

# **WVU Technology Classroom Configuration and Implementation Guidelines**

**August 10, 2023**

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## 1. Introduction

The WVU standard instructional technology classroom configurations provide an established minimum requirement for function in any size general-purpose classroom. WVU requires that these guidelines be followed as designated Classroom Technology instructional facilities are renovated or newly installed at WVU, as well as recommends these guidelines for all instructional technology facilities at our various campuses. These guidelines were designed and are being continually updated based on issues such as system functionality commonly requested by users, equipment that has a good record of usability, and equipment specifications that set devices apart from similar equipment, stemming from experience with past installations, on-going classroom maintenance, and feedback from WVU faculty, staff, and administration.

These guidelines may change to accommodate future functionality needs and technological evolution at any time without notice. Also, please note that Classroom Technology staff isn't able to provide installation or support services to all WVU departments, but can provide consultation in selecting an appropriate vendor who can provide installation and integration for technology facilities.

Definition of Terms:

General Contractor – “GC”

Electrical Contractor – “EC”

Audiovisual Installer – “Vendor”

The following project specification details the system needs and must be strictly followed. No deviations will be accepted without written authorization.

## 2. Project Stipulations

### 2.1 Contact Information

The term “Owner” typically refers to the following groups within WVU:

Project Client: **West Virginia University** – Representative of faculty and staff “Users”

Project AV Supervisor: **Classroom Technology Designee**, (304-293-2832)

Project Manager: **Facilities Management Designee**, (304-293-2330)

Procurement Officer: **Administration and Finance Designee** (304-293-5711)

### 2.2 Substitutions

No substitutions/deviations will be accepted without prior approval from the Project Manager or AV Supervisor. Requests for substitutions must be in writing and denote reason(s), as well as cost and functionality differences. WVU reserves the right to decline any proposal due to substitutions that do not meet the needs of the Project Client.

### 2.3 Bidding

A mandatory walk-through may be held (**Date and Time TBA**) to provide the vendor with an opportunity to visit the facility, address any questions or concerns up to that point, and to obtain room layouts and measurements.

Bids must include a proposed equipment list with itemized costs, proposed wiring diagram (if different from the one submitted for the bid), and a substitutions request (if needed). All expected compensations should be itemized. All work performed either by the bidding Vendor or by their Subcontractor must be clearly defined and shall be the

responsibility of the Vendor. Any additional detail for support of the bid should be attached at time of submission. Documents must be signed and dated by a principal or officer of the company.

Bid documents must be submitted before **(Date and Time TBA)** to the Procurement Officer, Project Manager, and AV Supervisor. Bidding Vendors are responsible for contacting the Project Supervisor to make sure bid documents have arrived before the submission deadline.

Costs and functionality changes of deviations are the sole responsibility of the Vendor. Any substitutions made after bid acceptance are considered deviations.

### **3. Classroom Description**

The WVU "Standard" general purpose classroom is designed to meet the needs of various teaching methods through the use of a diverse multimedia system. The standard technology system will include a video projection system, multimedia source devices (computer, document camera, and auxiliary inputs for user specific media sources), signal processing and routing, a media sound reinforcement audio system, a touch panel control system, an interactive pen display, and access for assistive systems. The sources and routing equipment are housed within one of WVU's standardized lecterns and the signals are routed to a ceiling mounted projector. Variations in design are used to fulfill different space requirements, but the overall scheme remains the same. While suggestions are desired to optimize classroom stability, no changes will be made to the design without expressed approval from the Project Manager.

### **4. Installation Guidelines**

Outside of specified timeframes, each classroom being installed must be kept usable for classes. The Vendor shall work in a professional manner, with proper safety measures taken into account at all times. Per state contract, the Audiovisual Vendor will supply labor, equipment, tools, materials, testing, as-built drawings, and follow up support for the audiovisual systems. All Vendor supplied equipment and material for installation will be the responsibility of the Vendor, new, and should arrive with the Vendor on the installation date. All shipping charges shall be considered as part of the total proposal. All products will be installed as indicated in these referenced standards unless recommended otherwise by the product manufacturer or specifically indicated otherwise by WVU. The completed project should meet or exceed West Virginia University standards and meet all applicable codes.

