St Johns County School District

Voice and Data

Structured Cabling Standards

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Document Updates:

Section/ Article	Summary of Changes	Changes by	Change Date	Document Version #
11.02	Added test results submittal email	Justin Forfar	10 Oct 06	V4.0
All	Version 4.2 Released	Justin Forfar	11 Oct 06	V4.2
All	Changed from Cat5E to Cat6 spec	Justin Forfar	8 Nov 06	V4.2
9.01(c)	Addressed space issues brought up by engineers	Justin Forfar	14 Nov 06	V4.2
8	Added Cat6 performance spec	Justin Forfar	14 Nov 06	V4.2
3	Added cable mgmt and cable tray reqs	Justin Forfar	27 Feb 07	V4.21
10	Added wireless network spec article	Justin Forfar	19 Nov 07	V4.22
3.01(b)	Added requirement for ER and TR detail drawings	Justin Forfar	10 Dec 07	V4.22
5.02(b)	Removed requirement isolated ground	Justin Forfar	24 Sep 08	V4.22
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14	Added Model Classroom AV inspection requirement	Justin Forfar	6 Jan 10	V4.3
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11	Clarified labeling and install requirements for WAP WAOs, MLC WAOs	Justin Forfar	10 Mar 11	V5.0
8.05	Clarified TR side requirements for modular jack color codes	Justin Forfar	10 Mar 11	V5.0
8.01	Clarified horizontal data cabling options	Justin Forfar	10 Mar 11	V5.0
9.02	Updated Fiber Optic cabling specifications	Justin Forfar	22 Mar 11	V5.0

14	Complete rewrite to include Extron PoleVault Standard including new AVerMedia Tuners, Clarified projection screen size and throw distance	Justin Forfar	30 Mar 11	V5.0
13	General update of portables section-new pedestal types, added detail drawings for portables.	Justin Forfar	30 Mar 11	V5.0
13.01	Added diagram for standard relocatable classroom data pedestal buildout.	Justin Forfar	3 May 12	V5.5
8.04	Edited section title to include faceplates as well as patch panels	Justin Forfar	3 May 12	V5.5
10.0	Revised wireless standards to include AP mfr, two cables per location	Justin Forfar	3 May 12	V5.5
14.03	Added Chief CMA470 Plenum enclosure to PoleVault System parts list	Justin Forfar	3 May 12	V5.5
14	Edited Exhibit E to reflect use of Chief CMA470 Plenum enclosure	Justin Forfar	3 May 12	V5.5
14	Removed Extron PoleVault Standard and added “New Solution TBD”	Justin Forfar	21 Mar 16	V6
8	Removed reference to AMP product line. Added Panduit and General Cat6 parts as approved cabling options	Justin Forfar	21 Mar 16	V6
9.02	Corrected reference to LC singlemode connectors with SC.	Justin Forfar	21 Mar 16	V6
8.03	Reduced the number of data cables in each CWAO from three to two. Total number of CWAOs within a classroom DID NOT change.	Justin Forfar	23 Mar 16	V6
14	Added equipment performance standards and diagrams outlining new AV standard	Justin Forfar	10 Mar 17	V7.0
8	Removed plenum cable requirement	Justin Forfar	10 Mar 17	V7.0
9	Added clarification regarding plenum/non-plenum cabling requirements	Justin Forfar	10 Mar 17	V7.0
14	Clarified common area and ELA sizing and projection needs. Added detail to new construction classroom diagram	Justin Forfar / Patrick McGee	3 May 17	V7.1.1
5	Added uninterrupted power supply (UPS) standards and practices	Justin Forfar	3 Oct 17	V7.1.1
9.01	Clarified copper backbone pair count requirements	Justin Forfar	3 Oct 17	V7.1.1
14	Removed required USB cable from interactive panel to HDMI wall plate	Patrick McGee	7/24/18	V7.1.2

13.02	Replaced Hubbell HSQ4836 cabinet for Hubbell RE4 REbox for TR portable	Justin Forfar	7/24/18	V7.1.2
8.04 (b)	Clarified outlet cover requirements	Justin Forfar	9/8/19	V7.2
14	Updated interactive panel information. Removed projector, screens and surfaces. Updated Document camera. Added section for Gym, Cafetorium, Auditorium space AV standards and removed legacy diagram for "Large Room Non-Standard Space".	Patrick McGee	9/9/19	V7.2
14.04	Removed HDMI Cable from Typical Classroom AV Diagrams	Patrick McGee	11/19/19	V7.3
8.03(g)	Changed horizontal cabling requirement for wireless access points	Justin Forfar	10/20/2021	V7.4
8.01	Added Belden 10GXW12 and 10GXW13 as approved horizontal copper cabling options for WAP	Justin Forfar	10/20/2021	V7.4
8.05(c)i	Added Panduit Cat6A modular jack part number for WAP	Justin Forfar	10/20/2021	V7.4
14.04	Updated interactive panel classroom AV connection information	Patrick McGee	2/5/2025	V7.5
3	Removed requirement to mark ends of conduits for portables	Justin Forfar	2/5/2025	V7.5
13	Removed legacy portable cabling diagrams, Reduced copper tie pair count from MTR to Ped from 100 to 25, Reduced copper tie pair count from 12 to 4 from Ped to Portable TR,	Justin Forfar	2/5/2025	V7.5

Article 1. General Information

Section 1.01 Statement of Purpose

The purpose of this document is to enumerate the standards and practices to be followed when designing structured cabling systems for the St Johns County School District. Each section of this document outlines: 1) a specific part of a structured cabling system or manner in which a product or technology should be installed or 2) a specific product line or product that shall be used for a certain part of an installation. This document is to be used in conjunction with all applicable industry standards and codes to provide the St Johns County School District with a flexible, scalable, easily managed, properly documented structured cabling network.

Section 1.02 General Voice and Data Network Service Requirements

(a) All areas of a building shall be equipped with voice and data network access during the design phase. These areas include but are not limited to:

(i) Classroom and learning spaces including teacher planning rooms

(ii) Administrative offices including conference rooms and work rooms

(iii) Storage spaces including book storage and central receiving

(iv) Media/Library spaces including all work rooms, professional work spaces, and group project areas

(v) Auditorium spaces including ticket windows, concessions, dressing areas, and control booth

(vi) Gym spaces including all coaches offices, breakout rooms, trainer's offices, and nurse's offices

(vii) Athletic fields including all field houses and press boxes

Section 1.03 Terminology

(a) MTR – Main telecommunications room that houses all core electronics and telephone service provider demark

(b) TR –Telecommunications room located throughout site as cable length requires

(c) Work Area Outlet (WAO) - a location within a classroom or office that offers a connection or group of connections to the structured cabling network.

