



CHARLESTON COUNTY SCHOOL DISTRICT

TECHNOLOGY STANDARDS FOR SCHOOL FACILITIES

HIGH

Department of Information Technology
Charleston County School District
Charleston, South Carolina

August 25, 2006
Version 2006.2

Charleston County School District

Technology Standards for School Facilities

Purpose

These Technology Standards for School Facilities are to ensure that technology actively supports the educational and administrative requirements of the schools. The standards are to provide for cost-effective access to electronic resources, at any time and any location in a school, using a rapidly evolving variety of end-user devices. The technology defined in the standards is to be adaptable to needs of individual teachers, administrators, and students.

These standards are designed to accommodate rapid changes in information technology during the long life of school facilities. The standards are to be updated as changes occur in the educational program and in the technology industry.

Types of Technology Standards

Technology Standards for School Facilities are guidelines for technical infrastructure and end-user equipment installed in schools. Therefore they are reflected in the Technology Standards for Products used for procurement and in the Technology Infrastructure Design Specifications incorporated in construction documents and contracts.

Applicability

These standards apply to new construction and complete rehabilitation of school facilities. The standards apply to existing facilities being partially renovated, upgraded or retrofitted to the extent they can be implemented cost-effectively within the total scope and cost of the project. Where existing conditions in retrofit projects preclude meeting these standards, case-by-case decisions must be made as to workable approaches.

Scope of Technology Standards for School Facilities

The standards are organized into three basic school types: elementary, middle and high. Within each school type, guidelines are defined for typical spaces such as typical classrooms, media centers and offices. The standards describe end-of-line equipment and technical infrastructure for the facility overall and for each space.

Unique projects and special use facilities will require modification of these typical guidelines.

The standards refer to related building system requirements for HVAC, electrical and security systems, but requirements for those systems are not specified in these standards.

Overview of Technology Standards for School Facilities

End-of-line devices overall

These standards prescribe a ‘standard classroom kit’ of networked instructional computers, laser printer, teacher computer, classroom telephone, and ceiling projector for video and data in each general purpose classroom. Special purpose classrooms will require modified standards. Video, data, phone and related end-of-line systems are defined for other spaces as well.

Computers

These standards provide for desktop computers for students in typical classrooms and labs, and laptop computers for teachers. Laptops can increase mobility and can be used with wireless access where available. Providing laptops for teachers requires that they adhere to security standards and accept responsibility for equipment taken off premises. Where these requirements may not be feasible, desktop computers can be substituted for teaching staff. Wireless tablets and other handheld devices may have widespread use by students and staff in the future.

Audio

At least one phone is proposed for every classroom and work space. The school phone systems are designed for voice mail and many other features, and for future integration into a unified CCSD phone network with five-digit dialing. The standard public address system is to be integrated with the building phone system. While classroom sound-enhancement systems are receiving increased attention, educators currently are divided as to whether they reinforce or detract from student attention to the teacher. Given the District’s small class size goals and the small classroom spaces proposed, these systems are not defined as a standard. Speakers are to be provided with ceiling projectors to provide audio along with video or data displays.

Video and Data Display

Ceiling projectors are recommended as the standard video and data display device for classrooms and conference rooms. They are to be integrated into the video distribution system (through a classroom VCR/DVD device), and equipped with ceiling audio speakers. Projectors are to be connected to the teacher workstation for data display. A flat panel video display is the standard recommended where a separate video display is required, such as in corridors or cafeterias. Cathode ray tube (CRT) TVs are no longer recommended for classrooms or other spaces in the school due to obsolescence of CRT televisions. Smart boards also may become more cost effective for widespread use. However, such devices are not defined as facility standards because of their rapid evolution and obsolescence, and because these portable devices are not integral to the facility itself.

Assistive Technology

Assistive technology can be provided when required to accommodate individual student or staff needs. For example portable sound reinforcement may be used as needed, or screen reader software provided if required. Such steps often involve portable or non-facility solutions and consequently are not defined as facility standards here.

Infrastructure: Wireless and cabling systems

The goal of the Technology Standards is to define facility infrastructure that can adapt to new end-user devices over a period of years. Both hardwired and wireless networks are planned throughout school facilities. While wireless technology is evolving quickly, for the foreseeable future it will continue to

lag behind the security and bandwidth of hardwiring. At the same time the capacity of copper cabling continues to grow. Therefore the communications cabling of schools is proposed to consist of a fiber backbone, copper connectivity to each occupied space, and copper cable to each radio location for the wireless overlay. Cable specifications are provided in the Technology Infrastructure Design Specifications.

Wireless service is specified for coverage of all occupied areas of a school. These standards outline cabling locations for wireless access points, with the capacity to add radios for increased signal density in the future. Access point radios, which are rapidly evolving, are specified separately. Video distribution throughout a school facility continues to require separate coax cable, since industry standards are not widely adopted for radio frequency video signal on data-quality twisted pair cable.

Infrastructure: Electronics and Telecommunications Rooms

These standards are provided in the Technology Infrastructure Design Specifications utilized for construction documents and contracts.

Ergonomics and Environmental Factors

Natural and artificial lighting should be designed for reduced intensity and glare on computers and video displays. Computer equipment should not be exposed to prolonged sunlight, or to direct view from outside the building at ground level. Provision should be provided for dimming ambient light on projection screens in classrooms, conference rooms and other spaces.

Floor boxes are not to be used for data drops and electrical receptacles, as they become safety hazards and maintenance problems. These boxes are to be wall mounted.

