



FACILITY PERFORMANCE STANDARDS

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INTRODUCTION

In order to ensure that Chicago Public Schools (CPS) facilities support educational functions and student safety, these standards were developed to provide guidance for future renovations and new construction projects. This document was created utilizing the expertise of both architects and engineers in the various components of school design, maintenance, operation and usage and in compliance with *Illinois Public Act 097-0474*.

Research supports that the physical environment can have a substantial impact on the performance of a student and the effectiveness of a teacher¹. Each facility performance standard is based on current research in the design and construction of the teaching environment, life cycle costing, and maintainability of systems that provide the appropriate teaching environment. As research into high performance schools evolves, these facility performance standards may change to reflect the new research.

Chicago Public School's diverse collection of facilities reflects its long and varied history. Currently, CPS owns, leases and utilizes as functioning educational institutions, more than 550 properties, built anywhere from the 1880s to today. This broad scope of facilities pose both challenges and opportunities in creating standards to address the uniqueness of CPS's building stock and yet provide an environment that supports both teaching and learning. The *Facility Performance Standards* outline minimum and optimal standards for thermal comfort, daylight, acoustics, indoor air quality, furniture ergonomics for students and staff, technology, life safety, ADA accessibility, plumbing and washroom access, environmental hazards and walkability. The minimum standards are developed to ensure that renovation projects provide spaces conducive to learning while at the same time dealing with the existing constraints of the building. The optimal standards are developed to provide guidance for the design and construction of new school buildings. These standards, shaped by current research, as well as in compliance with federal, state, and local laws and regulations, contribute to creating the most physically supportive environment for both students and staff.

¹ USA, The Tennessee Advisory Commission on Intergovernmental Relations, *A Staff Information Report, "Do K-12 School Facilities Affect Education Outcomes?"* (Nashville, TN: The Tennessee Advisory Commission on Intergovernmental Relations, January 2003) 9-25.

ACOUSTICS

Communication plays an integral role in any classroom. In order for a teacher to communicate effectively with students, and students with one another, ambient noise levels must be limited within and outside the classroom. Special considerations need to be taken when planning classroom layouts, selecting materials, and locating HVAC equipment, in order to provide classrooms in which teachers can speak to the class without straining their voices and students can understand the teacher clearly without distracting noises from inside, outside, and in adjacent spaces.

Definition of Terms:

ANSI (American National Standards Institute) Standard S12.....the standard comprises a part of a group of definitions, standards, and specifications for use in noise. It was developed and approved by *Accredited Standards Committee S12, "Noise,"* under its approved operating procedures. Those procedures have been accredited by the American National Standards Institute. The Scope of *Accredited Standards Committee S12* is as follows: Standards, specifications, and terminology in the field of acoustical noise pertaining to methods of measurement, evaluation, and control, including biological safety, tolerance, and comfort, and physical acoustics as related to environmental and occupational noise.¹

Decibel (dB).... A unit used to measure the power of a signal, such as an electrical signal or sound, relative to some reference level. An increase of ten decibels in the power of a signal is equivalent to increasing its power by a factor of ten. As a measure of sound intensity, a zero-decibel reference is stipulated to be the lowest level audible to the human ear; the speaking voice of most people ranges from 45 to 75 decibels.²

Laboratory vs. Field Ratings....Please be advised the Sound Transmission Class (STC) and Impact Insulation Class (IIC) ratings noted in this document are the ideal laboratory rated value, and should be used to define the level of effort and detail required for the barrier constructions. These values shall NOT be used for installed final performance criteria. Field installation is typically 3-6 points below ideal laboratory values.

Noise Criterion (NC)..... is a standard that describes the relative loudness of a space, examining a range of frequencies (rather than simply recording the decibel level). This level illustrates the extent to which noise interferes with speech intelligibility.³

¹ Accredited Standards Committee S12, *Noise, "Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools & Part 2: Relocatable Classroom Factors"*, (Melville, NY,: Acoustical Society of America, 2009, 10)

² The Free Dictionary by Farlex, www.thefreedictionary.com

³ Acoustics.com, *Codes and Testing Noise Criteria (NC)*

Noise Reduction Coefficient (NRC)..... is a single-number index determined in a lab test and used for rating how absorptive a particular material is. This industry standard ranges for zero (perfectly reflective) to 1*(perfectly absorptive). It is simply the average of the mid-frequency sound absorption coefficients (250, 500, 1000, and 2000 Hertz) rounded to the nearest 5%.⁴

Reverberation Time....is the primary descriptor of an acoustic environment. A space with a long reverberation time is referred to as “live” environment. When sound dies out quickly within a space it is referred to as being an acoustically “dead” environment. An optimum reverberation time depends highly on the use of the space.⁵

Sound Transmission Class (STC)is a single-number rating of a material’s or an assembly’s ability to resist airborne sound transfer and at the frequencies 125-4000hertz. In general, higher STC rating blocks more noise from transmitting through a partition.⁶

Optimal Standards

1. Educational spaces -- including science, music, and art labs -- and libraries shall be enclosed on all sides by full-height walls. Open plan configurations, with low or no walls, are not allowed. Below is the Maximum Steady State Background Noise Level for each individual room type:

<i>Room Type</i>	<i>ANSI Standard⁷</i>	<i>Recommended Range</i>
Small Classroom (smaller than 10,000 ft ³)	35 dBA (NC-30)	35-40 dBA (NC-30 to 35)
Large Classroom (between 10,000 ft ³ - 20,000ft ³)	35 dBA (NC-30)	35-40 dBA (NC-30 to 35)
Library	N/A	NC-35 to 40
Gym	N/A	NC-40 to 45
Music Room	N/A	NC-30 to 35
Washrooms	N/A	NC-45 to 50
Offices	N/A	NC-35 to 40
Cafeteria	N/A	NC-40 to 45
Mechanical Room	N/A	N/A

2. Noise from outside classroom, including adjacent spaces, shall be minimized.
 - a. Classroom walls shall be constructed to provide a minimum laboratory STC (Sound Transmission Class) value of:

⁴ Acoustics.com, NRCratings.com

⁵ Acoustics.com, Reverberationtime.com

⁶ Acoustics.com, STCratings.co

⁷ ANSI/ASA S 12.60-2002, *Acoustical Performance Criteria, Design Requirements and Guidelines for Schools*, American National Standards Institute, 2002.

<i>Room Type</i>	<i>ANSI Standard⁸</i>	<i>Recommended Range</i>
Classroom to Classroom	STC-50	STC-45 to 50
Classroom to Washroom	STC-53	STC-55 to 60
Classroom to Corridor, Office, Library	STC-45	STC-40 to 45
Classroom to Music Room, Gymnasium, Mechanical Room	STC-60	STC-55 to 60
Music Room to Any Other Occupied adjacent space	STC-60	STC-55 to 60
Mechanical Equipment Room	STC-60	STC-55 to 60
Minimum Exterior Wall/Window Construction	STC-45	STC-35 to 45+ TBD based on nature of exterior noise

- b. Wall and floor-ceiling assemblies that separate enclosed or open-plan core learning spaces from adjacent spaces shall be designed to achieve the minimum STS ratings rating requirements of the following table also shall apply to the design of temporary partitions that subdivide a learning space.

Minimum STC ratings required for single or composite wall and floor-ceiling assemblies that separate a core learning space from an adjacent space.

