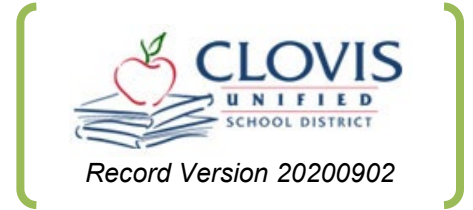


274200 – CLASSROOM AUDIO/VISUAL SYSTEMS

Part 1 - General



1.1 Scope of Work

- A. This document describes the products and execution requirements relating to furnishing and installing Classroom Audio/Visual systems. Classroom Audio/Visual System Electronics and installation requirements are covered under this document.
- B. The intent of these Specifications is to provide a complete classroom audio/visual system and it is the responsibility of the bidding Contractor to provide a complete solution. It is also the responsibility of the Contractor to provide all material necessary to provide a complete system even if the material is not described specifically in the following documentation. All questions concerning non-specified product and services will be address to the Owner's Representative before the Contactor provides a bid. Owner expects that by accepting the Contractor's bid proposal that they [the Contractor] have provided a competent bid for a complete solution.
- C. Contractor to include labor costs to install owner provided projector in each room an Extron system is installed in. If not installed, a credit is to be issued to owner for the labor costs not preformed.
- D. Excluded in this scope: projection surface & projection.

1.2 Related Work in Other Sections

- A. Division 270000 for all general conditions and work required by the contractor.
- B. All 120VAC power conductors and conduits associated with power circuits to all equipment locations shall be furnished and installed by Division 260000 contractor.
- C. All raceway systems including but not limited to conduit, j-boxes, outlet boxes, floor boxes, & surface mounted raceway shall be furnished and installed by Division 260000 and 270528 contractors.

1.3 Approvals

- A. The system shall maintain the following listings and/or approvals from the following agencies:
 - 1. (UL) Underwriters Laboratories
 - 2. (FCC) Federal Communications Commission

1.4 Contractor Qualifications/Quality Assurance

- A. **Safety and Indemnity**
 - 1. Contractors will submit the necessary documentation to demonstrate their compliance with Section 270000 "1.5 A. Safety & Indemnity".
- B. **Contractor Qualifications**
 - 1. Contractors will submit the necessary documentation to demonstrate their compliance with Section 270000 "1.5 B. Contractor Qualification".
- C. **Quality Assurance**
 - 1. Contractor shall comply with all requirements as specified in Section 270000 "1.5 C. Quality Assurance".
- D. **Warranty**
 - 1. Contractor shall comply with all requirements as specified in Section 270000 "1.8. Acceptance & Warranties".
 - 2. Contractor to provide liaison services of manufactures **THREE YEAR WARRANTY.**

1.5 Submittal Documentation

- A. The successful contractor shall provide their submittal package in accordance with the Section 01 20 00 1.06 Submittal Schedule, and Section 270000 "1.6 Submittal Documentation".
- B. Contractor shall also include in their Submittal Package:
 - 1. A shop drawing depicting all system components and interconnections.

1.6 Equivalent Products

- A. All Contractor provided product in this Specification are those of:
 - 1. Extron Systems
- B. Pre-Approved Equals:
 - 1. Equivalent Products must comply with Section 274200 1.8 Classroom Audio/Visual System Specification contained within this document.
- C. Contractors wishing to approve a system other than those specified in this document shall do so in accordance with Section 270000 “:1.7 Equivalent Products”.
- D. Equivalent products (equals), may be substituted for the specified Extron Systems by submitting a “Substitution Request Form” (see attached). The “Substitution Request Form” must be submitted to the Architect and District for evaluation. A complete product data submittal must be submitted along with the “substitution Request Form”.

1.7 Technology Clause

- A. As technology advances, it is understood that improved or enhanced products may supersede existing products in both price and performance and yet be essentially similar. This request for bids seeks to address the rapid advances in technology by allowing functionally similar or identical products that may be introduced in the future, during the term of this bid, to be included under the general umbrella of compatible product lines and are thus specifically included in this bid document.
- B. Discontinued or end of life products shall be replaced with an equal product to the original specified product at no additional costs to the owner.