#### **4.1 General Installation Requirements**

Any electrical outlet, network outlet, or structural work not already complete but needed for the completion of the project must be coordinated with the Project Manager within two weeks after bid acceptance. Equipment for installation with network connectivity must have its network hardware address (i.e. mac address) and room installation location provided to Owner at least 2 weeks prior to installation, so that network access, IP addresses, and other installation needs can be made available from Owner by the time Vendor arrives on-site.

Before and during the project, the Vendor must coordinate with the Project Manager, Project AV Supervisor, GC, EC, and any applicable subcontractors. Items to coordinate include the shipment and delivery dates of GC and EC installed items, attending construction meetings, and positioning of projector mounts and lifts.

All cabling, connectors, and interfaces needed to complete the project requirements

must be provided by the vendor. Cables, power, video and control, must be clearly labeled with input and output connections, specifically the equipment type it is connecting i.e. Doc Cam, PC, etc., and neatly secured using Velcro straps for cable management. Rear of all equipment must be accessible for future maintenance. All power cabling shall be routed separately from low-voltage audio, video, and control cabling. Only power strips with surge protection and lighted switches shall be used. The Vendor is to install and operationally test all components of the system, including those provided by the Owner, to ensure proper system functionality. Vendor is responsible for the removal and disposal of all packing material and other debris at an "off campus" land fill or recycling center and shall be responsible for repairing any damage caused to the premises by their installation activities, at no cost to the Owner. (Construction and Electrical tasks further explained in the Construction Standards Document)

#### 4.1.1 Installation

##### 4.1.1.1 Lectern

An Owner furnished, Vendor installed multimedia lectern will be provided. A "user" accessible side of the lectern will have space to house audio and video sources (i.e. microphones, PC, etc.). A "technician" accessible side of the lectern will have space inside for Vendor provided rack to house all of the audio/video routing and distribution gear. At least 13 rack spaces will be available for the audio and video routing/distribution equipment to be installed. The top rack space will be left open for ventilation. All appropriate spacing between rack-installed components, as directed by the equipment manufacturers' recommendations, must be accommodated. In rooms with only one entrance, the lectern should be placed at the front of the classroom toward the corner opposite the door. Lectern top locations of all mounted equipment are to be identified on-site by Owner.

##### 4.1.1.2 Floor Box

The floor box for WVU classrooms will allow adequate room for data, power, control, and audiovisual cables. The main concerns in placing the floor box are making sure that, once the lectern's internal access point is over the box, there is enough room all around the lectern so that it meets accessibility requirements to the "as built" walls and final seating arrangement. In locations where installing a floor box is impractical due to existing construction, wiring for data, power, control and audiovisual cables may be run through a wall and connected to the lectern through a wall mount enclosure and a short length of flexible conduit. In this type of installation, the lectern should be placed as close to the wall as possible while meeting accessibility requirements. (Construction and Electrical tasks further explained in the Construction Standards Document)

For the appropriate signals to reach the projector, a GC installed floor box will have conduit available for all system cabling, to be pulled by the EC. Two twisted pair cables (Belden 10GX 10GX62F for riser cabling, Belden 10GX 10GX63F for plenum space) will provide HDBaseT audiovisual/control transmission from the transmitter in the lectern through the floor box (and Vendor installed cable access cover) to each projector location. Speaker cabling from the audio amplifier in the lectern will run through conduit to the speakers at the ceiling. Low voltage wiring will run to all motorized screen controllers from the lectern, as well as to the dimmable lighting system interface. For projector lifts, the wired lift control remote cabling will also run

through the floor box and into the lectern. Just prior to moving the lectern over the floor box and wiring begins, the floor box cover needs to be removed and saved for the owner. No wire ties should be used to secure cabling, velcro straps should be used in lieu. (Construction and Electrical tasks further explained in the Construction Standards Document)

Each floor box will have multiple network jacks wired to the Telecom closet with predetermined and specifically assigned uses the Vendor must adhere to. In Standard rooms, Port 1 is used for the OFOI (Owner Furnished, Owner Installed) telephone, Port 2 is for future functionality, Port 3 used for the OFVI computer for network connectivity with a static IP, Port 4 connects the AMX system to the classroom control VLAN, Port 5 allows for a DHCP laptop connection, and Port 6 is for future functionality. (Construction and Electrical tasks further explained in the Construction Standards Document)

