirements these program and services place upon a facility's mechanical systems? Avoid stress upon the learning environment, particularly in older, less flexible facilities? Will this continuing program and service expansion continue in the years ahead? It would be hard to imagine that the trend of program and service expansion of the last 30-40 years will not continue.

School districts need to stress the need to plan for the continuing expansion or programs and services in their public information program. Flexible, convertible, expandable, and multipurpose spaces should be an integral part of any school facilities planning program. Although specific programs and services that will need to be expanded may not be predictable, the fact that there will be a need for additional spaces for expanding programs and services is a safe prediction. School facilities planning must be undertaken with present and future space considerations utmost in mind.

## Part 2.06 Renovate an Existing School or Build a New School?

The answer to this key question is not clear and simple, and it requires a detailed and time-consuming analysis of many factors. Through the review and comment process, the commissioner must consider both the economic and the educational advisability of a proposed school construction project; hence, both an economic and educational perspective on what is best educationally for students and economically for taxpayers of the community and the state are necessary.

The more "yes" answers there are to the following questions, the greater the likelihood that a school facility in its entirety is not adequate for current student, staff, program, and community needs, and needs to be replaced:

- Does the school district have too many school facilities for the numbers of students?
- Are there student safety issues (e.g., student and bus drop-offs) on the school site?
- Is the school site too small to meet current needs for parking and outdoor activities?
- Is it very difficult or impossible to solve school site issues by closing streets and/or purchasing adjacent properties?
- Are their major exterior issues such as leaking roofs, groundwater penetration, sagging walls, mold, and brick in need of repair or replacement?
- Are major portions of the school greater than 50 years old and/or in poor condition?
- Are there many additions to the school over the years, and are learning and support spaces separated that should be clustered together?
- Are major portions of the school inaccessible to students with disabilities and adults?
- Does the school have indoor health and safety issues such as poor indoor air quality, fire safety, and mold?
- Does the school have mold, asbestos, water penetration, or other issues behind exterior or interior surfaces the cost of which to repair or replace is difficult to estimate without special engineering studies?
- Are general classrooms, specialized areas (labs, shops, music, art, physical education, and special education), multipurpose areas, and support spaces (e.g., storage, conference spaces) insufficient for current needs?
- Are there many load-bearing walls, wood floors, and other design features that make renovation of the school difficult and expensive?
- Are the mechanical, electrical, plumbing, and heating, ventilation, and air-conditioning systems in poor condition?
- Is lighting insufficient and/or do the windows, ceilings, and walls need replacement?
- Is further wiring for technology costly because of the age and/or design of the school?
- Is the student enrollment either too small or too large for the capacity of the facility?
- Are school operational and maintenance costs high?
- Are community use spaces in the school few or insufficient for current needs?
- Are the high costs of renovating the school, the unpredictability of renovation costs, and the disadvantages of continuing to use it as a school clear and understandable?
- Are the concerns of supporters of the school centered on issues other than how the facility can best improve student learning and teaching, and help prepare students for their future?
- Does the school have good potential for reuse? Is there a viable reuse option for the school?
- Are the reasons for replacing the school and the advantages of building a new school clear and understandable?
- Does the school district have the bonding capacity to build a new school?
- Will the school likely be serving students for the life of the bond issue?

MDE's facilities/organization team uses the architectural guideline that when the estimated costs of renovating/improving a school facility approach 60 percent of the cost of replacing the facility, a school district needs to seriously consider replacement of the facility. In the case of a proposal to renovate an existing school, the local school board must also consider other relevant factors in determining whether to renovate or build a new school. It is worthwhile to note that the construction cost of a facility is one-seventh to one-tenth of its cost during its life cycle. The remaining costs of a facility are operations and maintenance costs. Taxpayers are best served when school boards view long-term building decisions in such a manner; considering all the costs of building ownership, not just construction costs.

In a proposed renovation project, a school district is expected to bring the facility up to current codes and address educational deficiencies as well. HVAC systems are often deficient in buildings that exceed the 60% of replacement cost rule identified above. The emphasis should be on making sure that adequate amounts of outside fresh air, measured in cubic feet per person per minute, reach each person in an occupied space. In prior years, the design standard for the amount of outside fresh air that should enter occupied spaces was significantly lower (5cfm/person) than today's standard. Since 1994, the code requirement is 15 cubic feet per minute per person. Schools renovating existing heating, ventilation, and air-conditioning systems or installing new systems must meet today's higher standard.

If the need to replace the school facility is not relatively self-evident, it may be necessary for school staff and consultants to assess existing school facilities and sites in detail using the criteria outlined in Part 2.04. A consulting architect or engineer will need to provide a detailed analysis of the estimated costs for necessary and desired renovations/improvements and develop comparative life cycle, cost-benefit analyses for all school construction alternatives under consideration. Potential problems involving mold, asbestos, and water penetration hidden behind roofs, walls, ceilings, and floors can require great cost and time to repair or replace, and can disrupt the existing school project budget and timelines. It is very important to get an accurate estimate of abatement, repair, or replacement costs for all such issues. The timing and scheduling of a school construction project also has cost implications due to the changing costs of equipment, materials, and labor. In general, the greater the gap between the present value of the renovated facility versus a replacement facility, as well as the actual versus desired site size, the less advisable it is to expand on the existing facility and site.

For rural school districts maintaining multiple attendance centers, the decision to renovate versus building new is complicated by the important role schools plays in the community. Rural schools are an integral part of the life of the communities they serve. The school is frequently the main facility for gatherings and entertainment such as high school sport events and widely attended by most members of the community. The school is also a conduit for supporting local community development activities which helps make rural communities more attractive to area residents. In some situations, the decision to build a new facility results in the closure of other attendance centers within the district. While sometimes easier said than done, school boards must strive to base long-term facility decisions on the best interests of the students they serve and the taxpaying public.

Sources: Minnesota Statutes, sections 123B.57 and 123B.595
Long-Term Facilities Maintenance Revenue-Guide for Allowable Expenditures; MDE
ASHRAE 62-1989 Guideline to Acceptable Indoor Air Quality; American Society of Heating, Refrigerating, and Air-Conditioning Engineers; 1990
Standard 62.1-2013-Ventilation for Acceptable Indoor Air Quality
Addenda Supplement 2015 to Standard 62.1-2013-Ventilation for Acceptable Indoor Air Quality

## Part 2.07 Selecting a School Site

Part 1.01 specifies the legal authority for school districts to select, purchase, and improve school sites. Selection of a school site may be part of a proposed school construction project subject to the review and comment requirements outlined in Part 1.05. Adequate school site size is an important consideration in the commissioner's review and comment on any school construction project proposal. School districts selecting a school site should be guided by the criteria for site selection described in Part 2.07.

School architects and superintendents report that user demands on school sites have increased dramatically in the past decade (see Part 2.05). Existing, even newer, school sites are often not of sufficient size to accommodate the increasing demand for outdoor physical education, athletic, and community recreation spaces, access roads, and student and community user parking. Changing needs and requirements require the continuing improvement and renewal of school sites. It is very important that any school site selection consider future expansion needs that will impact the site.

One of the greatest challenges to school districts is the acquisition or expansion of existing school sites. Buying homes and using eminent domain to get residents to move (e.g., 30 homes per 3 ½ acre block) has a high cost and social impact. Limited site sizes may also require school facilities that are multi-storied, adding to construction costs.

School districts consider improving an existing school rather than building a new school because of positive feelings for the old school and its central location. If considering renovating an existing school, it is important to understand that an inadequately sized site may make it very difficult or impossible to solve current site issues and construct an addition onto the school to accommodate new programs in a cost-effective manner.

### *(a) Site Selection Process*

A new school site selection process needs to involve the following steps:

(1) Specify the spaces needed for current school and community programs and for anticipated program expansion.
(2) Form a school site selection team composed of school and district staff, parents, students, citizens, school-community partners, and local officials (e.g., city and county planners, park board).
(3) Employ or work with consulting architects, engineers, local or state traffic/road officials, real estate specialists, and appraisers to evaluate possible school sites and the costs of site development.
(4) Research and review local and regional planning and zoning requirements and land costs.
(5) Convene public meetings to discuss impact of school construction.
(6) Review and apply the school site selection considerations specified in (b) below, rank sites, and recommend possible site(s) to the school board.

### *(b) Site Selection Considerations*

Selecting a new school site is different than assessing an existing school site in an existing neighborhood, where school site issues may already exist. Selecting a new school site in a suburban or inner-city setting is different

than selecting a site in a rural setting because of unique local issues that may impact school site possibilities and the final decision.

The selection of an adequate school site with expansion space will accommodate current and future educational programs and services, expanding student enrollments, increase community use of schools, and promote school-community partnerships. Conversely, continuing use of or the selection of an inadequate school site with limited or no expansion possibilities will create ongoing problems as program development, student enrollment, community use, and school-community partnership issues arise. Space accommodations in light of these issues will put additional stresses on an overcrowded school site and facility. A school site selection form or checklist may be put together using new school site considerations, including the following:

(1) **Size.** Allow for current site size needs and future expansion possibilities. Acquire contiguous acreage whenever possible and encourage the joint use of land in partnership with other local public agencies and private users. The basis of the following school site size guidelines are the experiences of school districts, school architects, and school facility planners in Minnesota and other states. School site size guidelines refer to usable acres. Do not include wetlands or land for on-site water, sewer, or zoning setbacks as usable land for calculating acreage to meet the school site guidelines. School sites with unusable geographical or topographical areas that prohibit normal school operations should also be excluded from the site acreage calculation. The school site size ranges specified below allow for schools planning different grade organizations, student enrollment capacities, and current and future program, support, community use/partnership, and program expansion spaces for the school site and school.

**Table I**
**School Site Size Guidelines**

| School Level | Site Size |
|---|---|
| Elementary School | 10-15 acres + |
| K-8 or Middle Level School | 25-35 acres + |
| K-12 School or Small High School | 35-40 acres + |
| Large High School (>2,000 students) | 60 acres + |
| Campus (two or more schools) | Combine site sizes + |
| All Schools | **Plus**<br>One additional acre for each 100 students of estimated student enrollment and community use/partnership program capacity, including possible additions. |

For example, a district would need to secure 15-20 acres for a 500-student elementary school, 47 acres for a 1,200-student junior high school, 43-48 acres for an 800-student high school or K-12 school, 80 acres for a large high school, and 65-70 acres for a campus with a separate 1,500-student middle level school and a 500-student elementary school.

Special local circumstances such as the unusually high cost of available land and the lack of suitable sites may preclude school districts from meeting the above site size guidelines. For example, in an urban or other unique setting (Minneapolis, St. Paul, Duluth, Rochester, Winona, etc.), the lack of available land and suitable school

sites may necessitate a multi-story school on fewer acres, while sharing other spaces (e.g., playground, athletic) with other public agencies or private owners.

The local school board retains the authority to determine minimum acreage needed to accommodate the school and related facilities.

(2) **Location.** The school site should be located near the following:
- center of community or school district;
- student population concentration or growth area;
- community resources (especially parks) and potential school-community partnership sites;
- major connecting roads and bus lines that afford easy access to the site;
- site expandable areas (preferably include in site purchase); and
- bus routes limiting travel time for students, whenever possible.

(3) **Health and Life Safety.** Avoid locations with nearby, high-density freeway, commercial, or commuter traffic flow. Avoid noisy, congested, or environmentally hazardous areas (e.g., near major highways or busy intersections, heavy industry, sewage or chemical plants, power and gas lines, railroads, or feedlots). See section (d) for planning for school site safety and access.

(4) **Topography, Soil.** A site should be gently sloping with an elevation and contour that ensures good drainage away from the school and site, and soil test borings need to assure that the subsoil provides a good base for footings and foundations. Extensive level areas are needed for outdoor activity areas, access, and parking. Uneven, wooded, and wet areas may be useful for nature/environmental study. Avoid sites located in lowlands and in or adjacent to extensive wetlands.

(5) **Present/Previous Use.** The site should be compatible with land use plans. If the site has or is presently heavily used, an environmental assessment of the site to check for contamination may be necessary. Check aircraft noise zones, if applicable. If the demolition or relocation of an existing business or housing is necessary, procure an estimate of the cost of demolition/relocation and any additional site preparation costs.

(6) **Zoning, Utilities.** Utility lines and fire protection service should be nearby and not excessive in cost. Zoning changes or existing easements should not be potential problems. Check adjacent area zoning for possible future construction and land use not compatible with a school neighborhood area. Secure written approvals or agreements as appropriate.

(7) **Cost and Availability.** Determine initial and potential long-term costs. Secure appraisals and review methods of site purchase.

### *(c) Improving an Existing School Site*

Planning an addition to a school facility on an existing, adequate site has many advantages. Construction cost efficiencies are achievable if existing building systems and support spaces (e.g., lunchroom, gymnasium, media center) have the capacity to provide the same level of service for additional spaces, and disruptions due to construction may be kept to a minimum.

However, there are cases when a building addition, no matter how well planned, may not be economically or educationally advisable, given the current configuration of the facility. Repeatedly adding on to a school facility on an inadequate site creates a maze of building additions, while further stressing the site and reducing spaces for outdoor activities, parking, and convenient access.

Select a site for a school addition to satisfy the considerations discussed in this part and the assessment of needs procedure as discussed in Part 2.02. This includes assessing existing sites and facilities, identifying space needs and projected costs, consulting with the school facilities team, and consideration of other alternatives. Develop a detailed cost-benefit analysis of adding on to the old facility and constructing a new facility.

In any school renovation/addition project proposal, every effort needs to be made to acquire adjacent properties if current school site size guidelines are not met. However, the local school board retains the authority to determine minimum acreage needed to accommodate the school and related facilities. Any school renovation/addition project proposal must address existing school site issues (e.g., lack of outdoor activity space, limited parking). If the deficiencies of the school site and facility are numerous, a school renovation/addition project will likely be judged not to be economically and/or educationally advisable.

### *(d) Planning for School Site Access and Safety*

New schools are more often being built adjacent to busy streets and highways, necessitating increased attention to school site access and safety issues. There may have to be more and longer turn lanes for cars and buses, and stop signs and walkways in potentially hazardous areas. This will impact the cost of the project and school officials need to determine what portion of the cost of these improvements the school district will need to assume. School site access and safety concerns necessitate consultation early on (before a review and comment submittal) with street and highway planning officials at the local and/or state level for the purpose of providing for adequate and safe school site access.

Safe and convenient access to the school for students, parents, visitors, and community users must be a priority in designing a school site. Student walkways, bus unloading or parent/student drop-off areas, special needs student drop-off, delivery, parking for students, staff, visitors, and community users, outdoor activity area access for students, and entrances and parking areas for community partnership users should be separate, distinct, and well-marked to avoid potential problems. One-way traffic flow is advised wherever possible. It is strongly advised to locate structures such as bus garages off site in order to avoid potential problems that buses backing up onto school sites and student walking areas could create.

The Minnesota Department of Transportation (MNDOT) will assist school districts in planning student, vehicle, and community user access to a school site. In Minneapolis and Saint Paul, city officials assist the school districts with school site access issues. In most areas, MNDOT District Offices will act as a coordinating agency for local school site access and safety planning using state, county and/or local streets and highways. For further information please contact:

MNDOT
Office of Traffic Engineering
395 John Ireland Blvd.
St. Paul, MN 55155
651-296-3000
MNDOT Office of Traffic Engineering
(http://www.dot.state.mn.us/trafficeng/)

## Part 2.08 Building Public Support for a School Bond Issue Referendum

### *(a) Trends in School Bond Issue Referendums*

The rate of successful school construction bond issue referendums in Minnesota has been highly variable over the years. Factors influencing bond issue passage rates include the strength of the national, state, and local economies, the condition of local school facilities, current educational issues that impact school facilities, changing program needs, state debt service equalization levels and local support or opposition.

**Dollars in Millions**

| Fiscal Year | Proposed Projects Subject to Voter Elections | Voter Approved Referendums | Voter Approved Percentage Rate |
|---|---|---|---|
| 1998 | $ 552.4 | $420.8 | 76.2% |
| 1999 | 1,150 | 838.1 | 72.9% |
| 2000 | 1,080 | 840.1 | 77.8% |
| 2001 | 1,096 | 547.7 | 50.0% |
| 2002 | 885.7 | 494.7 | 55.9% |
| 2003 | 703.1 | 310.7 | 44.2% |
| 2004 | 1,127.9 | 446.1 | 39.6% |
| 2005 | 1,063.1 | 594.8 | 55.9% |
| 2006 | 778.5 | 336.8 | 42.7% |
| 2007 | 639.7 | 409.6 | 64.0% |
| 2008 | 1,017.5 | 229.4 | 22.5% |
| 2009 | 245.5 | 69.9 | 28.5% |
| 2010 | 340.1 | 227.4 | 66.9% |
| 2011 | 486.7 | 314.3 | 64.6% |
| 2012 | 455.4 | 229.6 | 50.4% |
| 2013 | 373.6 | 116.6 | 31.2% |
| 2014 | 1,114.3 | 654.5 | 58.7% |
| 2015 | 1,421.4 | 1,070.7 | 75.3% |
| 2016 | 1,988.2 | 1,104.6 | 55.6% |
| 2017 | 1,289.7 | 591.2 | 45.8% |
| 2018 | 2,574.5 | 816.7 | 68.3% |

### *(b) Suggestions for Building Public Support*

Building public support for a school bond issue referendum is an increasingly challenging task for school districts. School district communities are made up of many constituencies and most often a majority of voters do not have children in school. Research on Minnesota operating and school construction bond referendums have demonstrated a strong correlation between the citizens' perception of the overall quality of district schools and the success or failure of referendums. A 17 percent or greater negative evaluation (fair or poor perception of quality of education in district) dramatically reduces a school district's chance of a successful referendum. A program of citizen education, including regular surveys to measure citizen perception of the quality of education, and a plan to establish and maintain a positive citizen perception of the quality of education in the school district is highly recommended.

In addition to the above efforts, a school district needs a long-term plan to keep the citizenry well informed of school facility needs and creative partnerships with community organizations to enhance school construction project proposals. If the school community has a positive perception of the quality of education offered by the school district, is knowledgeable about the school district's facility needs, and school construction projects propose partnerships which increase citizens' and community organizations' use of school facilities, chances of passing school bond issue referendums will improve. The opposite approach of relying on "crash programs" of public information on school facility needs and proposing traditional school construction projects centering on the needs of the school will likely make the passage of school bond issue referendums more difficult to achieve.

Suggestions on how to successfully pass school bond issue referendums were derived from feedback from Minnesota school districts and updated national sources. There is no consensus on the one way to pass a bond referendum. School districts may successfully employ a variety of strategies. Each school district community is unique and approaches strategies and techniques that pass a bond issue referendum in one community at one time may not work in another community or in the same community at a different time. Bond issue referendum campaigns must be made to fit the history and needs of each community.

A school bond issue referendum is part of the overall planning process described in Part 2.02 Planning a School Construction Project. Consider the following suggestions as a compendium of actions that a school district needs to consider in addition to those made in Part 2.02:

(1) Establish an ongoing school facility assessment program as part of the school district's overall strategic planning. Regularly communicate school facility issues and improvement needs to the school community through a public information program. Include comments from staff, citizens, and consultants.

(2) Stress school facility issues and improvement needs that relate to the vision and mission of the school and school district to improve student achievement and teaching, develop and expand programs and technology, increase community use of school facilities and school-community partnerships, solve health and safety, accessibility, and building code issues, and increase cost efficient operations.

(3) Research the history of previous school bond issue referendums (including voting patterns), identify constituencies and voter interests, and understand the present economic conditions of the area and community. Identify community opinion leaders, support and opposition groups, as well as issues that will generate support and controversy. Consider a community survey and focus groups to help determine community member's level of understanding of school facility needs, issues, and support. Develop appropriate strategies, action plans, and timelines.

(4) Build upon staff involvement in an ongoing school facilities assessment program. Generate school board and staff support for a school bond referendum proposal. If the school board and staff are divided, reassess the proposal and/or the advisability of proceeding with the referendum. The school board should be in unanimous or near-unanimous support of any school bond issue referendum proposal.

(5) Study community voting patterns to identify the best time of the year for an election (e.g., may want to avoid certain months or days of the month). Check the election laws and local elections dates for possible election dates.

(6) **Important:** School districts cannot lobby for a YES vote. Taxpayer dollars may not be spent to secure a YES vote. School districts must present balanced and objective information to voters. Parents and citizens need to raise funds for and coordinate and lead a campaign to approve the bond issue referendum, including any activities that encourage a "yes vote."

(7) Plan to use a variety of media and presentations with community and community groups. A longer overview piece may serve as the foundation for all other shorter information pieces and be the official information resource for the media and community groups. Keep messages and materials short, accurate, informative, and consistent. Every information piece needs to reflect a similar rationale and the same figures. Review all information pieces with care prior to distribution.

(8) Tailor and target messages to various constituencies in the community. Address all questions that voters are asking. Focus on what will happen with a YES and a NO vote. The campaign should be short in length (one-two months), positive, and low key. Circumstances may require a longer, more highly visible campaign, in which case planning for such a campaign may take considerably longer (six-12 months).

(9) Identify, stress, and repeat themes/issues such as a need to provide improved conditions for learning and teaching, adequately sized and technologically updated classrooms, labs, and support spaces for students, staff, and community users, bring facilities into compliance with health and safety, accessibility, and building codes, and develop and enhance school-community partnerships.

(10) Develop a list of speakers for community meetings. Make an effort to hold meetings in neighborhood and community settings, as well as in school settings. Maximize opportunities for esteemed teachers and student activity directors to specify the student, teacher, and community user needs for facility improvements and how the project proposal will meet those needs. Establish a bond issue referendum "hot line" to provide up-to-date and accurate responses to voter questions. Schedule school board members and school staff to be available to answer questions on the project proposal.

(11) A parent/citizen committee should attempt to identify "yes voters" through phone surveys and mailings. Establish a "yes vote" target and concentrate efforts on getting out "yes voters" versus trying to persuade "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 living in the area for 2-5 years, members of minority groups, college graduates, business and professional people, and other school-community partnership groups (e.g., school-community recreation facility users, adult education students, school technology users).

A checklist of actions to take to increase the chances of a successful referendum may include the following:

- ✓ develop and implement a plan to establish and maintain a positive citizen perception of the quality of education in the school district;
- ✓ complete a thorough facility assessment;
- ✓ increase community awareness of school facility needs and issues;

- ✓ develop school district vision-mission-goals and community understanding of the same;
- ✓ acquire knowledge of community, constituencies, and voting patterns;
- ✓ create a strong, representative citizen advisory committee;
- ✓ conduct extensive research and use data to support proposal(s);
- ✓ consider a variety of facility project proposals;
- ✓ develop strong school board support;
- ✓ encourage and develop strong citizen and staff leadership;
- ✓ develop school-community partnerships as part of a proposal;
- ✓ provide accurate tax impact data;
- ✓ develop positive referendum theme(s) and tailor messages to various constituencies;
- ✓ address all voter issues, even if they seem trivial;
- ✓ encourage communities/constituencies within school district to work together and be supportive of each other; and
- ✓ develop sufficient and inspiring referendum campaign.

A successful school bond issue referendum will normally require a well-organized effort by a dedicated team of citizens and school staff members. If a school bond issue referendum fails, carefully survey and/or review citizen perceptions of the quality of education in the district, the school construction project proposal, and bond issue referendum campaign prior to initiating another proposal and campaign.

Source: MSBA Journal, March-April 2000; Don Lifto and William Morris

## Part 2.09 Project Financing, Delivery, and Move Management

### *(a) Financial Planning Process*

Financial planning for a school construction project is an integral part of the overall planning process as outlined in Part 2.02. Financial planning involves the following steps:

(1) Determine the net debt limits of the school district, not to exceed 10 percent of the market value of taxable property situated within the school district (Minn. Stat. § 475.53, subd.4). Separate provisions apply to school districts located wholly or partly within cities of the first class (subd. 5).

(2) With architect and/or construction manager and fiscal consultant assistance, determine the estimated cost of school construction project proposal. Complete additional engineering and consultant studies for estimating the cost of mold, asbestos, and water penetration issues that may have major implications for the project budget. Include legal, fiscal, architect, management, and other consultant fees, as well as all other project costs. Provide adequate project reserve or contingency to cover higher bids and runaway renovation costs.

(3) Review alternative means of financing the construction project, including the use of operating capital revenues, school bond issue referendum, capital loans, grants, capital projects levy, lease-levy, LTFM funding, capital facility bonds, and other sources of funds (see Parts 1.02-.04).

(4) As part of a school bond referendum proposal, the public information campaign needs to include data and information on state debt service equalization aid and the tax impact on different classes of school district property owners.

(5) After a successful bond referendum, issue bonds. Assistance from legal counsel and a fiscal consultant is necessary to secure a bond rating, advertise for and sell bonds and secure project bids, and take delivery of bond proceeds.

(6) Advertise for bids, accept lowest responsible bidders, and receive contractor performance bonds. See Minnesota Statutes, section 123B.52 and Minnesota Statutes, section 471.345 for information on contracts and bidding procedures.

(7) Through the business manager or a fiscal consultant, reinvest bond referendum levy proceeds until funds are needed to pay project contractors.

In considering options for school construction projects, be wary of any ballpark or unwritten project cost estimates that lack supporting details, even from supposedly well-informed persons (e.g., “that project shouldn’t cost more than $… a square foot,” or “…can do it for no more than $… a square foot”). Such cost estimates may leave out substantial costs such as computer networking/infrastructure, library shelving, lockers, bleachers, furnishings and equipment, grading, site work, lighting, and outdoor facilities, permits and assessments, professional fees, and project financing expenses, and may mislead school facilities planning committees and citizens. New construction will contain cost items that renovations and additions will not and vice versa. Consider only written, detailed cost estimates prepared by professionals and review them carefully.

In estimating school construction project costs and presenting them to the public, it is important that the cost estimates not increase or change often, or public mistrust will develop. The result of adverse public reaction to project cost figures could well be a scaling down of the project proposal to the point where student and learning program needs are not adequately met.

Cost figures for recent school construction projects are available from MDE and school districts should consult with architects, consultants and other school districts undertaking similar projects. School districts must

determine precise project cost estimates after developing preliminary plans and detailed specifications for the project by working with an architect/construction management/fiscal consultant team. Include an adequate project budget reserve or contingency to cover higher bids and/or runaway renovation costs. Such cost estimates may then be presented to the public with confidence.

