Manual of Planning Standards

2022

The University of the State of New York
The State Education Department

MANUAL

OF

PLANNING STANDARDS

FOR

SCHOOL BUILDINGS

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PREFACE

Although focused on teaching and learning, education must also address the need to maintain a safe, secure, and healthy school environment. The capacity of children to learn is impeded if their school environment contains elements that are hazardous to their health. The State Education Department and educators throughout the State of New York have a responsibility to assure the school community and the public that, based on the best available knowledge, school buildings contribute to achievement by being safe, healthy and clean environments in which to learn.

In December 1994, the New York State Board of Regents adopted the following guiding principles developed by the Regents Advisory Committee on Environmental Quality in Schools:

- Every child has a right to an environmentally safe and healthy learning environment that is clean and in good repair.
- Every child, parent, and school employee have a "right to know" about environmental health issues and hazards in their school environment.
- School officials and appropriate public agencies should be held accountable for environmentally safe and healthy school facilities.
- Schools should serve as role models for environmentally responsible behavior.
- Federal, State, local, and private sector entities should work together to ensure that resources are used effectively and efficiently to address environmental health and safety concerns.

Among the many responsibilities of the Commissioner of Education is that of establishing and enforcing school building construction standards for the health, comfort and safety of all public-school occupants.

The Office of Facilities Planning (OFP), on behalf of the Commissioner, is the code enforcement authority for public schools, BOCES, and charter schools that were chartered after 7/31/10. In accordance with Department of State regulation Title 19, 1201.2(e), *The State Education Department shall be accountable for administration and enforcement of the Uniform Code with respect to buildings, premises and equipment in the custody of, or activities related thereto undertaken by, school districts and Boards of Cooperative Educational Services.*

Accordingly, all plans and specifications for the erection, repair, enlargement or remodeling of school buildings in any public-school district in the State, outside of New York City, must be reviewed and approved by the Commissioner. The OFP performs this function through the issuance of a building permit. However, the OFP offers services beyond the approval of plans and specifications. We offer advice and technical assistance to school districts, architects and engineers to help them solve their school building needs with consideration of educational and planning efficiency, conservation of natural resources, initial and life-cycle costs within the context of the most recent State and Federal laws.

The Manual of Planning Standards has proved invaluable to school district architects and engineers. It has simplified and expedited review and approval of plans and specifications by the Office of Facilities Planning. OFP would like to emphasize several things about this publication.

1. Included herein are both minimum requirements that shall be followed and recommendations which are optional. The language used indicates the distinction (e.g., words such as "shall" and "must" indicate requirements; "should" and "may" indicate recommendations).

2. The requirements stated herein are those that are currently in effect. Revisions will be made from time to time due to changes in fire safety regulations, construction techniques, technological developments and materials, and progress in education, which has implications for space requirements and types of facilities. This Manual, revisions, and other useful planning information is available at: *www.p12.nysed.gov/facplan*.

3. For help, technical assistance or current information relating to the layout of spaces and recommended equipment for the various curriculums, contact the Education Department's OFP at (518) 474-3906 or emscfp@nysed.gov.

We actively seek competent advice and welcome suggestions as to how our requirements might be improved to keep pace with educational and technical developments. We will gladly consider applications for approval of experimental projects that deviate from established standards if it is reasonable to expect that important benefits will result therefrom.

We urge that all school officials confronted with building needs to contact the OFP for consultation before detailed planning is undertaken. In this way costly mistakes and delays may be avoided. Even more importantly, early consultation will give us the opportunity to help districts secure the buildings best suited to their educational needs within the resources available.

This revision eliminates provisions of the former manual that are now incorporated in the Uniform Code. Where possible, we have included the guidance from newsletter articles in the appropriate sections.

There are also new provisions for health and safety that did not previously exist, which were added based on statewide experience.

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GENERAL PROVISIONS

S1 GENERAL

a. Any school district which proposes to erect, repair, enlarge, or remodel a school building must investigate the necessity of submitting plans to the Office of Facilities Planning in accordance with current administrative procedures. The "Instruction Guide for Public School Districts and BOCES Obtaining Building Permits for Capital Construction Projects" is available on our web site.

b. School Boards, School Administrators, Architects and Engineers should thoroughly understand the current requirements with respect to submission, review, and approval of plans and specifications and compliance with mandatory health and safety regulations.

c. School buildings, when designed or renovated, should use design principles and construction materials which further the goals of fire safety, conserving energy, ensuring good indoor air quality, pest-proofing, radon-proofing, and easy maintenance, and include other factors contributing to positive learning environments.

d. School Districts shall conduct a Phase I Environment Site Assessment for new building construction and additions greater than 10, 000 SF. Site assessments should be conducted for all projects which affect large site areas. Bordering properties should also be investigated if environmental issues are suspected in the area. All projects shall meet the requirements of the State Environment Quality Review Act (SEQRA).

S2 AUTHORITY

S2-1 Reviewing and Approving School Building Plans

a. The authority of the Commissioner of Education for reviewing and approving plans is found in Sections 408 and 409 of New York State Education Law (Appendix A).

b. The Commissioner's responsibility is recognized by the Department of State, which does not direct cities, towns or villages to take on this responsibility for school district and boards of cooperative educational services. This is found in Title 19 NYCRR Part 1201.2(e). (Appendix A).

c. While the New York State Education Department approves school district building projects pursuant to Education Law 401, 407, 408, and 409, courts have held that schools are not wholly immune or fully exempt from all municipal zoning regulations.

S2-2 Planning Standards

a. The authority for the standards set forth in this Manual is derived from Regents Rules Title 8 NYCRR Part 14 Section 14.1 – School Buildings and Grounds. (Appendix A)

S3 SCOPE

a. With the exception of schools in New York City, this Manual pertains to all public and BOCES school building construction and certain Charter school building construction.

S4 APPLICABLE CODES

a. All building construction is required to comply with the New York State Uniform Fire Prevention and Building Code and the Energy Conservation Construction Code of New York State. Subsequent to January 1, 2003, the New York State Uniform Fire Prevention and Building Code moved from Title 9B NYCRR 600-1250 to Title 19 NYCRR 1219-1228, 1240.

- Part 1219 Uniform Fire Protection and Building Code
- Part 1220 Residential Construction
- Part 1221 Building Construction
- Part 1222 Plumbing Systems
- Part 1223 Mechanical Systems
- Part 1224 Fuel Gas Equipment and Systems
- Part 1225 Fire Prevention
- Part 1226 Property Maintenance
- Part 1227 Existing Buildings
- Part 1228 Sugarhouse Alternative Activity Provisions
- Part 1240 State Energy Conservation Construction

b. The New York State Uniform Fire Prevention and Building Code and the Energy Conservation Construction Code apply to all buildings within New York State, with minor exceptions. This will hereafter be referred to as the Code.

c. All buildings are required to comply with the Manual of Planning Standards and the Code in effect at the time the Building Permit was issued. Over time, a building may have sections that comply with multiple editions of the Manual and the Code. At no time shall any additional construction create an adverse effect on the health and safety of the building occupants in existing buildings or have a negative impact on compliance with the code/standard requirements at the time of the original construction. Therefore, the portions of school district buildings built between 1984 and 2003 and not being modified would need to remain in compliance with the requirements of Title 9B NYCRR in effect at the time of construction.

d. This Manual and the Commissioner's Regulations Part 155 provide additional specific requirements beyond the Code. The Commissioner's Regulations are retroactive for all facilities with some exceptions for cities with a population over 125,000. If there are areas of the building out of the scope of work, they are still required to comply with the Commissioner's Regulations at all times.

S5 REFERENCE STANDARDS

a. All construction, including structural, mechanical and electrical shall conform to the Code, the "Referenced Standards" listed in the Code and commonly accepted good practice.

S6 FINAL AUTHORITY

a. Requirements set forth herein and in the Code are the minimum requirements unless otherwise specifically approved by the Commissioner of Education or the Department of State Division of Building Standards and Codes due to unusual conditions. Upon evaluation of a written request the Office of Facilities Planning may consider variances from the requirements of this Manual for a specific project. Variances from the Code may be pursued by application to the Board of Review of the Department of State, Office of Planning & Development, Division of Building Standards and Codes for resolution.

b. In any conflict between the Code, the Regulations of the Commissioner of Education, this Manual or other regulation, the stricter regulation shall be followed. Certain questions in this regard may occur and will require consultation with OFP staff or representatives from the Department of State, Division of Building Standards & Codes for resolution.

c. Requirements exceeding those of this Manual may be deemed necessary by the Commissioner to ensure health and safety. Each building will be reviewed based on its individual characteristics.

d. Spaces on approved plans are reviewed with the pupil and staff's health and safety in mind. Any changes to the space's use, exiting, access or function that may affect the health, safety and comfort of pupils and staff shall not be made without the approval of the Commissioner.

e. Any change to the building or its use must meet the requirements of the Code, the Regulations of the Commissioner of Education and this Manual. Such changes must be reported to the Office of Facilities Planning for further guidance.

S7 RESPONSIBILITY

S7-1 Building Permits for Capital Construction Projects

a. It is important to refer to the "Instruction Guide for Public School Districts and BOCES Obtaining Building Permits for Capital Construction Projects" for detailed requirements for obtaining building permits for capital construction. The instruction guide is available on our web site. http://www.p12.nysed.gov/facplan/publicat/BP_instruction_guide.PDF

S7-2 Architects and Engineers

a. Design for the construction of all buildings owned by or in the custody of public-school districts, BOCES, and certain charter schools and compliance of plans and specifications with the requirements of this Manual, the Commissioner's Regulations and the Code are the direct responsibility of the architect / engineer retained by the Owner (Board of Education or Board of Trustees).

S7-3 School Boards and School Administrators

a. In addition to the School Board's and School Administrator's responsibility for both immediate and long-range planning, it is their responsibility to obtain architectural and engineering services and adequate supervision or periodic inspection through the architect or engineer for all construction. Refer to the "*Instruction Guide for Public School Districts and BOCES Obtaining Building Permits for Capital Construction Projects*" for further guidance.

S8 COMPETITIVE BIDDING AND AWARDS

S8-1 All construction documents and bidding procedures must be in full compliance with the General Municipal Law. While Appendix A contains excerpts of the General Municipal Law, all parties involved in the bidding process should seek clear guidance from their legal counsel.

S9 PARKS, RECREATION, AND HISTORIC PRESERVATION LAW SECTION 14.09

S9-1 In accordance with Parks, Recreation, and Historic Preservation Law Section 14.09 projects which require approval from a state agency such as NYSED must be reviewed by the State Historic Preservation Office (SHPO). If any portion of the building in which a project is planned is 50 years or older or is listed or eligible to be listed on the State or National Register SHPO shall review and make comment. As part of SED's building permit application process, we specifically require documentation demonstrating coordination with SHPO. To obtain forms and information regarding the SHPO submission go to our website www.p12.nysed.gov/facplan/ and search for "Final Submission Forms Workbook".

S10 REGULATIONS OF THE COMMISSIONER OF EDUCATION, PART 155 EDUCATION FACILITIES (8NYCRR155)

S10-1 The "Commissioner's Regulations" are New York State statutory requirements which govern the acquisition, funding, management, maintenance, construction, health and safety and many other aspects of Public-School Buildings. Part 155 applies to all schools with some exceptions for cities with a population over 125,000. A link to the complete regulations can be found on our web site at:

www.p12.nysed.gov/facplan/Laws_Regs/8NYCRR155.htm

Design Professionals and Administrators should familiarize themselves with these regulations prior to performing any work on a school building. Currently there are 25 subdivisions, called Sections. Four of these sections, 155.2, 155.4, 155.5, and 155.7 specifically pertain to construction projects and are briefly described below.

S10-2 Section 155.2 - Construction and Remodeling of School District Facilities

This section provides a general overview of requirements the District must follow when undertaking a construction project.

S10-3 Section 155.4 – Health and Safety Committee

The Regulations of the Commissioner Part 155, Section 155.4, contains the requirement that schools establish a Health and Safety Committee. The committee is to be comprised of representation from district officials, staff, bargaining units and parents. Its purpose is to monitor the condition of occupied school buildings to assure they are safe and maintained in a state of good repair. During construction projects the committee shall be expanded to include the contractors, the architect/engineer and the construction manager.

S10-4 Section 155.5 - Uniform Safety Standards for School Construction and Maintenance Projects

This section contains the various requirements or responsibilities of the District, the Design Professional and the Contractor when a construction or maintenance project is executed. They are intended to ensure that safety is maintained for the students, staff and workers during the construction project. It is imperative that all of the requirements specifically related to the construction are thoroughly addressed in the Contract Documents. In larger projects temporary exit plans and/or phasing schedules may be required in order to satisfy these requirements. Some of the requirements are administrative or management issues and solely the responsibility of the District Administration.

S10-5 Section 155.7 - Health and Safety in Existing Educational Facilities

This section describes the minimum standards of construction, equipment and safety which a school building must meet in order to maintain a Certificate of Occupancy. These requirements are mandatory for all schools. It does not matter when the building was built. If a non-conformance exists, it must be corrected immediately. This section does not apply to city school districts in cities having a population of 125,000 inhabitants or more.

S11 DESIGN DOCUMENTS

a. General: The construction documents submitted for review are required to contain the information listed below in order to determine compliance with all applicable codes, rules and regulations. Any additional information that is needed to determine code compliance will be requested. If the work of the project does not necessitate one of the drawings or documents in part b. to confirm, code compliance, provide clarity or describe the work than it is not required to be submitted. Similarly, if the work is limited to one or two building elements, systems or trades, then all of the code compliance information noted in part c, is not required, only pertinent information. Reviews are accomplished more efficiently when all pertinent information is clearly indicated. It is important that information shown on the drawings and in the specifications be complete, coordinated and code compliant. "Complete" means that all materials and equipment are indicated on the drawings and specified on the drawings or in the Project Manual. The work must be coordinated among the trades and with utility companies, local municipalities and government agencies prior to submitting documents. The work must be code compliant and conform to all applicable regulations, including the New York State Uniform Fire Prevention and Building Code, the Energy Conservation Construction Code of New York State, the Regulations of the Commissioner of Education, this Manual, and regulations of all State and Federal agencies with jurisdiction.

b. All Trades:

1. All drawings and specifications must be dated and signed/sealed by a design professional.

2. Site/Civil, Architectural, Structural, Mechanical, Electrical, and Plumbing Drawings: Plans shall be drawn to scale. Details shall be drawn to scale as much as practicable.

3. North Arrows are required on Site Plans, Key Plans, and Floor Plans.

4. Key Plans shall be provided whenever Floor Plans have to be divided and shown on separate drawings.

5. Site Plans shall indicate:
   - Accessible parking and signs
   - Sidewalks
   - Curb ramps
   - Fire apparatus access roads
   - All new utilities
   - Existing and new fire hydrants
   - Property lines
   - Rights of way
   - Easements
   - Topography
   - Existing and new buildings and additions.

6. Floor Plans shall include:
   - Room labels (program use)
   - Square footage for each space (new and existing)
   - Door swings
   - Accessible toilet facilities
   - Stairs
   - Ramps
   - Window

7. All fire-rated walls and floor/ceiling assemblies (existing and new) must be shown on the Architectural and HVAC floor plans. Fire ratings shall be indicated for all new fire resistive assemblies including details showing conformance with UL, FM or other acceptable testing standard. Existing assemblies which are required to have a fire resistive rating by the work shall be thoroughly described so that the fire rating can be confirmed.

8. Provide key notes on all drawings to which they apply.

9. Provide legends for all devices, fixtures, partitions and symbols used on plans.

c. Code Compliance Drawings:

1. Code Summary: All projects shall have the following information:
   - Building Area of each floor
   - Construction Classification
   - Building Occupancy Classifications(s)
   - Existing Building Code compliance method
   - Classification of Work
   - Area of automatic sprinkler system coverage, if any
   - Structural Loads

2. New Building Additions, Change of Occupancy, Level 2&3 Alterations:
   - Provide Life Safety Floor Plans drawn to scale for each level of the building. Clearly indicate means of egress including:
     1. Room Name
     2. Occupant quantity
     3. Occupant classification
     4. Door swing/width
     5. Ramp and stair width
     6. Windows and rescue windows
     7. Max exit access travel distance
     8. Areas of refuge
     9. Smoke compartments
     10. Horizontal exits
     11. Exits stairs
     12. Exit passageways
     13. Fixed seating
     14. Accessible seating
     15. Built-in casework and furniture
     16. Handrails
     17. Guardrails
     18. Toilet rooms fixtures and partitions
     19. Exit signs and direction

   - Provide Code Floor Plans that indicate the following:
     1. Allowable building area with calculations
     2. Actual building areas
     3. Fire areas
     4. Fire rating
     5. Fire walls
     6. Fire barriers
     7. Fire partitions
     8. Smoke partitions
     9. Corridor partitions
     10. Fire-rated horizontal assemblies

3. Level 1 Alterations and Repairs:
    - Provide overall floor plans where work is located. Clearly indicate:
    - Location of work
    - Room names
    - Door swings
    - Corridor, stair and ramp configurations
    - Windows and rescue windows
    - Means of egress components
    - Fire ratings of all assemblies affected by work

4. Phasing and Temporary Egress:
    - For all projects where the work involves the replacement, removal or temporary blocking of any exit door Phasing and/or Temporary Exit Floor Plans and details shall be provided. Temporary means of egress shall be provided at all blocked exits, be sized to serve the occupant load and separated from work areas with non-combustible one hour rated fire barriers and overhead protection. Construction separations shall be indicated on floor plans and provided between all construction areas and occupied spaces. Temporary partitions, exit doors, panic hardware, exit signs, emergency lighting and phasing drawings shall be indicated and specified. Temporary exterior exit discharge routes shall be indicated, separated from construction areas with approved fencing. Walking surfaces shall be firm, stable, smooth and weather resistant.

d. Mechanical, Electrical and Plumbing (MEP): The MEP work must be coordinated among the trades, with the architectural components of the building, and with the site features. Mechanical equipment electrical power requirements must be shown on the electrical drawings. Water, sewer, gas, electric service, kitchens, pools, wastewater treatment, fuel tanks, etc. requirements must be coordinated with utility companies, local municipalities and government agencies prior to submitting documents. The following information shall be indicated on MEP Drawings:

- All new heating and cooling equipment: boilers, water heaters, solar heaters, flues/vents, air handlers, fans, duct/sizes, diffusers, grilles, dampers (fire, smoke, volume control, backdraft, etc.), heat exchangers, unit ventilators, unit heaters, refrigeration equipment, roof top units, exhaust fans, etc.;

- All piping must be shown including water and gas service, hot and cold-water supply, waste, gas, sanitary drains, vent, hydronic heating lines, recirculating, etc.;

- All new plumbing equipment: appliances, fixtures, valves, fittings, gages, vent terminations, drains, expansion fittings, hydrants, supports, appurtenances, etc.;

- All electrical equipment: service entrance feeders, service entrance equipment, transformers, metering equipment, electric panels, electric panel schedules, electric room equipment layout - drawn to scale, equipment loads, conduits, wiring, devices, lighting panels, fixture schedules, equipment schedules, fire alarm system panels and detection, notification devices, emergency and standby power equipment, emergency lighting, exit signs, electrically operated partition safety systems, site electrical connections, security, communications, technology, etc. And;

- Sizes and ratings of materials and equipment, such as: wires, conduit, fuses, circuit breakers, pipes, ducts, strobe candela, etc. must be indicated.

S12 HIGH PERFORMANCE SCHOOL BUILDINGS

S12-1 General

a. In response to the growing recognition that the quality of the environment where learning takes place has an impact on the success of students and the difficult economic challenges which school districts increasingly face, the NYS Education Department in conjunction with the NYS Energy Research and Development Authority (NYSERDA) developed the **NY-CHPS High Performance Schools Guidelines**. The document is based on the Massachusetts Collaborative for High Performance Schools Guidelines which were in turn based on CHPS, Inc. CHPS is the well-known acronym for Collaborative for High Performance Schools based in California. These guidelines are similar in intent and purpose to the LEED green building certification program developed by the United States Green Building Council. The NY-CHPS document contains most of the well-known and proven principals of sustainable design and is made available for Districts to use as a valuable resource in the design, construction and maintenance of their facilities.

b. The quality of the buildings and spaces in which students are taught is an important factor in the learning process. To be successful, a building must be attractive, efficiently organized, include a variety of spaces and have plenty of natural light and ventilation. Materials must be durable in order to maintain their appearance and function after many years of use. Students and teachers must be able to see and hear clearly, and their surroundings must be comfortable and healthy. The various educational activities which take place in school require special lighting, heating and ventilation systems. Natural and artificial lighting, brightness, glare, room proportions, colors and finishes, furnishings, sound control, and the ability to demonstrate and use equipment must be considered. It is imperative that buildings be designed to operate efficiently, use materials wisely, be attractive and conserve environmental and monetary resources. High Performance Schools exceed normal standards, provide exciting, functional spaces and conserve energy and resources throughout the life of the building.

c. The document can be found at the Facilities Planning web site *at http://www.p12.nysed.gov/facplan* by searching "NY-CHPS". The document extensively describes sustainable building design concepts which can be incorporated into a school construction project. Even the smallest project can benefit from the use of the ideas and construction practices of sustainable design. We strongly encourage School Districts to design their projects using these guidelines to reduce maintenance and operational costs over the life of the facility while providing outstanding learning environments.

S13 PROFESSIONAL DESIGN DELEGATION

a. Professional design delegation is often used in the design and construction of school construction projects. Building components which are often delegated include: grandstands, bleachers, modular buildings, pre-engineered metal buildings, press boxes, modular retaining walls, wood trusses, structural elements and mechanical and electrical systems and components. As construction technology continues to improve many components of the building require specialized design professionals to provide design and engineering for the manufacture and installation of these elements.

b. Proper design delegation is necessary for the Project Design Professional to legally assign the design of components or systems to specialized design professionals. Professional design delegation must be exercised in accordance with Education Law as established by the Rules of the Board of Regents, Part 29, Unprofessional Conduct, Section 29.3. Excerpts of these Rules can be found on the NYSED, Office of the Professions web site. Detailed explanations of these principles can be found on same the web site under Architecture, Practice Guidelines and are the same for the practice of Engineering and Land Surveying.

c. The basic requirements for design delegation are briefly described as follows:

- The delegated work shall be designed by a NYS Licensed Design Professional.
- The Delegator shall establish the parameters of the delegated work and thoroughly specify the criteria by which the work is to be designed. The specifications should require that complete and detailed construction documents be prepared and submitted to the Architect/Engineer of Record for review and approval.
- The design professional who has been delegated to design the special work (the delegate) shall sign and seal the drawings and provide a certification statement, that the design complies with the performance specifications and the New York State Uniform Fire Prevention and Building Code, the Energy Conservation Construction Code of New York State, the New York State Education Department Manual of Planning Standards and the Regulations of the Commissioner of Education.
- The Delegator shall review and approve in writing the submitted design.

d. To practice Engineering/Surveying and Architecture, design professionals must have a thorough knowledge of the Laws, Rules and Regulations of professional design practice. It is imperative the designer understands the legal implications of design delegation prior to executing this aspect of design service.

S14 ACCESSIBLE FACILITIES AND PROGRAMS

S14-1 Section 504 of the Rehabilitation Act of 1974 (updated July 2003)

a. All school districts are responsible for coordination and implementation of Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans Disabilities Act of 1990 (ADA), which prohibit discrimination based on disability. Each district must have a self-evaluation and transition plan required under both of these statutes and a grievance procedure required under Title II of the ADA.

b. This is not to say that all existing buildings must be fully accessible. However, ADA requires that public entities ensure that all programs and services must be accessible and usable by individuals with disabilities in the most integrated setting possible. The school district must provide access to all programs and services provided in the building. A school building is very challenging in this respect because it has so many program spaces. Program spaces include the administrative office, general classrooms, kindergarten or pre-K classrooms, cafeteria, auditorium, gymnasium, library, media center, music/band room, technology room, art room, home and career room, science room and toilets. An elevator (or ramp) is not necessarily required if all the program spaces are on one accessible floor. In older schools where it may be physically impossible to provide access to any of these spaces, the program provided in that space must be made accessible in another location or otherwise made available in a non-discriminatory manner. It is not uncommon to require a new elevator attached to the exterior of the facility if necessary, to provide accessibility to upper floor program spaces.

c. The requirement for accessible access to all primary functions extends to outdoor recreational facilities. All new athletic fields and recreational facilities shall include an accessible route from the building and/or the parking facilities. This applies to sports fields, track and field elements, playgrounds, tennis and basketball courts, bleachers, dugouts and related facilities.

S14-2 Americans with Disabilities Act of 1990 (ADA), Public Law

a. As public entities Public School Districts are responsible to have made "reasonable" modifications to provide accessibility in existing buildings as required by the provisions in Title II of the ADA. The ADA required an evaluation, a transition plan, and the removal of architectural barriers to be completed by all school districts prior to January 26, 1995. The design of new construction and alterations must comply with the most current ADA Standards to the extent its requirements exceed the standards referenced in the most current Building Code of New York State. Additionally, design must comply with the accessibility standards referenced in the Building Code of New York State. One purpose of the ADA is to compel public entities to perform ongoing improvements to accessibility in their buildings over time. If accessibility is lacking in certain areas it should be addressed in the ADA Transition Plan and incorporated in capital projects within a reasonable time frame. The design professional must take the time to become familiar with the ADA to be able to properly apply the requirements to the construction of schools. For more information about the ADA please visit the Department of Justice website www.ADA.gov. The ICC based building codes include scoping requirements and reference standards which ensure that construction in new and existing buildings comply with ADA accessibility standards. Plans for capital projects submitted to Facilities Planning are specifically checked for any previous or current modifications for accessibility.

S14-3 New York State Building Code Compliance

a. All new construction must meet New York State Uniform Fire Prevention and Building Code requirements and the referenced International Code Council (ICC) Standard ICC A117.1, Accessible and Usable Buildings and Facilities. The 2010 ADA Revised Standards have been closely harmonized with the standards given in ICC A117.1 ensuring that compliance with the Building Code of NYS will effectively achieve ADA compliance. Alterations must be fully accessible or accessible to the maximum extent feasible. Design professionals must comply with the 2010 ADA to the extent its requirements exceed the standards referenced in the current Building Code of NYS.