#### 4.1.1.3 Source Components

All “user” accessible components must be located at the lectern as specified. A Document Camera must be incorporated into the system and mounted to the lectern top. The signal going to the projector(s) will be through Belden 10GX62F or Belden 10GX63F Cat6a shielded twisted pair cable depending on environment. A WVU standard PC computer (Owner furnished, Vendor installed) must be incorporated into the system and placed inside the “user” side of the lectern. A touch-enabled flat panel LCD monitor must display the installed PC computer signal at all times and be securely mounted to the lectern top with a triple-pivot (tilt, swing & rotate) lectern mounted arm. This shall act as the primary monitor for the PC at all times. An input panel for connecting portable equipment to the multimedia system must meet configuration standards and be incorporated into the system. Connections will be provided for laptop (both HDMI and USB Type C via adapter cable), RJ45 Ethernet cable, and auxiliary microphone (three wire microphone cable with 3 pin female connector). Cable pass-through plates need to be installed low in the Cable Cubby to allow cables and connectors to easily fit inside with the Cubby door shut. Locations of all mounted equipment is to be identified on-site by Owner.

#### 4.1.1.4 Control

For all WVU Standard rooms refer to the “Requirements for the AMX Touch Panel Control Interface” document.

The computer will be controlled with wired keyboard and mouse at the lectern; as well as have connection to a wireless handheld presenter. All other technology must be controllable through an AMX control system, and a 10” or larger tabletop touch panel (AMX components are Vendor furnished, Vendor Installed, and Vendor programmed unless otherwise noted). The touch panel will be located on the lectern with enough cable to move into position for a seated instructor. In addition to controlling all audiovisual related devices and room lighting, the touch panel will show the last source selected/sent to the projector, projector power status, motorized screen status, and the current audio level of sources and microphones. In single projector classrooms a single press of the source button sends the signal to the projector, however, in multiple projector rooms a display button corresponding with each projector will allow different sources to be displayed simultaneously. The Vendor must adhere to the campus standard

established for the design and layout of touch panels (see Section 5.7.2). The WVU touch panel template can be provided by the Owner and programming shall be in coordination with the Owner.

Remote access for reporting and technician control of the AMX system must be provided and configured on Owner's AMX RMS server to match existing WVU standards. Each AMX system must report status on the RMS Hotlist and send default email notifications for Device Communicating, Device Online, and Lamp Hours attributes for all equipment to advise when parameters deviate from, and return to, normal range. All RMS code must be included in the provided control system source and configuration codes. In addition, all RMS asset licenses are Vendor provided and must be obtained prior to installation. Access to the RMS server is controlled through WVU's Office of Information Technology and approved through Classroom Technology. Remote access for the Vendor is possible but requires prior notice to be arranged.

#### 4.1.1.5 Audio

A stereo audio system (i.e. mixer, amplifier, speakers) will be incorporated into the audio/visual system, controllable via the AMX touch panel, capable of reproducing the projected source(s) audio. The exact format of the audio system is related directly to the size of the space being developed. Consistently used products will be an AMX Enova series controller, with built in audio amplifier, and an audio mixer. In cases where the space requires more power in order to fulfill audio demands an external power amplifier will be used. These components will be rack mounted in the "technician" access side of the lectern. All classrooms shall include a gooseneck microphone and an auxiliary microphone input connection. All classrooms with more than 60 seats shall also include a wireless lapel microphone. All classrooms with more than 100 seats shall incorporate a wireless handheld microphone. And finally, all classrooms with more than 200 seats shall incorporate a second wireless handheld microphone. For larger auditoriums a third wireless handheld microphone may be specified by the Project AV Supervisor on a case by case basis. All microphones must be capable of simultaneous use. All gooseneck microphones will connect at base to lectern-top mounted XLR jack and can be detached and be put inside lectern. Frequencies of newly installed wireless microphones are to be coordinated between Vendor and Owner, so as not to interfere with each other or existing systems. Wireless mic receivers will be rack mounted. (Construction and Electrical tasks further explained in the Construction Standards Document)

#### 4.1.1.6 Assistive Technology

An output panel located on the side of the lectern will duplicate the output(s) shown on the projector(s) and room audio for use with external ADA compliant monitors or audiovisual recording devices. See section 6 for equipment details. For rooms that do not get an Assistive Listening System installed directly, the connectivity for a personal assistive listening system with mixed (projected source(s) and all microphones) audio shall be installed in the "technician" access portion of the lectern by leaving a 3 foot loop of audio cable with a male XLR connector.

