Appendix VIII to the Design Guidelines and Performance Standards



# **Audio Video Equipment Standards**

Information Tecnology Services and Planning, Architectural and Engineering Services Established Date: July 2016

Item         Features and Performance requirements         Performance Product           udio/Video Displays         With HOMI Input R5-32 control and HDBaser Input, Lensing and Irightness determined by Events and an one of the communication of the community of the comm		Exhibit I Tech Ready Classroom AV Equipment (quantities determined by design) capacity 35 students as of July 201				
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Law Video Projector V/ Mout         Introm is and is one fight condition. Colling mouts the compatible with the tradected projector formers and subted in the trade of the condition of the compatibility of the		Item	Features and Performance requirements	Performance Product		
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Mode Number of Control         All colors and hardware accessing is used a complete working system         Medical Accessing Control           Control Equipment         P control leader for some of the control of the contof the control of the control of the contof the contro				Draper, Da-Lite, or approved equivalent		
Central Room Control Tuck/Parel Power CometCole www.suppy         7 Touch Panel for room control Power over etheres for touch galant lequined Power over thereas to the touch galant lequined Power Suppy         And XM MD-703-Let MST-701 AMX MD-703-Let MST-70		Ceiling Speakers	Must provide appropriate number of speakers for complete room coverage.	Sound Advance, JBL or approved equivalent		
Touchinel Power Connections         Power over shares for rouch panel fragmed Power Supply for AMC controller Power Supply for AMC controler Power Supply for AMC controller Power Supply for		Miscellaneous	All cables connectors and hardware necessary to install a complete working system			
Control E quipment         specifically designed to control Av and building technology using multiple analogies and digital performance, backwaid compatibility and electivity restores. The WA-2200 is indicate more ports and security capabilities than the N-1200.         AMX NN-2200           visite S performance         and security capabilities than the N-1200.         Errors N13605 MA 70 HOET HOEP-Compliant Scaling solutions on performance and security capabilities than the N-1200.         Errors N13605 MA 70 HOET HOEP-Compliant Scaling solutions of the Performance and security capabilities than the N-1200.         Errors N13605 MA 70 HOET HOEP-Compliant Scaling solutions of the Performance and the Scaling solutions of the Performance and the Scaling solution the Performance and the Scaling solution to the Performance and the Scaling solution to the Performance and the Scaling solution solution to the Performance and the Scaling soluting solution to the Performance and the Scaling solution		TouchPanel Power Connections	Power over ethernet for touch panel if required Low voltage interface to integrate screen control with control system	AMX PS-POE AF TC		
consisting Equipment         Stalling AV switcher         level control.         Switcher 60-1238-73           eo Source equipment         Annotation Tablet w/ 2 Perss         Digital HD 18.5° preview monitor with ability to annotate using Smart Technologies software. And Swiveling monitor arm to attach preview monitor to podium         Smart Tablet 59-13018 or approved equivalent Smart Tablet 59-13018 or approved equivalent           Micellaneous         All cables connectors and hardware necessary to install a complete working system         Middle Atlancic 15TURRRW23 USTN22AT, FIN-MA, and List with control or to the for sport of equivalent           View Policy         Teaching Podium         Native Maple finish, custom base, 23° turret frame with vested rack inserts, trim and finishing Lists with custom cut out for specific control panel.         Middle Atlancic 15TURRRW23 USTN22AT, FIN-MA, and Lists with custom cut out for specific control panel.           Example Podium         Native Maple finish, custom base, 23° turret frame with vested rack inserts, trim and finishing Lists with custom cut out for specific control panel.         Middle Atlancic 15TURRRW23 USTN22AT, FIN-MA, and Lists with custom cut out for specific control panel.           Example Podium         Policy-based access control, identify and role-aware network, data integrity and confidentiality. Lass of Disployment.         Middle Atlancic 15TURRW23 USTN22AT, FIN-MA, and Lists with custom file the specific control panel.           Example Podium         Policy-based access control, identify and role-aware network, data integrity and confidentiality. Lass of Disployment.         Science Customereceserecessed accos	Control Equipment	Master Controller	specifically designed to control AV and building technology using multiple analog and digital formats. The NX-2200 provides a scalable platform for the future by combining high performance, backward compatibility and extensive network security features. The NX-2200 is ideal for control and automation of medium-sized rooms and multi-room applications, as it	AMX NX-2200		
eo Source equipment         Anotation labels w/2 Pers and bks Monitor Am         Description of the state prevee monitor to podium         Smart Pen 200154-20 or approved equivalent Chief monitor am K1W1208 or approved equivalent           Middelaneous         All cables connectors and hardware necessary to install a complete working system         Middel Allantic LSTURFRW23, LSERC23HT, FINAN, and LSC 0USTPNL-2004 of the system of the s	Video Switching / Processing Equipment	Scaling AV Switcher				
Teaching Podium         Native Maple finish, custom base, 23" turrer frame with vented rack inserts, trim and finishing kits with custom cut out for specified control panel.         Middle Atlantic LSTURFRW23, LSKTK23NT, FIN-NM, and S-USTPNL-23 Podium with 15-SHOC-XRF-5 and L5- Takinght18 or approved equivalent           Policy-based access control, identity and role-aware network, data integrity and confidentiality. Layer 2 Strette defense capabilities with integrity and role-aware network, data integrity and confidentiality. Layer 2 Strette defense capabilities with integrity and role-aware network, data integrity and confidentiality. Layer 2 Strette defense capabilities with integrity and vice base control for the switch base on the type of device connected to the port -State-Of-the art QoS implementation for IP telephony and viceo Reduce Energy Costs: -Support to monitor, manage and reduce energy consumption of the devices connected to the switch - Connectivity: -9:12 Fast Ethernet or Gigabit Ethernet connectivity +9:0wer ower Sthement (PoS) and PoE pass-through +1: *0:15b Ethernet uplinis         RINK-SW815B SP           Complete Podium         Desk Mith able gased an custoffier and light. For wireless mic mounted to podium Gosteneck Mic Audo Amplifier         Dis shock mont Mic holder and light. For wireless mic mounted to podium USB switcher with aulow switching between multiple boxits compatible switching. For uni-input USB switcher         Sub shock mont Mic holder and light. For wireless mic mounted to podium Dis Ni Wattage d speakers exceed Extron Crosspoint 40 Amplifier wattage score chieves and multiple USB peripherals.         Extron T0.317.13 or approved equivalent           USB Switcher         Diss witching host and keyboard/mouse compatible switching.         Extron T0.317.13 or approved equivalent	/ideo Source equipment	-		Smart Pen 20-01545-20 or approved equivalent		
Complete Podium       Native Maple milabil, USU00 USAS, 25 United Table With Vertee Tack Hisels, Unit and Unitsum       L5-CUSTPNL-23 Podium with L5-SHOC-XIR-5 and L5-Tasklight18 or approved equivalent         Policy-based access control, identity and role-aware network, data integrity and confidentiality. Layer 2 threat defense capabilities with integrated security features for flexible collaboration between users on the network. Complement with cargend security with cable guard and lock. Ease of Deployment:		Miscellaneous	All cables connectors and hardware necessary to install a complete working system			
Complete Podium       Native Maple milabil, USU00 USAS, 25 United Table With Vertee Tack Hisels, Unit and Unitsum       L5-CUSTPNL-23 Podium with L5-SHOC-XIR-5 and L5-Tasklight18 or approved equivalent         Policy-based access control, identity and role-aware network, data integrity and confidentiality. Layer 2 threat defense capabilities with integrated security features for flexible collaboration between users on the network. Complement with cargend security with cable guard and lock. Ease of Deployment:						
Complete Podium         Layer 2 threat defense capabilities with integrated security features for thexible collaboration between users on the network. Compliance with Payment Card Industry Data Security Standard (PCI DSS) to meet regulatory mandates. Physical security with cable guard and lock. Ease of Deployment: -2ero touch deployment and ease of troubleshooting Automatic configuring of the switch based on the type of device connected to the port -State-of-the-art COS implementation for IP telephony and video Reduce Energy Costs: -Support to monitor, manage and reduce energy consumption of the devices connected to the switch Connectivity: B-12 Fast Ethernet or Gigabit Ethernet connectivity Two 1-Gb Ethernet uplinks         Clsco Catalyst 2960C 8 FE PoE or approved equivalent           Power Management Unit         Must have ethernet or Gigabit Ethernet connectivity Support to monitor, manage and reduce energy consumption of the devices connected to the switch Connectivity: Support to -Gb Ethernet uplinks         RLNK-SW815R-SP Code Audio C34E/SR-RF or approved equivalent           Gooseneck Mic         Must have ethernet control Audio Amplifier         Must have ethernet control Observer must plus host devices and multiple features witch emulation for smart software functionality between PC and laptop. Four-input USB switcher         Extron, QSC, JBL or approved equivalent           USB Switcher         Switcher and Peripheral Emulation Mode, which provides "keep alive" functionality by continuously municking host and keyboard/modes communications within the switching. Toren SW4 USB 60-954-02 or approved equivalent           USB Switcher         pate with one large hole and two small         Extron 70-317-13 or approved equivalent           Control points, Host		Teaching Podium		L5-CUSTPNL-23 Podium with L5-SHOC-XLR-S and L5-		
