Facilities Planning Guide
for Maryland Public Schools

Interagency Commission on School Construction

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IAC Facilities Planning Guide

Record of Changes

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1 Acknowledgments

Special acknowledgment is given to the 21st Century Schools Commission of the General Assembly of Maryland and the staff of the Interagency Commission on School Construction, who collectively dedicated more than two years to developing the program revisions that this *Planning Guide* accompanies. Additional deep thanks is given to the staff members of the local education agencies (LEAs) who gave their scarce time to provide input into and feedback on the content of this *Guide*.

2 Glossary

Definition of terms and acronyms used in this document:

Term/Acronym	Definition
ASHRAE	The American Society of Heating, Refrigerating and Air-Conditioning Engineers is a global professional association seeking to advance heating, ventilation, air conditioning and refrigeration systems design and construction.
Building Efficiency	The ratio of net square footage to gross square footage.
Campus	The facility and the site on which it is located.
Construction	The process of building, altering, repairing, improving, or demolishing any structure, building, or other improvement to real property. This includes any major work necessary to repair, replace, prevent damage to, or sustain existing components of an improvement to real property. (Construction does not include the maintenance or routine operation of an existing improvement to real property or activities related to an energy performance contract.)
Cooperative-use Space	Space within a school facility that is utilized to serve school children and/or the general community in order to support LEA and/or community initiatives and is in addition to space primarily designed for educational functions.
DGS	Maryland Department of General Services
DLLR	Maryland Department of Labor, Licensing, and Regulation
Facility	The building or buildings located on a single site.
FAPE	Free appropriate public education
GAB	Gross Area Baseline
Gross Square Footage (GSF)	The sum of the Net Square Footage (assignable space) and the Tare, which includes all building areas as measured to the outside of the exterior walls but does not include non-assignable penthouse spaces covered by a roof.
IAC	Interagency Commission on School Construction
IDEA	Federal Individuals with Disabilities Education Act, says states must assure that a free appropriate public education is made available to all children with disabilities.
IEP	Individualized Education Program — special education and related services to meet each students' unique needs
LEA	Local Education Agency
Locally Funded Project	A school construction project that the owner has designed, built, or occupied prior to State approval of planning.
MACC	Maximum allowable construction costs
Maintenance	Routine, preventative, or corrective activities that are performed to a facility to 1) continue operations or upkeep; 2) prevent deterioration; or 3) correct a deficiency.
MSDE	Maryland State Department of Education

Term/Acronym	Definition
Net Square Footage (NSF)	The interior usable spaces of a building that are required to meet general or specific programmatic needs.
Nominal Utilization	The total number of students enrolled in a school divided by the facility's state rated capacity (SRC) or state facility capacity (SFC) when an SFC is available for that facility.
Projected Enrollment	The total number of students that an LEA estimates will attend a school in the seventh year from the year of project funding request.
Renovation	A major construction project to upgrade an existing building and site, or a portion of a building and site, to achieve the current educational, building performance, and aesthetic qualities of a new school.
Site	The bounded area of land underneath and surrounding a facility.
Space Utilization	The percentage of normal operating hours during which an assignable space in a facility is occupied by the full number of users for which it is designed. When aggregated, the utilization for all assignable spaces in a facility can produce an overall space-utilization rate for the facility.
State Facility Capacity (SFC)	The number of students that the IAC or its designee determines that an individual facility has the physical capacity to enroll based upon an analysis of programming and space utilization.
State Rated Capacity (SRC)	The number of students that the IAC or its designee determines that an individual facility has the physical capacity to enroll based upon a calculation using standardized class sizes published by the IAC.
Supportive Practice	A technique, process, activity, or consideration that typically proves to be effective in meeting or exceeding sufficiency. These techniques and processes have been tested in past school designs and construction projects and can usually be adapted for use on new projects.
Tare	The non-assignable spaces within the building, including the circulation areas such as corridors, stairways, and elevators; restrooms (except for specialized restrooms such as in a kindergarten classroom); mechanical rooms (except for those in non-assignable penthouse spaces covered by a roof, which are not counted in gross square footage); electrical rooms; and the thicknesses of the walls and other partitions.
Total Cost of Ownership	The costs of constructing the facility (including the maximum allowable construction costs (MACC) and soft costs but excluding land-acquisition costs and costs outside the property lines) plus the costs of operating and maintaining the facility over 30 years and the costs of renewing building systems and components over 30 years.

3 The Maryland Educational Facilities Sufficiency Standards

Maryland state law gives the State Superintendent of Education the authority to approve or disapprove any plan or specification for the construction or renovation of—or addition to—a school building when the project will cost more than $350,000.[1] Maryland state law also gives to the Interagency Commission on School Construction (IAC) the authority to adopt regulations containing requirements for the approval of sites, plans, and specifications for school-building capital projects.[2]

[1] Md. Educ. Code Ann. § 2-303(f); 13A COMAR 01.02.03.

[2] Md. Educ. Code Ann. § 5-303(d).

To assist local education agencies (LEAs) as they seek approvals for capital projects, the IAC adopted in 2018 the *Maryland Public School Educational Facilities Sufficiency Standards*. The *Educational Facilities Sufficiency Standards* establish **minimum** levels for the physical condition, capacity, and educational suitability of public school facilities. The scope of these standards is limited to space and attributes needed to support the educational programs and curricula required by the Maryland State Board of Education in a manner that is sustainable within the operational budgets of the school systems for staffing, maintenance, and full utilization of the facilities. The *Educational Facilities Sufficiency Standards* are dynamic; the IAC shall periodically review them and recommend changes to them as time and circumstances require.

4 Purpose

The *Facilities Planning Guide* provides information intended to assist local education agencies (LEAs) in the acquisition of school sites and the planning and design of new schools, additions, and renovations in alignment with the *Educational Facilities Sufficiency Standards*. This *Guide* presents 1) the *Educational Facilities Sufficiency Standards* and 2) supportive practices and other guidelines to help inform LEAs as they plan their school facilities.

The IAC intends this *Facilities Planning Guide* to be a reference tool that complements and supports the *Educational Facilities Sufficiency Standards*. The *Facilities Planning Guide* does not supersede or increase the state's adopted *Educational Facilities Sufficiency Standards*. If there appears to be a conflict between the *Educational Facilities Sufficiency Standards* and the *Facilities Planning Guide* during the appraisal for sufficiency of an existing facility, the *Educational Facilities Sufficiency Standards* shall control.

By design, the *Guide* remains a dynamic document that the IAC intends to review periodically and modify to adapt to changes in Maryland's educational programs and facilities requirements. As the IAC develops or amends related policies, it will update this *Guide*.

5 Selected Policies and Procedures

A. School Classifications

Although school grade-level configurations may vary from LEA to LEA and within a given LEA, the Sufficiency Standards and this Guide are based on the following grade-level configurations:

1. Elementary Schools (PK-5 or any subset thereof)
2. Middle school (6-8)
3. High school (9-12)
4. Combination school (a combination of any grade levels)
5. Other school (includes early-childhood-education centers, special-education centers, career-technology centers, alternative-education schools)

B. Space Allocation

1. **Gross Area Baselines** (**GAB**s) in **gross square feet** (**GSF**) and GSF per pupil. The IAC has established Gross Area Baselines for determining state funding participation in facilities based on the type of school and number of students that the school is designed to serve. See Appendix C. The Baselines describe the default outer boundaries of size in which the state will participate while allowing the IAC to grant variances on a case by case basis as appropriate. Working within the total GSF allotted for the projected number of students to be served, an LEA should size individual spaces within the facility to accommodate the intended programs and to meet the required building efficiency and utilization ratios.

   Exceeding the GABs. If the square footage for a planned facility exceeds the GABs, the school district may wholly fund the excess area through a locally-funded initiative in addition to contributing the required local share to the project. As in the case of all projects reviewed by the IAC, the IAC will request both an estimate of the total costs of ownership (TCO) as well as space-utilization analyses to assist the IAC in working with the LEA to optimize the design of the facility.

   Exception: Certain oversized existing spaces may cause a given facility to exceed the allowable total GSF calculated using Appendix C. If the excess existing space cannot economically be subdivided or converted for other required purposes to meet sufficiency while remaining functional, then the excess amount of such space shall be individually identified, quantified separately, and excluded from the total GSF calculation for the entire school.

2. **Space Utilization.** Space utilization is the percentage of normal operating hours during which an assignable space in a facility is occupied by the full number of users for which it is designed. The inputs needed for the analysis are a listing of the assignable spaces and, for each space, a schedule of its uses and the number of users. Due to scheduling inefficiencies, the utilization of school facilities is normally less than 100%. An appropriate total **space**-**utilization ratio** is 80% or greater for middle and high schools and 95% or greater for elementary schools. The GABs in Appendix C assume a high utilization ratio for the facility.

3. **Building-Efficiency Ratio.** Building efficiencies for school buildings vary depending on the specific building design and variables such as school level, number of students, climate, and programmatic requirements. If you know the NSF, you can estimate the GSF by either of the following two methods:

   a. **Dividing the NSF by the target building efficiency**

      Sample calculation: An example for a facility with 70,000 NSF of programmable area is as follows:

      GSF = NSF divided by 70%:

      Divide 70,000 NSF by 70% = 100,000 GSF

      Tare: 100,000 – 70,000 = 30,000 sf

   b. **Multiplying NSF by target efficiency factor**

      Efficiency factor examples:

      75% efficiency = 1.33 70% efficiency = 1.43 65% efficiency = 1.54

Sample calculation: An example for a facility with 70,000 NSF of programmable area is as follows:

GSF = NSF multiplied by efficiency factor

Multiply 70,000 NSF by 1.428 = 100,000 GSF (nearest 1,000)

Tare: 100,000 – 70,000 = 30,000 sf

c. **Tare**

The IAC maintains a target maximum tare percentage of 30% for state-funded projects. The GABs are calculated based on a target maximum tare of 30% of gross square footage.

4. **Cooperative Use.** A school facility is a major public asset to a community and can help to meet various community needs. As resources such as water and energy become more expensive, maximizing the utility of a school facility—and therefore the return on the community's capital investment in that facility—becomes even more important. One way to increase the utility of a school facility is to design it to support both the educational programs it houses and other community activities. Cooperative-use space is in addition to space primarily designed for educational functions. Examples of such activities include the delivery of health services through a school-based health center and the provision of before- or after-care services for students. The IAC encourages school districts to fully examine opportunities for developing the shared use of public-school facilities when such use is appropriate and will result in mutual benefit to the educational program and to the community and the costs of operating and maintaining the space are appropriately apportioned. Up to 3,000 gross square feet of cooperative-use space in a school facility can be eligible for State funding participation.

C. Ineligible Expenditures

See Appendix B for a list of the facilities-related expenditures that are ineligible for state funding.

D. Process for Submitting Planning and Design Documents to the IAC

The IAC staff (which includes MSDE architects and DGS architects and engineers) reviews programs and plans for all new facilities and renovation projects whether systemic or whole-school. Please contact MSDE's School Facilities Branch and DGS's Public Schools/Community Colleges team for detailed submission requirements.

The IAC plan reviewer subsequently sends written notification listing the results of each review to the LEA, the LEA's design professional, and the IAC regional project manager responsible for that LEA. If the IAC plan-review process results in the identification of design components that do not meet the Sufficiency Standards, the LEA and design professional must respond promptly with corrections or further clarifications. These should be addressed directly to the IAC plan reviewer.

In the event that the corrections or clarifications have not, in the judgment of the IAC plan reviewer, resulted in conformance with the Educational Facilities Sufficiency Standards described in the Guide, the LEA may either accept the decision or appeal it using the appeals process described in section 701 of the IAC Administrative Procedures Guide.

1. Educational Specifications

Educational specifications (ed specs) are a tool used to communicate educators' requirements to facility designers. Ed specs are required for all new construction, renovation, limited renovation, and addition projects affecting schools. Space allocations for a new project are initially developed during the production of ed specs. This *Guide* is a resource that will assist the planner and the LEA in determining the total size of the project and individual space needs. Information about ed specs and related State requirements is available in Section 202 of the IAC Administrative Procedures Guide at: http://iac.maryland.gov/APG/revisedapgindex.cfm.