(d) TBB- Telecommunications Bus Bar

(e) WAP- Wireless access point

(f) EC- Equipment cabinet – may house active or passive equipment

Article 2. Telecommunications Conduit Systems

Section 2.01 General Standards for Conduit

(a) All voice or data conduits installed between an MTR or TR and another MTR/TR shall be filled to capacity with 1" nominal inside diameter corrugated innerduct.

(b) A ½" 1200lb rated pull tape shall be installed in each innerduct and secured at each end.

(c) Each conduit shall be capped with a duplex, triplex, or quadplex divider based on conduit size and installation requirements.

Section 2.02 Outside Plant Conduit

(a) Future Relocatable Classroom Service

(i) A minimum of two (2) each four inch (4") plastic Polyvinyl Chloride(PVC) conduits of schedule 40 or equivalent shall be installed from the MTR/TR nearest the forecasted relocatable classroom site and terminated at least ten feet from the building to allow for the installation of future voice and data backbone cabling to the relocatable classrooms

Article 3. Telecommunications Rooms

Section 3.01 Telecommunications Room Design and Build-out Requirements

(a) Engineer or designer shall consult w/ the current Information Technology Department project contact to determine specific MTR/TR layout needs.

(b) Engineer or designer shall provide detail drawings for MTR and each TR in the telecom section of drawings. Detail drawings shall include at a minimum:

(i) Front views of each equipment rack to be installed in the respective MTR/TR showing actual LIU and horizontal patch panel locations and quantity, type and quantity of cables to be terminated on said patch panel, panel numbers and jack labels, and open space for customer provided equipment

(ii) A chart outlining the quantities of each drop type to be installed in each respective MTR/TR.(example below)

Table 3.01.1

TR-XXX Cable Count

WAO Type	Qty
TWAO	5
AWAO	4
SWAO	3
WAP	3
…	…

(iii) Each FISH detail drawing shall be clearly labeled by TR's number.

(c) All TRs shall be designed with sufficient floor space to facilitate the use of floor standing racks for the support of all voice and data cabling and electronics.

(i) The use of wall mounted racks, either swing-gate or fixed is prohibited unless prior written approval is given by the current Information Technology Department project contact. These

types of racks are notoriously difficult for District IT staff and vendors to service once electronics, fiber jumpers, and copper patch cords have been installed in/on them.

(d) Each MTR and TR shall have a drop ceiling set at 10'AFF.

(e) All TRs shall have 3/4" plywood backboard covering all four (4) walls from 12" AFF to a height of 9' AFF. All plywood backboard shall be painted with 2 coats fire retardant on all 6 sides. All plywood backboard shall be A/C grade with the "A" side out.

(f) Ladder rack shall be installed around perimeter of TR at 8' AFF. All floor standing racks shall be mechanically bonded to the installed ladder rack for support.

(i) Ladder rack should be Chatsworth Products Inc. Cable Runway® and Radii Bends® or approved equal. A minimum width of 12" is required.

(ii) A cable runway radius drop (waterfall) must be used to support cables transitioning from ladder tray to equipment racks or another cable tray above or below the transition point.

Section 3.02 Equipment Rack and Enclosure Requirements

(a) Floor mounted equipment racks (ER)

(i) A standard 84" two post rack shall be provided and securely fastened to bare concrete or tile floor.

(ii) Isolation pads shall be placed between the rack and the bare concrete floor.

(b) Enclosures/Cabinets-

(i) Floor mounted equipment cabinets (EC) shall be installed in a manner that allows full access to both the front and the rear of the cabinet. Where a specific part number is listed, only that part number will be accepted unless prior written approval is received from the current Information Technology project contact.

1) 70" Floor-mount EC

a) Hubbell part number HPW70C19X30

(ii) Wall mounted cabinets shall be mounted in a manner that allows the EC's front door and center to swing fully open. Additionally, all wall mounted cabinets shall be affixed to a ¾" plywood backboard that has been painted with a fire retardant paint.

1) 48" Wall-mount/Floor-mount EC

a) Hubbell part number HSQ4826

2) 36" Wall-mount/Floor-mount EC

a) Hubbell part number HSQ3626

Section 3.03 Equipment Rack Cable Management

(a) Approved vertical and horizontal wire management is listed below (no other models will be accepted under ANY circumstances):

(i) Horizontal Management – Panduit Part # WMPH2E

(ii) Vertical Management – Panduit Part # WMPVHC45E

Article 4. Support Systems

Section 4.01 TBD

Article 5. Electrical Power

Section 5.01 General Power Requirements

(a) All power outlets that serve communications rooms shall originate from a computerbranch panel that serves only this sensitive equipment.

(b) Any and all circuits serving an MTR or TR are critical for building support and life safety systems (Voice, Data, BMS, EMS, A/C controls, security, surveillance, etc) and are required to be serviced by the site's backup generator.

Section 5.02 Power Conditioning and Protection Requirements

(a) Transient voltage surge suppression (TVSS) systems shall be installed, at a minimum, in front of every branch panel that will service communications rooms and equipment.

Section 5.03 Telecommunications Room Power Requirements

(a) A duplex NEMA5-20R receptacle serviced by a single 20Amp circuit shall be installed at a minimum of every three feet (3') at 18" AFF on all four (4) walls in all TR.

(b) A quad NEMA5-20R serviced by two 20Amp circuits, one circuit per duplex receptacle, shall be provided at the base of each floor-mounted equipment rack. The installation method shall

not interfere with any horizontal or riser cable routing into the management, owner provided equipment placement or create the potential for EMI.

(c) Any special receptacle and power needs will be specified on an individual project basis. Please see current Information Technology Department project contact for locations and quantities of special receptacles.

Section 5.04 Equipment Cabinet Power Requirements

(a) All equipment cabinets shall receive a duplex NEMA5-20R serviced by a single 20AMP circuit mounted inside of the equipment cabinet in the top right corner in manner that does not interfere with the locking mechanism of the cabinet or equipment mounting.

Section 5.05 Uninterrupted Power Supply (UPS) Requirements

All equipment cabinets and floor-mounted network racks shall receive power from an appropriately sized District standard UPS device. The device may be floor mounted or rack mounted based on the application.

The Information Technology Department (IT) will be responsible for sizing, purchase and installation of all UPS hardware.

(a) Runtime target for all standard MTR/TR network closets and racks (non-data center) is 30 minutes at approximately 60% load.