1.8 Extron Systems only -- Classroom Audio/Visual System Specification

- A. Control System
 - 1. The Control System shall provide on/off for all connected devices, projector control, audio and video switching, and volume control for all connected audio.
 - 2. Control System shall be operated from a wall mounted control panel located at the front of the classroom.
 - 3. The Control System shall use either RS-232 or Ethernet for projector control.
 - 4. The Control System shall be attached to the site’s IP data network via CAT 6 ethernet cabling.
 - 5. The Control System shall also be remote accessible via IP data network using administration software, web interface, as well as an iOS device.
 - 6. The control panel shall be mounted within 3’ to the left side of the projection surface (while facing the surface) at 48”aff, UON. Field verify placement with District staff.
- B. Switcher
 - 1. System shall incorporate a switching system that can allow for a minimum of two RGB inputs and two HDMI inputs.
 - 2. System cannot rely on projector for switching of any kind. Projector is only to be used for video output only.
 - 3. Switcher must output via a digital interface (HDMI, DVI, Display Port).
 - 4. Switcher must be able to output audio from both analog and digital sources to amplifier/speakers.
 - 5. Switcher components shall not be visible nor shall it be placed in existing cabinetry.
- C. Architecturally mounted AV Inputs
 - 6. One double-gang wall plate with two (2) HDMI inputs and one (1) 3.5mm TRS audio connection and one (1) USB connection. Check with Owner to determine location of the wall plate in each room.
 - 7. All structured cabling from AV wallplates to switcher shall be over twisted-pair cabling. All AV input sources must have the appropriate media and cabling converts on both ends.
- D. Audio and speakers
 - 1. System shall provide sound amplification for all audio and video sources. Voice (microphone) amplifications is not required unless otherwise noted.
 - 2. Projector may not be used to switch, de-embed, or pass-through audio.
 - 3. Speakers shall be flush mounted ceiling speakers located at the center of the room for even sound distribution.
- E. Manufacturer warranty three years parts and labor.
- F. Projectors and Mounting.

Projector is owner provided, contractor installed/configured.

Verify projector type and mount location with owner prior to installation.

1. Projector mounts shall be installed on the walls whenever possible. Please verify with owner if there are any questions as to which type to use.
 2. Ceiling Mounted Environments.
 - Projector mount must be designed for use with drop ceilings.
 - Projector shall be mounted in the ceiling centered on the learning wall, 10'-0 (+/- 6" or nearest tile) from screen/whiteboard or nearest grid alignment +/-6".
 - Classrooms that have a Smart Board, centered on the board, 10'-0 (+/- 6" or nearest tile) away from board.
 - Classrooms that only have a white board, centered on the board, 10'-0 (+/- 6" or nearest tile) from white board.
 - Classrooms that have an existing screen, centered on the screen, 10'-0(+/- 6" or nearest tile) from screen.
 - Contractor to contact CUSD if multiple conditions exist in the room or if anything is not clear on location of mounting equipment.
 3. Wall Mounted Environments.
 - Wall mounts shall be aesthetically pleasing. Structural support hardware shall be covered by an enclosure and should not be visible. Contact Owner if there are any issues. Wall mount is to be mounted as close to the top of the projection surface as possible to allow for any interactive devices.
 - Wall mount extension arm shall not exceed 36" from wall and shall be centered on the learning wall, which should align with the center of the projected surface.
 - Wall mount must support a projector weighing up to 20 pounds at full extension.
- G. Classroom that are non typical in shape (interior classrooms) or have offset/split whiteboards, both the control panel and projector mount will have to be located on an individual basis.
1. Contact Owner to locate the mount and controls in those rooms.