Gooseneck Mic       Also shock mont Mic holder and light. For wireless mic mounted to podium       Clock Audio C34E/SR-RF or approved equivalent         Audio Amplifier       Only if Wattage of speakers exceed Extron Crosspoint 40 Amplifier wattage       Extron, QSC, JBL or approved equivalent         Beatures with emulation for Smart software functionality between PC and laptop. Four-input       Features with emulation for Smart software functionality between PC and laptop. Four-input       Extron, QSC, JBL or approved equivalent         USB Switcher       Features with implementing USB 2.0 compatible switching. Streamline integrator friendly for implementing USB 2.0 compatible switching. Streamline integration such as: port status indication, RS-232 pass-through, front panel security lockout, and multiple control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality by continuously minicking host and keyboard/mouse communications within the switcher. Eliminates the need for enumeration, and reduction in the chance of failed device communications within the switcher. Eliminates the need for enumeration, and reduction in the chance of failed device communications throughout the switching process.       Extron 70-317-13 or approved equivalent         Captive Cable Kit       plate with one large hole and two small       Extron 70-317-13 or approved equivalent         Adapters       Display Port to HDMI adaptor for PC to switcher audio       Extron or approved equivalent	Complete Podium	Networking switch	Layer 2 threat defense capabilities with integrated security features for flexible collaboration between users on the network. Compliance with Payment Card Industry Data Security Standard (PCI DSS) to meet regulatory mandates. Physical security with cable guard and lock. Ease of Deployment: •Zero touch deployment and ease of troubleshooting •Automatic configuring of the switch based on the type of device connected to the port •State-of-the-art QoS implementation for IP telephony and video Reduce Energy Costs: •Support to monitor, manage and reduce energy consumption of the devices connected to the switch Connectivity: •8-12 Fast Ethernet or Gigabit Ethernet connectivity	Cisco Catalyst 2960C 8 FE PoE or approved equivalent		
Audio Amplifier       Only if Wattage of speakers exceed Extron Crosspoint 40 Amplifier wattage       Extron, QSC, JBL or approved equivalent         Audio Amplifier       Features with emulation for Smart software functionality between PC and laptop. Four-input USB switchers that allow switching between multiple host devices and multiple USB peripherals. Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such as: port status indication, R5-232 pass-through, front panel security lockout, and multiple control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality by continuously minicking host and keyboard/mouse communications within the switcher. Eliminates the need for enumeration, and reduction in the chance of failed device communications throughout the switching process.       Extron 70-317-13 or approved equivalent         Captive Cable Kit       plate with one large hole and two small       Extron 70-317-12 or approved equivalent         Grommet Plate       for VGA/Audio Cable       Extron 70-317-12 or approved equivalent         Adapters       Display Port to HDMI adaptor for PC to switcher audio       Extron or approved equivalent	Complete Podium		•Two 1-Gb Ethernet uplinks			
USB Switcher       Features with emulation for Smart software functionality between PC and laptop. Four-input USB switchers that allow switching between multiple host devices and multiple USB peripherals. Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such as: port status indication, RS-332 pass-through, front panel security lockout, and multiple control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality by continuously minicking host and keyboard/mouse communications within the switcher. Eliminates the need for enumeration, and reduction in the chance of failed device communications throughout the switching process.       Extron 70-317-13 or approved equivalent         Captive Cable Kit       plate with one large hole and two small       Extron 70-317-13 or approved equivalent         Grommet Plate       for VGA/Audio Cable       Extron 70-317-12 or approved equivalent         Adapters       Display Port to HDMI adaptor for PC to switcher audio       Extron or approved equivalent	Complete Podium		•Two 1-Gb Ethernet uplinks Must have ethernet control			
USB switchersUSB switchers that allow switching between multiple host devices and multiple USB peripherals. Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such as: port status indication, RS-232 pass-through, front panel security lockout, and multiple control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality by continuously minicking host and keyboard/mouse communications within the switcher. Eliminates the need for enumeration, and reduction in the chance of failed device communications throughout the switching process.Extron 70-317-13 or approved equivalentCaptive Cable Kitplate with one large hole and two smallExtron 70-317-12 or approved equivalentGrommet Platefor VGA/Audio CableExtron 70-317-12 or approved equivalentAdaptersCSM 6 captive screw to female adapter. Display Port to HDMI adaptor for PC to switcher audioExtron or approved equivalent	Complete Podium	Gooseneck Mic	•Two 1-Gb Ethernet uplinks Must have ethernet control Also shock mont Mic holder and light. For wireless mic mounted to podium	Clock Audio C34E/SR-RF or approved equivalent		
Grommet Plate     for VGA/Audio Cable     Extron 70-317-12 or approved equivalent       Adapters     CSM 6 captive screw to female adapter. Display Port to HDMI adaptor for PC to switcher audio     Extron or approved equivalent	Complete Podium	Gooseneck Mic	•Two 1-Gb Ethernet uplinks Must have ethernet control Also shock mont Mic holder and light. For wireless mic mounted to podium	Clock Audio C34E/SR-RF or approved equivalent		
Grommet Plate     for VGA/Audio Cable     Extron 70-317-12 or approved equivalent       Adapters     CSM 6 captive screw to female adapter. Display Port to HDMI adaptor for PC to switcher audio     Extron or approved equivalent	Complete Podium	Gooseneck Mic Audio Amplifier	Two 1-Gb Ethernet uplinks     Must have ethernet control     Also shock mont Mic holder and light. For wireless mic mounted to podium     Only if Wattage of speakers exceed Extron Crosspoint 40 Amplifier wattage     Features with emulation for Smart software functionality between PC and laptop. Four-input     USB switchers that allow switching between multiple host devices and multiple USB peripherals.     Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such     as: port status indication, RS-232 pass-through, front panel security lockout, and multiple     control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality     by continuously mimicking host and keyboard/mouse communications within the switcher.     Eliminates the need for enumeration, and reduction in the chance of failed device	Clock Audio C34E/SR-RF or approved equivalent Extron, QSC, JBL or approved equivalent		
Adapters CSM 6 captive screw to female adapter. Display Port to HDMI adaptor for PC to switcher audio Extron or approved equivalent	Complete Podium	Gooseneck Mic Audio Amplifier USB Switcher	•Two 1-Gb Ethernet uplinks  Must have ethernet control  Also shock mont Mic holder and light. For wireless mic mounted to podium Only if Wattage of speakers exceed Extron Crosspoint 40 Amplifier wattage Features with emulation for Smart software functionality between PC and laptop. Four-input USB switchers that allow switching between multiple host devices and multiple USB peripherals. Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such as: port status indication, RS-232 pass-through, front panel security lockout, and multiple control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality by continuously mimicking host and keyboard/mouse communications within the switcher. Eliminates the need for enumeration, and reduction in the chance of failed device communications throughout the switching process.	Clock Audio C34E/SR-RF or approved equivalent Extron, QSC, JBL or approved equivalent Extron SW4 USB 60-954-02 or approved equivalent		
	Complete Podium	Gooseneck Mic Audio Amplifier USB Switcher Captive Cable Kit	Two 1-Gb Ethernet uplinks     Must have ethernet control     Also shock mont Mic holder and light. For wireless mic mounted to podium     Only if Wattage of speakers exceed Extron Crosspoint 40 Amplifier wattage     Features with emulation for Smart software functionality between PC and laptop. Four-input     USB switchers that allow switching between multiple host devices and multiple USB peripherals.     Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such     as: port status indication, RS-232 pass-through, front panel security lockout, and multiple     control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality     by continuously mimicking host and keyboard/mouse communications within the switcher.     Eliminates the need for enumeration, and reduction in the chance of failed device     communications throughout the switching process.     plate with one large hole and two small	Clock Audio C34E/SR-RF or approved equivalent Extron, QSC, JBL or approved equivalent Extron SW4 USB 60-954-02 or approved equivalent Extron 70-317-13 or approved equivalent		
	Complete Podium	Gooseneck Mic Audio Amplifier USB Switcher Captive Cable Kit Grommet Plate	Two 1-Gb Ethernet uplinks     Must have ethernet control     Also shock mont Mic holder and light. For wireless mic mounted to podium     Only if Wattage of speakers exceed Extron Crosspoint 40 Amplifier wattage     Features with emulation for Smart software functionality between PC and laptop. Four-input     USB switchers that allow switching between multiple host devices and multiple USB peripherals.     Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such     as: port status indication, RS-232 pass-through, front panel security lockout, and multiple     control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality     by continuously mimicking host and keyboard/mouse communications within the switcher.     Eliminates the need for enumeration, and reduction in the chance of failed device     communications throughout the switching process.     plate with one large hole and two small     for VGA/Audio Cable     CSM 6 captive screw to female adapter.	Clock Audio C34E/SR-RF or approved equivalent Extron, QSC, JBL or approved equivalent Extron SW4 USB 60-954-02 or approved equivalent Extron 70-317-13 or approved equivalent Extron 70-317-12 or approved equivalent		