(b) All UPS devices will be connected to the network for monitoring via SNMP

(i) Monitored Settings:

1) Ping response time

2) Uptime

3) Battery Status

4) Remaining runtime

(c) Current UPS standards for design

1) Standard Manufacturer – Orion Power Systems/Tripp Lite

a) Standard Models (not an exhaustive list)

i) Rack mount 1RU – Tripp Lite 1000

ii) Rack mount 2RU – Trip Lite/Orion Power Systems 1500

iii) Rack mount 2RU – Tripp Lite/Orion Power Systems 2200

iv) Rack mount extended run trays are leveraged when additional runtime is needed.

Article 6. Telecommunications Systems Grounding/Bonding

Section 6.01 Design

(a) Grounding and bonding systems shall be designed using the TIA-942, ANSI/J-STD- 607-A, NEC 800.90(A), NEC 250 and NFPA 780 standards. Whenever two or more standards are in conflict with one another, the more stringent standard applies.

Section 6.02 Specific Grounding Requirements

(a) Relocatable Classroom Grounding and Bonding Requirements

(i) A TBB shall be installed in a relocatable classroom TR's equipment cabinet (EC) and shall be bonded directly to the nearest electrical panel ground using a green insulated 6 AWG conductor. In cases where running a ground conductor to the nearest electrical panel is not possible, a ground conductor shall be bonded to the structural steel of the relocatable classroom.

Article 7. Environmental Requirements for Telecommunications Rooms

Section 7.01 Room Conditioning Requirements

(a) A single room AC unit shall be installed in the MTR and each TR located in a building to allow the temperature in each MTR and TR to be maintained at the optimum level separate from the building HVAC systems.

Section 7.02 Temperature Requirements

(a) All MTRs and TRs should be kept at a temperature range of 68-75 degrees Fahrenheit per BICSI TDM Ch 8-19.

Article 8. **Horizontal Structured Cabling--** Cabling and connectivity installed in any St Johns County School District building must carry at a minimum a 20 year warranty through the cable manufacturer that will apply to the complete end-to-end installed solution. EIA/TIA Standard 568B wiring scheme shall be used for all horizontal cabling terminations. Horizontal Cat6 copper cable must be rated at 250 Mhz or better and must be appropriate and suitable for the installation environment, whether plenum or non-plenum, for which it is destined. **Cabling contractors shall possess Panduit PCI and Corning NPI/EWP manufacturer certifications.**

Section 8.01 Approved Horizontal Copper Cabling Manufacturers and Models

(i) *Belden DataTwist 2400 (non-bonded or bonded-pair) (minimum)*

(ii) *Belden 10GXW12 (Riser, non-bonded) and 10GXW13 (Plenum, non-bonded) (WAP ONLY)*

(iii) *Panduit TX6 (minimum)*

(iv) *General GenSpeed 6000 (minimum)*

Section 8.02 Horizontal Cabling Color Codes

The jacket color for all horizontal data cable installed in St Johns County School District building shall follow the color codes listed below.

(a) Data- Yellow jacket

(b) Voice- Green jacket

(c) Wireless Access Point- Blue jacket

(d) Security, fire, building automation device or audio visual controller- White jacket

Section 8.03 Communications Work Area Outlets (WAO)

(a) Administrative WAO (AWAO)

(i) An administrative WAO should consist of one (1) Cat6 voice connection and one (1) Cat6 data connection.

(ii) Each administrative area/office shall have a minimum of two administrative WAOs on opposite sides of the room and each WAO shall be no more than two feet away from power.

(b) Teacher WAO (TWAO)

(i) A teacher WAO shall consist of one (1) Cat6 voice connection, one (1) Cat6 data connection.

(ii) Each classroom and resource room shall have one teacher WAO and each WAO shall be no more than two feet away from power

(c) Workrooms/Storage Rooms/School Store WAO (SWAO)

(i) A Workroom/Storage Room/School Store WAO shall consist of one (1) Cat6 voice connection and one (1) Cat6 data connection

(ii) Each Workroom/Storage Room/School Store shall have one Workroom/Storage Room/School Store WAO that is no more than two feet away from power.

(d) Classroom\Resource Room WAO (CWAO)

(i) A classroom WAO shall consist of two (2) Cat6 data connections

(ii) Each classroom and resource room shall receive two WAOs and each WAO should be no more than two feet away from power.

(e) Media Center WAO (MWAO)

(i) A Media Center WAO shall consist of four (4) Cat6 data connections.

(ii) The exact quantity and placement of Media Center WAOs will be determined by room size and furniture layout.

(f) Kitchen/Cafeteria Manager Office WAO (KWAO)

(i) A Kitchen/Cafeteria Manager Office WAO shall consist of one (1) Cat6 data connections and (2) Cat6 voice connections terminated using shuttered jacks.

(g) Wireless Access Point (WAP) WAO (WAP)

(i) A wireless access point WAO shall consist of one (1) Cat6A data connection

(ii) The exact quantity and placement of Wireless Access Point WAOs will be determined by building size and layout. It should be assumed that ALL areas of a building shall require complete, full, and redundant coverage. WAP WAOs shall be installed above the drop ceiling and terminated in a 2 position surface mount (biscuit) box (Panduit part # CBXS2EI-A) w/ 10’

of service loop at the station end to allow for a wireless access point to be placed where needed by the IT Department. (see Section 10 for Wireless LAN Design requirements)

(iii) All WAP cables shall be terminated together on a patch panel that does not contain voice and data cables

(h) Cafeteria Point of Sale WAO (PWAO)

(i) A Cafeteria Point of Sale WAO shall consist of two (2) Cat6 data connections terminated using shuttered jacks.

(i) Classroom AV WAO (AVWAO)

(i) A Classroom AV WAO shall consist of one (1) Cat6 data connection to provide data connectivity classroom AV interface panel.

(ii) Drop shall terminate in a male RJ-45 connector at the station side.

Section 8.04 Patch panels and Faceplates

(a) Modular patch panels are to be used for horizontal copper connectivity. Approved manufacturers are Panduit (Part # CPP24FMWBL 24 port unloaded or Part# CPP48FMWBL 48 port unloaded).

(b) Faceplates will have four (4) positions and must be angled. Only Panduit Part # CFPSE4EI (4 port only). Blank covers shall be installed into each unused position.

Section 8.05 Cat6 Modular Jack Color Codes and Part Numbers- Color codes shall be used for all modular jacks including both station and telecommunications rack side.

