



ADDENDUM NO. 2
NEW DOVER HIGH SHOOOL – BID PACKAGE H-1
Dover, Delaware 19904

April 10, 2013

NOTICE: Attach this addendum to the project manual for this project. It modifies and becomes a part of the contract documents. Work or materials not specifically mentioned herein are to be described in the main body of the specifications and as shown on the drawings. Bidders shall acknowledge receipt of this addendum on the space provided on the Bid Form. Failure to do so may subject the bidder to disqualification.

Whenever this Addendum modifies a portion of the Project Manual added information is shown as **Bold** and deleted information is shown as strikethrough.

The contract documents for the above referenced project, dated March 8, 2013 are amended as follows:

GENERAL CLARIFICATIONS

- **BID DUE DATE CHANGED TO TUESDAY APRIL 16, 2013** and will be received at the Professional Development Administration Building located at 198 Commerce Way Dover, Delaware 19904-8210 until 3:00 pm.

MODIFICATIONS TO SPECIFICATIONS

A. Section 27 41 00 Audio Visual and Sound Systems: DELETE this section in its entirety and INSERT new section attached. (Part 2.01 Section A Classroom Sound Equipment was revised.)

MODIFICATIONS TO DRAWINGS

None

End of Addendum No. 2



SECTION 27 41 00

AUDIO VISUAL AND SOUND SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Classroom Sound Enhancement System
2. Specialized Instructional Space A/V Systems
3. Cafeteria A/V System
4. Main Gymnasium A/V System
5. Auxiliary Gymnasium Sound System
6. Music Room Sound Systems
7. Kitchen Lab Camera System
8. Video Wall Matrix
9. TV Studio Equipment

1.02 DEFINITIONS

- A. "Sound Enhancement" refers to a stand alone sound system which includes speakers, speaker wire, an infrared microphone and receiver, a pendant style microphone and amp/mixer unit.
- B. "Communications Network Outlet (CNO)" refers to a collection of one or more mechanical cable termination device for horizontal cable in the work area.
- C. "Drop" refers to the vertical transition to a location of one or more CNOs.
- D. "Horizontal Cabling" refers to the cabling between and including the work area communications network outlet and the horizontal cross-connect in the telecommunications room.
- E. "Jack" refers to a female-style telecommunication receptacle.

1.03 SYSTEM DESCRIPTION

A. Design Requirements

1. Classroom sound amplification and distribution through a pendent style portable microphone and at least one hand held microphone per learning area. System shall include inputs and controls for other classroom devices.
 - a. The system shall consist of a ceiling IR module and a low-profile wall mounted controller unit.
 - b. Amplifier/Receiver must have audio inputs for at least three auxiliary devices and an additional input to allow transmitting of sound to ceiling speakers from the microphone.
2. Specialized Space A/V systems shall include audio and video input locations, signal processing and scaling, switching, mixing distribution and amplification to speakers and display devices. The system shall be capable of analog and digital signal formats and have lectern or wall mounted controllers.

3. Cafeteria A/V System shall include audio and video input locations, signal processing and scaling, switching, mixing distribution and amplification to speakers and display devices. The system shall be capable of analog and digital signal formats as well as zoning and zone combining. Wireless microphones and assistive listening devices shall be provided as part of the systems
4. Gymnasium A/V System shall include audio and video input locations, signal processing and scaling, switching, mixing distribution and amplification to speakers and display devices. The system shall be capable of analog and digital signal formats as well as zoning and zone combining. Wireless microphones and assistive listening devices shall be provided as part of the systems
5. Auxiliary Gymnasium multi-input, mixing and multi-loudspeaker system shall be provided. The equipment rack shall contain the audio equipment and allow for presets or live mixing if various inputs. Loudspeakers shall be provided and place as shown on the drawings. Clearly label and color code the master volume control for all functions. Wireless microphones and assistive listening devices shall be provided as part of the systems
6. A music room multi-input, mixing and multi-loudspeaker system shall be provided. The mobile cart shall contain the audio equipment and allow for presets or live mixing if various inputs. Loudspeakers shall be provided and place as shown on the drawings. Clearly label and color code the master volume control for all functions.
7. Kitchen Lab camera system shall consist of a ceiling mounted PTZ camera connected to an HDMI video splitter. The video splitter shall be connected to two wall mounted LCD monitors. System shall include all cabling and connectors, electronics, power supplies, remotes and accessories.
8. Video Wall Matrix shall be a 4 input 4 output system including all cables, connectors, processors and accessories.
9. TV Studio shall include all audio and video editing equipment, cameras, screens, cabling, connectors and computers for a live system.
10. All stand-alone sound systems must have call override from the Intercom/PA system in the case of an emergency.