Sources: Minnesota Statutes, section 475.53, subdivisions 4-5
Minnesota Statutes, section 123B.52
Minnesota Statutes, section 471.345

### *(b) Project Delivery Methods*

There are several school construction project delivery methods available to school districts. School districts need to employ a project delivery method that responds best to their project size and complexity, district priorities, management capabilities, desired approach to risk, and desired level of involvement in design and construction decisions. Highest quality, lowest cost, and the shortest project completion time are also important considerations. When comparing project delivery methods, it is important to understand that different costs and fee structures (e.g., single or multiple contracts, contractor(s), architect, and construction management fees) and document and payment approval requirements may be associated with each delivery method. It is important for the school district owner to use recognized AIA architect/construction manager contract forms in case of possible future litigation.

The school construction project delivery methods available to Minnesota school districts are single or multiple prime general contracting and agency construction management. School districts and their boards must abide by the contract requirements in Minnesota Statutes, section 471.345 and related statutes. All of the delivery methods involve construction project management, but who manages the project and how and when they become involved in a project varies considerably. These delivery methods are briefly described below:

**(1) Single or Multiple Prime General Contracting**

The architect and the school district owner form a team during the assessment of needs or preliminary planning phases and the architect designs the project with input from the owner. The architect advises the owner prior to construction by providing estimates of construction cost and assists in the bidding process and preparation of construction contracts. Typically, the school district awards one to five construction contracts (e.g., general, electrical, and mechanical) to the lowest responsible bidders.

During construction, the architect serves as the agent for the owner. The architect provides quality control by observing/inspecting construction to ensure compliance with the contract documents by contractors, interprets contract documents, acts as a conduit for owner-contractor communications, evaluates claims made by contractor(s), initially resolves disputes between the owner and contractors, and signs off on certificates of payment. The general contractor(s) assumes and manages risk, directly employs subcontractors, and is responsible for the conformance of construction to the contract documents. The legal construction contract is between the general contractor and the school district owner. The architect has a contract with the school district owner and has no contractual ties to the general contractor.

The major difference between single and multiple prime general contracting is in the coordination of construction work. The coordination of construction work, but not the construction or the direction of construction or trade contractors, may be assigned to one of the

contractors, the architect, or a construction manager if the firm has the resources and capacity to absorb the increased risk.

**(2) Agency Construction Management**

The agency construction manager (ACM), architect, and school district owner form a team during the assessment of needs or preliminary planning phases. The architect designs the project with input from the owner. The ACM advises the school district owner prior to construction by providing estimates of construction costs, prepares the project schedule, coordinates various activities (e.g., ordering and delivery of materials), assists the owner in the bidding process and the preparation of construction contracts, and provides overall construction management. The ACM bids to prime contractors (20 to 60 prime contracts) and the school district awards contracts to the lowest responsible bidders.

The ACM advises the owner and architect during construction. The ACM provides scheduling and coordination (i.e., construction meetings, actual construction, safety programs), observes/inspects construction to ensure compliance with the contract documents by contractors, acts as a conduit for owner-architect-contractor communications, assists the architect in evaluating claims made by contractor(s), and signs off on certificates of payment.

In the construction management delivery method, the school district owner chooses the construction team and has input into the selection of the construction project manager and the job superintendent. During construction, the ACM manages construction risk, but the school district owner still assumes the overall risk for the project. The ACM and architect each have a separate contract with the school district owner.

Source: Use of Architects and/or Construction Managers in School Construction Projects; Stephen M. Knutson; 1997

### *(c) Move Management*

Carefully managing a move as your new/renovated facilities are being completed will help make the transition as smooth as possible. The complexities and complications of the move will positively or negatively affect the attitudes of staff and students towards the facilities. For management issues consider the following:

(1) **Moving into the Facility:** Allow ample time for the substantial completion of the new construction/addition/renovation and the commissioning process before the move. Moving into a facility while contractors are still working, cleaning up, or moving out can be a frustrating experience for all parties. Warranty assessment can be complicated, as building contractors do not cover damage to the facility during moving activity under warranty. Before moving, all spaces must be substantially completed, inspected, and certified by your contractor, architect, and/or the construction manager. Move into as complete a facility as possible.

(2) **Moving Timelines:** The move will take longer if moving into new facilities with all-new furnishings and equipment. Plan for moving existing equipment and recognize that moving science, technology, and other specialized equipment will require special handling. School districts should allow four to six weeks to move into a small elementary school and up to three to four months or longer to move into a large high school and be prepared for the school opening. This should allow for building and classroom equipment and systems to be tested and reduce down time after classes begin. Under Minnesota Statutes, section 120A.40 (b), school districts may begin the school year before September 1 to accommodate a school construction project exceeding $500,000.

(3) **Complete Landscaping:** This might seem trivial in view of the entire building project, but nothing creates a bigger mess than tracking mud and dirt into a school because walks and landscaping are not completed. Allow two to three months for landscaping to "take hold" before introducing students and the public to the facility.

(4) **Coordinating Move:** Make sure that final inspections are complete and final certificates of occupancy in place to avoid embarrassing situations for the school and the school district. Check with all local utility providers to make sure all services are connected and operational in the new facility. Check the emergency back-up power system, if available.

(5) **Commissioning Facility:** All new school facilities and many renovated school facilities must undergo commissioning, see Part 1.04 (e). As much as possible, complete this process of verifying the functionality of HVAC, airflow monitoring, and other building systems when the systems are installed and before the building is occupied. Ask your architect or engineer for assistance with this process. This process should also include training your facilities and maintenance staff to help them understand thoroughly how to operate and adjust building systems, thus reducing the chances of costly breakdowns and repairs.

Source: Minnesota Statutes, section 120A.40, part (b)

# Section III: Designing School Facility Spaces

The purpose of Section III is to highlight important considerations in planning and designing school facilities, cite gross square footage, general space, and square footage guidelines, and identify the essential elements to consider in designing learning, school support, and community use/partnership spaces in elementary, middle level, and high schools. School districts and school facilities planning committees need to use this information to help understand the design parameters for school facilities that will be a part of a school facilities project proposal. Architects and other consultants working with school district staff must subsequently develop detailed specifications for each space. Research studies are increasing documenting the positive effect of quality school facilities, lighting, acoustics, and indoor air quality and ventilation on student achievement and health, so any efforts that support quality school facilities will pay important dividends for learners, school staff, and the parents who work with them.

## Part 3.0 Sustainable Building Design

Sustainable design strategies strive to improve energy performance, minimize environmental impacts, and reduce waste. Sustainable design covers design and construction considerations such as planning, school site selection, utilities, water, and energy, the indoor environment, construction materials, waste, and building maintenance and operating costs. The following information is provided to assist school boards and their staffs with basic information on this relatively new element of school facility design and construction.

Minnesota Statutes, section 123B.71, subdivision 9, (14), requires that school districts comply with sustainable school facility design in the planning and executing of proposed facility projects. School districts funding facility projects with state bond proceeds are also mandated to follow the Minnesota Sustainable Building Guidelines (MSBG), also known as the B3 Guidelines. These guidelines are region-specific, tailored to the needs of public buildings in the state, and intended to document the actual costs and benefits of sustainable building. They are organized into five categories: performance management, site and water, energy and atmosphere, indoor environmental quality, and materials and waste.

The Minnesota Departments of Administration and Commerce refer to this initiative as the “B3” project- "Buildings, Benchmarks and Beyond."B3 guidelines ensure that the designs of new buildings are not only cost effective and energy efficient, but also beneficial to the environment and to the inhabitants of the building. It is the Minnesota Legislature's goal that all state-funded new buildings meet or exceed specific energy conservation goals. “State-funded buildings” refers to facilities that are funded through state bonding proceeds or direct appropriation. This goal is to take into account building design, the building's occupants and the building's surrounding external environment. More specifically, these guidelines seek to exceed existing Energy Code by at least 30 percent, encourage continual energy conservation improvements in new buildings and assist in establishing a process that will lead to an accounting of the actual costs and benefits of sustainable building design.

The school district and the project architect/engineer should discuss sustainable design and identify strategies relevant to the particular project. To get the most benefit from the sustainable design approach, be sure to include it in the earliest stages of planning a project. As the planning and design efforts proceed, various strategies can then be easily incorporated. Once the project design has been developed, it becomes more difficult to incorporate new design strategies.

Though a number of sustainable design guidelines exist, this list is Minnesota-specific, providing important information with regard to local materials, waste issues, and climate-related design considerations. The following sites provide additional information regarding sustainable building guidelines:

**Minnesota Sustainable Building Guidelines** Minnesota B3 Guidelines for Building
(http://www.msbg.umn.edu/)

**High Performance Schools for Higher Performing Students**

A pre-design guide on school design, construction and operations for school board members, March 2001, LHB Engineers and Architects and Factor 10, LLC. This was a collaborative project initiated in 2000 by LHB Engineers and Architects and completed in collaboration with Factor 10, LLC and Intep/AW Consulting with funding from the Minnesota Office of Environmental Assistance. (Now the Minnesota Pollution Control Agency). For more information about green and resilient design for schools, contact the Minnesota Pollution

Control Agency at 651-757-2568 or 1-800-657-3864 or visit Minnesota Pollution Control Agency website (https://www.pca.state.mn.us/).

**Healthy Sustainable Schools Guide and Assessment Tool for Change**

In November 2008, the Minnesota Pollution Control Agency and the United States Environmental Protection Agency published a sustainability guide. The document provides background on topics that could be addressed in any school on how to make practical, environmental improvements in school buildings and how to improve healthier, environmentally sustainable and higher performing schools. Also included is an Assessment Tool for Change to use as a checklist for walking through your buildings and assessing what needs to be done.

Healthy Sustainable Schools Guide for Change
(https://www.pca.state.mn.us/search?query=healthy+sustainable+schools+guide).

### *LEED*

The U.S. Green Building Council (USGBC), a nonprofit organization, established the LEED rating system as a way to define and measure "green buildings." LEED is an internationally recognized green building certification system, providing third-party verification that measures how well a building or community performs across all the metrics that matter most: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. The suite of LEED rating systems are designed to address the complete lifecycle of buildings. Each rating system provides a concise framework for identifying and implementing practical and measurable green building solutions. LEED points are awarded on a 100-point scale, and credits are weighted to reflect their potential environmental impacts. A project must satisfy specific prerequisites and earn a minimum number of points to be certified. Certification levels, based on the number of points, include: Certified, Silver, Gold, and Platinum.

School districts and charter schools can also "green" their existing building through the LEED for Existing Buildings: Operations and Maintenance rating system, which is a set of performance standards for the sustainable, ongoing operation of existing buildings that are not undergoing major renovations. The certification system identifies and rewards current best practices and provides an outline for buildings to use less energy, water, and natural resources; improve the indoor environment; and uncover operating inefficiencies. Prerequisites and credits within the rating system address high-performance building systems, O and M best practices, and sustainable policies.

Green School Buildings Website (http://www.centerforgreenschools.org/school-buildings-have-remarkable-effect-how-students-learn-and-teachers-teach)

U.S. Green Building Council Green Existing Schools Project Management Guide
(https://www.usgbc.org/search/green-existing%20schools%20toolkit?filters=type:resource).

USGBC website (http://go.usgbc.org/green-tools?gclid=CNbU4r-zusYCFQ6RaQodSIIPJg)

Minnesota Department of Commerce

Minnesota Pollution Control Agency

## Part 3.01 Planning for the Graduation Standards

Over the years, the legislature has enacted academic and graduation standards. The result was the development of basic skills and graduation standards requirements that students must meet in order to graduate from high school. To design school facilities that will assist in the implementation of these changes, school district facilities planning committees need to consider the following issues:

(1) Will schools need additional spaces for individual and small group work to help learn the basic skills? Varied educational methods may lead to a range of learning environment needs.

(2) Will schools need additional learning spaces for student demonstration and project preparation work that helps them work towards achieving graduation standard requirements? Performance learning may require more spaces for student independent and group work.

(3) Will classroom spaces need to be designed to reflect more student time spent on performance and demonstration activities and collaborative learning/small group project work and less desk time?

(4) Will the design and equipping of science labs and other spaces need to reflect learning activities emphasizing inquiry and work towards graduation standards?

(5) Will classroom storage and student locker spaces need to be enlarged to accommodate the storage of demonstration and project materials? A demonstration project to present to the class will require more storage space than a textbook and will likely not fit in a traditional student locker.

(6) Will schools and classrooms need additional wiring and technology resources to accommodate student demonstration and project work and necessary record keeping?

Sources: Minnesota Statutes, section 120B.02
Minnesota Rules, chapter 3501, parts .0010-.0290
Minnesota Rules, chapter 3501, parts .0505-.0955

## Part 3.02 Planning for Technology

It is essential that school districts develop a technology plan to provide up-to-date technology for students, teachers, and community users, and to be in a strong position to receive technology-related grants and assistance from public and private sources. The Minnesota Department of Education provides a Technology Planning Guide, which identifies 16 key elements in technology planning, including the following:

- overall mission and technology vision statement;
- needs assessment to meet the technology vision statement;
- objectives for the use of technology to address unmet needs;
- technology models;
- technology requirements;
- technology support staff and skills;
- technology operations management requirements; and
- action plan

A technology plan is a key reference document in the planning of a school construction or renovation project. A comprehensive technology system provides a technology infrastructure that supports learning and instruction and the generation of data and information. Infrastructure is the foundation for technology and includes adequate power, circuits and switching, pathways, lighting, and heating, ventilation, and air-conditioning. Planning for a technology infrastructure focuses on the infusion of technology across the curriculum as part of the planning process, rather than as an add-on computer lab or program.

Develop an inventory of existing school technology to identify unmet needs, including hardware, equipment, networking, voice communications, and related program and support spaces. Consider hiring a technology consultant or an architect specializing in technology systems and requirements early in the planning.

In the past, media centers and computer labs were the central focus for student and staff access to technology. Schools now have need for wired and wireless connections to supply an array of information including voice, data and video. Many are increasingly providing access to wireless connections in classrooms and commons areas within school facilities. Whether mobile devices are provided by the school or services are made available for users who bring their own device, wireless access networks are common and present a new set of facility issues to consider. Wireless technology with mobile devices access will play an important role in the future of students' school experience, work lives, and personal lives. Wireless networks for mobile device access must handle a myriad of devices, uses, and users while maintaining security and signal access.

**Some important considerations are:**

- Strength, speed, and reliability of wireless signals in all places across school district. Limitations include physical obstructions, distance transmitted, interference, and volume of users. Solutions include polarized signals with multiple redundant antennas and wireless systems that find best signal route and learn/retain data in algorithms using full-duplex equipment (simultaneous transmit and receive).
- Security with application visibility to network usage. To maintain the focus of the learning environment and provide proper supervision of children's access to web content, the ability to enable/block each device's usage is needed in addition to physical protection of the network and broad-based content filtering. For example, staff and students use learning apps and social sharing with collaborative learning

based on problem/task presentation and then students with teacher solve by gathering information via the internet.

- Mobile device management to keep network secure, protect students, identify devices, provide users with different rights to download content or limit web access and serve the many devices owned by students and staff.
- Districts will likely need bandwidth for expansion, new applications and multiple devices per person. Home use of technology advances faster than schools can keep up. Limitations inherent in the school environment are complex and depend on technology advances to overcome the limitations and funding is limited. The mobile wireless environment is in the growth phase for schools.
- Reliability and capacity for student testing with wireless solutions vs. direct connection. Standardized testing, whether state mandated or for local achievement measures, has evolved into computerized testing. Computerized testing over a wireless network requires cutting edge technology. The convenience of wireless will likely change the testing/assessment methodology in the next few years.
- Training of IT staff. The wireless technology environment and the addition of mobile device connectivity will mean IT staff will need training. The leap from the current school wireless environment to the mobile environment is achieved with different uses of radio frequencies that IT staff may not have been trained for. The need for trained staff may be the initial primary reason a district delays implementation of a mobile environment.

## Part 3.03 Planning a Secure School Environment

Security measures make a school site less vulnerable to unauthorized persons or intruders and help prevent and respond to property loss, and provide physical protection systems. School security measures should be designed to create a safe school climate, to help prevent school violence, and to facilitate timely response in the event of a mass casualty event. Mass casualty events can come from natural disasters, infectious disease, and man-made targeted violence.

Physical security measures to make a school less susceptible include the following:

- locate the school where it is visible from neighboring homes and businesses;
- make entries, loading docks, and administrative offices visible from the street;
- provide vehicle access around buildings to permit night surveillance and access by emergency vehicles and fire equipment;
- limit access to upper floors or roof by placing dumpsters, or other things onto which a person can climb or grasp, away from the building;
- install exterior lights with break-resistant lenses or mesh covers to illuminate the building exterior and surrounding grounds; and
- remove exterior door handles from all but main doors to deny entrance to intruders
- design parking lots in small units to decrease property damage, discourage through-traffic cruising, and use speed bumps to reduce traffic speed;
- provide entries and exits with strong, lockable gates;
- locate parking lots and playgrounds where easy and direct visual observation is possible;
- plan fenced playgrounds with separate activity areas. Keep vehicle traffic out of sports and play areas and block their entry to other unauthorized areas;
- anchor trashcans to holders or anchor posts to prevent overturning or theft;
- restrict bus loading and student drop-off/pick-up zone access; and
- provide designated use parking lots, e.g., staff, student, visitor.
- place trees at least 10 feet from buildings to prevent window and roof access;
- plant mature shrubs in large masses, making them less attractive to abuse;
- use high-perimeter chain-link fencing and gates near school to permit visibility; and
- either implement a nighttime total darkness policy or increase campus lighting to fully illuminate all areas, especially near potential points of access to the building.
- design walls to prevent roof access;
- install exterior fixtures flush or recessed to eliminate handholds for climbing;
- provide welded metal lockers for middle and high school students;
- make roofs of fire-resistant or fire-retardant material;
- design walls, stairwells, and corridors for high visibility; and
- avoid ceilings that can easily be vandalized and penetrated to hide weapons, drugs, and other items

Access controls and communications are also important components of security planning. Measures for access control include the following:

- install magnetic or electronically controlled locking system for all doors;
- designate one visitor entrance, monitor school entrances, and use an I.D. card system;

- limit building access and eliminate unnecessary doorways and handles and locks on the outside of exterior doors used primarily as exits;
- install doors with security features and install fire doors in necessary locations;
- consider the location, size, and necessity of windows;
- avoid placing windows on the ground floor, if possible, near outside play or gathering areas, and install break-proof windows;
- in lavatories use alternatives to plate-glass mirrors and avoid using windows for ventilation. Install solid plastic toilet partitions. Conceal as much lavatory piping as possible and use concealed automatic flush valves; and
- lock and secure building areas and specific spaces such as cafeterias/multipurpose rooms, administrative offices, safes and vaults, science laboratories, music rooms, shop, arts/crafts rooms, student store/supply rooms, library/media centers, gyms, locker rooms, and service areas.
- provide visual surveillance capability;
- signs direct visitors to designated building entrances and exits;
- visitors are provided with school-issued identification badges when on school grounds;
- vendors and contractors are escorted throughout facility; and
- background checks are conducted on all school employees, vendors and contractors

Measures for communications control include the following:

- enable teachers to contact the office through in-house phones or by use of a panic button in the classroom;
- use the public address system to broadcast emergency messages throughout the school and have two-way public address system so that classrooms can be monitored on the same system;
- do not install pay phones in the hallways or on school grounds to reduce loitering, rumor control, false 911 calls, and related misuse; and
- purchase cellular phones, two-way, portable walkie-talkies, and/or radio units for use in routine and emergency situations.

School Safety Center-Minnesota Department of Public Safety (https://dps.mn.gov/divisions/hsem/mn-school-safety-center/Pages/default.aspx).

Minnesota Department of Public Safety (DPS) school safety specialists initiate, develop, enhance, maintain and coordinate the programs of the School Safety Center by providing planning direction and interagency coordination through the development of guidance materials, research of best practices, analysis of data, and presentations to key school and emergency response audiences.

Randy Johnson – Director Minnesota School Safety Center
Randy Johnson
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## Part 3.04 Flexible Design and Multipurpose Use of Spaces

Specifications for school facilities spaces will continually be changing due to changes in law, revisions of building codes and health and safety regulations, new directions in learning, teaching, technology, and changing school community needs. It is therefore important to consider flexible design and the multipurpose use of spaces in designing educational spaces. The key to flexibility is to create adaptable, expandable, and multipurpose spaces that can adapt to a variety of learning environments and programs at all school levels. Design ideas that support flexible spaces include the following:

- a school site that meets or exceeds acreage guidelines and allows room for expansion;
- a support infrastructure (e.g., mechanical, ventilation, lighting, technology) that will best respond to changing use of spaces;
- core spaces (e.g., cafeteria, gymnasium, media center) that are "over built" to allow for increasing enrollments;
- portable tables, chairs, furnishings, and equipment;
- classrooms with folding, soundproof walls permitting different grouping options;
- studios/labs permitting use for consumer family life science, science, and art activities;
- common resource and support spaces outside groups of classrooms that include large group, team learning, technology, and small group and individual student workspaces with low dividers for sound control and visual separation;
- library/media/technology centers for school and community use;
- a multipurpose cafeteria/commons for dining and school/community meetings and events;
- an auditorium for music, theater, presentations, meetings, and community events; and
- a zoned facility that controls building access, use, and security after school hours.

## Part 3.05 Acoustical Considerations

Minnesota Statutes, section 123B.71, subdivision 9, (14), require a description of how the architects and engineers have considered the American National Standards Institute Acoustical Performance Criteria, Design Requirements and Guidelines for Schools of the maximum background noise level and reverberation times.

- There are children in every classroom, especially in the early grades that either cannot hear well and/or cannot process speech and language well.
- Not hearing and/or processing well negatively impacts student listening and learning, especially learning to read.
- Low teacher voice level, excessive background noise level, and excessive reverberation may exacerbate listening and may contribute to learning difficulties.
- Improvement in classroom acoustics may require solutions involving architectural design, and/or acoustical modifications, and in special cases, hearing assistive technologies.

The American National Standards Institute (ANSI), along with efforts of the U.S. Access Board, Acoustical Society of America, created the ANSI S12.60-2002, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools standard. Through specific design requirements and acoustical performance criteria, the standard tries to create a classroom environment that optimizes speech understanding.

In 2004, the American Speech-Language-Hearing Association's (ASHA's) Working Group on Classroom Acoustics recommended that an appropriate acoustical environment be established in all classrooms and learning spaces. ASHA endorses the ANSI standard and recommends the following criteria for classroom acoustics:

- Unoccupied classroom levels must not exceed 35 dBA (decibel).
- The signal-to-noise ratio (the difference between the teacher's voice and the background noise) should be at least +15 dB at the child's ears.
- Unoccupied classroom reverberation must not surpass 0.6 seconds in smaller classrooms or 0.7 seconds in larger rooms.

American National Standard on Classroom Acoustics (https://www.asha.org/Practice-Portal/professional-issues/classroom-acoustics/).

The American Speech-Language-Hearing Association (ASHA) (https://www.asha.org/policy/PS2005-00028.htm) is available at no cost from the Acoustical Society of America.

Additional information can be found in the following ASHA policy documents. Visit the website for the American Speech Language and Hearing Association (http://www.asha.org/).

Sources:
Acoustics in Educational Settings: Position Statement (2005) (http://www.asha.org/policy/PS2005-00028.htm)
Acoustics in Educational Settings: Technical Report (2005) (http://www.asha.org/policy/tr2005-00042.htm)
Appropriate School Facilities for Students With Speech-Language-Hearing Disorders - Technical Report (2002) (http://www.asha.org/policy/TR2002-00236.htm)
Guidelines for Addressing Acoustics in Educational Settings (2005) (http://www.asha.org/policy/GL2005-00023.htm)
Guidelines for Audiology Service Provision in and for Schools (2002) (http://www.asha.org/policy/GL2002-00005.htm

## Part 3.06 Gross Square Footage and General Space Guidelines for Elementary, Middle Level and High Schools

This part provides an overview of the gross square footage guidelines for elementary, middle level, and high schools of different student enrollments, and general space guidelines that apply to all school construction projects.

A frequent question is: "how many square feet do we need for an elementary/middle level/high school?" Adequate square footage, flexible and adaptable school spaces, and spaces for program expansion are the keys to the long-term and cost-efficient use of school facilities. Without adequate school sites and school facilities square footage, space renovations and expansions are costly and perhaps impossible to make. Space inadequacies will continue and probably compound over time, and it will be difficult to meet student needs as desired or required. Too often, in an effort to reduce school facilities project costs, school boards reduce school learning and support space square footages that results in a lack of adequate storage and program expansion spaces. In reality, this approach will cost a school district and local taxpayers more money in the long run because ongoing maintenance costs will be greater in school facilities under stress, and any renovations or additions will only be more costly if not completed as originally planned.

Within two years of project completion, many new or renovated schools report shortages of storage, support, and expandable learning and community use/partnership program spaces. School districts are strongly encouraged to make adequate site size, space square footages, flexible/adaptable spaces, and spaces for program expansion a high priority, even if it means completing the project or fully equipping facilities at a later date.

The following table provides guidelines for determining gross square footages per student for elementary, middle level, and high schools. Middle level refers to middle, intermediate, or junior high schools containing students in grades 5-9 in various combinations. Schools with other grade combinations (e.g., K-2, K-8, and K-12) need to consult with their architect to determine the appropriate gross square footages for their school.

These guidelines apply to new school construction projects. When it is educationally and economically advisable to renovate older school facilities, it is desirable for school districts to meet these guidelines as much as possible and/or as required.

**Table III**
**Gross Square Footage Per Student Guidelines**

| School Student Enrollment | Elementary SF | Middle Level SF | High School SF |
|---|---|---|---|
| Less than 550 | 125 – 155 | 170 – 200 | 200 – 320 |
| 500 – 999 | 110 – 135 | 160 – 190 | 190 -220 |
| 1,000 – 1,500 | 100 – 135 | 150 – 180 | 180 – 200 |
| 1,500 – 2,000 | | 140 – 170 | 170 – 190 |
| 2,000 plus | | | 150 – 180 |

For pool, auditorium, or community use/partnership spaces add square footage as appropriate.

These square footage guidelines should be used as a beginning point for determining the precise square footage needs of a proposed school through a thorough analysis of all space needs. If a proposed school is on the high or low end of the gross square footage range, school district facilities planning committees should understand the reasons why and the benefits or consequences for students, staff, and community users if square footage is less or greater than the guidelines. Facilities planning committees should not forget to include necessary school support space square footage as specified in Part 3.08.

