

**COLORADO DEPARTMENT OF EDUCATION**  
**DIVISION OF PUBLIC SCHOOL CAPITAL CONSTRUCTION ASSISTANCE**

**1 CCR 303(1)**

**PUBLIC SCHOOL FACILITY CONSTRUCTION GUIDELINES**

**Article 1 – Purpose and Authority to Promulgate Rules**

1.1. Purpose

1.1.1. Section 22-43.7-107(1)(a), C.R.S. states, The board shall establish public school facility construction guidelines for use by the board in assessing and prioritizing public school capital construction needs throughout the state as required by section 22-43.7-108, C.R.S. reviewing applications for financial assistance, and making recommendations to the state board regarding appropriate allocation of awards of financial assistance from the assistance fund only to applicants. The board shall establish the guidelines in rules promulgated in accordance with article 4 of title 24, C.R.S.

1.1.2. Section 22-43.7-107(1)(b), C.R.S. states, It is the intent of the general assembly that the Public School Facility Construction Guidelines established by the board be used only for the purposes specified in section 1.1.1 above.

1.1.3. The Public School Facility Construction Guidelines shall identify and describe the capital construction, renovation, and equipment needs in public school facilities and means of addressing those needs that will provide educational and safety benefits at a reasonable cost.

1.2. Statutory Authority

1.2.1. Section 22-43.7-106(2)(i)(I) C.R.S. states, the board may promulgate rules in accordance with article 4 of title 24, C.R.S. The board is directed to establish Public School Facility Construction Guidelines in rule pursuant to 22-43.7-107(1)(a), C.R.S.

**Article 2 – Definitions**

2.1. The definitions provided in 22-43.7-103, C.R.S., shall apply to these rules. The following additional definitions shall also apply:

“C.R.S.” means Colorado Revised Statutes.

“ES” means Elementary School.

“F.T.E.s” means Full Time Equivalent Students.

“Gross Square Feet (GSF)” means the total area of the building (inclusive of all levels as applicable) of a building within the outside faces of the exterior walls, including all vertical circulation and other shaft (HVAC) areas connecting one floor to another.

“Guidelines” means the Public School Facility Construction Guidelines.

“Historical significance” means having importance in the history, architecture, archaeology, or culture of this state or any political subdivision thereof or of the United States, as determined by the state historical society.

“HS” means High School.

“K12” means Kindergarten through 12<sup>th</sup> Grade School that is under all one facility / campus.

“MS” means Middle School.

“SF” means Square Foot.

“S.T.E.M.” means Science, Technology, Engineering, & Mathematics.

### **Article 3 – Codes, Documents and Standards incorporated by reference**

- 3.1. The following materials are incorporated by reference within the Public School Facility Construction Guidelines:
  - 3.1.1. ASHRAE 90.1-2013 Energy Standard for Buildings Except Low-Rise Residential Buildings.
  - 3.1.2. ASHRAE Standard Benchmark Energy Utilization Index (October 2009).
  - 3.1.3. ASHRAE Standard 189.1 - 2011 Standard for the Design of High-Performance Green Buildings.
  - 3.1.4. ANSI S12.60, Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools (2010).
  - 3.1.5. International Code Council’s International Plumbing Code (2015).
  - 3.1.6. National Fire Protection Association 70: National Electrical Code (2014).
  - 3.1.7. LEED 2009 for Schools New Construction and Major Renovations.
  - 3.1.8. CO-CHPS Criteria for New Construction and Major Modernizations (2009).
  - 3.1.9. ASHRAE Standard 62.1-2013 Ventilation for Acceptable Indoor Air Quality (2013).
  - 3.1.10. Environmental Protection Agency’s Safe Water Drinking Act (1996).
  - 3.1.11. All projects shall be constructed and maintained in accordance with the codes and regulations as currently adopted by the Colorado Division of Fire Prevention & Control in 8 CCR 1507-30, which incorporates current building, fire, existing building, mechanical, and energy conservation codes.
- 3.2. The Division shall maintain copies of the complete texts of the referenced incorporated materials, which are available for public inspection during regular business hours with copies available at a reasonable charge. Interested parties may inspect the referenced incorporated materials by contacting the Director of the Division of Public School Capital Construction Assistance, 1580 Logan Street, Suite 310, Denver, Colorado 80203.
- 3.3. This rule does not include later amendments or editions of the incorporated material.