(a) Yellow- Data

(i) Panduit part # CJ688TGYL

(b) Green – Voice

(i) Panduit part # CJ688TGGR

(c) Blue – Wireless Category 6A

(i) Panduit part # CJ6X88TGBU

(d) Red – Telco Provider Demark Extension

(i) Panduit part # CJ688TGRD

(e) White – Building controls connections to include security, fire, BMS/EMS, and Classroom A/V

(i) Panduit part # CJ6X88TGIW

Article 9. Backbone Cabling and Installation

Section 9.01 Copper Backbone Cabling

(a) 25 pairs of Cat5 multi-conductor copper cable shall be installed between the MTR and each TR.

Note: Copper backbone specifications for TRs that service relocatable classrooms fall under section 13.03.

(i) Approved multi-conductor copper cabling manufacturers are as follows:

1) TBD

(b) Inside Riser Copper Cabling Terminations

(i) All inside riser copper backbone cabling shall terminate on standard Cat5 rated 110 punchdown blocks that have been mounted to the installed backboard forming a wall field.

(c) Outside Plant Copper Cabling Terminations

(i) All copper backbone cabling that leaves the main footprint of the building and/or travels underground shall be terminated, at both ends, on lightning protection. A cross connect consisting of the same number of pairs as the installed outside rated cable should be installed from the "in" or "protected" side of the lightning protector and terminate on Cat5 rated 110 punch down blocks that have been mounted to the installed backboard forming a wall field.

(d) Copper Backbone Cabling Cross Connects – The District uses a modular approach to its voice cross connects and requires the installation of tie cables from the 110 block wall field, where backbone cabling from TR(s) is terminated, to patch panels (part number below) mounted in data racks in each MTR/TR.

(i) Standard MTR Cross Connect Requirements

1) 25 pairs of Cat5 rated multi-conductor copper cabling shall be installed from the 110 block wall field to the data rack that houses the site's IP Voice Gateway and shall terminate on standard 110-style Cat5 patch panels (Panduit Part #DP245E88TG) using 1 pair per patch panel port on the blue pair to serve as a cross connect. The District IT staff will be responsible for making the final cross connects between the 110 side of the cross connect and the 110 wall field made up of the 50 pair cables to the TRs during the IP Voice Gateway installation to bring phone service to the TRs based on need**.**

(ii) Standard TR Cross Connect Requirements

1) Copper backbone cabling installed between a site's MTR and a TR that does not require lightning protection shall have 10' of usable service located in the ladder rack and shall terminate at the TR directly on on standard 110-style Cat5e patch panels (Panduit Part #DP245E88TG) using 1 pair per patch panel port on the blue pair.

2) If the path from the MTR to the TR requires the use of lightning protection, a pigtail shall be installed from the "in" or "protected" side of the lightning protection to a standard 110-style Cat5e patch panel (Panduit Part #DP245E88TG) located in the TR's data cabling rack, using 1 pair per patch panel port on the blue pair at the patch panel end.

Section 9.02 Fiber Optic Backbone Cabling

(a) Approved Fiber Optic Connectivity Manufacturers- The manufacturers listed below are approved. The proposed fiber optic cable and connectors must both be sourced from one of the approved manufacturers.

(i) *Corning*

(b) Approved Fiber Optic Connectivity Product Lines

(i) *Corning Pretium Rack and Wallmount Enclosures*

(ii) *Corning Pretium Unicam Connectors*

(c) A minimum of twenty-four (24) strands of multimode and twelve (12) strands of single-mode fiber optic cabling shall be installed between the building MTR and each building TR. **Note:** Optical fiber backbone specifications for TRs that service relocatable classrooms fall under section 13.03.

(d) Unless otherwise recommended by the manufacturer, all fiber cables shall be run in innerduct. All strands will be terminated in the MTR/TR using approved SC type connectors in wall mounted interconnect centers(must have prior Information Technology project contact approval) or Pretium rack mounted LIUs equipped with sufficient ports, slack storage space and splice tray storage, if required, to terminate and secure all fibers.

(e) Fiber Optic Cable Requirements

(i) The fiber optic cabling included in the solution must be optimized for a 10Gbps VCSEL system (**OM3/OM4**).

(ii) All multimode fiber optic backbone cabling shall have a core diameter of 50 microns and a core cladding diameter of 125 microns.

(iii) All single-mode fiber optic backbone cabling installed shall have a core diameter of 8-9 microns and a core cladding diameter of 125 microns and shall be terminated with blue SC connectors.

Article 10. Wireless Voice and Data Network Design Requirements

Section 10.01 Wireless Design Requirements

(a) The exact quantity and placement of Wireless Access Point WAOs will be determined by building size and layout. It should be assumed that ALL areas of every building shall require complete, full, and redundant coverage. Required areas include but are not limited to; the gym, auditorium, cafeteria, media center, all administrative spaces, and all classroom and learning spaces, outlying PE buildings, etc.

(b) SJCSD requires that a wireless WAO is installed in every room (including but not limited to classrooms, conference rooms, storage rooms, offices, kitchen, etc) of the building with common areas such as gym, cafeteria and auditorium receiving additional locations based on size

(c) Signal strength requirements shall be built around current best practice standards for a heavily utilized enterprise class wireless LAN that will support both data and wireless IP telephony. AP quantity and placement shall be optimized for signal density with the target signal-to-noise-ratio (SNR) of -67dB.

Article 11. Labeling and Administration- EIA/TIA 606-A specification shall be used as a guideline

Section 11.01 MTR/TR Identification

(a) MTR

(i) A building MTR shall be labeled as follows:

MTR-XXX

where XXX is the FISH number that will be permanently associated with the room. This label shall be permanently mounted in plain view on both the inside and outside of the door for easy identification.

(b) TR

(i) A building TR shall be labeled as follows:

TR-XXX

where XXX is the FISH number that will be permanently associated with the room. This label shall be permanently mounted in plain view on both the inside and outside of the door for easy identification.

Section 11.02 Horizontal Connectivity Labeling

(a) Patch Panel Labeling

(i) Each patch panel shall be labeled with a number in the top left corner. This number shall be in ascending order from top left to right bottom.

(ii) Each port on a patch panel in a MTR or TR shall be labeled with the room number and an uppercase letter, A-Z, that corresponds to the faceplate and port labels at the station side of each link.