The guide features wider ranges of square footages for elementary, middle level, and high school learning, support, and community use/partnership spaces. It also features more options in space designs, reflecting the greater diversity in programs and services schools provided, and discusses alternative means of delivering technology and other educational and community services. The addition of the middle level reflects the need to specify the space needs of middle level learners and programs. More community use/partnership space descriptions have also been added, reflecting increasing demand for school-community spaces in schools.

Because there are many possible grade configurations for elementary, middle level, and high schools, school districts must carefully select space square footages and space designs that best match the needs of the students and programs.

General school construction project space guidelines and assumptions include:

- Classrooms designed to accommodate 15-28 students, depending upon the grade level, and whether the space is a general or specialized classroom or lab. Schools with consistently larger class sizes or specialized educational programming geared toward smaller groups should plan room sizes accordingly;
- All current building, accessibility, and health and safety codes will be met;
- Accessibility to all educational programs and services for students and adults with disabilities will be provided;
- Spaces are designed to be flexible, expandable, and, when appropriate, multipurpose;
- Specialized classrooms will vary more in size due to varying numbers of students, program standards, and the use of equipment and technology;
- Larger enrollment schools need a greater the number of specialized instructional and supportive spaces;

- Elementary, middle, and high schools may be able to schedule general classrooms for up to 100 percent utilization;
- Middle level and high school space guidelines are much more variable than elementary depending on the type of school (e.g., 5-8 middle school, six-year high school, or senior high), enrollment, and specialized programs that are a part of the curriculum;
- Parts 3.05-.09 lists and describes a variety of learning and support spaces that school districts are encouraged, but not always required, to include in projects; and
- Part 3.08 School Support Spaces contains "Rules of Thumb" formulas to identify the square footage needed for toilets, general storage, mechanical/electrical, and air circulation and structure.

## Part 3.07 Guidelines for Elementary School Learning Spaces

### *(a) Organization, Program, and Design Considerations for Elementary Schools*

Planning and designing facilities for students in preschool through grades four, five, or six is based in part on the basic skills and graduation standards as well as school district and school mission, goals, policies, learning program, and student and staff support service decisions. School district organization, learning program, and support service designs help students learn basic skills, work towards graduation standards benchmarks, assist teachers in delivering curriculum, and provide students and staff support services as needed.

Elementary school learning program and support service designs range from those emphasizing traditional, self-contained classrooms with centralized support services, to those with flexible classrooms in multi-age or grade level inclusive settings with decentralized support services. Elementary schools may cluster learning programs and support services in a variety of ways to enhance the learning program and services delivered, including the following:

- Preschool, kindergarten, after-school, and parent/family or community education programs and support services that may include such programs as ECFE (early childhood family education), Head Start, school-age care, parent education, and school-community health services;
- Primary, intermediate, and upper elementary grades in a traditional classroom setting with enhanced technology;
- Primary, intermediate, and upper elementary grades in house, wing, or pod classroom arrangements with adjacent resource, technology, and student and staff support service areas;
- Specialized learning spaces such as instrumental and choral music, physical education, computer labs, science, art, world language, special education, Title I, English as a second language, and gifted-talented;
- Library/media center, which may include a technology center with a computer lab, student production center, staff planning, and public access areas;
- Multipurpose school-community rooms which may include the media center, gymnasium, locker rooms, cafeteria, auditorium, student commons, and other large group assembly spaces; and
- Administrative, student/family support services, and building operations areas that include guidance counseling, social/psychological services, student records and test data, occupational and physical therapy, speech, vision, and audiology services, services for students with disabilities, health services, volunteer coordinator, outreach workers, parent room, conference rooms, building receiving, operations, equipment, storage, and workshops, and spaces for other intermittent staff and services.

Please recognize that more preschool and elementary school students are becoming larger and require more classroom, lab, and circulation spaces to be comfortable, relaxed, and experience less stress. Code requirements or guidelines (e.g., classroom seating, play space, hallway width) are minimal and may not be adequate for many students.

Elementary schools should locate student lockers in classrooms or locker bays, not hallways, to reduce hallway crowding and improve circulation. Student lockers should be at least 15 inches deep, 15 inches wide, and no more than four feet high to accommodate backpacks, the storage of student project materials, and offer clear sight lines for supervision and security.

Title II of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act require school districts to make all educational programs and services accessible to students and adults with disabilities. Schools must make appropriate modifications of rules, policies, and practices, and provide accommodations to assure accessibility. If accessibility requires altering the fundamental nature of a program (e.g., a student in a wheel chair wanting to participate in wrestling), providing accessibility to that program may not be necessary. Consider providing an optional activity.

In any renovation/remodeling project, school districts must remove all accessibility barriers. In a new school construction project, all accessibility requirements must be met. This includes exterior traffic, doors, and outdoor recreation areas, interior circulation, building features, doors, toilets and locker rooms, cafeteria/ dining and assembly/meeting areas, and classrooms, labs, and other spaces. The Accessibility Survey Tool will assist school districts in reviewing existing school facilities and in planning for new schools, and Accessible Outdoor Recreation Areas will provide the latest guidelines for outdoor spaces. When designing facilities, it is important to involve individuals who understand applicable codes and the functional impact of code requirements on programs and facilities.

An elementary school facilities planning team (see Section II) needs to determine the needed learning and school support spaces, and develop design options which will enhance the learning program and the delivery of curriculum and school support services. Elementary school designs need to be flexible and allow for alternative classroom, small, multipurpose, or large group learning arrangements, and optional ways of providing students and staff support services. A well-designed elementary school should be able to meet current as well as projected learning program and support service needs.

Sources: Americans with Disabilities Act; Title II; 1993
Rehabilitation Act, Section 504; 1973
Accessibility Survey Tool; Minnesota Department of Education; 1999
Accessible Outdoor Recreation Areas; Minnesota Department of Education; 1999

### *(b) Elementary School Learning Spaces Square Footage Guidelines*

**Table IV**

**Square Footage Guidelines for Elementary School Learning Spaces**

| Elementary School | Learning Spaces | SF |
|---|---|---|
| | Early Childhood | 1000-1400 |
| | Kindergarten | 1200-1500 |
| | Classrooms | 850-950 |
| Common Spaces | Large Group | 10-12 SF/Student |
| | Team Learning | 1200-1800 |
| | Small Group/Conference/Office | 150-200 |
| Library/Media Center | Entrance, Circulation, Distribution | 600 |
| | Seating, Stacks, Computer Access, Reference | 8-10% of Students x 35 SF |
| | Small Group/Conference/Office | 150 |
| | Multimedia Editing | 100 |
| | Classroom/Story Area | 800 |
| | Workroom/Storage | 400-600 |
| | Professional Library | 200 |
| Technology | Computer Lab | 1000-1200 |
| | Control and Headrooms, Closets | 390-440 |
| | Copy Center | 500 |
| Special Education | Classroom (5-8 students) | 450 |
| | Classroom/Lab | 800-1200 |
| Art/Science | Multipurpose Classroom/Lab | 1000-1500 |
| | Kiln, Glazing, Clay, Damp room | 250 |
| | Science Lab Preparation | 250 |
| Music | General Music | 1000-1500 |
| | Choral | 1200-1700 |
| | Instrumental | 1500-2000 |
| | Instrument Storage + Circulation | 600-800 (4 SF/Instrument) |
| | Ensemble/Keyboarding/Music Library | 400-500 |
| Physical Education/Sports | Gymnasium (two stations) | 6000-8000 |

| Elementary School | Learning Spaces | SF |
|---|---|---|
| | Multipurpose | 1700 |
| | Adaptive Physical Education | 500 |
| | General Storage | 300/Station |

| Elementary School Gross Square Footage | Student Enrollment | SF/Student |
|---|---|---|
| | Less than 500 | 125-155 |
| | 500-999 | 110-135 |
| | 1000-1500 | 100-135 |

For pool, auditorium, or community use/partnership spaces add square footage as appropriate

### *(c) Early Childhood*

School districts often provide spaces for early childhood programs such as early childhood family education, head start, school readiness, family literacy/even start, school age care, child care, and community preschools, frequently in elementary schools. Heightened awareness of infant brain research is impacting school facilities planning by increasing parental demand for infant development programs and early parent education. Families often prefer schools as a location for family resource centers and interagency services that better meet the needs of children and their families. Essential elements to consider for early childhood program spaces include:

(1) **Square footage:** 1,000-1,400 square feet, including bathroom(s) and clothing storage areas, for 15-25 children. Provide additional spaces for cribs, eating, auxiliary play or other non-play areas, and indoor and outdoor large-muscle activities. A room to accommodate 12 to 18 adults for parent education and support activities is especially important for programs that involve both parents and young children.

(2) **Location:** First floor, convenient to outdoor exit and play areas, and bus/parent drop-off and pick-up zones. Classrooms should contain or be readily accessible to space for clothing storage, age-appropriate bathroom(s), a hand washing area, and a drinking fountain. Consider clustering early childhood classrooms with common spaces for student activities, teacher planning, and parent volunteers. Providing conference rooms for consultants to work with individual children allows community services to follow the children rather than having to move children from place to place throughout the community.

(3) **Learning activities:** Large group activity, parent-child interaction, dramatic play, block and construction, crafts and creative arts, cognitive and manipulative experiences, music, science, reading, and large muscle active play. Provide a separate, safe area for infant and toddler-specific interest areas. Consider sharing spaces for large muscle activities and workrooms among early childhood programs, and providing dedicated spaces for the safety of children of different ages, and to ease scheduling complications.

(4) **Learning aids, equipment, technology:** Age-appropriate toys, portable tables and stackable chairs, portable equipment with wheels, adjustable shelving and bookcases, easels, counter workspace, a sink with hot and cold running water, a carpeted storytelling/ reading area, an

overhead projector and screen, electronic interactive white board capability, ceiling or wall-hung video monitors, and the ability to easily darken the room. Provide adequate display/bulletin board, AC power, and voice, video, and computer connections with high-speed Internet access. Plan work and play stations for students with disabilities.

(5) **Storage, other needs:** Provide storage spaces for food preparation equipment and eating facilities, diapering, and supplies, toys and equipment, including large muscle equipment. Provide workspace(s) for teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(d) Kindergarten*

Essential elements to consider for kindergarten spaces include:

(1) **Square footage:** 1,200-1,500 square feet for 15-25 students. Determine appropriate classroom size by analyzing current and anticipated class sizes, staffing, needed technology equipment and spaces, and whether clothing storage, bathroom(s), and other support resource and spaces will be located within or outside the classroom.

(2) **Location:** First floor, convenient to outdoors exit and play areas, bus/parent drop-off and pick-up zones. Classrooms should contain or be readily accessible to space for clothing storage, age-appropriate bathroom(s), a hand washing area, and a drinking fountain. Consider clustering kindergarten classrooms with common areas for student activities, teacher planning, and parent volunteers. If only a single kindergarten classroom, consider clustering with other early childhood or primary classrooms.

(3) **Learning activities:** Individual, small, and large group activities, story-telling and listening, reading, social studies, science and environmental education, arts, crafts, and music, and creative and active play. Provide spaces to display children's work.

(4) **Learning aids, equipment, technology:** Portable tables and stackable chairs, portable equipment, adjustable shelving and bookcases, plentiful white/chalkboard, counter and project workspaces, a sink with hot and cold running water, a carpeted storytelling/reading area, an overhead projector and screen, electronic interactive white board capability, ceiling or wall-hung video monitors, and the ability to easily darken the room. Provide adequate display/bulletin board, AC power, and voice, video, and computer connections with high-speed Internet access, required spaces for cable trays, wiring, and conduits, and adjustable computer furniture. Plan workstations for students with disabilities.

(5) **Storage, other needs:** Provide ample, flexible, and portable storage spaces for student and teacher work, equipment, and supplies. Provide workspace(s) for kindergarten teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

Non-load bearing walls between classrooms will best maintain flexibility in classroom design. Utilize a combination of hard surface, resilient flooring and carpet for wet versus dry and active versus quiet areas. Pay careful attention to classroom acoustics. Natural light and quality light fixtures are highly desirable, and heating, ventilation, and air-conditioning and humidity control systems that produce good indoor air quality will improve the classroom environment, reduce absenteeism, and help student performance.

### *(e) Classrooms*

Guidelines for classrooms apply to all non-specialized classrooms. These guidelines are meant to encourage the design of imaginative, flexible, accessible classrooms, or classrooms with adjacent common resource and support spaces, and to help avoid sterile, crammed classrooms lacking spaces for a variety of learning activities and storage. Essential elements to consider for elementary school classrooms include:

(1) **Square footage:** 850-950 square feet for 15-25 students. Determine appropriate classroom square footage by analyzing current and anticipated class sizes, staffing, needed space for technology and students with disabilities, and deciding whether common spaces (i.e., large group, team learning, small group, conference, and office spaces) will be located within or outside classrooms.

(2) **Location:** First floor for primary classrooms, with ready access to clothing storage, bathrooms, playground, and exit. Consider clustering classrooms by grade(s) and providing adjacent common spaces for large group, team learning, and small group activities.

(3) **Learning activities**: Individual, small group, and classroom activities, including reading, language arts, and social studies, science and environmental education, art and music, and creative activities. Provide spaces to display students' work. Consider providing additional space for individual student assistance/conferencing if space is not readily accessible, and technology stations for using technology to aid learning as a greater number of learning activities using technology are developed by teachers. Separate specialized classroom spaces for music, art and science activities are advantageous, especially for upper elementary school students.

(4) **Learning, aids, equipment, technology:** Portable tables or desks with stackable chairs, adjustable shelving and bookcases, counter and project workspaces, plentiful chalk/white and display board, electronic interactive white board capability, a sink with hot and cold water, audio visual and portable equipment, ceiling or wall-hung video monitors, and the ability to easily darken the room. Provide voice, video, and networked computer connections with high-speed Internet access, spaces for cable trays, wiring, and conduits, and adjustable computer furniture. Consider equipping classrooms with excess power and communications systems for future needs. Plan workstations for students with disabilities.

(5) **Storage, other needs:** Provide ample, flexible, accessible, and portable storage spaces for student and teacher work, equipment, and supplies. These spaces should increase in size and number with the students' age. Provide workspace(s) for teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

Utilize student-centered scale, textures, colors, and forms appropriate for the age group. Design non-load bearing, walls between classrooms to maintain flexibility and facilitate team teaching and multiple-class learning activities. Reinforce and soundproof walls in classrooms or student traffic areas to prevent student damage and disruptions. It is advisable to use a combination of hard surface, resilient flooring and carpet for wet versus dry and active versus quiet areas. Classroom acoustics need careful attention. Natural light and quality light fixtures are highly desirable, and heating, ventilation, and air-conditioning and humidity control systems that produce good indoor air quality will improve the classroom environment, reduce absenteeism, and help student performance. Minimize the number of interior classrooms with no natural light. Consider air-conditioning enough classrooms for summer use by students and adults, if the entire building is not air-conditioned.

### *(f) Large Group/Team Learning/Small Group Conference*

These common resource and support spaces permit teachers to use a wider variety of instructional styles in working with students with different learning styles. Essential elements to consider for elementary school large group, team learning, and small group conference spaces include:

(1) **Square footage:** 10-12 square feet per student in a large group space, 1,200-1,800 square feet for 125-175 students in a team learning space, and 150-200 square feet for students, staff, and parents in each small group, conference, or office space. If classroom technology space is limited, consider providing space for technology learning stations in common spaces, which may require additional square footage.

(2) **Location**: First floor for primary classrooms, adjacent to a cluster of classrooms with ready access to clothing storage, bathrooms, playground, and exit. Spaces for large group, team learning, and small group activities may overlap. Planning common spaces should provide for ease of supervision by teachers.

(3) **Learning activities:** Large group presentations, team learning, and small group activities, including reading, discussion, project work, use of technology, tutorial assistance, and hands-on work in various areas of study.

(4) **Learning, aids, equipment, technology:** Stackable chairs for large group presentations, portable tables for team, small group, and conference room activities, shelving, counter and project workspaces, ceiling or wall-hung video monitors, white/chalkboard, electronic interactive white board capability, display/bulletin board, a sink with hot and cold running water, audio visual and other portable equipment, and the ability to easily darken the large group space to use for audio visual presentations. Provide connections for technology workstations along walls, high-speed Internet access, and adjustable computer furniture. These spaces should be made as flexible as possible. Plan workstations for students with disabilities.

(5) **Storage, other needs:** Provide ample, flexible, accessible, and portable storage spaces for student and teacher work, equipment, and supplies. These spaces should increase in size and number with the students' age. Provide work or office space for teachers to prepare and store teaching materials, and access a phone, computer with high-speed Internet access, and a printer and copy machine.

### *(g) Library/Media Center*

Library/media center additions to schools are very common because of the need for larger library/media centers that can accommodate new technologies and increasing numbers of student and community users. School districts should carefully consider the size and layout of library/media center to best accommodate rapidly changing information technologies and an increasing number of users.

Increasingly, school curricula are based on collaborative and group projects. As a result, there is less and less emphasis on traditional, individual study settings, such as long rows of individual study carrels. Instead, school libraries are developing learning centers, which provide group study rooms and settings, well-supported by access to electronic information resources, hardware tools, and associated productivity software.

Essential elements to consider in an elementary school library/media center include:

(1) **Square footage:** 600 square feet for entrance, circulation, and distribution, and 35 square feet times 8-10 percent of the student enrollment capacity for seating, stacks, computer use with

Internet access, and reading and reference workspaces (e.g., 1,750 square feet for 50 students). Provide additional spaces for small group/conference rooms (150 square feet), multimedia editing space (100 square feet), a library classroom (800 square feet), workroom/storage space (400-600 square feet), and a professional library (200 square feet) either in or adjacent to the library/media center. See Part 3.05 (h) for computer lab space requirements. Utilize portable room dividers to separate areas if desired (e.g., primary reading area).

(2) **Location**: First floor for primary classroom use and near an entrance for delivery of equipment and materials and community user access. All student areas in the library/media center should be visible from the circulation desk area, and adjacent rooms need glass partitions for easy supervision. The backs of computers need to be accessible for maintenance purposes. Whereas natural light is desirable, the location of computers and shelving must not cause computer screen glare and book binding deterioration problems. The library/media center or adjacent spaces thereto may contain a computer lab, multimedia editing, a classroom, conference rooms, a staff library or workroom, and community user spaces. If the public accesses the library/media center during non-school hours, ADA restrooms must be accessible.

(3) **Learning activities:** Activities that teach students information literacy and research skills include individual reading, browsing, study and research, computer use, and small and large group instruction. The elementary school library/media center is a child-friendly environment where students often come in whole class groups and engage in focused activities. Design learning activities to the wide range of elementary age groups. Provide staff development in the use of information technologies to support curriculum and library/media center learning activities.

(4) **Learning aids, equipment, technology:** Portable and adjustable shelving, chairs, cushions, tables and desks of different sizes, computers with high-speed Internet access, printers, VCR's and tapes, newspapers and magazines, maps, audio visual equipment, electronic interactive white board capability, display cases and bulletin boards, and other furniture and equipment suitable to the wide range of elementary student age groups and interests. Provide some adult-sized furniture for staff and visitor use. Plan connectivity to school library/media center resources from classrooms, homes, other schools, and information centers (e.g., public library) to ensure all students equal and timely access to learning resources. Plan accessibility and workstations for students with disabilities.

(5) **Storage, other needs:** Provide ample storage spaces for materials and equipment. Carts for hauling books and equipment are essential. Carpeting, acoustics, lighting, temperature and humidity control, and ventilation need careful consideration. Plan to electronically automate, secure, and back-up library/media center operations. The library/media center should be flexible in design to accommodate emerging technologies and changing user needs. Air conditioning is often a necessity for summer use. Provide work and office space for a media specialist to prepare and store materials, and access a phone, computer, and a printer and copy machine.

Sources: Facilities Guidelines for Library/Media Programs; Maryland State Department of Education; 1998
Guidelines for Minnesota School Media Programs; Minnesota Educational Media Organization; 1992
National Institute of Building Sciences; School Library Design; 2014

### *(h) Technology*

Technology needs to be made available to students, staff, and community users in increasingly diverse forms and settings, including classrooms, library/media centers, offices, support spaces as well as in computer labs.

Each school district and school must design and deliver technology in the forms and settings that best meet the needs of students, staff, and community users.

Computer Labs – Essential elements to consider for elementary school computer labs include:

(1) **Square footage:** 1,000-1,200 square feet for 20-30 students, including a teacher demonstration area. Provide 390-440 square feet for control and headrooms, technology closet, and 500 square feet for a copy center.

(2) **Location:** First floor, near classrooms or a grade house, or the library/media center. Avoid light glare from windows that creates screen vision problems. Design the computer lab to fit the purpose(s) of the lab. The teacher should be able to view as many computer screens as possible. Secure the lab for after-hours use by students and community users, and locate it near a convenient entrance.

(3) **Learning activities**: Acquiring computer literacy skills and practicing keyboarding, Internet research, and other applications as appropriate. The primary purpose(s) of the lab will help determine the arrangement of spaces for individual student, small group, and teacher demonstration learning activities.

(4) **Learning aids, equipment, technology:** Computer desks, chairs, tables, and equipment should be portable and adjustable to accommodate the varied age, heights, and physical development support needs of the students. Networking centers, wiring, high-speed Internet access, software, and equipment must support the lab and its intended uses. Provide an LCD projector, a pull-down screen, and/or electronic interactive white board capability for teacher demonstrations, and ample chalk/white board and display/bulletin board. Plan computer workstations for students with disabilities.

(5) **Storage, other needs:** Secure storage spaces for student work and teaching materials are necessary. Provide a security system to ensure the safety of computer equipment. The electrical and power setup for the network system and student workstations need careful planning. Lighting needs special attention to avoid screen glare and eye fatigue. Provide temperature, humidity control, and air-conditioning to prevent computer lab overheating and for use during the summer. A static-free carpeting or floor covering is desirable. Provide work and office space for technology teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(i) Special Education*

Special education programs and services must provide for preschool and elementary school students with a wide range of disabilities, from mild to severe, and those with multiple disabilities. It is critically important to make a careful assessment of the projected number of special education students and the types of programs, staffing, and services needed. Next, determine program space needs and whether to locate resource and support spaces within or outside the classroom. Finally, design or modify spaces as appropriate (e.g. larger spaces are needed for students in wheelchairs or with walkers). Advance planning will help schools avoid the cramming of special education students into storage, office, and other spaces not intended for instruction. All ADA and building code requirements for accommodating students with disabilities must be met. It is important to involve staff and architects with knowledge of programs and code (e.g., time-out room) requirements. Essential elements to consider for elementary school special education spaces include:

(1) **Square footage:** 450 square feet for five to eight students in an individualized instruction setting, and 800-1,200 square feet in a classroom/lab setting. Utilize portable dividers to help make all spaces as flexible as possible to allow for regular modifications. Computers and other accommodations for individual students may require additional square footage. Students with severe disabilities and/or personal hygiene needs need separate, self-contained rooms or spaces, and spaces for sinks, toilets, diapering, showering, changing, and laundry. Spaces for a time-out or quiet space room and physical therapy may be necessary. Providing a room for observation, student/staff/ parent conferences, and small group work is highly recommended.

(2) **Location:** First floor, near playground and exit, clothing storage, food service, adaptive physical education, conference/testing, occupational/motor therapy, speech and music therapy rooms, and other related support service spaces. It may be appropriate to separate program and service areas for younger and older students.

(3) **Learning activities:** Individual and computer-assisted instruction, arts and crafts, home living skills, science and environmental education, music, and activities tailored to the special learning needs of students.

(4) **Learning aids, equipment, technology**: Learning aids, equipment, and technology that meets individual student's needs (e.g., braille machines, magnifiers, computers), and special handrails, walks, ramps, and doors to assure student access to the building, classrooms, and all program and service spaces. Provide adjustable and portable tables, chairs, and desks, computer stations with high-speed Internet access, ceiling or wall-hung video monitors, portable equipment, bookcases and adjustable shelving, counter and project workspaces, plentiful white/chalkboard, electronic interactive white board capability, display/bulletin board, a sink with hot and cold water, and audio visual equipment. Plan teacher work and demonstration spaces suitable for the program.

(5) **Storage, other needs:** Provide ample, flexible, accessible, and portable storage spaces for student, teacher and teacher aide materials, supplies, and equipment. Storage spaces should increase in size and number with the students' age. The observation room needs to have a one-way mirror. Provide private work and office space for special education teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine. Provide student-centered scale, textures, colors, and forms appropriate for the age group. Utilize treated or reinforced wallboard in classrooms or student traffic areas to prevent student damage.

Provide many power outlets throughout the room, and consider capping the outlets. Utilize a combination of hard surface, resilient flooring and carpet for wet versus dry and active versus quiet areas. Classrooms should have rounded corners and be acoustically treated. Utilize natural gray colors, natural light, quality light fixtures (fluorescent lights cause problems for students with auditory and visual processing difficulties), and heating, ventilation, and air-conditioning and humidity control systems that produce good indoor air quality to improve the classroom environment, reduce absenteeism, and help student performance. Minimize the number of interior classrooms with no natural light. Air-condition enough classrooms for summer program use. Provide work and office space for special education teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(j) Art/Science*

It is desirable to have separate or combined art and science rooms for art and science learning activities that cannot easily be provided in classrooms. Essential elements to consider for an elementary school art/science classroom include:

(1) **Square footage:** 1,000-1,500 square feet for 20-25 students in a multipurpose classroom/lab, including storage space for teacher and student materials. Square footage should be adjusted proportionately if class sizes are greater than 25. An additional 250 square feet may be necessary for teacher lab preparation space. Dividing a classroom/lab will facilitate students working on several art and/or science activities.

(2) **Location:** First floor, near an outside exit for access to an outdoor area for sketching and environmental education.

(3) **Learning activities:** Individual and small groups of students working with a variety of art materials and media (e.g., finger paints, clay, water color), and working in hands-on science activities using concrete objects, observing, exploring, and problem solving. Provide separate work surfaces for dry and water-based art activities. Extensive lab and field related activities using the hands-on, inquiry approach to learning are necessary to help students understand science and become scientifically literate. Stress safety throughout all science lab activities.

(4) **Learning aids, equipment, technology:** Adjustable and portable tables, work counters, and chairs for different age groups. Provide hard, mar-resistant table surfaces, clay bins, tool carts, workbenches, potters wheels and a kiln, and a variety of learning materials, tools, and equipment for art activities. Science lab stations need electricity, heat, and water, as well as magnets, lenses, microscopes, plant growing lights, and other age-appropriate tools and equipment. Utilize wall and case spaces to display student art and science work. Provide adequate wiring for audiovisual equipment, ceiling or wall-hung monitors, and computers with high-speed Internet access. Appropriate sink units for art and science lab work are necessary and adequate counter cleanup spaces are essential for fast cleanup. Plan workstations for students with disabilities.