### **Article 4 - These Guidelines are not mandatory standards to be imposed on school districts, charter schools, institute charter schools, the boards of cooperative services or the Colorado School for the Deaf and Blind. As required by statute, the Guidelines address:**

- 4.1 **Health and safety issues, including security needs and all applicable health, safety and environmental codes and standards as required by state and federal law. Public school facility accessibility.**
  - 4.1.1 **Sound building structures.** Each building should be constructed and maintained with sound structural foundation, floor, wall and roof systems.
    - 4.1.1.1 - All building structures shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30 and ANSI S12.60, Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools.

4.1.2 **Roofs.** A weather-tight roof that drains water positively off the roof and discharges the water off and away from the building. All roofs shall be installed by a qualified contractor who is approved by the roofing manufacturer to install the specified roof system and shall receive the specified warranty upon completion of the roof. The National Roofing Contractors Association divides roofing into two generic classifications: low-slope roofing and steep-slope roofing. Low-slope roofing includes water impermeable, or weatherproof types of roof membranes installed on slopes of less than or equal to 3:12 (fourteen degrees). Steep slope roofing includes water-shedding types of roof coverings installed on slopes exceeding 3:12 (fourteen degrees).

4.1.2.1 - Low slope roofing systems:

4.1.2.1.1- Built-up – minimum 4 ply, type IV fiberglass felt, asphalt BUR system. Gravel or cap sheet surfacing required.

4.1.2.1.2- Ethylene Propylene Diene Monomer - minimum 60 mil EPDM membrane, with a ballasted or adhered system.

4.1.2.1.3- Poly Vinyl Chloride - minimum 60 mil PVC membrane adhered or mechanically attached systems.

4.1.2.1.4- Thermal Polyolefin - minimum 60 mil membrane adhered or mechanically attached systems.

4.1.2.1.5- Polymer-modified bitumen sheet membrane - Styrene-Butadiene-Styrene (SBS) membranes only, to be used only as a component of a built-up system noted above.

4.1.2.2 - Steep slope roofing systems:

4.1.2.2.1- Asphalt shingles - minimum 50 year spec asphalt shingles, UL Class A.

4.1.2.2.2- Clay tile and concrete tile - minimum 50 year spec clay or concrete tile, UL Class A.

4.1.2.2.3- Metal roof systems for steep-slope applications - minimum 24 gage prefinished steel, standing seam roof system with a minimum 1.5" seam height.

4.1.2.2.4- Slate - ¼" minimum thickness, 50 year spec. UL Class A.

4.1.2.2.5- Synthetic shingles - minimum 50 year spec, UL Class A.

4.1.3 **Electrical and distribution systems.** Safe and secure electrical service and distribution systems designed and installed to meet the National Fire Protection Association 70: National Electrical Code (2014), and ASHRAE 90.1-2013 Energy Standard for Buildings Except Low-Rise Residential Buildings.

4.1.3.1– Energy use intensity should not exceed the U.S. Department of Energy (DOE) building benchmarks, and shall conform to ASHRAE Standard Benchmark Energy Utilization Index (October 2009).

4.1.3.2- Emergency lighting shall operate when normal lighting systems fail in locations and shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30.

4.1.4 **Mechanical systems.** A safe and efficient mechanical system that provides proper ventilation, proper sound levels and maintains the building temperature and relative humidity. The mechanical system shall be designed, maintained and installed utilizing current State and Federal building codes, and shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30.

4.1.4.1 - Healthy building indoor air quality (IAQ) through the use of the mechanical heating, ventilation and air conditioning (HVAC) systems or operable windows and by reducing air infiltration and water penetration with a tight building envelope.