Coordination of Trades

Throughout design and construction, special care must be taken to coordinate technology with other trades, particularly electrical and mechanical work, and furniture and finishes. Providing adequate HVAC in computer labs and telecommunications rooms is a key requirement. Purpose-designed grounding and uninterruptible power are needed in telecom rooms. Anti-static floor coverings are to be specified in equipment rooms and computer labs. High levels of physical security are required for those spaces as well.

Revisions

Version 2006.1 revised May 12, 2006

Version 2006.2 revised August 25, 2006

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Auditorium

Description of space usage

Instructional
 Auditorium, assembly.

End of line equipment

Item	Quantity	Location	Purpose
telephone handset on-off capability during recording	1	sound booth	Location used for recording, also doubles as instructional environment
Portable video display-flat panel	2 minimum as needed	at least one each side of stage	
Portable video display-flat panel or CRT depends on use	1 minimum as needed	sound booth	used for recording, also doubles as instructional environment

Infrastructure

Item	Quantity	Location	Purpose
BDS Video/TV connection	2 minimum as needed	at least one each side of stage	
BDS Video/TV connection	1 minimum as needed	sound booth	Location used for recording, also doubles as instructional environment
Voice drops	1	behind stage	
Data drops	4 minimum	sound booth	Location used for recording, also doubles as instructional environment
Wireless connectivity	based on site survey	based on site survey	public/guest access to Internet and authenticated access to District internal resources
PA speakers (Not sound reinforcement)	TBD	ceiling	

Special Conditions

Auditorium sound system, stage lighting and other requirements are not defined here.

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Cafeteria

Description of space usage

Non-Instructional, limited instructional

Dining, assembly, study hall, community programs, announcements, registration, in some cases voting is hosted.

End of line equipment

Item	Quantity	Location	Purpose
Telephone handset	1	manager's office	
Loud bell for phone	1	kitchen area	
Video display flat panel	1 minimum as needed - defined during architectural process	common area	based on size of room- if 2 or more, interconnection required
Desktop computer and 17" flat panel monitor	1	manager's office	CPU may be mounted to monitor to conserve space
Stand alone laser printer (monochrome)	1	manager's office	directly connected to computer

Infrastructure

Item	Quantity	Location	Purpose
BDS Video/TV connection	1 minimum as needed	common area	based on size of room-2 or more needs to be interconnected
Data drops	8 minimum as needed	common area	community space
Data drops	2 minimum as needed (per serving line)	at serving line	POS
Voice drops	2 voice drops/modem lines	common area	voting and community programs
Wireless connectivity	based on site survey	based on site survey	public/guest access to Internet and authenticated access to District internal resources
PA speakers	TBD	ceiling	

Special conditions

- If space is used or a gym or play area, no video display should be mounted on the wall.

- Window design should avoid direct sunlight on computers and limit equipment visibility from windows. This will increase security, protect equipment from storm damage and reduce glare on screens.
- Sufficient electrical outlets must be placed near data drops. No data drops or receptacles are to be mounted in the floor.
- Security: room needs to be locked and only assigned personnel authorized access

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Classroom

Description of space usage

Instructional

End of line equipment

Item	Quantity	Location	Purpose
Telephone handset	1	wall mount	
Laptop for each teacher	1		
Networked, work group class, laser printer (black & white)	1		
Video and data display-projector	1	ceiling mount	
DVD player	1	TBD	Cabled to BDS & projector for signal conversion to RGB
Desktop computers with 17" CRT	4		student use; flat panel monitor may be provided based on technological advances

Infrastructure

Item	Quantity	Location	Purpose
BDS Video/TV connection	1 minimum as needed	wall	for mounted projector
Data drops	7 minimum as needed	classroom	student/teacher PCs and networked laser printer
Data drop	1	wall	projector
Voice drops	1	classroom	phone
Wireless connectivity	based on site survey	based on site survey	authenticated access to network resources
PA speakers	1	ceiling	

Special conditions

- Window design should avoid direct sunlight on computers and limit equipment visibility from windows. This will increase security, protect equipment from storm damage and reduce glare on screens.

- Sufficient electrical outlets must be placed near data drops. No data drops or receptacles are to be mounted in the floor.
- Security: room needs to be locked and only assigned personnel authorized access
- Furniture: student PCs require six-ft tables for each two PCs
- Laptops are assigned per teacher not per classroom

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Computer Lab

Description of space usage

Instructional
 Lab, assembly

End of line equipment

Item	Quantity	Location	Purpose
Telephone handset	1	wall mount	
Laptop for each teacher	1		
Networked, departmental class, laser printer (monochrome)	2		teacher and student use; color laser printer may be substituted for black & white based on school need
Video and data display-projector	1	Ceiling mount	
Desktop computers with 17" flat panel monitors	30		student use; CPU may be attached to monitor to conserve work space
DVD player	1	TBD	Cabled to BDS & projector for signal conversion to RGB

Infrastructure

Item	Quantity	Location	Purpose
Data drops	2		printer
Voice drop	1		phone
Data drop	31		computers
Data drop	2 minimum as needed		undedicated
Data Drop	1	wall	Video and data display
			37 TOTAL DROPS
BDS Video/TV connection	1	wall	for mounted projector
Wireless connectivity	based on site survey	based on site survey	authenticated access to network resources
PA speaker	1	ceiling	

Notes

- Computer lab floor plans must follow the standard design layout provided separately. Alternative designs must be approved by Information Technology and Educational Technology Departments.
- All data drops and receptacles are to be wall mounted. No floor receptacles or network boxes are to be used.
- Lockable storage closet required for lab supplies.
- Teacher Station located back of room
- Video connection located in back of room
- Laptops are assigned per teacher not per classroom
- Security: room needs to be locked and only assigned personnel authorized access

Special conditions

HVAC

Needs to be maintained between 70-75 degrees and relative humidity of 50-70%.