Adjacent Space⁹			
Other enclosed or open-plan core learning space, therapy room, health care room and space requiring a high degree of acoustical privacy	Common-use and public-use toilet room and bathing room.	Corridor, staircase, office or conference room.	Music room, music performance space, auditorium, mechanical equipment room, cafeteria, gymnasium, or indoor swimming pool.
50	53	45	60

- 3. Educational spaces shall have a maximum reverberation time as follows:
 - a. Educational spaces ≤ 10,000 cubic feet (cu ft) = 0.6 second.
 - b. Educational spaces 10,000 cu ft less 20,000 cu ft = 0.7 second.
 - c. Educational spaces more than 20,000 cu ft shall be evaluated on a case by case basis by an acoustical consultant.

⁸ ANSI/ASA S 12.60-2002, *Acoustical Performance Criteria, Design Requirements and Guidelines for Schools*, American National Standards Institute, 2002.

⁹ Table 4 “Minimum STC ratings required for single or composite wall and floor-ceiling assemblies that separate a core learning space from an adjacent space,” ANSI/ASA S 12.60-2010/Part 1, *American national Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part1: Permanent Schools*.



4. Ceiling materials shall have an NRC of 0.70 or higher.

Minimum Standards¹⁰

1. Noise from outside classrooms, including adjacent spaces, shall be minimized.
 - a. During renovations, new roof-mounted mechanical equipment shall be installed with isolation devices to minimize vibrations being transferred to building structure. Ductwork from new roof-mounted mechanical equipment shall be installed and configured/routed to minimize transference of sound through the ductwork.
2. When required to reduce reverberation within auditoriums, music rooms, and libraries, as well as improve speech intelligibility, surfaces within these spaces shall receive some sound absorptive materials.
3. When provided, new ceiling materials shall have an NRC of 0.70 or higher.

¹⁰Accredited Standards Committee S12, *Noise, "Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools & Part 2: Relocatable Classroom Factors"*, (Melville, NY,: Acoustical Society of America, 2009, 10)



ADA ACCESSIBILITY

The Chicago Public Schools (CPS) district is made up of more than 600 CPS-controlled campuses, plus others that are controlled by charter or contract school organizations. CPS has newly constructed or ADA-renovated roughly 250 of the more than 600 CPS-controlled campuses to be accessible to students, family members, visitors, or staff members with physical disabilities. Accessibility of schools promotes equal opportunity and convenience to attend schools of choice, which help to improve the success of students with disabilities and the engagement of parents and guardians with disabilities. School accessibility is also necessary for new magnet, charter and other programs, as well as for public meetings, health clinics, polling places and other community functions.

I. EVALUATION METHODOLOGY

Applicable ADA Legal Requirements:¹

- The *Americans with Disabilities Act (ADA)* generally requires that school facilities designed and constructed after 1992, and areas of school facilities renovated after 1992, comply with the *ADA Standards for Accessible Design* in effect at the time of that construction or alteration.
- For other school facilities and parts of them, the ADA requires that CPS ensure “Program Access,” which does not necessarily obligate CPS to make every facility, or every part of those facilities, fully accessible.
- Ensuring “Program Access” means that CPS must have a sufficient amount of accessible facilities and spaces within facilities to make all of its different programs, on the whole, accessible to people with disabilities.
- CPS does not have to make every classroom accessible, and does not necessarily have to make each school that offers a particular program accessible, as long as the program is offered in enough accessible classrooms and facilities to afford comparable convenience to people with disabilities as is afforded to people without disabilities participating in that program, service or activity.
- Programs subject to this requirement are all of the types of programs, services and activities offered by CPS to students, parents, and the public.
- One acceptable method of achieving such program access, where a program is offered in a non-accessible building, is to also offer that program at a nearby alternative accessible site, or to relocate a 2nd floor class or event to a 1st floor upon request of a person with a disability.
- In any event, CPS is not required to undertake any action that would pose an undue financial or administrative burden, even where such an action would be necessary to achieve Program Access.

¹ For the statutory and regulatory language of the following requirements, see 42 U.S.C. § 12131 *et seq.* and 28 C.F.R. pt. 35, Subpart D.



II. APPLICATION TO CPS FACILITIES

Application to the CPS District as a Whole: Using this district-wide standard, CPS evaluates each facility's minimum accessibility requirements in the context of the programs it offers, its capacity to provide those programs in accessible rooms and spaces, and its distance from an accessible facility offering the same program.

A. Optimal ADA Standard for CPS

Optimally, all features of all facilities would be fully accessible according to ADA, Illinois and Chicago new construction standards. More specifically, the following would be as accessible as required in new construction:

- Accessible parking and multiple accessible exterior routes to the building.
- All or virtually all building entrances.
- All special function spaces -- such as the cafeteria, gymnasium, main office, auditorium, library, playground, or locker rooms.
- All classrooms, including labs and other specialty classrooms.
- All restrooms and drinking fountains.
- All Interior routes, including full vertical access (elevator or ramp) throughout the facility.
- Signage and fire alarm systems.
- All other features required to be made accessible under the ADA, state or local accessibility laws.

B. Minimum ADA Standard for CPS

School facilities should be evaluated to determine:

1. **Programs Offered:** Which programs, services and activities it offers; and
2. **Accessibility of Programs Offered:** Whether each of those programs, services and activities takes place in a Generally Accessible location or can be relocated to a comparably convenient Generally Accessible location in a timely fashion upon request.

Generally Accessible. Because the ADA does not necessarily require full accessibility throughout all facilities, for the purposes of examining ADA-required "Program Access," CPS determines whether a school facility is "generally accessible." "Generally accessible" is a term CPS created to describe a school facility that is not necessarily in full compliance with ADA new construction standards. The school facility is accessible enough to provide access to most people with disabilities in most types of programs the school is likely to offer, even if it might require

some program aspects to be relocated within the facility for a person with a disability. A generally accessible school facility should have the following features, at a minimum:

- Accessible parking and an accessible exterior route to the building.
- At least one accessible building entrance.
- At least one accessible of each type of special function space – including, but not limited to, the cafeteria, gymnasium, main office, auditorium, library, playground, or locker room.
- Enough accessible classrooms, including labs and other specialty classrooms to accommodate a full curriculum for a student with a disability of any age, integrated with same-age peers.
- At least one set of accessible restrooms and drinking fountains.
- Accessible interior routes as necessary to reach the above accessible rooms and features.
- Accessible signage and fire alarm systems.

3. Need for Supplemental Features for Individuals or Programs of Students with Low-Incidence Disabilities

- In addition to minimum ADA and building code standards, CPS sometimes renovates school areas to exceed ADA requirements in order to serve students with less common or more severe disabilities. For instance, some populations of students require personal care assistance and need washrooms that have private stalls with adult-sized changing tables.
- These features are not needed generally in CPS facilities and are implemented only where necessary for current student demand. This demand is calculated by the Office of Special Education and Supports, via current and anticipated IEPs and 504 plan requirements.

4. Comparable Convenience to Alternate Accessible Location: If a program, service or activity is not offered in a generally accessible school facility, whether there is an accessible location offering the same program, service or activity that is comparably convenient.

- “Comparable Convenience” for people with disabilities will vary from program to program, because different programs may offer different levels of geographic and other convenience to people without disabilities (e.g., magnet and selective enrollment schools are often less geographically convenient to enrolled families than are neighborhood schools).