- 4.1.4.2 - Mechanical systems shall comply with: ASHRAE Standard 62.1-2013 Ventilation for Acceptable Indoor Air Quality, ASHRAE 90.1-2013 Energy Standard for Buildings Except Low-Rise Residential Buildings, and ASHRAE Standard 189.1-2014 Standard for the Design of High-Performance Green Buildings.
- 4.1.5 **Plumbing.** A potable water source and supply system that complies with the Colorado Primary Drinking Water Regulations, 5 CCR 1003-1, the Environmental Protection Agency's Safe Water Drinking Act, and the International Code Council's 2015 International Plumbing Code.
- 4.1.6 **Fire management.** Building fire alarm and emergency notification systems in all school facilities shall be designed in accordance with state requirements. Exceptions include unoccupied very small single story buildings, sheds and temporary facilities where code required systems are not mandatory and the occupancy does not warrant a system. All fire management systems shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30.
- 4.1.6.1 - Types of fire alarm notifications systems.
- 4.1.6.1.1 – Internal audible and visual alarms.
- 4.1.6.1.2 – External alarm monitoring and dispatch via internet / modem, telephone, radio, or cellular monitoring systems.
- 4.1.6.2 - Types of fire suppression systems.
- 4.1.6.2.1 - Fire hydrants.
- 4.1.6.2.2 - Static fire water storage tanks.
- 4.1.7 **Paths of egress.** A continuous and unobstructed path of egress from any point in the school that provides accessible routes to an area of refuge, a horizontal exit, or public way. A facility code analysis shall be conducted to determine all code requirements.
- 4.1.8 **Facilities with safely managed hazardous materials.** Potential hazardous materials in building components, which are identified in the Asbestos Hazard Emergency Response Act (AHERA) report, may include: asbestos, radon, lead, lamps and devices containing mercury. Additional hazardous materials may include: science chemicals, cleaning chemicals, blood-borne pathogens, acid neutralization tank for science departments, and bulk fuel storage (UST/AST) management that may be stored by the occupant.
- 4.1.8.1 - Public schools shall comply with all AHERA criteria and develop, maintain, and update an asbestos management plan, to be kept on record at the school district. This should include a building survey of the exterior of the building, and identification of all friable, non-friable, and trace asbestos materials. Reference regulation Number 8, Control of Hazardous Air Pollutants, 5 CCR 1001-10.
- 4.1.8.2 - All new facilities and additions shall conduct radon testing following completion of construction within nineteen months after occupancy as required by Colorado Department of Public Health and Environment, 6 CCR 1010-6.
- 4.1.8.3 - Lead based paint. All schools shall conform to the regulations adopted by the Colorado Air Quality Control Commission governing the abatement of lead-based paint from target housing (constructed prior to 1978) and child-occupied facilities, reference C.R.S. 25-5-1101.
- 4.1.9 **Security.** The degree of resistance to, or protection from, harm. It applies to any vulnerable and valuable asset; such as a person, building or dwelling. Security provides "a form of protection where a separation is created between the assets and the threat." These separations are generically called

"controls," and sometimes include changes to the asset or the threat. These separations and degrees of resistance can be achieved through several models and techniques.

#### 4.1.9.1 - Video Management Systems (VMS).

4.1.9.1.1- Cameras. Cameras are typically used to implement a video management system. In new construction, these should be internet protocol (IP) cameras on Power over Ethernet (PoE) cabling infrastructure, high definition over coax cameras, or analog cameras. Cameras should support motion activation, pan-tilt-zoom functionality, and standard video compression.

4.1.9.1.2- Closed circuit or IP video recorders. A central video management system should be capable of monitoring live feeds from multiple cameras from a central location, recording to digital media. Acceptable recorders include: network video recorder (NVR), high-definition composite video interface (HD-CVI), digital video recorder (DVR).

4.1.9.1.3- All video management systems should be integrated into their local first responder's alert notification system.

#### 4.1.9.2 - Controlled access.

##### 4.1.9.2.1 - Manual.

4.1.9.2.1.1 - The number of entryways into the building or onto the campus should be limited. New construction shall be designed to restrict normal entrance to only one or two locations, with no recessed doorways, provided that sufficient entryways are available for fire department access and shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30.

4.1.9.2.1.2 - All exterior doors shall be locking and equipped with panic bars to open readily from the egress side. Panic bars should utilize flush push bar hardware to prevent chaining doors shut.

4.1.9.2.1.2.1 - Unless a door is intended for ingress, exterior doors should not have handles and locks on the outside. In all cases exposed hardware should be minimized, provided that sufficient entryways are available for fire department access and shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30.

4.1.9.2.1.3 - Doors should be constructed of steel, aluminum alloy, or solid-core hardwood. If necessary, glass doors should be fully framed and equipped with burglar-resistant tempered glass. Translucent glass should be avoided in all cases.

4.1.9.2.1.4 - Exit doors with panic push-bars should be "Access Control Doors" per the codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30, to prevent easy access by criminals and vandals, or in a lock-down / lock-out situation.

4.1.9.2.1.5 - Heavy-duty metal or solid-core wooden doors should be used at entrances in areas containing expensive items. These areas include classrooms, storerooms, and custodians' rooms. Interior doorway doors should also be heavy-duty metal or solid-core wooden doors.

4.1.9.2.1.6 - Door hinges should have non-removable pins.

4.1.9.2.1.7 - Door frames should be constructed of pry-proof material.