Lighting

Computers should avoid direct sunlight and limit equipment exposure to windows. Window level possibly raised so that computers are not visible from ground level. This will increase security, protect equipment from hurricane damage and reduce glare on screens during use on first second and third floor labs.

Reduced intensity lighting should be used to curb screen glare.

Electrical

Outlets must be placed near data drops and on the wall.

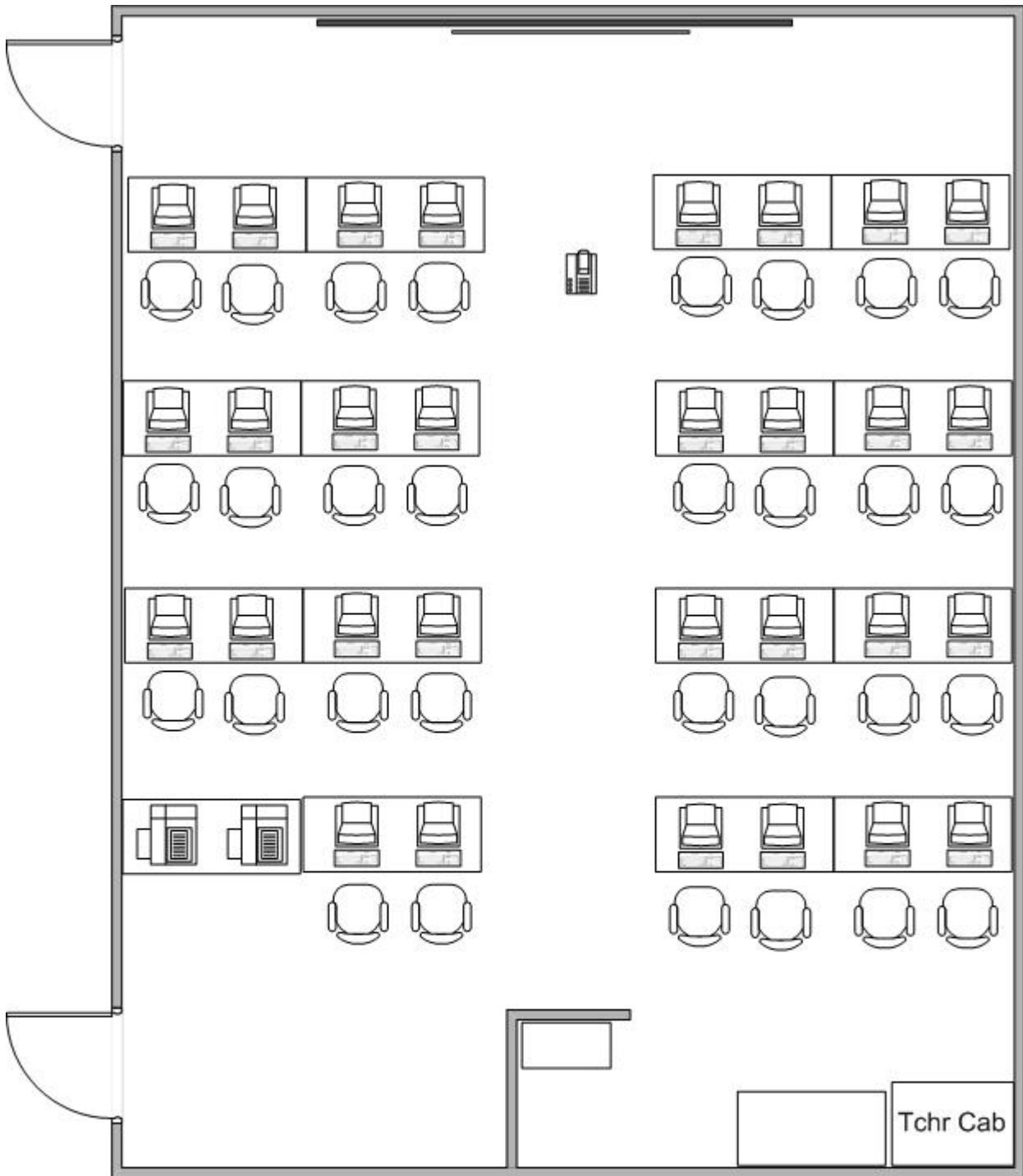
Space

Estimated 1100 square feet needed for 30 student lab.

Anti-static floor covering (such as carpeting) or VCT (vinyl composition tile).

Furniture

Six foot tables needed for every two student workstations.