S15 CHARTER SCHOOLS AND THE AUTHORITY HAVING JURISDICTION

a. State law regarding the treatment of charter schools is codified in Article 56, the New York State Charter Schools Act of 1998, as amended in 2007, and as amended most recently by Chapters 101, 102, and 221 of the Laws of 2010. A charter school is an independent public school that operates under a five-year charter. A charter school is free to organize around a core mission, curriculum, theme, or innovative teaching model. The original statute included a cap of 200 charters which was subsequently increased to a cap of 460 in the laws of 2010. New charter school applications can only be approved by the Board of Regents and the State University of New York Board of Trustees, except that in NYC, an application for the conversion of an existing public school to a charter school may be approved by the local board of education or the Chancellor of Education in New York City.

b. The treatment of charter school facilities depends on when the charter was issued and where the charter school is located in accordance with the following:

- All charter schools located in New York City are subject to the New York City Code as enforced by the City regardless of when the charter was issued. All local laws, rules, codes, regulations and ordinances are applicable. All building permits and Certificates of Occupancy will be issued by the city.

- All charters issued for schools under the original 200 thresholds will be subject to the local code enforcement jurisdiction in which the school is located. The local authority having jurisdiction

will review plans and specifications and issue building permits and certificates of occupancy. Those charter facilities are not subject to the NYSED's Manual of Planning Standards.

- All charters issued above the original cap of 200 and located outside of New York City will be subject to the State Education Department as the Authority Having Jurisdiction for code compliance. The Manual of Planning Standards will apply, and all building permit applications and certificates of occupancy will be issued by Facilities Planning after the completion of our typical process.

c. In addition, all charter schools are subject to various other federal and state laws that govern all public and private elementary schools. Examples include, but are not limited to: AHERA, fire inspections, fire drills, emergency evacuation plans, numerous provisions of education law 409 including no smoking on school property, eye safety during science, electrically operated partitions, notification of pesticide use, self-extinguishing mercury vapor or metal halide lamps, procurement and use of environmentally-sensitive cleaning and maintenance products, etc.

d. When charter schools are seeking appropriate facilities, it may be prudent to seek former school facilities such that a change in occupancy, and the relevant code upgrades may not be immediately required. Co-location in partially used public schools may also provide adequate space at low initial capital cost.

e. Charter schools under SED jurisdiction will be treated in the same manner as all other school projects and will be reviewed on a first in-first out basis. Please contact the Office of Facilities Planning to determine which charter schools are subject to SED jurisdiction, and to verify specific information and documents required for project review. If the proposed school is located in a leased building, approval from the local Building Code Authority will be required in addition to the SED approval.

PART I: BUILDING SAFETY PLANNING

S101 GENERAL

a. This Part addresses Building Construction, Fire Safety and Egress. All new work is to be in full compliance with the Code, this Manual, and the Commissioner's Regulations. The following information contains additional State Education Department requirements and clarifications. No construction materials shall be used, and no type of construction shall be permitted which would endanger the health and safety of occupants of the facility.

b. The Code is very receptive to building reuse. For guidance pertaining to work in existing buildings review the "Existing Building Code of New York State".

c. The Americans with Disabilities Act of 1990 (ADA) requires all district programs and services to be accessible. Many existing buildings still do not comply with this Federal Law. Before the preliminary design phase, districts must evaluate their existing buildings for compliance with the ADA.

S102 BUILDING CONSTRUCTION

S102-1 General

a. Typically, each school project requires financing. In many instances, districts are financing buildings for 30 years. Before the architect is brought on board, the district has typically sought guidance from bond counsel. They discuss financing and building longevity as it relates to Local Finance Law Article II; Local Indebtedness; Power to Contract Indebtedness; and Periods of Probable Usefulness, Section 11. If the building is to be financed for 25 or more years, the architect needs to be aware of the requirements imposed by the Local Finance Law. See Appendix A.

b. School buildings are a part of a community's infrastructure and sustainable design must be considered. School buildings are subject to wear and tear. District staff and designers would be well advised to read "High Performance School Guidelines" prepared jointly by Facilities Planning and the NY State Energy Research and Development Authority in cooperation with the Collaborative for High Performance Schools, Inc. This booklet can be a guide through all phases of a project. The goal is to provide a building that is healthy and productive, cost effective and sustainable. See General Provisions, Section S11.

c. Designers must have a discussion with their client about the anticipated useful life of the building or addition being designed. With the financial situation districts are facing today, there is the temptation to save pennies wherever possible. It is the architect and engineer's responsibility to advise their client of the long-term impacts of material and equipment choices.

S103 FIRE CONTROL

S103-1 Additions

a. Many times, an addition is located at the rear of a building. In the past, this was not an issue of concern. However, the current Fire Code Chapter 5, Fire Service Features, may require additional fire hydrants and apparatus access road features that can complicate the design. The designer must review this chapter thoroughly at the beginning of the design phase. If a site raises great challenges, it is strongly recommended the responding fire organization be involved.

b. Additions must comply with all requirements of the Code, this Manual, and the Commissioner's Regulations. If the addition can bring an existing building into conformance with the Code, this Manual, and the Commissioner's Regulations it should do so.

c. Sometimes an addition can create an enclosed court (courtyard). Refer to Section S106-8 for further guidance.

d. Passages or corridors connecting buildings to each other must meet all dead-end restrictions of the Commissioner's Regulations and the Code.

S104 FIRE-RESISTANT AND FIRE-RATED CONSTRUCTION

S104-1 Exterior Shell

a. All roof assemblies and coverings shall have a Class A fire classification as tested in accordance with ASTM E108 or UL 790.

S104-2 Interior Space Requirements

a. In addition to the Code requirements, the following spaces are required to have walls, floors, and ceilings of at least the fire resistance ratings listed below, with a non-combustible finish. The doors shall have the appropriate label for the wall fire rating. The doors shall be self-closing and latching. Those spaces having a roof over the entire space may have a roof/ceiling assembly which is non-rated.

b. Two-hour fire barrier construction:

1. Boiler, heater or furnace rooms.

2. Refrigeration rooms which house equipment that uses flammable refrigerant.

3. Electrical Rooms (See S801)

4. Emergency/standby generator rooms, or rooms housing equipment which uses any flammable liquid. (Sprinkler exception under S104-2 e below does not apply)

5. Individual Vocational Technology Shops.

6. Storage rooms for fuel, flammable liquids or gas-powered equipment. (See S106-7 b)

c. One-hour fire barrier construction:

1. High School and Middle School Art rooms, maker spaces, STEM labs, or science labs containing hot and chemical hazards (e.g. burners or fume hoods).

2. Home and Career rooms with cooking equipment (range, oven, cooktop, grill, etc.)

3. Storage rooms over 100 square feet (or provide automatic fire protection)

4. Each space containing a kiln.

5. Commercial Kitchens (Any kitchen that contains commercial cooking appliances as defined by the Fire Code of NYS)

   Exception: A fire rated separation is not required directly around the kitchen space if the kitchen and the adjacent spaces are provided with an approved automatic fire sprinkler system. A one-hour fire barrier is required at the perimeter of the fire area formed by the kitchen and its non-separated adjacent spaces. The fire barrier shall form the limit of the sprinkler coverage.

d. Under stage storage: Storage of scenery and equipment in space underneath the stage is not recommended. If it is provided, in addition to fire-rating requirements of the Code as storage space, the space shall have door or access hardware that is readily operable from the inside for egress. A light shall also be provided in the space.

e. Fire ratings in b and c above are reduced one hour if the room or space is provided with an automatic fire suppression system.

S105 SMOKE CONTROL

S105-1 General

a. Every floor of a building shall be separated from floor levels above and below by stair enclosures and smoke barriers constructed to effectively obstruct the passage of smoke and fumes.

S105-2 Smoke Zones / Smoke Barriers

a. Smoke barriers are required to divide a building into separate smoke zones to effectively obstruct the passage of smoke and fumes.

b. Separate fire areas and separate building areas are separate smoke zones.

c. In sprinklered buildings, all corridors shall be protected from the spread of smoke from adjacent spaces. Door closers and smoke dampers are required. Where a duct serves both a corridor and the classroom(s) or spaces on the other side of the corridor partition, a smoke damper is required. If a duct serves corridors on separate floors or separate corridors on the same floor a smoke damper is required.

S105-3 Stairway Enclosures

a. In those instances where a stairway enclosure is not required by the Code, the stairway shall be separated from the levels it serves so as to effectively provide smoke separation between floors. At one or more levels a smoke separation shall be provided to separate the stair opening from the Corridor to which it connects. This separation requirement only applies to stairs which connect to a corridor on at least one level.

S106 EGRESS

S106-1 General

a. There shall be at least two means of egress remote from each other leading from each floor of pupil occupancy. When a pupil enters into a corridor from a room of pupil occupancy, there shall be a choice of two unobstructed means of egress in different directions and leading to different exits.

b. Required exits shall always be located remote from each other within a room or enclosed area. Exits shall be distributed as uniformly as possible along the perimeter of the room, such as at diagonally opposite room corners.

c. Required exiting through adjacent spaces other than corridors will not be allowed, unless specifically authorized by SED Office of Facilities Planning.

d. Folding partitions, rolling partitions, and overhead doors are not permitted as exits. A code compliant door within an operable gymnasium partition or folding partition may be used as smoke zone exit.

e. Code compliant manual or power operated sliding doors are permitted as exits, but shall not be permitted at cross-corridor doors.

f. Fixed and movable gates shall not be located so that they create dead end conditions or obstructions. Smoke doors with panic hardware can generally be installed in lieu of gates to provide desired lockable administrative control to avoid dead end conditions beyond the doors.

g. Required building exits cannot discharge into completely enclosed courtyards. (see S106-8c).

h. The exit discharge portion of the means of egress shall be paved to the sidewalks or roadways.

i. Receiving areas may not be used for exiting purposes.

j. Open cubbies or other open storage furnishings are not allowed in corridors.

S106-2 Egress from Space of Pupil Occupancy - WITH Traditional Corridor Concept:

a. Where permitted by code all doors to corridors from spaces of pupil occupancy shall swing into the room unless fully recessed.

b. Every space of pupil occupancy over 500 square feet in area, shall have two separate means of egress from the space, each into a separate smoke zone. The primary means of egress is commonly the opening to the corridor. The second means of egress may be a door into a separate smoke zone or to the exterior, or a rescue window. A door providing a second means of egress through one intervening space may be approved on an individual basis.

c. The second means of egress provided through an adjacent space will only be approved if all of the following conditions are met:

1. The originating space is provided with a accessible door to the adjacent space and the door is posted with a sign which reads “Emergency Escape”. The sign shall have a bright yellow background with black letters, minimum size: 5 inches by 8 inches.

2. The adjacent (intervening) space which contains the smoke zone exit shall be provided with either a Rescue Window, or a door which provides access to either the exterior of the building, a stair enclosure, or a corridor which is not in the same smoke zone as the corridor door from the originating room.

3. The adjacent room shall be provided with emergency lighting.

d. Buildings of Type V Construction - every space of pupil occupancy shall have an exit to the corridor and, in addition, a door directly to the exterior.

S106-3 Egress from Space of Pupil Occupancy with Open-planned Areas:

a. When spaces of pupil occupancy are defined in an open area by wardrobes, cabinetry, and other furniture which DO NOT present obstructions to egress and allow students to circulate freely from one space to another, the total open space can be considered, for exiting purposes, as a single space.

b. Each open-planned area shall have exits into separate smoke zones at remote locations spaced such that no point is more than 75-foot straight-line distance from two separate smoke zone exits.

c. Furniture and partition layouts of all open-planned areas shall be included within drawing submissions. They shall provide free circulation, a 4 foot minimum space at all wall intersections, and show the extents of all movable partitions.

d. Enclosed pupil occupied space(s) within open-planned areas may be approved on an individual basis. Separate smoke zone exiting is required, per S106-2.

S106-4 Rescue Windows

a. Emergency rescue windows, as required in S106-2, shall be windows of such size and design that will permit and facilitate emergency egress through them. Window hardware shall be a maximum of 54 inches above the floor. It is recommended that all classroom windows permit emergency egress. Double hung, casement, and sliding windows are satisfactory window types. Casement windows must have hardware that permits the window to open at least 90 degrees.

b. The minimum clear opening area for rescue windows shall be at least 6 square feet and the minimum dimension shall be 24 inches unless otherwise approved.

c. Screens, if provided at rescue windows, shall be hinged or sliding and shall be operable from the inside with one hand, and without the use of a key, special tool or special knowledge.

d. When a rescue window is required, school authorities shall cause at least one such window per classroom, to be marked by an appropriate sign identifying the rescue window. Any window coverings that may cover the window must also have a label.

e. Rescue window labels shall be:

1. Color: bright yellow background with black letters

2. Size: 3 inches by 5 inches

3. Text: **Rescue Window** readable from each side of the window

f. Interior Rescue Window Access: Rescue windowsill height shall be at the recommended sill height for the grade level housed in the room (see Table S303-1). Casework/cabinets that support body weight, permanent platforms, or 60-degree ships ladders may be considered to access existing windowsill heights on an individual basis.

g. Exterior Rescue Window access: Ground level access and level working areas must be provided for the use of emergency personnel. Local conditions and equipment may allow varying solutions to this requirement. Approval of the responding emergency agency(s) may be required in situations that are difficult.

h. Rescue windows that open onto a roof from new construction may be approved on an individual basis providing the roof is readily accessible to emergency personnel and the roof structure is one-hour minimum fire protected. It is recommended that existing rescue windows meet these requirements for the safety of emergency personnel, students and staff. Renovations of areas under such windows must address this issue.

S106-5 Assembly Spaces

a. Assembly spaces must have at least two exits into separate smoke zones.

b. The means of egress width shall not be less than required by the Code. Additionally, assembly spaces listed herein must provide additional egress as follows:

> The total width of means of egress **in inches** shall not be less than the **total occupant load served** by the means of egress **multiplied by the factors below**. (The factor is inches per occupant.)

Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

Assembly Space	**Factor**
Gymnasium:	
Floor area	0.20 (Use 5 SQ. FT. per Occupant)
Bleacher	0.30 (Use actual number of seats)
Cafeteria	0.25 (Use 7 SQ. FT. per Occupant)
Auditorium	0.25
Pool:	
Deck & pool area	per Code
Pool Bleacher	0.30 (Use actual number of seats)

The calculation for numbers of doors of each assembly space shall be as follows:

Width (in inches) = Occupant Load x Factor (inches per occupant)

Width (in inches) ÷ Door size = Number of doors

Occupant Load is determined from the Maximum Floor Area Allowances per the Occupant Load Table in The Means of Egress Chapter of the Code.

c. In large gymnasiums, the calculation may result in a significantly larger width, resulting in a substantial number of additional doors. The Office of Facilities Planning may consider a reduction.

d. No single exit doorway from assembly spaces shall be less than 36 inches wide and whenever possible shall be a direct exit through an exterior wall.

e. Exit doors for assembly spaces, which open into a corridor, shall open outward in the direction of egress and must be fully recessed.

f. When folding partitions are used to separate floor areas in any gymnasium, a pass door may be acceptable as one of the required exits and must swing in the direction of egress, with appropriate hardware. Appropriate exit signage is required.

g. No exit can lead into a pool. (It is a violation of, and in conflict with Section 6-1.16(a) of the State Sanitary Code.) In addition, for this same reason, the pool cannot be used as an emergency egress route to conform to smoke zone exiting as required in this Manual.

S106-6 Egress for Miscellaneous Spaces

a. Boiler Rooms: Any boiler room over 300 square feet in area shall have two exits remote from each other, one of which may be by means of a ladder or through an areaway. Exterior doors should swing outward to relieve explosion pressures; interior doors in student occupied buildings shall swing into the boiler room (the Department of Labor allows this door to swing into the boiler room for schools by SED variance). For buildings of all other uses, the door must swing out. Alterations removing boiler room vestibules from existing buildings will only be considered if the altered boiler rooms are fully compliant with the latest code requirements.

b. Storage Areas: Access to storage areas for gasoline-powered equipment cannot be directly from the school, but must be through an outside door.

c. Projection Booths: Remote exiting into separate smoke zones is required for projection booths of 500 square feet or more in area.

S106-7 Enclosed Courts

a. All courts over 500 square feet in area which have their perimeters completely enclosed are considered to be potential areas of pupil occupancy and as such must have exiting into two separate smoke zones as required in S106-2, Courts greater than 500 square feet in area shall have a minimum of two remote exit doors. The doors shall swing in the direction of egress and be equipped with panic type hardware.

b. Courts 500 square feet or less shall have a minimum of one exit door providing that exit is into a different smoke zone than the room exits to the corridor from pupil occupied spaces which have smoke zone exiting into that courtyard.

c. Enclosed courts created by an addition, shall have at least one of their exits provided with a direct line of sight to the exterior of the building.

S107 CORRIDORS

S107-1 General

a. The designated widths of all corridors shall be the clear width, free of all fixed and movable obstructions.

b. Any point in any ground floor corridor must be within 150 feet along the line of travel to *an exterior doorway*. Any point in a corridor other than a ground floor corridor shall not exceed 120 feet along the line of travel to the *stair enclosure of an exit stairway*.

c. Corridor pockets and dead end corridors shall be restricted to a depth of 1 and 1/2 times the width of the pocket, or to 1 and 1/2 times the width of the corridor, whichever is less.

d. If lobbies or corridors are used for purposes other than circulation, they shall be planned with uninterrupted aisles equivalent to required corridor widths and separated by a fixed rail or other type of approved permanent divider.

e. Security desk areas not separated from the corridor with fire rated construction shall have non-combustible furniture, secured in place, not contain storage, and not encroach on the clear required corridor width. Security offices shall be accessible.

S107-2 Main Corridors

a. A main corridor is one that serves more than four standard classrooms, or more than 150 pupils.

b. The required minimum clear width, without lockers or wardrobes, is 8'-0" wide, wall-to-wall.

c. Corridor widths for large schools, particularly high schools, should be as wide as necessary for satisfactory circulation.

d. Corridor lockers must be permanently attached and must provide for ease of maintenance and cleaning. Corridor locker doors may not project into the required corridor width.

1. With lockers on one side, 9'-0" wide measured from the face of the locker to face of the opposite wall, assuming 12" locker doors.

2. With lockers on two sides, 10'-0" wide measured from the face of the locker to face of the opposing lockers, assuming 12" locker doors.

S107-3 Secondary Corridors

a. A secondary corridor is one that serves four or less classrooms, or not more than 150 pupils, exclusive of service areas. Consideration should be given to making these secondary corridors equal to the width of the main corridors for the addition of future classrooms.

b. Minimum clear width shall be 6'-0".

c. Secondary corridors are limited to 100'-0" in length.

d. Corridor lockers must be permanently attached and must provide for ease of maintenance and cleaning. Corridor locker doors may not project into the required corridor width.

1. With lockers on one side, 7'-0" wide measured from the face of the locker to face of the opposite wall, assuming 12" locker doors.

2. With lockers on two sides, 8'-0" wide measured from the face of the locker to face of the opposing lockers, assuming 12" locker doors.

S107-4 Passageways

a. A passageway provides access to rooms or areas not in the line of travel to main exits, such as passageways serving offices, locker rooms, or kitchen areas. These passageways vary in width according to the number of occupants involved but shall have a minimum width of 44 inches.

S108 STAIRS AND STAIRWAYS

S108-1 General

a. There shall be at least two means of egress remote from each other from each occupied floor level including basements and student occupied mezzanines.

b. There shall be no storage space under any stairs or landings unless separated from the stairway by two hour rated construction and accessed from another space or the corridor.

c. At the grade level, the stairway enclosure door or bottom riser of an approved unenclosed stair shall be within 50 feet along the line of travel of an exterior (not vestibule) door.

d. It is strongly suggested that new stairs are designed wider than the minimum required width to alleviate congestion and improve circulation.

e. Existing un-enclosed stairs in Type III, IV, and V construction must be enclosed with fire rated construction retroactively.

S108-2 Handrails / Railings

a. Buildings serving young children should have an additional handrail in accordance with ADA Accessibility Guidelines for Building Elements Designed for Children's Use.

b. Orientation and design of railing members shall inhibit climbing.

S108-3 Straight Runs of Stairs

a. Each stairway from story to story shall be in two or more runs with not more than 16 risers each, nor less than 3 risers, per run; except that a straight run of stairs without any intermediate landing may be used for differences in floor elevations not exceeding seven feet. This does not apply to service stairs.

S108-4 Corridor Stairs

a. Full-width corridor stairs separating changes of level within a corridor length shall have the top and/or bottom riser no closer to an intersecting corridor than 44 inches.

S108-5 Fire Escapes

a. Fire escapes are not permitted on new school buildings. (On existing school buildings covered exterior stairs shall be installed when other exits are determined to be inadequate for fire safety.)

S109 DOORS

S109-1 General

a. Classroom doors, stair doors, and corridor doors shall have vision panels. The minimum size shall be 100 square inches with a minimum dimension of 3 inches. Vision panels are recommended in any other doors commonly used by students or staff where privacy is not an issue.

b. Corridor and stair enclosure doors shall be provided so that traffic can flow in both directions at the same time and at the maximum corridor capacity during class changes.

c. Double-acting hinged doors are not permitted in exits.

S109-2 Exit Doors and Doorways

a. Permanent or removable mullions on pairs of doors are recommended at exterior doors for weather proofing and strength. Mullions are not recommended where doors are usually held in the open position.

S109-3 Door Sizes

a. No door from a space of pupil occupancy nor a single exit door shall be less than 36 inches in width nor more than 44 inches in width unless specifically approved. Each leaf of a pair of doors (i.e. no mullion) shall not be less than 36 inches nor more than 44 inches in width unless specifically approved.

b. Main corridors and stair enclosures which facilitate student movement from class to class shall be equipped with at least two 36" doors.

S109-4 Stairway Enclosures and Smoke Barriers

a. Stairway and Smoke Barrier doors shall be self-closing, swing in the direction of egress and be equipped with panic hardware.

b. Approved automatic hold-open devices shall be provided on all stair enclosure and corridor smoke barrier doors. The doors shall be released and close upon activation of the automatic fire alarm and detection system. An approved automatic building security system may be used to release the automatic hold-open devices allowing the doors to close, latch and lock.

S110 DOOR HARDWARE

S110-1 General

a. Magnetic locks and electronic (touch sensitive) panic devices are not allowed in new or existing buildings (no exceptions). Locking arrangements that inhibit or prevent egress discovered in existing buildings must be removed. Acceptable alternatives are electric strikes and mechanical panic devices with electric latch retraction.

b. Padlocks are not allowed in new or existing buildings for any interior or exterior door.

S110-2 Hardware Specifications

a. Hardware specifications shall include a statement that describes the type of hardware to be used on doors as described in this section.

S110-3 Door Hardware for Classrooms and Other Spaces of Pupil Occupancy

a. Hardware on doors from spaces of pupil occupancy shall be a type that will always permit the door to be opened from the inside without direct manipulation of any type of locking device.

b. Door closers and latches are required on all doors, including classroom doors, opening onto a corridor.

c. If doors are provided with hold open devices, the doors must automatically release and close upon activation of the automatic fire alarm and detection system.

S110-4 Door Hardware for Toilet Rooms

a. All toilet rooms on corridors shall have door hardware that will cause the door to close and latch.

b. Locking devices at multi-user toilet rooms should only be lockable from the outside with a key, and always allow the door to be opened from the inside without direct manipulation of the locking device.

c. Single user toilets will be allowed to have an ADA thumb turn inside, key outside deadbolt, in addition to the lockset, to provide privacy.

S110-5 Panic Hardware

a. All exterior and interior exit doors in exit ways and from all assembly spaces shall have panic hardware, with the following exceptions:

1. All exterior corridor doors shall have panic hardware, except those serving only one or two classrooms with less than 50 people total, or service areas (such as a boiler room, kitchen, or storage room). They may have hardware in accordance with S110-3.

2. Panic hardware is not required for push-pull interior doors from assembly spaces and exit ways if these doors have non-latching hardware and are not within fire rated walls or smoke partitions.

S110-6 Acoustical Seals

a. Where some degree of sound isolation is needed between two adjacent spaces, doors separating these spaces should be supplied with continuous acoustical seals and automatic drop bottoms to be coordinated with panic and closure hardware. For more critical applications a laboratory-tested acoustical door assembly might be necessary.

b. Door hardware must not interrupt perimeter seals or drop bottoms provided for acoustical reasons.

S111 SAFETY EQUIPMENT / ACCIDENT PROTECTION

S111-1 Fire Blankets

a. Fire blankets for smothering clothing fires should be available in all areas where students are exposed to the hazards of any fire producing equipment or equipment having an open flame. Such blankets shall not contain asbestos.

S111-2 Fire Shutters:

a. Full Height Fire Shutters: Vertical or horizontal fire shutters are permitted to protect rated full height openings but should be accompanied by contrasting floor striping and signs on either side of the door indicating that the stripped area must remain free and clear for emergency door closure.

b. Transaction Windows: Openings in rated walls protected by automatic fire shutters shall be equipped with smoke detectors on either side and connected to the building fire alarm system.

S111-3 Electrically Operated Partitions:

a. Electrically operated partitions must be provided with the following safety equipment in accordance with Commissioner's Regulations 155.25. Electrically operated partitions include any partition, divider, curtain, or other similar device which is controlled through the operation of an electric motor.

1. Two (2) key-operated, tamper-proof, constant pressure control stations that are wired in series, remotely located at opposite ends and opposite sides of, and in view of, the partition, and which are designed and constructed so as to require simultaneous activation of both control stations to operate the partition.

2. The electric device controlling the operation of the partition is capable of being reversed at any point in the extend, retract, or stack travel cycle.

3. Device(s) are provided for all partitions that will stop the motion of the partition when a body or object passes between the leading edge of such partition and a wall, floor, or other termination point. The devices typically include beam type sensors (with a sending device and a receiving device) or motion detection sensors on each side of the partition such that if the beam is broken or motion is detected the partition will stop movement prior to an occupant reaching the partition. The beam type sensors or motion detection sensors must be located such that it is not possible for an occupant to go over or under the beam(s) or avoid the motion detection range. Multiple sets of beam type sensors or motion detection sensors may be required on each side of the partition to achieve total coverage of the area. Note that the sole use of partition leading edge sensors that require physical contact is not adequate. Manual reset is required.

4. Device(s) are provided for all partitions that will stop the backward motion of the partition and stop the stacking motion of the partition when a body or object is in the stacking area of such partition. The devices typically include, beam type sensors (with a sending device and a receiving device), motion detection sensors, pressure/weight sensitive mats, or heat detection sensors within the pocket area such that if an occupant is sensed entering or within the pocket the partition shall not move. The sensors must be located such that it is not possible for an occupant to go over or under the beam(s) or avoid the detection range. Multiple sets of beam type sensors, motion detection sensors, pressure/weight sensitive mats, or heat detection sensors may be

required on each side of the partition to achieve total coverage of the area. Manual reset is required.