4.1.9.2.1.8 - Armored strike plates shall be securely fastened to the door frame in direct alignment to receive the latch easily.

4.1.9.2.2- Automated. Acceptable automated controlled access includes: automatic identification card/badge readers.

4.1.9.2.2.1 - Faculty, staff, and administration. School personnel may be issued additional tools for authenticating their identity in order to maintain efficient access to school facilities.

4.1.9.2.2.2 - Student. Schools shall expect students to carry some form of verifiable identification, if automated access to school facilities is to be provided.

#### 4.1.9.3 - Front door security

4.1.9.3.1- Building vestibules. Where appropriate, buildings shall employ double entry door designs that provide a secured area for visitors to authenticate and gain clearance. Known as “man traps”, security vestibules solve several common security issues such as students opening doors for visitors, visitors bypassing check-in points, direct access to the interior from attackers, piggy-back entrances, and propped doors.

4.1.9.3.2- Video entrance systems. Building designs shall allow for school personnel to be able to monitor incoming visitors from a safe location out of reach, or line of site from incoming visitors who have not yet been authenticated or cleared for entry. These entry points shall use remote video and access control technology to conduct multi-factor authentication of incoming visitors (e.g. visual verification and ID, PIN/password and ID, or biometric and other form of visual identification).

4.1.9.3.2.1 - Video entrance systems shall use IP technology to allow access control to be conducted by school personnel from multiple locations, so that multiple personnel can provide coverage for screening incoming visitors, eliminating entry system override or “door propping”.

4.1.9.3.2.2 - Video entrance systems shall be integrated with school communication, alarm, or school database systems to allow personnel to screen visitors.

4.1.9.3.3- Line of sight. The front entrance should be designed to maximize the line of sight distance for school occupants to detect an intruder from each relevant perimeter (e.g. classroom to hallway, office or guard station to entryway, or entryway to exterior fence access, or exterior fence access to property perimeter).

4.1.9.4- Door lock / intrusion detection. Doors should have sufficient data cabling to a central interim distribution frame (IDF) or master distribution frame (MDF) to support access control/door release mechanisms, door sensors, IP Authentication sensors, and/or IP surveillance cameras as well as power cabling sufficient to support such hardware.

4.1.9.4.1- Interior classroom doors shall have locking hardware for lock downs, which does not interfere with automatic closing and latching functions required by the fire code and may

have door sidelights, or door vision glass that allow line of sight into the corridors during emergencies, and shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30.

- 4.1.9.5 - Event alerting and notification (EAN) system. An EAN system that utilizes an intercom / phone system with communication devices located in all classrooms and throughout the school to provide efficient inter-school communications, and communication with local fire, police, and medical agencies during emergency situations.
- 4.1.9.6 - Secure sites should include the following:
  - 4.1.9.6.1 - Locations to avoid.
  - 4.1.9.6.2 - Location of utilities.
  - 4.1.9.6.3 - Roof access.
  - 4.1.9.6.4 - Lighted walkways.
  - 4.1.9.6.5 - Secured playgrounds.
  - 4.1.9.6.6 - Bollards at main entrances and shop areas with overhead doors.
  - 4.1.9.6.7 - Signage.
- 4.1.10 **Health code standards.** Schools, including labs, shops, vocational and other areas with hazardous substances shall conform to the Department Of Public Health and Environment Rules and Regulations Governing Schools: 6 CCR 1010-6.
- 4.1.11 **Food preparation equipment and maintenance.** Food preparation and associated facilities equipped and maintained to provide sanitary facilities for the preparation, distribution, and storage of food as required by Colorado Retail Food Establishment Rules and Regulations: 6 CCR 1010-2.
- 4.1.12 **Emergency care room.** A separate emergency care room shall be provided. This room shall have a dedicated bathroom, and shall comply with the Department Of Public Health and Environment Rules and Regulations Governing Schools 6 CCR 1010-6.
- 4.1.13 **A site that safely separates pedestrian and vehicular traffic and is laid out with the following guidelines:**
  - 4.1.13.1 - Physical routes for basic modes (busses, cars, pedestrians, and bicycles) of traffic should be separated as much as possible from each other. If schools are located on busy streets and/or high traffic intersections, coordinate with the applicable municipality or county to provide for adequate signage, traffic lights, and crosswalk signals to assist school traffic in entering the regular traffic flow.
  - 4.1.13.2 - When possible, provide a dedicated bus staging and unloading area located away from students, staff, and visitor parking.
  - 4.1.13.3 - Provide an adequate driveway zone for stacking cars on site for parent drop-off/pick-up zones. Drop-off area design should not require backward movement by vehicles, and be one-way in a counterclockwise direction where students are loaded and unloaded directly to the

curb/sidewalk. Students should not have to load or unload where they have to cross a vehicle path before entering the building. It is recommended all loading areas have "No Parking" signs posted.