(5) **Storage, other needs:** Provide storage spaces, some secured, for student projects and materials, hazardous substances, tools, and equipment. Frequent air exchange and an outside exhaust system for art and science lab activities are important. Place the kiln in a separate, small room. Provide a central teacher workspace, demonstration table, ceiling mounted projection screen, and electronic interactive white board capability. Supply and maintain safety glasses, gloves, first aid supplies, fire extinguisher(s), and other safety tools and equipment. Review the checklists for science lab and chemical storage safety contained in the health and safety materials annually sent to school district superintendents. All state and federal safety codes and regulations must be met. Provide work and office space for art/science teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(k) Music*

Cramped music spaces are often renovated and expanded because of higher than anticipated student enrollments and the need for expanded spaces for rehearsal, practice, circulation of large groups of students, and storage and offices. Essential elements to consider for elementary school music room spaces include:

(1) **Square footage**: 1,000-1,500 square feet for general music classes of 25-50 students, 1,200-1,700 square feet for choral groups of 35-80 students, and 1,500-2,000 square feet for instrumental classes of 30-65 students. Provide adjacent, but separate spaces for the storage of instruments, 600-800 square feet, and ensemble/keyboarding/music library, 400-500 square feet. Larger music programs require separate rooms for instrumental (band/orchestra), choral, and general music classes. In smaller programs, if the room is large enough and the schedule permits, one room may double as a general music room and a choral room. It is not desirable to have one room serve as an "all-purpose" general music, vocal, and instrumental room. Ceiling heights of at least 16 feet, preferably 18-20 feet are essential in a choral room and 18 feet in an instrumental room to assure good acoustics and sufficient sound-pressure-level dissipation.

(2) **Location:** First floor, near a large group performance/assembly area. Situate the music rooms in an isolated area of the building and utilize soundproofing construction to prevent the disruption of learning activities in other areas. Double doors leading into the music rooms and the performance area are necessary for moving pianos and large percussion instruments and equipment. A drinking fountain and restrooms should be convenient to the music area.

(3) **Learning activities**: Music is learning by listening and active participation, so spacious rooms with special care given to sound isolation and acoustic clarity provide the best quality music learning environments. Music spaces must accommodate a variety of learning experiences for individuals, small, and large groups of students. Listening, playing, singing, and expressing through both sound and physical movement are integral goals of all music programs. Plan for accessibility and workstations for students with disabilities that are increasingly involved in music programs;

(4) **Learning aids, equipment, technology:** For general music and vocal programs, a stereo system with recording capabilities, piano, sheet music with storage cabinets, music textbooks, CD's and tapes, classroom instruments, white boards with one-half plain white and one-half with staff lines, bulletin boards, chairs or other seating, and choral risers are necessary. An overhead projector with pull-down screen and/or electronic interactive white board capability, music stands, a VCR with monitor, film projector and wall maps, and computer workstations with electronic keyboards are also useful.

For instrumental programs, provide stereo recording and playback equipment, sheet music, music stands, music-posture chairs, a conductor's podium and stand, white boards with one-half plain and one-half with staff lines, district-purchased instruments, electronic tuner, portable chair risers, and if required, acoustic shells. An instrument repair bench with tools and a large, deep sink for instrument cleaning and maintenance are also desirable.

(5) **Storage, other needs:** Provide ample, specialized, and in some cases lockable storage spaces for a great variety of expensive musical instruments, ethnic instruments, equipment, risers, and learning materials including concert props, costumes, and bulletin board materials. These storage spaces should include shelving, cabinets, and instrument storage lockers. In general, separate, adjacent storage rooms are desirable for both choral and instrumental rooms to retain valuable floor space in the main room and to provide better security. Adjacent practice rooms need to have observation windows. The size, shape, ceiling height, acoustic treatment, heating, ventilation, humidity control, lighting, sound system, and other related requirements are most complex, and the involvement of staff and/or consultant assistance in detailing specifications is recommended. The reference materials listed below can provide valuable information for the planning team. Provide work and office space for music teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

Sources: Elementary Music Planning Guide; Wenger Corporation
The School Music Program: Description and Standards; Music Educators National Conference (MENC); 2005

### *(l) Physical Education/Sports*

Additions to physical education and sports activity spaces are very common because of crowded and insufficient spaces to accommodate increasing numbers of student and community users. Increasing demands on indoor and outdoor physical education and sports activity spaces come from legal requirements to provide gender equality and full access for students with disabilities in all programs, services, and facilities, and changes in programs emphasizing more personal fitness and non-traditional individual, dual, and team sports and activities. Planning for physical education and sports activity spaces must consider future program uses as well as student enrollment and community user trends; if one or more are positive, consider "over-building" to provide adequate spaces over the longer term at a cost savings.

All equipment and fall zones must conform to Consumer Product Safety Commission (CPSC) guidelines and use zones should be organized to encourage safe circulation between activities. Providing a wide variety of activity areas, including natural areas, has been found to reduce crowding, conflict and the incidence of injuries in outdoor environments. Other safety and security considerations include a careful separation from automobile traffic areas, appropriate perimeter barriers and designing for sightlines that ensure adequate teacher supervision.

Outdoor spaces and activities should follow universal design principles and allow for maximum engagement by children and adults with all levels of abilities. This encompasses "accessibility" in the traditional sense and, of course outdoor play spaces need to comply with ADA guidelines and any applicable local access standards. It also leads design teams to think broadly about children as having a wide range of physical and cognitive challenges and abilities. Essential elements to consider for elementary school physical education and sports activity spaces include:

(1) **Square footage:** 6,000-8,000 square feet for 30-60 pupils in a two-station gymnasium (one elementary teaching station equals 3,000-4,000 square feet). The two-station gymnasium ceiling height should be at least 25 feet. Provide at least 1,700 square feet and an 18-foot ceiling for a small multipurpose room used, for example, for preschool or kindergarten student games. A 500 square feet room is necessary for adaptive physical education activities. Providing adequate space for storage of equipment is essential. If planning for community or middle/high school after-school use of the gymnasium, locker rooms may also be necessary. In a larger gymnasium, it may be desirable to separate the teaching stations with a folding partition or curtain.

If there is only one gymnasium in the elementary school, it should not be a multipurpose gymnasium/cafeteria because of the difficulty of scheduling physical education classes around lunch periods. If planning a multipurpose gymnasium/cafeteria for a third physical education teaching station, special requirements need to be met. Portable or permanent stages for gymnasium assembly purposes require additional space for curtains, backdrops, exits, sound and lighting control, and storage space.

To provide adequate spaces for outdoor elementary physical education and sports activities, a minimum of 6.8+ acres should be set aside for field spaces and transition areas between fields.

Transition space acreage below provides buffer zones to allow for student and spectator safety, flow-through traffic, fencing, storage, parking, bleachers, or additional areas needed for future program needs, greater student participation, or community use.

**Table V**
**Elementary School Outdoor Activity Spaces**

| Area/Activity | Recommended Dimensions (in feet) | Space Required Square Feet | Number Required | Total Required Square Feet | Acres |
|---|---|---|---|---|---|
| Apparatus | 75x120 | 9,000 | 1 | 9,000 | 0.21 |
| Multipurpose | 100x120 | 12,000 | 2 | 24,000 | 0.55 |
| Track and Field | 80x120 | 9,600 | 1 | 9,600 | 0.22 |
| General Purpose | 100x200 | 20,000 | 1 | 20,000 | 0.46 |
| Softball | 250x250 | 62,500 | 2 | 125,000 | 2.87 |
| Field Games | 180x140 | 25,200 | 2 | 50,400 | 1.16 |
| | | | Net area | 229,000 | 5.26 |
| Transition Spaces | | +30% | | 68,700 | 1.58 |
| **Total** | | | **Gross area** | **297,700** | **6.84** |

Smaller enrollment schools may need somewhat less space, larger enrollment schools more space. Plan for additional acreage for larger or additional fields and parking spaces if middle/high school or community use of outdoor activity areas is envisioned. See Part 3.06 (m) or 3.07 (n) for the dimensions of other fields and specialized areas (e.g., tennis courts).

(2) **Location:** Next to the music rooms if for performance or assembly programs and close to parking for easy access by students and community users. Indoor and outdoor physical education, play, and sports activity areas need to be easily accessible, yet distant enough from classrooms and outside classroom walls to minimize disrupting classroom learning activities. Locate the playground apparatus area in a shady spot and separate apparatus for preschool and primary students from that for older elementary school students. Provide ample space around the various play apparatus and make safety a primary concern for locating and spacing apparatus. Avoid building a gymnasium in soil with a high water table or water runoff areas to limit construction and floor expansion and maintenance difficulties. Plan accessibility for students with disabilities.

If a multipurpose gymnasium, provide doors or partitions to separate the kitchen and preparation areas from the activity area. Plan to avoid the delivery of food supplies through the gymnasium.

(3) **Learning activities:** Provide spaces for a great variety of individual, small, and large group physical education and sports activities for various age groups. Indoor activities include learning fundamental movement patterns, rhythmic or dance, exercise conditioning, gymnastics, basketball, volleyball, badminton, floor hockey, aquatics, and games and sports for individuals

and teams. Outdoor activities include free play, field games such as track and field, softball, soccer, football, and hard-surface circle games, hopscotch basketball, tetherball, and tennis. Plan learning activities for students with disabilities.

(4) **Learning aids, equipment, technology:** Ropes, mats, balls, bats, rings, bars, baskets and backboards, wall markings, musical equipment, and many other supply and equipment items are necessary for indoor and outdoor activities. Provide sandboxes, playground apparatus, backstops, a multipurpose, hard-surfaced area for all-weather use, and field areas for outdoor field games and individual and team activities. Cushioning materials around playground apparatus and on gymnasium walls are essential for safety purposes. Provide a public address system with related audio equipment in the gymnasium for both instructional purposes and school events and performances. Modify equipment items for students with disabilities as appropriate.

The publication Accessible Outdoor Recreation Areas (https://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/final-guidelines-for-outdoor-developed-areas) contains design guidelines for routes of travel, surfacing materials, play field access, and equipment. School districts and architects must carefully follow these and other appropriate guidelines and meet all building and health and life safety codes.

(5) **Storage, other needs:** Provide storage spaces for indoor and outdoor equipment and supplies and large doors for easy access to and movement of equipment. The storage of audio equipment within the gymnasium is desirable. Portable means of hauling and securing equipment are also necessary. Provide portable folding or stackable tables and chairs for use in multipurpose gymnasiums and storage spaces for the same.

Plan carefully to meet all floor, ceiling, wall, windows, heating and ventilation, acoustics and sound insulation, electrical, and lighting requirements. Easy access to first aid supplies or help is important. Inside and outside drinking fountains are essential. Recess all light switches, drinking fountains, telephones, fire alarms/extinguishers, and other equipment below seven feet for student safety. Provide air-conditioning and bleachers for summer and/or sports or community event use. Provide work and office space for physical education teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

Sources: Facility Planning for Physical Education, Recreation, and Athletics; American Alliance for Health, Physical Education, Recreation and Dance; 2013

Design for Outdoor Learning; School Planning and Management, March; 2014

Accessible Outdoor Recreation Areas Manual 1997-1998; Minnesota Department of Education

## Part 3.08 Guidelines for Middle Level School Learning Spaces

### *(a) Organization, Program, and Design Considerations for Middle Level Schools*

Planning and designing facilities for middle level students is based in part on the graduation standards, including the basic skills standards and high standards, and local school district and school mission, goals, policies, learning program, and student and staff support service decisions. School organization, learning program, and support service designs help students learn basic skills, work towards graduation standards benchmarks, assist teachers in delivering curriculum, and provide students and staff support services as needed.

The diversity and complexity of school organization and programs (curriculum, services) increases from the elementary to the middle level due to a number of factors, which may include the following:

- A shift in emphasis on learning basic skills to exploring a greater variety of subjects;
- Larger student enrollments and more classes and teachers per student;
- The need to provide more specialized programs and staff to meet student interests and provide instruction at higher skill levels;
- Mainstreaming students with disabilities in a wider variety of classroom and lab settings;
- The need to provide more coaching and teaching of students in a great variety of extracurricular programs at higher skill levels;
- The greater impact of change on the greater variety of programs and spaces in a middle level school; and
- Increasing community use of middle level school facilities.

A middle level school must be flexible and adaptable in order to regularly change programs and use spaces for other purposes. Middle level school organizational designs may encompass any or all of the following concepts: self-contained or shared classrooms, large and small group, team learning, individual study and/or resource areas, and other specialized spaces. School facility planning should support the current best thinking in middle level education such as more interdisciplinary teaching and the need for a greater variety of learning experiences for students. Middle level schools may cluster learning programs and support services in a variety of ways to enhance the learning program, including the following:

- Middle level grades in linear academic classrooms with enhanced technology;
- Middle level grades in non-linear houses, wings, or pods with a core or block subject classroom arrangement with adjacent resource and support service spaces;
- Library/media center/technology center with central resource center, computer labs, video production or telecast, technology control centers, and public access area;
- Performing arts area including music, art, drama/theater, and an auditorium or performance space;
- Lifework development area, including technical and family and consumer science education; physical education, athletic, and community recreation area including gymnasium(s) and locker rooms, health classrooms, and other indoor and outdoor physical education, adaptive physical education, athletic, and community recreation spaces;
- Special and support services including English as a second language, reading, students with disabilities, and gifted-talented;

- Cafeteria/commons, including food service, student commons, study hall, performance space, and student activity and community meeting rooms;
- Administration, student/family support, and building operations areas including guidance counseling, social/psychological services, student records and test data, health, speech, vision, audiology services, conference rooms, building receiving, operations, equipment, storage, and workshops, and other intermittent staff and services; and
- Community education offices, rooms, and other community use/partnership spaces.

Please recognize that more high school students are becoming larger and require more classroom, lab, and circulation spaces to be comfortable, relaxed, and experience less stress. Code requirements or guidelines (e.g., classroom seating, lab space, hallway width) are minimal and may not be adequate for many students.

Middle level schools should locate student lockers in locker bays, not hallways, to reduce hallway crowding and improve circulation. Student lockers should be at least 15" deep, 15" wide, and no more than four feet high to accommodate backpacks, the storage of student project materials, and offer clear sight lines for supervision and security.

Title II of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act require school districts to make all educational programs and services accessible to students and adults with disabilities. Schools must make appropriate modifications of rules, policies, and practices, and provide accommodations to assure accessibility. If accessibility requires altering the fundamental nature of a program (e.g., a student in a wheel chair wanting to participate in wrestling), providing accessibility to that program may not be necessary. Consider providing an optional activity.

In any renovation/remodeling project, school districts must remove all accessibility barriers. In a new school construction project, all accessibility requirements must be met. This includes exterior traffic, doors, and outdoor recreation areas, interior circulation, building features, doors, toilets and locker rooms, cafeteria/dining and assembly/meeting areas, and classrooms, labs, and other spaces. The Accessibility Survey Tool (https://www.ada.gov/pcatoolkit/introapp1and2.htm) will assist school districts in reviewing existing school facilities and in planning for new schools and Accessible Outdoor Recreation Areas (https://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/final-guidelines-for-outdoor-developed-areas) will provide the latest guidelines for outdoor spaces. When designing facilities, it is important to involve individuals who understand applicable codes and the functional impact of code requirements on programs and facilities.

A middle level school facilities planning team (see Section II) needs to determine the needed learning and school support spaces and develop design options which will enhance the learning program and the delivery of curriculum and school support services. Middle level school designs need to be flexible and allow for alternative classroom, small, or large group learning arrangements, and optional ways of providing students and staff support services. A well-designed middle level school needs to be able to meet current as well as projected learning program and support service needs.

Please recognize that more middle level students are becoming larger and require more classroom, lab, and circulation spaces to be comfortable, relaxed, and experience less stress. Code requirements or guidelines (e.g., classroom seating, lab space, hallway width) are minimal and may not be adequate for many students.

Sources: Americans with Disabilities Act; Title II; 1993
Rehabilitation Act; Section 50, 1973
Accessibility Survey Tool; Minnesota Department of Education; 1999
Accessible Outdoor Recreation Areas 1999; Minnesota Department of Education

### *(b) Middle Level School Learning Spaces Square Footage Guidelines*

**Table VI**
**Square Footage Guidelines for Middle Level Schools**

| Middle Level | Learning Spaces | Square Footage |
|---|---|---|
| | Classrooms | 850-950 square feet |
| | Large Group | 15 square feet/student |
| | Team Learning Areas | 1500-2000 square feet |
| | Small Group/Conference/office | 150-200 square feet |
| Library/Media Center | Entrance, Circulation, Distribution | 600-800 square feet |
| | Seating, Stacks, Computer Access, Reference | 8-10% of Students x 35 square feet |
| | Small Group/Conference | 150 square feet |
| | Multimedia Production | 200 square feet |
| | Classroom | 800 square feet |
| | Workroom/Storage | 400-600 square feet |
| | Professional Library | 200 square feet |
| Technology | Computer Lab | 1000-1300 square feet |
| | Control and Headrooms, Closets | 540-640 square feet |
| | Copy Center | 500-800 square feet |
| Science | Classroom/Lab | 1200-1500 square feet |
| | Storage/Lab Prep | 300 square feet |
| Special Education | Classrooms (5-8 students) | 450 square feet |
| | Classroom/Lab | 800-1200 square feet |
| Technical Education | Tech Lab | 1800-2400 square feet |
| | General Shop | 2000-3000 square feet |
| | CADD/Graphics | 1400-2000 square feet |
| | Principals of Technology | 1200-1400 square feet |

| Middle Level | Learning Spaces | Square Footage |
|---|---|---|
| | Storage/Support Space | 150-250 square feet/teaching station |
| Family and Consumer Science | Classroom | 900-1000 square feet |
| | Classroom/Lab | 1200-1500 square feet |
| Art | Multipurpose | 1200-1500 square feet |
| | Drawing and Painting | 1200-1500 square feet |
| | Ceramics | 1500 square feet |
| | Kiln, Glazing, Clay, Damp Room | 400 square feet |
| | Storage | 300 square feet/area |
| | Photography/Darkroom | 1000/400-800 square feet |
| | Office | 120 square feet |
| Music | Instrumental | 1500-2700 square feet |
| | Choral | 1200-2000 square feet |
| | General Music | 1000-1200 square feet |
| | Instrument Storage | 600-800 (4 square feet/instrument) |
| | Small Practice | 60-80 square feet |
| | Group Practice | 100-150 square feet |
| | Electronic Keyboarding Lab | 750 square feet |
| | Music Library | 150-200 square feet |
| | Office/Lesson Studio | 100-200 square feet |
| | Instrument Repair | 75 square feet |
| | Performance Equipment Storage | 200-300 square feet |
| Physical Education/Athletics | Gymnasium (two stations) | 12000-14000 square feet |
| | Multipurpose/auxiliary gymnasium | 1700 square feet |
| | Weights/Fitness | 2000 square feet |
| | Adaptive Physical Education | 500 square feet |
| | Physical Education Locker Rooms | 1 square feet/Student Capacity |
| | Athletic Locker Rooms | 1000-1500 square feet |

| Middle Level | Learning Spaces | Square Footage |
|---|---|---|
| | General Storage | 300 square feet/station |
| | Athletic Storage | 600-800 square feet |
| | Spectator Seating | 8 square feet/person open bleachers 4" Deep to Close Bleachers |
| | Pool | 10000-12000 square feet |
| | Diving Well | 1500-2500 square feet |

| Middle Level<br>Gross Square Footage | Student Enrollment | Square Footage |
|---|---|---|
| | Less than 500 | 170-200 gross square feet |
| | 500-999 | 160-190 gross square feet |
| | 1000-1500 | 150-180 gross square feet |
| | 1500-2000 | 140-170 gross square feet |

For pool, auditorium, or community use/partnership spaces add square footage as appropriate.

### *(c) Classrooms*

Guidelines for classrooms apply to all non-specialized classrooms such as English, social studies, and math. These guidelines are meant to encourage the design of imaginative, flexible, accessible classrooms, or classrooms with adjacent common resource and support spaces and to help avoid sterile, crammed classrooms lacking spaces for a variety of learning activities and storage. Essential elements to consider for middle level school classrooms include:

(1) **Square footage:** 850-950 square feet for 20-28 students. Determine appropriate classroom square footage by analyzing current and anticipated class sizes, staffing, needed space for technology and students with disabilities, and deciding whether common spaces (i.e., large group, team learning, small group, conference, and office spaces) will be located within or outside classrooms. If resource and support spaces and/or more than several computers are to be placed in the classroom, additional square footage is necessary. Consider providing additional space for technology for more advanced student project work and teacher applications of technology to the curriculum.

(2) **Location:** In quiet areas, near the library/media center. Consider clustering classrooms by grade-level houses and providing adjacent common spaces for large group, team learning, small group, and individual student work on special projects or computers, as well as teacher team planning space.

(3) **Learning activities:** Individual, small, team, and large group activities in core academic subjects and elective classes, including computer applications. Provide spaces to display students' work.

Students working on graduation standards benchmarks may need additional space for small group and individual student project and demonstration learning activities. Consider providing space for additional technology stations as a greater number of curriculum and learning activities using technology are developed by teachers.

(4) **Learning aids, equipment, technology:** Portable tables or desks and stackable chairs, adjustable shelving and bookcases, white/chalkboard, electronic white board interactive capability, display/bulletin board, audio visual and other portable equipment, ceiling or wall-hung video monitors, and an overhead projector and screen. Provide voice, video, and networked computer connections with high-speed Internet access, required spaces for cable trays, wiring, and conduits, and adjustable computer furniture to enable students to use technology to aid learning. Consider equipping classrooms with excess power and communications systems for future needs. Plan workstations for students with disabilities.
Plan teacher work, demonstration, and equipment spaces to fit the curriculum. This would include providing audio recording equipment in English, graph chalkboard in math, maps and specialized reference materials in social studies, an elevated presentation stage in speech, and reading or language lab stations in reading or world languages.

(5) **Storage, other needs:** Provide ample, flexible, accessible, and portable storage spaces for student projects and teacher materials, equipment, and supplies. Provide shared work or office spaces for teachers to prepare and store teaching materials, and access a phone, computer with high-speed Internet access, printer, and copy machine.

Utilize non-load bearing walls between classrooms to best maintain flexibility in classroom design and facilitate team teaching and multiple-class learning activities. Reinforce and soundproof walls in classrooms or student traffic areas to prevent student damage and disruptions. Classroom acoustics need careful attention. Natural light and quality light fixtures are highly desirable, and heating, ventilation, and air-conditioning and humidity control systems that produce good indoor air quality will improve the classroom environment, reduce absenteeism, and help student performance. Minimize the number of interior classrooms with no natural light. Consider air-conditioning the entire building or at least enough classrooms for summer use by students and adults.

### *(d) Large Group/Team Learning/Small Group Conference*

These common resource and support spaces permit teachers to use a wider variety of instructional styles in working with students with different learning styles. Essential elements to consider for middle level school large group, team learning, and small group conference spaces include:

(1) **Square footage:** 15 square feet per student in a large group space, 1,500-2,000 square feet for 125-175 students in a team learning space and 150-200 square feet for each small group, conference, or office space. If classroom technology space is limited, consider providing space for technology learning stations in common spaces, which may require additional square footage.

(2) **Location:** Adjacent to a cluster of academic classrooms. Spaces for large group, team learning, and small group activities may overlap. Planning common spaces should provide for ease of supervision by teachers.

(3) **Learning activities:** Large group presentations, team learning, small group discussion and activities, student project work, tutorial assistance in basic skills, and computer work.

(4) **Learning, aids, equipment, technology:** Stackable chairs for large group presentations, portable tables for team and small group activities, counter and project workspaces, electronic interactive white board capability, ceiling or wall-hung video monitors, audio visual and other portable equipment, and the ability to easily darken the large group space to use for audio visual presentations. Provide other equipment appropriate for the classes using common spaces (e.g. reading or language lab stations, sinks for art or science work). Provide connections for technology workstations along walls, high-speed Internet access, and adjustable computer furniture. Plan workstations for students with disabilities.

(5) **Storage, other needs:** Provide ample, flexible, accessible, and portable storage spaces for student and teacher work, equipment, and supplies. Graduation standards work may require additional storage spaces for student project work. Provide work or office space for teachers to prepare and store teaching materials, and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(e) Library/Media Center*

Library/media center additions to middle level schools are very common because of the need for library/media center spaces that can accommodate new technologies and increasing numbers of student and community users. School districts should consider "over-building" the library/media center to better accommodate rapidly changing information technologies and increasing users. Essential elements to consider for a middle level school library/media center include:

(1) **Square footage**: 600-800 square feet for entrance, circulation, and distribution, and 35 square feet times 8-10 percent of the student enrollment capacity for seating, stacks, computer use with Internet access, and reading and reference workspaces (e.g., 1,750 square feet for 50 students). Provide additional spaces for small group/conference rooms (150 square feet), multimedia editing (200 square feet), a library classroom (800 square feet), workroom/storage space (400-600 square feet), and a professional library (200 square feet) either in or adjacent to the library/media center. See Part 3.06 (f) for computer and other technology space requirements.

(2) **Location:** Near academic classrooms on the first floor and near an entrance convenient for the delivery of equipment and materials and community user access. Plan carefully the design specifications and space allocations for activities such as study and research, informal reading, group instruction, production and group projects, and library administration. All student areas in the library/media center need to be visible from the circulation desk area and adjacent rooms need to have glass walls for ease of supervision purposes. Utilize short shelving in central areas that does not block viewing other areas. The backs of computers need to be accessible for maintenance purposes. Natural lighting is desirable, but the location of computers and shelving must not cause computer screen glare and book binding deterioration problems. The library/media center or adjacent spaces may contain a computer lab, multimedia editing, a classroom, conference rooms, a staff library or workroom, and community user spaces. Consider locating some collections, research and reference materials in common spaces next to classrooms. If used by the public during non-school hours, ADA restrooms must be accessible.

(3) **Learning activities:** Activities which help students learn and apply information literacy and research skills using available resources and technology to access, retrieve, organize, and manage information. This would include individual student reading and research, computer and Internet use, multimedia editing, small and large group instruction, and discussion. The middle level school library/media center is the main source of information for class projects and

personal interests and adolescents need both guided and independent and learning experiences. Tailor learning activities to different student developmental levels. Providing staff development in the use of information technologies supports the curriculum and student work towards graduation standards. Carefully consider the locations, space allocations, and relationships of computer workstations, computer labs, multimedia production, and other learning spaces that may become part of the library/media center program. The computer lab that becomes part of the library/media center should be a research lab accommodating a class of students.