5. Signage must give notice regarding safe and proper operation and supervision of the electrical controls and partition/door pathway. The following suggested or similar wording for this notice must be posted at every control station:

CAUTION
ELECTRICALLY POWERED PARTITION
Only Appropriately Trained Staff may operate this partition.
Control stations must be attended by staff members while the partition is in motion.
Staff members must stand on opposite sides of the opening or closing partition.
Students must stay away from the partition when in motion.

S111-4 Athletic Equipment (See Appendix "C" for additional information about Athletic Facilities.)

a. Athletic equipment layouts must take into consideration spectator areas as well as room for safe use of equipment and out-of-bounds areas.

b. District investment in athletic equipment should include secure and convenient storage of equipment when not in use.

S111-5 Shower Room Areas

a. Shower rooms shall be designed to prevent water from being tracked into locker rooms. Where possible, curbs should be eliminated by proper location of drains.

b. Consideration beyond accessibility requirements should be given to the installation of grab bars in shower rooms.

S112 VAULT CONSTRUCTION REQUIREMENTS

S112-1 Vaults for Regents Examination Storage

a. State required examinations and materials are required to be stored in safes or vaults. Access to the provided storage used to store Examination Materials should be from areas that are under constant supervision and must not be in areas that are accessible by the public so as to prohibit entry by students and other unauthorized persons.

b. Walk-in Vaults must have all of the following:
   1. Poured concrete floor
   2. No windows or access panels
   3. Walls of reinforced concrete block or reinforced concrete, sealed to a poured concrete floor below and structural floor or roof deck above
   4. Metal door in a metal frame
   5. Hardware must be medium or heavy duty, consisting of hinges inside the vault or welded pin hinges, and classroom function lock set with dead locking latch bolt

c. Duct work penetrations in the walls for ventilation may be approved on an individual basis depending upon location relative to the door, exterior accessibility, and normally not to exceed 36 square inches.

PART II: MATERIALS

S201 GENERAL

a. This Part addresses the selection of materials and finishes. Selections should be made with the specific goal of promoting health and safety. Things to consider: fire safety; indoor air quality; life-cycle costs; durability; renewable sources; economical, efficient operation and maintenance.

S202 GLAZING

S202-1 Glazed Panels and Doors

a. Safety glazing is required as indicated in the Code, and in the following additional locations unless railings or grilles are provided which will provide comparable protection from accidents due to physical contact:

1. All interior glazing less than 60 inches above the floor shall be safety glazing.

2. All glazing in areas where educational use may cause physical abuse, such as gymnasium, and playrooms.

S202-2 Marking of Glazed Doors and Sidelights

a. Glazed doors and sidelights within 6 feet of such doors shall be marked by appropriate means in accordance with 12 NYCRR 47. (See Appendix A)

S203 INTERIOR FINISHES AND FURNISHINGS

S203-1 Limitation of Use of Interior Finishes

a. Class A interior finishes shall be used in corridors, exit enclosures, exit passageways, exterior exit stairs, exterior exit ramps and horizontal exits. Class B is acceptable if these spaces have an approved NFPA-13 Sprinkler System.

b. Interior finishes in school construction shall be Class A, B, or C, per the Code.

S203-2 Furnishings

a. New fixed seating and existing fixed seating that is being refurbished/reupholstered is required to comply with the State of California's Department of Consumer Affairs-Requirements, Test Procedure and Apparatus for Testing the Smolder Resistance of Materials Used in Upholstered Furniture - TB 117-2013.

b. All upholstered furniture must meet interior finish and flammability standards for commercial installations. The school district is responsible for the compliance of each installation. The peak rate of heat release shall not exceed 80KW when tested in accordance with ASTM E1537 or California Technical Bulletin 133.

c. Plastic lockers are not permitted in Corridors or places of assembly.

d. Plastic specialty items are combustible. These items include wastepaper baskets, tote trays, milk crates, foam-rubber athletic landing mats and plastic furniture such as shelving, desks and beanbag chairs. They add substantially to the fire load of a building. Flammability, fuel contribution and smoke considerations must be carefully investigated during the selection of such specialty items and furnishings. Fire test criteria and test results should be required of the manufacturers prior to purchase. Items of questionable hazard should be avoided.

e. It should be noted that the School District assumes all liability for carpet, area rugs, furniture, and equipment placed in the building.

f. Districts should endeavor to procure upholstered furniture and other furnishings which have been manufactured in an environmentally sensitive manner. Furniture and furnishings should be verified to have low VOC emissions, constructed of materials which are free from formaldehyde and other toxins found in finishes and stain resistance coatings. Serious consideration and research should be made to procure "green" products made from recycled and/or sustainable materials manufactured locally.

PART III: ENVIRONMENT

S301 GENERAL

a. Although focused on teaching and learning, education must also address the need to maintain a safe, secure, and healthy school environment. The capacity of children to learn is impeded if their school environment contains elements that are hazardous to their health. The State Education Department and educators throughout the State of New York have a responsibility to assure the school community and the public that, based on the best available knowledge, school buildings are safe, healthy, clean and in good repair.

S302 SPATIAL ENVIRONMENT

S302-1 General

a. Adequate space must be provided to house the district's educational program. That space shall be properly proportioned as to size and shape of room, including ceiling height.

S302-2 Room Sizes

a. There are no laws regarding minimum classroom sizes. However, there are minimum size requirements to be eligible for State Aid. Additional information can be found in the publication "*State Building Aid for Public School Districts and BOCES*", available on our website.

S302-3 Classroom Proportions

a. Rooms shall be properly proportioned for intended use. In general, it is recommended that the short side of any room intended primarily for classroom or similar use be not less than two-thirds of the longer side. Since the windows are intended for view to the exterior, the maximum distance from the glazing to the most distant point within the room should be such as to permit view to the exterior by all room occupants. Forty feet is a suggested maximum.

S302-4 Ceiling Heights

a. The ceiling heights of classrooms and similar areas measured from the floor to the principal plane of the ceiling shall not be less than nine feet. Ceiling heights for modular classroom buildings are allowed to be eight feet.

b. Ceiling height of other spaces shall be compliant with Code. Note that low ceilings are generally more susceptible to physical abuse.

S303 VISUAL ENVIRONMENT

S303-1 Vision Strips / Windows

a. To provide a comfortable feeling for the room occupants and to provide eye relief through a substantial change in focusing distance, each room used by students must be designed to allow a view to the exterior (not just sky), in accordance with Table S303-1. Vision strips shall provide a minimum view distance of 30 feet beyond the exterior wall.

b. The length of the vision strip shall be at least 50% of the lineal length of the outside wall of the room and the head of the window shall be at least 6'-0" above the floor.

c. Windows should be placed and arranged to minimize brightness differences. Direct view of the sky or bright exterior surfaces produces glare and should be avoided. Glare can be controlled by:

1. Building orientation
2. Extension of roof overhangs
3. Installation of “mesh” shades which allow the natural light, but eliminate glare
4. Installation of blinds or drapes

d. Exceptions to the requirements of Table S303-1 may be granted if it can be shown by written application, that the educational program warrants an exception.

S303-2 Natural Light

a. Natural light should be provided to allow for safe exiting. Where windows, vision panels in walls or doors, or skylights are not possible, the minimum light levels required for egress must be provided.

TABLE S303-1
NATURAL LIGHT REQUIREMENTS

Space	Maximum Sill Height (inches)	Vision Strip Required	Vision Strip Recommended	Natural Light Required	Natural Light Recommended
Teaching Spaces					
Classrooms					
Art & Drawing	40	X			
Computer Rooms	--		X		
Elementary	32*	X			
Home and Careers	40	X			
Secondary (Academic)	32	X			
Science Rooms (All)	40	X			
Study Hall	32	X			
Music					
Elementary	32	X			
Junior High School	32		X	X	
Jr./Sr. & Sr. High School	40		X	X	
Shops/Technology					
Agriculture	60	X			
General	60	X			
Vocational	60	X			
Special Education					
Classroom	32	X			
Remedial/Resource	--		X		X
Therapy	--				X

* 30 inches recommended

Space	Maximum Sill Height (inches)	Vision Strip Required	Vision Strip Recommended	Natural Light Required	Natural Light Recommended
Other Student Occupied Spaces					
Cafeteria	--		X	X	
Gymnasium	--			X	X
Library – up to 2000 sq. ft.	44	X			
Library – over 2000 sq. ft.	--		X	X	
Swimming Pool	--			X	
Administrative and Support Spaces					
Administration	--				X
Corridors	--				X
Guidance	--		X		X
Health	--				X
Kitchen	--		X		X
Office & Workroom	--				X
Stairways	--				X
Storeroom	--				X
Teachers Room	--				X
Toilets	--				X

S304 ACOUSTICAL ENVIRONMENT

S304-1 Acoustics in Schools

a. School officials and designers are encouraged to achieve the background noise levels, reverberation times, and sound isolation standards recommended by the ANSI (American National Standard Institute) Standard entitled *'Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools' (ANSI/ASA S12.60-latest version)* for all core learning areas.

b. For further information on acoustics see Section 5.5 of NYCHPS.

S304-2 Mechanical/Electrical/Plumbing Noise Control

a. Achieving the proper level of ambient noise in an academic space is critical. If the level is too high, communication between teachers and students will be partially or fully masked. If too low, the slightest noises (pencils dropping, rustling of papers, etc.) will appear to be intensified in their level of disturbance. The intent of this section is to recommend the design of mechanical / electrical / plumbing systems to meet the sound standards of *ANSI/ASA S12.60-latest version* in classrooms and Large Group Instruction spaces used by any grade level. Sound levels do not apply to mechanical / electrical / plumbing systems used solely for emergency purposes such as fire alarm notification devices or emergency generators.

b. Table S304-1 is a table of ambient noise criteria for mechanical equipment based on the single number room criteria "RC" curves. The values and ranges represent general limits of acceptability for typical building occupancies. Designs should not exceed upper values stated in Table for instructional spaces. Lower values may be more appropriate and should be based on a careful analysis of economics, space usage and user needs.

c. Locations of mechanical and electrical equipment should be carefully chosen to not have an adverse impact on the ambient noise level in the adjacent spaces. To avoid excessive vibration of the building structure by mechanical air-handling units, chillers, compressors, transformers, etc., locate equipment rooms on grade whenever possible. Exterior equipment should be installed in locations such that the sound generated by the equipment will not intrude on instructional spaces at levels that exceed interior HVAC sound levels.

d. When locating electrical receptacles for switches and outlets, no back-to-back boxes should be installed in sound-critical rooms. Offset boxes at least two stud cavities from each other.

Table S304-1
Design Goals for Mechanical System Noise in Occupied Spaces

Space	RC Level
Classrooms, K-6	25
Classrooms, 7-12	25-30
Lecture Halls/Large Classrooms for more than 50 (unamplified speech)	25
Lecture Halls/Large Classrooms for more than 50 (amplified speech)	25-30
Libraries	30-40
Gymnasiums/Natatoriums	40-50
Cafeterias	40-50
Laboratories/ shops (group teaching)	35-45
Theaters/Auditoriums	25
Multi-purpose Rooms / Gymnasium / Auditorium / Cafeteria / Classroom	25-50
Music Teaching Studios	25
Music Practice Rooms	35
Halls, Corridors, Lobbies	35-45
Private Offices	25-35
Conference/Meeting Rooms	25-35
Offices	25-35

S305 INDOOR AIR QUALITY

S305-1 General

a. Ventilation systems should be designed to prevent re-entrainment of exhaust contaminants, condensation or freeze-ups (or both) and growth of microorganisms. Air intakes, relief air outlets and exhaust air outlets should be located to avoid contamination of the ventilation (outside) air.

S305-2 Air Intakes

a. Outside air intake openings should be located 25 feet from any hazardous or noxious contaminants such as chimneys, sanitary and fuel gas vents, exhaust fans, cooling towers, loading docks, dumpster/recycling areas, vehicle exhaust, bus loops or idling areas, and take into account prevailing wind direction. When locating an intake opening within 25 feet of a contaminant source is unavoidable, such opening should be located 10 feet horizontal distance and 2 feet lower than the contaminant source. Use good engineering practice and judgement to locate outside air intakes to avoid recirculation of relief air.

b. Locate air intakes at least 2 feet above grade or roof deck; away from areas of potential snow drifts and plantings. When locating an intake opening at least 2 feet above grade is unavoidable, a hard-surfaced well-drained area under the air intake is recommended. The hard surface should extend beyond the edges of the

opening and three feet out from the wall. To eliminate water ponding, top of surfaces should be at or above grade, and slope away from the building.

c. Grilles protecting air intakes should be bird- and rodent-proofed to prevent perching, roosting, and nesting. Intake screen should be accessible for cleaning.

S305-3 Filter Efficiency

a. We recommend air filters with a Minimum Efficiency Reporting Value (MERV) of 10 or higher, except for unit ventilator systems, which should have a MERV of 7 or higher. Consider air filters with a MERV of 13 or higher.

S305-4 Air Flow Measuring Stations

a. We recommend air flow measuring stations on all outside air intakes of central heating, ventilating and air-conditioning equipment (this is not intended to include unitary systems, such as unit ventilators, where it is considered impractical).

S305-5 Building Pressurization

a. Buildings should be designed to operate at a neutral or slightly positive pressure, relative to outdoors. Operating the building at a neutral or slightly positive pressure reduces the potential for the introduction of unconditioned air and pollutants from outside the building shell.

b. Avoid placing ducts under negative pressure (ie. return air ducts) in basements, crawlspaces, boiler/heater rooms, underground, refrigeration machine rooms, etc.

S305-6 Equipment Locations

a. Air handling units must not be installed in areas where they may pull contaminants into the units; such as boiler rooms, refrigeration machine rooms, areas with dirt floors, and secondary school science prep/storage rooms.

S305-7 Equipment Access

a. Ensure that all system components, including air handling units (AHUs), controls, and exhaust fans are easily accessible. To help ensure that proper operation and maintenance of HVAC system components will be performed, it is critical that the designer makes the components easily accessible. AHUs, controls, and exhaust fans should not require a ladder, the removal of ceiling tiles, or crawling to gain access. Rooftop equipment should be accessible by way of stairs and a full-sized door, not a fixed ladder and a hatch. Consider locating AHUs within the building (or penthouse) for ease of inspection and maintenance.

S305-8 Radon

a. If a school is being constructed in an area with a high potential for radon (long-term living area estimate for homes above 4 pCi/L is greater than or equal to 11 percent), preventive design and construction measures must be taken so that a remediation system can be installed if radon levels are too high after the school is completed. To determine if the school is in a radon-prone area, check the New York State Department of Health Radon Level Maps and Statistics (*http://www.health.state.ny.us/environmental/radiological/radon/maps_statistics.htm*) to get specific information about the town in which the school is located. Radon resistant construction should be considered for all school buildings.

S305-9 Selection of HVAC Equipment

a. We recommend central HVAC air handling units (AHUs) to serve multiple rooms in lieu of individual self-contained units. Central air handling units have a number of potential advantages as compared to individual units serving individual rooms. They are:

1. Quieter, and therefore more likely to be turned on or left on by teachers and staff;

2. Less drafty due to multiple supplies and a return that is away from occupants;

3. Better at controlling humidity and condensed moisture drainage;

4. Easier to maintain due to reduced number of components and few units to access;

5. More space around units and can be accessed without interfering with class activities;

6. Space for higher efficiency air filters, and more surface area;

7. Made of heavier duty components;

8. Less likely to have quantity of outdoor air supply inadvertently reduced.

b. Energy or Heat Recovery Units: We recommend energy recovery ventilation equipment. Most HVAC system designers understand that increased amounts of outdoor air supply is generally better for IAQ. Yet there are concerns over the implications that this added amount of outdoor air supply has on the first cost and operating cost of the HVAC system, as well as moisture control for the school (too wet or too dry). First cost, energy costs, and moisture control do not have to be at odds with good IAQ. Energy recovery ventilation equipment can reduce the negative implications of the minimum required volumetric quantities of outdoor air, while retaining the IAQ advantage.

c. Consider the use of thermal displacement ventilation units in classrooms as an alternative to unit ventilators to reduce noise, improve air quality, and reduce energy use.

PART IV: SITE AND UTILITIES

S401 GENERAL

a. Guidance can be found in the Facilities Planning publication, "School Site, Standards, Selection, Development."

b. Site design must also take into consideration separation of vehicular and pedestrian traffic for the health and safety of students. Strict requirements must be followed in the design of bus drop areas to eliminate vehicular traffic coming between the bus drop and the school building and bus movement during loading and unloading of students. Bus drop areas should be designed to eliminate the necessity to back up any bus. Guidance for detailed design, management and driver training is available from the Pupil Transportation Safety Institute, Inc.

c. Local and municipal codes may apply to school construction or to the site. Local permits will be needed for curb cuts, construction in flood plains and coastal plains, and connection to municipal utilities. It is intended that cooperation and communication be maintained with municipalities and state agencies to coordinate various efforts of good design.

d. Wetlands:

   1. School Districts and BOCES are required to comply with State and Federal wetland laws and regulations. The SEQRA process for a project undertaken by a School District or BOCES must consider if any state or federal wetlands will be affected.

   2. The New York State Department of Environmental Conservation has identified and mapped the wetlands which are protected under the Freshwater Wetlands Act of 1975. The maps, specific regulations and permit information are available on the DEC website at http://www.dec.ny.gov/lands/305.html.

   3. If it is determined that either state or federal wetlands may be disturbed, permits must be obtained from the US Army Corps of Engineers and/or NYS DEC prior to NYSED permit.

e. Wind Turbines and Cell Towers: Site the equipment such that the fall radius does not impinge on buildings, bleachers, sports fields, parking lots, etc.

S402 WATER SUPPLY

a. No source of water shall be utilized without the approval of the State Health Department through their appropriate District Office or County or City Health Department. Connection for water supply source shall be made to existing lines of nearby water districts or municipal water systems wherever possible. Permits for water well drilling and connections to public water supply systems are required by 10 NYCRR 5 State Sanitary Code.

S403 SEWAGE DISPOSAL

a. Plans for school sewage disposal systems should be based upon reasonable future requirements as well as present needs. Sewage connections to existing or nearby sewer districts or municipal systems should be made wherever possible. If no such system is available, an independent system must be designed. Plans and specifications for independent sewage disposal systems should be presented to the office of the appropriate local agency for approval. The services of the local public sanitary engineer should be sought in the early

preparation of plans in order that the plans when completed will be acceptable to the Department of Environmental Conservation. Permits for on-site sewage system construction and operation are required. See 6 NYCRR 750.

S404 SITE ELECTRIC

a. Electrical lines must be placed underground or if installed overhead must not cross any useable portion of the site or any area where they would present a hazard to the children. Overhead electrical service lines may follow property lines; however, it is preferred that service lines be installed underground wherever possible.

S405 SITE AIR EMISSIONS

a. New or substantially modified stationary fuel-fired air emission sources, such as fuel oil, fuel gas, and biomass heating plants or co-generation plants, or any other kind of installation capable of generating air emissions in excess of regulated levels, shall be subject to approval of the Department of Environmental Conservation, Division of Air Resources. A copy of the transmittal to the Department of Environmental Conservation shall be submitted to the Commissioner of Education.

PART V: MECHANICAL AND ELECTRICAL REQUIREMENTS

S501 GENERAL

a. A school building should provide for the health, comfort, and safety of children, teachers, and other occupants.

b. The school board should consider engineering studies of any new building program to determine all practical steps that can be taken in the building design to most efficiently utilize the energy. Selection of equipment should be made on a basis of Life Cycle Costing.

S502 STANDARDS

a. All mechanical and electrical devices and equipment shall meet the standards and bear the label of a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories Inc. (UL).

b. Generally, all mechanical and electrical installations should meet the requirements of the American National Standards Institute (ANSI), American Society for Testing of Materials (ASTM), and National Fire Protection Association (NFPA), as applicable.

c. All major kitchen equipment should be selected for sanitary operation and maintenance and shall bear the seal of National Sanitation Foundation (NSF).

S503 NOISE LEVELS

a. Mechanical and electrical equipment should be selected so that noise interference with communication or intended use in any place of pupil occupancy is minimized. See Section S304 Acoustic Environment.

S504 MECHANICAL AND ELECTRICAL CONSIDERATIONS FOR SPECIAL AREAS

a. Special consideration for mechanical and electrical equipment are anticipated for various areas, such as the large group instruction, auditorium-study halls, audio-visual, vocational, music, science, homemaking center, art center classrooms, cafeteria and kitchen. In these areas, special ventilation or air exhausting, temperature controls, temperature zoning, plumbing fixtures, gas and air piping, power provisions, acoustical requirements, and lighting may be required.

S505 PROTECTION OF PIPING

a. All underground pipes and conduits, regardless of their contents, shall be protected from corrosion and shall be provided with sleeves at the foundation wall and shall be sealed at the penetration into the building with a material that will form a gas-proof barrier.

S506 EQUIPMENT AND PIPING IDENTIFICATION

a. Heating, ventilating, air conditioning, plumbing, and electrical equipment and their controllers should be labeled and tagged for quick identification.

b. Piping and valves should be marked and identified as to direction of flows and type of flows within piping in accordance with American National Standards Institute (ANSI A13.1).

S507 MACHINERY GUARDS

a. Provide guards on all moving parts of mechanical and electrical equipment such as belts, pulleys, couplings which present a safety hazard.

S508 BALANCING AND TESTING OF MECHANICAL AND ELECTRICAL SYSTEMS

a. Responsibility for balancing and testing of mechanical and electrical systems should be clear in the specifications.

b. Initial start-up and operation of the mechanical and electrical systems by the contractor(s) should be conducted in the presence of the architect or engineer, the owner's representative, with the assistance of the necessary factory trained mechanics and public utility representatives as required for the various systems.

S509 COMMISSIONING THE BUILDING

a. Commissioning requirements should be integrated into the construction documents to clearly specify the responsibilities and tasks to be performed. Of particular importance is the delineation of the contractors' responsibilities regarding documentation, functional performance testing, occupant and operator training, and the creation of the operations and maintenance manuals. Commissioning should include a means to demonstrate that the building's systems: have met the design intent and specifications; have been properly installed; are performing as expected; and that proper operations and maintenance (O&M) documentation and training have been provided. As-built drawings and commissioning reports should be provided to the building owner.

b. Commissioning should include the following critical building systems:

1. Building Automation or Energy Management Systems (sequences, function, operation and training);
2. Lighting controls (daylight, occupancy, timers, etc.);
3. HVAC systems (ventilation and controls, test and balance), heating and chiller plant;
4. Plumbing systems (domestic hot water, fixtures, sprinkler, natural gas piping);
5. Life Safety (fire alarm, smoke control) systems and emergency (lights and exit signs) power;
6. Special systems (e.g. kitchen, security).

c. The mechanical and electrical specifications should require that trade contractors or their representatives instruct the maintenance staff in the proper operation and service of all mechanical and electrical equipment at the time of completion and before acceptance of the school building.

d. Operation manuals should be provided to the school facilities manager. The manuals should explain the mechanical and electrical systems: the function of heating, ventilating, and air conditioning systems, the programming and operation of the temperature control systems, operation of boilers or furnaces; the electrical systems, functions of the fire alarm and detection system, exit light system, emergency lighting and the distribution systems for lighting, power, and communications; and the necessary preventive maintenance for electrical equipment, fans, air handling systems and individual items of heating and equipment which are necessary to maintain the building.

S510 YEARLY INSPECTION, TESTING, AND MAINTENANCE

a. In addition to the inspection, testing and maintenance requirements of the Code, inspection, testing, and maintenance of all mechanical and electrical systems at least yearly, or in accordance with manufacturer's instructions, should be scheduled and conducted to ensure that the systems continue to operate as designed.

PART VI: HEATING, VENTILATING AND AIR CONDITIONING REQUIREMENTS

S601 GENERAL

a. These standards are performance standards. The Commissioner of Education has been given wide, discretionary powers in the approval of specifications for heating, ventilating, air-conditioning, and refrigeration (HVAC&R). Any type of system that meets these minimum standards will be considered for approval. Simplicity of design with detailed attention to the comfort and health of the occupants, the efficient use of energy, and ease of maintenance, should be considered by the engineer.

b. Boilers shall also meet the requirements of 12NYCRR 4 (low pressure boilers) or 14 (high pressure boilers) of the New York State Department of Labor.

S602 THERMAL ENVIRONMENT

S602-1 General

a. Architects, engineers, boards of education and educators must have common understanding, at the outset of a building program, of the design criteria selected, and of the thermal environment that can be attained from such criteria. The efficient use of energy for the operation of the heating, ventilating, and mechanical cooling systems may mean that, at certain infrequent outside temperatures, the interior thermal environment may not be optimum.

b. Schools are occupied during the warmer hours of the day, and, due to the metabolic heat released by occupants, the heat of lighting, office equipment, computers, and solar gain, there is a build-up of heat.

c. Infiltration occurs naturally through windows, doors and other areas of air leakage of a building that are not under positive pressure. To this is added the purges brought about by exterior doors being opened for passage of the entire school population at least twice daily, plus unavoidable air leakage through ventilation equipment.

d. Energy is more efficiently used in heating, ventilating, and mechanical cooling systems when outside air introduced by such systems does not have to be heated. Also, when inside temperatures rise, it is desirable to introduce increasing quantities of outside air to provide natural cooling without the use of mechanical cooling equipment. Auxiliary forms of ventilation such as operable windows, louver intakes, and supplemental mechanical exhaust should be considered in addition to ventilation supplied from basic units.

e. It is strongly recommended that energy/heat recovery devices be provided for all suitable exhaust air systems.

S602-2 Heating

a. Air motion in zones of occupancy should not cause discomfort of occupants, due to hot or cold air movements. Air should be introduced in such manner to prevent pockets of stagnant air in the breathing zone.

b. Heating and ventilating systems should be so designed that when properly installed and operated during the heating season they will produce the room temperatures required per Code and this section. Because of program use, the State Education Department requires higher design temperatures as follows:

Locker Rooms..... 70º - 72º
Shower Rooms..... 74º - 76º
Swimming Pool Area..... 78º - 80º (As per NYS DOH)

c. The State Education Department recommends that consideration be given to floor level temperatures for First Grade and younger occupancies. The Code does not adequately address design criteria for the comfort of spaces with younger students.