5. Undue Burden: If a school facility is not generally accessible and there is no comparably generally accessible location offering the same program, service or activity, CPS must determine whether it would be an undue financial or administrative burden to make this program, service or activity generally accessible at the current time.

DAYLIGHT

Natural lighting has positive effects on the learning environment. In 1999 a critical study was conducted that found that students of the same school district scored upwards of 25 percent higher on standardized testing when their lessons were conducted in classrooms with greater natural lighting, contrasted with those students who learned in environments with less natural lighting¹. This could be due to the fact that there is a direct correlation between behavior and daylight exposure, especially relative to levels of concentration and sociability². Below is a set of standards that establishes the criteria for daylighting in the classroom.

Definitions

Foot-Candles(fc)....a unit of luminance or illumination, equivalent to the illumination produced by a source of a one candle at a distance of one foot and equal to one lumen incident per square foot.³

Optimal Standards

1. In general classroom spaces, music, art, and science labs, staff lounges (elementary schools); departmental offices (high schools), and libraries, windows to the exterior shall be provided. The windows to the exterior shall provide an illumination level of not less than 25 foot-candles, but not more than 500 foot-candles throughout each space, when measured according to procedures prescribed in *LEED 2009, Indoor Environmental Quality Credit 8.1 "Daylight and Views – Daylight"*, with the area of windows provided being not less than 8 percent of the total floor area of the space, as required by the *Chicago Building Code 2010, 13-172-070) "Natural Light, (b) Minimum Glazing Area."*

2. Windows to the exterior shall be provided in all administrative area offices, conference rooms, and open office areas. The area of the windows shall not be less than 8 percent of the total floor area of the space, as required by the *Chicago Building Code 2010, 13-172-070, "Natural Light, (b) Minimum Glazing Area."*

¹ Cooper, Kenneth J. "Study says natural light boosts learning." *Boston Globe* [Boston] 11/26/99, Pg. A33

² Kuller, R and Lindsten, C "Health and Behavior of Children in Classrooms with and without Windows", *Journal of Environmental Psychology*, (1992) 12, 305-317.

³ Dictionary.com, [Http://dictionary.reference.com/browse/foot-candle](http://dictionary.reference.com/browse/foot-candle)



3. Windows to the exterior shall be provided in gymnatoriums (a room that serves two purposes a gym and an auditorium), gymnasiums, cafeterias, and natatoriums. Windows shall be located high on the east and/or north walls, but shall be located to prevent glare issues within the space.
4. Interior, view-preserving window shades, either manual or automated, shall be provided on all windows to allow school staff to control the amount of direct sunlight and glare within each space.
 - a. Where required for presentation or performance reasons, interior blackout shades shall be provided.
 - b. If required to control direct sunlight and glare, storefront, window wall, dining room, corridors, utility spaces and stairwells are to have view preserving window shades, either manual or automated.
5. Glazing installed in windows to the exterior shall comply with the fenestration criteria of the *American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) 90.1, "Energy Standard for Buildings except Low-Rise Residential Buildings"*, latest edition.

Minimum Standards

1. In educational spaces, the area of windows to the exterior shall not be less than 8 percent of the total floor area of the space, as required by the *Chicago Building Code 2010, 13-172-070) "Natural Light, (b) Minimum Glazing Area."*
 - a. Interior, window shades shall be provided on all windows to allow teachers to control the amount of direct sunlight and glare within the space.
 - b. Where required for presentation or performance reasons, interior blackout shades shall be provided.
 - c. If required to control direct sunlight and glare, storefront, window wall, dining room, corridors, utility spaces and stairwells are to have view preserving window shades, either manual or automated.



ENVIRONMENTAL HAZARDS

Environmental conditions contribute greatly to the health and well-being of individuals, especially during developmental years. For this reason, conditions found in classrooms and throughout schools are of the utmost concern when establishing safety criteria for individuals learning and working within CPS facilities. In order for staff and students to excel, learning environments must be free of overtly hazardous conditions in accordance with the Illinois Department of Public Health (IDPH), the Illinois Environmental Protection Agency (IEPA), and the United States Environmental Protection Agency (USEPA) regulations.

Optimal Standards

1. Asbestos and Asbestos-Containing Materials:
 - a. CPS shall comply with all Federal, State, and local laws and regulations regarding asbestos, asbestos-containing materials, and lead-based paint in its schools.
 - b. Repair, fully encapsulate, or abate all friable asbestos-containing materials, including removal of asbestos-containing floor tiles, in areas occupied by students and staff.
 - c. No asbestos containing materials shall be used in any renovation or new construction projects.

2. Lead-Based Paint:
 - a. Replace window systems coated with lead-based paint.
 - b. Repair or replace interior features with damaged lead-based paint.
 - c. Repair or replace exterior features with damaged lead-based paint including fences, play equipment, and exterior painted surfaces.

Minimum Standards

1. Asbestos and Asbestos-Containing Materials:
 - a. Comply with all Federal, State, and local laws and regulations regarding asbestos, asbestos-containing materials, and lead-based paint in its schools.
 - b. Identify asbestos-containing materials that could present a health hazard to building occupants through 3-year inspections and 6-month surveys.
 - i. Each school shall be inspected for asbestos-containing material every 3 years, as required by the State of Illinois.
 - ii. Each school shall be surveyed by the building engineer every 6 months, to identify asbestos-containing material that may present a hazard to building occupants, as required by the State of Illinois.
 - c. Repair, fully encapsulate, or abate all friable asbestos-containing materials.
 - i. All abatement/repair of asbestos-containing materials shall be performed in accordance with Federal, State, and local laws and regulations.



- d. All areas in which Capital Improvement (renovation/alteration) work is planned shall be surveyed by a State of Illinois licensed Asbestos Inspector. Where a survey identifies suspect materials, or materials known to contain asbestos, a State of Illinois licensed Asbestos Designer shall be included in both the project scoping and project design phase and process.
2. Lead-Based Paint:
- a. Comply with all Federal, State, and local laws and regulations regarding lead-based paint in its schools, including hazards that may be created by renovation, repair, and painting activities that disturb lead-based paint.
 - i. In all buildings constructed in 1978 or earlier, it must be assumed that all paint products are lead-based.
 - b. Identify damaged lead-based paint that could present a health hazard through periodic surveys, including building assessments.
 - c. Repair or remove surfaces with lead-based paint that is damaged or is subject to damage in areas occupied by students and staff.



FURNITURE ERGONOMICS

Over the years, school furniture has evolved. CPS periodically reviews the current availability of furniture. Furniture that provides good ergonomics for the user that is both durable and cost effective is specified. Based on the above criteria, one standard applies to all construction, both renovation and new construction.