Along with ed specs, the IAC requests that LEAs use and submit to the IAC the following tools:

a. The IAC's Ed Specs Total Cost of Ownership Estimator, which estimates the total cost of ownership over 30 years by applying industry standards for maintenance and operations as well as capital maintenance on an annual basis to the initial cost of construction. This tool helps LEAs estimate the future costs associated with a given project scope and shows that, in general, the 30-year costs are greater than the initial cost of construction even when not adjusted for inflation.

b. The IAC's Space-Utilization Calculators, which help LEAs calculate and project the percentage of normal operating hours during assignable spaces in a facility will be occupied by the full number of users for which they are designed. Use of this tool can help LEAs identify opportunities to trim facility size and associated costs through more efficient uses of spaces within the facility.

2. Feasibility Studies

Once an LEA has identified the programmatic requirements for a facility through ed specs, an LEA often will conduct a feasibility study to consider how various potential project solutions might meet the programmatic requirements and the pros and cons of each. A feasibility study also helps determine the practicality and likelihood that a certain site will meet given criteria. The options must evaluate how well the existing building(s) and each renovation and replacement option will accommodate the educational program.

The Maryland Interagency Commission on School Construction requires that a feasibility study be performed to justify the abandonment of an existing facility or the demolition of more than 50% of the gross square footage of an existing facility.

The study shall include one or more renovation options without major educational program deficiencies and a replacement option.

Each scheme is required to have:

a. floor plans at schematic design level;

b. a space summary comparison of each space;

c. a list of educational program deficiencies categorized as major or minor;

d. a 40-year life-cycle cost analysis of all building systems and construction; and

e. a cost estimate of construction, demolition, temporary housing (swing space), student transportation if required, interest on bond debt, maintenance costs, and energy costs.

Soft costs such as design fees, phasing costs, permitting fees, bonds, overhead and profit may also be provided in a separate section of the cost estimate.

6 Supportive Practices in Planning

As used in this Guide, a "supportive practice" is a technique, process, activity, or consideration that typically proves to be effective in meeting or exceeding sufficiency. These techniques and processes have been tested in past school designs and construction projects and can usually be adapted for use on new projects. The supportive practices included in the Guide should provide for increased efficiency in the programming and design processes and reduce the chance for errors in meeting the owner's needs. The supportive practices in this document are divided into those that are general in nature and others that are specific to each building-area category. An example of a specific supportive practice would be including two separated road access points in a school's site design as part of meeting the sufficiency standard of "[a] school site [that is] configured for safe and controlled ingress and egress."

A. Function of a School Facility

The primary purpose and function of a public school facility in Maryland is to provide a physical environment that facilitates student learning and the delivery of educational programs that meet the state's educational requirements. The state supports this purpose and function through contributions to local school-construction projects. Any additional functions—such as serving as a shelter in case of natural disaster or other emergency—are secondary to the educational functions of the school facility.

A facility's physical characteristics should reinforce and support the implementation of the educational requirements set by statute as well as those adopted by the LEA. These characteristics include site development, arrangement of spaces, occupant circulation, lighting, temperature comfort such as individual room controls, adequate air changes, storage, security, safety, and noise control. Functional school buildings are a product of an educational planning process that leads to a design that organizes all activity and space around students and teachers and the desired educational outcomes.

The design of facilities should be a collaborative process developed by staff, students, and community members with a clear vision of both the learning methods and the human roles that the spaces in the school will serve. Good design for any school building pays attention to vision, educational standards, and performance criteria, and supports the activities that translate those standards into learning, the spaces needed, and the relationship between those spaces and the persons who use them.

MSDE's content standards, benchmarks, and performance standards indicate the learning outcomes to be achieved by all students. In doing so, the educational standards describe the educational requirements for public schools in Maryland that each public school facility therefore must support. The standards provide guidance to the work of MSDE, local school boards and administrators, and local school personnel.

B. Long-Term Operations, Maintenance, and Sustainability

Sustainable design, construction and operation of K-12 educational facilities are highly valued. The ASHRAE definition of Sustainability is "providing for the needs of the present without detracting from the ability to fulfill the needs of the future". The fruit of a good sustainable design is protection of taxpayer investment, lesser operational costs, and more funding available for the classroom.

Maintainability is a major consideration through the entire building life-cycle, such as how often maintenance is required, location/accessibility to equipment, unintended consequences of one system upon

another (such as roof top equipment and roof damage), ease of custodial upkeep and safety of chemicals used for custodial purposes, and so on.

Durable construction materials and efficient systems typically reduce long-term operational and maintenance costs. The significant public investment in school facilities requires solutions that consider the continued costs and responsibilities of long-term building ownership. The design must facilitate the ability of school support staff to sustain the efficient operation and maintenance of the building after occupancy.

Sustainability also pertains to the facility location. Consider water availability, snow accumulation, freeze-thaw, drainage patterns, wind loads, expansive/collapsible soil, transportation availability and cost, future traffic, and future neighborhood development in the design solutions.

Air infiltration shall be maintained in compliance with ASHRAE Standard 62.1. All reasonable measures will be taken to minimize undesirable air infiltration for purposes of energy management, maintenance, and building occupant health. These measures should include vapor barriers, foam sealing of building penetrations, continuous air infiltration retarder, airtight seals of window and doors, double-door vestibule ingress and egress, and any other applicable measures. Tracer gas and/or pressure testing may be used as a performance measure, per ASTM E779.

C. Energy Management

The volatility of energy supply markets presents a difficult challenge in predicting long-range utility costs for schools. School buildings must be designed to optimize energy use and minimize utility costs.

All school building construction or renovation projects should make use of the best available technologies that minimize energy use and life costs within the budgets of individual projects. Special consideration shall be given to the building envelope, where actual performance for building systems and components installed in the structure must meet or exceed applicable standards and code requirements that are verifiable upon installation.

D. Total Cost of Ownership

An emphasis on the total cost of ownership—rather than only the first cost to construct a facility—is essential to creating an educationally sufficient and fiscally sustainable portfolio of schools. The costs of ownership of a facility fall into three main categories: 1) the costs of constructing the facility; 2) the costs of operating and maintaining the facility; and 3) the costs of renewing the facility and its major components when they reach the end of their service lives. Because the bulk of these three types of costs fall on the LEA, each LEA must devote considerable care to evaluating the costs in each of the three categories prior to constructing a facility. LEAs' capital and operating budgets each have limits. When constructing a facility, the LEA should consider the effects that design and construction decisions may have on the costs in each of the three categories.

Maryland law requires that a district school board "obtain [from the Department of General Services (DGS)] a projection of life-cycle costs and an energy consumption analysis for any new construction or

modernization project to which the State contributes funding.[3] "Life-cycle costs" means the sum of the following costs of a building:[4]

1. The cost of initial construction;
2. The cost of all energy conservation measures;
3. The cost of operation and maintenance, including labor and materials, for the life of the building;
4. The cost, over the life of the building, of the fuel used by:
    a. the equipment that controls or provides the humidity, lighting, power, temperature, and ventilation of the building; and
    b. other energy-using equipment in the building; and
5. The other costs incident to owning the building.

Information about criteria to be used in these analyses is provided in Appendix G of the IAC Administrative Procedures Guide, DGS's *Procedures for the Implementation of Life-Cycle Cost Analysis and Energy Conservation*, and DGS's *Procedure Manual for Professional Services*. In addition, the IAC offers tools that can help LEAs estimate the total cost of ownership of a proposed facility design.

In construction, rapid cost escalation can jeopardize the timely execution of even modest building projects. The designer must clearly inform the public owner regarding any new factor significantly affecting the project budget as the design develops. Long-term operational cost savings appear to be a benefit related to simpler and more efficient designs. When more costly solutions are needed to achieve desired functional or long-term operational benefits, the designer should weigh the pros and cons with the owner prior to proceeding. The IAC encourages innovative and cost-effective design that is appropriate to the facility's location.

7 General Requirements for School Facilities

The Facilities Sufficiency Standards are not intended to supersede or support any noncompliance with applicable building and fire codes or any other code, regulation, law, or standard that has been adopted by any Maryland state agency. Applicable codes and standards can be found on the website of the Building Codes Administration within the Maryland Department of Labor, Licensing, and Regulation (DLLR) at http://www.dllr.maryland.gov/labor/build/.

The following specific requirements apply to all public school facilities in Maryland:

A. Building Condition

A school facility must be safe *(COMAR 13A.01.04.03)* and capable of being maintained.

1. Structural. A school facility must be structurally sound. A school facility shall be considered structurally sound if the building presents no imminent danger or major visible signs of decay or distress.

[3] Md. Code Ann., State Finance & Proc. Art., § 4-803.
[4] Md. Code Ann., State Finance & Proc. Art., § 4-801(f).

2. Exterior envelope. An exterior envelope is safe and capable of being maintained if:
    a. Walls and roof are weather tight under normal conditions with routine upkeep;
    b. Doors and windows are weather tight under normal conditions with routine upkeep; and
    c. The building structural systems support the loads imposed on them.
3. Interior surfaces. An interior surface is safe and capable of being maintained if it is:
    a. Structurally sound;
    b. Capable of supporting a finish when designed to carry a finish; and
    c. Capable of continuing in its intended use with normal maintenance and repair.
4. Interior finishes. An interior finish is safe and capable of being maintained if it is:
    a. Free of exposed lead paint;
    b. Free of friable asbestos; and
    c. Capable of continuing in its intended use with normal maintenance and repair.

B. Building Systems

Building systems in a school facility must be in working order and capable of being properly maintained. Building systems include roof, plumbing, telephone, electrical, and heating and cooling systems, as well as fire alarm, 2-way internal and external communication, technological infrastructure, and security systems.

1. **General**. A building system shall be considered to be in working order and capable of being maintained if all of the following apply:
    a. The system is capable of being operated as intended and maintained.
    b. Newly manufactured or cost-effective refurbished replacement parts are available.
    c. The system is capable of supporting the standards established in this rule, including those pertaining to temperature, humidity, and indoor-air quality.
    d. Components of the system present no imminent danger of personal injury.
2. **Plumbing fixtures**. Fixtures shall include, but are not limited to, water closets, urinals, lavatories, and drinking fountains. In all new construction, restrooms shall be available so students will not have to exit the building. In existing facilities, restrooms shall be available for general classrooms for grades 3 and below and special needs classrooms without having to exit the building, wherever possible within reasonable cost constraints.
3. **Fire alarm and emergency notification system**. A school facility shall have a fire alarm and emergency notification system as required by applicable State fire codes and emergency procedures.
4. **Two-way communication system**. A school facility shall have a two-way internal communication system between a central location and each classroom, isolated office space, library media center, physical education space, cafeteria, and other regularly-used spaces.

C. Building Performance

Title 5, section 312 of the Education Article of the Maryland Code Annotated states that "a new school that receives State public school construction funds shall be constructed to be a high performance building" unless specifically granted a waiver by the IAC. See also COMAR § 23.03.02 and IAC Administrative Procedures Guide § 105. For the purposes of this statute, "high performance building" is defined as a building that

1. Meets or exceeds the current version of the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) Green Building Rating System Silver rating;
2. Achieves at least a comparable numeric rating according to a nationally recognized, accepted, and appropriate numeric sustainable development rating system, guideline, or standard approved by the Secretaries of Budget and Management and General Services; or
3. Complies with a nationally recognized and accepted green building code, guideline, or standard reviewed and recommended by the Maryland Green Building Council and approved by the Secretaries of Budget and Management and General Services.

8 Sufficiency Standards and Supportive Practices by Facility Area

In each subsection below, there are two parts. The first part of each subsection is labeled "Sufficiency Standards" and contains the excerpted *Sufficiency Standards* text pertaining specifically to the subsection. The second part—entitled "Supportive Practices"—provides supplemental information to be considered in planning for new school construction and renovation projects. See the definition of Supportive Practices in Glossary.

A. School Site

I. ***Sufficiency Standards—Site***

A school site shall be of sufficient size to accommodate safe access, parking, drainage, and security (COMAR 13A.01.04.03). Additionally, the site shall be provided with an adequate source of water and appropriate means of effluent disposal.