S602-3 Ventilating (Please see Part III Environment for additional requirements.)

a. Existing areas which complied with the Code for the original space programming may continue to operate with the approved natural or mechanical ventilation as the time of construction.

b. New occupied areas within school buildings should be provided with mechanical ventilation. Mechanical relief is required for the minimum ventilation air requirements. Relief for quantities of ventilation air greater than the minimum may be either mechanical or gravity relief. We recommend that all relief be mechanical (powered).

c. Air intakes. Please see Section S306

d. We recommend school districts upgrade heating, ventilation and air-conditioning systems to meet the ventilation requirements of the Code, where needed and feasible.

e. The use of air cleaning technology (e.g. ionization, corona discharge, UV light, etc.) is not permitted to reduce the outside air ventilation rate below the code required ventilation rate calculated per the Mechanical Code. Air cleaning is not permitted to replace ventilation outside air with recirculated air.

f. The ventilation outside air (in cfm) for a vertical unit ventilator which uses a fresh air intake and relief air exhaust on a common louver shall increase by 10% over the calculated full occupant load ventilation outside air rate due to the potential for recirculation of relief air to the outside air intake.

S602-4 Special Ventilation

a. Special ventilating equipment, entirely independent of the ventilating system(s) serving the rest of the building, should be provided in areas where odors are likely to be strong, where fumes or dust are common, where overheating is likely to occur, and as necessary to avoid accumulation of toxic fumes. Provide separate make-up air systems to all fume hoods wherever practicable, preferably using air recirculated from other portions of the building; however, if make-up air must be taken from the outside, temper such air sufficiently to avoid condensation in hoods. Consider heat recovery devices if permitted for the type of exhaust.

b. Shops, laboratories, science, art and homemaking rooms shall each have independent ventilation systems. Spaces with similar program use may be combined. These spaces should be maintained slightly negative with respect to adjacent occupied spaces, including corridors, when lab stations and equipment in the spaces are being used. Local mechanical ventilation with hood vents should be provided at all areas where off-gassing or smoke production is expected; such as but not limited to welding/brazing areas, plastic heating/extrusion areas, chemical mixing, the use photographic chemicals, and spray painting. Recirculation of exhaust from such operations is prohibited.

c. The air for chemical prep, mixing, and storage rooms should be changed six times per hour during the occupied period. These spaces shall be kept slightly negative with respect to adjacent spaces. Air from these spaces should not be recirculated. Exhaust fans should be selected to be explosion proof and corrosion resistant.

d. Cafeteria-Kitchens: Cafeterias and kitchens should have independent ventilation systems. Makeup air may be taken from cafeteria relief for kitchen exhaust. Consider systems designed to reduce energy use by automatically varying the kitchen hood exhaust and make-up air flow in response to detectors that sense the level of cooking duty.

e. Culinary Arts instructional spaces which use commercial appliances shall be designed in accordance with the Code for commercial kitchens, including appropriate kitchen exhaust hoods and make-up air systems.

f. Stationary internal combustion engines (eg. small engine repair shop) for educational use shall have an exhaust collection system (eg. hood with exhaust fan) to vent the products of combustion outdoors. Source capture exhaust systems that connect directly to the vehicle's exhaust are required in shops where fuel fired motor vehicles will be repaired, serviced or operated. This system is not required for vehicles that are operated only for the duration necessary to move the vehicle in or out of the building. Carbon monoxide detectors and alarm system are required in shops with stationary or mobile internal combustion engines, and fuel fired appliances. Provide make-up air for exhaust as required.

g. Fuel fired appliances (eg. furnace or boiler in vocational HVAC shop) shall vent products of combustion to the outdoors as required by the listing/labeling of the appliance. Provide make-up air for exhaust as required.

h. Teacher's workrooms and Arts and Crafts areas. Provide local exhaust for arts and crafts preparation areas where off gassing from significant quantities of materials or products may occur. Kilns should be served by an exhaust hood that can readily remove the heat.

i. Stationary wood dust collectors and separators involving such systems as cyclones, bag filter systems and similar devices and associated supports shall be located on the exterior of the building (i.e. they are not permitted inside the building). They may not be located on the roof or in an enclosed courtyard. A collector or separator shall not be located nearer than 10 feet to combustible construction or to an unprotected building opening. Smaller portable dust collectors (e.g. portable vacuum systems) are allowed indoors but must contain a MERV 13 or better filter, to meet a similar requirement that stationary recirculating dust collectors must meet for recirculating air. Such portable units may reduce the clean-up workload, offer flexibility for future changes, and may be more affordable; however, portable units are not eligible for building aid.

j. Welding exhaust systems are considered hazardous exhaust systems and shall exhaust to the outdoors. Provide make-up air for exhaust as required. Plate and frame heat exchangers which separate the make-up air from the exhaust air stream are permitted. Recirculation of welding exhaust is prohibited.

S602-5 Natural Cooling

a. Natural cooling should be available to all occupied spaces that are not mechanically cooled. In addition to providing ventilation air, mechanical equipment shall provide for variable introduction of outdoor air up to 100% fan capacity, with proportionate increases of exhaust air and decreases in return air.

b. SED recommends the Board of Education consider a resolution to set a standard for a maximum temperature at which the district will allow occupancy. Every year when the weather warms, the same questions arise and the answer points to School Board governing policy.

S602-6 Mechanical Cooling (Air-Conditioning)

a. During the normal school year there are many days when mechanical cooling provided by refrigeration equipment would be desirable, and to an even greater extent, when there is extensive summer use of rooms.

b. Mechanical cooling for interior spaces with no exterior operable windows: Interior spaces of pupil occupancy, which are approved because of educational program, shall be provided with equipment for mechanical cooling when a temperature of 78ºF cannot be maintained in the spaces.

S603 CONTROLS

a. New HVAC controls should be DDC (direct digital control) with electric actuators. DDC hardware and software should be specified open protocol and web-based communication. Temperature sensors/controls should be provided for every student occupied space. Groups of small spaces (such as offices) with similar building exposures may share sensors. SED recommends temperature sensors for kindergarten through second grades be located closer to the floor to more accurately provide for the comfort of younger students.

b. Building automation control workstations and temperature Control Panels should be located so as to be under the supervision of the building supervisor, either in the custodian's office, mechanical equipment room, or in a central area. Subpanels of lower control hierarchy should be located near equipment and spaces served for ease of maintenance and troubleshooting. Control indicator panels for rooftop units should be situated within the building so as to be readily accessible to facility staff.

c. Provide a sequence of operation for all HVAC&R equipment that is clearly written to be applicable to the spaces served and that maintains the code required ventilation and occupant comfort. Program to take advantage of natural free cooling whenever outdoor temperatures are favorable.

d. Consider employing variable frequency drives on pump and fan motors for energy efficiency under part load conditions.

e. Air flow monitoring stations. Please see Section S306.

f. Provide motorized, low leakage, insulated dampers at all HVAC&R intakes, relief and exhaust air openings.

S604 BOILERS

S604-1 Boilers and Boiler Pressures

a. Only low-pressure boilers should be installed in school buildings, which produce steam at a pressure of 15 pounds per square inch gauge (psig) or less, or hot water at a pressure not exceeding 160 pounds per square inch gauge (psig), and at a temperature not exceeding 250 degrees Fahrenheit.

b. High-pressure boilers may be installed in a centralized heating plant. The centralized heating plant shall be a separate facility not part of a school building. Heat exchangers should be installed in the school building at the point of entry of the high-pressure steam lines to provide a low-pressure distribution system throughout the building. High-pressure steam lines should not run through school buildings. Heat exchangers should be placed in spaces that meet the requirements of boiler rooms.

c. Boilers that are used for vocational instructional purposes shall meet all the equipment and control requirements as for conventional heating equipment used in boiler rooms.

S604-2 Boilers/Burner Controls

a. The State Education Department's intent is to encourage the incorporation of new devices and controls, as they are developed and accepted, into the control system of the boiler-burner and heating system. All boiler/burner controls and accessories, that are necessary to ensure safe operation, shall be listed and bear the seal of approval of a Nationally Recognized Testing Laboratory (NRTL).

b. The burner and boiler shall be installed with adequate controls to provide the following functions and interlocks:

1. Automatic flame safeguard controls.

2. Trial for ignition periods on the pilot and main burner.

3. Combustion airflow supervision to the combustion chamber.

4. Pre-ignition purging of the combustion chamber (four air changes of combustion chamber.)

5. Prove start and supervision of induced draft and forced draft fan operation.

6. Prove low-fire start on inputs over 1,000,000 BTU per hour.

7. Shut-down on low oil temperature and low oil pressure.

8. Non-recycling safety shut-down on upper limit gas pressure or low limit gas pressure.

9. Prove fuel valve in closed position for burners on boilers over 250 BHP.

10. All flame supervisory and programming control units shall include a self-checking circuit. This self-checking must be performed at least once on each ignition cycle. For 5 million BTU or larger systems, it is required that the flame detector and programmer check itself continuously and periodically during operation to assure safe equipment conditions during prolonged firing periods.

11. High limit manual reset operating control of heating medium. This additional limit control shall not

be installed on a common sampling tube with the operative limit control.

12. High-pressure limit control for steam; high temperature limit control for warm air and hot water.

13. Low water cut-off (LWCO) control.

14. An alarm system to signal burner failure and shut-down.

15. Observation ports shall be provided for visually observing the pilot and main flame.

S604-3 Boiler Room

a. The following general boiler room provisions should be provided:

1. A manual fuel shut-off valve on the supply main that is accessible for emergency use.

2. ASME approved safety relief valves of adequate capacity and size for the pressure vessel.

3. Emergency shut off controls clearly labeled at boiler room entrance or entrances (inside or outside of boiler room) to de-energize the primary control circuit, close the main fuel valves, and shut down the fuel pumps to stop the flow of fuel through the burner during an emergency.

4. We recommend natural gas detector(s) and alarm system where natural gas is provided.

5. We recommend propane (LPG) detectors and alarm system where LPG is provided.

6. Operational tests for all fuel and distribution piping and start-up tests for burners and boilers and furnaces and boiler room equipment.

7. We recommend a flood detection system and sump pumps for areas that have the ability to hold water, such as boiler pits.

8. Ventilation should be provided as necessary to reduce heat build-up in the space. Forced ventilation for heater and boiler rooms is required if the space above the room is occupied. Wherever spaces exist above the boiler room, then the ceiling should be made fire-resistive, providing at least a 2-hour fire rating and should be insulated to prevent heat transfer. Caution should be used so as not to cause the boiler room to operate at a negative air pressure, which can cause hazardous and explosive reactions.

S605 BIOMASS BOILERS: In addition to the general requirements for boilers the following apply to biomass boilers:

a. An evaluation of the potential health and environmental effects should be performed. This evaluation should include a comparison of potential biomass boiler emissions and thermal efficiencies to displaced fuels systems (e.g., oil, gas, *etc*.), discussion of proposed fuel delivery mechanisms and storage, consideration of potential wind patterns and terrain as it may influence emission impacts. A copy of the evaluation report should be made available to the public, and submitted with the design package.

b. Solid fuel fired boilers of one million Btu/hour rated input capacity or more may require the approval of the Department of Environmental Conservation Division of Air Resources by way of an issued air permit or registration.

c. Design:

1. The design should include the following requirements in addition to the general boiler requirements:

    a. Boiler room and fuel storage areas attached to student occupied buildings must be fully sprinkled.

    b. Final fuel feed delivery system to boiler should be interlocked with the boiler to operate at all times the boiler is operating, or otherwise maintained clear of fuel when the system is not actively calling for fuel.

    c. Final feed and portion of feed system delivering fuel to the final feed system must be provided with an automatic fire suppression system, designed to flood the feed system, upon detection of a fire in feed system.

    d. Control system should incorporate a time lag prior to reducing air supply when going from high fire to low fire.

    e. Upon loss of draft, the fuel feed system must shut down.

    f. Fuel storage areas, attached to occupied buildings, shall be separated from the occupied portion of the building by two-hour, fire rated construction.

    g. Fuel storage areas, attached to occupied buildings, should be designed to prevent dust, odors, and potential, toxic gases from entering the occupied portion of the building.

    h. Electrical devices located in fuel storage areas should be designed for expected hazard.

    i. Carbon monoxide detector(s) and alarm system are required in all building spaces, located adjacent to pellet storage areas that are attached to occupied buildings.

2. The design should address the following considerations:

    a. It is strongly recommended the following general system components be included in the consideration: high-efficiency pellet boiler (minimum efficiency of 85% at high load); emission controls; thermal storage; boiler optimization controls; and pellet storage.

    b. Fuel source and characteristics (including average moisture content);

    c. Multi-stage combustion;

    d. Equipment to reduce particulates (PM-10) in the combustion vent stream (*e.g.*, bag houses, cyclones, multi-cyclones, electrostatic precipitators);

    e. Stack heights consistent with good engineering practice to minimize building/terrain, causing wake effects on emissions;

    f. Sample ports in the combustion vent stream;

    g. Other technologies or equipment arrangements to minimize emissions.

h. Installation of active ventilation systems in pellet storage areas.

d. Biomass will only be approved in certain cases. While biomass boilers use renewable fuel resources and thus may reduce reliance on fossil fuel, the emissions may be poorly controlled and may become a new respiratory health hazard to the school population. Talk to Facilities Planning early in the planning phase of the project.

e. Operational considerations:

1. The amount of biomass fuel storage should be minimized, to the extent possible, during non-heating seasons.

2. Access to pellet storage areas must consider potential hazards associated with spaces.

S606 INDIRECT FIRED AND ELECTRIC HEATING UNITS (ALSO SEE S803)

a. Indirect fired heating units (sealed combustion chamber) with a heat exchanger, such as self-contained heaters or heating and ventilating furnaces, regardless of fuel used, shall not be installed in any place of pupil occupancy. Indirect fired roof top units are permitted. Indirect fired heaters located indoors (e.g. mechanical room) shall be located within fire resistive spaces having at least two-hour fire-rated construction. Such spaces must have fire dampers at wall penetrations. Exception: Indirect fired unit heaters are allowed in vocational shops.

b. Direct fired heating units are not allowed. Exception 1: Makeup air units directly serving a kitchen hood. Exception 2: Makeup air units directly serving an automotive paint spray room or directly serving an automotive paint spray booth installed in a spray room, where all occupants in the space are receiving their breathing air from a source that is not contaminated (supplied-air respirator or self-contained breathing apparatus).

c. Indirect and direct fired makeup air units shall have a duct smoke detector in the supply air duct (since there is no return air duct to the unit).

PART VII: PLUMBING AND GAS FACILITIES

S701 GENERAL

a. Complete, well-arranged, and well-maintained sanitary facilities are essential for health, comfort and convenience of the occupants.

b. Equipment should be selected, and operation designed so as to be energy efficient and water conserving.

S702 SITE

a. See Part IV, Site and Utilities.

S703 WATER SUPPLY

a. See Part IV, Site and Utilities.

b. All equipment installed as part of a potable water supply system should be specified at 0.25% or less lead content. Specify valves, fittings and faucets to meet National Sanitation Foundation (NSF) 61 and 372 no lead requirements.

S703-1 Water Conditioning

a. Where the school is served by municipal water supply, obtain a copy of the chemical water analysis to determine if water conditioning is required.

b. Generally, it is desirable to provide conditioned water as makeup water to the boiler, the water lines serving the kitchen, and domestic hot water outlets. Care shall be taken to ensure that there is no mixing of conditioned water and raw water in the distribution systems to prevent corrosion and restrictions in the pipe distribution lines. Check valves at strategic locations may have to be included.

c. Water conditioning processes should be considered early in order to incorporate such equipment into the final building plans and specifications. Where well water is to be the source of water supply, it is often difficult to predict the water condition and to select the water conditioning process equipment. It is beneficial to drill a test well to determine the aquifer yield and water quality. Water conditioning should then be considered for incorporation into the building project by means of an alternate. In such instances, piping arrangement and valves can be incorporated in the plans and specifications to accommodate the addition of equipment at a later date.

d. Separate and special valve connections and piping arrangements shall also be provided for boiler water treatment as deemed necessary.

S703-2 Domestic Hot Water

a. In Group E occupancy, tank-type domestic hot water heaters with a heat input capacity of 200 MBH or greater shall bear the seal of the ASME Boiler and Pressure Vessel Codes.

b. Consider specifying instantaneous hot water heaters to serve remote areas of the building rather than from a central hot water source to reduce the amount of supply and recirculation piping and associated heat loss.

c. Where cost effective, consider use of solar thermal hot water systems.

d. Provide water at 100 degrees F to all fixtures for elementary schools, and 110 degrees F for secondary schools.

e. Refer to Department of Health for hot water requirements at fixtures serving pool locker rooms.

S704 SWIMMING POOLS

a. Installations of swimming pools as part of the physical education program require certificates of construction by the Department of Health (DOH). Therefore, it is necessary to submit applications for approval to the local agency of the Health Department. SED approval is contingent upon DOH approval.

b. Mechanical equipment plans and layouts for swimming pools, together with their specifications, should be presented to the appropriate State Health Department Agency prior to the date of the approval desired from the Office of Facilities Planning. Final plans and specifications for school buildings that include swimming pools should be accompanied by a copy of the transmittal to the Department of Health.

c. See 10 NYCRR 6 (DOH Sanitary code), and 9 NYCRR 650 Article 9.

S705 SEWAGE DISPOSAL

a. See Part IV, Site and Utilities.

b. Kitchen grease traps should be located outdoors for ease of routine maintenance and maintaining sanitary conditions in the kitchen, and shall meet Code, municipal sewer authority, Department of Environmental Conservation (DEC), and health department requirements.

c. If septic tanks are used, the acid-proof drain from the science laboratories after neutralization should run into a separate holding tank.

d. Based upon the instruction program, art (ceramics) classrooms should be provided with clay traps in the waste system.

e. Consult municipal sewer authority, if there is an expected increase in waste flow to the municipal system.

f. The use of asbestos-cement pipe is not permitted.

S706 PLUMBING

S706-1 Toilet Rooms

a. Toilet rooms for pupils of both sexes should be located on each floor to provide greater convenience. Entrances to gang toilet rooms shall be screened. Toilet rooms shall be available and open at all times of building occupancy, and when occupants are on site for school authorized activities.

b. Toilet rooms for pre-kindergarten and kindergarten should be placed adjacent to these rooms, and open into them. For other elementary, junior high school, and senior high school pupils, the toilet rooms should be located in the elementary, junior high, or senior high school areas, respectively.

c. Toilet rooms should be conveniently located for assembly spaces such as auditoriums, gymnasiums, cafeterias, meeting rooms, and other parts of the school commonly used for assembly activities.

d. Separate toilet rooms should be provided for school staff.

e. Where school grounds are likely to be used for school authorized events at times when the school building is closed, toilet rooms must be accessible to the outdoor spaces. Provisions must be made to provide toilet rooms without making it necessary to open up large portions of the school building. If locker rooms are used for this purpose and the doors leading from the locker rooms into the interior of the building will be locked, exiting capacity requirements to the outdoors shall be maintained at all times. Portable toilets facilities may be used in accordance with the Code to accommodate up to 50% of the occupant load (eg. grandstand). Permanent toilet facilities should be within 500 feet travel distance to serve the remaining occupant load.

f. Toilet Facilities in detached Classroom Buildings (eg. modular building):

1. Classroom buildings that contain 3 or more classrooms shall contain toilet fixtures in such quantity as required by Code.

2. Classroom buildings that contain 1 or 2 classrooms are required to contain toilet fixtures unless all of the following conditions are met:

- Accessible toilet rooms are available in an existing, school building, and the fixture count meets the requirements of the Code for both the existing building and the new building.

- The path of travel from the classroom to the existing toilet facilities is on an accessible route and is within a maximum distance of 250 feet,

- The detached classrooms do not house elementary grade students, or classrooms dedicated to students with special needs.

- Potable water for drinking is provided in all classroom buildings.

S706-2 Accessories

a. Toilet rooms should be provided with soap dispensers, grab bars, toilet paper holders, waste containers, mirrors, shelves and hand drying facilities. Sanitary napkin dispensers and separate waste receptacles should be provided in appropriate toilet rooms.

S706-3 Water Closets, Urinals

a. Water closets and urinals should be of vitreous china or stainless steel.

S706-4 Lavatories

a. Lavatories or wash basins shall be provided for toilet rooms and should be placed so that pupils will pass them as they leave the room.

b. Wash facilities are strongly recommended on the path to or near the cafeteria with the number of lavatories based on the throughput of the cafeteria. The intent is to provide all students with the opportunity to wash their hands prior to eating.

c. Lavatories should be provided with a grid strainer. Positive temperature control must be provided to ensure that the hot water will not exceed 100 degrees F for elementary schools and 110 degrees F for secondary schools.

S706-5 Sinks

a. Classrooms sinks should be provided if required by program use.

S706-6 Showers

a. Showers should have a positive temperature control to ensure the temperature is at a maximum of 110 degrees F. Vandal proof heads are recommended.

S706-7 Service Sinks

a. We recommend a custodian's closet with a service sink on each floor. The sink should be placed low for convenience and have a chip-proof rim. Consideration should be given to the floor-recessed type of mop and service sink which has a rim approximately 8 inches above the floor. Faucets should be installed high enough above slop sinks to permit filling of water buckets. Service sinks should have available a three-quarter inch service pipe for flow of hot and cold water.

S706-8 Drinking Fountains / Water Coolers

a. Provide water fountains at the ratio required by code, with a minimum of one drinking fountain on each floor having pupil occupancy.

b. Drinking fountains/water coolers should be located convenient to gymnasiums, cafeterias, and multi-purpose rooms. We recommend providing access to drinking fountains from playgrounds. Locating drinking fountains and cuspidors within the gymnasium playing area may create a slip hazard.

c. Drinking facilities should be available in pre-kindergarten, kindergarten and first grade classrooms. Drinking fountains may be installed in conjunction with classroom sinks in the following manner: A shallow receptor for the fountain, having a minimum edge clearance from the sink of 6", may be installed in the counter top with its drain draining into the sink drain.

d. Drinking fountains of the frost proof type should be located convenient to the playground area.

S706-9 Floor Drains

a. Automotive shops should have floor drain(s) to cover an area approximately 14 x 14 feet in front of the overhead door. An oil interceptor should be provided for schools served by municipal sewer systems for automotive shop floor drains.

S706-10 Outside Hose Fixtures

a. Hose fixtures should be provided around the perimeter of the building. Frost proof hydrants here and elsewhere on the school grounds are recommended.

S706-11 Piping

a. All piping and valves should be labeled and tagged per requirements of Part V. Valves and fittings should also be selected with a view to ease of service and replacement. All valves shall be tagged for identification and a chart of the piping layout should be readily accessible in the custodian's room.

b. Insulate all hot water piping. Cold water piping should be insulated to prevent condensation.

S707 SPECIAL CONSIDERATIONS

S707-1 Cafeteria-Kitchen

a. In the cafeteria-kitchen, provide pre-rinse hot water at 110 degrees F, wash tank hot water at 140 degrees to 160 degrees F, and final rinse hot water (if no chemical sanitizer is used) at 180 degrees F. Dynamic pressure should be a minimum of 20-25 psig.

S707-2 Agricultural Shops

a. In vocational agriculture a milk-testing sink is usually included. The students may use this same sink, which should be acid-proof with an acid-proof trap and waste, as a wash sink.

S707-3 Emergency Showers and Eyewashes

a. Emergency showers shall be provided for high school chemistry laboratories and any other spaces where chemicals are corrosive, caustic, or immediately injurious to the skin of the occupants.

b. Emergency eyewash stations shall be provided in shops, laboratories, and other spaces based on program use where chemicals, paint, or particulates would likely injure the eye. In addition, chemistry preparation rooms with sinks shall be provided with emergency eyewashes or have an eyewash available within a travel time of ten seconds.

c. Boiler rooms and maintenance areas where occupants are handling chemicals, paint or particulate injurious to the eyes shall be provided with an emergency eyewash station.

S708 GAS FACILITIES

a. In addition to the shut-off valve located on the supply side of the meter in accordance with Code, a valve to shut off the supply of gas to the building shall be installed and located for ready accessibility on the load side of the meter in case of emergency. Additional shut-off valves and signage may be required by other provisions in Code.

b. All gas equipment shall be listed and labeled by a Nationally Recognized Testing Laboratory (NRTL) such as the Canadian Standards Association (CSA) or Underwriter's Laboratories, Inc. (UL). Installation of gas equipment and piping shall be in accord with the applicable American National Standards Institute (ANSI) Code and the rules and regulations of the local gas utility.

c. Whenever liquefied petroleum is used, special pipe joint compound resistant to liquefied petroleum gas should be used.

d. It is recommended that gas piping enter a building above grade.

e. It is recommended that LPG piping not be placed in areas of a building below grade.

f. LPG detectors and alarm system are recommended wherever LPG is used.

g. Natural gas detectors and alarm systems are recommended wherever natural gas is used.

h. Vent termination: All vent lines should terminate outdoors in a safe place and not less than two feet from any opening or overhang. Termination points shall also comply with distance requirements to outside air intakes. Adequate means shall be employed to prevent water from entering the vent pipe, and also to prevent blockage by insects or foreign matter.

S709 GAS DISTRIBUTION

a. A lockable master control valve should be provided in an accessible place for the instructor's control in any student occupied space having 3 or more gas outlets. This valve may be either a manual or an electrically operated solenoid valve with manual reset or electric key operated reset.

b. If gas outlets are in close proximity to water or air outlets, the gas supply pipe should be equipped with a gas check valve.

c. A lockable master control valve should be provided in an accessible place for the instructor's control for all student occupied spaces with fuel fired equipment. This valve may be either a manual or an electrically operated solenoid valve with manual reset or electric key operated reset.

d. Electrically operated solenoid valves should fail to the closed position.