Exhibit 2 Classroom Standards	Hi-Tech Ready Classroom AV Equipment (Quantities determined by design) capacity to 99 students		
	Item	Features and Performance requirements	as of July 2016 Performance Product
	Laser Video Projector w/ Mount	With HDMI input RS-232 control and HDBaseT Input. Lensing and brightness determined by screen size and room light conditions. Ceiling mount to be compatible with the for selected projector. Must have security features.	Sony VPL-FHZ57W projector or approved equivalent Chief RPA-020 Mount or approved equivalent
Audio/Video Displays	Projection Screen and Switch Control	Screen size shall be determined by 9' ceiling height mounting needs. Motorized contrast grey preferred. Switch mounted on wall for screen control.	Draper, Da-Lite, or approved equivalent
	Ceiling Speakers Miscellaneous	Must provide appropriate number of speakers for complete room coverage. All cables connectors and hardware necessary to install a complete working system	Sound Advance, JBL or approved equivalent
	Central Room Control TouchPanel Power Connections Power Supply	7" Touch Panel for room control Power over ethernet for touch panel if required Low voltage interface to integrate screen control with control system Power Supply for AMX controller	AMX MSD-701-L or MST-701 AMX PS-POE AF TC AMX PS4.4
Control Equipment	Master Controller	The NX-2200 / NetLinx <sup>®</sup> NX Integrated Controller is a programmable network appliance specifically designed to control AV and building technology using multiple analog and digital formats. The NX-2200 provides a scalable platform for the future by combining high performance, backward compatibility and extensive network security features. The NX-2200 is ideal for control and automation of medium-sized rooms and multi-room applications, as it includes more ports and security capabilities than the NX-1200.	AMX NX-2200
Video Switching / Processing Equipment	Scaling AV Switcher	IN-1608 AV switcher. 2 DTP inputs, 4 HDMI inputs, 2 VGA inputs, 3 scaleable outputs with audio level control.	Extron IN1608 MA 70 HDBT HDCP-Compliant Scaling Switcher 60-1238-73
	Annotation Tablet w/ 2 Pens and Desk Monitor Arm	Digital HD 18.5" preview monitor with ability to annotate using Smart Technologies software. And Swiveling monitor arm to attach preview monitor to podium	Smart Tablet SP-518NB or approved equivalent Smart Pen 20-01545-20 or approved equivalent Chief monitor arm K1W120B or approved equivalent
Video Source equipment	Document Camera	Desktop style with HDMI output	Epson, QOMO or approved equivalent
	Blu-ray Player	Blu-ray player with HDMI output.	Sony BDP-S5500 or approved equivalent
	Wired lavalier microphone	Must provide clear non-interference sound	Audio Technica AT-831R or approved equivalent
	Miscellaneous	All cables connectors and hardware necessary to install a complete working system	