1.9 TYPICAL CLASSROOM SETUP

- A. Control System
1. There is no control system. The projector will be controlled with the remote control.
- H. Switcher
1. There is no Switcher. The inputs will be controlled with the remote control.
- I. Architecturally mounted AV Inputs
1. One double-gang wall plate with one (2) HDMI, one (1) 3.5mm TRS audio connection, and (1) USB input located to the left of the projection surface. Verify location with Owner prior to installation.
 2. One 12 inch active USB repeater pigtail is to be included and connected to the wall plate above.
- J. Audio and speakers
1. Speakers shall be flush mounted ceiling speakers located at the center of the room for even sound distribution. Contractor to supply the cables from projector, to the amplifier, and on to the speakers.
- K. Projectors and Mounting.
- Projector is owner provided, contractor installed/configured.
1. The typical install will be with a Wall Mounted projector.
 - Wall mounts shall be aesthetically pleasing. Structural support hardware shall be covered by an enclosure and should not be visible. Contact Owner if there are any issues. Wall mount is to be mounted as close to the top of the projection surface as possible to allow for any interactive devices.
 - Wall mount extension arm shall not exceed 36" from wall and shall be centered on the learning wall, which should align with the center of the projected surface.
 - Wall mount must support a projector weighing up to 20 pounds at full extension.

Part 2 - Products

The following sections specifically list the acceptable equipment types and items for this project. Where quantities are not noted, they may be obtained from the project drawings. In the event of a discrepancy between the specifications and the project drawings, the greater quantity or better quality shall be furnished.

- 2.1** Classroom Equipment for all rooms have the same system with either wall mount or ceiling mounted speakers. Ceiling mounted speakers are preferred unless ceiling configuration does not allow for it.

A. STANDARD SYSTEM:

Wall Mounted UST projector – Owner provided, contractor installed and configured.

--Projector comes with a USB cable to connect from the projector to a laptop. This cable should be used to connect to the USB pigtail and wall plate. If not used, contractor responsible to provide the appropriate cable.

Actiontek Screenbeam 750W – Owner provided and configured, contractor installed.

--This unit provides wireless connectivity to the projector and plugs into the HDMI input on the projector. Connect it to HDMI 1 on the projector. Unit is to be secured to the wall mount arm with Velcro.

Wallplate with USB/3.5mm Audio/two HDMI – Contractor provided, configured and installed.

COVID – W1408-WH-P-A-ALT

COVID - CWP 0010-USB-BA-AC8”

--Contractor to provide all cables from this wallplate to the projector location. The USB cable is provided with the projector and contractor is to connect the USB cable from the projector to the pigtail, which connects to this wall plate. Note the provided cable is 15' long. If a longer length is needed, contractor is to provide the active USB cable needed to connect from the projector to the wallplate.

--The 3.5mm cable is to be provided by the Contractor and is to be connected to the wallplate to the audio input on the projector.

Two ceiling mounted speakers – Contractor provided, installed, and configured.

Extron 42-120-13, FF 120T Speakers (one pair)

Extron Amp -- Contractor provided, installed, and configured.

Extron 60-1449-01, MPA 601-70V

Audio Cable -- Contractor provided, installed, and configured.

Extron 18 AWG speaker cable.

B. Verify with owner prior to ordering this system as it is only used in specific cases, such as an MPR.

Extron WallVault WVS 400D Digital Audio Video Switching and Control System.

The system shall use the following configuration.

1. (1) Extron PVS 405D - Digital Switcher
2. (2) Extron PVT SW HDMI RGB D – HDMI / RGB Video and Stereo Audio Input – Wallplate
3. (1) Extron MLC 104 IP Plus - MediaLink Controller
4. (1 Pair) Extron FF 120 Speakers (**ceiling mounted speakers**)
5. (1) Extron USFM 100 Ultra Short-Throw Projector Mount and Equipment Enclosure
6. (1) Extron UPB 125 Universal Projector Bracket
7. (1) Extron WallVault WVS 400D Kit using custom part number: **42-210-000442**

- C.** Non-MPR installs need to include the active USB pigtail cable as noted above in the standard installation.

- D. Voice Amplification System (Not included in bid unless shown or requested by CUSD)
If a voice amplification system is requested, add the following to the above Extron PVS 400D configuration.
 - 1. (1) Extron VLM 2000H - VoiceLift Pendant and Handheld Microphone System

Part 3 - Execution

3.1 General

- A. All Work described in this specifying document and on the Project drawings shall be performed in accordance with the acknowledged Professional and Industry standards and practices. All installed equipment shall meet and/or exceed the specified manufactures regulations.
- B. The Contractor shall maintain a competent supervisor and Manufacture Certified Technician assigned to this installation for the duration of the Project.
- C. Furnish and install all materials, devices, components and equipment required for a complete and operational system.
- D. It is the contractor's obligation to inform the Owner and/or the Owner's Representative of any and all conflict's, between the project documents and the onsite conditions.
- E. It is the Contractor's responsibility and obligation to coordinate with all necessary trades to ensure the integrity and compliance of the Manufacture and Industry standards are meet during the duration of the installation.