Minimum and Optimal Standards

1. General: CPS provides static furniture that is appropriately sized for the user (student or staff), depending on the user's age and stature, with some furniture providing limited adjustability. Special requests for furniture for students/staff with needs that fall outside the average range shall be evaluated by CPS on a case by case basis and furniture may be purchased to address those specific needs.
2. Students:
 - a. Chairs are based upon average height within a specific grade and provide limited amount of adjustability.
 - b. Chair: Seat height is determined by the student, with feet having full contact to the floor and knees at close to 90 degree angle. When student is seated, with back pressed to chair back, the front edge of the chair shall not press into the lower legs or back of the knees. Chair seat backs shall be low, occurring below student's shoulder blades.
 - i. Chairs heights are selected based on grade level:
Pre Kindergarten – 12”
Kindergarten -1st Grade - 14”
2nd Grade -3rd Grade – 16”
4th Grade – 12th Grade– 18”
 - c. Desk: Desk shall provide adequate clearance for the legs, with the shoulders, elbows, and wrists at near neutral positions, and be free of obstructions within leg space. Desk height shall be approximately 1-inch above the bottom of the elbow of seated student with arms bent at 90-degree angle.
 - i. Elementary: Desk top height is based off height of chair seat, and is between 8 to 12 inches above chair seat. When allowance for storage compartment is included, 2-inches shall be added on to desk top height.
 - ii. High School: Desk height should be approximately 12-inches above the seat height for the student.
3. Staff:
 - a. Chairs and desks shall be based upon the staff member's average height and provide limited amount of adjustability.



- b. Chair: Chair height shall allow the user to sit with their feet comfortably on the floor or footrest without undue pressure on the underside of the thighs, and with hip and knee angles of approximately, but not less than, 90-degrees. When user is seated, with back pressed to chair back, the front edge of the chair shall not press into the lower legs or back of the knees.
 - i. The seat shall be wide enough to allow for user movement and clothing.
 - ii. The backrest shall provide adequate support but not interfere with the user's movements or cause localized pressure points, with backrest below the user's shoulder blades.
 - iii. The backrest and seat pan shall adjust to accommodate the varying postures assumed by the user throughout the day.
 - iv. When provided, armrests shall be adjustable, allowing users to sit in various positions while supporting their forearms and/or elbows in a manner that avoids lifting the shoulders or leaning to the side. The armrests shall not restrict performance of tasks.

- c. Desk: Desk shall provide adequate clearance for the legs, with the shoulders, elbows, and wrists at near neutral positions, and be free of obstructions within leg space. Desk height should be approximately 12-inches above the staff member's seat height. This should place the surface approximately 1-inch above the bottom of the elbow of seated user with arms bent at 90-degree angle. The desk surface shall also allow a standard computer screen to be at a position somewhat between 20 and 50 degrees below eye level, and at a distance of at least 16-inches from the user.

INDOOR AIR QUALITY

Fresh, clean air is a necessary component for a healthy life. Therefore, installing low-emitting building materials, using toxic-free cleaning agents, and supplying fresh outdoor air to spaces are baseline requirements for all CPS classrooms.

Definitions

ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers)....is an international technical society for all individuals and organizations interested in heating, ventilation, air-conditioning, and refrigeration.¹

CFM (Cubic Feet per Minute)....a standard measurement of airflow that indicates how many cubic feet of air pass by a stationary point in one minute. The higher the number, the more air is being forced through the system. ²

MERV (Minimum Efficiency Reporting Value)....is a number from 1 to 16 that is relative to an air filter’s efficiency. The higher the MERV, the more efficient the air filter is at removing particles.³

VOC (Volatile Organic Compounds)....are organic chemicals that have a high vapor pressure at ordinary, room-temperature conditions. Their high vapor pressure results from a low boiling point, which causes large numbers of molecules to evaporate from liquid or solid form of the compound and enter the surrounding air.⁴

Optimal Standards

1. In all schools, only low VOC materials shall be used and installed, including, but not limited to, paints and coatings, adhesives, sealants, composite wood, carpet, and hard flooring.
2. In all schools, cleaning products that are used shall be free of toxic materials and chemicals, added perfumes, and other contaminants, per the *Illinois Green Cleaning Schools Act (105 ILCS 140)*.
3. Every school shall have a mechanical ventilation system (air is provided by mechanical equipment such as fans, ducts etc.) providing supply air to, and exhausting air from, each space within the building in accordance with the requirements of the *Chicago Building Code 2010, 13-172-090* “Natural Ventilation, (b) Ventilation” area required.

¹ ASHRAE, “American society of Heating, Refrigerating and Air-Conditioning Engineers,” www.ashrae.org

² www.convetunits.com

³ Clean Air Solutions, www.filterair/infor/articles/article.cfm

⁴ Wikipedia, en.wikipedia.org/wiki/Volatile_organic_compound



4. Outdoor Air: Outdoor air shall be provided to every classroom space at not less than 15 cfm/occupant, or 0.5 cfm/sq. ft. of the floor area being ventilated, whichever is greater.
5. Filtration of Air: Both outdoor and re-circulated air shall be filtered through filters to ensure removal of fine particulates and contaminants. Pre-filters shall be rated at a minimum of MERV 8, and high efficiency filters shall be filtered at a minimum of MERV 13, as defined in *ASHRAE Standard 52* and tested in accordance with *ASHRAE 52.2* procedures.

Minimum Standards

1. In all schools, only low VOC (Volatile Organic Compounds) materials shall be installed, including, but not limited to, paints and coatings, adhesives, sealants, composite wood, carpet, and hard flooring.
2. In all schools, cleaning products that are used shall be free of toxic materials and chemicals, added perfumes, and other contaminants, per the *Illinois Green Cleaning Schools Act (105 ILCS 140)*.
3. Within schools constructed prior to July 1965, every assembly and educational space, with an occupant load of more than 10 persons shall be provided with outdoor air at not less than 5 cfm/occupant, whenever the room or space is occupied. Not included are toilet rooms, locker rooms, shower areas, corridors, and stairs.
 - a. The above requirement shall be considered to be met where one of the following conditions exist:
 - i. The space has operable exterior doors and/or windows, with total area of wall opening not less than 1 sq. ft. / occupant, or 3 percent of the net floor area.
 - ii. The space has operable exterior windows, with not less than 1/2 sq. ft. / occupant or 1 1/2 percent of the net floor area, plus an exhaust fan system capable of exhausting 5 cfm / occupant whenever the space is occupied and the windows are open.
 - iii. Mechanical ventilation of 5 cfm/occupant of outside air shall be provided.



LIFE SAFETY

The safety of the occupants within the CPS facilities is paramount. Without safety precautions, students and teachers would be ill-equipped during the possibility of an emergency situation. For this reason, emergency systems, including emergency lighting and auxiliary means of power, fire alarm systems and portable extinguishers that are clearly identified and uninterrupted methods of egress shall be provided to promote safety in case of emergency.

Definitions¹

Auxiliary Source of Current Supply.... shall be another independent source of current supply, isolated from the normal source, either from the utility, an on-site generator, an inverter, or unit batteries, where allowed.

Emergency Lighting systems....shall be lighting systems required by the "Chicago Building Code" which supplement the general lighting system.

Exit Lighting Systems....shall be those electrical systems which supply electricity to required exit, directional, stairway and fire escape signs.

Final Reserve Source of Current....shall be an approved battery source, on-site generator....or an approved on-site inverter system.

System I Emergency System....shall consist of three sources of supply of electrical energy....normal source, auxiliary source totally separate from the normal and final reserve sourced of current, from batteries or on-site generator.

System II Emergency System....shall consist of two source of current supply, normal source and auxiliary source totally separate from the normal.

System III Emergency System....shall consist of two sources of current supply, normal source of current supply to the structure which shall provide for the general illumination and the second source of current supply shall provide electrical service for the exit signs and the emergency lighting.

Optimal Standards

1. Emergency Systems: Emergency systems, including emergency lighting and auxiliary means of power, shall be provided at every school in accordance with Federal, State, and local laws and regulations.