PART VIII: ELECTRICAL WORK

S801 GENERAL

a. Electrical devices, materials, and packaged equipment shall be listed and labeled by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratories Inc. (UL), for the intended use, and shall bear its label. Note that NRTL approval of individual components of packaged equipment does not constitute approval of the entire package.

b. Provisions should be made in accordance with manufacturer's recommendations for adequate ventilation in rooms with transformers or other heat producing equipment.

c. Use of premium efficiency motors is recommended.

d. Lightning protection systems, where provided, should conform to the requirements of the most current edition of NFPA 780, UL96A, UL96, and other associated UL standards.

e. Instructional spaces should be provided with an adequate quantity of electric power, communication, and data outlets. The outlets shall be provided at appropriate locations. The anticipated program use of each space should be discussed with appropriate school district personnel and submitted designs should account for these requirements. Allowances should be made for flexibility in adding peripheral equipment, and special needs as they develop.

f. Cables within buildings: AC cables are not allowed unless they include an insulated (green) equipment grounding conductor. The following cable types are not allowed within school buildings: NM, NMC, NMS, SE, USE, UF, FC, FCC, and TC cables.

g. Minimum wire size shall be #12 AWG for branch circuits.

h. Coordinate with the electric utility company, as required. Provide load letters, as required. Submit the design to the electric utility company for review and approval, as required. Comply with all the requirements of the electric utility company.

i. Electrically driven fire pumps shall be provided with a standby power supply in addition to the normal electrical power source. Normal power sources will not be considered reliable when evaluating need for alternate power source in accordance with NFPA 20.

j. Carbon monoxide, propane, natural gas, and refrigerant detectors/sensors and alarm systems should be provided with a standby power supply in addition to the normal electrical power source.

k. Elevators should be provided with a standby power supply to lower the elevators (preferably to an egress level) in addition to the normal electrical power source.

l. Platform lifts and stairway chairlifts should be provided with a standby power supply to lower the platform lifts and stairway chairlifts (preferably to an egress level) in addition to the normal electrical power source.

m. Area of Refuge: The central control point communication equipment shall be located adjacent to the Fire Alarm Annunciator Panel(s) at the normal fire department entrance and also at a location in the building that is normally occupied at any time the building is occupied. The area of refuge should also have controlled access to a public telephone system. Communication equipment should connect to the central control point communication equipment prior to connecting to the public telephone system. The central

control point communication equipment must have a graphic plan, which indicates the location(s) of the activated area of refuge communication equipment, mounted immediately adjacent to the equipment. Coordinate with the fire department and obtain approval for the locations. The communication equipment and signage shall be provided with a standby power supply in addition to the normal electrical power source.

n. Doors (for occupant movement) shall not swing into the National Electrical Code (NEC) required working space.

o. Specify that new circuit breaker(s) to be added to existing panelboard(s) shall be listed/labeled for use with the existing panelboard(s).

p. The short-circuit ratings of all protective devices shall be equal to or exceed the available short-circuit current. Series-connected (combination) systems, where the short-circuit rating of the upstream protector is fully rated but the downstream protector is not fully rated, are not allowed.

q. When new panelboard interiors are retrofitted into existing enclosures (back boxes) the architect/engineer shall determine if the box wiring space is adequate for the installation. Panelboard interiors not marked for use in the existing enclosures revert to a short-circuit current rating of 10,000 AIC. If a short-circuit current rating above 10,000 AIC is required, a Field Evaluation shall be performed by UL (or other NRTL) to determine the actual short-circuit current rating of the new panelboard interior and existing enclosure combination.

r. When the buss of an existing panelboard or switchboard is tapped the architect/engineer shall determine if the box wiring space is adequate for the installation. Tap connections may violate the listing and labeling of the equipment. The holes in a panelboard or switchboard buss are not generally intended for tap connections. The equipment manufacturer should specify if the holes are intended for tap connections. The architect/engineer shall either acquire instructions on how to do the tap connection without violating the listing and labeling of the equipment from the manufacturer or require that a Field Evaluation shall be performed by UL (or other NRTL).

s. Where ground-fault circuit-interrupter (GFCI) protection for personnel is required or provided, the feed-through feature of a GFCI-type receptacle shall not be utilized. Installation of GFCI-type receptacles at each location, where GFCI protection for personnel is provided, is acceptable. GFCI-type circuit breakers may be used to supply a branch circuit where each receptacle supplied from the branch circuit is labeled “GFCI Protected”.

t. Corrosion resistant conduit, fittings, supports, boxes, cabinets, etc. shall be used in harsh environments, where corrosion may readily occur, such as pool equipment rooms and pool areas. PVC non-metallic and PVC coated metallic products are examples of acceptable materials.

u. Electrical Rooms – (Explanatory note: Designers should exercise engineering judgement when evaluating criteria for determining whether electrical rooms should be rated. The list below of electrical equipment provides examples of when rooms should be designed to separate main electrical equipment from the rest of the building: to provide fire separation; to prevent unintended access and minimize electrical hazards to untrained personnel; to discourage storage in such rooms (with recommended posted signage), which might increase the fire load and may violate the required working clearance to electrical equipment. Consider the potential electrical energy and risk of injury or fire due to the type and capacity of electrical equipment contained in the space. While rating a room will not prevent storage of combustibles, it would offer greater passive protection. This is where the architect and engineer of record's direct presence in the field and observation of the district's habits and behaviors might give cause to follow one's own best practice to protect the occupants.) Electrical rooms may include, but are not limited to:

1. Rooms housing transformers rated over 75kVA or panels/breakers/motor controllers/switches/etc. rated over 225A at 208V or over 100A at 480V.

2. Rooms housing multiple transformers; panels; motor controllers; disconnect switches.

3. Rooms housing stored electrical energy systems or generator systems.

4. Rooms housing electrical equipment rated greater than 600V.

S802 TESTS AND INSPECTIONS

a. Tests of all electrical work shall be performed, in the presence of the owner's representative, as equipment is installed and as systems installations are completed. Tests shall include a run under full load (or a reasonable overload) long enough to determine that no excessive heat will be developed at terminal points, switches, and other points of installation. Tests shall be specified and conducted for the Fire Alarm System, Emergency Lighting, Exit Signs, Generator Systems, Central Battery Inverter Systems, Other Emergency/Standby Power Supply Systems, Elevator Systems, Electrically Operated Partition/Curtain Safety Systems, Lighting, Lighting Controls, Communication Systems, Emergency Shutdowns, Motors, Safety Devices, Grounding, Ground Fault Protection, Interlocks, and other electrical equipment/systems. Tests shall verify that the equipment/system functions as designed and as required by the Code and this Manual. The tests shall be in accordance with the appropriate Code reference standard or be as specified by the engineer or architect for systems that do not have a Code reference standard. A record of all tests shall be maintained by the School District.

b. Electrical inspections are required for projects involving electric work. The electrical inspection shall be performed, in the presence of the owner's representative, by a qualified electrical inspection agency such as Middle Department Inspection Agency, Inc., Atlantic-Inland, Inc., and Commonwealth Electrical Inspection Service, Inc. An electric approval certificate shall be issued by the electrical inspection agency.

c. UL Master Label Certification (Certificate of Inspection) shall be obtained and maintained for lightning protection systems.

S803 ELECTRIC HEATING

S803-1 Requirements

a. Heating elements, rated over 50kW, and used with fans or in air-handling units are required to be installed in a furnace room, which is separated from the remainder of the building with a 2-hour fire barrier or located at the exterior of the building in accordance with provisions of Part VI.

b. Heating elements, rated 50kW or less, and used with fans, in air-handling units, or in duct reheat applications shall not be accessible nor within reach of the general population of the school building. A minimum horizontal distance of 24 inches shall be maintained from the outlet of the duct serving such space and the heating element.

c. Baseboard heaters and cabinet heaters must have heating elements of the enclosed, sheathed, and finned type.

d. Electrical space heating equipment should incorporate controls that will provide for safe operation of the equipment and will limit air discharge temperature.

S804 ARTIFICIAL LIGHTING

S804-1 General

a. School buildings should be provided with sufficient and suitable artificial light to conduct the school activities in the absence of natural light. Note Table S804-1 shows only minimum acceptable light levels. Illuminating Engineering Society of North America (IESNA) publishes recommended ranges of lighting levels, including detailed information based on specific program uses. Designers should use their professional judgement to specify lighting that promotes reading and skills development appropriate to the program use.

Table S804-1 Minimum Lighting Levels

Location	Minimum Maintained Foot-Candles
Classrooms, study halls, and lecture rooms (on desks and tables)	30
Offices (on desks)	30
Libraries (on desks and tables)	30
Music rooms (on work)	40
Sewing rooms, drafting rooms, home economics (on work)	40
Shops, laboratories, and art rooms (on work)	30
Gymnasiums and playrooms	20
Swimming pools*	*
Cafeterias (on tables used for study)	30
Cafeterias (not used for study)	20
Auditoriums	10
Conference, meeting rooms	20
Corridors, stairs, passageways, interior means of egress, area of refuge	10
Locker rooms and toilets	10

*Illumination levels and quality of lighting must comply with NYS Department of Health regulations (Sanitary Code 6-1).

b. IESNA publications provide useful design guidelines. Lighting designs should incorporate features which result in a high-quality visual environment.

c. Consider specifying direct-indirect, semi-indirect, or totally indirect luminaires in classrooms.

d. Color Rendering Index (CRI): Minimum CRI should be 80. Select appropriate CRI at or above 85 for specific program uses (i.e. art rooms, science labs, etc.). (Exception: Limited quantity of specialty lamps for particular circumstances.)

e. Correlated Color Temperature (CCT): Select appropriate CCT values for the program use.

f. Designs should incorporate appropriate levels of lighting uniformity, distribution, and contrast. Designs should minimize glare.

g. Mercury vapor and metal halide lamps must be of the safety type or self-extinguishing upon the breaking, cracking or removal of the outer shield protecting the lamp. If a safety type or self-extinguishing lamp is not available, each lamp or its fixture should be equipped with a shield adequate to protect against and absorb ultraviolet radiation if the lamp were to break or become defective.

h. Completely enclosed Courts (Courtyards): In addition to Code requirements, means of egress lighting shall be provided.

i. Lighting fixtures should not be solely supported by the framing members of suspended ceilings. Safety support (aircraft cable or else) connected to the building structure above the suspended ceiling should be provided in addition to any bolts, screws, rivets, or listed clips fastened to the ceiling framing members.

j. Lighting fixtures in gymnasiums and other areas where the lighting fixtures are subject to impact should be provided with safety support (aircraft cable or else) in addition to the normal lighting fixture support.

S804-2 Switching and Controls

a. Switching of electrical lighting circuits should be so arranged that certain windowless areas with student occupancy should either be circuited for some continuous lighting (night lights) directly from the lighting panel or should be on key-operated switches mounted on the wall. Occupancy sensors should not shut off all the lighting in the space. Such interior spaces may include, but are not limited to, classrooms, large group instruction areas, libraries, study halls, music rooms, gymnasiums, and gang toilets. All natatorium (swimming pools) should have some continuous lighting whether or not natural light is provided.

b. Automatic lighting control systems should be specified to be normally closed, such that failure of any system component results in power transfer through system to manual switches or light fixtures.

c. Automatic lighting controls in the means of egress, with the exception of stairs: The means of egress illumination level shall not be less than 1 foot-candle at the floor level at all times the building space served by the means of egress is occupied. Light fixtures shall be arranged such that failure of any single lamp does not result in an illumination level of less than 0.2 foot-candle in any space. Upon any occupant movement in the area served by the light fixtures, the illumination level must be brought up to at least the minimum level(s) as required by Section S804-1.

d. Automatic lighting controls in stairs and areas of refuge: The means of egress illumination level shall not be less than 10 foot-candle at the walking surfaces at all times the building space(s) served by the stairs and area(s) of refuge are occupied.

e. Automatic lighting controls serving light fixtures in areas where electric panels are located should have a manual means for overriding such controls. Automatic lighting controls serving light fixtures in areas with ladders or stairs leading to equipment rooms or providing roof access should have a manual means for overriding such controls, or controls installed to ensure lights will come on upon initial access to ladder/stair from any point.

S805 EMERGENCY LIGHTING

a. Emergency Lighting, in addition to code requirements, shall be provided in spaces including, but not limited to:

1. Completely enclosed Courts (Courtyards)
2. Libraries (over 1000 sq. ft)
3. Windowless, toilet rooms
4. Spaces used outside of normal daylight hours. Such spaces are dependent upon program use. These may include, but not be limited to the following: locker rooms; team rooms; classrooms; athletic/dance rooms; dressing rooms; music rooms; toilet rooms serving assembly occupancies.
5. Spaces requiring a second means of egress through an intervening space as well as the intervening space. (See S106-2. b)
6. Common areas (waiting areas) of spaces such as office suites, guidance suites, and nurse suites
7. Elevator machine rooms
8. Spaces with potential for injury to staff such as, but not limited to the following: boiler rooms, furnace rooms, mechanical equipment/appliance rooms, pool equipment rooms, and electric rooms.

b. SED considers program spaces with hot equipment, open flame, welders, kilns, rotating equipment and/or use of potentially hazardous chemicals to be in the same category as shops (i.e.. art, home economics, etc.) for purposes of retroactive emergency lighting requirements.

c. Emergency lighting systems shall be arranged such that failure of a normal area lighting circuit shall cause the emergency lighting system to automatically energize, within 10 seconds, or maintain energized emergency lighting in the area at all times (24 hours/day, 365 days/year) whether the building space served by the means of egress is occupied or not occupied.

d. New or modified emergency lighting circuits cannot be connected to existing generator and storage battery emergency power systems that do not comply with current code requirements. Generator and storage battery emergency power systems and emergency lighting circuiting shall be made to comply with current code requirements when new or modified emergency lighting circuit connections are installed.

e. Existing emergency lighting circuiting is acceptable if installed in accordance with the Code requirements at the time of design. If the existing emergency lighting circuiting is not in accordance with the Code requirements at the time of design the circuiting will have to be retrofitted to be compliant with current code requirements.

f. When replacing or adding exterior lighting at exterior exits, exterior exit areas shall be equipped with emergency lighting such that failure of the normal lighting circuit serving the exterior exit area shall cause the emergency power system to automatically energize or maintain energized emergency lighting serving the exterior exit area. Exterior emergency lighting shall be provided for new ramps and stairs when constructed. Exterior exit area is defined as the exterior landing and the ramps and/or stairs serving the landing.

g. Where emergency power for emergency lights in an area is supplied by an emergency generator, some lighting (normal lighting) in the area shall be supplied from a panelboard that is not supplied by the load side of the emergency generator transfer switch and other lighting (emergency lighting) in the area shall be supplied from a panelboard that is supplied by the load side of the emergency generator transfer switch. The normal lighting and the emergency lighting each, separately, shall provide illumination levels equal to or greater than the levels required by the Code for emergency lighting.

h. Where emergency power for emergency lights in an area is supplied by a central storage battery system, some lighting (normal lighting) in the area shall be supplied from a panelboard that is not supplied by the central storage battery system and other lighting (emergency lighting) in the area shall be supplied from the central storage battery system. The normal lighting and the emergency lighting each, separately, shall provide illumination levels equal to or greater than the levels required by the Code for emergency lighting.

i. Where UL 924 Automatic Load Control Relays or UL 1008 Transfer Devices are used to energize or maintain energized emergency lighting in an area upon loss of the normal lighting supply in the area, the relays/devices shall be located in the area served by the emergency lighting. Where a space has one luminaire (e.g. single toilet room) that serves as both the normal and emergency light, a UL 1008 Transfer Device shall be used.

j. Emergency lights should be easily identifiable for inspection and facilitating required maintenance. Wall mounted battery pack emergency lights are readily identifiable by their form. However, ceiling mounted emergency light fixtures, which have integral battery ballast backup or are tied into an emergency power system (i.e. emergency generator, central battery inverter, etc.), are not easily identifiable. Labels should be attached to these fixtures so that they are readily discernible, by a person standing on the normal walking surface in the area, for testing purposes. In addition, some emergency lights are designed to be illuminated at all times. Since these lights are on all the time, the lamps (bulbs) are likely to burn out faster than the rest of the lights serving the area. Lamps must be replaced immediately upon burning out to maintain emergency light coverage.

k. School district buildings that will be used as emergency shelter facilities must have appropriate emergency power systems. When a generator is installed to satisfy the lighting and power requirements of an occupied emergency shelter, consideration shall be given to the potential for generator failure and fuel supply depletion or failure. While the electric utility connection is failed, the generator is considered the normal power source for the occupied emergency shelter. If the generator was to fail or the fuel supply became unavailable, the occupied emergency shelter would immediately be left in darkness, resulting in a dangerous condition where the means of egress would be extremely difficult to navigate. Systems shall be provided to supplement the generator system such that code required emergency illumination is provided, for at least 90 minutes to allow for evacuation, in the event of generator failure or fuel supply unavailability.

l. Floor proximity egress path marking in accordance with the provisions in NFPA 101 are recommended.

S806 EXIT SIGNS

a. In addition to code requirements, exit signs shall be provided in spaces including, but not limited to:

1. Completely enclosed Courts (Courtyards)
2. Libraries (over 1000 sq. ft)
3. Spaces where egress doors are not readily visible or apparent or where the egress path is difficult to navigate. These may include, but not be limited to the following: locker rooms; team rooms; common areas of office; guidance or nurse suites.

b. Doors should be presumed closed for layout of Exit Signs.

c. Clearly indicate “EXIT” face(s) and directional arrows on the drawings.

d. Where emergency power for Exit Signs is supplied by an emergency generator, the exit signs shall be listed/labeled for two separate circuit inputs. Exit Signs shall be supplied from both a panelboard that is not supplied by the load side of the emergency generator transfer switch and also from a panelboard that is supplied by the load side of the emergency generator transfer switch. Exit Sign circuiting shall be supplied from both the local area normal lighting circuit and the local area emergency lighting circuit, ahead of any switching, and wired to minimize the possibility of interruption.

e. Where emergency power for Exit Signs is supplied by a central storage battery system, the Exit Signs shall be listed/labeled for two separate circuit inputs. Exit Signs shall be supplied from a panelboard that is not supplied by the central storage battery system and also from the central storage battery system. Exit Sign circuiting shall be supplied from both the local area normal lighting circuit and the local area emergency lighting circuit, ahead of any switching, and wired to minimize the possibility of interruption.

f. Exit Sign circuiting, for battery equipped unit equipment exit signs, shall be supplied from the local area normal lighting circuit, ahead of any switching, and wired to minimize the possibility of interruption.

g. Exit Signs should be the LED type.

h. Floor proximity exit signs in accordance with the provisions in NFPA 101 are recommended.

S807 EMERGENCY and STANDBY POWER SYSTEMS

a. Clearly indicate if generator systems are separately derived or not separately derived.

b. Clearly indicate Level, Type, and Class for systems.

c. Clearly indicate all loads connected to emergency and standby power systems. Clearly indicate if the loads are emergency or standby loads.

S808 GROUNDING and BONDING

a. Provide a separate (insulated green) equipment grounding conductor (EGC) for all feeders and branch circuits. Use of a conduit as the sole EGC is not allowed.

b. Above-ground portions of metal air ducts should be electrically continuous and bonded to an effective ground-fault current path. Metal air ducts should be considered to be bonded when connected to the equipment grounding conductors of associated heating, ventilating, and air conditioning equipment. Install bonding jumper to bond across flexible duct connections. Use braided bonding straps.

c. Above-ground portions of metal piping systems should be electrically continuous and bonded to an effective ground-fault current path. Metal piping systems should be considered to be bonded when connected to the equipment grounding conductors of associated pumps and equipment. Install bonding jumper to bond across flexible pipe connections. Use braided bonding straps. Metal underground gas piping shall not be used as a grounding electrode. Coordinate with the gas utility company to determine if a dielectric fitting is required to be installed in the gas piping where it connects to the utility company meter.

d. Provide a ground rod and ground conductor bonded to each site lighting pole, CCTV pole, etc.

e. Provide ground rods and ground conductors bonded to metal fences and gates.

f. Provide, at a minimum, ground rods and ground ring conductors at exterior generators.

g. Provide detailed grounding design including locations/configurations/sizes of all grounding electrodes, sizes of grounding electrode conductors, and neutral to ground bonding requirements. Simply specifying compliance with Article 250 of the NEC is not adequate.

h. Coordinate with the electric utility company, regarding service entrance grounding, as required. Submit the design to the electric utility company for review and approval, as required.

i. Solar Photovoltaic (PV) Systems with Alternating-Current and Direct-Current Grounding Requirements: Provide a separate DC grounding electrode conductor routed to either DC grounding electrode(s) [typically ground rods] near the PV system or directly to the building AC electrical service entrance grounding electrode(s) if nearby. DC grounding electrode(s), when used, shall be bonded to the building AC electrical service entrance grounding electrode(s).

S809 FIRE ALARM SYSTEMS

S809-1 General Requirements

a. A manual and automatic fire alarm system shall be installed.

b. Any school located in a municipal fire district having a general fire alarm system should be provided with a fire alarm box on the premises that shall be interlocked with the school system to automatically notify the fire department reporting system. The typical alarm box used in the city, village, town, or fire district should be located on the premises as directed by a responsible authority in the fire department.

c. Motors operating fans in air handling systems and exhaust systems, serving multiple spaces, assembly spaces or corridors, having fan capacities of greater than 1000 CFM, shall be interconnected to the fire alarm system to shut down such motors when the fire alarm is activated. It is recommended that single unit ventilators serving individual rooms, and exhaust fans of 1000 CFM capacity and less, also be so connected. Building control panels may be used as part of the fan motor shutdown, if they are listed and labeled as fire alarm control panels and protected as required for fire alarm control panels. Note that there may be special circumstances where shutdown of fans is not desirable (examples: certain commercial kitchen exhaust hoods with extinguishing systems that require the exhaust fans to operate – verify with the manufacturer of the proposed extinguishing system; certain laboratory fume hood exhaust systems where it would not be prudent to allow the vapors of hazardous chemicals used in experiments to escape into the laboratory; smoke control systems; etc.).

d. The Fire Alarm Control Panel (FACP) shall be available to responding fire department personnel. Coordinate with the fire department and obtain approval for the location(s). The location(s) should be easily accessible and free of clutter.

e. The Fire Alarm Annunciator Panel (FAAP) and the FACP should have graphic plans, which indicate the location(s) of the activated initiation device(s), mounted immediately adjacent to the panels. The graphic plans should be protected from damage. Where the building is broken into zones on the graphic plans, careful thought should be put into the zone layouts such that responding fire department personnel can

easily locate areas of interest. Proposed FAAP and FACP graphic plans should be included in the design submission to SED. FAAP and graphic plans must be located at the normal fire department entrance, near a window so that they may be read by firefighter personnel without entering the building and also at a location in the building that is normally occupied at any time the building is occupied (i.e. main office). A locked fire drill switch should be provided in the main office. Coordinate with the fire department and obtain approval for the locations and graphic plans.

f. Door hold-open release devices (i.e. magnetic door holders) normally holding doors in the open position must be interlocked with the fire alarm system such that, upon activation of the fire alarm system the door hold-open release devices will automatically allow the doors to close. (See S109 and S110 for additional information.) Automatic fire detection on both sides of the door hold-open device shall comply with the requirements of NFPA 72.

g. Smoke dampers must be interlocked with the fire alarm system so that, upon activation of the fire alarm system the smoke dampers will automatically close. [Exception: Smoke control systems.]

h. Elevator Recall: Clearly indicate which floor level is the designated recall floor level. Clearly indicate which floor level is the alternate recall floor level. Clearly indicate which detectors initiate recall including which floor level the elevator shall recall to.

i. Carbon monoxide (CO), propane, natural gas, and refrigerant detectors/sensors and alarm systems shall be connected to the combination (fire and non-fire) alarm system, except where permitted by the code (e.g. code compliant battery CO alarms). Propane, natural gas, and refrigerant detectors/sensors shall be listed/labeled in accordance with UL 2075. Provide local audible and visual alarms based on initiation of these detectors/sensors. Audible and visual alarms activated based on initiation of these detectors/sensors should be distinctively different from fire alarm signals. Initiation of these detectors/sensors shall be monitored, as a supervisory signal, by the supervising station specifically as to the type of detection. These detectors/sensors should send a specific trouble signal to the fire alarm system if a problem exists with the sensing circuit or if the detector has reached its maximum lifespan. Note that appropriate monitor modules will be necessary when the detectors/sensors are not specifically listed/labeled to be directly connected to the combination (fire and non-fire) alarm system. Electrochemical carbon monoxide detectors and sensors are recommended.

j. Systems such as security; lockdown; public announcement; emergency communication systems; mass notification system; building automation systems; etc., which connect to, or are required by NFPA 72 to connect to, the fire alarm system, shall comply with the requirements of NFPA 72 National Fire Alarm Code to protect the integrity and reliability of the fire alarm system, and to issue a coordinated message. Other notification systems shall coordinate with the fire alarm notification system to avoid confusion of directions and intended actions and response.

k. FACP Replacement Only: Provide a FACP that complies with the listing/labeling requirements of the current Code and this Manual. Provide a FACP that is capable of, or can be readily expanded to be capable of, accommodating the future installation of all initiation devices, notification appliances, and other equipment, required by current Code and this Manual, throughout the building. The fire alarm equipment shall be protected in accordance with current Code and this Manual.

l. FACP and Device/Appliance/Equipment Replacement: The fire alarm system shall be considered a replacement when the replacement number of devices exceeds roughly 50% of the current system; the intent is to discourage replacing the fire alarm system in piecemeal fashion to avoid upgrading the fire alarm system to current code (i.e. an emergency voice alarm communication system). The entire fire alarm system shall comply with current Code and this Manual. All devices and appliances shall be installed in

accordance with their listing/labeling and the requirements of Code and this Manual. (For Example: any existing pull station locations that are not located within the height and distance requirements of current Code and this Manual can't be reused.)

S809-2 Manual Fire Alarm Boxes (Pull Stations)

a. In addition to code requirements, fire alarm manual pull stations, shall be located within 5 feet of the following: exterior doors from occupied areas; exterior doors from areas having unusual fire hazards including, but not limited to, boiler rooms, furnace rooms, mechanical equipment/appliance rooms, and electrical rooms (the intent is to not have persons need to run back into a burning building to pull a manual station).

b. Covers, protective shields or guards shall be listed for use with the manufacturer's fire alarm box and shall meet the requirements of NFPA 72 – current version for the number of actions required to activate the pull station.

c. In accordance with the Fire Code where manual fire alarm boxes are not required in Group E occupancies, at least one fire alarm pull station shall be located at a normally attended station (e.g. main office) such that the building can be evacuated manually.