Room 30' x 38' (1140 sq.ft.)
6' tables

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Computer Mini-Lab

Description of space usage

Instructional

End of line equipment

Item	Quantity	Location	Purpose
Telephone handset	1	wall mount	
Laptop for each teacher	1		
Networked, departmental class, laser printer (monochrome)	1		teacher and student use; color laser printer may be substituted for black & white based on school need
Video and data display-projector	1	ceiling mount	
DVD player	1	TBD	Cabled to BDS & projector for signal conversion to RGB
Desktop computers with 17" flat panel monitors	16		student use; CPU may be attached to monitor to conserve work space

Infrastructure

Item	Quantity	Location	Purpose
Data drops	2		printers
Voice drop	1		phone
Data drops	17		computers
Data drop	2		undedicated
Data drop	1	wall	video and data display
			23 TOTAL DROPS
BDS Video/TV connection	1	wall	for mounted projector
Wireless connectivity	based on site survey	based on site survey	authenticated access to network resources
PA speakers	1	Ceiling mount	

Notes

- Computer lab floor plans must follow the standard design layout provided separately.
- All data drops and receptacles are to be wall mounted. No floor receptacles or network boxes are to be used.
- Lockable storage closet required for lab supplies
- Teacher Station located back of room
- Video connection located in back of room
- Laptops are assigned per teacher not per classroom
- Security: room needs to be locked and only assigned personnel authorized access

Special conditions

HVAC

Needs to be maintained between 70-75 degrees and relative humidity of 50-70%.

Lighting

Computers should avoid direct sunlight and limit equipment exposure to windows. Window level possibly raised so that computers are not visible from ground level. This will increase security, protect equipment from hurricane damage and reduce glare on screens during use on first second and third floor labs.

Reduced intensity lighting should be used to curb screen glare.

Electrical

Outlets must be placed near data drops and on the wall.

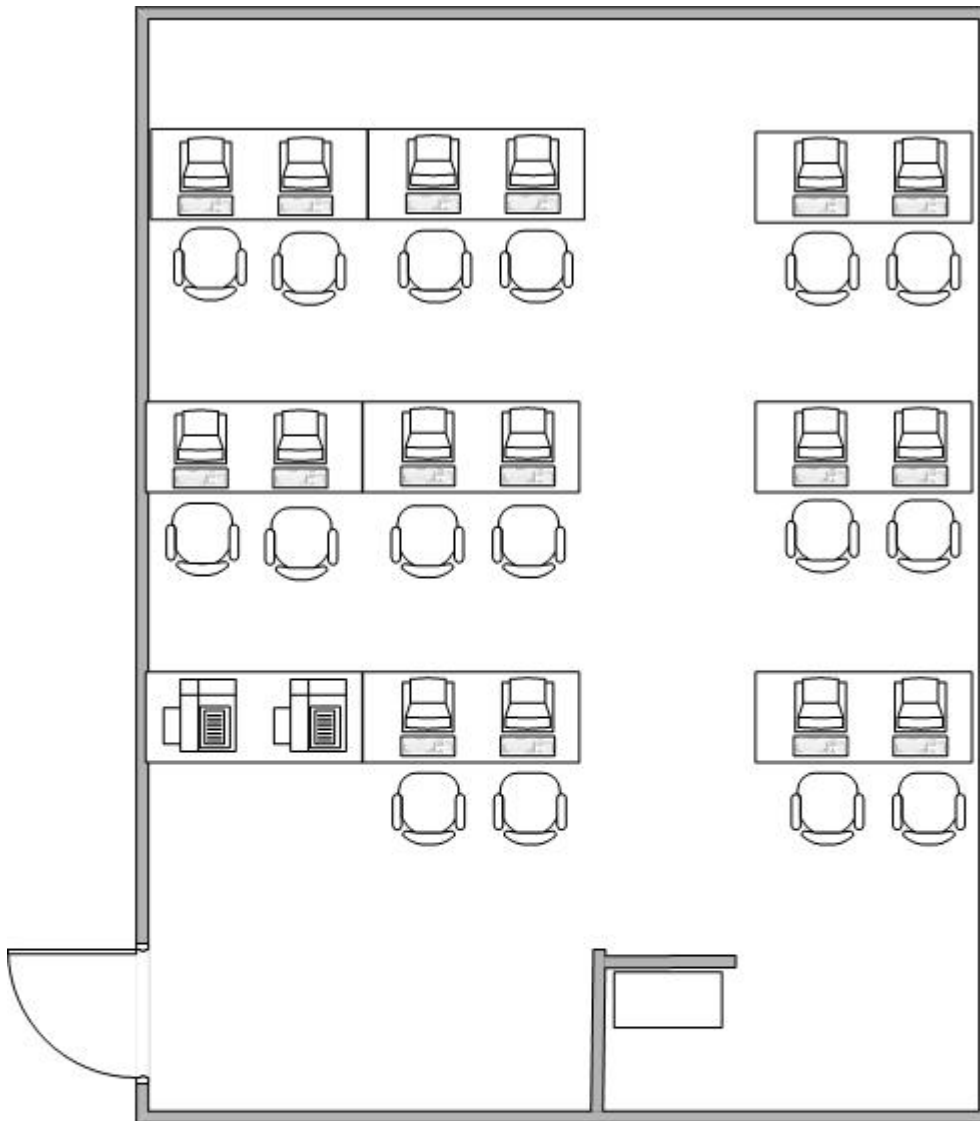
Space

Estimated 690 square feet needed for 16 student lab.

Anti-static floor covering (such as carpeting) or VCT (vinyl composition tile).

Furniture

Six foot tables needed for every two student workstations.