¹ Chicago Building Code, Articles 700 through 780 Special Conditions, 18-27-700.4, Definitions, 18-27-700.20, System I, 18-27-700.21, System II, 18-27-700.22, System III,



- a. Except where required by the *Chicago Building Code 2010, 18-27-770.5, "Types of Emergency Systems Required,"* to have a System I emergency system, every school shall have a System II emergency system, as required in compliance with *Chapter 18-27, Article 700, of the Chicago Electrical Code.*
 - b. Every newly constructed school shall be fully sprinklered as required by State and local laws and regulations *Chicago Building Code 2010, 15-16-010, "Sprinkler Systems", 15-16-020, "General Requirements," and 15-16-030 "Special Requirements."*
2. Fire Alarm System:
- a. Every school shall have an approved, addressable fire alarm system that automatically transmits alarms to the Chicago Fire Department.
 - b. The fire alarm shall include activation devices including, but not limited to, manual pull stations, smoke detectors, flow switches (if building has a sprinkler system), heat detectors (if building does not have a sprinkler system) and duct detectors.
 - c. The fire alarm system shall be tested monthly, as required by State and local laws and regulations per the *Chicago Building Code, 15-16-1360, "Tests."* Tests shall take place with representatives from the Chicago Fire Department present.
 - d. Manual pull stations shall be located to be readily visible and accessible. They shall be located not more than 200 feet apart, in the natural path of exit travel from the building, at exit doors, at doors leading to stairwells, and in food service areas.
 - e. Alarm signaling devices shall include visual and audible signals.
 - i. Visual signaling devices shall be synchronized as required by federal, state, and local authorities having jurisdiction.
 - ii. Audible signaling devices shall deliver alarm sounds that are 15 dB louder than ambient noise levels, with a decibel rating of not more than 90 dB, when measured at 10 feet from the source. Audible signaling devices shall produce a temporal signal that shall be synchronized as required by the federal, state, and local authorities having jurisdiction.
 - 1. Audible signaling devices shall be used for fire alarm purposes only, with the same signal utilized both for drills and for actual alarms.
3. Exiting:
- a. Exits shall be provided as required by federal, state, and local authorities having jurisdiction.



- b. Exits shall be separated by fire-protective enclosures as required by federal, state, and local authorities having jurisdiction.
 - c. Exits shall provide readily accessible means of egress from the building, to the public way, in the event of an emergency.
 - d. Exits shall be continuous and uninterrupted, and unobstructed.
 - e. Exits shall have emergency lighting as required by federal, state, and local authorities having jurisdiction.
 - f. Exits and exit passageways that are part of a path of exit travel shall be clearly designated by illuminated exit signage as required by federal, state, and local authorities having jurisdiction.
4. Portable Fire Extinguishers:
- a. Portable fire extinguishers shall be provided in every school in accordance with State and local laws and regulations, *Chicago Building Code, 15-16-640, "Where Required."*
 - b. Travel distance to any portable fire extinguisher shall not exceed 75 feet.
 - c. Portable fire extinguishers located in electrical or computer rooms shall be CO₂ or clean agent type.

Minimum Standards

- 1. Emergency Systems: Emergency systems, including emergency lighting and auxiliary means of power, shall be provided at every school in accordance with Federal, State, and local laws and regulations.
 - a. In every school, when renovations/alterations affecting the electrical system are undertaken the existing emergency system shall be upgraded as required to be in compliance with *Chapter 18-27, Article 700, "Emergency Systems," of the Chicago Electrical Code.*
- 2. Fire Alarm System:
 - a. Every school shall have an approved, addressable fire alarm system that automatically transmits alarms to the Chicago Fire Department.
 - b. The fire alarm shall include activation devices including, but not limited to, manual pull stations, smoke detectors, heat detectors (if building does not have a sprinkler system), and duct detectors.



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- c. The fire alarm system shall be tested monthly, as required by State and local laws and regulations. Representatives from the Chicago Fire Department shall be notified prior to any fire alarm testing.
 - d. Manual pull stations shall be provided.
 - e. Alarm signaling devices shall include audible signals.
3. Exiting:
- a. Exits shall be provided as required by federal, state, and local authorities having jurisdiction.
 - b. Exits shall provide readily accessible means of egress from the building, to the public way, in the event of an emergency.
 - c. Exits shall be continuous and uninterrupted, and unobstructed.
 - d. Exits and exit passageways that are part of a path of exit travel shall be clearly designated by illuminated exit signage as required by federal, state, and local authorities having jurisdiction.
4. Portable Fire Extinguishers:
- a. Portable fire extinguishers shall be provided in every school in accordance with State and local laws and regulations, *Chicago Building Code, 15-16-640, "Where Required."*



PLUMBING AND WASHROOM ACCESS

Accessibility to toilets and drinking fountains is necessary for teachers and students alike. Toilets and sinks shall be provided with adequate water pressure to ensure and maintain sanitary conditions for all of the CPS facility occupants. Similarly, potable water shall be made readily available and accessible.

Optimal Standards

1. Plumbing fixtures shall be provided in accordance with the *Chicago Building Code, Section 29(18-29-403) "Minimum Plumbing Facilities."*
 - a. Accessible plumbing fixtures shall be provided in accordance with the Facility Performance Standard "ADA Accessibility," and with federal, state, and local laws and regulations.
2. Water delivered to CPS schools shall comply with the Safe Water Drinking Act (SWDA) and the United States Environmental Protection Agency's National Primary Drinking Water Regulations.
 - a. No objectionable taste or odors shall be permitted.
3. The water supply and distribution system shall be in compliance with *Chapter 18-29 "Plumbing Systems," Article VI – Water Supply and Distribution, of the Chicago Building Code* and shall be capable, at all times, of maintaining not less than 20 pounds static pressure at every fixture.
4. Sanitary drainage systems shall be provided in accordance with *Chapter 18-29 "Plumbing Systems," Article VII – Sanitary Drainage, of the Chicago Building Code.*

Minimum Standards

1. Plumbing fixtures shall be provided in accordance with *Chapter 18-29 "Plumbing Systems" of the Chicago Building Code, including Section 29(18-29-403) "Minimum Plumbing Facilities."*
 - a. Toilet rooms and drinking fountains shall be made available at schools at various locations.
 - b. Toilet rooms and drinking fountains shall be made accessible to people with disabilities as required for Americans with Disabilities Act "Program Access", as detailed in the "Facility Performance Standard - ADA Accessibility."
2. Water delivered to CPS schools shall comply with the "Safe Water Drinking Act" (SWDA) and the *United States Environmental Protection Agency's "National Primary Drinking Water Regulations."*



3. The water supply and distribution system shall be in compliance with *Chapter 18-29 "Plumbing Systems," Article VI – Water Supply and Distribution, of the Chicago Building Code* and shall be capable, at all times, of maintaining not less than 20 pounds static pressure at every fixture.

4. Sanitary drainage systems shall be provided in accordance with *Chapter 18-29 "Plumbing Systems," Article VII – Sanitary Drainage, of the Chicago Building Code.*



TECHNOLOGY

Technology is becoming ever more critical within the learning environment. As these tools become more affordable, readily available, and incorporated into our society as a whole, it is necessary for our children to be exposed and connected to these advancements, in order to be technologically savvy and adequately prepared for the future. Having a modernized classroom allows teachers and students the possibility of utilizing technology to shape the educational experience so that it may be both more efficient and ultimately more beneficial.