S809-3 Automatic Fire Detection – Smoke Detectors and Heat Detectors

a. Smoke detectors are recommended to be provided in each student occupied space. Exception: Heat detectors may be substituted for smoke detectors if the environmental conditions in a particular area hinder the proper operation of smoke detectors.

b. Duct smoke detectors must be installed in both the supply air and return air duct(s) to indirect fired and electric heating units and must be interconnected with the unit and fire alarm system such that detection of smoke will shut off the main supply of fuel or energy and shut off the fans and activate the building fire alarm system. Exception: Duct smoke detectors are not required where all spaces served have area smoke detector coverage, and the unit shuts down upon activation of the fire alarm system.

c. Provide a readily accessible remote alarm indicator and test/reset station for each duct smoke detector. Locate the indicator and station outside of the access point for each duct smoke detector.

d. Provide a readily accessible remote alarm indicator and test/reset station for each smoke or heat detector that is either not readily accessible or concealed. Locate the indicator and station outside of the access point for each concealed detector.

e. All smoke and heat detectors must be interconnected with the fire alarm system to: automatically activate the building's fire alarm notification appliances; automatically send a signal to the municipal fire alarm system (where available); automatically send signal to the approved supervising station; initiate fire safety functions in accordance with the requirements of NFPA 72.

f. Clearly indicate the type of smoke or heat detector on the construction documents. Clearly indicate the temperature classification of heat detectors on the construction documents. Clearly indicate the listed spacing required for the smoke and heat detectors on the construction documents.

S809-4 Alarm Notification Appliances

a. Visual, audible, and/or audible/visual notification appliances should be provided in areas including, but not limited to, boiler rooms, furnace rooms, mechanical equipment/appliance rooms, electrical rooms, attics, basements, and crawlspaces in addition to code requirements.

b. Visual notification appliances: Public and Common areas include, but are not limited to: corridors, lobbies, assembly spaces (50 occupants or more) and associated surrounding spaces, music rooms, practice rooms, stages, platforms, various types of classrooms, cafeterias, ganged toilet rooms, toilet rooms accessible to the public, single water closet toilet rooms, dressing rooms, locker and shower areas, team rooms, libraries, meeting and conference rooms, common areas of office suites, offices, filing and photocopy rooms, employee break rooms, common areas of nurse suites, examination and treatment rooms, and courtyards (exception: teacher supervised single water closet toilet room, serving a single lower grade level classroom in an existing building, that does not meet the accessibility requirements of ANSI A117.1 and will not be used by someone who is hearing impaired).

c. Doors should be presumed closed for layout of notification appliances.

d. Clearly indicate the candela rating/setting of each visual notification appliance on the construction documents.

e. Clearly indicate the type of audible notification appliance (i.e. voice speaker; horn; bell).

f. When an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed, visual notification appliances shall be provided throughout the entire building.

S810 COMMUNICATION SYSTEMS

a. A Public Address (PA) system should be provided in all school buildings having pupil occupancy. The public address system should broadcast to every occupied space. PA systems should be provided with a standby power supply power supply in addition to the normal electrical power source.

b. Communication equipment should be provided in each student occupied space. The communication equipment should be capable of two-way communication between the pupil occupied space and the main office. The communication equipment should also have controlled access to a public telephone system. Communication equipment should connect to the central control point communication equipment prior to connecting to the public telephone system. The communication equipment should be provided with a standby power supply in addition to the normal electrical power source.

c. Communications: Installations should comply with current TIA and EIA standards.

S811 TELEPHONE

a. A public telephone should be provided in all school buildings having pupil occupancy.

b. Telephone systems should be provided with a standby power supply in addition to the normal electrical power source.

S812 AREAS OF SPECIAL ELECTRICAL NEEDS

a. Areas including, but not limited to, Home and Careers, Science, Art, Electric Kilns, Shops, Kitchens, Stages, Audio Visual, Paint Spray Rooms, and Computer Rooms often have special electrical needs such as voltage ratings other than 120 Volts; circuits rated greater than 20 Amps; 3-Phase circuits; dedicated equipment circuits; emergency power off (EPO) stations; floor outlets; power poles; cord reels; etc. The anticipated program use of each space should be discussed with appropriate school district personnel and submitted designs should account for these requirements. Allowances should be made for flexibility in adding peripheral equipment, and special needs as they develop.

b. Gymnasium:

1. Provide impact guards and lenses for light fixtures such that shards from a broken lamp will be contained within the fixture. Provide listed impact guards for fire alarm system equipment.

2. Where occupancy sensors are utilized for control of HID lighting, provide supplemental means of egress lighting to offset the impact of the HID lighting warm-up time.

c. Crawlspaces and Maintenance Work Areas: 125-volt, single-phase, 15- and 20-ampere receptacles shall have GFCI protection for personnel. Lighting fixtures – lamps should be shielded from accidental blows.

d. Serving areas for kitchens and cafeterias should be considered a "kitchen" (per the NEC) for the purposes of providing GFCI protection for all 125-volt, single-phase, 15- and 20-ampere receptacles.

S813 VOCATIONAL TECHNOLOGY and SHOPS

a. Lighting fixtures for vocational technology or shops should be of a type in which the maximum surface temperature of the lamp or tube does not rise above 165°C. Shielding of the lamps from accidental blows should also be provided.

b. Woodworking machine tools should be provided with dust-tight plugs and receptacles or should be provided with a rigid to flexible permanent connection. Dust-tight motor starters should be provided on such equipment. Motors attached to woodworking machine tools should be the self-enclosed type.

c. Shop emergency shutdown stations are required where potentially hazardous equipment is installed. The emergency shutdown stations should be red Emergency Stop mushroom pushbuttons (key-released version). One (1) should be located on each wall of the room. The emergency shutdown stations should be provided in locations with a clear unobstructed access that is minimum 36" wide. The emergency shutdown stations should be configured to de-energize the power panel(s) supplying shop equipment in emergencies.

d. 125-volt, single-phase, 15- and 20-ampere receptacles should have GFCI protection for personnel.

e. Shop equipment should be provided with magnetic switches such that the equipment will not restart automatically upon restoration of power after an electrical shutdown.

f. Automotive areas should be designed in accordance with the NEC requirements for Commercial Garages.

S814 PANEL LOCKING DEVICES

a. Lighting and power panels should be provided with door locking devices. Doors should be locked to prevent unintended access.

S815 ELECTRICAL IDENTIFICATION

a. General:

1. Provide identification on all equipment, raceways, boxes, conductors, and devices.

2. Identification provided should match the identification names, designations, and letters/numbers indicated on drawings schematic and interconnection diagrams, equipment manufacturer's shop drawings, and in specifications. Identification names, designations, and letters/numbers should match the standards of each individual school district. If no school district standard exists, a standard should be developed.

3. Electrical identification includes, but is not limited to, warning signs, nameplates, cable tags, wire markers, phase identification tape, identification labels, and nominal system voltage designation labels.

4. Electrical identification should be permanent.

5. Electrical identification should be machine printed.

6. Utilize machine engraved laminated engraving stock where appropriate.

7. Electrical identification should be appropriately sized.

8. Electrical identification should be provided such that it is easily read upon approach or within enclosures.

b. Power, Lighting, and Control:

1. Switchboards, Panelboards, MCCs, Equipment Cabinets, Control Panels, Generators, UPS, Disconnect Switches, Enclosed Circuit Breakers, and Motor Controllers:
   i. Provide nameplate with equipment identification as indicated on the drawings.
   ii. Indicate source and location of the source.
   iii. Provide nominal system voltage designation labels on cover.

2. Disconnect Switches and Enclosed Circuit Breakers:
   i. Indicate the equipment designation and location which the disconnect serves.

3. Motor Controllers:
   i. Indicate the motor designation, location, and the type of service

4. Transfer Switches:
   i. Provide nameplate with equipment identification as indicated on the drawings.
   ii. Indicate the equipment designation and location which the transfer switch serves.
   iii. Indicate normal and standby/emergency sources and location of the sources.
   iv. Provide nominal system voltage designation labels on cover.

5. Pull boxes, Enclosures, Junction Boxes:
    i. Provide identification labels with feeder, branch circuit, and control circuit numbers on cover.
    ii. Indicate source(s) and location(s) of the source(s).
    iii. Indicate the load(s) and location(s) of the load(s) served.
    iv. Provide nominal system voltage designation labels on cover.

6. Feeder Circuits, Branch Circuits, Control Circuits, Site Lighting Circuits:
    i. Provide cable tags, wire markers, and phase identification tape as appropriate.
    ii. Identify circuits in each junction box, pull box, outlet box, enclosure, gutter, manhole, handhole, lighting standard base, and at each termination**.**
    iii. Identify with circuit number, load and location served, and panel (equipment) designation and location from which it originates.
    iv. Include identification of the building from which it originates for exterior circuits.

7. Circuits Over 600 Volts:
    i. Cables should be identified at each manhole, handhole, junction box, transformer, switch, and at each termination using cable tags.
    ii. Identify nominal voltage, circuit number, circuit size, load served, and equipment designation and location from which it originates.
    iii. Exposed conduit runs should be identified continuously similar to “DANGER – 4160 VOLTS”, “DANGER – 13,200 VOLTS” or as appropriate.

8. Underground Conduits and Circuits:
    i. Provide warning ribbon above the underground installation. The ribbon should be capable of being identified by a metal detector. The ribbon shall include continuous lettering similar to “CAUTION BURIED ELECTRIC BELOW”.

9. Empty Conduit Runs and Conduits with Conductors for Future Use:
    i. Provide cable tags
    ii. Indicate proposed future use
    iii. Label conduits and conductors at both ends, including location of another end.

10. Receptacles, Switches, and Control Devices:
    i. Provide identification label on faceplate.
    ii. Identify branch circuit number and panel designation and location from which it originates.
    iii. Identify receptacles supplied from GFCI-type circuit breakers in accordance with Section S801.

11. Emergency Lighting Fixtures:
    i. Provide identification labels in accordance with 805-i requirements.

c. Systems:
    1. Equipment Cabinets, Terminal Cabinets, Control Panels, Patch Panels, Racks:
        i. Provide nameplates with equipment identification as indicated on the drawings.
        ii. Label termination blocks and ports.
        iii. Provide nominal system voltage designation labels on cover.

2. Pull boxes, Enclosures, Junction Boxes:
   i. Provide identification labels including system type and circuit numbers on cover.
   ii. Indicate equipment and location(s) from which enclosed cables originate.
   iii. Indicate the equipment and location(s) of the equipment served.
   iv. Provide nominal system voltage designation labels on cover.

3. Cables and Conduits:
   i. Provide cable tags, wire markers, and identification labels including system type and circuit numbers as appropriate.
   ii. Identify cables in each junction box, pull box, device box, enclosure, gutter, manhole, handhole, and at each termination**.**
   iii. Identify with cable number, equipment and location(s) of the equipment served, and equipment designation and location from which it originates.
   iv. Label conduits at both ends, including conduit number and location of other end.
   v. Include identification of the building from which it originates for exterior cables.

4. Underground Conduits and Cables:
   i. Provide warning ribbon above the underground installation. The ribbon shall be capable of being identified by a metal detector. The ribbon shall include continuous lettering similar to "CAUTION BURIED ELECTRIC BELOW".

5. Empty Conduit Runs and Conduits with Cables for Future Use:
   i. Provide cable tags and identification labels.
   ii. Indicate proposed future use.
   iii. Label conduits and cables at both ends (including location of other end).

6. Fire Alarm:
   i. Fire alarm junction boxes and pull fittings should be painted to identify them as components of the fire alarm system as compared to other systems. Red is a typical paint color for fire alarm system components although the color should match the standards of the school district.
   ii. Remote Smoke Detector Lamps and Test Stations – Provide nameplate indicating the location of the connected device.
   iii. Initiation Devices, Notification Appliances, Fire Alarm Relays – Provide device identification and zone or address identification label.

7. Communication:
   i. Comply with applicable EIA, TIA, and ANSI standards.
   ii. Data Outlets – Provide device identification label on faceplate. Identify equipment designation and location from which it originates.

8. Security:
   i. Provide device identification labels.
   ii. Identify equipment designation and location from which it originates.

APPENDIX A: LAWS (EXCERPTS) RELATING TO SCHOOL BUILDING PROJECTS

A001 INTRODUCTION

The following excerpts from Laws and Regulations of the State of New York serve to highlight a few of the various laws which pertain to school construction, financing and safety. The excerpts provide the full name of the title of the law or regulation from which they are taken to enable the reader to easily find and review the regulation in full. These are just of few of the many laws which govern capital improvements of public-school facilities. The design professionals and school administrators must be familiar with those laws and are encouraged to consult with their attorneys to ensure that all aspects of the construction and financing of school facilities are performed properly.

A002 EDUCATION LAW - Excerpts

Title 1 General Provisions, Article 9 – School Buildings and Sites
Section 408.

Plans and specifications of school buildings must be approved by the Commissioner of Education.

1. No schoolhouse shall hereafter be erected, purchased, repaired, enlarged or remodeled . . . in any school district except in a city school district in a city having seventy thousand inhabitants or more, at an expense which shall exceed one hundred thousand dollars, until the plans and specifications ~~thereof~~ shall have been submitted to the commissioner of education and his approval endorsed thereon. Such plans and specifications shall show in detail the ventilation, heating and lighting of such buildings.

   In the case of a school district in a city having seventy thousand inhabitants or more, all of the provisions previously set forth in this subdivision shall apply...

   In either case, the commissioner may, in his discretion, review plans and specification for projects estimated at an expense of less than one hundred thousand dollars.

2. The commissioner of education shall not approve the plans for the erection of any school building or addition thereto or remodeling thereof unless the same shall provide for heating, ventilation, lighting, sanitation, storm drainage and health, fire and accident protection adequate to maintain healthful, safety and comfortable conditions therein and unless the county superintendent of highways or commissioner of public works has been advised of the location of all temporary and permanent entrances and exits shown on public highways and the storm drainage plan which is to be used.

3. The commissioner of education shall approve the plans and specifications, heretofore or hereafter submitted pursuant to this section, for the erection or purchase of any school building or addition thereto or remodeling thereof on the site or sites selected therefore pursuant to this chapter, if such plans conform to the requirements and provisions of this chapter and regulations of the commissioner adopted pursuant to this chapter in all other respects; provided, however, that the commissioner of education shall not approve the plans for the erection or purchase of any school building or addition thereto unless the site has been selected with reasonable consideration of the following factors; its place in a comprehensive, long-term school building program; area required for outdoor educational activities; educational adaptability, environment, accessibility; soil conditions; initial and ultimate cost. In developing such plans and specifications, school districts are encouraged to review the energy conservation and saving best practices available from the department and the New York State Energy Research and Development Authority.

4. No funds voted by a district meeting or other competent authority in any school district to which the provisions of subdivision one of this section are applicable, exceeding the amounts specified in such subdivision, shall be expended by the trustees or board of education until the commissioner of education shall certify that the plans and specifications for the same comply with the provisions of this section.

Section 409.
School building regulations in relation to health and safety.

All school buildings of common, union free, central, central high school, and city school districts other than city school districts of cities having one hundred twenty-five thousand inhabitants or more and boards of cooperative educational services shall comply with such regulations as the commissioner of education shall adopt from time to time for the purpose of insuring the health and safety of pupils in relation to proper heating, lighting, ventilation, sanitation and health, fire and accident protection.

Title 8, The Professions, Article 145 Engineering and Land Surveying
Section 7209. Special provisions

1. ...all plans, specifications, ...relating to the construction or alteration of buildings or structures ... shall be stamped with such seal and shall be signed, on the original with the personal signature of such professional engineer....No official of this State, or of any city, county, town or village therein, charged with the enforcement of laws, ordinances or regulations shall accept or approve any plans or specifications that are not stamped: a. With the seal of an architect or professional engineer....

3. No county, city, town or village or other political subdivision of this State shall engage in the construction or maintenance of any public work...for which plans, specifications and estimates have not been made by, and the construction or maintenance supervised by, a professional engineer...; provided that this section shall not apply to the construction...of county roads or town highways, nor to any other public works wherein the contemplated expenditure for the completed project does not exceed five thousand dollars. This section shall not be construed as affecting or preventing any . . . political subdivision of this state from engaging an architect licensed in this State for the preparation of plans, specifications and estimates for and the supervision of construction or maintenance of public works.

A003 NEW YORK CODES RULES AND REGULATIONS (8 NYCRR 14) – Excerpts

Title 8 Education Department, Chapter I – Rules of the Board of Regents, Part 14
Section 14.1 – School Buildings and Grounds

a. Regulations. The Commissioner shall make regulations governing the requirements for the plans and specifications for the erection, repair, enlargement and remodeling of school buildings.

General requirement. Each school district shall provide suitable and adequate school buildings and grounds for the instruction and accommodation of the pupils of such district.

A004 NEW YORK CODES RULES AND REGULATIONS (19 NYCRR 1201) – Excerpts

Title 19 Department of State, Chapter XXXII - Division of Code Enforcement and Administration, Part 1201 Uniform Code: Procedures for Certain Classes of Buildings

1201.1 Introduction. In general, Section 381 of the Executive Law directs the State's cities, towns and villages administer and enforce the New York State Uniform Fire Prevention and Building Code (Uniform Code). However, the statute contemplates the need for alternative procedures for certain classes of buildings based upon their design, construction, ownership, occupancy or use, and authorizes the Secretary of State to establish those procedures. Those exceptions are subject of this Part.

1201.2 Governmental Buildings and Activities

(e) The State Education Department shall be accountable for administration and enforcement of the Uniform Code with respect to buildings, premises and equipment in the custody of, or activities related thereto undertaken by, school districts and boards of cooperative educational services.

A005 GENERAL MUNICIPAL LAW – Excerpts

Article 5-A – Public Contracts

Section 101. Separate specifications for certain public work.

1. Every officer, board or agency of a political subdivision … charged with the duty of preparing specification or awarding or entering into contracts for the erection, construction, reconstruction or alteration of buildings, when the entire cost of such work shall exceed three million dollars in counties of the Bronx, Kings, New York, Queens, and Richmond; one million five hundred thousand dollars in the counties of Nassau, Suffolk and Westchester; and five hundred thousand dollars in all other counties within the state, shall prepare separate specifications for the following three subdivisions of the work to be performed:
   (a) plumbing and gas fittings;
   (b) steam heating, hot water heating, ventilating and air conditioning apparatus; and
   (c) electrical wiring and standard illuminating fixtures.

2. Such specifications shall be drawn so as to permit separate and independent bidding upon each of the above three subdivisions of work. All contracts awarded . . . . shall award the three separate subdivisions of the above specified work separately . . . . Nothing in this section shall be construed to prevent any political subdivision from performing any such branches of work by or through their regular employees . . . .

Section 103. Advertising for bids and offers; letting contracts; criminal conspiracies.

1. Except as otherwise expressly provided by an act of the legislature or by a local law adopted prior to September first, nineteen hundred fifty-three, all contracts for public work involving an expenditure of more than thirty-five thousand dollars and all purchase contracts involving an expenditure of more than twenty thousand dollars, shall be awarded by the appropriate officer, board or agency of a political subdivision or of any district therein including but not limited to a soil conservation district to the lowest responsible bidder furnishing the required security after advertisement for sealed bids in the manner provided by this section, ~~provided~~ . . .

A006 LOCAL FINANCE LAW – Excerpts

Article II – Local Indebtedness
Title 1 – Power to Contract Indebtedness and Periods of Probable Usefulness

11.0 – Periods of Probable Usefulness

11. Buildings. The acquisition or construction of buildings not included in any other subdivision hereof, whether or not including grading or improvement of the site, original furnishings, equipment, machinery or apparatus required for the purposes for which such buildings are to be used, as follows:
   (a) Class “A” (fireproof and certain fire resistant) buildings.
      (1) Buildings, the walls of which are constructed of brick, stone, concrete, metal or other incombustible material, and in which there are no wooden beams or lintels, except wood glue laminated structural members, and in which the floors, roofs, stair halls, and other means of vertical communication between floors and their enclosures are built entirely of brick, stone, metal or other incombustible materials, and in which no woodwork or other inflammable material is used in any of the rough partitions, floor or ceiling structures, or

(2) Buildings, not more than one story above the ground, the outer walls of which are constructed of brick, the outer walls of which are constructed of brick, stone, concrete, metal, stucco or other fire-resisting material and which are to be used as school houses by school districts wholly outside of a city, thirty years.

(b) Class "B" (fire-resistant) buildings. Buildings, the outer walls of which are constructed of brick, stone, concrete, metal, stucco, or other fire-resistant material, twenty-five years.

(c) Class "C" buildings. Buildings which are neither class "A" nor class "B", as defined in items (a) and (b) above, including any such building which is rebuilt or altered so that it, together with any addition ore vertical or other extension, is not fire-proof nor fire-resisting, as thus defined, fifteen years.

12. Additions to or conversion of buildings.

(a) (1) The construction of an addition or additions to or the reconstruction of a class "A" building, whether or not such construction or reconstruction includes grading or improvement of the site, twenty five years, except as hereinafter provided; the conversion of a class "B" or class "C" building into a class "A" building, whether or not such conversion includes grading or improvement of the site, twenty-five years. If indebtedness has been contracted or is to be contracted with a maximum maturity of over twenty-five years, but not to exceed thirty years, to finance the acquisition or construction of a class "A" building and if more than twenty-five annual installments of principal on the indebtedness evidenced or to be evidenced by bonds or notes have not matured, then the foregoing twenty-five year period of probable usefulness for the construction of an addition to such class "A" building shall be increased by the number of years over twenty-five as there are unmatured annual installments of principal on such indebtedness which has been or is to be contracted for the class "A" building; provided that such addition is to be constructed to meet the construction standards of the class "A" building to which it is an addition. The maximum maturity of such indebtedness for the class "A" building shall be measured from the date of the bonds or from the date of the first bond anticipation note issued on anticipation of such bonds, whichever is the earlier.

(2) The construction of an addition or additions to or the reconstruction of a class "B" building or the conversion of a class "C" building into a class "B" building, whether or not such construction, reconstruction or conversion includes grading or improvement of the site, fifteen years.

(3) The construction of an addition or addition to or the reconstruction of a class "C" building, whether or not such construction or reconstruction includes grading or improvement of the site, ten years.

(b) The periods of probable usefulness set forth in item (a) above shall include original furnishings, equipment, machinery or apparatus required for the purposes for which such additions to such buildings for which such reconstructed or converted buildings are to be used.

(c) A building which is to be attached to an existing building or buildings shall be deemed to be a new building and not an addition if the probable useful life thereof is not dependent upon the useful life of such existing building or buildings.

A007 NEW YORK CODES, RULES AND REGULATIONS (12 NYCRR 47) – Excerpts

Title 12 Department of Labor, Chapter I – Board of Appeals, Part 47
(Industrial Code Rule No. 47)

Part 47 Transparent Glass Doors in Mercantile Establishments and in Public and Commercial Buildings and Structures

47.4 Application. This Part (rule) applies … to all transparent glass doors and fixed adjacent glass sidelights …
Exceptions:

1. Fixed adjacent transparent glass sidelights 20 inches or less in width with opaque stiles at least one and three-quarters inches in width shall be exempt from the requirements of this Part. (rule)
2. Where the ground, floor or equivalent surface area in the path of approach to a fixed adjacent transparent glass sidelight from either side for a minimum distance of three feet from such sidelight is so arranged, constructed or designed as to deter persons from approaching such sidelight or a permanent barrier is installed in the path of approach, the sidelight shall be exempt from the requirements of this Part (rule). Decorative pools, horticultural planting or similar installations shall be considered as indicating that the ground, floor or

equivalent surface area is not a path of approach. Planters, benches and similar barriers which are securely fastened to the floor or wall to prevent their removal shall be considered as blocking the path of approach provided they shall not be less than 18 inches in height from the ground, floor or equivalent surface and extend across at least two-thirds of the total width of the glazed area of the sidelight.

3. Fixed adjacent transparent glass sidelights which are supported by opaque sill and wall construction of at least 18 inches above the ground, floor or equivalent surface immediately adjacent shall be exempt from the requirements of this Part (rule)…

47.5 Definitions. (g) Sidelights. Fixed panels of transparent glass which form part of or are immediately adjacent to and within six feet horizontally of the vertical edge of an opening in which transparent glass doors are located. For purposes of this rule, a sidelight shall consist of transparent glass in which the transparent area above a reference line 18 inches above the adjacent ground, floor or equivalent surface is 80 percent or more of the remaining area of the panel above such reference line.

47.7 Marking. All transparent doors and fixed adjacent transparent glass sidelights shall be marked as hereinafter required…shall be of such a design as to be readily discernible to any person approaching the doors and sidelights from any direction.

47.8 Marking locations. Transparent glass doors and fixed adjacent transparent glass sidelights shall be marked in two areas on the glass surface thereof. One such area shall be located at least 30, but not more than 36 inches and the other at least 60, but not more than 66 inches above the ground, floor or equivalent surface below the door or sidelight.
Exceptions:

1. Transparent glass doors and fixed adjacent transparent glass sidelights shall be exempt from the upper area marking requirement (60 to 66 inches above the ground, floor or equivalent surface) if they are provided with horizontal separation bars, muntin bars or equivalent at least one and one-half inches in vertical dimension that extend across the total width of the glazed area and are located at least 40, but not more than 50 inches above the bottom of the door or sidelight.

47.9 Marking dimensions. The marking design shall be at least four inches in diameter if circular or four inches in its least dimension if elliptical or polygonal or shall be at least 12 inches in horizontal dimension if the marking is less than four inches in its least dimension. In no event shall the vertical dimension of any marking including lettering be less than one and one-half inches in height.

47.10 Marking methods. (a) In addition to horizontal muntin bars, separation bars or equivalent, any of the following methods may be used to alert persons to the presence of transparent glass doors and fixed adjacent transparent glass sidelight in their path of movement:

(1) chemical etching
(2) sandblasting
(3) adhesive strips not less than one and one-half inches in vertical dimension extending across at least two-thirds of the total glazed area.
(4) Decals
(5) Paint, gilding or other opaque marking materials
(6) Opaque door pulls or push bars extending across at least two-thirds of the total width of the glazed area

A008 NEW YORK CODES, RULES AND REGULATIONS (6 CRR-NY VI 617) – Excerpt
Title 6 Department of Environmental Conservation, Chapter VI – General Regulations,
Part 617 State Environmental Quality Review (SEQR)
Section 617.1 Authority, intent, and purpose.

(a) This Part is adopted pursuant to sections 3-0301(1)(b), (2)(m) and 8-0113 of the Environmental Conservation Law to implement the provisions of the State Environmental Quality Review Act (SEQR).

(b) In adopting SEQR, it was the Legislature's intention that all agencies conduct their affairs with an awareness that they are stewards of the air, water, land and living resources, and that they have an obligation to protect the environment for the use and enjoyment of this and all future generations.