B. Performance Requirements

1. Comply with applicable requirements in Local, State and Federal Codes, TIA/EIA Standards, and BICSI methodology.
2. Specified cabling system derived from recommendations in approved telecommunications industry codes, standards and methods, including the following documents:
 - a. Articles 250, 725, 760, 770, 800,810 and 820 of the current National Electrical Code.
 - b. ANSI/TIA/EIA-568-B.1: Commercial Building Telecommunications Cabling Standard Part 1 – General Requirements
 - c. ANSI/TIA/EIA-569-A: Commercial Building Standard for Telecommunications Pathways and Spaces
 - d. ANSI/TIA/EIA-606: Administration Standard for Telecommunications Infrastructure of Commercial Buildings
 - e. BICSI Telecommunications Distribution Methods Manual (TDMM), 12th Edition
 - f. National Fire Protection Agency (NFPA-70): National Electrical Code (NEC)

1.04 SUBMITTALS

- A. Comply with requirements of Division 0 and Division 1 - Submittals and as modified below.

- B. Contractor must maintain a local presence in the State of Delaware. Submit office locations for review.
- C. Contractor must provide proof that service and warranty work can be initiated with a 24 hour time period from a service call.
- D. All submittals must conform to the state of Delaware K-12 wiring standards, please refer to this link for additional details:
 - 1. <http://dti.delaware.gov/pdfs/pp/CablingAndWiringStandard-K12.pdf>
- E. Product Data: Submit manufacturer's product literature, technical specifications and similar information for the following items demonstrating compliance with the specified requirements. Product submittals must clearly highlight the equipment being proposed. Failure to clearly indicate the selected items shall be rejected at the contractor's expense.
 - 1. Digital and Analog Input Plates
 - 2. Scalers
 - 3. Processors
 - 4. Mixers
 - 5. Touch Panels
 - 6. Controllers
 - 7. Signal Extenders
 - 8. Switchers
 - 9. Display Devices
 - 10. Input Sources
 - 11. Sound coverage and pressure level diagram for each auxiliary sound system
 - 12. Sound Amplifier
 - 13. Sound Speakers
 - 14. Sound Microphones
 - 15. Sound Cabling and Wiring
 - 16. Audio Visual cables and connectors
 - 17. Communications outlets, faceplates, and accessories.
 - 18. Wall outlets
- F. Samples: Provide samples of equipment, cables, microphones and assemblies as described below, prior to installation, for approval by designer.
 - 1. Sound Enhancement – Submit samples of audio visual cables provided including following components and characteristics:
 - a. Sample characteristics:
 - i. Provide all components in colors selected by Design consultant.
 - ii. Provide multiple samples where required to accurately represent range of cables to be provided.

- G. The Contractor shall submit shop drawing line drawings of all systems showing major components of the systems. Submit wiring diagrams showing typical connections for all systems and equipment.
- H. Quality Control Submittal
 - 1. Test Reports: Submit complete sample test data and reports with exact labels used on cables and faceplates.
 - 2. Certificates
 - a. Manufacturer Certification: Submit certification from manufacturer of products to be installed under this contract certifying that Installer is authorized by manufacturer to install specified products.
 - b. Installer Experience Listing: Submit list of at least 5 completed projects as specified below in "Quality Assurance – Qualifications – Installer."
- I. Contract Closeout Submittal: Comply with requirements of Division 0, including submission of operating and maintenance instructions as item in "Operation and Maintenance Data" manual described in that Section.