1. Safe access. A school site shall be configured for safe and controlled access that separates pedestrian from vehicular traffic. If buses are used to transport students, then bus loading/unloading areas shall be separated from vehicular-traffic areas wherever possible. Dedicated student drop-off and pickup areas shall be provided for safe use by student passengers arriving or departing by automobile.
2. Parking. A school site shall include a maintainable surfaced area that is stable, firm, and slip resistant and is large enough to accommodate 1.5 parking spaces/staff FTE and one student space /ten high school students. If this standard is not met, alternative parking may be approved after the sufficiency of parking at the site is reviewed by the IAC using the following criteria:
    a. Availability of street parking around the school;
    b. Availability of any nearby parking lots;
    c. Availability of public transit;
    d. Number of staff who drive to work on a daily basis; and
    e. Average number of visitors on a daily basis.

3. Drainage. A school site shall be configured such that runoff does not undermine the structural integrity of the school buildings located on the site or create flooding, ponding, or erosion resulting in a threat to health, safety, or welfare.
4. Security.
    a. All schools shall have safe and secure site fencing or other barriers with accommodations for safe passage through openings to protect students from the hazards of traffic, railroad tracks, animal nuisance, and steep slopes.

II. ***Supportive Practices—Site***

Consider the following when selecting or developing a site:

1. In practice, site size may be reduced significantly for urban schools, and other small schools requiring creative solutions in site development, facility utilization and building design and still remain educationally viable.
2. Considerations in properly and economically developing a school site are covered in detail in Appendix 104: Sustainable Community Planning Practices, of the IAC's Administrative Procedures Guide. The on-site characteristics that primarily impact the design and construction of a school facility are generally summarized as follows:
    a. Sub-surface conditions;
    b. Topography (slope, drainage, etc.);
    c. Size and shape of site; and
    d. Vegetation.
3. Site location and size: The initial site purchase should meet all the site location requirements because land adjacent to a new educational facility may not be available later. The site for anticipated full development should be determined largely by the nature and scope of the contemplated educational program. The IAC recommends reviewing the Smart Growth materials available from the Maryland Department of Planning at http://smartgrowth.org/ and the U.S. EPA's Smart Growth and School Siting resources available at https://www.epa.gov/smartgrowth/smart-growth-and-school-siting/.
4. Site Utilities: Essential utilities should be available to serve the site as follows:
    a. Energy: The site should have economical access to adequate energy sources such as natural gas and electrical power. Alternative energy sources for utilities may include solar power, wind, biomass fuel, and geothermal energy. Establish the availability of all utilities early in the site selection and planning process and ensure that quantity and quality of service is sufficient to accommodate estimated present and future needs.
    b. Water: There should be an ample supply of water to meet the facility's needs, including potable water, water for landscaping, and water for fire-suppression.
5. Access
    a. Holistic Access Design: Access to the school should be designed holistically as a complete system to support safe and efficient access by students, staff, visitors, and members of the community, using multiple modes of transportation.
    b. General access: There should be good connectivity between the school site and surrounding neighborhood. The site should be designed with respect for the safety and convenience of all

users. Coordinate motor vehicle and non-motorized vehicle flow to avoid or reduce conflicts between the users.

c. Vehicular access: The site should have clear, separate, distinct and safe on-site circulation paths for pedestrians, buses, staff, students, visitors and service vehicles. IAC recommends that each site have two separated road access points for safe ingress and egress from the property.

d. Pedestrian/Bicycle Access: On-site pedestrian and bicycle paths should be connected with street bike lanes, pedestrian routes, etc. to ensure safe travel to and through the campus.

6. Sidewalks: The school site should have safe walking routes for all children and adults accessing the school. These on-site routes should be connected to off-site sidewalks to provide safe and convenient walking routes. Avoid or minimize pedestrian crossings of roads, driveways, and parking lots. Provide wide sidewalks (5' minimum) and student gathering areas in convenient locations that are easily supervised. Speed zones around the school site and crossing locations need to be coordinated with local jurisdictions responsible for traffic controls in the public right-of-way.

7. Bus loading/unloading: The site should have separate bus loading/unloading zones accommodating the required number of buses for the school that do not conflict with other vehicular or pedestrian pathways and that provide for the safe loading and unloading of students. Typically, a 45' minimum outside turning radius is needed for a full-size bus. Consider also:

    a. Separate bus driveways and entrances to avoid conflicts with private cars and service vehicles.

    b. Counter-clockwise circulation for loading/unloading areas to prevent students exiting buses from crossing other vehicular paths.

8. Student drop-off/pick-up*:* The site should have a separate area for the drop-off and pick-up of students by private vehicles that provides for the safe loading and unloading of students. Traffic circulation should move in a counterclockwise direction and student-waiting areas should be designed to provide adequate space for waiting students. See the National Center for Safe Routes to School's Safe Routes to School Online Guide at http://guide.saferoutesinfo.org/index.cfm.

9. Vehicular entrances/exits*:* Vehicular entrances and exits should be planned for safe and efficient traffic flows. Avoid conflict with pedestrian flows.

10. Service/emergency access: The site should have properly identified, appropriate, and safe access to all areas for service and emergency vehicles. Service and delivery access routes should not conflict with other vehicular pathways and should avoid sharing on-site bus lanes.

11. Trash dumpsters*:* Locate convenient to pickup vehicles but also within reasonable distance from the building area(s).

12. Portable buildings*:* The site should have sufficient room for ingress and egress to and occupancy of portable buildings. Good planning practice is to consider future potential placement of portable buildings during initial site master planning. It is important that portable classrooms have equal access to centralized facilities and school support facilities while not obstructing future expansion.

13. Parking

    a. Reliance on curbside parking to handle school parking should be avoided when possible. Most Authorities-Having-Jurisdiction consider off-street parking essential. Adequate parking that is well designed for safe entrance and exit of traffic at peak hours is a key site element.

Circulation patterns of students, staff, visitors and service vehicles should be separated from bus drives and pedestrian walkways. Provide appropriate, secure, easy to use, and conveniently-located bicycle parking. See the Association of Bicycle and Pedestrian Professionals' "Bicycle Parking Guidelines" at http://www.apbp.org/.

b. Provide adequate visitor and handicapped-accessible parking conveniently located near the school office. Driveways and parking areas should be well-drained with solid, traffic-bearing surfaces. Parking areas should be landscaped to improve appearance, reduce heat-island effects, and promote better drainage.

c. Parking lots should address the needs of motorists when in their vehicles and when walking through the parking lots, such as providing pedestrian pathways and raised crosswalks.

14. Grading: Creative, functional grading of the site can improve the appearance of the building and provide screening from noise, wind and other climatic conditions. For example, earth berms, or mounding, along highways can shield the site from traffic noise.

15. Drainage/Storm Water Management: The school site should be well-drained and free from erosion. The maximum recommended site slope is 2% - 4% over a minimum of 50% of the site for ease of design and access. Drainage considerations include the following:

    a. The impacts of off-site drainage patterns upon the site itself should be considered to prevent the danger of erosion or flooding.

    b. Water should not discharge over sidewalks except by un-concentrated sheet flow.

    c. Design sidewalks with a 1% cross slope for drainage.

    d. Drainage should be removed by adequate catch basins and drainpipes or retained on-site.

    e. Roof drainage should be directed away from the building while avoiding sidewalk areas subject to freezing during cold weather (i.e., at the north side of structures).

    f. Recreation and play areas should be properly drained.

    g. Drainage into public rights of way should be avoided.

    h. Consider use of run-off water as a resource. Incorporate water-harvesting techniques where practical for use in irrigation or groundwater recharging.

16. Security

    a. Safety/security hazards: The site should be free of safety or security hazards such as excessive slope and stairs and retaining walls not designed in compliance with life-safety requirements and building codes. Sidewalks should be located and designed to reduce the formation of ice upon their surfaces. Balance safety and security with inviting community access.

    b. Fencing: Fences should be provided to protect students from the hazards of traffic, railroad tracks and steep terraces; to protect adjacent properties from trespass by students; and to discourage passersby from walking onto the campus. Security fencing should not prohibit students who are walking or bicycling from accessing the school site via the most convenient and direct access points. Connectivity with the surrounding neighborhood should be considered to provide multiple access points that facilitate safe and convenient walking and bicycling routes for students.

    c. Security lighting: Site should have illuminated parking areas, walks, entrances and exterior building areas for both safety and security purposes. Comply with any "night sky" ordinances and avoid creating lighting nuisance conditions for adjacent neighbors.

d. Utility systems: Discourage tampering and improper activation of exposed utility fixtures such as backflow preventers, electrical panels, irrigation and fire safety systems by installing protective lockable coverings, fencing, etc.

e. Drain fields: Septic tanks and drainage fields should be isolated from recreational areas where possible and protected from traffic.

f. Site and playground supervision: The site and play areas should be laid out to allow ease of visual supervision of the entire area by school personnel standing in one or two locations. The school facility shall invite the community in while ensuring student safety. Locate the main administrative office in a prominent place to help control access to the site. Community use of fields and other school facilities shall not interrupt the educational mission.

B. Site Recreation and Outdoor Physical Education

I. ***Sufficiency Standards—Site Recreation and Outdoor Physical Education***

A school facility shall have area, space and fixtures, in accordance with the standard equipment necessary to meet the educational requirements of the public education department, for physical education activity. (COMAR 13A.01.02.05 and 13A.04.13, Physical Education only)

1. Elementary school. Safe play area(s) and playground(s) including hard surfaced court(s) and unpaved recreation area(s) shall be conveniently accessible to the students. Play area(s) and appropriate equipment for physical education and school recreational purposes shall be provided based on the planned school program capacity. For schools that serve students in grade 5 and below, a protected play area shall be provided. Play-equipment areas shall have surfacing materials that meet or exceed safety specifications for shock-absorbing qualities as outlined by the U.S. Consumer Product Safety Commission.
2. Middle school. Hard surfaced court(s) and playing field(s) for physical education activities shall be provided. Playing field(s) and equipment shall be based on the planned school program capacity.
3. High school. A playing field for physical education activities shall be provided. Playing fields and equipment shall be based on the planned school program capacity.
4. Combination school. A combination school shall provide the elements of the grades served by Subsections A, B and C above without duplication, but shall meet the highest standard.
5. Other school. Other schools shall provide the elements above necessary to meet the educational requirements of the specific programs and capacity of the schools.

II. ***Supportive Practices—Site Recreation and Outdoor Physical Education***

Consider the following when developing recreation and outdoor physical education facilities on the school site:

1. The physical education program of the school determines the main extent of required outdoor playing areas, while the general category of “Site Recreation” is established to provide for outdoor activities.
2. Community and Shared Use: Opportunities to share facilities with other schools and/or LEAs should be explored. The site facilities may be used as community resources as long as they can operate as such without disrupting the educational program. Sharing the funding and operational costs with

community groups and public organizations should be explored when considering expanded or enlarged site recreation facilities which serve the community beyond the educational program's needs.

3. Intramural and Interscholastic athletics: Intramural athletics are commonly a part of the total educational program. The type and quality of special facilities for interscholastic athletic programs will depend on the available local funds and on the level of importance given to competitive sports by the school's students, staff, parents, alumni and community.
4. Suggested Kindergarten to 5th-Grade Recreation Areas:
    a. General design considerations for playgrounds: Students should not have to cross service roads, parking lots, or driveways to access play areas. The design of play facilities should be based upon the range of student ages and total student population. Provide appropriate areas and equipment devoted to safe, active play. Provide appropriate fencing for separation of play areas designed for very young students from the general playground area. Playground design and equipment installation must meet LEA insurance-coverage safety requirements and be in conformance with all governing safety standards. Verify such standards with the district's insurance administrator.
    b. Playground equipment: Playground apparatus and equipment should be carefully selected by playground committees and playground design professionals. Only equipment of sturdy construction should be selected. Equipment should be erected by certified playground equipment installation contractors. Hard surfaces under climbing equipment must conform to required safety standards to reduce injuries. In locating equipment, consider safety, the ease of supervision, and the economical use of space. Placement of play areas and equipment near building exits can facilitate accessibility, but the noise created during play should be considered. Ample space for safe use around equipment and fall zones must meet playground safety standards. Hard-surfaced or unpaved play areas shall be provided for P.E. based upon program capacity needs and made accessible for all students.
5. Suggested Middle School/Junior High School Recreation Areas:
    a. Playing field(s) and fixed equipment for P.E.: Larger schools may require more fields based on utilization requirements for physical education classes.
6. Suggested High School Recreation Areas:
    a. Playing field(s) for P.E.: Larger schools may require more fields based on utilization requirements for physical education classes.
7. Suggested Combination School Recreation Areas: A facility serving multiple grade-level bands will require the provision of recreation and playground facilities to accommodate all grade levels served.