Mini Labs
 690 Sq. Ft
 Physical dimensions 23'x30'
 Limited capacity – 16 PC's shown using 6' tables

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Conference room

Description of space usage

Private meeting space

End of line equipment

Item	Quantity	Location	Purpose
telephone handset w/ speaker phone	1	TBD	
video display-flat panel	1	TBD	

Infrastructure

Item	Quantity	Location	purpose
BDS Video/TV connection	1	TBD	
data drops	3	TBD	
voice drop	1	TBD	
Wireless connectivity	based on site survey	based on site survey	authenticated access to network resources

Special conditions

- Sufficient electrical outlets must be placed near data drops. No data drops or receptacles are to be mounted in the floor.
- Security: room needs to be locked and only assigned personnel authorized access

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Corridor

Description of space usage

Non-Instructional

Student and staff traffic, student lockers.

End of line equipment

Item	Quantity	Location	Purpose
Video display – flat panel	selected during architectural process/as needed	key intersections in building	news and announcements

Infrastructure

Item	Quantity	Location	Purpose
BDS video/TV connection	selected during architectural process/as needed	key intersections in building	news and announcements
Data and voice drops	none unless specific requirements		
Wireless connectivity	as needed		authenticated access to district resources may be provided
PA speakers	selected during architectural process/as needed	ceiling mount	accompany video display

Special conditions

- Bottom of video display should be no less than 7 feet above finished floor.

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Gymnasium

Description of space usage

Instructional and non-instructional
 Physical Education, assembly, sporting events.

End of line equipment

Item	Quantity	Location	Purpose
telephone handset	1	office	
laptop for each teacher	1	office	
laser printer (monochrome)	1	office	attached directly to computer, NOT networked
video display-flat panel or CRT depends on total use of space	2 minimum as needed	cart mounted	pep rally, game replay

Infrastructure

Item	Quantity	Location	Purpose
BDS Video/TV connection	2 minimum as needed	gym - 18" above finished floor	pep rally, game replay
data drops	2 minimum as needed	gym area	
data drops	2 minimum as needed	office	
voice drops	2 minimum as needed	office	
wireless connectivity	based on site survey	gym area	public/guest access to Internet and authenticated access to District internal resources
PA speakers	as required by code	gym area	

Special conditions

- Laptops are assigned per teacher not per classroom
- No video display of any kind should be mounted on gymnasium walls or suspended from ceiling

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Main Telecommunications Room

Description of space usage

Non-instructional
Secure, technology operations room

End of line equipment

Defined during architectural process.

Item	Quantity	Location	Purpose
Telephone handset	1 minimum		

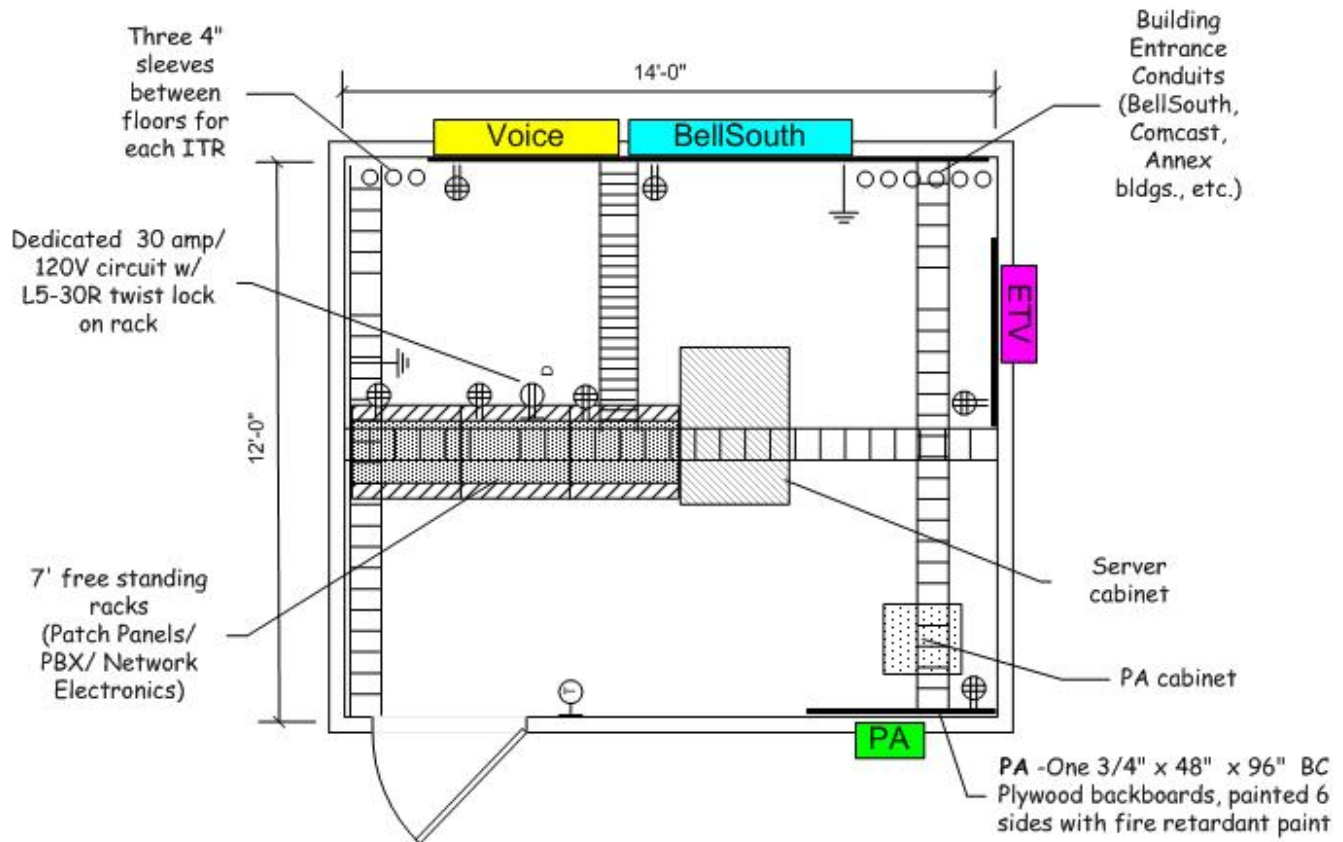
Infrastructure

Is defined for the Telecommunications Room in the Infrastructure Specifications Design Document.