(4) **Learning aids, equipment, technology:** Portable and adjustable shelving, chairs, carrels, tables and desks, computers with high-speed Internet access, electronic interactive white board capability, printers, VCR's and tapes, newspapers and magazines, maps, audio visual equipment, display cases and bulletin boards, and other furniture and equipment suitable to middle level student interests. Design and equip library/media centers to help students become familiar with current and emerging voice, video, and data technologies. Plan for student work or production areas with an accessible copy machine. Provide adult-sized furniture for staff and visitor use. Plan connectivity and networking accessibility to the library/media center and other sources of information from classrooms, homes, other schools, and information centers (e.g., public library). Plan accessibility and workstations for students with disabilities.

(5) **Storage, other needs:** Large storage spaces and floor space for certain materials (e.g., newspapers, reference books) may no longer be necessary because of computer access to such materials. Provide ample and secure storage spaces for student and staff materials and equipment. Carts for hauling books and equipment are essential. Carpeting, acoustics, lighting, temperature and humidity control, and ventilation need careful consideration. Providing for the smooth traffic flow of classes in and out of the library/media center is important. Plan to electronically automate, secure, and back-up library/media center operations. The library/media center should be flexible in design to accommodate emerging technologies and changing user needs. Air condition for summer use. Provide work and office space for a media specialist to prepare and store materials, and access a phone, computer, and a printer and copy machine.

Sources: Facilities Guidelines for Library/Media Programs; Maryland State Department of Education; 1998
Guidelines for Minnesota School Media Programs; Minnesota Educational Media Organization; 1992
National Institute of Building Sciences; School Library Design; 2014

### *(f) Technology*

Technology needs to be made available to students, staff, and community users in increasingly diverse forms and settings, including classrooms, media centers, offices and support spaces, as well as in computer labs. Each school district and school must design and deliver technology in the forms and settings that best meet the needs of students, staff, and community users.

Computer Labs – Essential elements to consider for middle level school computer labs include:

(1) **Square footage:** 1,000-1,300 square feet for 20-30 students in a computer lab, including a teacher demonstration area. For support spaces, provide 540-640 square feet for a technology closet and control and headrooms, 500-800 square feet for a copy center.

(2) **Location:** Near classrooms or a grade house or the library/media center. Avoid light glare from windows that creates screen vision problems. Design the computer lab as a separate, stand-alone lab, or with a wall or partition separating classroom areas from the lab. The teacher needs

to be able to view as many computer screens as possible. Secure the lab for after-hours use by students and community users and locate it near a convenient entrance.

(3) **Learning activities:** Acquiring word processing and some desktop publishing skills, becoming familiar with spreadsheets and data base applications, and developing research and presentation skills using the Internet and graphics. The primary purpose(s) of the lab will help determine the arrangement of spaces for individual student, small group, and teacher demonstration learning activities.

(4) **Learning aids, equipment, technology**: Computer desks, chairs, tables, and equipment should be portable and adjustable to accommodate the varying physical development and support needs of students, and the purpose of the lab. Networking, wiring, high-speed Internet access, software, and related equipment must support the lab and its intended uses. Counter top space is necessary for student work projects. Provide a LCD projector, a pull-down screen, and electronic interactive white board capability for demonstrations and for illustrating software applications. Provide workstations for lap top computers as appropriate. Plan computer workstations for students with disabilities.

(5) **Storage, other needs:** Secure storage spaces for student work, teaching materials, and equipment are necessary. A security system is essential to ensure the safety of computer equipment and student work. The electrical and power setup for the network system and student workstations need careful planning. Lighting needs special attention to avoid screen glare and eye fatigue. Provide temperature, humidity control, and air-conditioning to prevent computer lab overheating and for use during the summer. Consider a static-free carpeting or floor covering. Provide work and office space for technology teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(g) Science*

Essential elements to consider for a middle level school science lab or classroom/lab include:

(1) **Square footage:** 1,200-1,400 square feet for 28 students in a classroom/lab setting. Square footage must be adjusted proportionately if class sizes are greater than 28. Avoid overcrowded labs that are hazardous and reduce student “hands on” learning time. Plan an additional 300 square feet of space for lab preparation and the storage of specimens, chemicals, and materials. Several classrooms or labs may share preparation space.

(2) **Location:** Cluster labs in an academic house setting and/or with other science labs. Locate labs on an outside wall to help vent fumes and access an outdoor environmental study area. Several labs may share a classroom area with student desks or a classroom may be included in a perimeter or peninsular lab set-up. The teacher needs to be able to observe all student lab work areas. Consider a “universal lab” that accommodates different preparation and lab work needs if several different classes (e.g., life science, earth science) are sharing a lab.

(3) **Learning activities:** Individual and small group inquiry, pre/post-lab, and field-related activities. Stress lab safety throughout. Computer learning activities (e.g., simulations, data collection) should enhance, not replace lab or field activities.

(4) **Learning aids, equipment, technology:** Extensive lab work requires enhancing student science lab stations with portable tables, sinks, electricity and heat, and student workspace. A teacher’s table with demonstration space, ceiling mounted projection screen, electronic interactive white board capability, and audio/visual/data connections and controls is necessary. Provide microscopes, specimens, plants, chemicals, containers, specialized plant or animal work areas,

and other materials and equipment. Computers with high-speed Internet access and software should be available to supplement lab work. Provide adequate marker board and display/tackboard to display experiments and student work. The teacher lab preparation area needs a counter, large sink, refrigerator, and storage cabinets. A rolling cart for teachers to transport lab materials is very helpful. Plan lab stations for students with disabilities.

(5) **Storage, other needs:** State and federal requirements for science labs, storage, ventilation, and safety codes are critically important and must be met. Review the checklists for science lab and chemical storage safety contained in the health and safety materials annually sent to school district superintendents. Exchange air regularly because of chemicals and other materials used in the lab. Provide student drawers, tote trays, and a variety of secure storage spaces for teacher and student supplies, equipment, and flammable and hazardous materials. Shut-off valves for electricity, gas, and water must be readily accessible. Supply and maintain safety supplies and equipment, including first aid supplies, safety glasses, gloves, a demonstration fume hood, shower/eye wash, and fire extinguisher(s). Provide work and office space for science teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(h) Special Education*

Special education programs and services must provide for students with a range of disabilities, from mild to severe, and those with multiple disabilities. It is critically important to make a careful assessment of the projected number of special education students and the types of programs, staffing, and services needed. Next, determine program space needs and whether to locate resource and support spaces within or outside the classroom. Finally, design or modify spaces as appropriate (e.g., larger spaces are needed for severely disabled students). Advance planning will help schools avoid the cramming of special education students into storage, office, and other spaces not intended for instruction. All ADA and building code requirements for accommodating students with disabilities must be met. It is important to involve staff and architects with knowledge of programs and code (e.g., time-out room) requirements. Essential elements to consider for middle level school special education spaces include:

(1) **Square footage:** 450 square feet for 5-8 students in a smaller classroom setting and 800-1,200 square feet in a classroom/lab setting. Utilize portable dividers to help make all spaces as flexible as possible to allow for regular modifications. Computers and other accommodations for individual students may require additional square footage. Students with severe disabilities and/or personal hygiene needs may need separate, self-contained rooms or spaces for sinks, toilets, diapering, showering, changing, and laundry areas. Spaces for a time-out or quiet space room, kitchen facilities, and physical therapy and adaptive equipment may be necessary. It may be desirable to provide a room for observation, student/staff/parent conferences, and small group work.

(2) **Location:** First floor, near exit and lockers, food service, adaptive physical education, conference/testing, occupational/motor therapy, speech and music therapy rooms, and other related support service spaces. Consider locating learning stations in academic houses around building to facilitate student inclusion.

(3) **Learning activities:** Individual and small group learning activities, including general and computer instruction, life survival skills, and activities that meet the special learning needs of students. Plan to use workstations for students with disabilities that must be provided in all

program areas such as consumer life science and technology education labs, physical education, music, art, and science as appropriate.

(4) **Learning aids, equipment, technology:** Learning aids, equipment, and technology that meets individual student needs (e.g., audio and recording equipment) and special handrails, walks, ramps, and doors to assure student access to the school, classrooms, and all program and service spaces. Provide adjustable and portable tables, chairs, and desks, computer stations with high-speed Internet access, ceiling or wall-hung video monitors, portable equipment, bookcases and adjustable shelving, counter and project workspaces, white/chalkboard, electronic interactive white board capability, display/bulletin board, a sink, and audio visual equipment. Provide voice, video, and networked computer connections with Internet access to enable students to use technology to aid learning. Consider equipping classrooms with excess power and communications systems for future needs. Plan teacher work and demonstration spaces suitable for the program.

(5) **Storage, other needs:** Provide ample, flexible, accessible, and portable storage spaces for student, teacher, and teacher aide materials, supplies, and equipment. Provide private work and office space for teachers to prepare and store teaching materials and access a phone, computer with Internet access, and a printer and copy machine. The observation room needs to have a one-way mirror.

Utilize treated or reinforced wallboard in classrooms or student traffic areas to prevent student damage. Provide many power outlets throughout the room and consider capping the outlets. Use a combination of hard surface, resilient flooring and carpet for classroom and resource and support spaces. Classrooms should have rounded corners and be acoustically treated. Utilize natural gray colors, natural light, quality light fixtures (fluorescent lights cause problems for students with auditory and visual processing difficulties) and heating, ventilation, and air-conditioning and humidity control systems that produce good indoor air quality to improve the classroom environment, reduce absenteeism, and help student performance. Minimize the number of interior classrooms with no natural light. Air-condition enough classrooms for summer program use. Provide work and office space for special education teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(i) Technical Education*

Technical education includes labs, shops, and classrooms suitable for a variety of lifework development activities. At the middle level, programs are likely to be exploratory. Detailed specifications for labs or shops must be found in other sources. Essential elements to consider for middle level school technical education spaces include:

(1) **Square footage:** 1,800-2,400 square feet for up to 25 students in a technical education lab, 2,000-3,000 square feet in a general shop (woods/construction, metals, agribusiness), 1,400-2,000 square feet in a CADD/Graphics lab, and 1,200-1,400 square feet in a principles of technology lab. Provide an additional 500-600 square feet for storage, 150 square feet per teacher for offices, 850-950 square feet for a related classroom, 90-100 square feet for a tool room, and 120-300 square feet for a finishing room or other specialized space.

(2) **Location:** Ground floor, with ready access to the outside through an over-sized overhead door for the delivery of materials, machinery, and equipment. Several shops or labs may share related classrooms. Building codes require separating incompatible activities (e.g., dust and dust-free, flammable and non-flammable activities) within or between shops. Use non-load

bearing walls to separate labs, shops and related areas, and to facilitate redesigning for changing program needs.

(3) **Learning activities:** General background, demonstration, exploration, and project work activities in a lab, shop, or classroom setting. Technology labs may include separate spaces for video production and/or photography, and need Intranet and high-speed Internet access. Provide flexible student workstations to allow for multiple activities. Teachers need to have clear vision of all work areas in a lab or shop. Consider installing interior windows to provide supervision of adjacent labs and shop areas. Plan workstations for students with disabilities.

(4) **Learning aids, equipment, technology**: A variety of workstations, equipment, machines, technology, and hand and power tools for labs, shops, and classrooms. Provide teacher demonstration space, electronic interactive white board capability, and adequate workspaces and surfaces suitable for the learning activities, tools, and the equipment used. Adequate ventilation and dust collection, power, lighting, and sound control are essential. Labs with computers may require air-conditioning. Ceilings, walls, floors, partitions, windows, and doors need special design consideration. Electrical demands may be heavy and numerous power outlets and a master shut-off switch are necessary. Install electrical troughs along the walls or overhead to ease the relocation of equipment. Provide a sink and supplies for clean-up. Floors should have non-skid preparation. Static-free flooring or carpeting is desirable in some work areas. An emergency eyewash station, first aid equipment, and fire extinguishers must be readily accessible. Provide safety glasses, operations guards, and other safety protection for students. All power equipment must meet local, state, and OSHA mechanical and electrical requirements, as well as safety codes. Danger zones should be outlined with painted lines.

(5) **Storage, other needs:** Provide ample and secure storage areas for small and large student projects, tools, materials, and equipment in use and not in use to maintain student safety and the learning environment. Storage areas need to be sized to the materials. Tool cribs and wall mounted tool cabinets need to be part of all spaces that require hand tools, hand power tools, and machine tools. Consider a security system to ensure the safety of the equipment and student work. Provide work and office space for technology teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(j) Family and Consumer Science*

Essential elements to consider for middle level school family and consumer science spaces include:

(1) **Square footage**: 900-1,000 square feet in a classroom space or 1,200-1,500 square feet in a multipurpose lab or classroom/lab for 20-24 students. Provide classroom or classroom/lab spaces for student seating, teacher demonstration, lab work such as food preparation and serving, related student learning activities, and storage. Plan food/nutrition labs as specialized labs or as part of a multipurpose classroom/lab. Provide flexible spaces with portable walls or room dividers to accommodate changing program needs.

(2) **Location**: First floor, near an entrance for the delivery of materials.

(3) **Learning activities**: Individual, small group, and large group learning activities in foods/nutrition, clothing, child care, personal and family resource management, and careers. Plan workstations for students with disabilities.

(4) **Learning aids, equipment, technology**: Portable tables and chairs, carts, cabinets, mirrors, sewing machines, bookcases with adjustable shelving, counter and project workspaces, white/ chalkboard, tack/bulletin boards in several areas, computer stations with high-speed Internet

access, ceiling or wall-hung video monitors, audio-visual equipment, and teacher demonstration space with electronic interactive white board capability. Provide portable equipment for use in the multipurpose areas. For the foods/nutrition lab, provide preparation equipment, large and small appliances, sinks, waste disposal unit, cooking and baking utensils and supplies, linens, cleaning supplies, and serving carts. Supply and maintain first aid equipment (fire cleaning extinguishers and blankets). Provide voice, video, and networked computer connections with Internet access to enable students to use technology to aid learning.

(5) **Storage, other needs**: Provide adequate storage spaces, some secure, for equipment, supplies, teacher materials, and student project work. In the foods/nutrition lab, a variety of wall and base cabinets are necessary, and in most all other areas, portable storage units, tote trays, bookcases, and carts are essential. Plan acoustics, lighting, temperature and humidity controls, sound control, and sufficient ventilation to prevent food preparation fumes. Plumbing is very important in the food lab, where a hot water and gas supply is essential. Electrical service demands are heavy in family and consumer science; therefore, plan outlets and control panel locations to afford both permanent and flexible arrangements of equipment. Select floor coverings with ease of maintenance in mind, especially in the food lab. Provide work and office space for family and consumer life science teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(k) Art*

Essential elements to consider for middle level school art rooms include:

(1) **Square footage:** 1,200-1,500 square feet for 20-28 students in a multipurpose, drawing and painting, or ceramics room, 400 square feet for a kiln and a glazing/clay/damp room, 300 square feet for storage spaces in each area, and 120 square feet per teacher for office space. A photography room needs 1,000 square feet and a darkroom 400-800 square feet.

(2) **Location:** First floor in an area with plenty of indirect natural light, near an entrance for the delivery of materials, and an outdoor area for art activities such as sketching. Provide separate rooms free of dust for computer graphics and audio-visual equipment and a fire-protected and well-ventilated room for the kiln. Use non-load bearing walls or partitions to separate work areas.

(3) **Learning activities:** A variety of learning activities in two-or-three dimensional media, wet and dry, including painting, clay, block printing, etching, lithography, metals, jewelry, weaving, plastics, modeling, sculpture, photography, and computer drawing and graphics. Teachers need to have clear vision of all artwork areas. Provide flexible workstations within art rooms to allow for multiple activities and changing program needs. Plan workstations for students with disabilities.

(4) **Learning aids, equipment, technology:** Portable work surfaces including single, double, and/or four-student art tables, stools, easels, ceramic benches, potters wheels, and clay carts. Provide powered work counters with sinks accessible from more than one side, drying racks, tool panels, and a work area with a large mirror. Plan for computer stations, ceiling or wall-hung video monitors, audio-visual equipment, electronic interactive white board capability, and the darkening of the room for demonstrating, showing slides, films, and spotlighting. Provide a room ceiling grid system, cork board, and deep, adjustable display cases off the corridor or in other areas of the school (e.g., library, lobby) to display student work. Flooring which is easily maintained and resistant to water, cleaning solvents, and oil is essential. Concrete with floor drains is best for heavy-duty work areas (e.g., clay). Provide voice, video, and networked

computer connections with high-speed Internet access to enable students to use technology to aid learning.

(5) **Storage, other needs:** Providing a variety of ample storage spaces with adjustable shelving, drawers, and cabinets, some secure, for student projects, teacher materials, tools, paints, acids, solvents, cleaners, and bulk supplies of materials and equipment is critical. Plan for ceilings to be 10-14 feet high and install ventilation and exhaust hoods to handle fumes, odors, dust, and contaminant vapors. Provide multiple sinks with strainers and sediment interceptor traps that are easily accessible to students for fast cleanup. Supply and maintain a fire extinguisher and emergency washing facilities. Plan wiring, electrical, and gas supply outlets, including accessible master and emergency shutoff switches/valves for safety. Provide work and office space for art teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(l) Music*

Music spaces are a frequent component of additions to middle level schools because of large class sizes and the need for spaces to play, sing (including choreography and movement), listen, practice, and store equipment. It is important to inventory equipment, uniforms, music scores, and supplies and plan for storage spaces accordingly. Essential elements to consider for middle level school music spaces include:

(1) **Square footage:** the variety of music classes and group sizes requires a more specific breakdown of music spaces. Plan square footage for the maximum desirable class size, not current enrollments. Provide adequate ceiling heights to create a satisfactory listening environment, regardless of class size.

| Program Function | 45-60 Students | 90 Students | Ceiling Height |
|---|---|---|---|
| Instrumental | 1500-2000 square feet for 45-60 students | 2700 square feet for 90 students | 18’-22’ ceiling height |
| Choral | 1200-1500 square feet for 45-60 students | 2700 square feet for 90 students | 16’-20’ ceiling height |

| | |
|---|---|
| General Music Classroom | 1000-1200 square feet for 25-30 students |
| Instrument Storage Room | 600-800 square feet or 4 square feet per instrument |
| Small Practice Rooms | 60-80 square feet for 1-2 students |
| Group Practice/Lesson Rooms | 100-150 square feet for 3-6 students |
| Electronic Keyboarding Lab | 750 square feet for 11-21 students |
| Music Library | 150-200 square feet per 150 students |
| Office/Lesson Studio | 100-200 square feet per teacher |
| Instrument Repair | 75 Square Feet |
| Performance Equipment Storage | 200-300 Square Feet for risers, portable acoustic shell, platforms, etc. door for student safety and teacher observation. Pre-engineered modular practice rooms provide the best guarantee for good sound isolation. |

(2) **Location**: a separate, secured wing to minimize noise problems, and adjacent to the stage and athletic fields for indoor/outdoor performances, and to a parking lot for loading and transporting equipment. The internal arrangement of music spaces is critical-locate storage, office spaces and corridors between the instrumental and choral rehearsal rooms. Practice rooms should not open directly into the rehearsal rooms to minimize disruptive sound transmissions. Provide wide doors for the easy and quick movement of students and equipment. Plan for multiple entrances and exits, double doors, and wide corridors and commons spaces to efficiently move large numbers of students, pianos, and large percussion equipment in and out of music and performance areas. Locate teacher offices to maximize visible supervision. Separate the music library from other storage areas.

(3) **Learning activities**: listening, playing, and singing and expressing through sound and physical movement. Provide spacious rooms with sound isolation and acoustic clarity in order to provide the best quality music learning environments. Plan to accommodate students with disabilities who are increasingly involved in music programs.

(4) **Learning aids, equipment, technology**: portable or built-in semi-circular risers provide better sight lines in both instrumental and choral rooms. Provide space in front of the rehearsal room for a teacher's podium, piano, cabinets, tack boards, recording/playback equipment, and white boards equipped with staff lines on one half the surface. Plan to purchase and use school-owned instruments, music posture chairs and music stands, an instrument repair bench, a large sink and tools, and robes and uniforms are necessary. Install adequate playback/recording equipment in all music spaces, including performance areas, and networked phone jacks in the keyboarding lab.

Provide quiet mechanical systems and HVAC systems to increase air exchange and maintain the integrity of the listening environment. Equip florescent lights with quiet-rated electronic ballasts to prevent the "hum" characteristic of standard ballasts. Treat interior wall and ceiling surfaces of rehearsal rooms with a mixture of diffusive and absorptive materials or panels to create good musical communication within the room. Carpets are not effective musical sound absorbers. Use acoustically rated doors to prevent sound transmission in and out of music spaces. Provide ample electrical power outlets throughout all music rooms, including on floors for electronic instruments.

(5) **Storage, other needs:** provide walk-through storage for most or all instruments adjacent to, not within instrumental rehearsal rooms. The width of storage room doors must accommodate size requirements of contents. Plan a variety of secure, well-ventilated storage spaces, large and small, for instruments, uniforms, robes, music stands, and chair racks. Provide temperature and humidity control in instrument storage spaces. Plan for adequate ventilation in practice rooms, and install a large, double-glazed observation window in each door for student safety and teacher observation. Pre-engineered modular practice rooms provide the best guarantee for good sound isolation.

Locate toilets, changing areas, and drinking fountains near rehearsal and performance areas for student and community member use during off-school hours. Performance area users may have incompatible sound control needs, necessitating additional equipment such as acoustic shells, risers, and sound systems for musical events. Consider air-conditioning. Provide work and office space for music teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

Sources: Planning Guide for Secondary Music Facilities; Wenger Corporation; 2002;

Music Facilities: Building, Equipping, and Renovating; MENC; 1987
703-800-4000
The School Music Program: Description and Standards, 2nd Edition; MENC; 1986;
703-800-4000

### *(m) Physical Education/Athletics*

Physical education and athletic activity space additions to middle level schools are very common. Schools must provide gender equality and full access for students with disabilities in all programs, services, and facilities. Recent trends include increasing interest in nontraditional individual activities such as exercise walking and fitness conditioning and the need to accommodate the community drop-in recreational user in multipurpose spaces. Planning for physical education and athletic activity spaces must consider future program uses as well as student enrollment and community user trends; if one or more are positive, consider "over-building" to provide adequate spaces over the longer term at a cost savings. Essential elements to consider for middle level school physical education and athletic activity spaces include:

(1) **Square footage**: The variety of physical education and athletic activities for boy and girl users require a more specific breakdown of indoor and outdoor spaces. For a middle level gymnasium, consider 6,000-7,000 square feet as one teaching station. Plan indoor and outdoor spaces for current and projected maximum usage during and after school by physical education, athletic, and community activities.

| **Area/Program** | **Space Required** |
|---|---|
| Gymnasium – Two Teaching Stations | 12,000-14,000 square feet space required |
| Auxiliary Gymnasium with Spectator Space | 7,300-7,500 square feet space required |
| Multipurpose – Gymnastics, Wrestling | 1,700 square feet space required |
| Weights/Fitness Room | 1,500 square feet space required |
| Adaptive Physical Education | 500 square feet space required |
| Physical Education Locker Rooms | 1 square feet space required per student capacity |
| Athletic Locker Rooms | 1,000-1,500 square feet space required |
| Student/Community Showers | 400-1,500 square feet space required |
| General Storage Rooms | 300 square feet per station space required |
| Athletic Storage Room | 600-800 square feet space required |
| Spectator Seating | 8 square feet space required per person, open bleachers |
| Closed Bleachers | 4 feet deep |
| Pool | 10,000-12,000 square feet space required |
| Diving Well | 1,500-2,500 square feet space required |

In addition to inside facilities, school districts need to provide the acreage needed for current and future middle level school and community outdoor activities, including any shared spaces with other schools or community recreation. A minimum of 34+ acres should be set aside for field spaces and transition areas between fields for outdoor physical education, athletic, and community recreational use activities. Transition space acreage below provides buffer zones to allow for student and spectator safety, flow-through traffic, fencing, storage, parking, bleachers, or additional areas needed for future program needs, greater student participation, or community use.

**Table VII**
**Middle School Outdoor Activity Spaces**

| Area/Activity | Recommended Dimensions (in feet) | Space Required Square Feet | Number Required | Total Required Square Feet | Acres |
|---|---|---|---|---|---|
| Multipurpose | 100x120 | 12,000 | 2 | 24,000 | 0.55 |
| Track and Field | 320x600 | 192,000 | 1 | 192,000 | 4.41 |
| Football | 160x360 | 57,600 | 2 | 115,200 | 2.64 |
| Soccer | 225x360 | 81,000 | 2 | 162,000 | 3.72 |
| Softball | 270x270 | 72,900 | 4 | 291,600 | 6.69 |
| Baseball | 300x300 | 90,000 | 2 | 180,000 | 4.13 |
| Archery | 90x225 | 20,250 | 2 | 40,500 | 0.93 |
| Driving Range | 80x600 | 48,000 | 1 | 48,000 | 1.10 |
| Tennis | 48x120 | 5,760 | 8 | 46,080 | 1.06 |
| General Purpose | 10x200 | 20,000 | 2 | 40,000 | 0.92 |
| | | | Net Area | 1,139,380 | 26.16 |
| Transition spaces | | + 30% | | 341,814 | 7.85 |
| **Total** | | | **Gross Area** | **1,481,194** | **34.01** |

To accommodate additional outdoor activities, many school districts must purchase additional acreage off-site, taking on additional student safety, transportation, and maintenance issues at a higher cost to the district while causing inconvenience to students, school staff, and parents. Consider a larger school site to provide adequate spaces over the longer term at a cost savings.

(2) **Location:** Away from the academic classroom areas of the school to minimize classroom disruptions, with convenient, direct access to outdoor spaces and a parking lot for loading and transporting equipment. Provide several hallway approaches to the gymnasium and locker rooms to ease traffic congestion levels. Carefully plan teacher and coach offices and locker rooms for ease of supervision and security. Provide for locking off indoor activity spaces from the rest of the school to permit after-hours access by students, community users, and parents

with a minimum of security problems. Use wall partitions or nets to separate indoor teaching stations. Plan outdoor activity locations in relationship to their intensity and compatibility of use (e.g., general purpose fields should be nearest the building).