C. Academic Classroom Space

I. ***Sufficiency Standards—Academic Classroom Space***

All classroom space shall meet or exceed the requirements listed below:

1. Area of classroom spaces. Classroom spaces, including those for physical education, shall be sufficient for educational programs that are appropriate for the class-level needs.
2. Classroom fixtures and equipment

a. With the exception of physical-education spaces, each general and specialty classroom shall contain a work surface and seat for each student in the classroom. The work surface and seat shall be appropriate for the normal activity of the class conducted in the room.

b. Each general and specialty classroom shall have an erasable surface and a surface suitable for projection purposes, appropriate for group classroom instruction, and a display surface. A single surface may meet one or more of these purposes.

c. Each general and specialty classroom shall have storage for classroom materials or access to conveniently located storage.

d. With the exception of physical-education spaces and music-education spaces, each general and specialty classroom shall have a work surface and seat for the teacher and for any aide assigned to the classroom. The classroom shall have secure storage for student records that is located in the classroom or is conveniently accessible to the classroom.

3. Classroom lighting

    a. Each general and specialty classroom shall have a light system capable of maintaining at least 50 foot-candles of well-distributed light. Provide appropriate task lighting in specialty classrooms where enhanced visibility is required.

    b. The light level shall be measured at a work surface located in the approximate center of the classroom, between clean light fixtures.

4. Classroom temperature and relative humidity

    a. Each general and specialty classroom shall have a heating, ventilation and air conditioning (HVAC) system capable of maintaining a temperature between 68 and 75 degrees Fahrenheit and a relative humidity between 30 and 60% at full occupancy.

    b. The temperature and humidity shall be measured at a work surface in the approximate center of the classroom.

5. Classroom acoustics

    a. With the exception of physical-education spaces, each general and specialty classroom shall be maintainable at a sustained background sound level of less than 55 decibels.

    b. The sound level shall be measured at a work surface in the approximate center of the classroom.

6. Classroom air quality

    a. Each general, science, and fine arts classroom shall have an HVAC system that continually moves air and is capable of maintaining a CO2 level of not more than 1,200 parts per million.

    b. The air quality shall be measured at a work surface in the approximate center of the classroom.

For more information about classroom design, see the Maryland State Department of Education's *Facility Guidelines for General Classroom Design* (2005) and *Classroom Acoustics Guidelines* (2006).

D. General-Use Classrooms

(English Language Arts/Literacy, Mathematics, Social Studies, and World Languages)

I. ***Sufficiency Standards—General-Use Classrooms***

1. Cumulative classroom net square foot (sf) requirements, excluding in-classroom storage space and any in-classroom toilet rooms, shall be at least:
    a. Prekindergarten 50 net sf/student
    b. Kindergarten 50 net sf/student
    c. Grades 1 – 8 32 net sf/student
    d. Grades 9 – 12 25 net sf/student
2. At least 2 net sf/student shall be available for dedicated, in-classroom storage and may be provided vertically to avoid the need for additional floor area.
3. Sufficient number of classrooms shall be provided to meet state and local board mandated student/staff ratio requirements.

II. ***Supportive Practices—General-Use Classrooms***

1. General Classroom Environment
    a. Size and arrangement: Many factors, such as furniture, equipment (computers), class size and educational programs, will affect the optimum size and arrangement of a classroom. Configure electrical outlet locations in a manner that allows for locating furnishings and equipment to suit varying needs. Take into consideration the location of white boards and interactive projection surfaces in relation to glare-producing windows. It is recommended that interactive white boards be tilted from 5 to 10 degrees away from the wall at the base to prevent glare. Provide a good balance of window vs. wall space. White boards should be installed in every room that has an interactive white board and both should be specified with a low visible sheen.
    b. Lighting: Studies have found a correlation between the levels of natural light and educational achievement. In addition to encouraging energy savings through proper control of artificial lighting, the designer should emphasize the provision of diffuse natural light that can be controlled when needed into all learning spaces. The Sufficiency Standards require a level of at least 50 foot candles of well-distributed light at classroom work surfaces. Skylights, clerestories, windows with light diffusing “eyebrows,” and other daylight-harvesting features are typical elements of a well-lighted space. These apertures should be able to be darkened for AV presentations and positioned so that the room does not become overheated. Properly adjusted dual-technology occupancy controls can help maintain sufficient lighting during times of low occupancy conditions. Zoned lighting controls can help occupants modulate the lighting to match the activities taking place in each area of a room and to save energy.
    c. Temperature: Classroom temperature should be easily maintained between 68 and 75 degrees Fahrenheit with individual controls for each classroom. Special attention should be paid to regulating air flows and drafts at the floor level in pre-Kindergarten and Kindergarten classrooms, as that is where the students spend a substantial portion of their time.

d. Acoustics: The acoustical quality of learning spaces is becoming a critical matter. Designers will need to pay attention to the effect of noise-producing factors and absorbing noise that is generated within the classroom. The Sufficiency Standards require that a one-hour, A-weighted Noise Criteria of less than 55 decibels should be maintained (45 decibels or less is preferred). Keep reverberation times in classrooms within a range of 0.4 – 0.6 seconds.

e. Air Quality: Comply with ventilation standards in ASHRAE 62.

f. Computer Technology: Accommodations for networked multimedia computer connections shall be provided. These computers may be dispersed throughout the entire facility, concentrated in computer labs, or provided through a combination of both methods.

2. Grade-Level Considerations

a. Pre-Kindergarten/ Kindergarten: Instruction tends to be project and center oriented. The curriculum is generally contained in one space and should accommodate many activities. The space in the Classroom should support physical movement, long-term projects, and learning centers. Water should be readily available.

b. Grades 1 – 5: Curriculum at the elementary level tends to be self-contained within a single classroom involving a single teacher supported by any number of specialty instructors. Consequently, large groups, small groups and independent study should all be supported within the confines of the classroom at various times. Classroom activities include physical movement, long-term projects, cooperative learning groups, learning centers and process learning. Space layout should be flexible enough to accommodate these needs.

c. Grades 6 – 8: Early adolescence is a unique period of transition with specific educational requirements. Programs provide exploratory learning opportunities typically based around interdisciplinary instructional teams. The need for specialty subject-area classrooms begins to emerge at the middle school level.

d. Grades 9 – 12: The content-driven curriculum of high schools is expressed in the trend toward academic teaming, with many schools developing learning academies that focus on a number of separate disciplines within a single facility. The goal of facility planning at the high school level should be to create a dynamic learning environment that allows both faculty and students a fair amount of flexibility in organizing their time and schedules. The layout of general classrooms should allow for easy access to specialized learning environments. Facilities should be designed with the potential future reconfiguration of learning spaces in mind.

3. Standard Classroom Furnishings. Provisions for the following items should be made in the layout of each classroom.

Grade Level	Standard Furnishings
Pre- Kindergarten/ Kindergarten	• Storage (some lockable) • Cubbies/lockers for storing the belongings of each student • 1 snack area w/sink and bubbler, counter and overhead cabinets • Toilet facilities accessible from the classroom • Access to computer networking (1 network drop for every 3 students, or wireless capability) • Bookshelves • Intercom system • White board • Kidney-shaped table for group work

Grade Level	Standard Furnishings
	• One seat per student plus at least three additional seats
Elementary	• Storage (some lockable) • Cubbies within the classroom or lockers in an adjacent corridor for the belongings of each student • Countertop with sink and bubbler • Cabinets and file storage • Access to computer networking (1 computer station for each 3 students or wireless capability) • Projection surface • Intercom system • White boards • Kidney-shaped table for group work • One seat and workspace per student plus at least three additional seats
Middle/ Junior High/ High School	• Storage (some lockable) • Cabinets and file storage • Computer networking (1 computer station for every 3 students or wireless capability) • Projection surface • Intercom system • White boards • One seat and workspace per student plus at least three additional seats

For more information about classroom design, see the Maryland State Department of Education's *Facility Guidelines for General Classroom Design* (2005).

E. Collaboration Spaces

I. ***Supportive Practices—Collaboration Spaces***

1. Current educational practices put a high value on flexible individual and small group instruction as well as collaborative learning. To support these activities, consider providing
    a. Extra space within a classroom to accommodate several small groupings of students or
    b. Collaborative learning areas outside but near the classroom, such as in the nearby public areas of the school. These spaces may be widened corridors, niches within a corridor, or partially enclosed spaces.
2. Collaborative learning spaces within the public areas of the school should be highly visible, located near the classrooms that they serve, and easily monitored by teachers and other staff.
3. Ensure that the acoustics of the space support teaching and learning.
4. Provide adequate teaching aids such as white boards, tack boards, electrical outlets, and data access.
5. Consider defining the space through changes in ceiling planes, changes in flooring material and/or color, or by providing low barriers such as bookshelves or low built-in seating, especially when placed in an area of egress.

F. Specialty Classrooms—Special Education

I. ***Sufficiency Standards—Special Education Classrooms***

Maryland assures a free appropriate public education for all students with disabilities, birth through the end of the school year in which the student turns 21 years old, in accordance with the student's Individualized Education Program. Early Intervention Services for children from birth through two years is typically provided through the Maryland Infants and Toddlers Program. To the maximum extent appropriate, students with disabilities are educated in the least restrictive environment with students who are not disabled. A continuum of alternative placements shall be provided.

1. If a special-education space for pull-out purposes other than calming is provided and the space is required to support educational programs, services, and curricula, the space shall not be smaller than 450 net sf.
2. When the need is demonstrated by the LEA, additional space in the classroom shall be provided with, or students shall have an accessible route to: an accessible unisex restroom with one toilet, sink, washer/dryer, and shower stall/tub, as needed, and at least 15 net sf of storage.
3. When the need is demonstrated by the LEA, in 6th grade classrooms and above, a kitchenette of least 30 net sf shall be provided.

II. ***Supportive Practices—Special Education***

In order to be eligible to receive funds under Part B of the federal Individuals with Disabilities Education Act (IDEA), states must assure that a free appropriate public education (FAPE) is made available to all children with disabilities. The student's Individualized Education Program (IEP)—which contains the statement of the special education and related services to meet each disabled students' unique needs—forms the basis for the entitlement of each student with a disability to an individualized and appropriate education.

IDEA further provides that states must have in place procedures assuring that, "to the maximum extent appropriate, children with disabilities are educated with children who are not disabled, and that special classes, separate schooling, or other removal of children with disabilities from the regular educational environment occurs only when the nature or severity of the disability is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily."

Each Local School System and Public Agency must ensure that a continuum of placements be available to meet the needs of students with disabilities. The Least Restrictive Environment (LRE) mandate of the IDEA requires that students with disabilities receive their education in a general-education setting to the maximum extent possible. If such a setting is not appropriate, the student is to receive his or her education in a setting with the least amount of segregation from his or her non-disabled peers as is possible. The continuum begins with the general-education classroom. Placements in self-contained settings and in public or nonpublic facilities should be used only when a student's IEP cannot be implemented in a less restrictive setting.

Schools need flexible spaces that can be used for a variety of purposes. In many cases, spaces used for special-education functions are also used for other purposes; IEP meetings are held in a conference room that may also be used for grade-level-team meetings, etc., if scheduling permits. An "intervention room" that is used by a special-education teacher to deliver instruction to an individual student or small group may also be used for small-group instruction of students without disabilities that are participating in remediation or enrichment activities. Spaces are necessary for related-service providers (speech pathologists,

occupational and physical therapists, etc.) to deliver services outside of the classroom setting. Depending on caseloads, schedules, and equipment needs, these spaces may be dedicated or shared spaces. School planners should also consider space needs relating to instructional staff who work across multiple subjects and grade levels and therefore are not assigned a dedicated classroom, but who still need to store records, materials, and personal items; and engage in planning and report writing, etc. The size and configuration of these spaces will vary based on the size, structure, and student and staff populations of the school.

The size and configuration of a special-education classroom will vary depending on the number of students served, the nature of their disabilities, their equipment needs, and the personnel support that may be required. These classrooms should be flexible in their design and should contain adequate storage space for curricular materials and for the equipment required to support students requiring special apparatus (e.g., wheelchairs, readers, text-to-sound translators, walkers, standers, etc.) so that such materials and equipment do not take up valuable classroom space. Special-education classrooms may also need to contain or have ready access to kitchen and laundry facilities and may contain separate restroom and/or shower facilities.