Special conditions

- Design is subject to size and capacity of school and must be approved by IT personnel
- Security: room needs to be locked and only accessible to only Principal and IT personnel
- HVAC - maintain between 65-75 degrees F, and relative humidity of 50-70%.
- Room without windows preferred
- **Not to be used for storage of any kind**

CCSD Main Telecommunications Room (MTR) Standards (for TR's dedicated to Technology use ONLY)



Room size: 12'x14' (slight modifications may be needed, depending on building layout)

Room use: Telecommunications only

Special Notes:

- 1) Room signage to read "Telecommunications Room 1"
- 2) Door shall be located at side wall as shown.
- 3) All floor cores shall be at backboard location.
- 4) All sleeves shall be as close to rack locations as possible.
- 5) Thermostat shall be located as far away from equipment as possible.
- 6) Air Handling Units (AHU) shall not be installed inside the TR.
- 7) There shall be no plumbing (water, gas, drains, etc) in this ceiling space.
- 8) There shall be penetrations in this ceiling space except for riser sleeves to a TR above.
- 9) There shall be no other services, panels or equipment in this room except for Data, Voice, PA and ETV.

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Secondary Telecommunications Room

Description of space usage

Non-instructional
Secure, technology operations room

End of line equipment

Defined during architectural process.

Item	Quantity	Location	Purpose
Telephone handset	1 minimum		

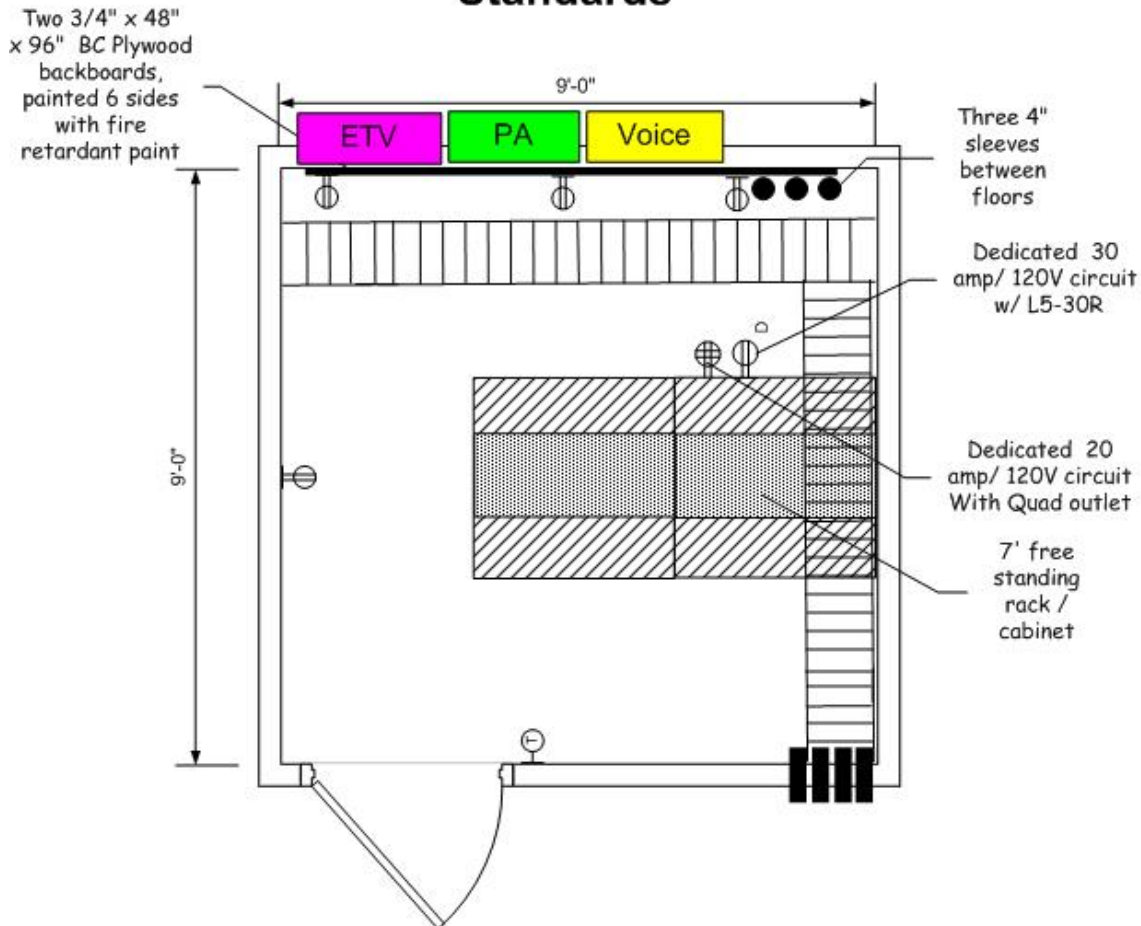
Infrastructure

Is defined for the Telecommunications Room in the Infrastructure Specifications Design Document.