4.1.13.4 - Provide well-maintained sidewalks and a designated safe path leading to the school entrance(s).

4.1.13.5 - Building service loading areas and docks should be independent from other traffic and pedestrian crosswalks. If possible, loading areas shall be located away from school pedestrian entries.

4.1.13.6 - Facilities should provide bicycle access and storage.

4.1.13.7 - Fire lanes shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30.

4.1.13.8 - Playgrounds shall comply with the Americans with Disabilities Act and shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30.

**4.1.14 Severe weather preparedness.**

4.1.14.1 - Designated emergency shelters shall be constructed as category IV buildings and shall conform to all applicable codes adopted by the Colorado Division of Fire Prevention and Control in 8 CCR 1507-30.

**4.2 Technology, including but not limited to telecommunications and internet connectivity technology and technology for individual student learning and classroom instruction.**

4.2.1 Educational facilities for individual student learning, classroom instruction, online instruction and associated technologies, connected to the Colorado institutions of higher education distant learning networks "Internet" and "Internet two."

4.2.2 Educational facilities with standards based wired and wireless network connectivity.

4.2.3 Security and associated filtering and intrusion control for internal voice, video and data networks.

4.2.4 External internet service provider (ISP) connection and internal wide area network (WAN) connections meeting or exceeding recommended guidelines of the state education technology education directors association (SETDA) broadband imperative, and devices meeting or exceeding recommended specifications according to the most current version of technology guidelines for the partnership for assessment of readiness for college and careers (PARCC) assessments.

4.2.5 Provide school administrative offices with web-based activity access.

4.2.6 Administrative software individual educational programs (IEP), individual learning programs (ILP), and personal learning plans (PLP).

4.2.7 Emergency power backup, redundant a/c for voice, video and data systems.

4.2.8 Bi-Directional Amplification (BDA). Signal boosters that enhance in-building signals across a range of frequencies.

4.2.9 Building shall be constructed with long-term sustainable technology infrastructure. Facilities should be built with sufficient data cabling and/or conduit and power infrastructure to allow for maximum flexibility

as technological systems are upgraded and replaced in the future. A plan for technology lifecycle review intervals should be put in place for review at 2-4 year intervals.

#### 4.2.10 Data center and non-data centers.

4.2.10.1 - Uninterruptible power center (UPS). IDF and MDF locations should be wired with 30 Amp or 40 Amp power circuits to support sufficient backup power systems to maintain secure systems operation during a power outage, or intentional school attack.

4.2.10.1.1 - Data center and non-data centers should be backed up by a generator.

#### 4.2.11 Connectivity standards.

4.2.11.1 - Wireless. Data cabling shall be planned to support appropriately spaced multiple-antenna wireless networking infrastructure allowing for a centrally located antenna every 2500 to 5000 square feet (or preferably performing a professional site survey/ resonance analysis). Support for 802.11b/g/n, 802.11ac, and/or newer protocols are recommended.

4.2.11.2 - Wired.

4.2.11.2.1 - Cabling. All new runs of copper data cable should be augmented category 6 cable or newer standards. Any data jack should be backed by two cable runs.

4.2.11.2.2 - Intermediate distribution frame (IDF) or Main distribution frame (MDF). Data closets shall be connected by conduit and fiber optic cable to allow for maximum data performance and upgradeability.

4.2.11.2.3 - IDF or MDF to classroom. Classrooms should have a data jack on the wall at the front and back of the room as well as data cable to the door for access control and a data jack on the ceiling near the front of the room for projection and/or smart board equipment as well as security/PA/clock devices.

4.2.11.2.4 - IDF to office, and library or technology/media centers. Any areas designed for independent work or study should have a dedicated data jack with two copper cable runs each.

4.2.11.2.5 - IDF to common areas, auditorium, and cafeteria. Common areas should contain one data jack per forty feet of linear wall space and such jacks shall be distributed at reasonably equal spacing throughout the room.

