



Port Jervis City School District
Alterations to Port Jervis High School
SED Control No. 44-18-00-05-0-012-041 Kuhl ES K-6/PJHS 9-12
SED Control No. 44-18-00-05-0-005-018 Middle School 7-8
BCA Project No. 2022-143

Bid Addendum No. 2
March 29, 2024

To: All Bidders

This addendum is hereby made part of the Contract Documents as though it were originally included therein. It modifies the following documents:

Original Drawings and Project Manual dated 03/08/2024.
Addendum No. 1 dated March 20, 2024.

All Bidders must acknowledge receipt of this Addendum in the space provided on the Form of Proposal.

CLARIFICATIONS:

- A. Casework Provision
 - a. Science Room Demo Tables are to be provided by the GC and coordinated for plumbing requirements with the PC, and power requirements with the EC.
 - b. See Alternate GC-02 note for bookcases in the Science Classrooms; bookcases for this alternate to be provided by the GC.
 - c. The custom Circulation Desk in the Library to be provided by the GC.
 - d. All Bookcases in the Library are part of a separate contract provided by the Owner.
- B. Tech Booth Roll Top Units
 - a. GC to provide roll top units per basis of design or equal. Roll top package to include (2) ADA compliant desk top units and (4) side rack units. Desk top unit basis of design dimensions: 45"W x 38.25"H with 28" vertical clearance below counter. Side rack unit basis of design dimensions: 22"W x 38.25"H. Overall width to be verified in field prior to fabrication. All units constructed of 1" engineered core panels with clear finish white oak veneer; veneer to match existing auditorium wood species and finish. All units to receive aluminum interlocking tambour doors with flush institutional locks. Rack units to provide a minimum of 16 standard rack mount equipment spaces with intermediate mounts to accommodate half-rack equipment.
- C. Library Linear Ceiling Baffles
 - a. Unlit baffles are by GC and lighted baffles are by EC. GC and EC to coordinate for placement of the baffles.
- D. Window Shades
 - a. Library 132: All existing window shades will be re-used.
 - b. Science Classrooms 200 and 200A: All existing window shades will be kept in their current location during construction.
- E. Existing Wood Species and Finish
 - a. Existing wood door veneer and facility accent trim and millwork is assumed to be clear finish white oak; existing finish to be confirmed and matched in field during the construction phase.



NEW 8 1/2" X 11" DRAWINGS:

SK-1 S SIGNAGE TYPES

REMOVED PROJECT MANUAL SECTIONS:

12 2400 WINDOW SHADES

REISSUED PROJECT MANUAL SECTIONS:

27 5125 AUDITORIUM SOUND SYSTEM

REISSUED DRAWINGS:

E601 ELECTRICAL SCHEDULES

REVISIONS TO THE PROJECT MANUAL:

- A. Refer to Specification Section 12 2400 WINDOW SHADES; **DELETE** in its entirety.
- B. Refer to Specification Section 27 5125 AUDITORIUM SOUND SYSTEM; **DELETE** in its entirety; and **REPLACE** with new Specification Section 27 5125 AUDITORIUM SOUND SYSTEM issued as part of this addendum.

REVISIONS TO CONTRACT DRAWINGS:

- A. Refer to Drawing A800 DOOR AND FRAME SCHEDULES, ELEVATIONS AND DETAILS; **AMEND** as follows:
 - a. DOOR SCHEDULE
 - i. Door 132.2 DOOR TYPE MATERIAL to be "ALUMINUM."
 - ii. Door 132.3 DOOR TYPE MATERIAL to be "ALUMINUM."
- B. Refer to Drawing E601 ELECTRICAL SCHEDULES; **DELETE** in its entirety and **REPLACE** with new Drawing E601 ELECTRICAL SCHEDULES issued as part of this addendum.

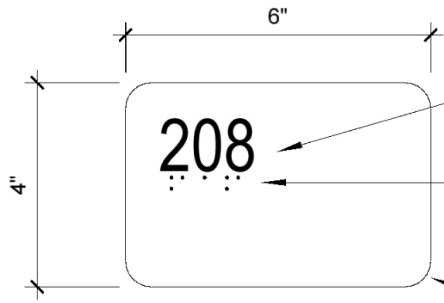
END OF ADDENDUM

Please do not hesitate to contact me with any questions on this addendum, thank you.

Respectfully,

BCA ARCHITECTS & ENGINEERS

Eric Allen Van Tassel, AIA, NCARB
Senior Project Architect



MATCH EXISTING SIGNAGE IN BUILDING FOR ALL NEW CLASSROOM SIGNAGE

3/4" UPPER CASE CENTURY GOTHIC - 1/32" RAISED TACTILE LETTERS
 GRADE 2 BRAILLE, COLOR CLEAR OR TO MATCH BACKGROUND

1/2" RADIUS, TYP.