	Teaching Podium	Native Maple finish, custom base, 33" turret frame with vented rack inserts, trim and finishing kits with custom cut out for specified control panel.	Middle Atlantic L5TURFRW33, L5KTK33NT, FIN- NM, and L5-CUSTPNL-33 Podium with L5-SHOC- XLR-S and L5-Tasklight18 or approved equivalent
Complete Podium	Networking switch	Policy-based access control, identity and role-aware network, data integrity and confidentiality. Layer 2 threat defense capabilities with integrated security features for flexible collaboration between users on the network. Compliance with Payment Card Industry Data Security Standard (PCI DSS) to meet regulatory mandates. Physical security with cable guard and lock. <b>Ease of Deployment:</b> •Zero touch deployment and ease of troubleshooting •Automatic configuring of the switch based on the type of device connected to the port •State-of-the-art QoS implementation for IP telephony and video <b>Reduce Energy Costs:</b> •Support to monitor, manage and reduce energy consumption of the devices connected to the switch <b>Connectivity:</b> •8-12 Fast Ethernet or Gigabit Ethernet connectivity •Power over Ethernet (POE) and POE pass-through •Two 1-Gb Ethernet uplinks	Cisco Catalyst 2960C 8 FE PoE or approved equivalent
	Power Management Unit	Must have ethernet control	RLNK-SW815R-SP
	Gooseneck Mic	With shock mont Mic holder and light. For wireless mic mounted to podium	Clock Audio C34E/SR-RF or approved equivalent
	Wireless Mic System with microphone	Must be G3 frequency	Shure ULXS124/85 or approved equivalent
	Audio Amplifier	Only if Wattage of speakers exceed Extron Crosspoint 84 Amplifier wattage	Extron, QSC, JBL or approved equivalent
	USB Switcher	Features with emulation for Smart software functionality between PC and laptop. Four-input USB switchers that allow switching between multiple host devices and multiple USB peripherals. Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such as: port status indication, RS-232 pass-through, front panel security lockout, and multiple control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality by continuously mimicking host and keyboard/mouse communications within the switcher. Eliminates the need for enumeration, and reduction in the chance of failed device communications throughout the switching process.	Extron SW4 USB 60-954-02 or approved equivalent
			Extron 70-317-13 or approved equivalent
	Captive Cable Kit	plate with one large noie and two small	Extron 70-517-15 of approved equivalent
	Captive Cable Kit Grommet Plate	plate with one large hole and two small for VGA/Audio Cable	Extron 70-317-12 or approved equivalent
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	Grommet Plate	for VGA/Audio Cable	Extron 70-317-12 or approved equivalent