(b) Individual Horizontal Station Cable Labeling

(i) Each station cable shall be labeled 2" from the termination with a permanent, water resistant, electronically generated, sticker-type label, using the following scheme:

TRXXX-Y-nnnV

Where XXX stands for the FISH number of the TR that the cabling originates from and Y stands for the number of the patch panel on which the cabling terminates in TRXXX and where nnn stands for the FISH number of the room the drop is located in and the V is a consecutive identifier (A,B,C,D,etc) for each cable in the room. In the event that a single room contains more than 26 single connections double letter designations shall be used to accommodate the connections over 26 (AA, BB, etc).

(c) Work Area Outlet Faceplate Labeling

(i) A WAO faceplate shall be labeled using the following scheme:

Top of faceplate - TRXXX-Y

Where XXX stands for the FISH number of the TR that the cabling originates from and Y stands for patch panel # where the cabling terminates in TRXXX

Each individual outlet on the faceplate – nnnV

Where nnn stands for the FISH number of the room the drop is located in and the V is a consecutive identifier (A,B,C,D,etc) for each cable in the room starting at the left side of the room and working clockwise. In the event that a single room contains more than 26 single connections double letter designations shall be used to accommodate the connections over 26 (AA, BB, etc).

Section 11.03 Backbone Connectivity Labeling

(a) Copper Backbone Cabling shall be labeled on the cable jacket, using a permanent water and tear-resistant label, three times starting from the patch panel, wall block, or lightning protection and working down the cable at 12" increments using the following scheme:

Ppair-MTRXXX-TRYYY

Where P stands for the number of pairs in the cable and XXX is the FISH number of the MTR or TR the cable originates from and YYY is the FISH number of the TR the cable terminates in.

(i) Patch panels used to terminate copper backbone cabling shall be labeled in the top center of each panel using the following scheme:

Ppair-MTRXXX-TRYYY

Where P stands for the number of pairs in the cable and XXX is the FISH number of the MTR or TR the cable originates from and YYY is the FISH number of the TR the cable terminates.

(b) Fiber optic backbone cabling shall be labeled on the jacket using a permanent water and heat resistant label, three times starting from the termination tray and working down the cable at 12" increments using the following scheme:

Pstrand-S/MM-MTRXXX-TRYYY

Where P stands for the number of strands in the cable and either S or M stands for single-mode or multimode fiber and XXX is the FISH number of the MTR or TR the cable originates from and YYY is the FISH number of the TR the cable terminates in.

Section 11.04 Special Use Outlet Labeling

(a) Wireless Access Point (WAP) WAOs shall be labeled on the biscuit box and on the T-bar of the drop ceiling directly below the biscuit box with a Yellow ¾" permanent label in plain view using the following scheme:

TRXXX-Y-WAP-RRR-V

Where XXX stands for the FISH number of the TR that the cabling originates from and Y stands for the number of the patch panel on which the cabling terminates in TRXXX , the WAP is a constant, the RRR is the FISH number of the **room** or **corridor** that the WAP is located in, and the V is a consecutive identifier (A,B,C,D,etc) for each WAP located in the same room or corridor. In the event that a single area contains more than 26 wireless access points a double letter consecutive identifier shall be used to accommodate the WAPs over 26 (AA, BB, etc).

(b) Media Link Controller (MLC) WAOs shall be labeled on the cable using a permanent cable label using the following scheme:

TRXXX-Y-MLC-RRR-V

Where XXX stands for the FISH number of the TR that the cabling originates from and Y stands for the number of the patch panel on which the cabling terminates in TRXXX , the MLC is a constant, the RRR is the FISH number of the room or commons area that the MLC panel is located in, and the V is a consecutive identifier (A,B,C,D,etc) for each MLC panel. In the event that a single building contains more than 26 MLC panels a double letter consecutive identifier shall be used to accommodate the WAPs over 26 (AA, BB, etc). **Note:** MLC cables will not be visible unless the MLC panel is removed from the wall. To see the cable label, remove the four screws which secure it to the wall to expose the cable.

Article 12. Testing and Documentation

Section 12.01 Testing shall follow all standards set forth in TIA/EIA-568-B.1, TIA/EIA-568-B.2, TIA/EIA-568-B.3, TIA/EIA-TSB-140, TIA/EIA-526-14-A, and TIA/EIA-526-7

(a) Horizontal Copper Cabling

(i) Testing and certification of horizontal copper cabling shall be performed using the permanent link method.

(b) Copper Backbone Cabling

(i) All copper backbone cabling shall be tested for continuity.

(c) Fiber Optic Backbone Cabling

(i) All fiber optic backbone cabling shall be tested and certified using the BICSI Tier 2 method for testing optical fiber. A launch cable that is a minimum of 200 meters in length shall be utilized during all OTDR tests to ensure accurate trace results.

Section 12.02 Documentation

(a) Submitting Test Results

(i) Cabling test results for Move, Add, or Change projects or Summer Relocatable Classroom installs shall be submitted via electronic mail to the address below:

cabletests@stjohns.k12.fl.us

(ii) Cabling test results for large projects such as new schools and large scale additions and renovations shall include each horizontal copper location and each backbone fiber strand and must be submitted in triplicate in both of the following form (three each CD/DVD media):

1) Hard copy- Shall be neatly contained in a three-ring binder. The cover of the binder shall be printed with, at a minimum, the following information, St Johns County school construction name, school address, cabling contractor and their project manager's name, and date of cabling completion. The three-ring binder must have tabbed dividers labeled with the TR that the tests originated separating each TR's tests from the others.

2) Digital- CD or DVD media may be used and the files must be in the native database format of the tester used for testing and certification. (Tab delimited, .CSV files, excel spreadsheets, or other non-native file formats will not be accepted). The CD or DVD media must have a computer generated label that includes at a minimum, the following information: St Johns County school construction name, school address, cabling contractor and their project manager's name, and date of cabling completion. In addition to the test results in native format each CD/DVD shall also contain an installable copy of all necessary proprietary viewing software for the tester format used in the certification.

Article 13. Relocatable Classroom Systems Specifications

Structured cabling networks for relocatable classrooms are designed and installed to provide the greatest scalability, flexibility and ease of management.

Section 13.01 Relocatable Classroom Conduit System Specifications *(See diagrams 13.02a and 13.02d for external conduit termination routing detail)*

(a) All connectivity will originate from a pedestal, which should be a minimum of a 36" x 36" x 12" NEMA 3 rated *(Acceptable Models - Cooper B-Line part number 363012RHCF or Hoffman Cabinet part number A36H3612GQRLP)* enclosure, securely mounted to/near the relocatable classroom that houses the first TR installed. All future backbone cabling, both optical fiber and

copper will originate from this enclosure. *(See diagram 13.01a for pedestal buildout requirements)*

(b) A minimum of 2 ea 2" or 1 ea 4" conduit should be installed from the in-ground voice and data network expansion box located closest to the pedestal mounted on/near the relocatable classroom that is closest to the main building.