Auditoriums that are primarily accessed through the back of the hall may

also have need for audio and video accessibility output signals run to special floor boxes for additional displays. These “student station” floor boxes will require the same preparation during construction as the lectern floor box (a route for cable and the wiring pulled by the EC). These boxes should include power outlets and Ethernet jacks. (Construction and Electrical tasks further explained in the Construction Standards Document)

For the large, cart-mounted TV monitors (see Sec. 6 for equipment details) to function quickly and effectively, they must be prepared to optimize ease of use. They utilize one shielded 25 foot HDMI 1.4a (or higher) cable and one power extension cable. These should be wrapped in a mesh sheath, secured at the TV & cart, as well as along the run for tension relief, and loosely attached to the rear of the cart using Velcro cable management. The TV remote control should be attached to the rear of the cart, out of site from the front, using hard Velcro.

#### 4.1.1.7 Projection

To ensure image quality, WVU uses different projectors to match the needs of each room. For best results, the image height should be at least 1/6 of the distance from the screen to the farthest average seat. Also, it is preferable that the first row of seats be no closer than 2 times the measurement of the screen height. In a typical 8'-11' ceiling classroom, unless otherwise noted, the main display shall be a high definition networked ceiling mounted laser projector with a minimum of 40 ANSI lumens per square foot. Projectors are to use the auto shutdown feature when a signal has not been received for 60 minutes. The projection screen is to be mounted as high as possible to the ceiling for the best viewing angle and largest image size. The projector is to be mounted within the same range of height as the screen surface, but above the WVU minimum required height for proper human clearance underneath, within 6 inches of the top of the screen to avoid significant image keystone. The screen should be mounted at least 4 inches from the wall to avoid contacting the chalkboard tray, and descend no lower than the 3" above the chalkboard tray. The projector should send a warning indication to the technician (email is preferred) when maintenance is needed.

A typical classroom with a standard projector will use a universal mount attached to a ceiling mounted pole provided by the GC. For rooms requiring a larger image, a high-output projector, usually large and heavy, must be installed with a projector lift. A projector lift must also be installed in rooms where the projector is mounted above 11' from the floor below, mounted above seating on a tiered or ramped floor, or the projector and mount combined weight is over 50 lbs. The lift should be installed so that during daily normal use the lift is kept in its “full up” position. Projector lift limits must be adjusted to locations agreed upon by the Owner & AV Supervisor. (Construction and Electrical tasks further explained in the Construction Standards Document)

## 4.2 Project Completion

Equipment and system configuration (both hardware and software), associated files, and development software (and all relevant documentation and license) must be provided to the owner with the final documentation through email and removable flash storage (USB “stick”). The software developer shall retain intellectual property rights; the Owner

shall have a license for perpetuity for use as it applies to this project, including the right to modify/enhance. The software code may not be sold or used, in part or in whole, in any other project or application other than that intended by this specification, in part or in whole, by the Owner or any other party

The Vendor must also provide the Owner with the following "As Built":

- All spare documentation and accessory items shipped with equipment from manufacturers shall be provided to the owner
- A list of the wireless microphone frequencies used for each room
- All equipment manuals, service documentation and warranty information which indexes all documentation that came with the installed equipment
- As built diagram of the installed system (detailed drawings indicating equipment wiring, signal flow, layout and orientation) printed on paper mounted in tech-side of each lectern and provided in electronic format
- Spreadsheet that lists brand, model, serial number and a functional description for each piece of vendor installed equipment
- All equipment configuration settings (including those set physically or through computer interface), including AMX code, provided in electronic format for all installed equipment

Total installation and proof of performance is the responsibility of the Vendor and must be demonstrated to the Owner by completion date. The Vendor shall assist the Owner in final system tests and adjustments. The Vendor's representative assisting in the performance of these tests shall be thoroughly familiar with the details of the system and shall include the field supervisor responsible for installing the system. Training on operation and maintenance procedures must be provided to the Project Manager, AV Supervisor and other designated personnel. The Vendor can anticipate providing required training sessions of an average of 1 hour per room after final testing has been completed.