1.05 QUALITY ASSURANCE

- A. All Work shall be installed in a first class, neat and professional manner by skilled Technicians. The quality of the workmanship shall be subject to inspection and approval by authorized school district personnel. Any work found to be of inferior quality and/or workmanship shall be replaced and/or reworked until the approval of the school district is obtained.
- B. Installer Qualifications: Qualified to cable, terminate and test cabling system specified in this Section, certified by manufacturer of products to be installed, and completed at least 5 installations of similar size, nature and complexity as specified for this project.
- C. Conditions for Consideration of "Or Equal" Products: Where products are specified by name and accompanied by the term "or equal", the proposed "or equal" product will be considered when the following conditions are satisfied. If all the following conditions are not satisfied, Design Consultant will return requests without action, except to record noncompliance with these requirements:
 - 1. Proposed product does not require extensive revisions to the Contract Documents.
 - 2. With the exception of the product name or number and manufacturer's name, proposed product conforms with requirements indicated on the Drawings and in the Specifications in every respect and will produce indicated results.
 - 3. Proposed product is fully documented and properly submitted.
 - 4. Proposed product has received necessary approvals of authorities having jurisdiction.
 - 5. Proposed product is compatible with AND has been coordinated with other portions of the Work.
 - 6. Proposed product provides specified warranty.
 - 7. If proposed product involves more than one contractor, proposed product has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
 - 8. Submission is accompanied with detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 9. Submission is accompanied with a list of similar installations for completed projects with project names and addresses and names and addresses of design consultants and authorities, if requested.

10. Submission is accompanied with proposed product's Manufacturer signed written statement on Manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents.

1.06 WARRANTY

- A. Installer's Warranty: Provide manufacturer's system warranty against electrical or mechanical defects for 1 year from date of final acceptance.
 1. System Certification: Upon successful completion of the installation and subsequent inspection, the Authority shall be provided with a numbered certificate, from the manufacturing company, registering the installation.

PART 2 - PRODUCTS

2.01 MATERIALS – ALL MATERIALS SHALL BE NEW AND UNUSED

- A. Classroom Sound Equipment (Listen Technologies Listen Point)
 1. ListenPoint Advanced Control Unit
 2. ListenPoint Powered Room Module
 3. ListenPoint Microphone/Media Interface Kit
 4. ListenPoint LPT-A104 Ceiling Speakers
 5. ListenPoint Audio Cable Kit
 6. Cable
 - a. Speaker Cable:
 - i. Class 2 or better plenum rated. (16 AWG Plenum)
 - b. Infrared Cable
 - i. Plenum rated Cat 5e or Cat6 UTP
 7. Or approved equal from
 - a. Rauland Class
 - b. Or approved Equal
- B. Specialized Space A/V systems
 1. Extron Pole Vault with Voice Lift Systems or approved equal.
 - a. See Drawings for exact locations, equipment and parts.
 - b. System shall be complete and include all jacks, faceplates, connectors, cables and electronics as part of this contract.
- C. Music Room Sound Equipment
 1. Speakers
 - a. EV SX100 with Adjustable Bracket
 2. Mobile Cart