Optimal Standards:

1. Every school shall have the following:
 - a. One incoming T1 cable and one fiber-optic cable tied into the primary CPS network and database.
 - b. Wireless overlay, with an individual access point in each educational space, the library, gymnasium, natatorium, and auditorium.
2. Every MDF and IDF are to be air conditioned.
3. Every school shall have technology infrastructure as outlined below.
4. Spaces within each school shall be provided with the following:
 - a. CLASSROOMS
 - i. Pre-K
 - A. 6 Student Data Outlets w/IG (Isolated Ground) Power
 - B. 2 Teacher Data Outlets w/IG Power
 - C. 1 Wireless Access Point Data Outlet
 - D. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - E. 1 Duplex Intercom Location
 - ii. Traditional Classroom
 - A. 4 Student Data Outlets w/IG Power
 - B. 2 Teacher Data Outlets w/IG Power
 - C. 1 Teacher Voice Outlet
 - D. 1 Wireless Access Point Data Outlet
 - E. 1 Overhead Projector Data Outlet w / IG Power
 - F. 1 Smart Board Data Outlet w /IG power
 - G. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - H. 1 Duplex Intercom Location
 - b. SPECIALTY CLASSROOMS
 - i. Computer Lab (Elementary -1 / High School - 3)
 - A. 30 Student Data Outlets w/IG Power
 - B. 2 Printer Data Outlets w IG Power



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- C. 2 Teacher Data Outlets w/IG Power
- D. 1 Teacher Voice Outlet
- E. 1 Wireless Access Point Data Outlet
- F. 1 Overhead Projector Data Outlet w / IG Power
- G. 1 Smart Board Data Outlet w /IG power
- H. 1 Multi Media TV Outlet w/IG Power and Control Lead
- I. 1 Duplex Intercom Location
- ii. Music Lab – High Schools (2)
 - A. 6 Student Data Outlets w/IG Power
 - B. 2 Teacher Data Outlets w/IG Power
 - C. 1 Teacher Voice Outlet
 - D. 1 Wireless Access Point Data Outlet
 - E. 1 Overhead Projector Data Outlet w / IG Power
 - F. 1 Smart Board Data Outlet w /IG power
 - G. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - H. 1 Duplex Intercom Location
 - I. Practice Rooms (4)
 - 1. 1 Data Outlet w/IG Power
 - 2. 1 Duplex Intercom Location
- iii. Art Room (Elementary (1) – High School (2))
 - A. 6 Student Data Outlets w/IG Power
 - B. 2 Teacher Data Outlets w/IG Power
 - C. 1 Teacher Voice Outlet
 - D. 1 Wireless Access Point Data Outlet
 - E. 1 Overhead Projector Data Outlet w / IG Power
 - F. 1 Smart Board Data Outlet w /IG power
 - G. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - H. 1 Duplex Intercom Location
 - I. Work Rooms
 - 1. 1 Data Outlet w/IG Power
 - 2. 1 Voice Outlet
 - 3. 1 Duplex Intercom Location
- iv. Science Labs
 - A. Elementary (1-2)
 - 1. 8 Student Data Outlets w/IG Power
 - 2. 2 Teacher Data Outlets w/IG Power
 - 3. 1 Printer Data Outlet w/IG Power
 - 4. 1 Teacher Voice Outlet
 - 5. 1 Wireless Access Point Data Outlet
 - 6. 1 Overhead Projector Data Outlet w / IG Power
 - 7. 1 Smart Board Data Outlet w /IG power
 - 8. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - 9. 1 Duplex Intercom Location



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- B. High School (4-6)
 - 1. 7 Student Data Outlets w/IG Power
 - 2. 2 Teacher Data Outlets w/IG Power
 - 3. 1 Teacher Voice Outlet
 - 4. 1 Administrative Outlet w/IG Power @ Teaching Island
 - 5. 1 Wireless Access Point Data Outlet
 - 6. 1 Overhead Projector Data Outlet w / IG Power
 - 7. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - 8. 1 Duplex Intercom Location
 - 9. Science Prep Room
 - a. 4 Data Outlets w/IG Power
 - b. 1 Voice Outlet
 - c. 1 Duplex Intercom Location
- v. Library - Elementary
 - A. 20 Student Data Outlets w/IG Power
 - B. 2 Staff Data Outlets w/IG Power
 - C. 2 Printer Locations
 - D. 2 Staff Voice Outlets
 - E. 1 Data Outlet w/IG power for Security Station
 - F. 2 Multi Media TV Outlet w/IG Power and Control Lead
 - G. 1 Overhead Projector Data Outlet w / IG Power
 - H. 1 Duplex Intercom Station
 - I. 9. Workroom
 - 1. 2 Staff Data Outlets w/IG Power
 - 2. 2 Staff Voice Outlets
 - 3. 1 Printer Data Outlet w/IG Power
 - 4. 1 Duplex Intercom Location
- vi. Library - High School
 - A. 30 Student Data Outlets w/IG Power
 - B. 3 Staff Data Outlets w/IG Power
 - C. 2 Printer Locations
 - D. 3 Staff Voice Outlets
 - E. 1 Data Outlet w/IG power for Security Station
 - F. 2 Multi Media TV Outlet w/IG Power and Control Lead
 - G. 1 Overhead Projector Data Outlet w / IG Power
 - H. 1 Duplex Intercom Station
 - I. Media Center
 - 1. 2 Staff Data Outlets w/IG Power
 - 2. 32 Student Data Outlets w/IG Power
 - 3. 4 Printer Data Outlets w/IG Power
 - 4. 1 Staff Voice Outlet
 - 5. 1 Overhead Projector Data Outlet w / IG Power
 - 6. 1 Duplex Intercom Location



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- J. Office
 - 1. 1 Staff Data Outlets w/IG Power
 - 2. 1 Staff Voice Outlets
 - 3. 1 Duplex Intercom Location
- K. Workroom
 - 1. 2 Staff Data Outlets w/IG Power
 - 2. 2 Staff Voice Outlets
 - 3. 1 Printer Data Outlet w/IG Power
 - 4. 1 Duplex Intercom Location
- vii. Multi-Purpose - Elementary
 - L. 4 Staff Data Outlets w/IG Power
 - M. 8 Student Data Outlets w/IG Power
 - N. 2 Staff Voice Outlet
 - O. 2 Overhead Projector Data Outlet w / IG Power
 - P. 2 Duplex Intercom Location
- viii. Gymatorium - Elementary
 - A. 1 Data Outlet w/IG Power
 - B. Scorer's Table
 - 1. 1 Data Outlet w/IG Power
 - 2. 1 Staff Voice Outlets
 - C. 2 Multi Media TV Outlet w/IG Power and Control Lead
 - D. 1 Duplex Intercom Location
 - E. Stage
 - 1. 1 Data Outlet w/IG Power
 - 2. 1 Staff Voice Outlets
 - 3. 1 Duplex Intercom Location
 - F. Gym Office
 - 1. 1 Data Outlet w/IG Power
 - 2. 1 Staff Voice Outlets
 - 3. 1 Duplex Intercom Location
- ix. Gymatorium - High School
 - A. 1 Data Outlet w/IG Power
 - B. Scorer's Table
 - 1. 1 Data Outlet w/IG Power
 - 2. 1 Staff Voice Outlets
 - C. 2 Multi Media TV Outlet w/IG Power and Control Lead
 - D. 1 Duplex Intercom Location
 - E. Stage
 - 1. 1 Data Outlet w/IG Power
 - 2. 1 Staff Voice Outlets
 - 3. 1 Duplex Intercom Location
 - F. Green Room
 - 1. 1 Data Outlet w/IG Power