### **4.3 Building site requirements. Functionality of existing and planned public school facilities for core educational programs, particularly those educational programs for which the State Board has adopted state model content standards. Capacity of existing and planned public school facilities, taking into consideration potential expansion of services for the benefit of students such as full-day kindergarten and preschool- and school-based health services and programs.**

#### 4.3.1 Traditional education model, S.T.E.M. & Montessori / Expeditionary education models.

4.3.1.1 - Minimum occupancy requirements for schools:

Median Gross Square Foot (GSF) Per Pupil								
F.T.E.s	Traditional ES (K-5)		Traditional MS (6-8)		Traditional HS (9-12)		Traditional K-12	
	GSF/Pupil	Total GSF	GSF/Pupil	Total GSF	GSF/Pupil	Total GSF	GSF/Pupil	Total GSF
100	151	15,064	161	16,102	192	19,183	164	16,393
200	146	29,197	159	31,813	190	38,030	161	32,298
300	141	42,401	157	47,136	188	56,540	159	47,715
400	137	54,674	155	62,068	187	74,713	157	62,645
500	132	66,017	153	76,610	185	92,550	154	77,087
600	127	76,429	151	90,763	183	110,050	152	91,041
700	123	85,912	149	104,526	182	127,214	149	104,508
800	118	94,464	147	117,899	180	144,041	147	117,488
900	113	102,086	145	130,883	178	160,531	144	129,979
1000	109	108,778	143	143,476	177	176,685	142	141,984
1100	104	114,540	142	155,680	175	192,502	140	153,500
1200	99	119,371	140	167,494	173	207,982	137	164,529

Median Gross Square Foot Per Pupil - Alternate Programs (Expeditionary (Exp.), Montessori (Mtsri.), S.T.E.M.)												
F.T.E.s	Alt. ES (GSF/Pupil)			Alt. MS (GSF/Pupil)			Alt. HS (GSF/Pupil)			Alt. K12 (GSF/Pupil)		
	Exp.	Mtsri.	S.T.E.M.	Exp.	Mtsri.	S.T.E.M.	Exp.	Mtsri.	S.T.E.M.	Exp.	Mtsri.	S.T.E.M.
100	160	161	156	171	169	166	203	198	201	174	172	180
200	155	156	151	169	167	164	202	196	199	171	170	177
300	150	151	146	167	165	162	200	194	197	169	167	175
400	145	146	141	164	163	160	198	192	195	166	164	172
500	140	141	137	162	161	158	196	191	194	163	162	169
600	135	136	132	160	159	156	194	189	192	161	159	167
700	130	131	127	158	157	154	193	187	190	158	157	164
800	125	126	122	156	155	152	191	185	188	156	154	161
900	120	121	117	154	153	150	189	184	187	153	152	159
1000	115	116	113	152	151	148	187	182	185	151	149	156
1100	110	111	108	150	149	146	186	180	183	148	146	153
1200	105	106	103	148	147	144	184	179	181	145	144	151

Square Foot Values - Assembly									
F.T.E.s	ES Assembly		MS Assembly		HS Assembly		K12 Assembly		
	Cafeteria	Auditorium	Cafeteria	Auditorium	Cafeteria	Auditorium	Cafeteria	Auditorium	
100	675	1,300	675	1,500	675	1,700	675	1,700	
200	1,200	1,600	1,200	1,800	1,200	2,000	1,200	2,000	
300	1,800	1,900	1,800	2,100	1,800	2,300	1,800	2,300	
400	2,400	2,400	2,400	2,600	2,400	2,800	2,400	2,800	
500	3,000	2,700	3,000	2,900	3,000	3,100	3,000	3,100	
600	3,600	3,000	3,600	3,200	3,600	3,400	3,600	3,400	
700	4,200	3,900	4,200	3,900	4,200	3,900	4,200	3,900	
800	4,800	4,200	4,800	4,200	4,800	4,200	4,800	4,200	
900	5,400	4,500	5,400	4,500	5,400	4,500	5,400	4,500	
1000	6,000	4,800	6,000	4,800	6,000	4,800	6,000	4,800	
1100	6,600	5,100	6,600	5,100	6,600	5,100	6,600	5,100	
1200	7,200	5,400	7,200	5,400	7,200	5,400	7,200	5,400	

- Cafeteria Capacity assumes three (3) seatings without a secondary function overlay.

- Auditorium Capacity SF is sized for 1/3 of General enrollment and is inclusive of stage (size varies: 1,000 to 1,800); Basis is 9 SF per seat (1/3 FTES) plus stage at various sizes, stage includes a small amount of storage or similar support.