(c) A 2" conduit will be installed from each new relocatable classroom TR back to the pedestal using the most direct path. A 12" x 12" pull box shall be installed at 150' intervals or every 180 degrees of bend (or two 90degree bends) in a conduit run to minimize strain on cables.

(d) External boxes shall be a minimum of 16" x 16" x 10" (Acceptable Model -Allied Moulded Products part # AM1648RL) and possess a minimum NEMA 3 rating.

(e) A minimum of a 1-1/2" conduit shall be installed in an unbroken path between a relocatable classroom and nearest TR. Daisy chaining pipes between relocatable classrooms is prohibited due to the added pull points, added distance, and 90 degree bends created.

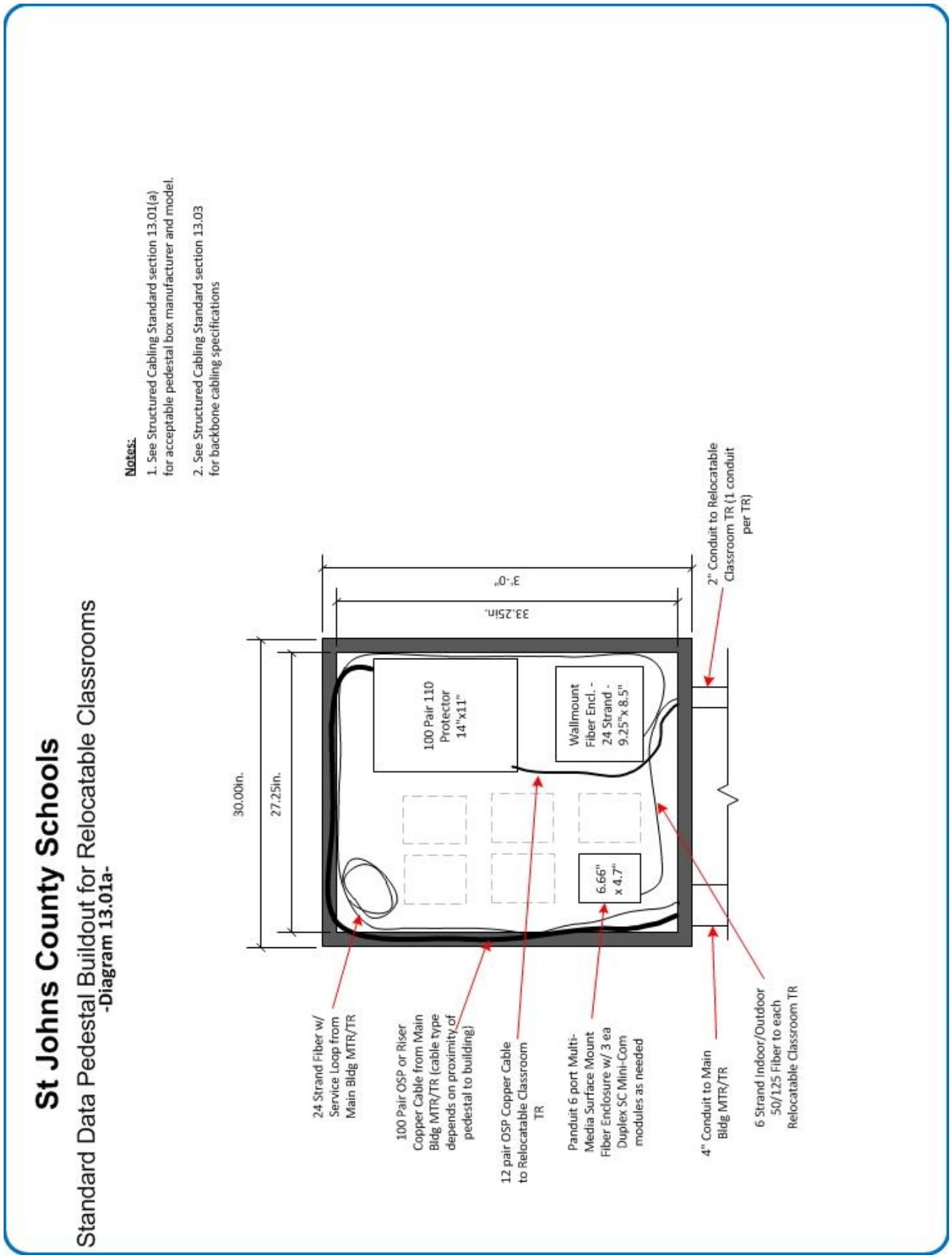
(f) A single run of conduit between a relocatable classroom and a TR may contain no more than two (2) 90 degree bends including the exit from the TR and entrance into the relocatable. Sweep bends shall be used to minimize pull force needed.

(g) 1-1/2" conduits that will house horizontal copper cabling (Cat5e, Cat6, etc.) shall be no more than 220' in length, not including turn-ups into the relocatable classroom, from TR to relocatable classroom being served.

(h) No more than eight (8) cat6 gel-filled cables should be run in any 1-1/2" conduit between a TR and relocatable classroom.

(i) All conduits shall be clearly marked at both ends and again every twenty-five feet (25') w/ fluorescent orange spray paint to differentiate voice and data conduits from any other conduits buried in the same trench.

Diagram 13.01a – Voice and Data Pedestal for Relocatable Classrooms



Section 13.02 Relocatable Classroom Horizontal Cabling and Connectivity Specifications

(a) A Hubbell RE4 REbox shall be installed in the relocatable that will serve as the TR. A 38"x28" backboard shall be painted on all six sides with fire-retardent paint and affixed to the wall. The cabinet shall be mounted to the plywood and set on two sections of uni-strut to relieve load strain from the wall. *(see Diagram 13.02a and 13.02b and Image 13.02a and 13.02b for placement detail)*

(b) Each relocatable classroom shall receive five (5) gel-filled Cat6 data cables.

(i) See diagram 13.02c for drop location placement detail

(ii) A single drop is to be installed in the ceiling and terminated with a Blue jack in a 2position surface mount box (Panduit part # CBXS2EI-A) w/ 10' of service loop at the station end to allow for a wireless access point to be placed where needed by the IT Department.

(iii) Approved Horizontal Copper Cabling Manufacturers

1) See Article 8 for horizontal copper cabling requirements.