The Vendor shall provide a service contract to WVU for a period of one year that covers the provided hardware, software, and functionality. The contract shall cover repairs of hardware or control system software during WVU business hours. All travel expenses, labor, shipping and parts shall be covered by this service contract. This contract does not supersede any manufacturer warranties and shall not be construed as part of said warranties.



## 5. Equipment Lists by Room Type

The following equipment lists provide the latest classroom technology configurations being implemented across campus at the time of this document's last update and is meant to serve as a guideline; WVU reserves the right to alter the technology implemented to meet classroom functionality requirements and equipment availability.

### 5.1 Standard HD Classroom Equipment Example

#### Projection Equipment:

- 1 Panasonic PT-FRZ60 Laser Projector (Choose Black or White to Match Ceiling)
- 1 Chief RPA-U Projector Mount (Color to Match Ceiling)
- 1 Chief CMS-445 Ceiling Panel
- 1 Chief CMA-003W 3" Pipe (Color to Match Ceiling)

#### Input Panel:

- 1 Extron 60-1399-02 Cable Cubby 1202 w/ US AC Power Module (Black)
- 1 Extron 70-267-01 Cable Pass-Through Right AAP Module (Black)
- 1 Extron 70-270-01 Cable Pass-Through Left AAP Module (Black)
- 1 Extron 70-090-11 Blank Single AAP Module (Black)
- 1 HDMI to USB Type C Adapter Cable (ex. Monoprice 24441)
- 1 Slim High-Speed HDMI 15' Cable (ex. Monoprice 14196)

#### Output Panel:

- 1 Extron 60-300-02 AAP102 Connectivity Panel Frame (Black)
- 1 Extron 70-616-12 HDMI Plate with Pigtail (Black)
- 1 Extron 70-090-11 Blank Single AAP Plate (Black)
- 1 Extron 70-432-11 XLR 3-pin Male to Solder Cups (Black)

#### Video Equipment:

- 1 Lumens DC193 Document Camera
- 1 Specialty 6' Serial Control Cable for DC193
- 1 AMX Enova DVX-2265-4K All In One Presentation Switcher
- 1 Dell P2418HT Multi-Touch Enabled PC Monitor

#### Audio Equipment:

- 1 Biamp Tesira FORTE AI Digital Signal Processor
- 1 Crown CDi1000 Audio Power Amplifier
- 1 AKG GN30E 15" Gooseneck Microphone Base
- 1 AKG CK80 Hypercardioid Capsule for Gooseneck Microphone
- 1 Shure QLXD14/93-G50 Wireless Lapel Microphone System
- 1 Shure QLXD24/SM58-G50 Wireless Handheld Microphone System
- 1 XLR 3-pin Male 3' Cable for Assistive Listening System Connection

#### Control Equipment:

- 1 AMX VARIA-100N 10.1" Touch Panel
- 1 AMX VARIA-ACS-100F Fixed Tabletop Stand
- 1 AMX PS-POE-AF-TC PoE Injector for Touch Panel
- 1 Netgear GS108 8-port 10/100/1000 Switch

#### Video Conferencing Specific Items:

- 1 Samsung MZ-76E1T0B/AM SSD, 1TB 2.5" Internal EVO SATA III (Owner Installed)
- 1 Visiontech USB 3.0 Card, PCIe 4 Port Host Adapter (Owner Installed to PC)
- 1 Polsen XLR USB-48 XLR to USB Audio Interface w/ Phantom Power
- 1 Huddlecum HC-EPTZ-USB USB3/HDMI Webcam
- 1 Pearstone USB3-AB15 15' USB Cable, Type A Male to Type B Male
- 1 Pearstone CT08-100-B 8" Plastic Cable Ties (Black, 100-Pack)

#### Security Related Items:

- 2 Flexguard BC84B/BB6KP 6' Security Cable, Lock & Loop Terminals
- 1 Flexguard BC84B/BB8KP 8' Security Cable, Lock & Loop Terminals
- 1 Flexguard MC98 Standard Scissor Clip