(c) The basic purpose of SEQR is to incorporate the consideration of environmental factors into the existing planning, review and decision-making processes of State, regional and local government agencies at the earliest possible time. To accomplish this goal, SEQR requires that all agencies determine whether the actions they directly undertake, fund or approve may have a significant impact on the environment, and, if it is determined that the action may have a significant adverse impact, prepare or request an environmental impact statement.

(d) It was the intention of the Legislature that the protection and enhancement of the environment, human and community resources should be given appropriate weight with social and economic considerations in determining public policy, and that those factors be considered together in reaching decisions on proposed activities. Accordingly, it is the intention of this Part that a suitable balance of social, economic, and environmental factors be incorporated into the planning and decision-making processes of State, regional and local agencies. It is not the intention of SEQR that environmental factors be the sole consideration in decision-making.

(e) This Part is intended to provide a statewide regulatory framework for the implementation of SEQR by all State and local agencies. It includes:

(1) procedural requirements for compliance with the law;
(2) provisions for coordinating multiple agency environmental reviews through a single lead agency (section 617.6 of this Part);
(3) criteria to determine whether a proposed action may have a significant adverse impact on the environment (section 617.7 of this Part);
(4) model environmental assessment forms to aid in determining whether an action may have a significant adverse impact on the environment (Appendices A and B of section 617.20 of this Part); and
(5) examples of actions and classes of actions which are likely to require an EIS (section 617.4 of this Part), and those which will not require an EIS (section 617.5 of this Part).

APPENDIX B: MANUFACTURED CLASSROOM BUILDINGS

B001 GENERAL

a. Manufactured Classroom Buildings are often referred to as Modular, Relocatable, or Portable Classrooms. This section applies to new or used and purchased or leased buildings. A Manufactured Classroom Building cannot be legally occupied without a Certificate of Occupancy from Facilities Planning. Review the SED Instruction Guide For Public School Districts and BOCES Obtaining Building Permits for Capital Construction Projects for additional information on Manufactured Buildings.

b. All Manufactured Classroom Building installations or relocations require building permits prior to bidding, leasing or installation. Therefore, every installation or relocation must be submitted to Facilities Planning for review, the same as any other capital project. Purchased and leased manufactured buildings must be bid before they are installed or relocated.

c. Leasing of modular buildings is not eligible for building aid, purchase of modular buildings is eligible for building aid, and manufacturers will often buy back units. However, if you are planning to build permanent classroom space in the future this may affect that aid. You should consult with your SED project manager.

B002 CODE COMPLIANCE

a. All construction shall comply with the New York State Uniform Fire Prevention and Building Code, the Manual of Planning Standards and the Commissioner's Regulations. This applies to all disciplines; architectural, heating, ventilation, plumbing, electric, fire alarm detection/suppression, energy code, and accessibility requirements.

b. The State Building Code requires new manufactured buildings to have an Insignia of Approval issued by the Secretary of State that certifies that the structure or component is in compliance with the building code for the proposed use. The architect/engineer of record must provide a copy of the Insignia to Facilities Planning with the Certificate of Substantial Completion. This will be required prior to Facilities Planning issuing a certificate of occupancy (see the note below);

c. For buildings that are being relocated, Chapter 14 of the Existing Building Code of New York State, Relocated or Moved Buildings, applies. If the building will contain classrooms, Commissioner's Regulation 155.7 also applies.

B003 BUILDING DESIGN

a. Every new installation or relocation of a manufactured building will require the building to be accessible for the physically impaired. Previously approved manufactured buildings being relocated that are not accessible must be made 100% accessible. Accessibility includes parking, an exterior route to the building, entrance, all door clearances, door hardware, workstations, sinks, bubblers, toilets, and signage.

b. Manufactured buildings which are wood frame or Type 5 Construction and will be used for classrooms are required to have two exit doors from each classroom.

   i. The primary entrance door, exit stair, and/or ramp shall be covered with a canopy or may be enclosed.

   ii. As noted above, the secondary exit for classrooms in buildings with any wood construction must be a door and not a rescue window.

iii. The secondary exit is not required to be covered. However, if the secondary exit stair and/or ramp is not covered, it shall have a non-slip surface. If the secondary exit does not have a ramp it shall have a landing for an exterior area for assisted rescue.

c. Exterior stair risers shall be 6" maximum height, and treads and risers shall be solid.

d. 8-foot ceiling heights will be allowed in modular classrooms.

e. Modular classroom buildings are required to have foundations which resist the effects of frost and structured to resist lateral and overturning forces.

f. If the modular is heated with gas fired units, there must be the required fire resistance separation from the classroom space.

g. The ventilation equipment must be capable of supplying the minimum quantity of fresh air per person.

B004 SUBMISSION

a. Providing a submission to Facilities Planning for a manufactured classroom building is no different than any other project. An SED Code Compliance Checklist, Form FP-CCC (latest date), is required.

b. The site plans must show property lines, existing buildings, proper building distance separations, existing and new exterior stairs, ramps, sidewalks, underground and overhead utilities including electric, gas, sanitary, storm, and water lines.

c. The drawings and specifications must provide clear information for the structure including loads, foundation design, modular structure, and anchoring details. Drawings and specifications are required for mechanical, ventilation, electric, fire alarm detection/suppression, and plumbing systems. The drawings must also show plans and details for all construction built on site such as canopies, ramps, stairs, vestibules, and covered walkways.

d. If enclosed walkways are provided, the drawings shall show the proper fire wall or fire barrier, foundation, wall, and roof construction.

B005 PROJECT COMPLETION

a. Like all other construction projects, upon completion of construction or installation and prior to occupancy, the school district must submit a Certificate of Substantial Completion and a Fire Safety Report to Facilities Planning to obtain their Certificate of Occupancy.

b. The Insignia of Approval must be attached to the Certificate of Substantial Completion.

APPENDIX C: ATHLETIC FACILITIES AND SITE STRUCTURES

C001 GENERAL

a. Athletic Facilities pertain to buildings and structures placed on the school district's sites in support of athletic events. In addition to the playing surface or court, support facilities include Grandstands/Bleachers, Press Boxes, Concession Stands, Dugouts, and Toilet Facilities.

b. Athletic Competition and Sports Facility Design:

- For playing surfaces, dimensions and parameters comply with the New York State Public High School Athletic Association (NYSPHSAA) standards. NYSPHSAA is a member of the National Federation of State High School Associations (NFHS). With the exception of Health and Labor Department Code requirements that apply in only a few instances, neither the State Education Department nor the Code have any requirements for the competition rooms and fields. In the instance that the playing field is exterior, NYSED participates in the SEQRA process and provide comments regarding environmental impacts as necessary. NYSED does not review the adequacy of sports field design beyond code compliance. For interior spaces NYSED follows the Code requirements for fire ratings, exiting, etc.

- Typically, each school follows the requirements for rules set by NFHS. Many of their "rule books" have requirements for setting up playing fields, courts, etc. This includes football, basketball, volleyball, swimming, diving, baseball, soccer, field hockey, ice hockey, wrestling, lacrosse, and others. For example, when there is a health code that applies to the depth of a pool, this is a minimum standard. When the corresponding NFHS rules require the depth to be deeper, the pool must be deeper to comply with athletic competition requirements.

- The National Federation of High School Athletic Associations web address is *http://www.nfhs.org*.

C002 CODE COMPLIANCE

a. All construction is to be fully compliant with the New York State Uniform Fire Prevention and Building Code, the Manual of Planning Standards, and the Commissioner's Regulations. This applies to all disciplines; architectural, heating, ventilation, plumbing, electric, fire alarm detection/suppression, and energy code.

b. These facilities, like all other district facilities, may only be used if they have a current Certificate of Occupancy. The facility must be listed on the New York State Education Department Fire/Safety building inventory and pass annual Fire/Safety Inspections.

c. If your building is not listed on the Annual Fire Inspection biography, please submit the "Request for Approval of Use of a Facility Form" (Form FP-AU) to apply for Commissioner's approval of an existing building. The form can be found on our web site.

d. If the district is constructing a new building, follow our normal procedures by submitting a letter of intent so that NYSED may issue a project number. Approval is based on the New York State Uniform Fire Prevention and Building Code (Code) and NYSED requirements.

C003 GRANDSTANDS/BLEACHERS

a. The Occupancy Classification listed in the Uniform Fire Prevention and Building Code for Grandstands/Bleachers is A-5 (Assembly uses intended for participation in or viewing outdoor activities).

b. The primary exit stair to grade from the grandstand/bleacher platform shall be a non-slip surface (not wood).

c. New grandstands/bleachers, and replacement units that are substantially larger than the existing units, are required to have toilet facilities in compliance with the Plumbing Code of New York State.

C004 PRESS BOXES

a. General:

1. Public school districts often construct a Press Box to provide shelter and a vantage point for score keepers, videography, and broadcast equipment. These facilities, like all other district facilities, may only be used if they have a current Certificate of Occupancy. The facility must be listed on the New York State Education Department Fire/Safety building inventory and pass annual Fire/Safety Inspections.

b. Press Boxes are considered a B – Business occupancy. Buildings that also include other occupancies such as storage or concession stands, must comply with the Code and NYSED requirements for each occupancy.

c. The "Construction Classification" depends on what materials are used in the construction of the building. The materials and fire protection of building components, as well as the height and fire area of the building, are governed by the Code. In addition, Press Boxes must meet the following requirements:

1. Maximum occupancy signs shall be posted at occupied roof levels and inside the press box on the basis of 15 square feet per person. Code compliant egress is required from all occupied levels.

2. Buildings having two usable floor levels (i.e., two enclosed floors with no access to or use of the roof), or one enclosed floor and use of the roof level, must have a minimum Construction Type II-B, III-B or V-A, unless more restrictive type is required by code.

3. Guards per Code are required on three sides of all floor and roof openings, and at open sides of stairs. Handrails are required on both sides of stairs. Usable roof viewing or filming platforms must have compliant guardrails, with a toe board, on all four sides.

4. Hardware on exit doors shall allow instantaneous operation without a key or special knowledge. Dead bolts or padlock hasps are not allowed on any public school owned or occupied building or space.

5. Building systems, electrical, plumbing, heating and ventilation systems shall meet all applicable Code provisions. Conditioned buildings shall comply with the current Energy Code.

6. Accessibility by disabled persons is not required for Press Boxes with an aggregate area of 500 square feet or less. However, an outlet or wireless controls for operation of the scoreboard and public address systems is required at an accessible location.

7. Interior and exterior emergency lighting shall be provided in accordance with the Code.

C005 CONCESSION STANDS

a. General:

1. Many School Districts have concession stands at their sporting fields to accommodate spectators. The concession stands are often constructed and operated by booster clubs. Regardless of who constructs or operates the concession stand, the District is the owner, and is responsible and liable for the building.

2. Districts should be very careful about Booster Club constructed concession stands. If the building is constructed by volunteer labor, the District needs to be aware that they could be liable for any injuries during construction. The District must have drawings stamped by a NYS licensed professional that have been approved by SED, and the NYS licensed design professional must inspect the construction. If the district expends any funds for the concession stand, they must get voter approval.

b. Concession Stands are considered an M – Mercantile occupancy. Provided plans must be sure to indicating code compliant distance separation to other structures, fire rated separation to adjacent spaces, fire alarm systems, emergency lighting, and full accessibility.

c. One exit is allowed if the maximum travel distance is 25 feet or less. Concession stands cannot be placed under grandstands/bleachers unless there is a 1-hour fire separation from the grandstands/bleachers. Concession stands must also comply with Department of Health regulations for cleanable surfaces, three bowl sinks, etc.

d. The Fire Code of NY requires a Type I exhaust hood be installed in accordance with the Mechanical Code of NY at all commercial cooking appliances and domestic appliances used for commercial purposes that produce grease vapors. There are two exceptions to this rule. First the countertop plug in appliances are not regulated by the Code and therefore the hood requirement would not apply. Second, the Mechanical Code Commentary states that the code official should consider the frequency of use of the appliances in making the determination of the need for a Type I hood. The commentary cites VFW and similar halls as an example. NYSED believes that very few, if any school district concession stands would rise to the level of requiring a Type I Hood. NYSED will review projects with this in mind and question the expected frequency of use of large extensive concession stands. Note that proper fire extinguishers are required and if there is a vegetable oil fryer, a Class K extinguisher is required.

e. Hardware on exit doors shall be at least classroom function. Dead bolts or padlock hasps are not allowed on any public school owned or occupied building or space.

C006 TOILET FACILITIES

a. General:

1. Many School Districts have toilet facilities at their sporting fields to accommodate spectators. Toilet Facilities are considered a U occupancy. Provided plans must be sure to indicating code compliant distance separation to other structures, fire rated separation to adjacent spaces, fire alarm systems, emergency lighting, and full accessibility.

2. Hardware on exit doors shall be at least classroom function. Dead bolts or padlock hasps are not allowed on any public school owned or occupied building or space.

C007 DUGOUTS

a. A building permit is required for dugouts if they include storage space or other enclosed areas. Each dugout requires its own permit. For dugouts not exceeding 200 Square feet a full building permit submission will not be required. It will only be necessary to follow the procedure which applies when using Form FP-AU Request for Approval of Use of a Facility.

b. Dugouts without storage space or other enclosed areas shall be fully described and shown on submission drawings for the project in which they are included.

c. All dugouts must be fully accessible and shall include a wheelchair space, turn around area, and accessible openings. An accessible route must be provided to the dugout.

d. Free egress from all dugouts shall always be provided. Hardware on doors and latching devices on gates shall allow instantaneous operation without the use of a key or special knowledge. Padlocks and similar locking devices are not permitted.

C008 PERMANENT & TEMPORARY GREENHOUSES

a. A Permanent Greenhouse shall be submitted to NYSED for a building permit as a new building. A permanent greenhouse structure is regulated by the Building Code of New York State and the SED Manual of Planning Standards and must comply fully with their requirements. As a reminder, Code compliance for the following greenhouses related items must be confirmed:

1. Fire propagation performance criteria of the structure's materials
2. Ventilation of heating units
3. Exiting and door hardware
4. Accessibility

b. A Temporary Greenhouse is defined in the NYS Uniform Fire Prevention and Building Code Act. The definition is given in a Department of State, Division of Building Standards and Codes (DOS) Technical Bulletin, October 31, 2017, Topic: Temporary Greenhouse, as follows: *specialized agricultural equipment having a framework covered with demountable polyurethane materials or materials of polyurethane nature and lacking a permanent and continuous foundation, which is specifically designed, constructed and used for the culture and propagation of horticultural commodities. A 'temporary greenhouse' may include supporting poles embedded in non-continuous concrete. In no instance will a temporary greenhouse be used for the retail sale of any farm or nonfarm products.* The Bulletin states The Building Code Act provides for the definition of a building and that it shall not include "temporary greenhouse". Therefore, as temporary greenhouse does not meet the

definition of a building, the Uniform Code does not regulate the construction of structures that meet the definition of a temporary greenhouse. The definition, nor anything else in the law, requires the temporary greenhouse to be dismantled periodically.

In light of the above determination by the DOS: the construction of a "temporary greenhouse" that meets the construction requirements described above shall be approved without a building permit when the following additional requirements are met:

1. Area less than 250 SF;

2. No electric or gas shall be provided to the structure;

3. It shall have at least one door with appropriate exiting hardware which permits instantaneous operation without the use of a key or special knowledge and;

4. It shall be located not closer than 20 feet from any other building or structure;

These structures are to be used for agricultural purposes only, not for storage. It is imperative that the districts ensure that the temporary greenhouses are constructed and operated safely.

C009 PLAYGROUNDS

b. The State Education Department does not have specific regulations regarding playgrounds. Compliance with the Handbook for Public Playground Safety by the US Consumer Product Safety Commission (CPSC) is required. The Handbook is available at *www.cpsc.gov/s3fs-public/325.pdf*.

c. All playgrounds are required to be accessible to persons with disabilities, including the access walkway to the playground.

d. Existing playgrounds fall under the ADA's requirement that all programs and services provided by a school district be accessible. While the NYSED Office of Facilities Planning does not enforce the ADA, the school district is still required to comply with the ADA.

e. New and renovated or relocated playgrounds must comply with the Architectural and Transportation Barriers Compliance Board's Play Area Access Guidelines. The Guidelines are available at *www.access-board.gov/play/guide/guide.pdf*.

f. The use of Chromated Copper Arsenate (CCA) lumber:
- New playground equipment is prohibited to be CCA lumber per New York State law.
- Existing CCA playground equipment or adjacent materials are not required to be removed, but they must be encapsulated. If the district chooses to maintain or remove the CCA products, the Federal Environmental Protection Agency has guidelines to follow. The guidelines may be found at *www.epa.gov*.

C010 SUBMISSION

a. Provide plans as applicable with toilet rooms, foundation, structural section, anchoring details, mechanical, ventilation, electric, fire alarm detection/suppression, plumbing, and structural loading.

b. Provide Site plans (including proper distance separations, exits, stairs, ramps, sidewalks, electric, waste disposal and plumbing).

C011 PROJECT COMPLETION

a. Like all other construction projects, upon completion of construction or installation, and prior to occupancy, the School District must submit a Certificate of Substantial Completion and a Fire Safety Report to Facilities Planning to obtain a Certificate of Occupancy.

APPENDIX D: DISCOVERED BUILDINGS

D001 GENERAL

a. A "discovered building" is any building constructed or placed on school district property without first obtaining approval from the Commissioner of Education and a Building Permit from the Office of Facilities Planning. Most "discovered buildings" are identified by a fire inspector hired by the district to conduct the required annual building and fire safety inspections of every building owned or used by the district.

b. To effectively safeguard the occupants of manufactured classroom buildings (i.e. modulars, relocatables, portables, etc.), there are additional submission requirements for instructional space. Refer to Appendix B.

c. Occupying or using any building without a Certificate of Occupancy (C.O.) is illegal and potentially dangerous. It also places substantial liability on the district, the Superintendent and the Board of Education. NYSED realizes districts face significant time and financial constraints. However, districts must comply with legal requirements regarding all capital construction. Also refer to Exist Building Code sections 105.2.4 & 105.5. It is incumbent upon the district to send us an LOI form as soon as possible when there is a facility on their property, possibly being used, that does not have a C.O.

D002 CODE COMPLIANCE

a. All construction is to be fully compliant with the New York State Uniform Fire Prevention and Building Code, the Manual of Planning Standards, and the Commissioner's Regulations. This applies to all disciplines; architectural, heating, ventilation, plumbing, electric, fire alarm detection/suppression, and energy code.

D003 SUBMISSION

a. The following are to be provided:

1. REQUEST FOR APPROVAL OF USE OF A FACILITY (Form FP-AU) with authorizing signatures and page 2, outline specifications.

2. FIRE SAFETY REPORT. Completion of all items on the cover and Part I, General Information; Part III, Certifications; and the Public Fire Safety Nonconformance Report Form.

3. Certification by an Architect or Engineer – The district must have an Architect or Engineer who is licensed by the State of New York certify in writing (usually by letter) that the building complies with applicable provisions of the New York State Uniform Fire Prevention and Building Code. If the building is heated or air-conditioned, conformance with the Energy Conservation Construction Code of New York State must also be certified.
   - Exception: Shipping containers and manufactured sheds of maximum 150 square foot size will not require certification by an Architect or Engineer.

4. Proof of the existence of an Asbestos Management Plan or certification that no asbestos was used in construction.

b. To ascertain code compliance, drawings shall be submitted showing all floor levels of the building use and square feet. The following drawings are required:

    1. Architectural quality floor plans which show doors/door swings, windows, stairs, ramps, room names, dimensions, and fire extinguishers.

    2. Exterior photographs of the building which show major materials, doors, roof, and grade.

    3. Site Plan which shows walks, parking, drives, and buildings on the same lot as well as the same street or road.

    4. Accessibility in accordance with the NYS Uniform Fire Prevention and Building Code, Americans with Disabilities Act (ADA), and Section 504 of the Rehabilitation Act of 1973.

c. Submit SHPO Determination Letter with NYSED Project Number.

d. Submit Applicable SEQRA Resolution Form.

APPENDIX E: TEMPORARY QUARTERS

E001 GENERAL

a. Temporary quarters take many forms. For the purposes of NYSED, two categories apply:
   - Leased space for educational use, acquired pursuant to Education Law, Section 1709.7 (Church rooms, grange halls, store fronts etc.)
   - Leased space for other than educational use, acquired pursuant to Education Law, Section 1709.7 (Administration, office, storage, etc.)

b. Temporary quarters shall be approved by the Commissioner pursuant to Section 155.4 of the Regulations of the Commissioner of Education and by the local authority having jurisdiction (AHJ) pursuant to 19 NYCRR Part 1203. Such facilities must meet specific requirements of educational adequacy and of health and safety prior to approval and occupancy.

E002 CODE COMPLIANCE

a. All construction is to be fully compliant with the New York State Uniform Fire Prevention and Building Code, the Manual of Planning Standards, and the Commissioner's Regulations. This applies to all disciplines; architectural, heating, ventilation, plumbing, electric, fire alarm detection/suppression, and Energy Code.

E003 SUBMISSION

a. To ascertain compliance, drawings shall be submitted showing all floor levels of the building and the areas to be leased. The overall building area and leased area (in square feet) are to be indicated. The following drawings are required:

   1. Architectural quality floor plans which show doors/door swings, windows, stairs, ramps, room names, and dimensions.

   2. Exterior photographs of the building which show major materials, windows, doors, roof, and grade.

   3. Site Plan which shows walks, parking, drives, and buildings on the same lot as well as the street or road.

b. Compliance with Commissioner's Regulation 155.7 is required, and the following requirements verified and indicated on the drawings:

   1. Egress into two separate smoke zones from pupil occupied spaces over 500 square feet in size.

   2. Dead end corridor pockets limited to a maximum of 1-1/2 times the width of the corridor.

   3. Two-hour fire-rated enclosures at boiler/furnace rooms, electrical equipment rooms, incinerator rooms, rooms for storage of flammable liquids and gas-powered equipment, and transformer vaults.

   4. Exit lights, emergency lighting, and fire alarm system requirements in accordance with 155.7(g) (detectors, audio/visual devices, manual stations, fire alarm control panel, etc.).

5. Heating, ventilating, and air-conditioning system which operate according to the Code requirements in effect at the time they were installed.

6. Fire extinguishers.

7. Accessible in accordance with the New York State Uniform Fire Prevention and Building Code and the Americans with Disabilities Act.

c. Alterations:

1. If alterations to the building are required to achieve code compliance or meet NYSED requirements, then fully prepared construction documents shall be submitted for review and approval. The documents shall include all elements of the construction, including site work if necessary and be certified by a New York State design professional.

2. Drawings and specification which fully describe the work shall be included.

3. Building permit(s) from the local code authority having jurisdiction shall be submitted.

4. SHPO Determination Letter is required for building older than 50 years.

5. SEQRA shall be addressed by the landlord or the district.

6. A Certificate of Substantial Completion shall be submitted upon completion of construction.

7. At completion of construction a fire safety inspection shall be performed, and a hard copy of the Public-School Fire Safety Report submitted.

d. Forms and Documents:

1. REQUEST FOR APPROVAL OF USE OF A FACILITY (form FP-AU) with authorizing signatures and page 2, outlining specifications.

2. FIRE SAFETY REPORT. Completion of all items on the cover and Part I, General Information; Part III, Certifications; and the Public Fire Safety Nonconformance Report Form.

3. A copy of the current Certificate of Occupancy or Certificate of Use, issued by the local code enforcement agency, showing approval for proposed use. If owned by a public-school district, certification by a licensed architect or engineer that the whole building, as well as the space being used, complies with applicable provisions of the New York State Uniform Fire Prevention and Building Code.

4. A copy of the Asbestos Management Plan.

E004 TEMPORARY TENTS

a. Criteria for submission: Tents greater than 400 SF must be submitted for a permit and comply with Fire Code Chapter 31 (see exceptions)
b. The following documents are required:

1. Letter of Intent (LOI) for a temporary quarters (TQ)

2. Facilities Planning Form FP-AU
3. Site and Floor plans drawn to scale, dimensioned and signed & sealed by an architect or engineer.
4. Means of egress indicated - see FC Table 3103.12.2
5. Seating plan, Fire extinguisher locations
6. Exit signs
7. Tent canopy, in accordance with FC 3104: fabric tested to NFPA 701..
8. Compliance of flame propagation performance. FC 3104.4
9. Outdoor Assembly Event - comply with FC 3106.
10. Fire Safety Inspection Report submitted to SED prior to occupancy.

E005 PROJECT COMPLETION

a. Once approved, a NYSED Annual Certificate of Occupancy for the building or space will be issued.

APPENDIX F: SHIPPING CONTAINERS

F001 GENERAL

a. Metal shipping containers may be used as an alternative to storage sheds and will require review and approval as a building project or a discovered building.

F002 SUBMISSION

a. Provide the following documents for review:
- Letter of Intent, Form FP-AU
- Site Plan indicating location and distance separation requirements (20’ minimum separation).
- Door hardware: one of the doors must always be easily operable from the inside. A description of the hardware or photograph will be acceptable.
- The unit must have a louver to allow ventilation of the space.
- Asbestos Management Plan or certification by a NYS design professional that the structure does not contain asbestos.

b. The unit will not require a foundation or tie-downs.

c. We will not require certification by an Architect or Engineer that the unit complies with the Code.

APPENDIX G: PRE-K and DAY CARE

G001 GENERAL

a. Many Pre-kindergarten (Pre-K) programs fit the requirement for Child Day Care Centers, especially those located in leased spaces or operated by a BOCES.

b. Any program designated Pre-K operated in a leased space or meeting the definition of Child Day Care Centers in any other fashion must be licensed by the New York State Office of Children and Family Service (OCFS) as a Child Day Care Center. The link to the Office of Children and Family Services (OCFS) Regulations is: *https://ocfs.ny.gov/main/documents/defaultkeyword1.asp*

c. Further, the program must be operated by a school district on the campus where the elementary and/or the secondary programs are conducted. A Pre-K program cannot be off-campus or in a rented temporary space.