(3) **Learning activities**: Developing motor skills, physical conditioning, and individual and team skills and interests through physical education and athletic activities. Physical education activities concentrate on developing lifetime fitness, sports, and recreational interests, while athletic activities concentrate on developing specific athletic skills and emphasize individual and team competition. Plan indoor and outdoor spaces and activities for students with disabilities.

(4) **Learning aids, equipment, technology:** Provide specifically designed spaces for basketball, volleyball, weights/fitness, wrestling, gymnastics, dance, softball, track and field, soccer, football, etc., as well as the related equipment and supplies for physical education and athletic activities. This includes balls and bats, clubs, shot puts, mats, weights and fitness equipment, racquets, standards, parallel bars, floor plates and anchors, uniforms and protective gear, benches and dugouts, etc., in many sizes and/or adjustable for students at various levels of skill development. Consider built-in audio and tape equipment in weight and fitness rooms. Provide white/chalkboard, display/bulletin board, first aid and emergency equipment, and a public address sound system. Provide quiet mechanical systems and HVAC systems to increase air exchange in locker rooms, gymnasiums, and other activity stations.

(5) **Storage, other needs:** Providing ample storage space for physical education and athletic programs is important, both for ease of access and security. Plan for storage rooms to be built flush with walls at all teaching stations and convenient to outdoor activity areas. Provide portable means of hauling and securing equipment and build off-season storage spaces. Carefully plan flooring, lower and upper walls, ceilings, acoustic treatment, heating and ventilation, and lighting needs for various activities that have different needs. Recess all light switches, drinking fountains, telephones, fire alarms/extinguishers, and other equipment below seven feet for student safety. Enhance the lobby area with trophy cases. Plan easy road access to outdoor activity sites for students and spectators.

Locate toilets and drinking fountains near indoor and outdoor practice and contest areas for student and community member use during off-school hours. Locker room doors should not swing out into crowded corridors. Provide secure and durable locker units of various sizes for both physical education and athletic programs, including visiting teams. Girls' locker room spaces, service areas, and spaces for activities must be equitable in size and quality to boys. Provide work and office space for physical education teachers and coaches to prepare and store materials and access a phone, computer with high-speed Internet access, printer, and copy machine. Plan access to spaces for adults with disabilities.

The publication Accessible Outdoor Recreation Areas provides guidelines on routes of travel, surfacing materials, play field access, equipment, etc., pending final passage of design guidelines. School districts planning swimming pools need to consult the Minnesota Department of Health regarding requirements for swimming pools. See Minnesota Department of Health Pool Guidelines (http://www.health.state.mn.us/divs/eh/pools/code/rulerevision.html).

Sources: Facility Planning for Physical Education, Recreation, and Athletics; American Alliance for Health, Physical Education, Recreation and Dance; 2013
Design for Outdoor Learning; School Planning & Management, March; 2014
Accessible Outdoor Recreation Areas Manual 1997-1998; Minnesota Department of Education

## Part 3.09 Guidelines for High School Learning Spaces

### *(a) Organization, Program, and Design Considerations for High Schools*

Planning and designing facilities for high school students is based in part on the graduation standards, including the basic skills standards and high standards, and local school district and school mission, goals, policies, learning program, and student and staff support service decisions. School organization, learning program, and support service designs help students apply basic skills, work towards graduation standards high standards, assist teachers in delivering curriculum, and provide students and staff support services as needed.

The diversity and complexity of school organization and programs (curriculum, services) increases from the elementary to the middle level to the high school due to a number of factors, which may include the following:

- The need to adapt curriculum and facilities to support student achievement of graduation standards high standards;
- A shift in emphasis on learning basic skills to exploration of subjects or areas of interest to preparation for post-secondary programs or employment;
- The need to provide more specialized programs and staff to help students prepare for post-secondary education and employment;
- Mainstreaming students with disabilities in a wider variety of classroom, lab, and post-secondary preparation settings;
- The need to provide more expansive athletic and performance arts facilities for students and coaches/advisors in a great variety of more competitive extracurricular programs for boys and girls;
- The more immediate impact of change on post-secondary preparation programs and spaces in a high school; and
- Increasing community use of high school facilities.

High schools must prepare graduates to pursue post-secondary education and/or job-training programs, enter the job market, and assume new adult roles as learners, workers, partners, parents, and citizens. Most young adults will sample different lifestyles and necessarily have to compete for places in education or training programs and jobs on a local, regional, national, even international basis. The great variety of emerging needs, opportunities, and challenges facing young adults demands comprehensive high school programs to service students and flexible facilities that will accommodate an ever-changing panorama of needed programs to accomplish this goal.

A high school must be flexible and adaptable as programs change and spaces must be used for other purposes. High school organizational designs may encompass any or all of the following concepts: classrooms, large and small group, team learning, individual study and/or resource areas, lab activities, and other specialized spaces. High schools may cluster learning programs and support services in a variety of ways to enhance the learning program, including the following:

- High school grades in linear classrooms with enhanced technology;
- High school grades in department or interdisciplinary groupings areas with adjacent common resource and support service spaces;

- Library/media center/technology center with central resource center, computer labs, video production or telecast, ITV/distance learning, technology control center, and public access area;
- Performing arts area including music, art, drama/theater, and an auditorium;
- Lifework development area including technical, business/marketing, and family and consumer science education;
- Physical education, athletic, and community recreation area including gymnasiums and locker rooms, health classrooms, and other indoor and outdoor physical education, adaptive physical education, athletic, and community recreation spaces;
- Cafeteria/commons, including food service, student commons, study hall, performance space, student locker bays, and student activity and community meeting rooms;
- Administration, student/family support services, and building operations areas including guidance counseling, career center, social/psychological services, student records and test data, health services, conference rooms, building receiving, operations, equipment, storage, and workshops, and other intermittent staff and services; and
- Community education offices, rooms, and other community use/partnership spaces.

Please recognize that more high school students are becoming larger and require more classroom, lab, and circulation spaces to be comfortable, relaxed, and experience less stress. Code requirements or guidelines (e.g., classroom seating, lab space, hallway width) are minimal and may not be adequate for many students.

High schools should locate student lockers in locker bays, not hallways, to reduce hallway crowding and improve circulation. Student lockers should be at least 15” deep, 15” wide, and no more than four feet high to accommodate backpacks, the storage of student project materials, and offer clear sight lines for supervision and security.

Title II of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act require school districts to make all educational programs and services accessible to students and adults with disabilities. Schools must make appropriate modifications of rules, policies, and practices, and provide accommodations to assure accessibility. If accessibility requires altering the fundamental nature of a program (e.g., a student in a wheel chair wanting to participate in wrestling) providing accessibility to that program may not be necessary. Consider providing an optional activity.

In any renovation/remodeling project, school districts must remove all accessibility barriers. In a new school construction project, all accessibility requirements must be met. This includes exterior traffic, doors, and outdoor recreation areas, interior circulation, building features, doors, toilets and locker rooms, cafeteria/dining and assembly/meeting areas, and classrooms, labs, and other spaces. The Accessibility Survey Tool will assist school districts in reviewing existing school facilities and in planning for new schools and Accessible Outdoor Recreation Areas will provide the latest guidelines for outdoor spaces. When designing facilities, it is important to involve individuals who understand applicable codes and the functional impact of code requirements on programs and facilities.

A high school facilities planning team (see Section II) needs to determine the needed learning and school support spaces and develop design options which will enhance the learning program and the delivery of curriculum and school support services. High school designs need to be flexible and allow for alternative classroom, small or large group learning arrangements, and optional ways of providing students and staff

support services. A well-designed high school needs to be able to meet current as well as projected learning program and support service needs.

Sources: Americans with Disabilities Act; Title II; 1993
Rehabilitation Act, Section 504; 1973
Accessibility Survey Tool; Minnesota Department of Education; 1999
Accessible Outdoor Recreation Areas 1999; Minnesota Department of Education

### *(b) High School Learning Spaces Square Footage Guidelines*

**Table VIII**
**Square Footage Guidelines for High School Learning Spaces**

| High School | Learning Spaces | Square Footage |
|---|---|---|
| | Classrooms | 850-950 square feet |
| | Large Group | 15 square feet/student |
| | Team Learning Areas | 1500-2000 square feet |
| | Small Group/Conference | 150-200 square feet |
| Library/Media Center | Entrance, Circulation, Distribution | 700-900 square feet |
| | Seating, Stacks, Computer Access, Reference | 8-10% of Students x 40 square feet |
| | Small Group/Conference | 150-200 square feet |
| | Multimedia Production | 300-400 square feet |
| | Classroom | 800 square feet |
| | Workroom/Storage | 400-600 square feet |
| | Professional Library | 200 square feet |
| Technology | Computer Lab | 1000-1400 square feet |
| | Control and Headrooms, Closets | 640-740 square feet |
| | Copy Center | 500-800 square feet |
| | ITV/Distance Learning | 900 square feet |
| | TV/Video Studio | 1250 square feet |
| Science | Classroom/Lab | 1200-1500 square feet |
| | Storage/Lab Prep | 350 square feet |
| Special Education | Classrooms (5-8 students) | 450 square feet |
| | Classroom/Lab | 800-1200 square feet |
| Technical Education | Tech Lab | 1800-2400 square feet |
| | General Shop | 2000-3000 square feet |
| | CADD/Graphics | 1400-2000 square feet |

| High School | Learning Spaces | Square Footage |
|---|---|---|
| | Principals of Technology | 1200-1400 square feet |
| | Storage/Support Space | 150-250 square feet/teaching station |
| Business/Marketing Education | Classroom | 1000-1200 square feet |
| | Classroom/Lab | 1200-1400 square feet |
| Family and Consumer Science | Classroom | 900-1000 square feet |
| | Classroom/Lab | 1200-1500 square feet |
| Art | Multipurpose | 1200-1500 square feet |
| | Drawing and Painting | 1200-1500 square feet |
| | Ceramics | 1500 square feet |
| | Kiln, Glazing, Clay, Damp Room | 400-600 square feet |
| | Storage | 350 square feet/area |
| | Photography/Darkroom | 1000-1200/400-800 square feet |
| High School | Learning Spaces | Square Footage |
| | Office | 120 square feet |
| Music | Instrumental | 2000-3000 square feet |
| | Choral | 1500-2200 square feet |
| | General Music | 1000 square feet |
| | Instrument Storage | 600-800 (4 square feet/instrument) |
| | Uniform Storage | 300-400 (3 square feet/uniform) |
| | Choral Robe Storage | 150-250 (2.5 square feet/robe) |
| | Small Practice | 60-80 square feet |
| | Group Practice | 100-150 square feet |
| | Electronic Keyboarding Lab | 750 square feet |
| | Recording Control Room | 100-150 square feet |
| | Music Library | 150-200 square feet |
| | Office/Lesson Studio | 100-200 square feet |
| | Instrument Repair | 75 square feet |
| | Performance Equipment Storage | 200-300 square feet |
| Physical Education/Athletics | Gymnasium (two stations) | 12000-14000 square feet |
| | Multipurpose/auxiliary gymnasium | 3200-7500 square feet |
| | Weights/Fitness | 2000-4000 square feet |
| | Physical Education Locker Rooms | 1 square feet/Student Capacity |

| High School | Learning Spaces | Square Footage |
|---|---|---|
| | Athletic Locker Rooms | 1000-3000 square feet |
| | General Storage | 300 square feet/station |
| | Athletic Storage | 1000-1200 square feet |
| | Spectator Seating | 10 square feet/person open bleachers |
| | Training Room | 200-400 square feet |
| | Laundry | 200 square feet |
| | Pool | 10000-12000 square feet |
| | Diving Well | 1500-2500 square feet |

| High School<br>Gross Square Footage | Student Enrollment | Square Footage |
|---|---|---|
| | Less than 500 | 200-320 gross square feet |
| | 500-999 | 190-220 gross square feet |
| | 1000-1500 | 180-220 gross square feet |
| | 1500-2000 | 170-190 gross square feet |

For pool, auditorium, or community use/partnership spaces add square footage as appropriate.

### *(c) Classrooms*

Guidelines for classrooms apply to all non-specialized classrooms such as English, social studies, and math. These guidelines are meant to encourage the design of imaginative, flexible, accessible classrooms, or classrooms with adjacent common resource and support spaces, and to help avoid sterile, crammed classrooms lacking spaces for a variety of learning activities and storage. Essential elements to consider for high school classrooms include:

(1) **Square footage**: 850-950 square feet for 20-28 students. Determine appropriate classroom square footage by analyzing current and anticipated class sizes, staffing, needed space for technology and students with disabilities, and deciding whether common spaces (i.e., large group, team learning, small group, conference, and office spaces) will be located within or outside classrooms. If resource and support spaces and/or more than several computers are to be placed in the classroom, additional square footage is necessary. Consider providing additional space for technology for more advanced student project work and teacher applications of technology to the curriculum.

(2) **Location:** In quiet areas, near the library/media center. Consider clustering classrooms by grade-level, department, or interdisciplinary wings with adjacent common spaces for large group, team learning, small group, and individual student work on special projects, as well as teacher team planning space.

(3) **Learning activities:** Individual, small, team, and large group activities in academic, elective, and life development classes, including computer applications. Provide spaces to display students' work. Students working on graduation standards may need additional space for small group and individual student project and demonstration learning activities. Consider providing space for

additional technology stations as a greater number of curriculum and learning activities using technology are developed by teachers and students become more able to do project work using technology.

(4) **Learning aids, equipment, technology:** Portable tables or desks and stackable chairs, adjustable shelving and bookcases, white/chalkboard, electronic interactive white board capability, display/bulletin board, audio visual and other portable equipment, ceiling or wall-hung video monitors, and an overhead projector and screen. Provide voice, video, and networked computer connections with high-speed Internet access, required spaces for cable trays, wiring, and conduits, and adjustable computer furniture to enable students to use technology to aid learning. Consider equipping classrooms with excess power and communications systems for future needs. Plan workstations for students with disabilities.

Plan teacher work, demonstration, and equipment spaces to fit the curriculum. This would include providing magazine and periodical racks in English, real and computer software models of geometric figures in math, specialized maps and software reference materials in world geography, desktop publishing software and equipment in journalism, and language lab stations in world language classes.

(5) **Storage, other needs:** Provide ample, flexible, accessible, and portable storage spaces for student projects and teacher materials, equipment, and supplies. Provide shared work or office spaces for teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

Utilize non-load bearing walls between classrooms to best maintain flexibility in classroom design and facilitate team teaching and multiple-class learning activities. Reinforce and soundproof walls in classrooms or student traffic areas to prevent student damage and disruptions. Classroom acoustics need careful attention. Natural light and quality light fixtures are highly desirable, and heating, ventilation, and air-conditioning and humidity control systems that produce good indoor air quality will improve the classroom environment, reduce absenteeism, and help student performance. Minimize the number of interior classrooms with no natural light. Consider air-conditioning the entire building or at least enough classrooms for summer use by students and adults.

### *(d) Large Group/Team Learning/Small Group Conference /Individual Learning Station*

These common resource and support spaces permit teachers to use a wider variety of instructional styles in working with students and enable individual or groups of students to work independently on projects. Essential elements to consider high school large group, team learning, small group conference, and individual learning station spaces include:

(1) **Square footage:** 15 square feet per student in a large group space, 1,500-2,000 square feet for 125-175 students in a team learning space, 150-200 square feet for each small group, conference, or office space, and 40 square feet per student for each individual learning station. If classroom technology space is limited, consider providing space for technology learning stations in common spaces, which may require additional square footage.

(2) **Location**: Adjacent to a cluster of academic classrooms. Spaces for large group, team learning, small group, and individual learning station activities may overlap. Planning common spaces should provide for ease of supervision by teachers.

(3) **Learning Activities**: large group presentations, team learning, small group discussion and activities, student project work, and computer work or media production.

(4) **Learning, aids, equipment, technology**: Stackable chairs for large group presentations, portable tables for team and small group activities, counter and project workspaces, electronic interactive white board capability, ceiling or wall-hung video monitors, audio visual and other portable equipment, and the ability to easily darken the large group space to use for audio visual presentations. Provide other equipment appropriate for the classes, groups, or students using common spaces (e.g., language or science lab stations, media production area). Provide connections for technology workstations along walls, high-speed Internet access, and adjustable computer furniture. Plan workstations for students with disabilities.

(5) **Storage, other needs**: Provide ample, flexible, accessible, and portable storage spaces for student and teacher work, equipment, and supplies. Graduation standards work may require additional storage spaces for student project work. Provide work or office space for teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(e) Library/Media Center*

Library/media center additions to high schools are very common because of the need for library/media center spaces that can accommodate new technologies and increasing numbers of student and community users. School districts may want to consider "over-building" the library/media center to better accommodate rapidly changing information technologies and increasing users. Essential elements to consider for a high school library/media center include:

(1) **Square footage**: 700-900 square feet for entrance, circulation, and distribution and 40 square feet times 8-10 percent of the student enrollment capacity for seating, stacks, computer access, and reading and reference workspaces (e.g., 2,000 square feet for 50 students). Provide additional spaces for small group/conference rooms (150-200 square feet), multimedia production (300-400 square feet), a library classroom (800 square feet), workroom/storage space (500-700 square feet), and a professional library (200 square feet) whether in or adjacent to the library/media center. See Part 3.07 (f) for computer lab and other technology space requirements.

(2) **Location**: Near academic classrooms on the first floor and near an entrance convenient for the delivery of equipment and materials and community user access. Plan carefully the design specifications and space allocations for activities such as individual and group study and research, informal reading, group instruction, media production, and library administration. All student areas in the library/media center should be visible from the circulation desk area and adjacent rooms should have glass walls for ease of supervision purposes. Utilize short shelving in central areas that does not block viewing other areas. The backs of computers need to be accessible for maintenance purposes. Natural light is desirable, but the location of computers and shelving must not cause computer screen glare and book binding deterioration problems. The library/media center or adjacent spaces thereto may contain a computer lab, multimedia editing, a classroom, conference rooms, a staff library or workroom, and community user spaces. Some collections, research and reference materials may be located in common spaces next to classrooms. If used by the public during non-school hours ADA restrooms must be accessible.

(3) **Learning activities:** Activities which help students learn and apply information literacy and research skills to efficiently access, retrieve, organize, manage, and evaluate information include

individual and collaborative reading and research, computer, network, and Internet use, multimedia production, small and large group instruction, projects, and discussion. The high school library/media center is the link between the school and other libraries and sources of information for students and high school students are capable of both independent and collaborative work. Tailor learning activities to student inquiries, research interests, and their desires to seek information to help them explore career paths and life directions. Providing staff development in the use of information technologies supports the curriculum and student work towards graduation standards. Carefully consider the locations, space allocations, and relationships of computer workstations, computer labs, multimedia production, and other learning spaces that may become part of the library/media center program. The computer lab that becomes part of the library/media center should be a research lab accommodating a class of students.

(4) **Learning aids, equipment, technology:** Portable and adjustable shelving, chairs, carrels, tables and desks, computers with network and high-speed Internet access, electronic interactive white board capability, printers, VCR's and tapes, newspapers and magazines, maps, specialized reference sources, audio visual equipment, display cases and bulletin boards, and other furniture and equipment suitable to high school student interests. Design and equip library/media centers to help students access current and emerging voice, video, and data technologies. Plan for student work or production areas with an accessible copy machine. Provide adult-sized furniture for staff and visitor use. Plan connectivity and networking accessibility to the library/media center, other local, national, global library/media centers, and other sources of information. Plan accessibility and workstations for students with disabilities.

(5) **Storage, other needs:** Large storage spaces and floor space for certain materials (e.g., newspapers, reference books) may no longer be necessary because of computer access to such materials. Provide ample and secure storage spaces for student projects and staff materials and equipment. Carts for hauling books and equipment are essential. Carpeting, acoustics, lighting, temperature and humidity control, and ventilation need careful consideration. Providing for the smooth traffic flow of classes in and out of the library/media center is important. Plan to electronically automate, secure, and back-up library/media center operations. The library/media center should be flexible in design to accommodate emerging technologies and changing user needs. Air condition for summer use. Provide work and office space for a media specialist to prepare and store materials, access a phone, computer, printer, and copy machine.

Sources: Facilities Guidelines for Library/Media Programs; Maryland State Department of Education; 1998
Guidelines for Minnesota School Media Programs; Minnesota Educational Media Organization; 1992
National Institute of Building Sciences; School Library Design; 2014

### *(f) Technology*

Technology needs to be made available to students, staff, and community users in increasingly diverse forms and settings, including classrooms, media centers, offices and support spaces, through mobile computer stations, laptop computers, and in computer labs. Each school district and school must design and deliver technology in the forms and settings that best meet the needs of students, staff, and community users.

**Computer Labs – Essential elements to consider for high school computer labs include:**

(1) **Square footage:** 1,000-1,400 square feet for 20-30 students in a computer lab, including a teacher demonstration area. For support and related spaces provide 640-740 square feet for a technology closet and control and headrooms, 500-800 square feet for a copy center.

(2) **Location:** Near classrooms, a department, interdisciplinary wing, or the library/media center. Avoid light glare from windows that creates screen vision problems. Design the computer lab as a separate, stand-alone lab or with a wall or partition separating classroom areas from the lab. The teacher needs to be able to view as many computer screens as possible. Secure the lab for after-hours use by students and community users and locate it near a convenient entrance.

(3) **Learning activities:** Applying word processing and desktop publishing skills, using spreadsheets and data base applications, and presenting research using the Internet, graphics, and design. The primary purpose(s) of the lab will help determine the arrangement of spaces for individual student, small group, and teacher demonstration learning activities.

(4) **Learning aids, equipment, technology:** Computer desks, chairs, tables, and equipment should be flexible, portable and adjustable to accommodate the varying physical development and support needs of students and the purpose of the lab. Networking, wiring, high-speed Internet access, software, and related equipment must support the lab and its intended uses. Counter top space is necessary for student work projects. Provide a LCD projector, a pull-down screen, and electronic interactive white board capability for demonstrations and for illustrating software applications. Provide workstations for lap top computers as appropriate. Plan computer workstations for students with disabilities.

(5) **Storage, other needs:** Secure storage spaces for student work, teaching materials, and equipment are necessary. A security system is essential to ensure the safety of computer equipment and student work. The electrical and power setup for the network system and student workstations need careful planning. Lighting needs special attention to avoid screen glare and eye fatigue. Provide temperature, humidity control, and air-conditioning to prevent computer lab overheating and for use during the summer. Consider a static-free carpeting or floor covering. Provide work and office space for technology teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

**ITV/Distance Learning** – Available technology allows students at different school sites the opportunity to share a class or learning experience. Essential elements to consider for high school ITV (interactive television)/distance learning spaces include:

(1) **Square footage:** 900 square feet for up to 20 students, including equipment. Additional spaces are necessary for wiring and to store equipment. Providing a greater number of technologies (e.g., cable, satellite, fiber optics, fax, telephones, computers), requires greater space to install, use, and store equipment.

(2) **Location**: In a quiet, academic area where traffic or noise will not interfere with broadcasts. Locate near a secured entrance for after-hours use and broadcasts. Provide accessible telephones and other interactive technology within the classroom.

(3) **Learning activities**: Media presentation, demonstration, and student interaction activities using available technologies. Provide spaces for individual and small group work to accommodate different class and student needs. Install monitors at the front and rear of the classroom to permit the teacher and students from all sites to view each other.

(4) **Learning, aids, equipment, technology:** Ceiling or wall-hung monitors, cameras, including an overhead camera for display and demonstration, electronic interactive white board capability, student and teacher desks on risers, microphones, modulators, demodulators, and switches,

sound controls, a VCR, telephone lines, wiring and hook-ups for various technologies, and chalk/marker board. Consider the addition of a computer with high speed Internet access for multimedia presentations. Utilize portable furniture and work units to maximize space flexibility.

To facilitate an ITV broadcast at another site, provide a cart to transport student and display cameras and a monitor and computer (or the ability to connect to a monitor and computer) to another site. Provide connections into the network for the mobile equipment to broadcast from the remote classroom site.

(5) **Storage, other needs**: Provide ample space for the use and storage of equipment within or adjacent to the ITV classroom.

**TV/Video Studio – Essential elements to consider for a high school ITV/Video Studio include:**

(1) **Square footage:** 1,250 square feet for 10-15 students, including space(s) for video production, editing, broadcasting, and equipment. Provide separate and secure enclosed spaces for broadcasting equipment, controls, and editing.

(2) Location: In a quiet, academic area where traffic, noise, vibrations, or visual access will not interfere with video recordings. Locate near a secure entrance for after-hours use of the TV/Video studio.

(3) Learning activities: Individual and small group video production activities for use in multimedia presentations or local cable broadcasts. Implementation of the graduation standards will create additional opportunities for students to produce videos to help them achieve high standards.

(4) Learning aids, equipment, technology: Cameras on tripods, studio lighting, monitors, switchers, modulators and demodulators, microphones, sound mixers and controls, video playback and editing equipment, intercom system, and materials and equipment to construct sets.

(5) Storage, other needs**:** Provide storage spaces for equipment, a secure area for modulators and demodulators to control broadcast settings, and archives for tapes.

### *(g) Science*

Essential elements to consider for high school science labs or classroom/labs include:

(1) **Square footage:** 1,200-1,500 square feet for 28 students in a classroom/lab setting. Square footage must be adjusted proportionately if class sizes are greater than 28. Avoid overcrowded labs that are hazardous and reduce student "hands on" learning time. Plan an additional 350 square feet of space for lab preparation and the storage of specimens, chemicals, and materials. Several classrooms/labs may share preparation space.

(2) **Location:** Cluster labs in an academic wing or with other science labs. Locate labs on an outside wall to help vent fumes and to access an outdoor environmental study area. Several labs may share a classroom area with student desks or a classroom may be included in a perimeter or peninsular lab set-up. The teacher needs to be able to observe all student lab work areas. Consider a "universal lab" that accommodates different preparation and lab work needs if several different classes (e.g., biology, chemistry) are sharing a lab.

(3) **Learning activities:** Individual and small group inquiry, lab pre/post-lab, and integrated lab-field activities. Stress lab safety. Computer learning activities (e.g., graphics, data analysis) should enhance not replace lab or field activities. Plan lab stations for students with disabilities.

(4) **Learning aids, equipment, technology:** Extensive lab work requires enhancing student science lab stations with portable tables, sinks, electricity and heat, and student workspace. A teacher's table with demonstration space, ceiling mounted projection screen, electronic interactive white

board capability, and audio/visual/data connections and controls is necessary. Provide microscopes, specimens, plants, chemicals, containers, specialized plant or animal work areas, and other materials and equipment. Computers with high-speed Internet access, software, and supplies should be available to supplement lab and field work. Provide adequate marker board and display/tack board to display experiments and student work. The teacher lab preparation area needs a counter, large sink, and refrigerator. A rolling cart for teachers to transport lab materials is very helpful. Plan lab stations for students with disabilities.