- a. Raxxess ECR-ST
 - 3. Mixer
 - a. Peavey PV14 USB
 - 4. Power Distribution
 - a. Raxxess PD-800L
 - 5. Amplifier
 - a. Peavey IPR 1600
 - 6. Blu Ray Player
 - a. Denon DBP-1611UDP
 - 7. Wireless Mic
 - a. Shure SLX24/SM86
 - 8. Ipod Dock
 - a. Chief NAID1BA
 - 9. Storage Cabinet
 - a. Raxxess
 - 10. Wiring and Cables
 - a. Shielded Cat 5e or greater UTP for audio faceplate cables.
 - b. West Penn 226, or equal, for the loudspeaker cluster circuits.
 - 11. Miscellaneous Connectors
 - a. Provide Neutrik NC3 series “XLR”, Neutrik NP3C “TRS” or Canare F-09 “RCA” connectors.
 - b. Provide Switchcraft N112B connectors.
 - c. Provide crimped or gas-tight terminals for all loudspeaker connections. Wirenuts are not acceptable.
 - 12. Approved equals must provide equal or greater performance.
- D. Cafeteria A/V Equipment: (substitutions must provide equal or greater performance)
- 1. Projectors
 - a. Epson PowerLite Pro Z8050WNL
 - b. Chief Adjustable Projector Pole
 - c. Lens ELPLS04
 - i. Coordinate lens with exact installed location and projection surface.
 - 2. Equipment Cabinet
 - a. Lowell LER-3522 or approved equal

3. A/V Receiver
 - a. Extron MTP/HDMI UR
4. A/V Transmitter
 - a. Extron MTP/HDMI UTAD
5. Mic Jack
 - a. Extron MLP 101D
6. HDMI Audio Deembedder
 - a. Extron HAE 101
7. Digital Video Switcher
 - a. Extron DVS 304 DVI A
8. Power Supplies
 - a. Extron PS 124
9. HDMI Switcher
 - a. Extron DXP 88 HDMI
10. Mixer
 - a. Extron MAV Plus 88A
11. DSP
 - a. Extron DMP 128
12. HDMI Transmitter
 - a. Extron DTP HDMI 230 Tx
13. HDMI Receiver
 - a. Extron DTP HDMI 230 Rx
14. Controller
 - a. Extron IPCP 505
15. Amplifiers
 - a. Extron XPA 2002 70V
16. Control Panels
 - a. Extron TLP 700MV
 - b. Extron MLC 226 IP
17. Wireless Mics
 - a. Shure SLX124/85/58
18. Assistive Listening

- a. Listen LS-03
- 19. Speakers
 - a. Extron SI 28W
 - b. Atlas Sound HT327 at each speaker
- 20. A/V Cables
 - a. Extron recommended A/V cables
- E. Auxiliary Gym Equipment (substitutions must provide equal or greater performance)
 - 1. DVD/CD Player
 - a. Tascam CD-200i
 - 2. Auxiliary Input Switcher
 - a. RDL EZ-HSX4
 - 3. Mixer
 - a. Biamp 801i
 - 4. Digital Signal Processor
 - a. Biamp Nexia SP
 - 5. Power Conditioner
 - a. Lowell SCS8R-ASM
 - 6. Equipment Drawer
 - a. Lowell UDEL-214
 - 7. Two Channel Amplifier
 - a. Crown XLS1500
 - 8. UPS Equipment
 - a. APC 3000 120 VAC Smart Ups
 - 9. Wired Microphone
 - a. Shure SM58S
 - 10. Podium Microphone
 - a. Shure MX 412/C Gooseneck Podium Microphone
 - 11. Microphone Stands
 - a. Atlas TEB-E
 - 12. Loudspeakers
 - a. EVI SX300E
 - 13. Wireless Mics