G002 CODE COMPLIANCE

a. All construction is to be fully compliant with the New York State Uniform Fire Prevention and Building Code, the Manual of Planning Standards and the Commissioner's Regulations. This applies to all disciplines: architectural, heating, ventilation, plumbing, electric, fire alarm detection/suppression, and energy code.

b. In addition, if it is in a leased space it must have a Certificate of Occupancy as a Day Care Center from the local municipal code enforcement official.

c. The facility must also comply with the Commissioner of Education's Part 151-1.7 Facilities Requirements for the universal pre-kindergarten program. The link for Part 151-1.7 Facilities Requirements for the universal pre-kindergarten program is found on Westlaw site for New York Codes, Rules, and Regulations, 8 CRR-NY151-1.7. This regulation requires the Pre-K program meet the Office of Children and Family Services (OCFS) Regulations for Child Day Care Centers, Part 418.

G003 BUILDING DESIGN

a. Every building is to be 100% accessible for the physically impaired. Accessibility includes parking, an exterior route to the building, entrance, interior routes, all door clearances, door hardware, workstations, sinks, bubblers, toilets, and signage

b. If is important for the designer to review the OFCS Regulations, in particular Part 413, Definitions, and Part 418, Child Day Care Centers.

c. The keys to Pre-Ks being exempt from being licensed as a day care center are:
- To meet the definition for daycare it must have more than 6 children and operate for more than 3 hours per day,
- No carryover of children in the under 3-hour program, i.e., children in a morning program cannot attend an afternoon program in the same facility.

G004 SUBMISSION

a. Follow the guidance provided for Temporary Quarters or Discovered Building.

APPENDIX H: ASBESTOS, LEAD, PCBs & MOLD

H001 ASBESTOS

a. Asbestos Designer

1. Asbestos designers must have a current New York State Department of Labor Certificate.

2. Asbestos designers must be a Registered Architect or Professional Engineer (R.A or P.E.) licensed in New York State.

3. The completed documents shall have the seal of the R.A or P.E. asbestos designer on the drawings and within the specifications either on the specification cover with the other professional seals or on the fist page of the asbestos specification.

b. Asbestos Reports (Reference State of New York Department of Labor, (DOL) Industrial Code Rule 56, 12 NYCRR, SUBPART 56-5, 56-5.1, PHASE IA: ASBESTOS SURVEY PLANNING AND DESIGN)

1. One (1) copy of the completed asbestos survey shall be sent to the local government entity charged with issuing a permit for such demolition, renovation, remodeling or repair work under applicable State or local laws. For Public Schools, that's Facilities Planning. Please provide the completed asbestos survey with your Asbestos Designer's DOL Certificate.

2. Exemptions that pertain to schools where reports are not necessary:

- Buildings or structures for which original construction commenced on or after January 1, 1974;

- Buildings being entirely demolished that are being treated as containing asbestos.

c. Asbestos Final Air Clearance Requirements:

Asbestos Abatement Project Clearance Air Samples				
Project Size	**AHERA**	**NYSED**	**NYS DOL**	**Notes**
NYSDOL—Large (≥260 ft. or ≥160 ft²)	5 inside + 5 outside + 3 blanks (TEM)	5 inside + 5 outside + 3 blanks (TEM)	≥ 5 inside* + 5 outside** + 2/3 blanks (PCM/TEM)	* Inside will increase if work area >25,000 sq. ft. ** Outside samples will vary with methodology. For PCM and TEM (NIOSH 7402) in non- school buildings only 1 outside sample is required when the entire building/structure is the regulated abatement work area.
NYSDOL—Small (>25 - <260 ft or >10 - <160 ft²)	5 inside + 2 blanks (PCM)	5 inside + 2 blanks (PCM)	3 inside + 3 outside** + 2 blanks (PCM)	** Outside samples will vary with methodology. For PCM and TEM (NIOSH 7402) in non- school buildings only 1 outside sample is required when the entire building/structure is the regulated abatement work area.
NYSDOL—Minor (≤25 ft or ≤10 ft²)	5 inside + 2 blanks (PCM)	5 inside + 2 blanks (PCM)	None if planned minor size asbestos project only *** 1 inside + 1 outside + 2 blanks (PCM)	*** Only for incidental disturbance, glove bag/tent failure or if minor size asbestos project work area is part of a small or large asbestos project
AHERA—SSSD or Minor Fiber Release (≤3 ft or ≤3 ft²)	None	None if planned minor size asbestos project only *** 1 inside + 1 outside + 2 blanks (PCM)		

The containment barriers used to isolate the functional space must not be artificially created to limit the quantity of asbestos containing materials to be abated. Contiguous portions of material to be abated at approximately the same time must not be separated to qualify as a smaller sized project.

d. AHERA Air Sampling Requirements in Dirt Crawlspaces:

1. Many school districts are involved in projects which will require asbestos abatement in dirt-floored crawlspaces. Aggressive sampling as per the code rule presents a problem in these situations. The dirt floor creates airborne dust which can over-load sample cassettes and thus render them un-readable and unacceptable under Industrial Code Rule 56 and AHERA requirements. This results in re-cleaning and re-sampling of the area, and in some cases may result in multiple failures/re-cleanings/re-samplings, each adding time and cost to the process of clearing a regulated work area.

2. Unfortunately, AHERA does not provide flexible language concerning this issue. The EPA's Office of Pollution Prevention and Toxins (OPPT) recognized this problem many years ago and, in 1994, had attempted to propose new language amending AHERA that would have addressed this area of concern. However, the amendments were never pushed forward.

3. The NYS Department of Labor has been in discussions with the EPA and they have acknowledged that the current regulatory language is inadequate in some cases. The EPA's OPPT suggests that common sense be used in such situations and if it is necessary to provide guidance to address those deviant scenarios, one should refer to the language used to address alternative approaches as presented in the drafted 1994 AHERA amendments. Although they are not legally binding, are not captured in their regulations, and are not enforceable, the discussions presented provide a reasonable approach for dealing with these situations.

4. NYS DOL has accepted, by variance, a clearance air sampling strategy that does not involve the use of "normal", aggressive air sampling techniques. Clearance air samples are collected during final cleaning activities. This method appears acceptable to both NYS DOL and EPA.

5. The accredited project designer shall develop and include in the project design the modification to be followed, including the particular element to be modified, and a justification for deviating from the aggressive air monitoring method, addressing the elements of subparagraphs § 763.90(i)(6)(ii)(A) and (B) and submit the request for a variance to the NYS DOL.

H002 LEAD

a. The EPA established the Lead; Renovation, Repair and Paint Program Rule which became effective April 2010. The Rule requires contractors that are hired to perform renovation, repair and painting projects in homes, childcare facilities and schools (containing preschool and kindergarten classrooms) built before 1978 that disturb lead-based paint to be certified and trained to follow specific work practices to prevent lead contamination.

b. Because the EPA did not have any regulations for construction or renovation activities which effect surfaces containing lead based paints, the Office of Facilities Planning wrote into the 1998 RESCUE regulations for schools a provision that required *all public schools, regardless of grade level*, to test for the presence of lead in any areas that were scheduled to be disturbed by construction or renovation activities. If lead was discovered, it required that districts follow the HUD standard entitled "Guidelines for the evaluation and control of lead-based paint hazards in Housing." The Commissioner's Regulations Part 155, Section 155.5(l) states that "all areas scheduled for construction as well as areas of flaking or peeling paint shall be tested for the presence of lead and abated or encapsulated in accordance with the above noted guidelines". Since the RESCUE regulations cover district obligations under construction and maintenance activities, all work at districts had been subject to these requirements.

c. In that the EPA has finally established regulations for renovation work effecting lead-based paint, SED will require the EPA Lead; Renovation, Repair and Paint Program Rule be followed for all public-school construction and maintenance operations.

d. The Rule requires the renovation company to be certified and the work must be supervised by an EPA certified contractor. Workers must receive on-the-job training in lead safe practices. The Rule also requires pre-renovation education, posting of warning signs, containment of the work area, waste management, cleaning and post-renovation cleaning verification.

e. Minor repair and maintenance that will disturb less than 6 sq. ft per room interior or 20 sq. ft exterior, excluding window replacement are exempt from this Rule.

f. Not more than 60 days prior to the renovation, the contractor must provide the owner of the building with the EPA pamphlet "Renovating Right". SED Commissioners Regulations Part 155.5(d) requires the school

district to notify parents, staff and the community of construction projects. That notification will now have to be modified to include the availability of the EPA pamphlet. During the renovation the contractor must post informational signs describing the general nature and locations of the renovation and the anticipated completion date.

g. For school district maintenance projects performed by district personnel, there must be an EPA certified person that will supervise the work and train the workers in lead safe practices and the school district will have to register with the EPA as a contractor. Additional information on this EPA rule can be found at *www.epa.gov/lead*.

H003 PCBs IN CAULK AND LIGHTING BALLASTS

a. Polychlorinated biphenyls, PCBs, are persistent manmade chemicals that were widely used in caulking and electrical fixtures before 1978. In 1976, Congress banned the manufacture and use of PCBs because of concern about their health and environmental effects. Because the Federal manufacturing ban did not require removal of existing PCB containing products, they remain present today in the caulking and electrical fixtures of some New York State schools. The following is a protocol for addressing PCBs in caulking materials in schools, which was developed in consultation with the New York State Health Department. Leaking PCB containing lighting ballasts shall be removed immediately and non-leaking PCB containing ballasts should be removed as soon as possible. Removal of PCB containing ballasts shall be performed by workers with special training in hazardous waste handling.

b. Protocol for Addressing Polychlorinated Biphenyls (PCBs) in Caulking Materials in School Buildings:

1. Background:

- Recently, several school districts have discovered that PCBs are present in building caulk installed on their facilities and sometimes in the soil near caulked structures. Typical locations include windows and expansion joints. PCBs are regulated by the U.S. Environmental Protection Agency (U.S. EPA) and the State of New York**,** and caulk containing PCBs should be properly managed when disturbed through building renovations.

- PCBs are currently prohibited from being used in caulk and other commodities (U.S. EPA, 40 CFR 761). However, prior to 1977, PCBs were present in some caulking materials used in the construction of schools and other buildings. Studies have shown that concentrations of PCB can exceed 1% (10,000 ppm) by weight in some caulk materials. An investigation of 24 buildings in the Greater Boston Area revealed that one-third of the buildings tested (8 of 24) contained caulking materials with polychlorinated biphenyl (PCB) content exceeding 50 ppm by weight with an average concentration of 15,600 ppm or 1.5% (Herrick *et al.*, 2004). These buildings included schools and other public buildings.

- The U.S. EPA regulates the disposal of caulk, as well as soil and other materials contaminated with PCBs from caulk, if the concentration of PCBs exceeds 50 ppm. Such materials must be disposed at an appropriate approved or permitted facility.

- U.S. EPA regulation 40 CFR 761 defines "PCB remediation waste" to include contaminated soil and specifies a clean-up level of $\leq$1ppm without further conditions for unrestricted use in "high occupancy areas" (i.e., areas where individuals may be present for 335 hours or more per year). PCB caulk is defined as a PCB bulk product waste, and its disposal is subject to U.S.

EPA regulations under the Toxic Substances Control Act (40 CFR761.62).

- This protocol has been developed in consultation with the New York State Department of Health, Division of Environmental Health Assessment, Bureau of Toxic Substance Assessment to address concerns about properly managing caulk containing PCBs that will be disturbed during building renovation and maintenance.

2. Objective:

- For any school buildings constructed or renovated between 1950 and 1977 and undergoing current renovation or demolition, NYSED and NYSDOH recommend that the building(s) be evaluated prior to the renovation work to determine whether they contain caulk that is contaminated with PCBs. If so, a plan should be developed to address potential environmental and public health concerns about potential PCB exposure.

3. Investigation and Testing:

- To adequately characterize PCB contamination, a professional environmental consultant with appropriate experience in environmental investigation and testing should prepare a detailed work plan to guide this work.

- Caulk Sample Collection:

  - Buildings constructed or renovated between 1950 and 1977 have a potential to contain PCBs in existing caulk. Representative samples of caulking materials from these buildings prior to renovation or demolition work should be tested to determine whether the caulk is contaminated with PCBs. Professional judgment should be used to design the sampling plan for characterizing caulk throughout the building. The consultant should pay particular attention to construction and maintenance records and to the appearance of caulking materials (likenesses and differences). Samples should be taken from window frames or expansion joints that have not been repaired or replaced since 1977. Depending on specific information provided in the work plan developed by the project manager, such as window placement, compositing of some caulk samples might be appropriate. Caulk from different time periods or that have a different appearance should not be composited together.

  - It is important to note that caulk used during the time period of interest may also contain asbestos or lead. Therefore, the work plan should include testing, handling and disposal requirements appropriate for such regulated materials.

- Soil Sample Collection:

  - Buildings constructed or renovated between 1950 and 1977, which have undergone further renovation after 1977, may have residual PCB contamination in adjacent soils. An adequate representation of surface soils should be tested to assess the potential for residual PCB contamination.

  - When designing a representative soil sampling plan, the likelihood of soil contamination from deteriorated or deteriorating caulk should be considered. Caulk that has in the past dried out and fallen to the ground is the most important source of soil contamination. Thus, sampling should include soil beneath windows where caulk has

obviously deteriorated or been replaced because of previous deterioration. Areas subject to the stress of sun and prevailing weather (typically the southern and western side of each structure) should be included for sampling. These samples would provide a conservative evaluation of soil conditions due to an increased potential for material failure, possibly resulting in contamination of soil. Also, if earlier renovation or demolition work may have stockpiled potentially contaminated caulk in other school areas, the school should consider having soils in those areas tested as well.

- Soil sampling should focus on areas of the building where "banks" or "gangs" of windows exist/were replaced and areas of the structure where large expansion joints are located. This would provide a conservative evaluation of potential soil contamination and permit efficient sampling.

- Samples should be collected in a manner that prevents cross-contamination. Augers or driven core samplers should be avoided, as any caulk caught on the edge of this type of tool could be driven to lower intervals. Using a designated trowel for each sample location and each interval of depth is encouraged. If the sampling tool is field cleaned between samples, do so in a manner that does not add solvent contamination to the environment.

- Laboratory Analyses of Soil and Caulk Samples

  - Specific information concerning laboratory procedures and protocols must be detailed in the work plan.

  - Duplicate analysis should be performed on 10% of samples received by the laboratory.

  - The soil sample or extract of the soil sample collected at a depth of 6-12 inches may be archived until the sample results for 2-6 inches are available, provided that the appropriate sample holding times are not exceeded.

  - All caulk and soil samples must be analyzed for PCBs by a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory. ELAP certified labs can be found at the following link: *www.wadsworth.org/labcert/elap/elap.html*. Results provided should be for total PCBs.

4. Abatement:

   - If it is determined that caulk materials contain PCBs, a site-specific abatement plan should be developed to address potential environmental and public health concerns. The **HUD Technical Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing** available at *www.hud.gov/offices/lead/guidelines/hudguidelines/* can be used as a basis for developing the steps for abating the contamination and preventing contamination of nearby areas. This is the same guideline required by NYSED to manage lead contaminated materials in schools under the RESCUE regulations. Caulking materials that contain either lead, PCBs, or both can therefore be managed under the same guidance. Caulking materials that contain asbestos in addition to either lead or PCBs or samples that contain only asbestos will be managed in accordance with requirements of the NYS Department of Labor Code Rule 56.

   - As stated in Section I, cleanup and disposal of PCB remediation and bulk product waste is subject to U.S. EPA regulations under the Toxic Substances Control Act (40 CFR 761) (see

http://www.epa.gov/pcb/pubs/200540cfr761.pdf). For information or assistance pertaining to the federal PCB regulations, please contact either Daniel Kraft or James Haklar, at the Pesticides and Toxic Substances Branch of U.S. EPA Region 2. Daniel Kraft can be contacted at kraft.daniel@epa.gov or (732) 321-6669, and James Haklar can be reached at haklar.james@epa.gov or (732) 906-6817.

- Disposal of contaminated materials from abatement activities (soil or caulk) is regulated by the NYSDEC solid waste regulations (6NYCRRPart 360) if concentrations are <50 ppm and by the hazardous waste regulations (6NYCRR370-373) if PCB concentrations are 50 ppm or greater. Contact the NYSDEC Regional Office for additional guidance.

5. References:

- Herrick RF, McClean MD, Meeker JD, Baxter LK, Weymouth GA. 2004. An Unrecognized Source of PCB Contamination in Schools and Other Buildings. Environmental Health Perspectives. 112:1051-1053.

- USEPA. 40 CFR 761. Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions. (http://www.epa.gov/pcb/pubs/200540cfr761.pdf)

- 6 NYCRR Part 375. Environmental Remedial Programs. Subpart 375-6: Remedial Program Soil Cleanup Objectives. §375-6.8 Soil Cleanup Objective Tables. Table 375-6.8(b): Restricted Use Soil Cleanup Objectives. (*http://www.dec.ny.gov/regs/15507.html*)

H004 MOLD

a. Exposure to mold can cause a variety of health effects and symptoms, including allergic reactions. Molds can be found almost anywhere; they can grow on virtually any organic substance, as long as moisture and oxygen are present. There are molds that can grow on wood, paper, carpet, foods, and insulation. When excessive moisture accumulates in buildings or on building materials, mold growth will often occur, particularly if the moisture problem remains undiscovered or unaddressed.

b. Mold requires water to grow, it is important to prevent moisture problems in buildings. Moisture problems can have many causes, including uncontrolled humidity; roof leaks; landscaping or gutters that direct water into or under the building; and unvented combustion appliances. Delayed maintenance or insufficient maintenance are frequently associated with moisture mold remediation in schools and large buildings.

c. The Environmental Protection Agency provides a useful reference document about mold remediation in schools and commercial buildings at the following web address: http:/www.epa.gov/mold/mold_remediation.html#intro. Additional information on mold can be found at the NYS Dept of Health and the U.S Center for Disease Control and Prevention web sites.

APPENDIX I: DEMAND CONTROL VENTILATION

I001 GENERAL

a. Demand Control Ventilation (DCV) is required for some ventilation systems in accordance with Code.

b. Where demand control ventilation is not required by Code, it may be permitted.

c. Where not required by Code, use of demand control ventilation (through use of carbon dioxide (CO_2) sensors) is not recommended for instructional spaces.

b. Design of DCV requires a whole building approach.

c. Different types of DCV.

1. Occupancy through use of sensor.

   i. On/Off similar to lighting occupancy sensor.

   ii. Variable flow rate of outside air based upon occupant load (i.e. CO_2 sensor).

2. Occupancy scheduled through building control system.

I002 WHERE PERMITTED

a. DCV is required by the "Energy Conservation Construction Code of New York State" for certain systems that comply with the ventilation requirements of the "Mechanical Code of New York State".

b. Where not required by Code, use of demand control ventilation (through use of CO_2 sensors) is not recommended for instructional spaces.

   1. It has been demonstrated that ventilation air (outside air) provided to classrooms has a beneficial impact on, indoor air quality, occupant health, and student achievement.

   2. DCV through the use of CO_2 sensors results in a time lag between the time the occupants enter the space and the time the appropriate amount of outside air for the occupant load is brought into the space. Thus, the use of CO_2 sensors almost always results in indoor air quality that is poorer than that provided using the minimum required by the Mechanical Code.

c. If a school district wishes to employ demand control ventilation (DCV), it will be permitted; where strict compliance with the "Code" and the requirements of this Appendix are complied.

d. DCV may not be used in such spaces where the source of contaminants is primarily not occupant related. Such spaces include, but are not limited to locker rooms, gang toilet rooms, and storage or science prep rooms containing chemicals.

e. DCV is not recommended for areas where odors are likely to be strong or where fumes or dust are common. (Spaces such as science rooms, art rooms, home and careers, and technology.) Local exhaust systems serving such spaces must be tied into ventilation systems to ensure sufficient makeup air is provided for the exhaust.

I003 MINIMUM REQUIREMENTS FOR DEMAND CONTROL VENTILATION

a. All air handling equipment must be set up and capable of handling the volumetric flow rate of outside air at design day conditions for the maximum occupant load of the space(s) to receive DCV. Volumetric flow rate shall be determined using the Mechanical Code.

b. Building pressures shall be maintained neutral or slightly positive during all occupied times.

1. All building pressurization requirements of the Indoor Air Quality section of Part III Environment shall be provided.

c. Air Flow Stations.

1. An air flow station should be provided in the outdoor air flow and in the relief air flow.

d. Radon testing during the first heating season, after installation, is required in areas to receive DCV after installation. Exception: Areas of the State where the long-term living area estimate for homes above 4 pCi/L is less than 2 percent. To determine if the school is in a radon-prone area, check the New York State Department of Health Radon Level Maps and Statistics (*http://www.health.state.ny.us/environmental/radiological/radon/maps_statistics.htm*) to get specific information about the town in which the school is located. Testing results to be provided to NYS Department of Health and School District's Health and Safety Committee.

1. Other potential indoor air contaminants: DCV may not be appropriate for buildings with existing, potential, air, contaminant sources. School District must evaluate other potential indoor air contaminants that may be present in their buildings.

e. Carbon monoxide detector(s) and alarm system are required in at least one of the occupied spaces served by each indirect fuel fired heating unit to be controlled by DCV.

f. Direct digital controls are required for all control devices serving the air handling systems to be controlled by variable volumetric flow rates of outside air.

g. Air handling units (AHU's), serving multiple spaces must have sensors provided in each occupiable space served by the AHU. AHU's must be controlled in such a manner that occupancy of any space will result in the proper amount of ventilation air (outside air) supplied to that space.

I004 REQUIREMENTS FOR DEMAND CONTROL VENTILATION ON EXISTING EQUIPMENT

a. DCV may only be installed on existing equipment where the existing systems fully comply with the requirements of a new installation.

1. If the existing ventilation rate for a space, based upon the maximum occupant load, as determined by the "Mechanical Code", is less than that required for new construction, adding DCV will make the ventilation rate (and indoor air quality) worse than the existing condition and worse than if the system was new. For example, if the volumetric flow rate of the existing ventilation system is less that current requirements (say 10 cfm/of outside air per occupant), then demand control ventilation cannot be installed on that system. By shutting down ventilation air when the space is unoccupied, but the building is occupied; the existing condition is made worse. There is no opportunity for the indoor air quality to come back to an acceptable condition (according to current code) prior to the next class.

I005 REQUIREMENTS FOR DEMAND CONTROL VENTILATION USING ON-OFF OCCUPANCY SENSORS

a. Control systems shall be set up such that sensor failure results in the delivery of outside air for the maximum occupant load during occupied times.

I006 REQUIREMENTS FOR DEMAND CONTROL VENTILATION USING SCHEDULED OCCUPANCY

a. Occupancy must be scheduled through building control system. In addition, occupancy may be overridden on by manual control.

b. CO_2 sensor must be provided to monitor occupant load.

c. Record keeping: Records to be provided to School District's Health and Safety Committee.

1. Space CO_2 concentrations must be recorded at not greater than 15-minute intervals. Records of CO_2 concentrations must be kept for a minimum of three years.

2. Air flow readings are recommended.

I007 REQUIREMENTS FOR DEMAND CONTROL VENTILATION USING CO_2 SENSORS

a. Requirements applicable to all DCV systems shall also apply to those systems using CO_2 sensors.

b. Sensors shall have the following requirements:

1. Sensors must be located at points that are reflective of the breathing zone of each space served.

i. Sensor location(s) must avoid impact of doorways, windows, short circuiting, and supply air vents.

ii. An adequate number of CO_2 sensors must be provided for each space.

2. Sensor quality:

i. Error not to exceed 50 parts per million (ppm) in expected range of measurement.

ii. Drift not to exceed 20 ppm.

3. Redundant CO2 sensors shall be provided at each location installed. If the difference in reading between sensors at the same location exceeds ten percent (10%), both sensors will require calibration.

4. Measurement of outside air CO_2 concentrations are not required. An assumed value of 350 ppm may be used in determining ambient CO_2 concentration.

5. Sensors shall take measurements (readings) in each space at intervals not to exceed 1 minute.

c. A minimum volumetric flow of outside air must be provided during occupied times.

1. Minimum flow rate must consider dilution of non-occupant generated contaminants as well as make-up air requirements of all spaces served by the unit (i.e. make-up air delivered to locker rooms from gymnasium).

i. If not providing make-up air to other spaces requiring greater flow rates of outside air, the minimum volumetric flow rate of outside air for large spaces (Gyms with spectator seating, Auditoriums, Cafeterias, Band/Choir rooms, Large Group Instruction) shall be at least twenty percent (20%) of volumetric flow rate of outside air for the maximum occupant load of the space.

ii. Classrooms: If not providing make-up air to other spaces requiring greater flow rates of outside air, the minimum volumetric flow rate of outside air shall be at least twenty-five percent (25%) of volumetric flow rate of outside air for the maximum occupant load of the space.

d. Preoccupancy purge: If the sequence does not include a provision for minimum ventilation rate, 24 hours per day, 365 days per year, a purge of the space is required prior to occupancy. A preoccupancy purge cycle shall consist of a 30-minute operation of the air handling systems, serving the area, with all dampers (outside air, return air, exhaust air, relief air) positioned, and all fans running to provide the quantity of outside air for the maximum occupant loading of the space.

e. Post Occupancy Flush: Air handling systems, serving the area, must operate after the occupied times to reduce CO_2 concentrations in the space to outside air levels, prior to shutting down. Dampers (outside air, return air, exhaust air, relief air) must be positioned, and all fans must run at speeds to provide at least the minimum flow rate of outside air during the post occupancy flush.

f. Provide provision for economizer override of CO_2 control when conditions permit natural cooling of space(s) served.

g. Upper limit of CO_2 (ppm) must be provided. The upper limit (Control Point) must be based on the metabolic rate of activities in area and the volumetric flow rate required by Code for the area served.

h. Air handling system control during occupied times: All dampers and fans serving a space shall modulate from the minimum setting, starting at an interior CO_2 concentration of not greater than 100 ppm over that of the outside air. Dampers and fans shall modulate such that concentrations never exceed upper limit for space.

i. Provide provision for a proportional-integral or a proportional-integral-derivative CO_2 controller.

j. DCV through the use of CO_2 sensors may not be used where there is a provision to remove CO_2 by any method other than dilution.

k. Provide provision for extended commissioning (1 year) to check calibration of CO_2 sensor, monitor/test CO_2 levels to ensure target per person ventilation rates are met and maintained.

l. Record keeping: Records to be provided to School District's Health and Safety Committee.

1. CO_2 concentration readings from all sensors serving each space must be recorded at not greater than 15-minute intervals. Records of CO_2 concentrations must be kept for a minimum of three years.

2. Air flow readings are recommended.

I008 REQUIREMENTS FOR DCV USING OTHER TYPES OF SENSORS/EQUIPMENT

a. (RESERVED)

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