Special conditions

- Design is subject to size and capacity of school and must be approved by IT personnel
- Security: room needs to be locked and only accessible to only Principal and IT personnel
- HVAC - maintain between 65-75 degrees F, and relative humidity of 50-70%.
- Room without windows preferred
- **Not to be used for storage of any kind**

CCSD Large Intermediate Telecommunications Room (ITR) Standards



Room size: 9'x9' (slight modifications may be needed, depending on building layout)

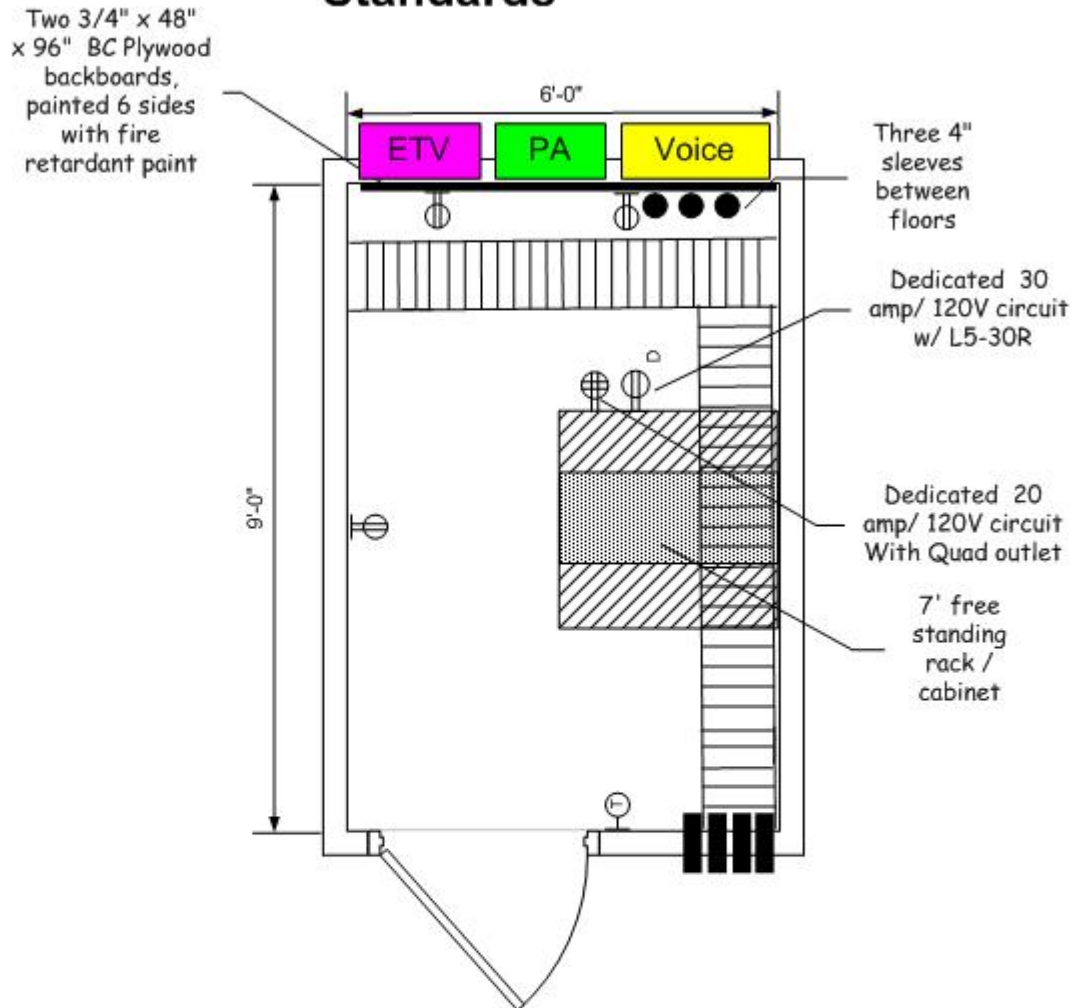
Room use: Telecommunications only

Special Notes:

- 1) Room signage to read "Telecommunications Room X" (where X = 1,2,3,4,etc. provided by CCSD)
- 2) Door shall be located at side wall as shown.
- 3) All floor cores shall be at backboard location.
- 4) All sleeves shall be as close to rack locations as possible.
- 5) Thermostat shall be located as far away from equipment as possible.
- 6) Air Handling Units (AHU) shall not be installed inside the TR.
- 7) There shall be no plumbing (water, gas, drains, etc) in this ceiling space.
- 8) There shall be no penetrations in this ceiling space except for riser sleeves to a TR above.
- 9) There shall be no other services, panels or equipment in this room except for Data, Voice, PA and ETV.

CCSD

Small Intermediate Telecommunications Room (ITR) Standards



Room size: 6'x9' (slight modifications may be needed, depending on building layout)

Room use: Telecommunications only

Special Notes:

- 1) Room signage to read "Telecommunications Room X" (where X = 1,2,3,4,etc. provided by CCSD)
- 2) Door shall be located at side wall as shown.
- 3) All floor cores shall be at backboard location.
- 4) All sleeves shall be as close to rack locations as possible.
- 5) Thermostat shall be located as far away from equipment as possible.
- 6) Air Handling Units (AHU) shall not be installed inside the TR.
- 7) There shall be no plumbing (water, gas, drains, etc) in this ceiling space.
- 8) There shall be penetrations in this ceiling space except for riser sleeves to a TR above.
- 9) There shall be no other services, panels or equipment in this room except for Data, Voice, PA and ETV.