- a. Shure SLX124/85/SM58
- 14. Assistive Listening
 - a. Listen LS-03
- 15. Wiring
 - a. Shielded Cat 5e or greater UTP for audio faceplate cables.
 - b. West Penn 226, or equal, for the loudspeaker cluster circuits.
- 16. Miscellaneous Connectors
 - a. Provide Neutrik NC3 series “XLR”, Neutrik NP3C “TRS” or Canare F-09 “RCA” connectors.
 - b. Provide Switchcraft N112B connectors.
 - c. Provide crimped or gas-tight terminals for all loudspeaker connections. Wirenuts are not acceptable.
- F. Main Gymnasium A/V Equipment (substitutions must provide equal or greater performance)
 - 1. Projector
 - a. Panasonic PT-DZ12000
 - b. Lens ET-D75LE6
 - i. Coordinate lens with exact projector, distance and screen at time of construction.
 - 2. Equipment Cabinet
 - a. Lowell LER-3522
 - b. Atlas SD4-Drawer
 - 3. Mixer
 - a. Roland M200i EXP Mixer with Digital Snake
 - b. Roland S-1608 Digital Snake
 - c. Ipad 4 Generation 16 GB
 - 4. DSP
 - a. Rane Hal 2
 - 5. Amps
 - a. QSC CMX 500V
 - 6. Speakers
 - a. Community R.5-99TZ
 - b. Community R.5SUB-T
 - c. QSC K8 Powered Speakers
 - 7. CD Player

- a. Tascam CD-200i
- 8. Ipod Dock
 - a. Chief NAID
- 9. Switch
 - a. 8 port gigabit switch
- 10. Wireless Systems
 - a. Shure SLX124/85/SM58
- 11. Assistive Listening
 - a. Listen LS-03
- 12. Page Override
 - a. RDL TX-70A
 - b. RDL ST-ACR2
- 13. Power Sequencer
 - a. Atlas ECS-6RM
- 14. UPS
 - a. APC 3000VAC 120V
- 15. Mobile Lectern with Rack Rails
 - a. Spectrum Link
 - i. Extron Touchlink 710 CV
 - ii. Extron Cable Cubby 600 with Extron jacks
- 16. Video Scaler
 - a. Extron DSC 301 HD
- 17. Video Transmitter
 - a. Extron DTP 230 Tx
- 18. Video Receiver
 - a. Extron DTP 230 Rx
- 19. Video Switcher
 - a. Extron SW4 HDMI
- 20. Controller
 - a. Extron IPCP 505
- 21. Wiring and Cables
 - a. Shielded Cat 5e or greater UTP for audio faceplate cables.

- b. West Penn 226, or equal, for the loudspeaker cluster circuits.
- 22. Miscellaneous Connectors
 - a. Provide Neutrik NC3 series “XLR”, Neutrik NP3C “TRS” or Canare F-09 “RCA” connectors.
 - b. Provide Switchcraft N112B connectors.
 - c. Provide crimped or gas-tight terminals for all loudspeaker connections. Wirenuts are not acceptable.
 - d. Per Manufacturer’s equipment
 - i. Cat X cable
 - ii. RS-232
 - iii. HDMI
- G. Kitchen Lab Camera Systems (substitutions must provide equal or greater performance)
 - 1. Ceiling Kit
 - a. Chief CMS440 with Chief CMA470
 - 2. Camera
 - a. Panasonic AW-HE50HN/HE
 - 3. Distribution Amplifier
 - a. Extron HDMI DA2
 - 4. Cables
 - a. Extron HDMI Series
 - 5. Connectors
 - a. HDMI Pass Thru Keystone connectors.
 - 6. Power Supplies
 - a. Extron PS
- H. Video Wall (substitutions must provide equal or greater performance)
 - 1. Matrix Switcher
 - a. Extron DXP 88 HDMI
 - 2. Signal Extenders
 - a. Extron DTP 230 Rx and Tx
 - 3. Cables
 - a. HDMI
 - b. Cat 6 S/FTP
 - 4. Power Supplies