G. Specialty Classrooms—Science

I. ***Sufficiency Standards—Science Classrooms***

1. For grades PK through 5, no additional space is required beyond the classroom requirement.
2. For grades 6 through 12, 4 net sf/student of the specialty program capacity for science is required. The space shall not be smaller than the average classroom at the facility. This space is included in the academic classroom requirement and may be used for other instruction. The space shall have science fixtures and equipment, in accordance with the standard equipment necessary to meet the educational requirements of the Maryland Science Content Standards.
3. For grades 9 through 12 only, at least 40 net sf of space is provided for securable, well-ventilated storage/prep space for each science room having science fixtures and equipment. Storage/prep room(s) may be combined and shared between more than one classroom.

II. ***Supportive Practices—Science Classrooms***

1. Shared spaces may decrease the need for laboratories dedicated to a specific science discipline. Lecture areas can be combined with lab space or separated within the same room or in different rooms. For safety and program quality, science labs should be designed for a maximum of 28 students and may accommodate the following:
    a. Sink(s);
    b. Lab equipment;
    c. Computer and multimedia presentations;
    d. Flexible furnishings that facilitate working in teams;
    e. Interactive learning programs that facilitate hands-on assignments;
    f. Flexible, high-density storage;
    g. Secure storage;
    h. OSHA requirements (e.g., eyewash stations, emergency shutoffs, etc.); and
    i. Student outlets for water, electricity, and gas.

2. To maximize the integration of students with disabilities with their non-disabled peers, provide a multi-student work station lowered in its entirety to meet accessibility requirements including accessible reach requirements for utilities.
3. The trend toward "virtual" lab investigations requires consideration of computer networking, portable demonstration tables, yet smaller table-based furnishings and equipment.
4. Science classrooms may be larger than regular classrooms in order to accommodate lecture areas, demonstration areas, lab tables for small-group investigations, and specialized furniture and equipment.
5. Science classrooms in small schools might be used for other programs during part of the day.
6. When storage/prep space is provided, it shall be separate, well-ventilated, and preferably adjacent and accessible to each lab. It shall contain safe and secure storage for valuable equipment and chemicals used for investigations. The space may be combined and shared between more than one classroom. It is recommended to provide one storage/prep room shared between paired classroom/labs.
7. Separate the fume hood and the safety center by a distance of fifteen to twenty feet to allow the emergency eyewash/safety center to be used in case of accidental discharge of fumes at the hood.
8. To maintain the effectiveness of the exhaust hood, avoid locating it in proximity to foot traffic, particularly at the classroom or laboratory entrances and exits.
9. Provide negative pressure in labs when the hood exhaust is in use.
10. Provide no supply air velocities greater than 50 cfm near a science laboratory hood exhaust.
11. Locate outside air intakes a minimum of 7 feet vertically and 25 feet horizontally from known sources of air contaminants such as a cooling tower, loading dock, science laboratory fume hood exhaust, or chemical storage room exhaust.

For more information about science classroom design, see the Maryland State Department of Education's *Science Facilities Design Guidelines* (1994).

H. Specialty Classrooms—Fine-Arts Education

I. ***Sufficiency Standards—Fine-Arts Education Classrooms***

A school facility shall have classroom space to deliver fine-arts education programs. Fine arts subjects include dance, media arts, music, theater, and visual art. Classroom space(s) for fine-arts education shall not be smaller than the average classroom at the facility. Fine-arts education classroom space(s) may be included in the academic-classroom requirement and may be used for other instruction.

1. Elementary school. Fine-arts education programs may be accommodated within a general use or dedicated arts classroom. Provide one dedicated classroom for each fine-arts subject area staffed with greater than 0.5 full time fine-arts teacher. Provide additional dedicated fine-arts program storage of at least 60 net sf for each subject area per facility.
2. Middle school. Classroom space(s) for fine-arts education programs shall have no less than 4 net sf/student of the specialty program capacity for fine-arts subjects. Provide one dedicated classroom for each fine-arts subject area staffed with greater than 0.5 full time fine-arts teacher. Provide additional 60 net sf of storage for each fine-arts program subject.

3. High school. Classroom space(s) for fine-arts education programs shall have no less than 5 net sf/student of the specialty program capacity for fine-arts subjects.
4. Combination school. A combination school shall provide the elements of the grades served by paragraphs (1), (2) and (3) above without duplication but meeting the higher standards.
5. Other school. Other schools shall provide the elements above necessary to meet the educational requirements of the specific programs and capacity of the schools.

II. ***Supportive Practices—Fine-Arts Education Classrooms***

1. Visual-arts learning spaces
    a. Visual-arts learning spaces are best located on the ground floor with access to related curricular areas and convenient entry for delivery purposes. If the spaces are to be used after regular school hours, they should permit easy but controlled entry from the outside. During school hours, students need ready access to the out-of-doors for sketching, painting, field trips, and other such activities.
    b. High school visual-arts programs at larger schools or schools with specialty arts programming may justify separate areas for classes such as painting/drawing/printmaking, jewelry/ceramics/sculpture and photography/filmmaking/digital design. Small-scale or limited programs might only require shared use of appropriately sized and equipped space so long as adequate storage space is provided.
    c. Art activities are best performed on tables with mar-resistant surfaces.
    d. Illumination that is glare-free, intense enough for detailed work and that allows true color discrimination is vital. Natural light from north-facing windows is ideal. Provisions for adjustable spot lighting to highlight still-life setups or wall displays are beneficial for art rooms in the upper grades.
    e. In schools with enrollments below 500 students, art can be shared with other uses or incorporated into the regular classroom. Depending on layout, design, and equipment, an art room can share a dual-purpose room with music or science programming so long as a sink with a clay trap and drain board is provided.
2. Performing-arts learning spaces
    a. Consider including the following when designing performing-arts spaces for music:
        i. Teaching spaces for instrumental and vocal instruction on an individual and group basis.
        ii. Acoustically-treated rehearsal room for individuals and small groups. Offices for the faculty and staff, some of which may double as studios.
        iii. Storage areas to accommodate musical instruments, teaching aids, uniforms, music stands, risers, shells, lights and other performance apparatuses. These should be located close to areas where the equipment will be used. Storage areas for student instruments work best when designed for flow-through one-way traffic.
        iv. Facilities for instrument repair that include a sink.
    b. Pay careful attention to acoustics, room size, shape (provide at least one non-parallel wall), temperature, relative humidity, and spatial relationships.

c. Because acoustics are critically important, a consultant can be helpful in designing spaces that enhance the quality of sound. Surface materials that eliminate distortions and undesirable transmissions of sound can be applied. Windows, doors, walls and floors should be treated so that transmission of sounds to and from areas is reduced. Keep reverberation times in rehearsal areas within a range of 0.6 – 1.1 seconds.

d. Band, orchestra and chorus programs at larger schools may justify separate areas for each program while small-scale programs might only require shared use of appropriately sized and equipped space so long as adequate lockable storage space is provided.

e. Dance may need to be provided in a shared-use space, particularly in elementary school. Consideration should be given to impact-resilient flooring materials and sufficient travel distances for combinations of steps. Spaces suitable for dance instruction in middle and high school should also include flooring designed to minimize injuries, ballet barres, mirrored surfaces, and sufficient travel distance. With consideration for lighting and curtains, such a space may also be used for theater.

f. Many schools expressing an interest in creating some form of performance venue may develop performance space within schools without creating a separate auditorium. Black-box theaters and multi-purpose rooms can provide solutions, but such spaces should have proper lighting and acoustics. Music rooms can be located next to cafeterias to double as a stage or green room. Combining gyms and cafeterias separated by movable partitions can help to create even larger spaces.

For more information about arts-education facilities design, see the Maryland State Department of Education's *Facilities Guidelines for Fine Arts Programs (2001).*

I. Specialty Classrooms—Digital Experiences/Technology Education and Computer Science

I. ***Sufficiency Standards—Digital Experiences***

1. For grades K through 5, no additional space is required beyond the classroom requirement.
2. For grades 6 through 8, 3 net sf/student, and 4 net sf/student for grades 9 through 12, of the specialty program capacity for technology education and family and consumer science is required. The space shall not be smaller than the average classroom at the facility. This space is included in the academic classroom requirement and may be used for other instruction.
3. The space shall have technology fixtures and equipment, in accordance with the standard equipment necessary to meet the educational requirements of the Maryland Technology Education Content Standards, and in high school, the requirements of Maryland Advanced Technology Education electives where such electives are offered.
4. Provide at least 80 net sf for securable, well-ventilated storage/prep space for each technology education room having technology fixtures and equipment. Storage/prep room(s) may be combined and shared between more than one classroom.

II. ***Supportive Practices—Digital Experiences***

1. Adequate access to electrical outlets and network connections shall be provided to ensure flexibility of the space.

2. Include dust-free writing boards (instead of chalkboards), and increased shelving, cabinets, and storage space.
3. Include independent temperature controls if the lab is in a separate room.
4. Determine whether portable and/or wirelessly networked technology should be accommodated.
5. There are few differences between a classroom, tech-ed lab, computer lab, business lab, and other classroom areas in a building. If all of the spaces are equipped appropriately, any space can be designated as a computer lab. Portable carts may be used to transport portable devices to classrooms for computer instruction.

For more information about classroom design, see the Maryland State Department of Education's *Technology Education Facilities Guidelines* (2006).

J. Specialty Classrooms—Career & Technology Education (CTE)

I. ***Sufficiency Standards—Career & Technology Education (CTE)***

1. Elementary school. No requirement.
2. Middle school. Space shall be provided for career-development and career-exploration activities. Each program lab or classroom space shall be no smaller than 650 net sf.
3. High school. Career and technology education programs space shall be provided with no less than 4 net sf/student of the specialty program capacity of the school for career education. Each program lab or classroom space shall be no smaller than 650 net sf. Spaces for programs requiring licensing, certification, or accreditation by a state board or agency shall meet all applicable health and safety standards. Cosmetology and barber programs shall comply with the sanitation requirements of the State Board of Cosmetologists and the State Board of Barbers, respectively.
4. Combination school. A combination school shall provide the elements of the grades served by Paragraphs (1), (2) and (3) above without duplication, but meeting the higher standards.
5. Other school. Other schools shall provide the elements above necessary to meet the educational requirements of the specific programs and capacity of the schools.

II. ***Supportive Practices—Career & Technology Education (CTE)***

1. During the initial planning phase, it is essential to consult with faculty, administration, and community members to gain a thorough understanding of the immediate and long-range goals and needs of the career education program that the facility will support. Many LEAs have begun to organize these programs into career academies and school-to-work or career pathway programs, fostering or strengthening partnerships with community colleges, technical/vocational schools, and the surrounding business community. The character and design of career education spaces will depend on the nature of the specific programs offered, the students served, and the resources of the school.
2. The Career & Technology Education field is undergoing rapid change. Today, all fields have a major technology focus. Agriculture is dominated by science and business, and manufacturing by robotics and advances in technology-based tools. Schools delivering CTE programming will need flexible spaces such as multipurpose classrooms that have the ability to incorporate extensive technology,

especially computers with moveable furnishings and equipment. Shared fabrication areas should be capable of easy reconfiguration to meet the requirements of multiple disciplines and instructors.

3. Many CTE spaces will require adequate electrical circuitry with receptacles in well-planned locations. Floor outlets should be avoided. Consider outlets mounted in "pony" walls or integral with furnishings. Ceilings should be acoustically treated and may need to accommodate a separate ventilation system. CTE spaces should be located where there is easy but controlled access to/from the outside. Adequate storage should be provided, including cabinets, shelving and closets. Consider including a sink with hot and cold water. Beyond minimum standards, the space should be large enough to accommodate persons, machinery, and furniture, as well as to allow easy traffic flow.

For more information about career/technical-education facilities design, see the Maryland State Department of Education's *Family and Consumer Sciences: A Facility Planning and Design Guide for School Systems* (2001).