**Classroom Standards** 

# Standard Hi-Tech with iTV Classroom AV Equipment (Quantities determined by design)

as of July 2016

	Item	Features and Performance requirements	Performance Product
	Commercial grade rear	Monitor with RS-232 control and HDMI inputs to be viewed by system user from teaching station.	NEC
	monitor	Size determined by room size.	
	Commercial grade front reinforcement monitor(s)	Monitor with RS-232 control and HDMI. Quantity and size determined by room size.	NEC
	Wall Mount	For Confidence and Reinforcement Monitors. Required for rooms that have a ceiling height of nine (9) feet or more. Must have 180 degree radius and security features.	Chief or approved equivalent
Audio/Video Displays	Ceiling Mount	For Confidence and Reinforcement Monitors. Required for rooms that have a ceiling height of nine (9) feet or more and ceiling material of lay-in accoustical tile. Must have Must have 180 degree radius and security features.	Chief or approved equivalent
	Laser Video Projector w/ Mount	With HDMI input RS-232 control and HDBaseT Input. Lensing and brightness determined by screen size and room light conditions. Ceiling mount to be compatible with the for selected projector. Must have security features.	Sony VPL-FHZ57W projector or approved equivalent Chief RPA-020 Mount or approved equivalent
	Projection Screen and Switch Control	Screen size shall be determined by 9' ceiling height mounting needs. Motorized contrast grey preferred. Switch mounted on wall for screen control.	Draper, Da-Lite, or approved equivalent
	Ceiling Speakers	Must provide appropriate number of speakers for complete room coverage.	Sound Advance, JBL or approved equivalent
	Miscellaneous	All cables connectors and hardware necessary to install a complete working system	
	Central Room Control TouchPanel Power Connections Power Supply	7" Touch Panel for room control Power over ethernet for touch panel if required Low voltage interface to integrate screen control with control system Power Supply for AMX controller	AMX MSD-701-L or MST-701 AMX PS-POE AF TC AMX PS4.4
Control Equipment	Master Controller	The NX-3200 / NetLinx® NX Integrated Controller is a programmable network appliance specifically designed to control AV and building technology using multiple analog and digital formats. The NX-2200 provides a scalable platform for the future by combining high performance, backward compatibility and extensive network security features	AMX NX-3200
	Scaling matrix switcher switcher.	All-in-one 8x4 matrix switcher, scaler, audio DSP, audio power amplifier, and control processor	Extron DTP CrossPoint 84 IPCP MA 70 - 60-1368- 13
Video Switching / Processing Equipment	Digital Video Transmitter/Receiver	Long distance transmitter for sending HDMI, audio, and bidirectional RS-232 and IR signals up to 330 feet (100 meters) over a shielded CATx cable to enabled products. Extending HDMI with embedded multi-channel audio from HDMI-equipped devices and accepts analog stereo audio signals for simultaneous transmission over the same shielded twisted pair cable. It supports video signals at resolutions up to 4K. Compact enclosure size and remote power capability.	Extron DTP HDMI 330 TX , 60-1331-12 or approved equivalent
	Digital Receiver	Long distance, digital twisted pair receiver that works with the transmitter to send HDMI, audio, and bidirectional RS-232 and IR signals up to 330 feet (100 meters) over a shielded CATx cable. Extended HDMI with embedded multi-channel audio from HDMI-equipped devices. Accepts analog stereo audio signals over the same shielded twisted pair cable. Supports video signals at resolutions up to 4K. Compact enclosure size and remote power capability for discreet placement in lecterns and behind flat-panel displays.	Extron DTP HDMI 330 RX, 60-1331-13 or approved equivalent
	HDMI video DA	HDMI Distrubution Amplifier for output to Front and Rear Monitors for Video Conferencing	Extron or approved equivalent

	Annotation Tablet w/ 2 Pens and Desk Monitor Arm		Smart Tablet SP-518NB or approved equivalent Smart Pen 20-01545-20 or approved equivalent Chief monitor arm K1W120B or approved equivalent
Video Source equipment	Document Camera	Desktop style with HDMI output	Epson, QOMO or approved equivalent
	Blu-ray Player	Blu-ray player with HDMI output.	Sony BDP-S5500 or approved equivalent
	Wired lavalier microphone	Must provide clear non-interference sound	Audio Technica AT-831R or approved equivalent
	Miscellaneous	All cables connectors and hardware necessary to install a complete working system	
	Teaching Podium	Native Maple finish, custom base, 33" turret frame with vented rack inserts, trim and finishing kits with custom cut out for specified control panel.	Middle Atlantic L5TURFRW33, L5KTK33NT, FIN- NM, and L5-CUSTPNL-33 Podium with L5-SHOC- XLR-S and L5-Tasklight18 or approved equivalent
Complete Podium	Networking switch	Policy-based access control, identity and role-aware network, data integrity and confidentiality. Layer 2 threat defense capabilities with integrated security features for flexible collaboration between users on the network. Compliance with Payment Card Industry Data Security Standard (PCI DSS) to meet regulatory mandates. Physical security with cable guard and lock. Ease of Deployment: •Zero touch deployment and ease of troubleshooting •Automatic configuring of the switch based on the type of device connected to the port •State-of-the-art QoS implementation for IP telephony and video Reduce Energy Costs: •Support to monitor, manage and reduce energy consumption of the devices connected to the switch Connectivity: •8-12 Fast Ethernet or Gigabit Ethernet connectivity •Power over Ethernet (PoE) and PoE pass-through •Two 1-Gb Ethernet uplinks	Cisco Catalyst 2960C 8 FE PoE or approved equivalent