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- 2. 1 Staff Voice Outlets
 - 3. 1 Duplex Intercom Location
 - G. Scene Shop
 - 1. 1 Data Outlet w/IG Power
 - 2. 1 Staff Voice Outlets
 - 3. 1 Duplex Intercom Location
 - H. Projection Room
 - 1. 2 Data Outlet w/IG Power
 - 2. 2 Staff Voice Outlets
 - 3. 1 Duplex Intercom Location
 - 4. 2 Data Outlet w/IG Power
 - 5. 2 Staff Voice Outlets
 - 6. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - 7. 1 Duplex Intercom Location
 - x. Natatorium (High School)
 - A. 1 Data Outlet w/IG Power
 - B. 2 Voice Outlets (one P.O.T.S. line)
 - C. Scorer's Table
 - 1. 1 Data Outlet w/IG Power
 - 2. 1 Staff Voice Outlets
 - D. 1 Duplex Intercom Location
 - E. Office (2)
 - 1. 2 Staff Data Outlets w/IG Power
 - 2. 2 Staff Voice Outlets
 - 3. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - 4. 1 Duplex Intercom Location
- c. OFFICES
- i. Main Office Suite - Elementary
 - A. 3 Staff Data Outlets w/IG Power
 - B. 3 Staff Voice Outlets
 - C. 1 KRONOS Data Outlets w/IG Power
 - D. 1 FAX Outlet
 - E. 1 Security Door Entry Station
 - F. 2 Master Intercom Station
 - ii. Main Office Suite - High School
 - A. 6 Staff Data Outlets w/IG Power
 - B. 6 Staff Voice Outlets
 - C. 1 KRONOS Data Outlets w/IG Power
 - D. 1 FAX Outlet
 - E. 1 Security Door Entry Station
 - F. 2 Master Intercom Stations



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- iii. Principal Office
 - A. 2 Staff Data Outlets w/IG Power
 - B. 1 Staff Voice Outlets
 - C. 1 FAX Outlet
 - D. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - E. 1 Master Intercom Station
- iv. Assistant Principal Office (Elementary -1 / High School -2)
 - A. 2 Staff Data Outlets w/IG Power
 - B. 1 Staff Voice Outlets
 - C. 1 FAX Outlet
 - D. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - E. 1 Master Intercom Station
- v. Conference Room
 - A. 2 Staff Data Outlets w/IG Power
 - B. 2 Staff Voice Outlets
 - C. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - D. 1 Master Intercom Location
- vi. Work Room
 - A. 2 Staff Data Outlets w/IG Power
 - B. 1 Printer Data Outlet w/IG Power
 - C. 2 Staff Voice Outlets
 - D. 1 Fax Outlet
 - E. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - F. 1 Master Intercom Location
- vii. Vault
 - A. 1 Staff Data Outlets w/IG Power
 - B. 1 Staff Voice Outlet
 - C. 1 Duplex Intercom Location
- viii. Counselor / Business Manager
 - A. 1 Staff Data Outlets w/IG Power
 - B. 1 Staff Voice Outlets
 - C. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - D. 1 Duplex Intercom Location
- ix. Nurses Suite
 - A. 2 Staff Data Outlets w/IG Power
 - B. 1 Printer Data Outlet w/IG Power
 - C. 2 Staff Voice Outlets
 - D. 1 FAX Outlet
 - E. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - F. 1 Master Intercom Station
- x. Exam Rooms (2)
 - A. 1 Staff Data Outlets w/IG Power
 - B. 1 Staff Voice Outlets



- C. 1 Intercom Station
- xi. Counselor Suite
 - A. 2 Staff Data Outlets w/IG Power
 - B. 2 Staff Voice Outlets
 - C. 1 Intercom Station
- xii. Social Worker Suite
 - A. 2 Staff Data Outlets w/IG Power
 - B. 2 Staff Voice Outlets
 - C. 1 Intercom Station
- xiii. Speech Therapist Suite
 - A. 2 Staff Data Outlets w/IG Power
 - B. 2 Staff Voice Outlets
 - C. 1 Intercom Station
- xiv. Staff Workroom - Elementary
 - A. 2 Staff Data Outlets w/IG Power
 - B. 1 Printer Data Outlet w/IG Power
 - C. 2 Staff Voice Outlets
 - D. 1 FAX Outlet
 - E. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - F. 1 Duplex Intercom Station
- xv. Staff Workroom - High School
 - A. 6 Staff Data Outlets w/IG Power
 - B. 1 Printer Data Outlet w/IG Power
 - C. 2 Staff Voice Outlets
 - D. 1 FAX Outlet
 - E. 1 Multi Media TV Outlet w/IG Power and Control Lead
 - F. 1 Duplex Intercom Station
- xvi. Security Office - High School (2)
 - A. 2 Staff Data Outlets w/IG Power
 - B. 2 Staff Voice Outlets
 - C. 1 Duplex Intercom Station
- xvii. Guard Station @ Main Entrance
 - A. 2 Staff Data Outlets w/IG Power
 - B. 2 Staff Voice Outlets
 - C. 1 Security Door Entry Station

Minimum Standards:

1. Every school shall have one (1) incoming T1 cable and be tied into the primary CPS network and database.
2. Every school shall have an incoming cable television drop, as required to be provided by one of the cable companies servicing Chicago neighborhoods.



3. Modified MDF and IDF rooms are to be air conditioned where needed.
4. Classrooms: Every classroom shall have one (1) data port and one (1) voice outlet for the teacher.
5. Computer Lab: Four (4) data ports, a printer data port, and one (1) voice outlet for the teacher. Twenty Four (24) data ports for students.
6. Science Lab: Two (2) data ports, a printer data port, and one (1) voice outlet for the teacher.
7. Art Room: One (1) data port and one (1) voice outlet for the teacher.
8. Music Lab: One (1) data port and one (1) voice outlet for the teacher.
9. Library: Every library shall have two (2) data ports, one (1) printer data port, one (1) data port and one (1) voice outlet for the librarian, and one (1) duplex intercom station.
10. Auditorium: Where provided, each dedicated auditorium shall have one (1) voice outlet and one (1) duplex intercom station at the stage.
11. Gymatorium (Combination of gymnasium and auditorium): Where provided, each gymatorium shall have the following:
 - a. Stage: One (1) voice outlet and one (1) duplex intercom station at the stage.
 - b. Gym Office: One (1) data port and one (1) voice outlet.
 - c. Gym: One (1) data port and one (1) voice outlet for use with a scorer's table.
12. Natatorium: Where provided, each natatorium shall have the following:
 - a. Where a natatorium shall be used for competitive meets, it shall have the following:
 - i. If permissible by code, one (1) data port, one (1) P.O.T.S. (Plain Old Telephone Service) and one (1) voice outlet shall be provided on the pool deck for use with a scorer's table.
 - ii. One (1) data port and one (1) duplex outlet (line voltage power) for a scoreboard.
13. Multi-Purpose: Where provided, each multi-purpose space shall have one (1) data port, one (1) voice outlet, and one (1) duplex intercom location.
14. Offices:
 - a. Each main office shall have the following:
 - i. One (1) data port, one (1) voice outlet, one (1) fax outlet, and one (1) printer data port.
 - ii. One (1) data port for the CPS KRONOS system.
 - iii. One (1) access control station, tied to the secure entrance door.