K. Student-Support and Resource Spaces

I. ***Supportive Practices—Student-Support and Resource Spaces***

1. Resource spaces are essential to providing well-rounded educational experiences for students and necessary support for the educational staff.
2. Provide a variety of office spaces for essential staff, including itinerant staff, speech pathologists, reading specialists, occupational therapists, and physical-therapy practitioners. An appropriately configured office setting can double as a space in which to deliver instruction or support services to a small number of students.
3. Provide several sizes of resource rooms: a small instructional space for 6–8 students (350–450 NSF) and a large instructional space for 10–18 students (600 NSF). Both instructional rooms require a teacher's computer workstation; lockable storage for teacher belongings; desks and chairs for students (occupants + 3 additional chairs); one kidney-shaped table; 10–15 linear feet of magnetic marker board; tack strips and a map rail; glare-free marker boards; 50 linear feet of built-in adjustable shelving; and mailboxes for student work. A sink with a bubbler, counter space, and storage cabinets are preferred in large instructional rooms. Provide electrical, voice, and data outlets.

L. Libraries/Media Centers

I. ***Sufficiency Standards—Libraries/Media Centers***

A school facility shall have a unified school library/media program for the use of all students which shall include an organized and centrally managed collection of instructional materials and technologies and direct instruction. Provide space for collections, reference, circulation, instruction, workroom for staff, and storage.

1. Elementary school. The area for stacks and seating space shall be at least 3 net sf/student of the planned school program capacity. The instructional space shall not be smaller than the average classroom at the facility. In addition, office/workroom space and secure storage shall be provided.

2. Middle or high school. The area for stacks and seating shall be at least 3 net sf/student of the planned school program capacity. The space shall not be smaller than the average classroom at the facility. In addition, office/workroom space and secure storage shall be provided.
3. Combination school. Provide the elements of the grades set out in Paragraphs (1) and (2) above without duplication, but meeting the higher standards.
4. Other school. Other schools shall provide the elements above necessary to meet the educational requirements of the specific programs and capacity of the schools.

II. ***Supportive Practices—Libraries/Media Centers***

1. The library/media center is the academic core of the building, serving as an extension of each classroom. It should occupy a central physical and visual position in the building.
2. Provide space for instruction; team collaboration; creation/innovation; storage; and secure areas and appropriate space for computers, digital devices, and electronic communications equipment. For elementary schools, consider ways to integrate space for a storytelling area. In larger schools, consider programming for multi-media production.
3. Design the library/media center as an inviting, stimulating and accessible place providing workspace for individuals and small and large groups for research, browsing, listening, viewing, reading and producing materials for instructional purposes.
4. Provide maximum flexibility in order to meet the needs of students and staff, accommodate program priorities and respond to student population growth, information expansion and changing technologies.
5. Because libraries/media centers may receive extensive after-hours use by students, staff, and the community, consideration might be given to locating the media center near a public entry point of the building.
6. Logical circulation patterns should be considered early in the design process. Design for ease of visual control.
7. The use of natural lighting is encouraged.
8. Lighting fixtures and patterns should be designed to illuminate between, not over, bookcases. Strive to maintain a light level of between 50 and 70 foot candles in reading areas. Efforts should be made to reduce glare in computer areas.
9. Appropriate wiring for audiovisual and computer equipment is required.
10. Access to the library/media center should be controllable.
11. Provide an adjacent office for the librarian.
12. Carefully consider immediate and long-term library/media center needs and technological trends. As some portions of a collection are converted to digital technology, the overall storage needs of a facility may diminish. The spread of wireless technology may make expensive wiring of computer stations obsolete. Flexibility of design and technology planning is becoming increasingly necessary in considering the infrastructure and space layout of new libraries and the updating of existing facilities.
13. Sturdy bookshelves with adjustable shelving and locking wheels is recommended for flexibility and easy reconfiguration of the space. Utilize tables and chairs that can be stacked, nested, or otherwise compactly stored when not in use to increase the flexibility of the space.

14. The library media center should have a range of furniture types and placement to appeal to different users and address the range of activities that occur in the space: class instruction, small group collaboration at tables or informal seating, individual study and research (such as at counters or partitioned tables), and recreational reading in lounge chairs and window seats if windows are included.
15. In addition to computers, consider providing space and required supports for electronic and communications equipment (e.g., copiers, telephones, scanners, printers, etc.) that may be needed. Provide appropriate storage and workstation space for such equipment.
16. To protect the collection and electronic equipment, controls for the heating, cooling and ventilation of a library/media center should be independent of other parts of the facility.

For more information about library and media-center design, see the Maryland State Department of Education's *Facilities Guidelines for Library Media Programs* (1998).

M. Physical Education

Note: See "School Site" section for outdoor P.E. area requirements.

I. ***Sufficiency Standards—Physical Education***

1. General requirements. Each school shall provide an instructional program in physical education each year for all students in grades PK-8. Each school shall offer a physical-education program in grades 9–12 which shall enable students to meet graduation requirements and to select physical education electives. The following minimum spaces are required: gymnasium, teacher office or planning area, equipment storage, and outdoor instructional playing field.
    a. Elementary school. Provide a gymnasium with at least 2,200 net sf. This space may have multi-purpose use in accommodating other educational program activities such as art program performances.
    b. Middle school. Provide a gymnasium with a minimum of 5,200 net sf plus an additional 4 net sf times 40% of the enrollment of the school devoted to bleacher seating.
    c. High school. Provide a gymnasium with at least 6,500 net sf plus an additional 4 net sf times 40% of the enrollment of the school devoted to bleacher seating.
    d. Combination school. Provide the elements of the grades served by Paragraphs (a), (b) and (c) above without duplication, but meeting the higher net sf standards.
    e. Other school. Other schools shall provide the elements above necessary to meet the educational requirements of the specific programs and capacity of the schools.
2. Additional physical education requirements in addition to space requirements in Subsection 1:
    a. Elementary school. One office shall be provided. Separate physical education equipment storage shall be provided.
    b. Middle school. One office shall be provided. Separate physical education equipment storage space shall be provided.
    c. High school. Two dressing rooms shall be provided, with lockers, showers and restroom fixtures. Two offices shall be provided. Separate physical education equipment storage space shall be provided.

d. Combination school. A combination school shall provide the elements of the grades served by Paragraphs (1), (2) and (3) above without duplication, but meeting the higher standards.

e. Other school. Other schools shall provide the elements above necessary to meet the educational requirements of the specific programs and capacity of the schools.

II. ***Supportive Practices—Physical Education***

1. Due to the high cost and difficulty of expanding physical-education facilities, consider the immediate and long-range use requirements during initial planning phases. Indoor gymnasium facilities made larger for expanded community use will have greater construction and operational costs. Consideration should be given to partnering with local government, community groups, or organizations to share in both initial and operating/maintenance costs for added portions of enlarged facilities if shared use is planned.
2. It is important to define the interrelationship between indoor and outdoor facilities early on. Interscholastic sports and community recreation provide opportunities for partnerships between the LEA, parks & recreation departments, and other local organizations. Because these facilities may be used during non-school hours, considerations should be made for separate entrances, zoning of HVAC, location of parking, exterior lighting, storage, location of toilet rooms, and the ability of accessing these facilities without accessing the entire building.
3. Include the provision of equal facilities for men and women, access and suitability for physically impaired persons and providing flexibility so that the facility can be used for a variety of purposes.
4. Isolate physical education facilities from other classroom areas due to noise considerations. Reduce noise, reverberation, and echoes within the gymnasium. Keep reverberation times in the gym within a range of .8 - 1.5 seconds. (See “Performing Arts” section for acoustical recommendations for gyms used also as performing arts spaces).
5. Specify non-slip floors and non-abrasive wall surfaces.
6. Ensure that there are no sharp edges, corners, or dangerous protrusions within reach in any court space.
7. Protect all wall-mounted items susceptible to damage with wire guards or other durable coverings.
8. Suitable light fixtures that are recessed or shielded should be installed. Windows in the gymnasium should be elevated and protected.
9. Provide a public address system with provisions for an assistive listening system.
10. Facilities for applying emergency first aid should be conveniently accessible.
11. PE facilities in elementary schools are typically designed to allow for multi-use of the space.
12. For middle/junior-high and high schools: It is important to recognize the trend at the middle school/junior high school level to use the physical education facility for all-school assemblies. This may result in the increased need for proper acoustic control.
    a. Placement and storage of bleachers should be carefully studied.
    b. Consider providing outdoor equipment storage accessible from outdoor areas.
    c. Floors in shower and drying areas should have slip-resistant floor surfaces.
    d. Ensure adequate storage space for equipment (recreation mats, chairs, etc.), particularly if the space is to be used for multiple functions.

For more information about physical-education facilities design, see the Maryland State Department of Education's *Physical Education Facilities Guidelines for New Construction and Major Renovations* (2011).

N. Food Services

I. ***Sufficiency Standards—Food Services***

1. Dining. A school facility shall have a space to permit students to eat within the school outside of general classrooms. This space may have more than one function and may fulfill more than one sufficiency standards requirement. Schools are encouraged to provide sufficient lunch periods that are long enough to give all students enough time to be served and to eat their lunches. The dining area shall be sized to accommodate no less than one third of the planned school program capacity of the school. The dining area shall have no less than 15 net sf/seated student.
2. A serving area shall be provided in addition to a dining area.
3. Kitchen. A kitchen shall have a telephone, plumbing providing potable water, a sink suitable for use both in preparing food and washing utensils, and a separate hand-washing sink. Kitchen and equipment shall comply with either the food preparation kitchen or the serving kitchen standards defined as follows:
    a. Food preparation kitchen. Provide at least the greater of 1) a minimum of 2 net sf/meal served during the single largest serving period or 2) no fewer than 2 sf per enrolled student eligible for free or reduced-price meals.
    b. Serving kitchen. Where food is not prepared, there shall be a minimum of 200 net sf.

II. ***Supportive Practices—Food Services***

1. The designer should work to understand the owner's plan for food service and consider the following:
    a. Design to a maximum of three serving periods for each meal.
    b. Food service equipment, layout of serving areas and overall size depend on the typical menu and food preparation and serving concepts.
    c. Determine whether the kitchen will provide food for other sites in addition to the facility where located.
    d. Many schools have satellite kitchens that serve or warm food entirely prepared off-site. Some schools serve as main food-preparation facilities for several satellite kitchens and therefore require more space and equipment.
    e. Many locations in Maryland can augment a cafeteria with protected outdoor dining areas.
    f. It is recommended that enough storage be provided for a schedule that does not exceed one week between deliveries of food provisions. Schools in remote locations may require additional storage space if deliveries are less frequent.
    g. For most schools under 300, and allowing for two cafeteria sittings per day, the likely solution will be a multi-purpose space that is used as the cafeteria and for assemblies and performances. If a cafeteria is to double with any other function, the designer should eliminate interior columns where possible and provide adequate space for storage. A multi-use space also calls for extra attention to acoustics and a built-in sound system with reverberation times within a range of 0.7 – 1.2 seconds.

h. Areas in which large amounts of food are prepared are typically regulated by the appropriate state and federal agencies concerned with health and environmental hazards related to prevention of food contamination. In addition, the types of activities inherent in the delivery and preparation of food demand great care. Hazard Analysis and Critical Control Points (HACCP) is a systematic preventive approach to food safety. It is recommended that a HACCP analysis is performed by the food services designer to identify potential food safety hazards which can be avoided by the design. Large kitchen projects may benefit from the services of a consultant who is experienced in this type of analysis.

2. General requirements for related spaces:

   a. Receiving Area: The receiving dock should permit easy unloading of supplies and food. This area should be located away from student traffic. The floor level of the dock and the storage/kitchen areas should be the same.

   b. Storage: Storage for food items that do not require refrigeration should be adjacent to the receiving area and convenient to the kitchen. This area should be dry and clean. Separate bulk storage from food preparation area.

   c. Kitchen: The type of kitchen planned will depend on the nature of the food service program. The following questions should be answered:

      i. Is the food to be prepared on site or will it be delivered from an off-site kitchen?

      ii. What type of food will be served – hot meals, convenient pre-packaged foods, vended items?

      iii. How many meals will be served every school day for breakfast, for lunch, for after-school programs, and for special events?

   d. The size of the kitchen will depend on the nature of the equipment and the number of people required preparing meals. Food preparation equipment is expensive, and it should be chosen with care before the kitchen is designed. Refrigerators and freezers for food storage – if required by the program – must be planned for and accommodated. Lay out the kitchen with defined cold-food-prep, hot-food-prep, and assembly areas to enable the staff to operate efficiently.