- a. Extron PS
- I. TV Studio Equipment
 - 1. Video editor
 - a. Tricaster 40 with Curriculum and Live Text
 - b. Quantity (1)
 - 2. Chroma Key Scree
 - a. 9'X15" with adjustable bracket
 - b. Quantity (1)
 - 3. HD Camcorder
 - a. Panasonic AG-AC90
 - b. Quantity (1)
 - 4. Tripod
 - a. Libec TH-650DV with Head and Brace, Pan Handle and Case
 - 5. Portable Dolly
 - a. Manfrotto 127VS
 - 6. Wireless System
 - a. Shure ULXS14/83
 - 7. Hand Held Mics
 - a. Shure ULXS24/58
 - b. Quantity (1)
 - 8. Camera Mic
 - a. Shure VP82
 - b. Quantity (1)
 - 9. Power Strip
 - a. MC3 PB9-03
 - b. Quantity (3)
 - 10. Antenna and PDU
 - a. Shure UA844SWB
 - 11. Video Editing Workstation
 - a. Apple Mac Pro
 - 12. Display
 - a. Apple 27" LED Cinema Display

13. Intercom
 - a. Telex MS-1002
14. Beltpack
 - a. Telex BP-1002
 - b. Quantity (2)
15. 25' Beltpack Cable
 - a. Telex ME25
 - b. Quantity (2)
16. 2 Channel Plate
 - a. Telex WP-3
 - b. Quantity (2)
17. Headset
 - a. Telex PH100
 - b. Quantity (2)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Examine conditions under which AV cabling and sound enhancement equipment and related components are to be installed in coordination with Installer of materials and components specified in this Section and notify affected Prime Contractors and Design consultant in writing of any conditions detrimental to proper and timely installation. Do not proceed with installation until unsatisfactory conditions have been corrected to ensure a safe and timely installation.
 1. When Installer confirms conditions as acceptable to ensure proper and timely installation and to ensure requirements for applicable warranty or guarantee can be satisfied, submit to Design consultant written confirmation from applicable Installer. Failure to submit written confirmation and subsequent installation will be assumed to indicate conditions are acceptable to Installer.
 2. Visit Site to identify and become familiar with existing field conditions and specific requirements of each Site.
 3. Verify all dimensions in field and confirm condition of existing hardware to be utilized.
 4. Confirm space requirements and physical confines of all work areas to ensure that all materials can be installed in indicated spaces.
 5. Confirm all outlet locations and cable pathways and advise Design consultant in writing of any discrepancies or issues in Design described in Contract Documents.

3.02 PREPARATION

- A. Protection: Provide adequate protection of equipment and hardware before and after installation.
- B. Existing Communications Services: Ensure all telecommunications systems (voice, video and data) remain operational throughout the project.

1. Identify any additional outlets, circuits, and wiring at the site not shown on T-Drawings and interfering with installation of specified equipment.
2. Remove all accessible portions of abandoned communications cabling per NEC 800.52. Tag all communications cabling not terminated at both ends but retained for future use.

3.03 INSTALLATION

- A. Provide and install all components necessary to install complete AV cabling and sound enhancement equipment systems, including (but is not limited to) connectors, electronics, terminators, pass-thrus, cables etc...
 1. Cable runs shall be factory terminated. Splicing of any cable is prohibited
 2. Secure all cables within ceiling cavities to building structure.
 3. Loosely bundle all cables and support from structure at unequal intervals from 5 to 6 feet with spring steel fasteners and cable clip rated for use with high performance cables where cable tray or other support structure has not been provided as indicated on Drawings. All mounting clips shall be seismic type as per BOCA.
 4. Do not violate manufacturer's recommended loadings. Leave 30% capacity for future use of pathway.
 5. Verify all horizontal cable run lengths prior to installation. Ensure cables do not exceed distances that would degrade the signal transmission requirements
 6. Do not support cables from ceiling grid T-Bars, grid wire supports or bridle rings. Do not allow cables to touch ceiling grid.
 7. Install cables in EMT in all unfinished or exposed areas
 8. Do not secure cables with permanent cable ties. Do not tighten cable bundles in such a way as to cause jacket deformation or damage.
 9. Place cables in compliance with TIA/EIA-568.B standards and BICSI recommended methods.
 10. Tight 90-degree bends are unacceptable, and use of plastic "cinch-type" tie-wraps are not permitted, in order to prevent damage to cable jacket and compromise the cable's electrical or optical characteristics.
 11. Communications outlets shall be located to be no more than 6 feet from an electrical outlet.
- B. Determine allowable cable proximity to other electrical power sources of 480 Volts or less using TIA/EIA-569A "Cabling Pathway Standard" for UTP cable separations from sources of EMI:

1. Minimum separation distance from Power Source at 480 V or less:

CONDITION	<u>< 2kVA</u>	<u>2-5 Kva</u>	<u>≥ 5 kVA</u>
a. Unshielded power lines or electrical equipment in proximity to open or non-metal pathways	6 in.	12 in.	24 in.
b. Unshielded power lines or electrical equipment in proximity to open or non-metal pathways	3 in.	6 in.	12 in.
c. Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to grounded metal conduit	3 in.	6 in.	12 in.

pathway

d. Transformers & Elec. Motors	40 in.	40 in.	40 in.
e. Fluorescent Lighting	12 in.	12 in.	12 in.

- C. Install all cable in accordance with National, state and local codes and TIA/EIA Standards, and BICSI methods.

1. Follow manufacturer's guidelines and requirements for all cable termination.

- D. Permanently identify all system components following TIA/EIA-606A "Administration Standard for Commercial Telecommunications Infrastructure" with identification format:

1. Identification: Provide permanent identification labels for outlets, faceplates and cables.
2. Each individual cable shall be labeled on both ends of cable terminations regardless of cable intended use. Labels must be machine printed with permanent black ink on laminated white label material. Contractors must check with appropriate school district personnel for appropriate labeling scheme. The intended format and labeling material must be approved by the school district Technology Department before labeling begins.

3.04 TESTING

A. Sound Enhancement System

1. The contractor shall test all aspects of the sound enhancement amp/mixer once it is installed and demonstrate these functions to the owner of owner's representative.
 - a. Speaker levels shall be verified to function individually and as a unit
 - b. Microphones shall be demonstrated to work as intended by the manufacturer.

B. A/V Systems

1. The contractor shall test all aspects of the Audio/Visual Systems once it is installed and demonstrate these functions to the owner of owner's representative.
 - a. Speaker levels shall be verified to function individually and as a unit.
 - b. Video Displays shall be verified to display from all input sources.
 - c. Control of the system shall be shown to control all aspects of the systems.
 - d. Levels shall be set for all outputs.
 - e. EDID and HDCP compliance shall be setup and verified.
 - f. Microphones shall be demonstrated to work as intended by the manufacturer.

3.05 AS-BUILTS

- A. As-builts shall be provided by the contractor in hardcopy and electronic CAD format prior to project completion and inspection.
- B. As-builts by contractor must include parts lists and wiring diagrams that clearly indicate all equipment, locations, wiring and connections.
- C. Owner's manuals shall be supplied as part of the as-built documentation.

3.06 DEMONSTRATION AND TRAINING

- A. All aspects of the systems must be demonstrated for the owner at the time of training
- B. A minimum of 16 hours of training shall be provided.
- C. Training shall be video and audio recorder for the owner and turned over to the owner at acceptance.

3.07 ACCEPTANCE

- A. Contractors work shall be considered complete after the following conditions have been met:
 - 1. As-built documentation has been provided and approved.
 - 2. Cable installation is complete and all cable runs have been tested and documented to be installed according to specifications and drawings.
 - 3. Equipment installation is complete and all functions have been tested and documented to function as designed and per the manufacturer's recommendations.
 - 4. All punch list items have been reconciled.
 - 5. All disturbed ceiling panels, fire stopping materials, covers, etc. have been properly reinstalled.
 - 6. All materials and trash have been removed from the site.
 - 7. A 1-Year Installers warranty has been given to a school district Technology representative.
 - 8. Submit Manufacturers Extended Warranty Application.

END OF SECTION