Square Foot (SF) Values - Core Classrooms (Minimum (Min) classroom size = 675 sf)								
F.T.E.s	ES Min (24-30 FTES)		MS Min (24-30 FTES)		HS Min (24-30 FTES)		K12 Min (24-30 FTES)	
	SF/Pupil	Total SF	SF/Pupil	Total SF	SF/Pupil	Total SF	SF/Pupil	Total SF
Kindergarten	38	1,140	-	-	-	-	38	1,140
Grade 1	32	960	-	-	-	-	32	960
Grade 2	32	960	-	-	-	-	32	960
Grade 3	32	960	-	-	-	-	32	960
Grade 4	30	900	-	-	-	-	30	900
Grade 5	30	900	-	-	-	-	30	900
Grade 6	-	-	30	900	-	-	30	900
Grade 7	-	-	28	840	-	-	28	840
Grade 8	-	-	28	840	-	-	28	840
Grade 9	-	-	-	-	28	840	28	840
Grade 10	-	-	-	-	28	840	28	840
Grade 11	-	-	-	-	28	840	28	840
Grade 12	-	-	-	-	28	840	28	840
Montessori	40	1,200	40	1,200	40	1,200	40	1,200
Expeditionary	36	1,080	36	1,080	36	1,080	36	1,080

Square Foot (SF) Values - Exploratory Spaces (minimum size = 675 sf)								
F.T.E.s	ES Min (24-30 F.T.E.s)		MS Min (24-30 F.T.E.s)		HS Min (24-30 F.T.E.s)		K12 Min (24-30 F.T.E.s)	
	SF/Pupil	Total SF	SF/Pupil	Total SF	SF/Pupil	Total SF	SF/Pupil	Total SF
Comp/Tech	30		32	-	32	-	32	
Music	35		35	-	35	-	35	
Science	38		40		44		44	
Lecture	28		28		28		28	
Art	35		40		45		45	
Gym / MP	3,000 SF (50'x60')		5,400 SF (60'x90')		7,300 SF (70'x104')		7,300 SF (70'x104')	
Special Ed	37		37		37		37	
VoAg	-	-	-	-	60	-	60	-
Media Center	1200 sf (30 occ)		2400 sf (60 occ)		3600 sf (60 occ)		3600 sf (60 occ)	
"Gymatorium"	4,400 SF (See notes)		4,400 SF (See notes)		-		-	

- ES Gymnasium basis is 50'X60' play area; Capacity Assumes (GE\*.25)/7 periods (without fixed seats)
- MS Gymnasium basis is 60'X90' play area; Capacity Assumes (GE\*.5)/7 periods (without fixed seats)
- HS Gymnasium basis is 70'X104' practice gym; Capacity Assumes (GE\*.5)/7 periods (with limited fixed seats) Note: National Federation of State High School Association's standards outline an "ideal" court for high school age as 84'x50' (and not greater than 94'x50')
- "Gymatorium" basis is 50'x60' play area and 1000 SF platform stage with 400 SF storage

Instructor / Support Areas		
Space Type:	Square Feet	Notes:
Office - typical	120	
Office - large	150	
Work room	250	Multiple individual (or in aggregate) may be required due to scale
Team planning (conf)	240	12-16 occupants (assembly use)
Instruction - sm group	320	16 occupants (classroom use)
Storage	50	Ave per instructor
Staff toilets	50	Multiple may be required due to scale

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#### 4.3.2 Other rooms.

4.3.2.1 - Facilities with preschools shall comply with Rules Regulating Child Care Centers (Less Than 24-Hour Care) 12 CCR 2509-8 and shall comply with the Colorado Department of Public Health and Safety's Regulations Governing Child Care, 6 CCR 1010-7.

4.3.2.2- Special education classrooms. Special Education classrooms and facilities meeting or exceeding the accessibility and adaptive needs of the current and reasonably anticipated student population, in accordance with Section 504 and Title II of the Americans with Disabilities Act, the Exceptional Children's Educational Act, and Individuals with Disabilities Education Act.

#### **4.4 Building performance standards and guidelines for green building and energy efficiency.**

Section 24-30-1305.5 C.R.S., requires all new facilities, additions, and renovation projects funded with 25% or more of state funds to conform with the High Performance Certification Program (HPCP) policy adopted by the Office of the State Architect (OSA) if:

- The new facility, addition, or renovation project contains 5,000 or more building square feet; and
- The project includes an HVAC system; and
- If increased initial cost resulting from HPCP can be recouped by decreased operational costs within 15 years, and
- In the case of a renovation project, the cost of the renovation exceeds 25% of the current value of the property.