- iv. One (1) master intercom station.
- b. Where provided, the following office spaces/rooms shall have one (1) data port and one (1) voice outlet:
 - i. Principal's office.
 - ii. Assistant Principal's office.
 - iii. Nurse's office.
 - iv. Counselor's office.
 - v. Social Worker's office.
- c. Security Office: Each security office shall have one (1) data port and one (1) voice outlet.

THERMAL COMFORT

Providing comfortable conditions for students and staff is vital to maintaining an environment conducive for learning. Ventilation and mechanical heating are required for all CPS occupied spaces. Generally speaking, these environments are expected to be able to be warmed in the winter, and ventilated during the summer. When afforded, mechanical cooling systems are implemented to enhance student and staff comfort.

Definitions

Dry Bulb Temperature....is the temperature of air measured by a thermometer freely exposed to the air but shielded from radiation and moisture.¹

Relative Humidity....is a term used to describe the amount of water vapor in a mixture of air and water vapor.²

Optimal Standards

1. Summer Conditions:
 - a. Air conditioning shall be provided.
 - b. Each of the following spaces shall have individual thermostat and zone control:
 - i. Each educational classroom.
 - ii. Science, art, and music labs and libraries.
 - iii. Offices and student services suites.
 - c. Humidity control shall be incidental to mechanical cooling (no active humidity control).
 - d. Air-handlers and terminal equipment shall be sized for 75 degrees Fahrenheit dry-bulb and 50 percent relative humidity.
 - e. For control set points and operation, 78 degrees Fahrenheit dry-bulb and 50% relative humidity (maximum level 60% relative humidity).
 - f. Normally unoccupied spaces (e.g. mechanical, electrical, janitor’s closet, storage, and elevator machine rooms) shall be designed for 85 degrees Fahrenheit or a temperature rise of 10 degrees Fahrenheit, whichever is less.
 - g. Kitchens and Gymnasiums shall be designed for 80 degrees Fahrenheit dry bulb.
 - h. Natatoriums shall be designed for 80 degrees Fahrenheit dry bulb @ 60 percent relative humidity.

¹ Wikipedia, en.wikipedia.org/wiki/Dry-bulb_temperature

² Wikipedia, en.wikipedia.org/wiki/Relative_humidity



- i. Natatorium mechanical units, or any make-up air units that provide 100 percent outside air, shall be designed in accordance with the *American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards* at 0.4% of the dehumidification design conditions for outside air (84.2 deg F wet-bulb/76 deg F dry-bulb).
- 2. Winter Conditions:
 - a. Each educational space shall have individual thermostat and zone control.
 - b. Humidity control shall be incidental to mechanical heating (no active humidity control).
 - c. Mechanical equipment shall be designed to provide the following:
 - i. Normally occupied and transient spaces shall be designed for 70 degrees Fahrenheit dry-bulb and 25 percent relative humidity (or level set by *ASHRAE 55*).
 - ii. Normally unoccupied spaces, such as storage, mechanical, and electrical rooms, and janitor closets, shall be designed for 60 degrees Fahrenheit dry bulb and 25 percent relative humidity.
 - iii. When designing mechanical equipment to provide the interior conditions detailed above, the outdoor conditions used for design calculations shall be negative 10 degrees Fahrenheit dry-bulb (exceeds *ASHRAE 99.6* percent dry-bulb), or conditions prescribed by the Chicago Building Code.

Minimum Standards

- 1. Summer Conditions:
 - a. Air conditioning (mechanical ventilation) is not required.
 - i. Where air conditioning (mechanical ventilation) exists, the mechanical system shall be capable of maintaining a maximum indoor temperature of 78 degrees Fahrenheit during the hours the building is scheduled to be occupied. Cooling mode shall be available from April through October.
 - 1. Spaces that are normally unoccupied, such as storage rooms and janitor closets, shall be maintained at 85 degrees Fahrenheit.
 - 2. Natatoriums, kitchens, and gymnasiums shall be maintained at 80 degrees Fahrenheit.
 - b. No active humidity control shall be provided. Humidity control shall be incidental to mechanical cooling.
- 2. Winter Conditions:
 - a. Heating for schools shall be provided by systems utilizing gravity-fed or forced circulation hot water, low-pressure steam, warm air, radiant panels, gravity-fed or forced circulation space heaters, or electric heating units or panels.
 - b. Specific to schools built by CPS, heating systems serving assembly and educational spaces having an occupant load of more than 20 persons shall be provided with zone temperature control, individual to each room.



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- c. Heating systems shall be capable of maintaining a minimum indoor temperature of 70 degrees Fahrenheit during the hours the building is scheduled to be occupied. Heating mode shall be available from October through May.
 - i. Spaces that are normally unoccupied, such as storage rooms and janitor closets, shall be maintained at 60 degrees Fahrenheit during occupied periods and 50 degrees Fahrenheit during unoccupied periods.
 - ii. No occupied space shall fall below 55 degrees Fahrenheit at any time.



WALKABILITY

"Walkability reflects overall walking conditions in an area. Walkability takes into account the quality of pedestrian facilities, roadway conditions, land use patterns, community support, security and comfort for walking."

- *Walkability Improvements, Strategies to Make Walking Convenient, Safe and Pleasant*; Victoria Transport Policy Institute; June 9, 2011

Chicago is considered to be one of the most walkable cities in the country, with an average score of 78 (very walkable) awarded by *WalkScore* (www.walkscore.com). Chicago provides a regular, consistent grid of connected, well illuminated streets through a densely populated urban environment that has an extensive system of broad concrete sidewalks. Residents are afforded multiple options for walking routes between two points, which help residents avoid areas in poor physical condition, and assist with issues of personal and perceived safety.

Walkability is affected by many elements and features within the built environment, many of which CPS has limited, or no, control over. CPS can control only those elements that exist upon CPS property, including condition of walkways/sidewalks, access to building entries, exterior/site lighting, views/connectedness to the sidewalk from the building, and control of litter/debris. Other elements, such as conditions at street intersections and street crossings, the existence of abandoned buildings or open lots, and adequate lighting levels along a student's route to a particular school are beyond the control of CPS.

Optimal Standards

1. Students required to walk more than 1 1/2 miles to school must be provided transportation per the *Illinois Transportation School Code (105 ILCS 5)*.
2. On the school property:
 - a. Pedestrian access shall be provided from the adjoining neighborhood in each direction to the building entry.
 - b. External site lighting shall provide even illumination intensity of at least 2-1/2 foot-candles, if so requested by the school.
3. CPS shall evaluate each request for transportation due to hardship, including physical barriers (breaks within a route) in the urban environment.
 - a. The City of Chicago shall work with CPS, including information from students and parents, to ensure breaks in routes, including areas in poor condition, within the urban environment are repaired.

Minimum Standards

1. Students required to walk more than 1 1/2 miles to school must be provided transportation per the *Illinois Transportation School Code (105 ILCS 5)*.
2. On the school property:
 - a. Pedestrian access shall be provided from the adjoining neighborhood in each direction to the building entry.
3. CPS shall evaluate each request for transportation due to hardship, including physical barriers (breaks within a route) in the urban environment.