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Media Center

Description of space usage

Book circulation, instruction, research, assembly, community space in some instances.

End of line equipment

Item	Quantity	Location	Purpose
telephone handset	2	circulation desk	
telephone handset	1 minimum	office	
telephone handset	1	TV studio	
networked laser printer monochrome	1	circulation desk	
networked laser printer monochrome	1	common area	
networked laser printer monochrome	1	TV studio	
networked laser printer monochrome	1	office	
desktop PCs	2	circulation desk	
PCs for catalog search OPAC	2 minimum as needed	common area	‘Search Kiosk’
laptop for media specialist	1	office	
PCs desktop or mini tower with headphones CD/DVD/RW	21	common area	research stations
TV on cart	1 minimum	office	
video editing workstations	2	TV studio	

Infrastructure

Item	Quantity	Location	Purpose
data drops	4	TV studio	workstations, printer, phone
data drops	8	circulation desk	PCs, printer, phones
data drops	4	office	PC, phone, copier
data drops	32	common area	PCs, printer, copier
data drops	4	office	PC, phone, fax
data drop	1	ceiling mount	future projector

BDS Video/TV connection	2	TV studio	
			flat panel TV on cart and anticipated projector
BDS Video/TV connection	3	wall and ceiling	
wireless access			Based on site survey
PA speakers	TBD	ceiling mount	

Notes

Portable projectors, fax machine, copiers not included in facility standard

Special conditions

- Window design should avoid direct sunlight on computers and limit equipment visibility from windows. This will increase security, protect equipment from storm damage and reduce glare on screens.
- No data drops or receptacles are to be mounted in the floor.
- Outlets must be placed near data drops.
- Anti-static floor covering such as carpeting or VCT (vinyl composition tile).
- TV studio needs to be locked and only authorized personnel allowed access.
- Six foot tables needed for every two student workstations.

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Office

Description of space usage

Personal work space

End of line equipment

Item	Quantity	Location	Purpose
telephone handset w/ speaker phone	1	TBD	

Infrastructure

Item	Quantity	Location	purpose
data drops	3	TBD	
voice drop	1	TBD	
Wireless connectivity	based on site survey	based on site survey	authenticated access to network resources

Special conditions

- Sufficient electrical outlets must be placed near data drops. No data drops or receptacles are to be mounted in the floor.
- Security: room needs to be locked and only assigned personnel authorized access

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Reception Area

Description of space usage

Reception area, assembly

End of line equipment

Item	Quantity	Location	Purpose
telephone handset some with voicemail-per desk	2 minimum/as needed	behind front desk	
fax	1 minimum/as needed		
Video display-flat panel or CRT depends on total use of space	1	in view from in front and behind desk	
Desktop	2 minimum/as needed		
Networked laser printer (monochrome)	1 minimum as needed	behind front desk	

Infrastructure

Item	Quantity	Location	Purpose
BDS Video/TV connection	1	in view from in front and behind desk	
data drops	2 minimum-per desk	behind front desk	
data drop for copiers	1 minimum as needed	behind front desk	
data drops	1	not behind desk	student access
voice drop	1	not behind desk	student access

Special conditions

- Window design should avoid direct sunlight on computers and limit equipment visibility from windows. This will increase security, protect equipment from storm damage and reduce glare on screens.
- Sufficient electrical outlets must be placed near data drops. No data drops or receptacles are to be mounted in the floor.
- Security: room needs to be locked and only assigned personnel authorized access
- Furniture: student PCs require six-ft tables for each two PCs
- Laptops are assigned per teacher not per classroom

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Science Lab

Description of space usage

Instructional
 Science Lab, assembly

End of line equipment

Item	Quantity	Location	Purpose
Telephone handset	1	wall mount	
Laptop for each teacher	1		
Networked, work group class, laser printer	1		
Video and data display-projector	1	ceiling mount	
DVD player	1	TBD	Cabled to BDS & projector
Desktop computers with 17” flat panel monitors	5		student use; CPU may be attached to monitor to conserve work space

Infrastructure

Item	Quantity	Location	Purpose
BDS Video/TV connection	1	ceiling	for mounted projector
Data drops	7 minimum as needed	common area	student/teacher CPU and networked Laser Jet printer
Voice drops	1	office	phone
Wireless connectivity	based on site survey	based on site survey	authenticated access to network resources
PA speakers	1	ceiling mount	

Notes

- May utilize various other technology items such as “Elmo” projectors that are provided as part of the curriculum standard for the space. Additional infrastructure may be needed.

- Curriculum-driven technology needs should be determined as early in project as possible and communicated to Educational Technology and Information Technology prior to the design phase.

Special conditions

- Window design should avoid direct sunlight on computers and limit equipment visibility from windows. This will increase security, protect equipment from storm damage and reduce glare on screens.
- Security: room needs to be locked and only assigned personnel authorized access
- Furniture: student PCs require six-ft tables for each two PCs
- **Data drops and electrical outlets should not be placed near gas or water or mounted in the floor.** Sufficient electrical outlets must be placed near data drops.
- Laptops are assigned per teacher not per classroom