(c) Connectivity

(i) Copper Connectivity

1) Modular Patch panels are to be used for copper connectivity. Either Panduit (Part # CPP24FMWBL 24 port unloaded or Part# CPP48FMWBL 48 port unloaded).

2) Modular Cat5E jacks are to be used. Colors for each jack at the panel side should match the color at the station side and follow the owner's color code.

a) Yellow- Data

i) Panduit part # CJ688TGYL

b) Green – Voice

i) Panduit part # CJ688TGGR

c) Blue – Wireless

i) Panduit part # CJ688TGBU

3) Work area outlets

a) Faceplates will have two (2) or four (4) positions and must be angled. Only Panduit Part # CFPSE4EI 4 port only port will be accepted.

(ii) Management

1) Horizontal- Panduit finger duct where applicable. Space will usually prevent the use of management in cabinets. If management is requested, use Panduit part # WMPLFSE

Section 13.03 Relocatable Classroom Backbone Cabling Specifications – *(See Diagram 13.01a for installation detail)*

(a) Optical Fiber Backbone Cabling

(i) All fiber optic cabling installed for relocatable classrooms shall meet the specifications outlined in section 9.02

(ii) 24 strands of 50/125 OM3 multimode optical fiber shall be installed from the main building MTR located nearest to the newly installed relocatable classroom that will serve as the first TR. All 24 strands of multimode optical fiber shall terminate in an optical fiber enclosure located inside the 36”x36” pedestal mounted on/near the portable that will house the first TR. SC connectors shall be used to terminate all 24 strands of multimode optical fiber.

(iii) Six (6) strands of muilti-mode optical fiber shall be installed from the 36”x36” pedestal located on/outside the first relocatable classroom TR to each relocatable classroom TR. All six (6) strands shall be terminated at both ends using SC connectors.

(iv) The connectors for each 6-strand cable installed between the data pedestal and a TR portable shall be mounted in a standard Panduit Multi-Media Surface-Mount Fiber Enclosure with 3 ea Duplex SC Minicom modules as needed at the Portable TR and Data pedestal side.

(v) All optical fiber backbone labeling shall follow the labeling scheme detailed in Section 10.03b

(b) Copper Backbone Cabling

(i) A minimum of 50 pairs of Category 3 copper backbone cabling shall be installed from the main building MTR to the pedestal that has been installed on/near the relocatable classroom that will serve as the first TR. All 50 pairs shall terminate on the “In” side of an appropriately sized 110 style lightning protector located inside the 36”x36” pedestal.

(ii) A maximum of 4 pairs of copper backbone cabling shall be installed from the 36”x36” pedestal located on/outside the first relocatable classroom TR to each relocatable classroom TR. Every pair of each 4 pair cable shall be terminated on

the “Out” side of the lightning protection installed in the 36”x36” pedestal using the next available 4 pairs of the 50 pair cable.

(iii) All copper backbone cabling installed from a pedestal to a relocatable classroom TR shall terminate at the relocatable classroom side on an appropriately sized Circa 4000N building entrance terminal.

(iv) All copper backbone cabling shall terminate in the MTR/TR rack and relocatable classroom TR cabinet on standard Cat5e patch panels (Panduit Part #DPA485E88TG) for voice 1 pair per port on the blue pair at both ends.

(v) All copper backbone cabling shall follow the labeling scheme detailed in Section 10.03a

Article 14. Classroom Audio/Visual (AV) Systems

Section 14.01 General Information – The St. Johns County School District classroom AV standard utilizes a combination of interactive panels, classroom sound reinforcement, and document cameras (where appropriate) to provide teachers and students with a multimedia rich learning environment. Wall-mounted interactive panels range in size from 65”-84” diagonal and are utilized in new construction classrooms, common areas and training/conference rooms. Relocatable classrooms (sometimes referred to as modular or portable classrooms) receive similar 65”- 75” diagonal interactive panel which are mounted to a purpose-built wheeled cart. Retrofit classroom AV solutions will be handled on a case-by-case basis, which will take into account pre-existing hardware and room requirements.

Section 14.02 Classroom AV Systems Detail

(a) **Classroom/Common Area/Extended Learning Area (ELA) Sound Reinforcement** – Each classroom, common area and ELA shall receive a classroom sound reinforcement system to ensure consistent delivery of teacher voice and digital content. (Gym, Cafetorium, Auditorium, Café systems shall be purpose/custom designed to fit the space.)

(i) System shall consist of an amplifier in each learning area, 1, 2 or 4 ceiling mounted speakers based on manufacturer’s recommended placement and coverage specifications and 2 wireless microphones (1teacher pendant mic with necklace/lanyard and 1student handheld) with rechargeable batteries and charging station.

1) Large format rooms such as ELA may require additional speakers. Designers should again refer to manufacturers specifications for requirements.

(ii) System may utilize RF, infrared or other approved means to transmit wireless signals between amplifiers, wireless microphones and/or speakers as needed.

(iii) System must have the ability to duck program audio in the event that a classroom receives a page from the building’s paging system.

(b) **Interactive Display Panel (Owner Purchased Equipment)–** Large interactive display panel – wall mounted or cart mounted and serves as the primary display for newer construction and retrofits in classroom and common area or extended learning areas.

(i) Panel Inputs/Outputs:

1) Inputs: 4 HDMI, 1 VGA, 1 3.5 mm audio, 4 USB A (2.0/3.0)

2) Outputs: Coax

(ii) LED lamp life: 30,000 hours minimum

(iii) 3 year warranty

(iv) Integrated speakers

(v) Tempered glass

(vi) 10 points of touch minimum

(vii) Onboard operating system capable of supporting common interactive software

(viii) Includes interactive software

(ix) Capable of integrating with onboard Windows computer

(x) 65”- 84” diagonal screen size

(xi) Resolution to be 1080p or higher

(xii) Reference the District IT Department for current standard model

1) *Panel model and mounting bracket specs and diagrams available upon request*

(c) **Document Camera (Owner Purchased Equipment) -** presents documents and live video through external display or computer.

(i) Inputs:

1) HDMI

(ii) Outputs:

1) HDMI, VGA

(iii) Please reference the District IT Department for current standard model

Section 14.03 Auditorium, Cafetorium & Gym AV System Details

(a) This is to be custom designed by engineer or designated contractor in concert with District IT Department and District Media Services contacts, to provide a complete system capable of supporting use case for specific designated space (gym, cafetorium, auditorium, etc.)