- 1 Flexguard MC99 Heavy-Duty Scissor Clip
- 3 CCL Security K2470BN Sesamee Traditional Combination Padlocks (Owner Installed)
- 1 Hosa Technology WTI-508 Hook & Loop Cable Ties 0.5"x8" (Black, 50-Pack)
- Miscellaneous:
  - 1 Ergotron 45-241-026 Single LCD Mounting Arm (Black)
  - 1 Wolfvision WOL105436 Write On Working Surface (Owner Installed)
  - 1 Logitech R400 Wireless Remote Presenter
  - 1 Middle Atlantic PD-815R-PL 8-Outlet Rack Mounted Power/Surge Strip
  - 1 Middle Atlantic C5, Custom Multimedia Cabinet Lectern – WVU Standard
  - All manuals, tools, software, & spare parts packaged with these products
  - Cables, connectors, and any additionally needed accessories
- AVC Furnished & GC Installed:
  - 1 Da-Lite Tensioned Advantage Deluxe Electrol 16:9 Screen w/ Wall Switch
  - 1 Da-Lite Single Motor Low Voltage Controller Interface for External Control
  - X? KSI-8081 Ceiling Speakers (with Transformer T-70-15 Installed)
  - Cable Runs Through Conduit
- GC Furnished & Installed:
  - 1 Preset Programmable Zoned Lighting System
  - 1 Lighting System Interface for External RS232 Control System
  - 1 Instructor Station Floorbox w/ Network, Power, and AV Pathways
- Owner Furnished & AVC Installed:
  - 1 Dell Optiplex Computer w/ Digital Video Output
  - 1 Dell USB Keyboard
  - 1 Dell USB Mouse

## 5.2 Standard HD Auditorium Equipment Example

- Projection Equipment:
  - 2 Panasonic PT-RZ970BU
  - 2 Chief HB76P VCM Projector Mount (Black)
  - 2 Chief CMA100 8" Ceiling Plate with Adjustable 1.5" NPT Column (Black)
- Input Panel:
  - 1 Extron 60-1399-02 Cable Cubby 1202 w/ US AC Power Module (Black)
  - 1 Extron 70-267-01 Cable Pass-Through Right AAP Module (Black)
  - 1 Extron 70-270-01 Cable Pass-Through Left AAP Module (Black)
  - 1 Extron 70-090-11 Blank Single AAP Module (Black)
  - 1 HDMI to USB Type C Adapter Cable (ex. Monoprice 24441)
  - 1 Slim High-Speed HDMI 15' Cable (ex. Monoprice 14196)
- Output Panel:
  - 1 Extron 60-300-02 AAP102 Connectivity Panel Frame (Black)
  - 1 Extron 70-1219-02 Two HDMI Female to Female on 10" Pigtails (Black)
  - 1 Extron 70-090-11 Blank Single AAP Module (Black)
  - 1 Extron 70-432-11 XLR 3-pin Male to Solder Cups (Black)
- Video Equipment:
  - 1 Lumens DC193 Document Camera
  - 1 Specialty 6' Serial Control Cable for DC193
  - 1 AMX Enova DVX-3266-4K All In One Presentation Switcher
  - 2 Dell P2418HT Multi-Touch Enabled PC Monitors
- Assistive Technology:
  - 1 Listen LT-800 FM Transmitter
  - 1 Listen LA-326 Rack Mount Bracket
  - 4 Listen LR-500 Receiver
  - 4 Listen LA-164 Single Ear Speaker
  - 1 Listen LA-122 Coax Dipole/Monopole Antenna Kit