3. *Service:* Food service may occur in a section of the kitchen, in a separate room, or in the dining area. The space needed, the equipment required, and the food preparation/service program will determine the arrangement of service counters. The objective here is to facilitate an attractive display, easy selection, and quick service of food. Student circulation related to serving should be well-planned and coordinated within the space with other traffic paths.

4. *Dishwashing:* The dishwashing and maintenance area is a separate function from food preparation and holding, and should be located separately but adjacent to the dining room, preferably near its exit. Equipment selected for cleaning dishes and utensils will determine the size of the space.

5. *Garbage and trash disposal* must be separated from food to prevent contamination. This applies to dirty dishes and trays, food waste, soaps and detergents, de-greasers, pesticides, and other potential contaminants. Garbage and trash should never be carried through the cafeteria or kitchen to be disposed. Provisions in space and equipment should be made for appropriate separation and collection of recyclables.

6. *Office:* Provide an enclosed office(s) for the head cook and/or administrator to accommodate menu preparation, purchasing, and other tasks related to the management and supervision of the kitchen. The office should have a window providing a view of the kitchen and serving areas. Provide a telephone with an external line. Locate the office near the receiving door and/or near the cafeteria dining room.
7. *Utility Room:* A utility/custodial room with mop sink is required within the food services area.
8. *Staff Restrooms:* Appropriate restroom facilities, isolated from food prep areas but easily accessible to the kitchen staff, should be provided. Individual lockers for the use of kitchen staff may be required.
9. The type of food service program operated by the school will depend on the site location of the school and the ease with which deliveries can be made. Site therefore influences the type of kitchen facility that will be needed and the type of equipment that should be purchased. Thus, if a school is in a rural area, daily deliveries from a central kitchen may be impractical, and a fully equipped, independent kitchen may be a necessity. Also, a remote location may call for the installation of large freezers for the storage of food that would not be necessary in a suburban school to which deliveries can be quickly and easily made.
10. If the preparation and packaging of food is done at a remote location outside the school, the elaborate cooking, service, and clean-up facilities described above may not be required.

For more information about food-services facilities design, see the Maryland State Department of Education's *School Food and Nutrition Service* (1996).

O. Other Facility Areas

I. ***Sufficiency Standards—Other Facility Areas***

1. Administrative space. A school facility shall have space to be used for the administration of the school. The space shall consist of a minimum of 150 net sf, plus 1 net sf/student of the planned school program capacity.
2. Faculty workroom/lounge. A school facility shall have workspace/lounge available to the faculty. This space is in addition to any workspace/lounge available to a teacher in or near a classroom. The space shall consist of 1 net sf/student of the planned school program capacity with no less than 150 net sf. The space may consist of more than one room and may have more than one function. This space shall include a break area with a sink.
3. Health services. (COMAR 13A.01.02.05 and 13A.05.05.10A) A school facility shall have a dedicated health services space with areas for waiting, examination and treatment, resting, storage, and an accessible toilet room. There shall be a separate room for private consultations and for use as a health service professional's office. Provide lockable cabinets for medical records and medications and at least one sink in addition to the sink in the toilet room. All sinks must provide both hot and cold water. Provide a minimum of 500 net sf.
4. Pupil services. (COMAR 13A.05.05) A school shall provide a coordinated program of pupil services for all students which shall include, but not be limited to, school counseling, pupil personnel, school psychology, and health services. The school facility shall provide a minimum of 120 net sf for each discipline, except school health services, staffed with greater than a 0.5 full time professional.

II. ***Supportive Practices—Other Facility Areas***

1. Administrative Space: Provide space for the basic administrative functions concerned with the operation of the school. This area should be located near the main entrance of the school where it is easily accessible to visitors and close to parking areas, with a suitable reception area readily available to students, teachers and visitors. Appropriate display areas should be available to display student art and other school artifacts. The administration offices should be accessed directly through the administrative reception area. The principal's office should be accessible from within the main office area as well as directly from the main corridor and commons areas. Additional considerations for the administrative space should include:
    a. Ample and conveniently located storage.
    b. Conferencing space.
    c. Secure place for permanent records (fireproof file storage). (REQUIRED)
    d. A small safe.
    e. All appropriate building infrastructure for telecommunications and technology.
    f. Mail rooms/workrooms.
    g. Acoustically-separated small meeting or conference spaces for specialized staff use.
    h. Staff toilets and coat closet.
    i. A waiting area.
2. Counseling: In elementary schools these services may be only needed on a part-time basis but space for both individual and small group consultation sessions is recommended. Middle and high schools typically require space for full-time counseling staff and usually employ the services of several counselors depending on school size. Small schools may have only one counselor. Part-time counseling services may be provided on a shared-schedule basis in another office. Students should feel secure and comfortable in accessing and utilizing the counseling area.
3. Student Health: Provide space for activities including maintaining student health records, treating minor injuries, conferencing with students and parents, conducting health screening activities, immunizations and conferring with other health professionals, teachers and administrators. Additional considerations are as follows:
    a. The Health Suite should have its entry door off a main corridor in the school and close to a main entrance for quick access in cases of emergency. Ideally, it should be adjacent to the administrative office with a secondary entrance for ease of access when the nurse may need additional staff support.
    b. The Health Suite needs to efficiently accommodate large numbers of student visits in a short period of time. The placement of the suite's entrances and treatment area should allow a flow of circulation for ease of medication distribution and prompt treatment.
    c. At a minimum, a health suite should have a separate space that can serve as the health professional's office and consultation/examination room. This should be acoustically separate from the waiting, treatment, and rest areas so that the health practitioner can discuss a student's health concerns in private. However, it must be positioned in the suite and with glazing to allow the health professional to have clear sight lines to all areas of the suite—particularly its entrance, waiting, rest, and treatment areas. This office should have a phone.

d. There should be sufficient space to conduct eye examinations (minimum of 20 feet).

e. The rest areas should be open but have privacy curtains that can be closed when needed. A wall separating the rest areas for male and female students is recommended in secondary schools.

f. Locked file cabinets shall be available for storing health records and medications.

g. Any examination space must include a sink.

For more information about school health-services facilities design, see the Maryland State Department of Education's *School Health Services: A Facility Planning and Design Guide for School Systems* (2002).

4. Faculty Workspace/Teacher Lounge: Locate near the administrative hub of the facility. The atmosphere of the lounge should be relaxing and comfortable. The room should invite relaxation and informal communication, as well as provide an atmosphere of work-related collaboration. The space should be provided to accommodate the following:

    a. A sink;

    b. A break area with comfortable chairs and tables;

    c. Technology access (Internet, etc.); and

    d. Where feasible, a small private space should be provided for private telephone calls.

5. Parent Workspace: Parents are encouraged to form active partnerships with schools to assist with planning and carrying out school activities. This space should have:

    a. Small group meeting capabilities;

    b. Space to house parent coordinator or volunteers to coordinate school outreach activities;

    c. Storage space; and

    d. Easy access to administration and outside entrance.

6. School-Based Health Center (SBHC): In addition to the general student health area, a school may be eligible to incorporate a school-based health center. SBHCs provide primary and behavioral health care including substance abuse treatment. Services are available to all students/clients regardless of ability to pay. The oversight and distribution of state funding for the Maryland SBHC program is monitored by the Maryland State Department of Education, Division of Student Services, Academic Enrichment, and Educational Policy - Student Services and Strategic Planning Branch. Additional funding sources include the Maryland Department of Health and local funding sources. The Maryland Department of Health, Office of Health Services provides oversight for the Medicaid billing process for SBHC Programs. The SBHC is operated by contracted health professional partners and groups who may be subject to additional accrediting requirements and regulations pertaining to facilities. Each state SBHC is classified to provide one of three levels of service (Level 1, 2 or 3) depending upon staffing capabilities and arrangements. Some SBHCs are designed to serve a client base which extends beyond the school campus and into the surrounding community. The SBHCs and schools work as cooperative partners serving the needs of the students and the community.

    When planning an SBHC, it is important to identify the anticipated level of the program, the professional-service providers, and whether or not services will extend into the community. The SBHC must have qualities of privacy, safety and comfort and should be convenient to accessible student pathways, parking and emergency vehicle access. Proximity to the school nurse's area is

preferred, dependent upon that area's location on campus. Sharing of the center's waiting area with the general student health center waiting area may also be considered. Confidentiality in accessing SBHC services must be fostered by the location on campus and the design. The location should be inclusive without impairing the student's perception of privacy when traveling to and visiting the center. Locating the SBHC in proximity to administration and/or security staff offices is not recommended. Interior provisions for privacy and confidentiality are necessary and can be achieved through the use of visual screening and sound transmission control. Other important considerations are security of records, medications, instruments, etc., maintaining hygiene and the proper disposal of clinical waste. The private areas of the SBHC should be designed as a suite of spaces that can be entirely secured after-hours or when not in use.

An SBHC should include a waiting/reception room, a business office for coordinator or provider, exam rooms, a behavioral health office and group counseling room (if part of the program), a pharmacy area, a laboratory area with toilet room nearby, and general storage and medical-record storage.

More detailed programmatic information is available from the Maryland State Department of Education, Division of Student Services, Academic Enrichment, and Educational Policy - Student Services and Strategic Planning Branch and in the Maryland School-Based Health Center Standards (April 2006) published by the Maryland School-Based Health Center Advisory Council.

P. Building-Support Spaces

I. ***Sufficiency Standards—Building-Support Spaces***

For storage, at least 1 net sf/student of the planned school program capacity may be distributed in or throughout any type of room or space, but may not count toward required room square footages. General storage must be securable and include textbook storage.
Each school shall designate 0.5 net sf per student of the planned school program capacity for maintenance and janitorial space. Janitorial space shall include a janitorial sink.

II. ***Supportive Practices—Building-Support Spaces***

1. General storage is typically dispersed throughout the facility and receiving areas should be located where easily and safely accessed for deliveries without disrupting other normal school traffic.
2. The number and locations of such areas are dependent upon the scale of the facility and the limitations of the systems or functions provided. For example, custodial space should be provided to allow for reasonable access to a mop sink and supplies in every major building area.
3. It is essential that custodial and grounds maintenance storage be sufficient in size, properly located, and separate from general storage and mechanical/electrical rooms. Safe storage of potentially hazardous cleaning materials, fuels, etc. is mandatory. Code compliance in rooms with mechanical and electrical equipment requires that general and custodial storage not be accommodated within these spaces.
4. Provide an access hatch to the roof that is accessible within a lockable storage, custodial, or mechanical space.
5. Provide secure filing space for building maintenance documents, training videos, handbooks, and manuals.

6. General design considerations related to building maintenance are as follows:
    a. Where there will be above-ceiling space for mechanical and electrical system components, design spaces for convenient installation and maintenance of fixtures and equipment. Provide access panels in ceilings and include doorways for large chase spaces to facilitate maintenance and repair work.
    b. Make sure there is proper lighting in all support spaces.
    c. When planning rooms for specialized data and telephone electronics equipment, work closely with the appropriate specialists to determine room sizes, clearances and any critical ventilation requirements to handle the heat buildup from this equipment. Louvers in interior doors are not recommended. Use ducted transfer ventilation or undercut doors. Consider any other special requirements such as needed to prevent or reduce dust infiltration.

Q. Circulation, Entryways, and Commons

I. ***Supportive Practices—Circulation, Entryways, and Commons***

1. Key points to consider when designing *hallways* and *entries* are as follows:
    a. Exit-way widths are prescribed in the code, and can be increased to allow for locker installations.
    b. Exit ways should be carefully laid out to provide a simple, clear, supervised way out of all school facilities.
    c. Openings to outdoor areas may include vestibules and airlocks.
    d. If interior windows are provided between classrooms and corridors, install blinds to allow visual control capability.
2. Key points to consider when designing *commons* are as follows:
    a. The student commons can be a central location in the school where students can congregate for relaxation, conversation, committee meetings, study and snacks. Its purpose is to nurture social and personal as well as academic advancement and to provide for student-teacher interchange in an informal atmosphere. It is normally provided only in secondary facilities and may be a repetitive feature in schools designed for learning academies.
    b. Although the student commons should be centrally located – perhaps in conjunction with a library, auditorium or dining area – it should be somewhat secluded.
    c. Commons space may be dispersed among the various “houses” and associated with grade levels and/or academies.
    d. It should always be available for use and furnished as a place for informal study and socializing.
    e. Snacking facilities may be incorporated within or adjacent to the area.