(5) **Storage, other needs:** State and federal storage, ventilation, and safety codes and requirements for science labs are critically important and must be met. Review the checklists for science lab and chemical storage safety contained in the health and safety materials annually sent to school district superintendents. Exchange air regularly because of chemicals and other materials used in the lab. Provide student drawers and tote trays, and a variety of secure storage spaces for teacher and student supplies, equipment, and for chemicals and flammable and hazardous materials. Shut-off valves for electricity, gas, and water must be readily accessible. Supply and maintain safety supplies and equipment, including first aid supplies, safety glasses, gloves, aprons, a demonstration fume hood, shower/eye wash, and fire extinguisher(s). Provide work and office space for science teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

Source: Capital Expenditure: Health and Safety Revenue Application; Minnesota Department of Education; 2002

### *(h) Special Education*

Special education programs and services must provide for students with a range of disabilities, from mild to severe, and those with multiple disabilities. It is critically important to make a careful assessment of the projected number of special education students and the types of programs, staffing, and services needed. Next, determine program space needs and whether to locate resource and support spaces within or outside the classroom. Finally, design or modify spaces as appropriate (e.g., larger spaces are needed for severely disabled students). Advance planning will help schools avoid the cramming of special education students into storage, office, and other spaces not intended for instruction. All ADA and building code requirements for accommodating students with disabilities must be met. It is important to involve staff and architects with knowledge of programs and code (e.g., time-out room) requirements. Essential elements to consider for high school special education spaces include:

(1) **Square footage:** 450 square feet for 5-8 students in a smaller classroom setting, and 800-1,200 square feet in a classroom/lab setting. Utilize portable dividers to help make all spaces as flexible as possible to allow for regular modifications. Computers and other accommodations for individual students may require additional square footage. Students with severe disabilities and/or personal hygiene needs may need separate, self-contained rooms or spaces for sinks, toilets, diapering, showering, changing, and laundry areas. Spaces for a time-out or quiet space room, kitchen facilities, physical therapy, and adaptive equipment may be necessary. It may be desirable to provide a room for observation, student/staff/parent conferences, and small group work.

(2) **Location:** First floor, near exit and lockers, food service, adaptive physical education, conference/ testing, occupational/motor therapy, speech and music therapy rooms, and other

related support service spaces. Consider locating learning stations in academic houses around building to facilitate student inclusion.

(3) **Learning activities:** Individual and small group learning activities, including general and computer instruction, life survival skills, and activities that meet the special learning needs of students. Plan to use workstations for students with disabilities that must be provided in all program areas such as consumer life science and technology education labs, physical education, music, art, and science as appropriate.

(4) **Learning aids, equipment, technology:** Learning aids, equipment, and technology that meets individual student needs (e.g., audio and recording equipment), and special handrails, walks, ramps, and doors to assure student access to the school, classrooms, and all program and service spaces. Provide adjustable and portable tables, chairs, and desks, computer stations with high-speed Internet access, ceiling or wall-hung video monitors, portable equipment, bookcases and adjustable shelving, counter and project workspaces, white/chalkboard, electronic interactive white board capability, display/bulletin board, a sink, and audio visual equipment. Provide voice, video, and networked computer connections with Internet access to enable students to use technology to aid learning. Consider equipping classrooms with excess power and communications systems for future needs. Plan teacher work and demonstration spaces suitable for the program.

(5) **Storage, other needs:** Provide ample, flexible, accessible, and portable storage spaces for student, teacher, and teacher aide materials, supplies, and equipment. Provide private work and office space for teachers to prepare and store teaching materials and have access to a phone, computer with Internet access, a printer and copy machine. The observation room needs to have a one-way mirror.

Utilize treated or reinforced wallboard in classrooms or student traffic areas to prevent student damage. Provide many power outlets throughout the room and consider capping the outlets. Utilize a combination of hard surface, resilient flooring and carpet for classroom and resource and support spaces. Classrooms should have rounded corners and be acoustically treated. Utilize natural gray colors, natural light, quality light fixtures (fluorescent lights cause problems for students with auditory and visual processing difficulties), and heating, ventilation, and air-conditioning and humidity control systems that produce good indoor air quality to improve the classroom environment, reduce absenteeism, and help student performance. Minimize the number of interior classrooms with no natural light. Air-condition enough classrooms for summer program use. Provide work and office space for special education teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(i) Technical Education*

Technical education includes labs, shops, and classrooms suitable for a variety of lifework development activities. Detailed specifications for labs or shops must be found in other sources. Essential elements to consider for high school technical education spaces include:

(1) **Square footage**: 1,800-2,400 square feet for up to 25 students in a technical education lab, 2,000-3,000 square feet in a general shop (woods/construction, metals, agribusiness, auto/small engines) 1,400-2,000 square feet in a CADD/Graphics lab, and 1,200-1,400 square feet in a principles of technology lab. Provide an additional 500-600 square feet for storage, 150 square feet per teacher for office space, 850-950 square feet for a related classroom, 540-600 square

feet for a greenhouse, 90-100 square feet for a tool room, and 120-300 square feet for a finishing room.

(2) **Location**: Ground floor, with outside access through an over-sized overhead door for the delivery of materials, machinery, equipment, and vehicle entry. A separate wing for labs, shops, and related classrooms will maximize the sharing of spaces. Building codes require separating incompatible activities (e.g., dust and dust-free, flammable and non-flammable) within shops. Use non-load bearing walls to separate labs and shops to facilitate redesigning for changing programs.

(3) **Learning activities**: General background, demonstration, project work, occupational exploration, or job entry preparation in a lab, shop, or classroom setting. Technology labs often include separate spaces for video production and/or photography and need access to both Intranet and Internet networks. Plan flexible workstations and arrange equipment and machines emphasizing safety, work procedures, multiple activities, and the easy flow of materials and efficiency. Teachers need to have clear vision of all work areas. Consider installing interior windows to provide supervision of adjacent labs and shop areas. Plan workstations for students with disabilities.

(4) Learning aids, equipment, technology: A variety of equipment, machines, technology, hand and power tools, and work surfaces for labs, shops, or classrooms. Provide teacher demonstration space and electronic interactive white board capability. Providing adequate workspace, especially around hazardous machines. Plan for adequate ventilation and dust collection. Ceilings, walls, floors, partitions, windows, and doors need special design consideration. Electrical demands are heavy, numerous power outlets and a master shut off switch are necessary. Install electrical troughs along the walls or overhead to ease relocation of equipment. Provide gas outlets and fume heads as needed. Lighting needs vary with the workstation. An emergency eyewash station, first aid equipment, and fire extinguishers must be readily accessible. Provide safety glasses, operation guards, and other safety protection for students. All power equipment must meet local, state, and OSHA mechanical and electrical requirements, as well as safety codes. Provide a sink for clean-up. Danger zones should be outlined with painted lines. Non-skid, static free flooring or carpeting is desirable in some areas.

(5) Storage, other needs: Provide ample and secure storage areas for small and large student projects, tools, materials and equipment in use and not in use to maintain student safety and the learning environment. Storage areas need to be sized to the materials; e.g., lumber or steel stock storage areas may need to be up to 21 feet in length. Tool cribs and wall mounted tool cabinets need to be part of all spaces that require hand tools, hand power tools, and machine tools. Consider a security system to ensure the safety of the equipment and student work. Provide work and office space for technology teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(j) Business/Marketing Education*

Specifications for general business/marketing education spaces at the high school level are the focus of this part. Specialized school-to-work program spaces may need additional space and equipment, specifications for those spaces must be found in other sources as appropriate. Essential elements to consider for high school business/marketing education spaces include:

(1) **Square footage**: 1,000-1,200 square feet for up to 25 students in a multipurpose classroom and 1,200-1,400 square feet for 25-35 students in a classroom/lab setting. Course offerings appropriate for a multipurpose classroom include general business, marketing, accounting,

business law, consumer economics, and advanced courses in these same areas. Determine the appropriate size for each classroom or lab by analyzing current and projected student enrollments and specifying the desirable furnishings and equipment. Utilize portable walls or room dividers to separate classrooms or lab work areas where appropriate. Teacher offices require additional space.

(2) **Location**: Cluster business/marketing education classrooms in one area. Various designs and layouts are possible, flexibility to accommodate changing program needs is essential. Consider locating near an exit for evening and community use.

(3) **Learning activities**: Teaching students essential skills (e.g., word processing, spreadsheets, data base applications), orienting students to the world of business, and helping students prepare for the transition from school to work and for more specialized training in business/marketing education related fields.

(4) **Learning aids, equipment, technology:** Ergonomically designed desks, chairs, tables, files, computer workstations, ceiling or wall-hung monitors, electronic interactive white board capability, and audio visual equipment. Provide adjustable and portable furnishings and equipment whenever possible, counter workspace, and ample chalk/white board and display space. Design computer workstations with networking and high-speed Internet access and locate in a lab or classroom as needed. Carefully design AC power, air-conditioning and humidity control. Plan workstations for students with disabilities.

(5) **Storage, other needs**: Provide space for a teacher demonstration stand or work area. Install power outlets on the perimeter and in the floor and provide a master circuit control switch for safety and access to turn off all equipment. Provide lighting for close work, acoustical treatment for noise control, and storage spaces for materials, projects, and equipment. Provide work and office space for business education teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(k) Family and Consumer Science*

Essential elements to consider for high school family and consumer science spaces include:

(1) **Square footage:** 900-1,000 square feet in a classroom space or 1,200-1,500 square feet in a multipurpose classroom/lab space for 20-24 students. Classroom or lab spaces need to be provided for student seating, teacher demonstration, lab work such as food preparation and serving, various student learning activities, and storage for student project work and equipment. Plan food/nutrition labs as specialized labs or as part of a multipurpose classroom/lab. It is important that family and consumer science spaces are flexible with portable walls or room dividers to accommodate changing program needs.

(2) **Location:** First floor, near an entrance for delivery of materials and for ease of access for children and parents in a child care or parenting program. Separate kitchen areas and child care facilities.

(3) **Learning activities:** Individual, small group, and large group learning activities in foods/nutrition, clothing, child care, housing, health and home safety, personal and family resource management, and careers. Plan workstations for students with disabilities.

(4) **Learning aids, equipment, technology:** Portable tables and chairs, carts, cabinets, wardrobes, mirrors, sewing machines, home furnishings, bookcases with adjustable shelving, counter and project workspaces, white/chalkboard, tack/bulletin boards in several areas, computer stations with high-speed Internet access, tack/bulletin boards in several areas, ceiling or wall-hung video monitors, audio-visual equipment, and teacher demonstration space with electronic interactive

white board capability. Provide portable equipment for use in the multipurpose areas. For the food/nutrition lab, provide preparation equipment, large and small appliances, sinks, a waste disposal unit, cooking and baking utensils and supplies, linens, cleaning supplies, and serving carts. Install an observation room with a two-way mirror and a speaker system for child development/parenting. Plan for increasing the number of related play and activity spaces, both indoors and outdoors, as the number of participating children increases. Supply and maintain first aid equipment (fire cleaning extinguishers and blankets). Provide voice, video, and networked computer connections with Internet access to enable students to use technology to aid learning.

(5) **Storage, other needs**: Provide adequate storage spaces, some secure, for equipment, supplies, teacher materials, and student project work. Install a variety of wall and base cabinets in the foods/nutrition lab, and use portable storage units, tote trays, and carts in most all other areas. Plan acoustics, lighting, temperature and humidity controls, sound control, and sufficient ventilation to prevent food preparation fumes. Plumbing is very important in the food lab, where a hot water and gas supply is essential. Install a changing area and toilet for child care and clothing. Electrical service demands are heavy in family and consumer science; therefore, plan outlets and control panel locations to afford both permanent and flexible arrangements of equipment. Select floor coverings with ease of maintenance in mind, especially in the food lab. Provide work and office space for family and consumer life science teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(l) Art*

Essential elements to consider for high school art rooms include:

(1) **Square footage:** 1,200-1,500 square feet for 20-28 students in a multipurpose, drawing and painting, or ceramics room, 400-600 square feet for a kiln and a glazing/clay/damp room, 350 square feet for storage spaces in each area, and 120 square feet per teacher for office space. A photography room needs 1,000 square feet and a darkroom 400-800 square feet.

(2) **Location:** First floor in an area with plenty of indirect natural light, near an entrance for the delivery of materials, an outdoor area for art activities such as sketching, and close to other performing arts areas to facilitate coordination of activities. Provide separate rooms free of dust for computer graphics and audio-visual equipment and a fire-protected and well-ventilated room for the kiln. Use non-load bearing walls or partitions to separate work areas.

(3) **Learning activities:** A variety of learning activities in two or three-dimensional media, wet and dry, including painting, printing, etching, lithography, metals, jewelry, weaving, plastics, modeling, sculpture and ceramics, photography, and computer drawing and graphics. Teachers need to have clear vision of all artwork areas. Provide flexible workstations to allow for multiple activities and changing program needs. Plan workstations for students with disabilities.

(4) **Learning aids, equipment, technology**: Portable work surfaces including single, double, and/or four-student art tables, stools, easels, model stands, ceramic benches, potters wheels, and clay carts. Provide powered work counters with sinks accessible from more than one side, drying racks, tool panels, and a work area with a large mirror and stands for modeling. Plan for computer stations, ceiling or wall-hung video monitors, audio-visual equipment, electronic interactive white board capability, and the darkening of the room for demonstrating, showing slides, films, and spotlighting. Provide a room ceiling grid system, cork board, and deep, adjustable display cases off the corridor or in other areas of the school (e.g., library, lobby) to

display student work. Flooring which is easily maintained and resistant to water, cleaning solvents, and oil is essential. Concrete with floor drains is best for heavy-duty work areas (e.g., clay). Provide voice, video, and networked computer connections with high-speed Internet access to enable students to use technology to aid learning.

(5) **Storage, other needs**: Providing a variety of ample storage spaces with adjustable shelving, drawers, and cabinets, some secure, for student projects, teacher materials, tools, paints, acids, solvents, cleaners, and bulk supplies of materials and equipment is critical. Plan for ceilings to be 10-14 feet high. Install ventilation and exhaust hoods to handle fumes, odors, dust, and contaminant vapors. Provide multiple sinks with strainers and sediment interceptor traps that are easily accessible to students for fast cleanup. Supply and maintain a fire extinguisher and emergency washing facilities. Plan wiring, electrical, and gas supply outlets, including accessible master and emergency shutoff switches/valves for safety. Provide work and office space for art teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(m) Music*

Music spaces are a frequent component of additions to high schools because of large class sizes and the need for spaces to play, sing, listen, practice, and store equipment. It is important to inventory equipment, uniforms, music scores, and supplies and plan for storage spaces accordingly. Essential elements to consider for high school music spaces include:

(1) **Square footage:** The variety of music classes and group sizes requires a more specific breakdown of music spaces. Plan square footage for the maximum desirable group size, not current enrollments. Adequate ceiling heights are necessary to provide a satisfactory listening environment, regardless of class size.

| Program/Function | 60-75 Students | 90 Students | Ceiling Height |
|---|---|---|---|
| Instrumental | 2,000-2,500 square feet | 3,000 square feet | 18-22 feet |
| Choral | 1,500-1,800 square feet | 2,200 square feet | 16-20 feet |

| Function | Square footage |
|---|---|
| General Music Classroom | 1000 square feet for 25-35 students |
| Instrument Storage | 600-800 (4 square feet/instrument) |
| Uniform Storage | 300-400 (3 square feet/uniform) |
| Choral Robe Storage | 150-250 (2.5 square feet/robe) |
| Small Practice | 60-80 square feet (1-2 students) |
| Group Practice/Lesson Rooms | 100-150 square feet (3-6 students) |
| Small Ensemble Practice Room | 350-400 square feet (up to 15 students) |
| Electronic Keyboarding Lab | 750 square feet |
| Recording Control Room | 100-150 square feet |
| Music Library | 150-200 square feet (per 150 students) |
| Office/Lesson Studio | 100-200 square feet per teacher |
| Instrument Repair | 75 square feet |
| Performance Equipment Storage | 200-300 square feet for risers, portable acoustic shell, platforms, etc. |

(2) **Location:** A separate, secured wing to minimize noise problems, and adjacent to the stage and athletic fields for indoor/outdoor performances and to a parking lot for loading and transporting equipment. The internal arrangement of music spaces is critical, locate storage, office spaces, and corridors between the instrumental and choral rehearsal rooms. Practice rooms should not open directly into the rehearsal rooms to minimize disruptive sound transmissions. Plan for multiple entrances and exits, double doors, and wide corridors and commons spaces to efficiently move large numbers of students, pianos, and large percussion equipment in and out of music rooms and performance areas. Locate teacher offices to maximize visible supervision. Separate the music library from other storage areas. Plan for the recording control room to be adjacent to the rehearsal room and performance equipment storage space near the stage level of the auditorium or gym.

(3) **Learning activities**: Listening, playing, and singing and expressing through sound and physical movement. Provide spacious rooms with sound isolation and acoustic clarity in order to provide the best quality music learning environments. Plan to accommodate students with disabilities who are increasingly involved in music programs.

(4) **Learning aids, equipment, technology:** Portable or built-in semi-circular risers provide better sight lines in both instrumental and choral rooms. Provide space in front of the rehearsal room for a teacher's podium, piano, cabinets, tack boards, recording/playback equipment, and white boards equipped with staff lines on one half the surface. Plan to purchase and use school-owned instruments, music posture chairs, music stands, an instrument repair bench, a large sink and tools, robes, and uniforms. Install adequate playback/recording equipment in all music spaces, including performance areas and networked phone jacks in the keyboarding lab.

Provide quiet mechanical systems and HVAC systems to increase air exchange and maintain the integrity of the listening environment. Equip fluorescent lights with quiet-rated electronic ballasts to prevent the "hum" characteristic of standard ballasts. Treat interior wall and ceiling surfaces of rehearsal rooms with a mixture of diffusive and absorptive materials or panels to create good musical communication within the room. Carpets are not effective musical sound absorbers. Use acoustically rated doors to prevent sound transmission in and out of music spaces. Provide ample electrical power outlets throughout all music rooms, including on floors for electronic instruments.

(5) **Storage, other needs:** Provide walk-through storage for most or all instruments adjacent to, not within instrumental rehearsal rooms. The width of storage room doors must accommodate size requirements of contents. Plan a variety of secure, well-ventilated storage spaces, large and small, for instruments, uniforms, robes, music stands, and chair racks. Provide temperature and humidity control in instrument storage spaces. Plan for adequate ventilation in practice rooms and install a large, double-glazed observation window in each door for student safety and teacher observation. Pre-engineered modular practice rooms provide the best guarantee for good sound isolation.

Locate toilets, changing areas, and drinking fountains near rehearsal and performance areas for student and community member use during off-school hours. Performance area users may have incompatible sound control needs, necessitating additional equipment such as acoustic shells, risers, and sound systems for musical events. Consider air-conditioning. Provide work and office space for music teachers to prepare and store teaching materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

Sources: Planning Guide for Secondary Music Facilities; Wenger Corporation; 2002;
Music Facilities: Building, Equipping, and Renovating; MENC; 1987;
The School Music Program: Description and Standards, 2nd Edition, MENC; 1986;

### *(n) Physical Education/Athletics*

Physical education and athletic activity space additions to high schools are very common. Schools must provide gender equality and full access for students with disabilities in all programs, services, and facilities. Recent trends include increasing interest in non-traditional individual activities such as exercise walking and fitness conditioning and the need to accommodate the community drop-in recreational user in multipurpose spaces. The planning of physical education and athletic spaces, especially pools, stadiums, field houses, hockey arenas, concession, and public lobby areas requires the extensive involvement of staff, architects, regulatory agencies, and specialized consultants to provide the best design for users. Essential elements to consider for high school physical education and athletic activity spaces include:

(1) **Square footage:** The variety of physical education and athletic activities for boys and girls requires a more specific breakdown of indoor and outdoor spaces. For a high school gymnasium, consider 6,000-7,000 square feet as one teaching station. Plan indoor and outdoor spaces for current and projected maximum usage during and after school. Provide additional gymnasium, locker room, single/multipurpose, and outdoor spaces as student enrollments and participation in physical education and athletic activities, the number and levels (A, Junior Varsity, B teams) of competitive athletic programs and community recreational use of spaces increase.

| Area/Program | Spaced Needed |
|---|---|
| Gymnasium (Two Teaching Stations) | 12,000-14,000 square feet |
| Auxiliary Gymnasium with Spectator Space | 7,300-7,500 square feet |
| Multipurpose (Gymnastics, Wrestling) | 3,200-7,200 square feet and free floor space |
| Weights/Fitness | 2,000-4,000 square feet |
| Adaptive Physical Education | 500 square feet |
| Physical Education Locker Rooms | 1 square feet/student capacity |
| Athletic Locker Rooms | 1,000-3,000 square feet |
| Student/Community Showers | 400-1,500 square feet |
| Athletic Storage | 1,000-1,200 square feet |
| Spectator Seating | 10 square feet/person open bleachers |
| Closed Bleachers | 4 feet deep |
| Training Room | 200-400 square feet |
| Laundry | 200 square feet |
| Pool | 10,000-12,000 square feet |
| Diving Well | 1,500-2,500 square feet |

In addition to inside facilities, school districts need to provide the acreage needed for current and future high school and community outdoor activities, including any shared spaces with the middle level or elementary schools, or the city. A minimum of 41+ acres should be set aside for outdoor physical education, athletics, and community recreational use activities. Transition space acreage below provides buffer zones to allow for student and spectator safety, flow-through traffic, fencing, storage, parking, bleachers, or additional areas needed for future program needs, greater student participation, or community use. Where school, after-school, and community programs require intense school activities, community recreation use, multiple game fields, a running track, a stadium, hockey arena, or field house that requires much additional space should be considered.

**Table IX**
**High School Outdoor Activity Spaces**

| Area/Activity | Recommended Dimensions (in feet) | Space Required Square Feet | Number Required | Total Required Square Feet | Acres |
|---|---|---|---|---|---|
| Multipurpose | 100 x120 feet | 12,000 square feet | 2 | 24,000 square feet | .55 acres |
| Track and Field | 320 x 600 feet | 192,000 square feet | 1 | 192,000 square feet | 4.41 acres |
| Shot Put | 60 X 80 feet | 4,800 square feet | 2 | 9,600 square feet | .22 acres |
| Discuss | 100 x 180 feet | 18,000 square feet | 1 | 18,000 square feet | .41 acres |
| Football | 160 x 360 feet | 57,600 square feet | 2 | 115,200 square feet | 2.64 acres |
| Soccer | 225 x 360 feet | 81, 000 square feet | 2 | 162,000 square feet | 3.72 acres |
| Softball | 320 x 320 feet | 102,400 square feet | 4 | 409,600 square feet | 9.40 acres |
| Baseball | 360 x 360 feet | 129,600 square feet | 2 | 249,200 square feet | 5.95 acres |
| Archery | 90 x 225 feet | 20,250 square feet | 2 | 40,500 square feet | .93 acres |
| Driving Range | 80 x 750 feet | 60,000 square feet | 1 | 60,000 square feet | 1.38 acres |
| Tennis | 48 x 120 feet | 5,760 square feet | 8 | 46,080 square feet | 1.06 acres |
| General Purpose | 100 x 200 feet | 20,000 square feet | 2 | 40,000 square feet | .92 acres |
| | | | | 1,376,180 net | 31.59 net acres |
| | | Transition of +30 percent | | 1,789,034 gross required square feet | 41.07 gross acres |

To accommodate additional outdoor activities, many school districts purchase additional off-site acreage, taking on additional student safety, transportation, and maintenance issues at a higher cost to the district while causing inconvenience to students, school staff, and parents. Consider a larger school site to provide adequate spaces over the longer term at a cost savings.

(2) **Location:** Away from the academic classroom areas of the school to minimize classroom disruptions, with convenient and direct access to outdoor spaces and a parking lot for loading and transporting equipment. Consider sharing a lobby area with the cafeteria/commons or a performance arts/auditorium area. Provide several hallway approaches to the gymnasium and locker rooms, separate student and public entrances, and parking to ease traffic congestion levels. Carefully plan teacher and coach offices and locker rooms for ease of supervision and security. Provide for locking off indoor activity spaces from the rest of the school to permit after-hours access by students, community users, and parents with a minimum of security problems. Use wall partitions or nets to separate indoor teaching stations. Plan outdoor activity locations in relationship to their intensity and compatibility of use (e.g., general purpose fields should be nearest the building). Consider the direction of the sun for locating outdoor spectator seating.

(3) **Learning activities:** Developing motor skills, physical conditioning, and individual and team skills and interests through physical education and athletic activities. Physical education activities concentrate on developing lifetime fitness, sports, and recreational interests, while athletic activities concentrate on developing specific athletic skills and emphasize individual and team competition. Plan indoor and outdoor spaces and activities for students with disabilities.

(4) **Learning aids, equipment, technology**: Provide specifically designed spaces for basketball, volleyball, weights/fitness, wrestling, gymnastics, dance, softball, track and field, soccer, football, etc., as well as the related equipment and supplies for physical education and athletic activities. This includes balls and bats, clubs, shot puts, mats, weights and fitness equipment, racquets, standards, parallel bars, floor plates and anchors, uniforms and protective gear, benches and dugouts, etc., in many sizes and/or adjustable for students at various levels of skill development. Plan for built-in audio and tape equipment in weight and fitness rooms. Provide white/chalkboard, display/bulletin board, first aid and emergency equipment, and portable and permanent public address sound systems. Provide quiet mechanical systems and HVAC systems to increase air exchange in locker rooms, gymnasiums, and other activity stations.

(5) **Storage, other needs:** Providing ample storage space for physical education and athletic programs is critical, both for ease of access and security. Plan for storage rooms to be built flush with walls at all teaching stations and convenient to outdoor activity areas. Provide portable means of hauling and securing equipment and build off-season storage spaces. Carefully plan flooring, lower and upper walls, ceilings, acoustic treatment, heating and ventilation, and lighting needs for various activities that have different needs. Recess all light switches, drinking fountains, telephones, fire alarms/extinguishers, and other equipment below seven feet for student safety. Enhance the lobby area with trophy cases. Plan easy road access to outdoor activity sites for students and spectators, especially to stadiums and other varsity contest fields.

