3D/I Research & Development

Standards for School Design

Setting the Bar

In the pursuit of facility equity, standards form the measuring guide for the assessment and forecasting processes. Setting detailed physical and functional standards can provide a real understanding of how existing school and university facilities compare within their campus, their state and their nation. They are also useful in applying best practices and lessons learned to new construction.

Standards can and do cover many diverse areas of interest, from square footage of white board to preferred HVAC systems. Their content and detail varies depending on the needs of the particular state or district. When carefully and comprehensively outlined, standards can ensure educational adequacy while also laying the foundation for quality facilities that are cost effective and maintainable.

Typical Standards

Space standards define requirements for student capacity, square foot allocations and utilization. For example, Florida Community Colleges set these standards forth in the *Size of Space and Occupant Design Criteria Tables* of the *State Requirements for Educational Facilities* (SREF) and in the Florida Inventory of Schoolhouses (FISH). *Figure 1* provides an example. Many other states have established similar standards, which vary from state to state. While some states require minimums enforceable by law, others provide only recommendations. Paramount is the establishment of the process for developing and implementing space standards to ensure adequate facilities on a statewide level.

Functional standards align the educational specifications for space and equipment with specific curricula requirements. These usually include requirements for teaching aides, spatial relationships and instructional technology. The rapid pace of technological integration and convergence in education requires special focus, often establishing technology as a separate category of standard.

Design standards typically include requirements for building system quality, performance, durability and condition. Physical design standards may also include recommended facility condition index and system life expectancy based on nationally promulgated recommendations from organizations such as the Building Owners and Managers Association. Statutory design standards include handicapped accessibility requirements and state building codes. Preferential design standards include an institution's own design criteria.

ICS Code	Facility Space Name	Recommended Occupants			
			Min	Norm	Max
1.00.00	Classroom	Varies	20	25	30
1.11.01	Agricultural & Natural Resources	Varies			
	Small		35	40	45
	Medium		50	55	60
1.11.09	Engineering	Varies			
	Small		40	50	60
	Medium		70	80	90
	Large		100	125	150
1.11.12	Health Professions	Varies			
	Small		40	50	60
	Medium		70	80	90
	Large		100	125	150
1.11.19	Physical Sciences	Varies			
	Small		35	40	45
	Large		50	55	60
1.12.10	Fine & Applied Arts Varies	Peak			
	Art		40	50	60
	Music (Choral or Band)		25	35	45
1.13.11	Foreign Languages	Varies	35	40	45
1.13.15	Letters	Varies	20	25	30
1.14.08	Education	Varies	35	45	55
1.15.05	Business & Management	Varies	35	45	55
1.16.07	Computer & Information Science	Varies	35	45	55
1.16.17	Math	Varies	20	25	30
1.17.22	Social Sciences	Varies			
	Small		35	40	45
	Large		50	55	60
1.18.06	Communications	Varies	35	45	55
1.18.13	Home Economics	Varies			
	Small		40	50	60
	Large		70	80	90
1.18.14	Law	Varies	20	25	30
1.18.16	Library Science	Varies	20	25	30

Figure 1. Florida Community College recommended occupancy for various spaces.

Better learning environments

Detailed, progressive standards can result in better learning environments. In recent years, substantial research has shown that the built environment has a direct impact on student and teacher performance. Students working in daylit classrooms, for instance, have been found to progress 20 percent faster on math tests and 26 percent faster on reading tests than those students with the minimal amounts of daylighting. The General Accounting Office has found that more than 15,000 schools suffer from poor indoor air quality, affecting more than 8 million students. As these issues gain attention, more states are taking notice and adopting standards to improve the quality of their learning environments.

Cost Effective Facilities

Standards can also produce more cost effective and efficient facilities. Standardized MEP, building envelope and interior finish systems allow for the mass procurement of these items at the state or campus level. Replacement parts can be more easily and cheaply obtained at increased convenience to facility staff. Maintenance training is also simplified because of the reduced variety of systems and processes.

Life cycle cost is another important consideration. In some cases, specifying a more energy efficient or durable system at a slightly increased initial cost can be cheaper in the long run. A slightly more expensive roof may quickly pay for itself by lasting for an extra five years or requiring less maintenance. By developing standards for durable, maintainable and cost effective buildings, states and districts can make better use of the limited dollars budgeted for school and university facilities.

Setting *Your* Bar: Defining Your Own Standards

Standards can and should be customized to address the specific needs and priorities of states and districts. *Figure 2* shows some examples of the breadth of subject matter covered in statewide standards. Few subjects are covered by all six states in the table and many have differing levels of detail and enforceability. The concept of statewide standards is, then, very flexible and open to interpretation.

The critical task toward creating purposeful and relevant standards is the development of a team that can study and weigh past successes and mistakes, future possibilities and projections, and efficient, durable construction solutions to devise the best plan of action. Facility operators, educators, administrators and students can provide a wealth of knowledge about their facilities' current and future needs. Each group has their own concerns: facility operators want to invest in reliable, easy-to-maintain building systems; educators want spaces that are optimal for learning; administrators want a facility that is adaptable to future growth and curriculum shifts. By bringing all these various concerns to the table during standards review and development, you can ensure that the result will be a well-rounded, forward-thinking, lasting document that truly addresses your important concerns.

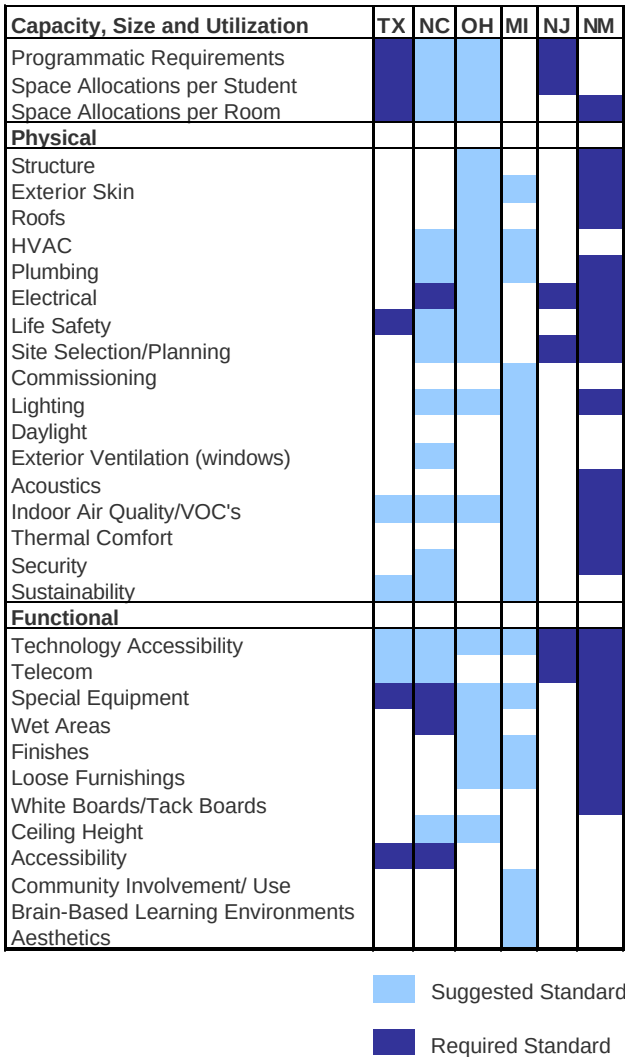

Figure 2. Sample Statewide Facility Standards

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