9 Resources

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National Center for Safe Routes to School, *Safe Routes to School Guide: Student Drop-off and Pick-up Strategies* (2007), available at http://guide.saferoutesinfo.org/index.cfm.

National Clearinghouse for Educational Facilities Resource Lists. View online at: http://www.ncef.org/.

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10 Appendices

Appendix A: Accessibility and Universal Design

The Maryland Building Code has adopted accessibility codes for all public buildings. Compliance with the Americans with Disabilities Act (ADA) is a requirement for all public schools. Further, in 1997 the Individuals with Disabilities Education Act (IDEA) was amended to strengthen, to the maximum extent possible, the right of students with disabilities to be educated with non-disabled students (mainstreaming). Once relegated to special needs classrooms or specialized facilities, an increasing number of students with moderate, severe and even profound disabilities are now requiring full accessibility to public school facilities at all grade levels. Accordingly, issues of accessibility are a fundamental component of public school facility design. The final decision on interpretation of accessibility requirements shall be according to the State of Maryland Building Code.

The following issues should be considered with regard to accessibility in public schools:

Universal Design. Pursuing universal design principles results in easier access and increased safety for all users. The expansion of school-based programs means an increase of users ranging from preschoolers to senior citizens. The application of universal design principles can allow a wider range of users' access to a facility.

Versatile Classroom Space. Classrooms that provide a variety of choices in the physical environment can be important in meeting the needs of students with a wide range of disabilities. The creation of alcoves and use of varying ceiling heights to define space separations within the classroom can aid students with emotional disabilities and those with attention disorders who require greater physical and/or acoustic separation between activities to reduce distractions. Modular furniture can also lend an element of versatility to the classroom. Data outlets should be dispersed throughout a classroom rather than clustered.

Minimized Travel Distances. It is important to minimize the distance any student travels from one destination to another, especially for students with disabilities. Gymnasiums, libraries, music and art classrooms and elevators should all be centrally located to reduce travel distances. In multi-story facilities, it may be necessary to provide more than one elevator to provide reasonable travel distances.

Integration of General and Specialty Classrooms. To the extent possible, specialized education spaces should not be isolated or clustered in a single area of the building, but dispersed throughout the school.

Outdoor Areas. Accessibility issues are not limited to the facility but should be extended to include the entire site. Far too often playgrounds and other outdoor areas are inaccessible to students with disabilities. New federal guidelines address what types and to what extent playground components must be made accessible. Though the Department of Justice has not yet adopted these, they should be used as a guide. (The outdoor play area guidelines and all other regulations of the ADAAG and UFAS are available at http://www.access-board.gov.)

Classroom Acoustics. The acoustical quality of learning spaces is becoming a critical matter in today's schools. Designers should pay specific attention to the effect of noise-producing factors and absorption of noise generated within the learning space and of noise isolation between spaces. A good source of information on this subject is the publication entitled "Classroom Acoustics" issued by the Acoustical Society of America, available at https://acousticalsociety.org/.

In 2002, voluntary acoustic standards were adopted for classrooms serving students with hearing impairments, attention disorders, emotional disabilities and multiple disabilities. The background noise standard is set at a

maximum of 35 dBA with a reverberation time standard in an unoccupied classroom of 0.5 seconds for classroom volume under 10,000 cubic feet, 0.6 seconds for volumes between 10,001 and 20,000, and reverberation times of 1.5 seconds for classrooms with volumes exceeding 20,001 cubic feet.

For classrooms serving mainstream students the background noise standard is set at a maximum of 45 dBA for new construction and renovation projects, with a reverberation time standard in an unoccupied classroom of 0.6 seconds for classroom volume under 10,000 cubic feet, 0.7 seconds for volumes between 10,001 and 20,000, and reverberation times of 1.5 seconds for classrooms with volumes exceeding 20,001 cubic feet.

Special attention shall be given to noise isolation of and between classrooms and noisy adjacencies as outlined in ANSI S12.60 - 2002.

Building Security. The general trend toward controlling access to keep unauthorized individuals from entering schools can also serve to keep students with disabilities, such as autism and emotional disabilities from leaving the school building. Such students are prone to leaving the school building unsupervised and risking harm to them. Access to areas such as storage rooms and mechanical areas with potentially dangerous equipment or supplies presents other security issues worthy of consideration.

Appendix B: Expenditures Ineligible for State Funding

COMAR § 23.03.02.12 lists the expenditures that are ineligible for state funding:

1. Site acquisition;
2. Offsite development costs except those listed as eligible in Regulation .11 of this chapter;
3. Architecture, engineering, or other consultant fees, except as permitted by Regulation .10 of this chapter;
4. Master plans, feasibility studies, programs, educational specifications, or equipment specifications;
5. Projects proposed in buildings or portions of buildings that have been constructed or renovated within 15 years, except that a building or portion of a building in which a limited renovation was performed is eligible for additional work within 15 years of the date that the limited renovation construction was completed;
6. Systemic renovation projects to replace, upgrade, or renovate building systems that have been replaced, upgraded, or renovated within 15 years.
7. Ancillary construction costs such as: (1) Permits; (2) Test borings; (3) Soil analysis; (4) Bid advertising; (5) Water and sewer connection charges; (6) Topographical surveys; (7) Models; (8) Renderings; or (9) Cost estimating;
8. Leasing or purchasing school facilities except as provided in COMAR 23.03.05;
9. Construction inspection services;
10. Relocation costs for site occupants;
11. Salaries of local employees;
12. Construction of administrative or support facilities, including regional or central administrative offices, warehousing, resource, printing, vehicle storage, and maintenance facilities;
13. Movable equipment, furnishings, and artwork as defined by the IAC;
14. Maintenance; and
15. Temporary storage.

Appendix C: Gross Area Baselines in Gross Square Feet (GSF)/GSF per Pupil

1. Reference. Code of Maryland Regulations 23.03.02.06.
2. Gross Area Baselines in Gross Square Feet (GSF)/GSF per Pupil

for Elementary Schools (Grades PK - 5)		
Est. Total Projected Enrollment	Baseline GSF per Student	Baseline Total Facility GSF
300 or fewer	141	
350	140	49,000
400	136	54,400
450	131	58,950
500	127	63,500
550	122	67,100
600	120	72,000
650	117	76,050
700	114	79,800
750	112	84,000
800	110	88,000
850	108	91,800
900	106	95,400
950	105	99,750
1,000 or more	105	

for Middle Schools (Grades 6 - 8)		
Est. Total Projected Enrollment	Baseline GSF per Student	Baseline Total Facility GSF
600 or fewer	145	
650	144	93,600
700	142	99,400
750	141	105,750
800	140	112,000
850	138	117,300
900	136	122,400
950	135	128,250
1000	134	134,000
1050	133	139,650
1100	132	145,200
1150	131	150,650
1200	130	156,000
1250	129	161,250
1,300 or more	128	

for High Schools (Grades 9 - 12)					
Est. Total Projected Enrollment	Baseline GSF per Student	Baseline Total Facility GSF	Est. Total Projected Enrollment	Baseline GSF per Student	Baseline Total Facility GSF
800 or fewer	160		1600	154	246,400
850	160	136,000	1650	154	254,100
900	159	143,100	1700	153	260,100
950	159	151,050	1750	153	267,750
1000	158	158,000	1800	153	275,400
1050	158	165,900	1850	153	283,050
1100	157	172,700	1900	152	288,800
1150	157	180,550	1950	152	296,400
1200	157	188,400	2000	152	304,000
1250	156	195,000	2050	151	309,550
1300	156	202,800	2100	151	317,100
1350	156	210,600	2150	151	324,650
1400	155	217,000	2200	150	330,000
1450	155	224,750	2250	150	337,500
1500	154	231,000	2300	150	345,000
1550	154	238,700	2350 or more	149	350,150

3. In General. These total GSF baselines are for determining state funding participation. They are intended to support all of the spaces required to deliver the educational programs required by the

State of Maryland and to encourage multiple uses of spaces and other utilization-maximizing strategies that can reduce facility size and therefore the long-term costs of ownership. An LEA may challenge these baselines for a given project on a case-by-case basis through an application for consideration by the IAC for a variance. As part of such an application, the LEA shall provide information sufficient that the IAC staff can analyze the proposed spaces and uses on a program-by-program basis.

4. Special Education. For the purpose of determining state-funded Gross Area Baselines, special-education students in MSDE LRE categories C, S, and W in grades PK through 8 are counted separately and assigned 180 GSF each instead of the baseline GSF per student. Special-education students in MSDE LRE categories C, S, and W in grades 9 through 12 are counted separately and assigned 200 GSF each instead of the baseline GSF per student.
5. Career and Technology Education (CTE). For the purpose of determining state-funded Gross Area Baselines, students in grades 9 through 12 who are in career and technology education programs are counted separately and assigned 210 GSF each instead of the baseline GSF per student.
6. Combination Schools. For schools with grade configurations not matching the above tables, please contact the IAC staff for a customized calculation of gross area baselines.
7. Alternative Education – separate school. The gross area baseline will be determined by program offerings, with an allowance for administration, support, circulation, mechanical system, etc. The baseline shall not exceed 225 gross square feet per full time equivalent student.
8. Auditorium. An auditorium may be designed within the gross area baseline. No additional area allowance will be made to increase the maximum square footage or State funding for an auditorium.
9. Auditorium Addition – constructed as a separate project. The gross area baseline will be determined on a case by case basis.
10. Career and Technology Education – separate school. The gross area baseline will be determined by program offerings, with an allowance for administration, support, circulation, mechanical system, etc. The baseline shall not exceed 240 gross square feet per full time equivalent student.
11. Cooperative-Use Space. The gross area baseline will be determined by program offerings with an allowance for support space. Cooperative use space is above and beyond the size of school function areas typically provided by the LEA. The baseline shall not exceed 3,000 gross square feet.
12. Fine-Arts High School. The gross area baseline will be determined by program offerings, with an allowance for administration, support, circulation, mechanical system, etc. The gross area baseline will be determined on a case by case basis.
13. Gymnasium – constructed as a separate project.
    a. Elementary - The gross area baseline will be determined by program offerings with an allowance for storage, toilet, mechanical system, circulation, and other support spaces. The maximum shall not exceed 6,500 gross square feet per gymnasium designed for one teacher and one class and 11,000 gross square feet per gymnasium designed for simultaneous use by two teachers and two classes.
    b. Secondary - The gross area baseline will be determined on a case by case basis.
14. High School Science – constructed as a separate project. The gross area baseline shall be determined by program offerings with an allowance for preparation, storage, mechanical system, circulation, and

other support spaces. The baseline shall not exceed 2,200 gross square feet per classroom/laboratory.

15. Kindergarten and prekindergarten – constructed as a separate project. The gross area baseline shall be determined by program offerings with an allowance for lecture, laboratory, preparation, storage, mechanical system, circulation, and other support spaces. The baseline shall not exceed 1,800 gross square feet per classroom.
16. Special Education – public separate day school. The gross area baseline will be determined by program offerings, with an allowance for administration, support, circulation, mechanical system, etc. The gross area baseline will be determined on a case by case basis.

Appendix D: Natural Lighting in the Classroom

A substantial percentage of the energy use in Maryland public schools goes toward lighting the facilities. The proper use of natural lighting in the classroom can help to reduce overall energy use. Recent studies have shown that daylight in the classroom can also have a positive effect upon human psychology and performance. A number of studies have demonstrated a direct correlation between increased daylight exposure in the classroom and increased test scores on standardized tests for students at all grade levels. Properly designed daylighting systems can be both aesthetically pleasing and cost-effective to integrate into building design. Successful daylighting solutions in schools include translucent wall panels and clerestory light monitors with operable shading devices. Any solution needs to consider the problems of glare and the distribution of usable light.

In selecting window types, sizes, and locations, consider safety, security, the potential of distracting views to the outside, and any necessity for visual monitoring. Properly selected blinds or shades are typically useful in controlling natural light and views to the outside and classroom interior. Avoid window coverings and windows that introduce visual patterns that are distracting to students. Consider the need for a certain level of room-darkening for audio/visual presentations. Black-out shades are not recommended except where absolutely necessary.

END OF DOCUMENT

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