3.2 Installation

- A. Furnish components, wire, connectors, materials, parts, equipment, labor, etc. necessary for the complete installation of the systems in full accordance with the recommendations of the equipment manufacturers and the requirements of the drawings and specifications.
- B. Wire and cable for all other devices shall be supplied in accordance with the recommendations of the device manufacturer and the National Electrical Code.
- C. Equipment shall be held firmly in place with proper types of mounting hardware. All equipment affixed to the building structure must be self-supporting with a safety factor of at least three. All equipment shall be installed so as to provide reasonable safety to the operator. Supply adequate ventilation for all enclosed equipment items which produce heat.
- D. Furnish the system to facilitate expansion and servicing using modular, solid-state components. All equipment shall be designed and rated for continuous operation and shall be UL listed, or manufactured to UL standards.
- E. Observe proper circuit polarity and loudspeaker wiring polarity. No cables shall be wired with a polarity reversal between connectors with respect to either end.
- F. Route cables and wiring according to function, separating wires of different signal levels (video, microphone, line level, amplifier output, AC, control, etc.) by as much physical distance as possible. Neatly arrange and bundle all cables loosely with velcro cable ties. Cables and wires shall be continuous lengths without splices.
- G. All cables in conduits shall be insulated from each other and from the conduit the entire length and shall not be spliced. All cables and wires are to be continuous lengths without splices.
- H. Mechanical connections shall be made using approved connectors of the correct size and type for the connection. Wire nuts will not be accepted.
- I. Label all wires as to destination and purpose. Clearly and permanently label all jacks, controls, and connections with permanent labels, unless otherwise noted.
- J. Contractor to include labor costs to install owner provided projector in each room an Extron system is installed in. Projector is to be aligned to designated screen/board, as directed by Owner. If not installed, a credit is to be issued to owner for the labor costs not preformed.
- K. Contractor is to turn over to the owner any items included with the kit, including but not limited to, any extra cables, labels, templates, tools, and manuals. All items to be placed in a bag with the room number on the bag.
- L. Contractor to label control panel buttons 1 - 4 and label the inputs accordingly. Verify with Owner prior to printing.
- M. One CAT6 data cable shall be connected from the Control Panel to the nearest IDF (Extron installs only).
- N. Projector (whether owner contractor provided or owner provided) and Control Panel are to be assigned an IP address (contact Owner on what to use). Assigned address to be

documented for every unit and provided back to Owner. Contact owner for sample spreadsheet to use.

- O. All wall mounted projectors come with interactive capabilities via pens. Contractor to calibrate the system prior to turning over to Owner.

3.3 Programming

- A. Contractor shall provide all necessary programming to provide a complete operating Audio Visual System.
- B. Contractor shall include in their bid a one (1) hour planning meetings with the owner and their Representatives to outline all specific programming issues, as well as, but limited to:
 - 1. Contractor will be informed of any specific requirements for use of the system.
 - 2. Contractor will provide overview of system capabilities.
 - 3. Contractor will address all concerns of the Owner and their Representatives.
- C. All Control System Programming shall be custom produced for this installation by qualified factory-trained installer and software support shall be provided to owner for 12 months after the final acceptance of this project. AV contractor to work with the Owner's staff to assign IP addresses and set-up of all A/V equipment.
- D. Any programming needed to configure the interactive capabilities is to be included and completed by the contractor.

3.4 Testing

- A. The completed AV systems shall be physically inspected by the Owner's representative to assure that all equipment is installed in a neat and professional manner, and in accordance with these Specifications.
- B. The final system testing and commissioning shall be performed after all installation and initial testing has been completed by the Installer, but prior to any use of the systems.
- C. The Contractor, prior to requesting systems testing and demonstration to the Owner's representative, shall ensure that all systems are in first-class working condition and free of short circuits, ground loops, parasitic oscillations, excessive hum and noise, RF interference, or instability of any form.
- D. The Contractor shall be responsible for properly performing all setup and alignment of systems, and all assembly and setup of portable equipment.
- E. The Contractor to provide a listing of each room/location and sign off that each part of the system was tested and the result of the test. Contact owner for an example form to use.