	Gooseneck Mic	With shock mont Mic holder and light. For wireless mic mounted to podium	Clock Audio C34E/SR-RF or approved equivalent
	Power Management Unit	Must have ethernet control	RLNK-SW815R-SP
	Wireless Mic System w/microphone	Must be G3 frequency	Shure ULXS124/85 or approved equivalent
	Audio Amplifier	Only if Wattage of speakers exceed Extron Crosspoint 84 Amplifier wattage	Extron, QSC, JBL or approved equivalent
Podium Continue	USB Switcher	Features with emulation for Smart software functionality between PC and laptop. Four-input USB switchers that allow switching between multiple host devices and multiple USB peripherals. Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such as: port status indication, RS-232 pass-through, front panel security lockout, and multiple control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality by continuously mimicking host and keyboard/mouse communications within the switcher. Eliminates the need for enumeration, and reduction in the chance of failed device communications throughout the switching process.	
	Captive Cable Kit	plate with one large hole and two small	Extron 70-317-13 or approved equivalent
	Grommet Plate	for VGA/Audio Cable	Extron 70-317-12 or approved equivalent
	Adapters	CSM 6 captive screw to female adapter. Display Port to HDMI adaptor for PC to switcher audio	Extron or approved equivalent
	Miscellaneous	All cables connectors and hardware necessary to install a complete working system	
		The audio and video engine to incorporate high-definition video collaboration applications into large meeting rooms. See weblink for all features and capabilities. http://www.cisco.com/c/en/us/products/collateral/collaboration-endpoints/telepresence-quick-set-series/datasheet-c78-731242.html	
	Video Conference Codec	SX80 Codec	Cisco CTS-SX80-IPST60-K9
	Cameras and Camera	Wall Mount Kit for Speaker Track 60 Microphone Array	Cisco CTS-ST-ARR60-WMK-
		Interface plate CAM-P60 to Speaker Track 60	Cisco CTS-ST-INT-PLATE-
		Bracket for mounting of Precision 60 Camera	Cisco CTS-CAM60-BRKT
	Mounting Hardware	Speaker Track 60 Microphone Array	Cisco CTS-ST-ARRAY60+
Videoconference Equipment		Cisco TelePresence Precision 60 Camera - auto expand only	Cisco CTS-CAM-P60+
		TelePresence Precision 60 Camera	Cisco CTS-CAM-P60
	Touch Panel	Touch 10 auto expand	Cisco CTS-CTRL-DVX-10+
		Pwr Cord US 1.8m Black YP-12 To YC-12	Cisco PWR-CORD-US-A
		12.5 meter flat grey Ethernet cable for Touch 10	Cisco CAB-DV10-12.5M
		Presentation cable w/audio VGA/Jack to DVI/Phoenix	Cisco CAB-DVI-VGA-PHOEN
	Miscellaneous	Two Ethernet cables (0.35m & 0.2m) for SpeakerTrack 60	Cisco CAB-ETH-ST-SHORT-
		Two 12V power cables (0.45m & 0.2m) for SpeakerTrack 60	Cisco CAB-PWR-ST-SHORT-
		Power supply 12VDC 84W	Cisco PWR-12VDC-84W-
		SX80 rack ears - for auto expand only	Cisco CTS-SX80-RACKEARS- Hi Tech w/TV - 3

		4 meter flat grey Ethernet cable for Touch 10	Cisco CAB-DV10-4M
		Power Injector (802.3af)	Cisco CTS-PWR-AIR-INJ5+
	Miscellaneous	Power Supply 12 VDC 40W	Cisco PSU-12VDC-40W2
		Power Cord US 1.8m Black YP-12 To YC-12	Cisco PWR-CORD-US-A
		Installation sheet for Precision 60 Camera bracket	Cisco DOC-P60CAM-BRKT
	Microphone	TelePresence Table Microphone 60	Cisco CTS-MIC-TABL60
		Universal AudioScience Mounting Kit	Cisco CTS-MTKIT-UA
		Ceiling Microphone Gen 2 stand alone kit	Cisco CTS-MIC-CLNG-G2=
		Ceiling Mic. dongles, RJ45-Euroblock and RJ45-MiniJack Spare	Cisco CTS-MIC-CLNG-DNG=
Video Conference Equipment Continue	Ceiling Microphone	Ceiling Microphone parts - Ceiling mounting wire kit Spare	Cisco CTS-MIC-CLNG-WRK=
continue		Microphone element for Ceiling Microphone Spare	Cisco CTS-MIC-CLNG-ELM=
		Ceiling Microphone parts - Top and Back plates Spare	Cisco CTS-MIC-CLNG-PLT=
		Remote monitoring options for TelePresence Endpoints	Cisco L-TP-RM
		Remote monitoring option for SX series Endpoints	Cisco L-SX-SERIES-RM
		ESS WITH 8X5XNBD Cisco SX80 Codec Speaker Trk 60 Touch	Cisco CON-ECDN-SX80IP60
	License Key or Serice Warranty	License key to activate sw encryption module	Cisco LIC-TC-CRYPTO-K9
		ESS WITH 8X5XNBD Cisco TelePresence Precision 60 Camera	Cisco CON-ECDN-CTSCAM60
		ESS WITH 8X5XNBD Cisco TelePresence Table Microphone 60	Cisco CON-ECDN-CTSMICTB
		SW Image for SX80 MX700 MX800	Cisco SW-S52020-TC7-K9