Locate toilets and drinking fountains near indoor and outdoor practice and contest areas for student and community member use during off-school hours. Locker room doors should not swing out into crowded corridors. Provide secure and durable locker units of various sizes for both physical education and athletic programs, including visiting teams. Girls' locker room spaces, service areas, and spaces for activities must be equitable in size and quality to boys. Provide work and office space for physical education teachers and coaches to prepare and store materials and access a phone, computer with high-speed Internet access, printer, and copy machine. Plan access to spaces for adults with disabilities.

The publication Accessible Outdoor Recreation Areas (https://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/final-guidelines-for-outdoor-developed-areas) provides guidelines on routes of travel, surfacing materials, play field access, equipment, etc., pending final

passage of design guidelines. School districts planning swimming pools need to consult the Minnesota Department of Health regarding requirements for swimming pools.

Sources: Facility Planning for Physical Education, Recreation, and Athletics; American Alliance for Health, Physical Education, Recreation and Dance; 2013
Design for Outdoor Learning; School Planning & Management, March; 2014
Accessible Outdoor Recreation Areas Manual 1997-1998; Minnesota Department of Education

## Part 3.10 Guidelines for School Support Spaces

School support spaces include reception, work, conference, office, storage, and related spaces for administration (including the school nurse), guidance and student services, teacher and staff, food service, and the building systems and maintenance areas. This part also includes a discussion of auditoriums, as most school districts will consider constructing an auditorium in at least one school within the district.

School support spaces often take a back seat in school facility planning sessions or are subject to school construction project budget reductions; consequently, schools are typically short of support spaces, often severely. Schools are increasingly providing many additional programs and services before, during, and after school hours (see Part 2.05) and need program and support spaces to do so. A shortage of support office, storage, and conference room spaces hampers teachers and school support staff in the performance of their duties and reduced services to students, staff, and parents.

It is therefore highly desirable to plan for additional support spaces that current or future school programs and services will need (e.g., child care and parenting) and to make an extra effort to see that support spaces are not cut from school project budgets. School support spaces are most always a part of subsequent building addition and renovation projects.

### *(a) School Support Spaces Square Footage Guidelines*

**Table X**
**School Support Spaces Square Footage Guidelines**

| School Support Spaces | Elementary | Middle Level | High School |
|---|---|---|---|
| Student Store/Activities | NA | 250-400 | 400-700 |
| **Teacher/Staff** | | | |
| Planning Workstations | 50 SF/staff | 50 SF/staff | 50 SF/staff |
| Offices | 100-150 | 100-150 | 100-150 |
| Conference, Kitchenette, Storage, Print, Copy | 10-20 SF/staff | 10-20 SF/staff | 10-20 SF/staff |
| Toilets | 120-180 | 120-180 | 120-180 |
| Food Service | SF varies greatly based | on type and quantity of | meals served |
| Cafeteria Dining Space | 12-13 SF/student | 13-15 SF/student | 14-16 SF/student |
| Staff Dining Area | 20 SF/staff dining | 20 SF/staff dining | 20 SF/staff dining |
| Full Preparation Kitchen<br>Serving Only Kitchen | 1000-2000<br>500-1000 | 1500-2500<br>750-1225 | 2000-3000<br>1000-1500 |
| Serving Line | 800 | 1000-1500 | 1500-2000 |
| Dry Food Storage | 300 | 350 | 350-450 |
| Cooler | 250 | 300 | 300-400 |
| Freezer | 350 | 350 | 350-450 |
| Dishwasher | 300 | 350-400 | 400-600 |
| Office | 150 | 150 | 150 |
| Locker Rooms, Toilet | 120 | 150 | 150-200 |
| Receiving and Holding | 300 | 300-400 | 350-450 |
| Auditorium | Small-250 persons | Medium-500 persons | Large-750 persons |
| Seating | 2500 | 5500 | 8250 |
| Stage | 2200 | 3000 | 3500 |
| Dressing Rooms (2) | 400/room | 500/room | 600/room |
| Make-up Room | 200 | 250 | 300 |
| Toilets with Shower | 128 | 128 | 180 |
| Costume Storage | 150 | 225 | 300 |
| Scene Shop | 800 | 1000 | 1200 |

| Teacher/Staff | Elementary | Middle Level | High School |
|---|---|---|---|
| Lobby | 500 | 1000 | 1300 |
| Toilets in Lobby Area | 492 | 600 | 672 |
| Control Room | 200 | 240 | 240 |
| Dimmer Room | 120 | 150 | 150 |
| Catwalks | 600 | 700-1000 | 700-1400 |
| Loading Bridge | 150 | 150 | 150 |
| Piano Storage | 80 | 80 | 80 |
| Other Options-see Part 3.08 (g) | | | |
| **Building Systems, Maintenance** | | | |
| Custodial | 400-600 | 500-700 | 600-800 |
| Custodial closets | 40 | 40 | 40 |
| Toilets | 2.5% x Net SF | 2.5% x Net SF | 2.5% x Net SF |
| General Storage | 3% x Net SF | 3% x Net SF | 3.5% x Net SF |
| Mechanical/Electrical Interior Systems | 7.5-8.5% x Net SF | 7.5-8.5% x Net SF | 7.5-8.5% x Net SF |
| Circulation and Structure | 30-40% x Net SF | 35-45% x Net SF | 35-45% x Net SF |

### *(b) Administration/Health Services*

Provide an accessible, customer-friendly administration and school nurse/health services office area to help set a positive tone for students and visitors to a school. Essential elements to consider for administration and health services spaces include:

(1) **Square footage:** 1,840-4,790 square feet depending upon school level, size, and staffing levels (see Table X above). Determine current and projected staffing levels to identify the needed spaces. The school nurse/health services room should be at least 650 square feet with an accessible toilet of at least 130 square feet. For vision screening, 22 feet is needed. Provide additional square footage as community health services are added.

(2) **Location:** Locate administration offices near the main entrance and/or student commons for ease of access by students, staff, parents, and visitors. Plan for the ease of traffic flow in and through the office area for students, staff, parents, and visitors. Provide for the visibility of bus loading and student commons areas from the administration office area.
In larger schools with student houses or wings, consider locating an assistant principal's office in those areas to personalize student services. However, do not forget to provide for support staff assistance to administrative staff and coverage for absent support staff when planning such a decentralized office location. Plan for a separate entrance and reception area for school district administration offices that are located within a school.

Provide a separate entrance for the school nurse/health services room for ready access by paramedics and to quickly transport students and equipment in and out of the building. Plan for the school nurse/health services room to have doors leading to the hallway, the administration and student services areas, and the chemical health specialist or other health related program.

(3) **Activities, equipment, storage, and other needs**: Multiple entrances/exits to ease traffic flow in and out of the administration office and a service counter to separate visitor from work and office spaces are important. Consider providing a school business window open to the corridor to sell lunch and school event tickets. Plan to soundproof inner offices for administrative staff, and provide portable walls to accommodate flexible locations for offices and workspaces.

Utilize the school nurse/health services room for the health care of students, health screening, and for storing student health records. Plan for a waiting area with chairs and a telephone, examination space with scales, table(s), an observable rest area with cots (one per 300 students with curtains on tracks), an isolation cot room, toilet(s), sink, and mirror, and secured storage spaces and a small refrigerator for medical supplies and prescriptions. Provide work and office spaces for administrators and the nurse or health specialist to prepare and store materials and access a phone, fax machine, computer with high-speed Internet access, printer, and copy machine.

### *(c) Guidance/Student Services*

Providing undersized guidance/student services spaces creates major problems for guidance and student services staff, student and parent access, traffic control, and the delivery of student services. Essential elements to consider for guidance/student services spaces include:

(1) **Square footage:** 1,000-4,400 square feet depending upon the school, size, and staffing levels. Determine current and projected staffing levels to identify the additional spaces needed for staff such as social workers, psychologists, audiologists, work-study coordinators, and others.

(2) **Location:** Within or near the administration area. Consider locating a guidance counselor's office in a student house or classroom wing. Do not forget to plan for support staff assistance to counseling staff and coverage for absent support staff. Plan to locate the career information center within or near the guidance/student services area or the library/media center.

(3) **Activities, equipment, storage, and other needs**: Plan flexible and expandable spaces to accommodate changing program and staffing needs. Provide at least one conference room large enough for 8-10 students. Acoustically treat offices to assure privacy and provide a locking file cabinet for guidance counselors. Provide a secure, accessible storage area for student records. Plan for accessibility to the area by students or parents with a disability. Provide for ample display/ bulletin board space within and adjacent to the guidance and student services office area.

Plan for several small multipurpose rooms for student government, debate, newspaper, yearbook, and other purposes. Consider providing a general conference room separate from the administration and guidance and student services areas to provide space for department meetings and teacher-student-parent conferences. Provide work and office space for guidance counselors to meet with students and parents, prepare and store materials, and access a phone, computer with high-speed Internet access, printer, and copy machine.

### *(d) Teacher/Staff*

Essential elements to consider for teacher/staff spaces include:

(1) **Square footage:** 50 square feet for a planning workstation, and 100-150 square feet for an office or for other spaces for intermittent staff, teacher aides, and volunteers. Plan for 10-20 square feet per teacher and staff member for conference, kitchenette, storage, and printing and copying spaces. Provide for and assure privacy for toilets of at least 120-180 square feet each for men and women adjacent to the staff dining/break room.

(2) **Location:** Central for accessibility of all staff, or near houses, departments, or program areas as appropriate. Provide groups of teachers common or shared planning workstations or office spaces to improve staff communications, team planning, and the use of resource materials. An all-staff dining/break room needs to be large enough to provide seating for 20-25% of the staff and have adequate power for appliances.

(3) **Activities, equipment, storage, and other needs:** Provide planning workstation and office spaces for teachers and staff to plan and prepare teaching materials, store equipment and materials, and access a phone, computer with high-speed Internet access, printer, and copy machine. Plan for the adequate ventilation of teacher and staff office areas.

### *(e) Food Service*

The food service area includes spaces for dining, food preparation, serving, storage, dishwashing, staff, and receiving and holding. Essential elements to consider for food service spaces include:

(1) **Square footage**: Provide 3,070-7,700+ square feet for a kitchen, serving line, storage, office, receiving and holding, and other spaces, in addition to student and staff dining spaces. Providing spaces for food preparation, meal service, and dining varies greatly depending upon the type of food service system, the number of menus, serving lines, and lunch periods, table and seating arrangements, and the ages and number of students served in each lunch period.

| Function /Activity | Space Needed |
|---|---|
| Cafeteria Dining Space | 12-16 square feet/student |
| Student Circulation Space | 30% of dining space |
| Staff Dining Area | 15 square feet/person |
| Full Preparation Kitchen | 1,000-3,000 square feet |
| Serving Kitchen Only | 250-1,800 square feet |
| Serving Line | 800-1,000 square feet |
| Dry Food Storage | 200-700 square feet |
| Refrigerated Storage | 130-750 square feet |
| Chemical/Soap Storage | 50-160 square feet |
| Freezer | 350-450 square feet |
| Pot and Pan Washing | 75-150 square feet |
| Dish/Try Washing | 100-400 square feet |
| Recycling, Laundry | 100-200 square feet |
| Office | 50-160 square feet |
| Lockers, Toilets | 100-250 square feet |
| Receiving and Holding | 300-450 square feet |

(2) **Location:** Near an outside delivery platform to easily move food and supplies to the inside receiving and holding area, through storage to the kitchen preparation areas, and finally to the serving area. Special consideration needs to be given to the layout of equipment, serving line(s), and the location of the dishwasher. Plan student traffic lanes in and out of the serving and dining areas to avoid cross traffic and allow for an orderly end to the serving lines. Locate the dishwashing area in a separate room close or adjacent to the kitchen, near an exit from the dining area, and accessible without crossing incoming traffic. Provide dining space for students who bring their own lunch and serving and dining facilities for students with disabilities.

(3) **Activities, equipment, storage, and other needs:** Plan a dining area that is attractive, brightly colored, cheerful, non-institutional in atmosphere, interesting, and preferably with windows to establish a pleasant eating environment. Utilize dining space for a student commons, large group instruction, study hall, or community meetings. Provide work and office space for a food service director to prepare and store materials and access a phone, computer with high-speed Internet access, printer, and copy machine.

For further information, please refer to the following publications:

- The New Design Handbook for School Food Service (https://eric.ed.gov/?q=The+New+Design+Handbook+for+School+Food+Service&id=ED432881) provides guidelines for designing or improving food service areas. Covers traffic flow, efficient kitchen layout, and equipment requirements. 227 pages.
- A Guide for Purchasing Food Service Equipment (presents a decision-making process and critical pathway approach to purchasing conventional foodservice production equipment. Addresses issues related to new construction, renovation, and replacements. 304 pages.

- A Guide for Purchasing Food Service Equipment and The New Design Handbook for School Food Service can be downloaded in PDF format or purchased in hardcopy from the National Food Service Management Institute website (https://theicn.org/). To order by phone, call 1-800-321-3054.
- Rules for Food and Beverages Establishments, a publication from the Minnesota Department of Health, provides guidelines on sanitation, cleaning, water supply, disposal, floors, walls, ceilings, lighting and ventilation. This resource can be purchased from Minnesota's Bookstore. To order by phone, call 651-297-3000 or 1-800-657-3757.

Involve food service staff who will use the facility throughout the planning process. Consider employing professional consultants who work with school kitchen design and layout.

Sources: The New Design Handbook for School Food Service; National Food Service Management Institute
A Guide for Purchasing Food Service Equipment; National Food Service Management Institute
Rules for Food and Beverage Establishments; Minnesota Department of Health

### *(f) Auditorium*

Early in the planning process, a school district needs to decide whether to design an auditorium space specifically for music, theater performances, or for multipurpose uses. Auditoriums typically provide space for many school and community events, suggesting that a multipurpose auditorium is suitable for most school districts. Essential elements to consider for auditoriums include:

(1) **Square footage:** 8,220-17,787+ square feet for an auditorium seating 250-750 persons, not including optional features listed below. Each type of auditorium has specific size, shape, and outfitting requirements. Larger auditoriums need more and larger spaces than smaller auditoriums. Refer to Table VIII School Support Space Square Footage Guidelines for specifications for a small, medium, and large auditorium. An auditorium should provide space for most of the following functions/activities:

| **Function /Activity** | **Space Needed** |
|---|---|
| Seating | 10-12 square feet/seat |
| Stage 20-50 feet deep | 2,200-3,500 square feet |
| Dressing Rooms | 200-300 square feet/DR |
| Make-Up Room | 200-300 square feet |
| Toilets with Shower | 64-90 square feet |
| Costume Storage | 150-300 square feet |
| Scene Shop | 800-1,200 square feet |
| Lobby | 1.5-3.5 square feet/seat |
| Toilets in Lobby | 492-672 square feet |
| Control Room | 200-240 square feet |
| Dimmer Room | 120-150 square feet |
| Catwalks | 600-1,400 square feet |
| Loading Bridge | 150 square feet |
| Piano Storage | 80 square feet |
| Green Room (optional) | 150-250 square feet |
| Grid Iron (optional) | +/- ¾ stage area |
| Camera Ports (optional) | 50 square feet per port |
| Orchestra Pit (optional) | 400-700 square feet |
| Coat Room (optional) | 80-150 square feet |
| Sound Tower Storage (optional) | 150 square feet |
| Ticket Office (optional) | 80-160 square feet |
| Concessions (optional) | 200-250 square feet |

(2) **Location:** In a separate wing of the school to minimize adverse sound transmissions to other school areas. An entrance to the stage portion of the auditorium should be near the music and

drama/theater classrooms. The lobby should not be near the stage entrance for proper performer/audience visual and acoustic separation. Consider sharing auditorium lobby/commons space with the gymnasium and cafeteria; however, crowd and noise control from concurrent events need careful attention, as do building code requirements for lobby intermission activities. The auditorium should have ready access to an entrance for rapid exiting of parents and visitors. Special attention must be given to providing adequate parking and access roads for easing traffic.

(3) **Learning activities**: In addition to musical or dramatic performance activities, students will engage in auditorium and performance management activities, including theatrical lighting, sound system, rigging design and execution, scenery design and construction, recording, and directing. Consider providing smaller areas (e.g., seating for 75-150).

(4) **Teacher, school large group presentations, or for community use**. Students may also participate in and learn from other school and community group programs and performances.

(5) **Learning aids, equipment, and technology:** Design considerations determine what learning aids, equipment, and technology are needed in an auditorium. These design considerations include: the auditorium shape, stage type, floor slope, fly, proscenium proportions, rigging, curtains, acoustical equipment and layout, catwalks, loading bridge (assists the rigging system for raising scenery), box booms, theatrical lighting, dimming equipment and capabilities, fire safety, control room, sound system, camera ports, special needs student/adult accessibility to seating and stage, noise criterion, heating, ventilation, and air-conditioning, sound isolation, video projection, and video production.

(6) **Storage, other needs:** The design of the auditorium, i.e., its shape, stage type, floor slope, rigging, curtains, rigging, lighting, etc., will determine storage and other needs. For example, providing a wide space is desirable for dramatic performances and a narrow space is desirable for musical performances. A multipurpose auditorium is normally a hybrid of the two designs. Common stage types are proscenium, thrust, theater-in-the-round and arena. The proscenium stage is very common. Consider the specific advantages and disadvantages of each stage type.

Consult with an architect who specializes in design consideration options early on in the planning process to help determine design specifications, equipment, technology, storage, and other costs. The greater the amount of pre-planning of spaces to be used by various school and community activities, the better fit the auditorium will be for users.

## (g) Building Systems, Maintenance, Storage

Providing a smoothly operating and well-maintained school improves the learning environment and creates a more welcoming tone for students, staff, parents, and visitors. It is much more difficult to create such an environment without adequate spaces for mechanical, electrical equipment, and custodial services. Involve school district maintenance and school custodial staff with engineers and architects in determining what spaces are needed. Essential elements to consider for building systems, maintenance, and storage spaces include:

(1) **Square footage:** 400-800 square feet for a custodial workshop, office, and storage space, and 40 square feet per custodial closet. Plan for 2.5 percent of the net square feet of the school for toilets, 3-3.5 percent for general storage, 7.5-8.5 percent for mechanical/electrical interior systems, and 30-45 percent for circulation and structure. A student commons area, auditorium, pool, and lobby spaces require additional square footage.

(2) **Location**: Provide for one or more custodial closets, complete with service sinks, on each floor or for each wing of the school. Locate the custodial workshop, office, and storage space(s) near an outside shipping/receiving area with a loading platform. Provide closets, receiving and storage spaces, and toilets near areas requiring special maintenance, equipment, and supplies, such as the cafeteria, gym, pool, auditorium, or industrial technology. Plan a separate storage space for flammable supplies away from student traffic areas. Consider locating student lockers in one or more locker bays or in hallways throughout the building.

(3) **Activities, equipment, storage, and other needs:** Providing storage spaces for outdoor maintenance equipment such as mowers, snow removal equipment, ladders, and other tools and equipment is essential. Storage areas for equipment and fuel must comply with fire code regulations. School bus garages require the design services of a registered architect or engineer and must conform to all building code requirements.

## Part 3.11 Guidelines for Community Use/Partnership Spaces

School-community partnerships" have long been a part of school districts and communities. In urban and rural areas, the school has traditionally been a vital and central part of neighborhood and community life. In recent years, family, school and community engagement has become essential for achieving desired educational outcomes. Engagement activities establish relationships, define roles and develop competence of teachers, parents, administrators and community members to establish an effective support network. People who care about children's achievement gain the competence to be a part of a successful education system.

Schools often use school spaces to provide additional programs and services for students, adults, and community members, and organizations. These programs and services include preschool and after-school classes, social services such as day care and counseling, health services, parent education, adult education, community sports and recreation, community cultural and art exhibitions, senior citizen activities, and civic and private organization meetings/events.

School-community partnerships may also include formal contract use agreements with community groups, public agencies, and private organizations. Developing such partnerships is in the long-term best interest of school districts and communities alike. Community use of school facilities enables more cost-effective use of public resources and builds stronger bonds between schools and communities.

For example, under Minnesota Statutes, section 124.D23, Family Services and Community Based Collaboratives, a school district may qualify as a family services collaborative with at least one of each, a county, public health organization, community action agency and Head Start grantee, and include other community service providers who agree in writing to provide coordinated family services and commit resources to an integrated fund. Through joint powers agreements and interagency agreements, schools can be the hub for service planning and delivery.

To successfully develop partnerships, consider including the following components:

- joint facility, program, and operations planning;
- joint ownership and operational agreements;
- joint funding from multiple sources and fee schedules for community users;
- clearly defining goals, roles, clientele, coordination needs, and communication channels;
- sharing information and meeting with school and partnership program staff;
- separating partnership program budgets and review by all partners, if applicable; and
- setting up an advisory council of participating community groups, public agencies, and private users.

To increase community use, school facility designs should include the following features:

- a large, mall-like building easily modifiable to accommodate program and partnership changes;
- separate, private areas to house partnership programs and services with multiple secure entrances;
- ample office, conference, classroom, and storage spaces which can be easily resized;
- central mechanical system control and surveillance; and
- a sophisticated security system.

Sources: Minnesota Statutes, section 124D.23

Minnesota Department of Education, Family, School and Community Engagement
(https://education.mn.gov/MDE/dse/fsce/)

U.S. Department of Education Family and Community Engagement Website
(http://www.ed.gov/family-and-community-engagement)
Community Center Schools for Today; Ringers, Joe CEFPI's Educational Facility Planner; 1996
Establishing a School-Community Agency Collaboration; NASSP Practitioner; 1992

### *(a) Community Education*

Community education includes early childhood family education, child care, adult basic education, and other programs for children, youth, and adults based upon community member and school district requests.

### *(b) Adult Basic Education Spaces*

Many school sites provide spaces to accommodate day and/or evening classes in Adult Basic Education (ABE). These programs include adult diploma, English as a second language, family literacy, GED, and basic skill brush-up classes. Essential elements to consider for ABE program school facility spaces include:

- classroom space with adult-size chairs and desks. Portable walls/dividers are desirable to facilitate small group learning;
- computer workstations and computer labs with adult-size chairs and tables
- space/rooms for preschool aged child care and family literacy; and
- small, private spaces for one-to-one tutoring, learner assessment activities, and counseling.

### *(c) School-Age Care*

An increasing number of school districts are offering School-Age Care (SAC) for children and youth from kindergarten through age 14 as part of their community education program. The overall purpose of such programs is to expand students' learning opportunities during their out-of-school time. One out of eight school-aged children in Minnesota is left alone during their out-of-school time. Welfare reform is also increasing the need for accessible, high quality child care, including school age care. Most participating school districts provide programs after school, others before and after school, and more than half school release day, summer, and vacation day programs. Many districts offer either half day or every other day SAC programs for kindergartners. Participating children and youth in SAC programs can spend more time in the SAC environments than they do in the classroom or at home.

Schools can be rich environments for SAC programs, children, youth, and families. Quality SAC programs provide a wide range of children with multiple levels of abilities, needs, and interests with accessible indoor and outdoor environments that meet the needs of their age group. SAC programs are "gateways" to schools and can be integrated with activities involving families and community groups.

It is important to provide SAC programs dedicated space(s) for program activities, in addition to integrating activities and sharing school spaces with other programs. Plan for providing spaces for SAC activities, including classroom, storage, computer lab, gymnasium, art and music, media center, cafeteria, and outdoor spaces with age appropriate equipment.

Provide square footage to meet the needs of the age group and the number of children or youth served. See elementary school space descriptions under Part 3.05 (e.g., Early Childhood, Kindergarten, etc.) for square footage guidelines and essential elements for each space.

Sources: Minnesota Statutes, section 124D.19, subdivision 11
Minnesota Statutes, section 124D.22, subdivisions 1-4

### *(d) Public/School Library*

School-community partnerships enhance school and community resources and services. Public/school libraries sharing services are one such potential partnership. Developing a jointly operated library requires the full participation of school, public library, community, and city/county representatives.

Minnesota Statutes, section 134.195 provides for a school district and a city to jointly operate and finance a public library, subject to approval by the governing school and public library boards. Criteria for public library services operated under such a joint agreement include the following:

- the public library shall be centrally located in the community;
- a separate entrance, accessible from the outside of the school building, shall be provided for persons using the public library;
- the public library shall be available for users during school hours and during at least 15 additional evening and Saturday hours;
- public library services, materials, programs, and equipment shall be available for simultaneous use by students and public library users;
- the public library shall have a separate telephone service;
- parking, restrooms, water fountains, and other necessities shall be easily accessible to public library users; and
- a media supervisor licensed by the board of teaching may be the director of the public library.

Special design considerations are required in part to ensure the safety of school children in proximity to public library users and to provide adequate services for public library users. These considerations include:

### *(e) Location, Entrance, and Adjacent Areas*

- provide a distinguishable building façade and exterior signage that clearly state that a public library exists within the school;
- design the required separate entrance to the public library to eliminate the possibility of an unauthorized person gaining access to students in or near their classrooms;
- designate a public library parking area separate from student and staff parking areas;
- provide lighted parking and sidewalk areas for the safety of public library users during evening hours;
- comply with local and state regulations concerning emergency exits and evacuation signage;
- locate the public library on the ground floor accessible to those with special needs;
- provide signage which clearly indicates where the public can and cannot go; and
- provide restrooms and water fountains that can be used by public library users without entering student portions of the school.

### *(f) Public Library Areas*

- design a highly open, visible public library area to quickly provide assistance to users and to minimize staffing;
- provide a large reference desk to permit the school and/or public librarian to work;
- provide a variety of seat, table heights, and shelving to accommodate children, adults, and special needs users (including preschool and home-school students);
- provide a public user area for research/reading without disturbance by student users;
- provide enough library equipment for student and public users, especially for computers accessing library resources, databases, or online and Internet services;
- provide a meeting room (not a classroom) for preschool children's story-times during school hours and for after-school children, adult, and community programs;
- provide a separate space for the delivery of public library materials;
- provide separate public and school library office, work, break, and storage areas;
- consider shelving public library materials for children and young adults with school materials; and
- provide separate air-conditioning and heating units or access to the equipment by public library staff.

A manual developed by MDE provides guidance to schools, districts and communities in analyzing the desirability of a joint public/school library partnership. Consult the "Jointly Operated School and Public Library Services…" guide referenced below for further information. Questions on joint school/public libraries should be directed to:

Minnesota Department of Education
State Library Services and School Technology
1500 Highway 36 West
Roseville, MN 55113
651-582-8251

Sources: Minnesota Statutes, section 134.195
Jointly Operated School and Public Library Services in the Same Location: Co-Location; State Library Services and School Technology; 2000