3.5 System Commissioning

- A. Audio Visual System Commissioning
 - 1. In the presence of the Owner's Representative the Contractor shall perform the attached functions listed below:
 - (1) Inspection of all terminations
 - (2) Inspection of all inputs and output devices
 - (3) Verify polarity of speaker system and connectors
 - (4) Check wire types at all locations
 - (5) Verify connector types
 - (6) Check Impedance of speaker lines
 - (7) Verify coverage of speaker system
 - (8) Check general operation of control surface
 - (9) Check programming of control surface for routing and proper function
 - (10) Check power sequencing
 - 2. All testing documentation will be supplied as a part of the Contractors As-built Documentation.
- B. Contractor will include in their bid price six (6) hours for onsite commissioning. Contractor will provide the installation technician who was responsible for this project to be present at the system commissioning to tune, fix, repair, replace all system components that do not operate within the tolerance as set forth in this specification, the project documents, and industry standards.
- C. The final acceptance of the system by the Owner will be based upon the report of the Owner representative following inspection, testing, and commissioning. A list of items in need of completion or correction shall be generated by the owner, which must be corrected by the Installer before final acceptance will be granted.

3.6 Training

- A. Contractor shall provide no less than two (2) one (1) hour training sessions.
 - 1. The first training session will be a "Train the Trainer". The owner will appoint their representative to be provided extensive training so that he/she will be able to provide additional support once the project has been completed.
 - 2. The additional training session will be provided as a general overview of the system operation for large groups or several smaller groups as designated by the owner. Usually these additional training events will coincide with a school function when the sound system will be used.
 - 3. Provide sign in sheets for all training events. Deliver to architect in the close out documents.

3.7 Warranty

- A. Contractor will provide a minimum of a 1 year Workmanship Warranty that includes Parts and Labor.
- B. All equipment provided under this specification shall be warranted to be free from defects in materials and workmanship for a period of 12 months from the notice of completion.
- C. The Contractor shall maintain regular service facilities and provide a qualified technician familiar with the work specified for this project. Contractor will respond to all notice of malfunction from the Owner within 24 hours of receiving trouble call. As part of this warranty, the Contractor shall provide, at no expense to the Owner, all material, devices, equipment, and personnel necessary and resolve malfunction and/or to provide alternate facilities, services, or equipment for the duration of repairs to any defective work as described in this section.
- D. All repairs and service under warranty shall be at the jobsite unless in violation of manufacturer's warranty, wherein contractor shall provide substitute equipment for the duration of repairs. Transportation of substitute or test equipment and personnel to and from the jobsite shall be at no expense to the owner.
- E. All repair and service work under warranty work, except emergency repairs can be performed during regular working hours of regular working days. Emergency repairs shall be made when a system or component malfunctions during use, and shall be performed on an immediate basis. All work shall be performed by personnel in the employ of contractor, having specific experience in the work of this specification and shall not be subcontracted or assigned to another company for service, unless Owner has approved such assignment in writing, in which event contractor shall nevertheless be responsible to the Owner for such work.

3.8 System Documentation

- A. Upon completion of the installation, the contractor shall provide four copies (one hardcopy and three electronic copies) of Project Close-Out Documents to the Owner. Documentation shall include the items detailed in the sub-sections below:
 - 1. Maintenance and Operation Manuals
 - 2. All System source codes and passwords must be handed over to, and become property of the Owner upon completion of this project.
 - 3. As-Built Drawings
- B. The **As-Built** drawings are to include cable routes, outlet locations and the approved labeling identifiers, equipment layout and system single line drawings. The Owner will provide floor plans in paper and electronic (DWG, AutoCAD 2008) formats on which as-built construction information can be added. These documents will be modified accordingly by the telecommunications contractor to denote as-built information as defined above and returned to the Owner.
- C. Contractor to provide a document with the site and reseller at the top of the page and a table listing the Room and MAC of the controller for every room a system is installed. The sticker on the control panel shall be attached to this document. Assigned IP addresses and MAC addresses are to be included in the documentation.

END OF SECTION