Exhibit 4

**Classroom Standards** 

# Lecture Hall and Auditoria AV Equipment (Quantities determined by design)

### capacity for 100 students and up

as of July 2016

Classroom Standards	capacity for 100 students and up		as of July 20	
	Item	Features and Performance requirements	Performance Product	
	Commercial grade rear monitor	Monitor with RS-232 control and HDMI inputs to be viewed by system user from teaching station. Size determined by room size.	NEC	
	Commercial grade front reinforcement monitor(s)	Monitor with RS-232 control and HDMI. Quantity and size determined by room size.	NEC	
	Wall Mount	For Confidence and Reinforcement Monitors. Required for rooms that have a ceiling height of nine (9) feet or more. Must have 180 degree radius and security features.	Chief or approved equivalent	
Audio / Video Displays	Ceiling Mount	For Confidence and Reinforcement Monitors. Required for rooms that have a ceiling height of nine (9) feet or more and ceiling material of lay-in accoustical tile. Must have Must have 180 degree radius and security features.	Chief or approved equivalent	
	Laser Video Projector w/ Mount	With HDMI input RS-232 control and HDBaseT Input. Lensing and brightness determined by screen size and room light conditions. Ceiling mount to be compatible with the for selected projector. Must have security features.	Sony VPL-FHZ57W projector or approved equivalent Chief RPA-020 Mount or approve equivalent	
	Projection Screen and Switch Control	Screen size shall be determined by 9' ceiling height mounting needs. Motorized contrast grey preferred. Switch mounted on wall for screen control.	Draper, Da-Lite, or approved equivalent	
	Ceiling Speakers	Must provide appropriate number of speakers for complete room coverage.	Sound Advance, JBL or approved equivalent	
	Miscellaneous	All cables connectors and hardware necessary to install a complete working system		
	Central Room Control TouchPanel Power Connections	7" Touch Panel for room control Power over ethernet for touch panel if required Low voltage interface to integrate screen control with control system	AMX MSD-701-L or MST-701 AMX PS-POE AF TC	
Control Equipment	Master Controller	The NX-3200 / NetLinx® NX Integrated Controller is a programmable network appliance specifically designed to control AV and building technology using multiple analog and digital formats. The NX-2200 provides a scalable platform for the future by combining high performance, backward compatibility and extensive network security features	AMX NX-3200	
	Scaling matrix switcher switcher.	All-in-one 8x4 matrix switcher, scaler, audio DSP, audio power amplifier, and control processor	Extron DTP CrossPoint 84 IPCP MA 70 - 60-13 13	
Video Switching /	Digital Video Transmitter/Receiver	Long distance transmitter for sending HDMI, audio, and bidirectional RS-232 and IR signals up to 330 feet (100 meters) over a shielded CATx cable to enabled products. Extending HDMI with embedded multi- channel audio from HDMI-equipped devices and accepts analog stereo audio signals for simultaneous transmission over the same shielded twisted pair cable. It supports video signals at resolutions up to 4K. Compact enclosure size and remote power capability.	Extron DTP HDMI 330 TX , 60-1331-12 or approved equivalent	
Processing Equipment	Digital Receiver	Long distance, digital twisted pair receiver that works with the transmitter to send HDMI, audio, and bidirectional RS-232 and IR signals up to 330 feet (100 meters) over a shielded CATx cable. Extended HDMI with embedded multi-channel audio from HDMI-equipped devices. Accepts analog stereo audio signals over the same shielded twisted pair cable. Supports video signals at resolutions up to 4K. Compact enclosure size and remote power capability for discreet placement in lecterns and behind flat- panel displays.	Extron DTP HDMI 330 RX, 60-1331-13 or approved equivalent	
	HDMI video DA	HDMI Distrubution Amplifier for output to Front and Rear Monitors for Video Conferencing	Extron or approved equivalent	
	Video PIP Device	Smeamless scaller for Picture in Picture	DVS 605	
Video Source Equipment	Annotation Tablet w/ 2 Pens and Desk Monitor Arm	Digital HD 18.5" preview monitor with ability to annotate using Smart Technologies software. And Swiveling monitor arm to attach preview monitor to podium	Smart Tablet SP-518NB or approved equivale Smart Pen 20-01545-20 or approved equivale Chief monitor arm K1W120B or approved equivalent	