- 2 Samsung 400FP-3 Professional 40" Large LCD Assistive Display Monitor
- 2 Large LCD ADM Security Mount for Samsung
- 2 Display Devices CMC-5000 Professional LCD ADM Cart for Samsung
- Audio Equipment:
  - 1 Biamp Tesira FORTE AI Digital Signal Processor
  - 1 Crown CDi1000 Audio Power Amplifier
  - 1 AKG GN30E 15" Gooseneck Microphone Base
  - 1 AKG CK80 Hypercardioid Capsule for Gooseneck Microphone
  - 1 Shure QLXD14/93-G50 Wireless Lapel Microphone System
  - 2 Shure QLXD24/SM58-G50 Wireless Handheld Microphone Systems
- Control Equipment:
  - 1 AMX MST-1002 10.1" Tabletop Touch Panel
  - 1 AMX PS-POE-AF-TC PoE Injector for Touch Panel
  - 1 Netgear GS108 8-port 10/100/1000 Switch
- Video Conference Specific Items:
  - 1 Samsung MZ-76E1T0B/AM SSD, 1TB 2.5" Internal EVO SATA III (Owner Installed)
  - 1 Visiontech USB 3.0 Card, PCIe 4 Port Host Adapter (Owner Installed to PC)
  - 1 Polsen XLR USB-48 XLR to USB Audio Interface w/ Phantom Power
  - 1 Huddlecam HC-EPTZ-USB USB3/HDMI Webcam
  - 1 Pearstone USB3-AB15 15' USB Cable, Type A Male to Type B Male
  - 1 Pearstone CT08-100-B 8" Plastic Cable Ties (Black, 100-Pack)
- Security Related Items:
  - 2 Flexguard BC84B/BB6KP 6' Security Cable, Lock & Loop Terminals (Black)
  - 1 Flexguard BC84B/BB8KP 8' Security Cable, Lock & Loop Terminals (Black)
  - 1 Flexguard MC99 Heavy-Duty Scissor Clip
  - 3 CCL Security K2470BN Sesamee Traditional Combination Padlocks (Owner Installed)
  - 1 Hosa Technology WTI-508 Hook & Loop Cable Ties 0.5"x8" (Black, 50-Pack)
- Miscellaneous:
  - 1 Ergotron 45-245-026 Dual LCD Mounting Arm (Black)
  - 1 Wolfvision WOL105436 Write-On Working Surface (Owner Installed)
  - 1 Logitech R400 Wireless Remote Presenter
  - 2 Middle Atlantic PD-815R-PL 8-Outlet Rack Mounted Power/Surge Strip
  - 1 Middle Atlantic C5, Custom Multimedia Cabinet Lectern (WVU-CTec Current Standard)
  - All manuals, tools, software, & spare parts packaged with these products
  - Cables, connectors, and any additionally needed accessories
- AVC Furnished & GC Installed:
  - 2 Draper SL or SLX Ceiling-Mount Projector Lifts
  - 2 Da-Lite Tensioned Advantage Deluxe Electrol Screen 16:9 w/ Wall Switches
  - 2 Da-Lite Single Motor Low Voltage Controller Interface for External Control
  - X? KSI-8081 Ceiling Speakers (w/ Transformer T-70-15 Installed)
  - Cable runs through conduit
- GC Furnished & Installed:
  - 1 Preset Programmable Zoned Lighting System
  - 1 Lighting System Interface for External RS232 Control System
  - 1 Instructor Station Floorbox w/ Network, Power, and AV Pathways
- Owner Furnished & AVC Installed:
  - 1 Dell Optiplex Computer w/ Digital Video Outputs
  - 1 Dell USB Keyboard
  - 1 Dell USB Mouse

## 6. Lectern Styles

Technology lectern designs, diagrams, and specifications, including but not limited to room specifications, flowcharts, specialized touch panel designs and templates, audio

programming files, and any provided specific AMX code, are the sole intellectual property of West Virginia University. Design specifications are subject to change at any time. Dimensions and other specifications may be requested from the Project Manager.

## **7. Wiring Diagrams**

The Project Manager and the Project AV Supervisor must be consulted before any changes, corrections, or addition and subtractions can be made to the project wiring diagrams.

## 8. Document Edits

Date Started	Location of Change (Sec. #)	Description of Change	Date Finalized
3/7/18	5.1, 5.2	Updated equipment list	3/7/18
3/8/18	7	Altered wording	
11/19/19	5	Updated Equipment	11/19/19
11/19/19	6	Removed	11/19/19
1/12/21	5	Updated Equipment	3/24/21
3/24/21	5.1, 5.2	Altered Titles	3/24/21
4/14/21	5.1, 5.2	Updated Equipment	4/14/21
2/1/23	5.1, 5.2	Updated Equipment	2/1/23
7/25/23	5	Updated Equipment Section	7/31/23
7/31/23	4	Updated Install Details	7/31/23