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Section 14.04 ***Classroom Audio/Visual System Configuration Diagram***

St Johns County School District Audio Visual Component Diagram

-New Construction Classroom/Common Area-

① **Audio Enhancement Sound Reinforcement**
-Located at TWA-

① To 3.5mm Audio Output labeled "Earphone"

② **Current District Standard Wall-mounted Interactive Panel**
-Panel will serve as switcher via remote or front-panel buttons-

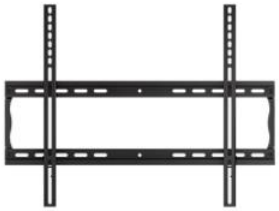
③ **ScreenBeam 1000 Edu**
-Located behind panel-

③ USB Output → USB USB Touch Input

③ HDMI Output → HDMI Input 1

Current ELMO Doc cam ③
-Located at Teacher Station-

② **Aver Wall Mount or Current District Standard Mount**
-must meet VESA and weight specifications of current district standard interactive panel-



Notes:

① Purchased by contractor Installed by contractor

② Purchased by IT Department Installed by contractor

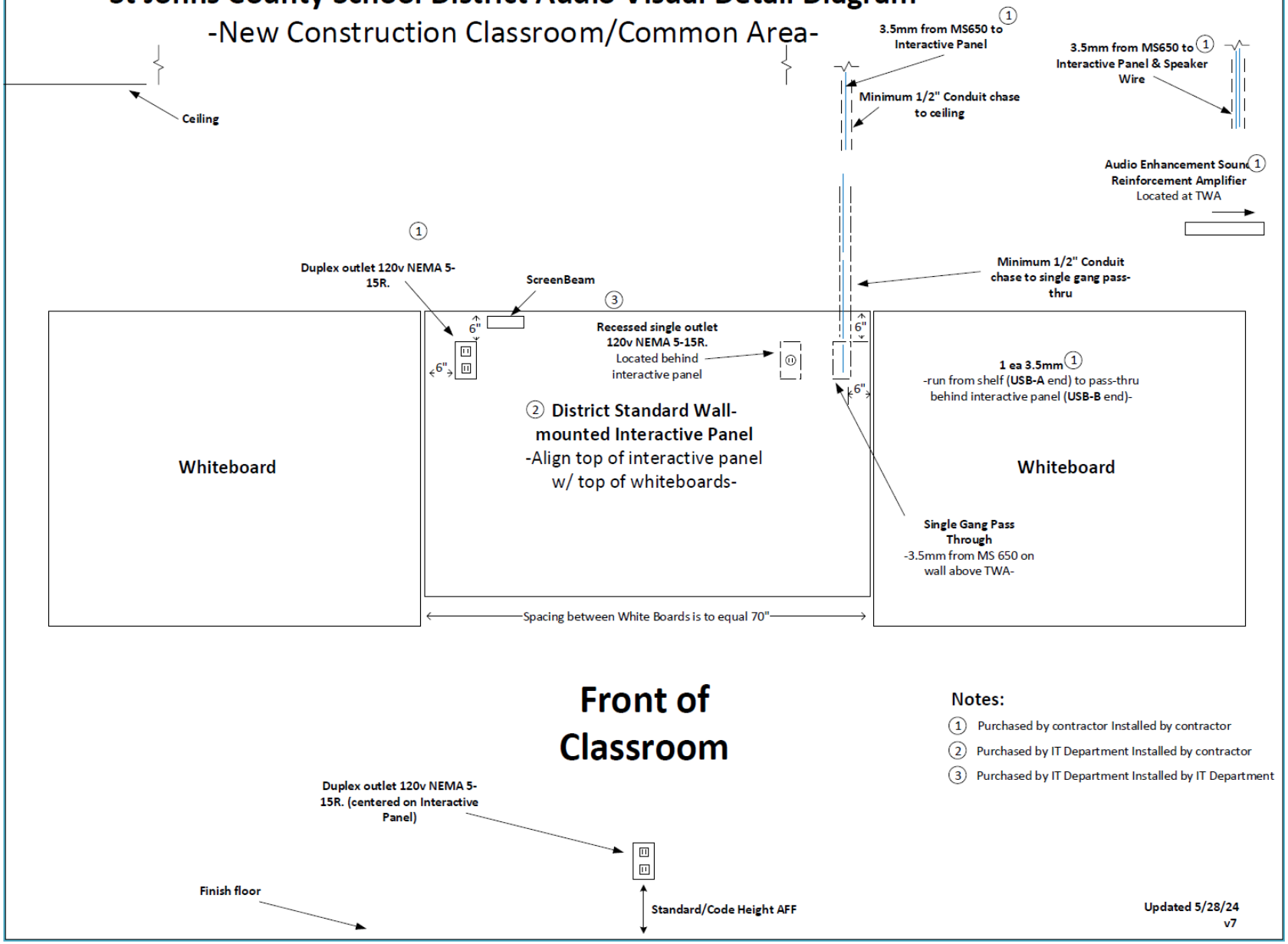
③ Purchased by IT Department Installed by IT Department

Notes:
See Audio Visual Detail diagram for power needs.

Updated 5/28/24
v7

St Johns County School District Audio Visual Detail Diagram

-New Construction Classroom/Common Area-



Front of Classroom

Notes:

(1) Purchased by contractor Installed by contractor

(2) Purchased by IT Department Installed by contractor

(3) Purchased by IT Department Installed by IT Department

Updated 5/28/24
v7

Article 15. Standards

BICSI, Telecommunications Distribution Methods Manual

ANSI/TIA/EIA-568B, Commercial Building Telecommunications Cabling Standard

TIA/EIA TSB-67 Transmission Performance Specifications for Field Testing of Unshielded Twisted Pair Cabling Systems

TIA/EIA TSB-140 Additional Guidelines for Field-Testing Length, Loss and Polarity of Optical Fiber Cabling Systems

TIA/EIA TSB-75, Additional Horizontal Cabling Practices for Open Offices.

ANSI/TIA/EIA-569A, Commercial Building Standard for Telecommunications Pathways and Spaces

ANSI/TIA/EIA-606A, Administration Standard for Telecommunications Infrastructure of Commercial Buildings

ANSI/TIA/EIA-607, Commercial Building Grounding and Bonding Requirements for Telecommunications
TIA-942, Telecommunications Infrastructure Standard for Data Centers

ANSI/NFPA-70

NEC, National Electrical Code

NFPA-101, Life Safety Code

NFPA-780, Standard for the Installation of Lightning Protection Systems

Other applicable NFPA Codes.

ANSI/IEEE Codes, All Applicable Codes.

NESC, National Electrical Safety Code (ANSI/IEEE C-2, overhead and underground telecommunications cable).

Local Uniform Building Codes