	Document Camera	Desktop style with HDMI output	Epson, QOMO or approved equivalent
Video Source	Blu-ray Player	Blu-ray player with HDMI output.	Sony BDP-S5500 or approved equivalent
Equipment Continue	Wired lavalier microphone	Must provide clear non-interference sound	Audio Technica AT-831R or approved equivalent
	Miscellaneous	All cables connectors and hardware necessary to install a complete working system	
	Teaching Podium	Native Maple finish, custom base, 33" turret frame with vented rack inserts, trim and finishing kits with custom cut out for specified control panel.	Middle Atlantic L5TURFRW43, L5KTK43NT, FIN- NM, and L5-CUSTPNL-43 Podium with L5-SHOC- XLR-S and L5-Tasklight18 or approved equivalent
Complete Podium	Networking switch	Policy-based access control, identity and role-aware network, data integrity and confidentiality. Layer 2 threat defense capabilities with integrated security features for flexible collaboration between users on the network. Compliance with Payment Card Industry Data Security Standard (PCI DSS) to meet regulatory mandates. Physical security with cable guard and lock. Ease of Deployment: •Zero touch deployment and ease of troubleshooting •Automatic configuring of the switch based on the type of device connected to the port •State-of-the-art QOS implementation for IP telephony and video Reduce Energy Costs: •Support to monitor, manage and reduce energy consumption of the devices connected to the switch Connectivity: •8-12 Fast Ethernet or Gigabit Ethernet connectivity •Power over Ethernet (PoE) and PoE pass-through •Two 1-Gb Ethernet uplinks	Cisco Catalyst 2960C 8 FE PoE or approved equivalent
	Gooseneck Mic	With shock mont Mic holder and light. For wireless mic mounted to podium	Clock Audio C34E/SR-RF or approved equivalent
	Wireless Mic System w/microphone	Must be G3 frequency	Shure ULXS124/85 or approved equivalent
	Audio Amplifier	Only if Wattage of speakers exceed Extron Crosspoint 84 Amplifier wattage	Extron, QSC, JBL or approved equivalent
	USB Switcher	Features with emulation for Smart software functionality between PC and laptop. Four-input USB switchers that allow switching between multiple host devices and multiple USB peripherals. Integrator-friendly for implementing USB 2.0 compatible switching. Streamline integration such as: port status indication, RS-232 pass-through, front panel security lockout, and multiple control points. Host and Peripheral Emulation Mode, which provides "keep alive" functionality by continuously mimicking host and keyboard/mouse communications within the switcher. Eliminates the need for enumeration, and reduction in the chance of failed device communications throughout the switching process.	Extron SW4 USB 60-954-02 or approved equivalent
	Hearing Assist Listening Device		LS-51-072, LA-125
	Captive Cable Kit	plate with one large hole and two small	Extron 70-317-13 or approved equivalent
	Grommet Plate	for VGA/Audio Cable	Extron 70-317-12 or approved equivalent
	Adapters	CSM 6 captive screw to female adapter. Display Port to HDMI adaptor for PC to switcher audio	Extron or approved equivalent
	Miscellaneous	All cables connectors and hardware necessary to install a complete working system	
	Video Conference Codec	Cisco SX20 with 12X camera	CTS-SX20-PHD12X-K9
Video Conference /	Maintenance	8x5xNBD service	CON-ECDN-SX2PHD12
Streaming Equipment	Remote monitoring option	option key	L-SX-SERIES-RM
	Camera cable adapter	break out cable	CAB-PHD4XS2-SPLIT=

Exhibit 5

## Basic VTC Conference Room Equipment (Quantities determined by design)

#### capacity 16 people **Classroom Standards** as of July 2016 Item **Features and Performance requirements Performance Product** RS-232 control appropriate size for room NEC comercial or approved equal Monitor Audio / Video Displays Mount Mount for Monitor (wall or ceiling, room dictates type) Chief or approved equal Video Switching / Video Scaler Video scaler to scale duo video channel for video conference system Extron HD-HD or equivalent **Processing Equipment** HDMI DA HDMI DA to split content to video conference system and monitor Extron or approved equal Video Source Equipment Wall plate to plug laptop/other sources into. Must have HDMI and VGA Input Wall Plate Extron or approved equal Video Conference Camera and Condec Video conference codec with maintenance warranty CTS-SX10-K9, CON-PSRN-CTSSX10 Equipment Wall Push Button Control **Control Equipment** Push button system on the wall to control the inputs and monitor Device SP Systems Pixie Plus or approved equal

Exhibit 6	Exec	utive VTC Conference Room Equipment (Quantities determined by	design)
		capacity 20 people	as of July 2016
	ltem	Features and Performance requirements	Performance Product
Audio/Video Displays	Monitor	RS-232 control	NEC comercial or equivelent
	Mount	Mount for Monitor	Chief or equivalent
Video Switching / Processing	Video Scaler	Video scaler to scale duo video channel for video conference system	HD-HD
Equipment	Scaling AV Switcher	IN-1606 AV switcher. 4 HDMI inputs, 2 VGA inputs, 2 HDMI scaleable outputs with audio level control.	Extron IN1606 HDCP-Compliant Scaling Switcher 60-1081-01
Video Source Equipment	Input Wall Plate	Wall plate to plug laptop/other sources into. Must have HDMI and VGA	- - -
Video Conference Equipment	Cisco SX10	Video conference codec with maintenance warranty	CTS-SX10-K9, CON-PSRN-CTSSX10
Control Equipment	Master Controller	The NX-2200 / NetLinx <sup>®</sup> NX Integrated Controller is a programmable network appliance specifically designed to control AV and building technology using multiple analog and digital formats. The NX-2200 provides a scalable platform for the future by combining high performance, backward compatibility and extensive network security features. The NX-2200 is ideal for control and automation of medium-sized rooms and multi-room applications, as it includes more ports and security capabilities than the NX-1200.	AMX NX-2200
	Central Room Control TouchPanel Power Connections Power Supply	7" Touch Panel for room control Power over ethernet for touch panel if required Low voltage interface to integrate screen control with control system Power Supply for AMX controller	AMX MSD-701-L or MST-701 AMX PS-POE AF TC AMX PS4.4
		ו טוכץ שטכם מכובשי כטוורטו, ומכוונוץ מום רטוב מאמרב ווכנאטוא, ממנם וווכבוונץ מום כטווומכוונטווץ.	
Rack/Podium	Networking switch	Layer 2 threat defense capabilities with integrated security features for flexible collaboration between users on the network. Compliance with Payment Card Industry Data Security Standard (PCI DSS) to meet regulatory mandates. Physical security with cable guard and lock. Ease of Deployment: •Zero touch deployment and ease of troubleshooting •Automatic configuring of the switch based on the type of device connected to the port •State-of-the-art QoS implementation for IP telephony and video Reduce Energy Costs: •Support to monitor, manage and reduce energy consumption of the devices connected to the switch Connectivity: •8-12 Fast Ethernet or Gigabit Ethernet connectivity •Power over Ethernet (PoE) and PoE pass-through •Two 1-Gb Ethernet uplinks	Cisco Catalyst 2960C 8 FE PoE or approved equivalent
	16U Rack	VFI REX16 equipment Rack	