##### **4.4.1 High Performance Certification Programs.**

4.4.1.1 - Leadership in Energy and Environmental Design (LEED) for schools. Reference LEED 2009 for Schools New Construction and Major Renovations.

4.4.1.1.1- LEED is an internationally recognized certification system that measures a building using several metrics, including: energy savings, water efficiency, sustainable land use, improved air quality, and stewardship of natural resources.

4.4.1.1.2- Points are awarded on a 100-point scale, and credits are weighted to reflect their potential environmental impacts. Different levels of certification are granted based on the total number of earned points. The four progressive levels of certification from lowest to highest are: certified, silver, gold and platinum.

4.4.1.2 - Colorado Collaborative for High Performance Schools (CO-CHPS).

4.4.1.2.1- The CO-CHPS Criteria is a benchmarking system that defines the attributes of a high performance school. The criteria addresses site and materials selection, energy and water efficiency, indoor environmental quality, innovation, performance, and integrated delivery, and provide high performance school strategies that can be used by schools and districts and their design teams for new campuses, buildings and major modernizations.

4.4.1.2.2- The CO-CHPS Criteria for New Construction and Major Modernizations (2009) requires the project achieves a 25% reduction in total energy cost savings compared to ASHRAE 90.1-2013 Energy Standard for Buildings Except Low-Rise Residential Buildings, set an ENERGY STAR goal of at least 75, and use the resulting site Energy Use Intensity (EUI) as a performance target and utilize the Flex Energy design tool.

##### **4.4.2 Renewable energy strategies.**

4.4.2.1 - Solar Photovoltaic / Solar Thermal.

4.4.2.2 - Geothermal / Geo exchange.

4.4.2.3 - Wind.

4.4.2.4 - Passive Solar Design.

##### **4.4.3 Energy management plan.**

4.4.3.1 - Energy programs assist with creating a culture of energy efficiency within a school. Reference Energy Star Guidelines for Energy Management to help develop a plan.

##### **4.4.4 Other energy efficient options.**

4.4.4.1 - ENERGY STAR Labeled HVAC / mechanical systems.

4.4.4.2 - Windows, doors, and skylights (collectively known as fenestration).

#### 4.4.4.3 - Building Envelope.

4.4.4.3.1- The interface between the interior of the building and the outdoor environment, including the walls, roof, and foundation – serves as a thermal barrier and plays an important role in determining the amount of energy necessary to maintain a comfortable indoor environment relative to the outside environment.

4.4.4.3.2- Roof. Roof design and materials can reduce the amount of air conditioning required in hot climates by increasing the amount of solar heat that is reflected, rather than absorbed, by the roof. For example, roofs that qualify for ENERGY STAR® are estimated to reduce the demand for peak cooling by 10 to 15 percent.

4.4.4.3.3- Insulation is important throughout the building envelope.

#### 4.4.4.4 - Lighting.

4.4.4.4.1- Light emitting diodes (LEDs), compact fluorescents (CFLs) and fluorescent lighting should be considered over traditional incandescent lighting.

#### 4.4.4.5 - Commissioning, retro commissioning and re-commissioning.

4.4.4.5.1- Commissioning ensures that a new building operates initially as the owner intended and that building staff are prepared to operate and maintain its systems and equipment.

4.4.4.5.2- Retro commissioning is the application of the commissioning process to existing buildings.

4.4.4.5.3- Re-commissioning is another type of commissioning that occurs when a building that has already been commissioned, undergoes another commissioning process.

4.4.4.6- Measurement and verification. Measurement and verification (M&V) is the term given to the process for quantifying savings delivered by an Energy Conservation Measure (ECM), as well as the sub-sector of the energy industry involved with this practice. M & V demonstrates how much energy the ECM has avoided using, rather than the total cost saved.

#### 4.4.4.7 - Landscaping.

### **4.5 The historic significance of existing public school facilities and their potential to meet current programming needs by rehabilitating such facilities.**

4.5.1 Buildings that are 50 years or older at the time of application may be subject to the State Register Act 24-80.1-101 to 108 in determining if the affected properties have historical significance.

4.5.1.1 - Historical significance means having importance in the history, architecture, archaeology, or culture of this state or any political subdivision thereof or of the United States, as determined by the state historical society.

4.5.2 When determining if a facility should be replaced, the cost to rehabilitate versus the cost to replace should be evaluated.