TYPE 1 - TYPICAL CLASSROOM OR OFFICE

Provide for Rooms:

- 132 -Library (room number only)
- 162 -Closet (add the word CLOSET below number)
- 163- Closet (add the word CLOSET below number)
- 200- Science (room number only)
- 200A- Science (room number only)
- 200B- Science Storage add SCIENCE STORAGE below number)

See Detail #1 for typical location at door

**MAXIMUM
OCCUPANCY
68 PERSONS**

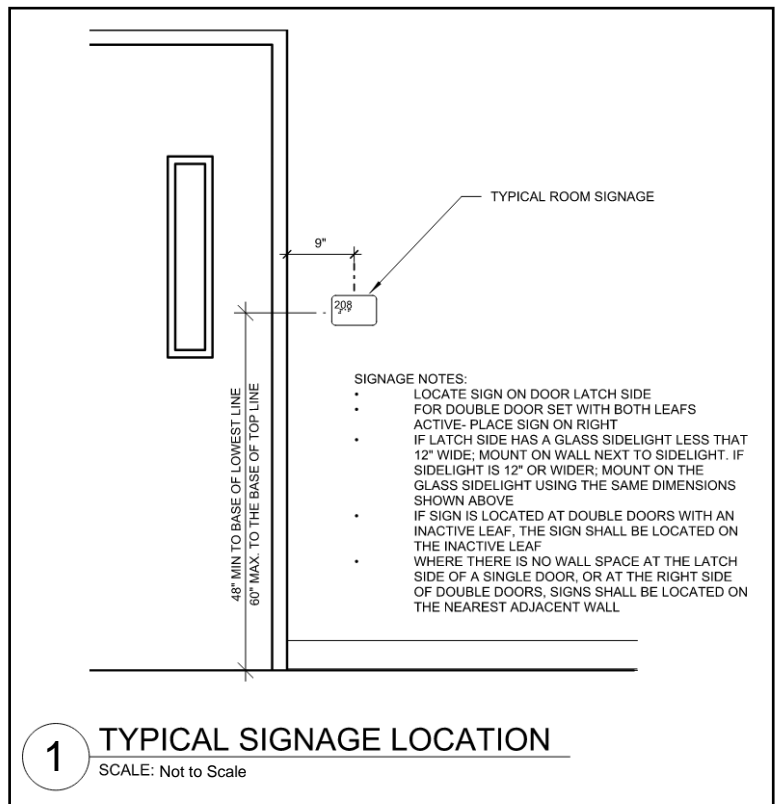
TYPE 2 - OCCUPANCY SIGN

12" x 7" Brushed aluminum - No Braille

Provide for Rooms:

- 132 -Library

(Wall location to be determined)



NOTE: Refer to Section 10 1400 in the Project Manual for additional information.

Designed By	Checked By	Reference No.
BJL	SJD	
Scale	Date	Project Number
N.T.S.	3.28.24	2022-143

PORT JERVIS CITY SCHOOL DISTRICT
 ALTERATIONS TO: PORT JERVIS HIGH SCHOOL / MIDDLE SCHOOL
 10 ROUTE 209, PORT JERVIS, NEW YORK 12771
 ALTERATIONS TO: PORT JERVIS MIDDLE SCHOOL
 118 EAST MAIN STREET, PORT JERVIS, NEW YORK 12771
 ARCHITECT'S PROJECT NO.2022-143

SIGNAGE TYPES

Sheet No.

SK-1

BCA
ARCHITECTS
ENGINEERS

BCA Architects & Engineers
 Watertown | Ithaca | Saratoga | Rochester | Troy | Binghamton | Syracuse
 WWW.THEBCGROUP.COM

THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AT THE SITE & NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES.

**SECTION 27 5125
AUDITORIUM SOUND SYSTEM**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Complete operating system (racks, equipment, loudspeakers, mounting hardware, wire, connectors, terminations, raceways and all required accessories) for the pickup, amplification, distribution, recording and reproduction of voice and/or other audio program material.
- B. All necessary interconnecting cable and connections.
- C. System programming, equalization and training.
- D. Connection to main building public address system for emergency all-call override.
- E. Provide labor, materials, services & equipment necessary to supply, install and demonstrate Theatre Audio & AV work as shown on the drawings, specified herein, listed in the Theatre Audio & Av BOM and/or as required by job conditions.
- F. Provide interconnection with the fire alarm system to provide a cut out relay so when fire alarm system is activated the auditorium sound system outputs will be turned off.
- G. Utilize EASE software prior to shop drawing submission to verify speaker coverage.

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.03 SCOPE OF WORK

- A. Supply and install:
 - 1. Sound system for performances
 - 2. Sound system for multimedia presentation
 - 3. Sound system for public address
 - 4. Performance Intercom System for lighting, audio, stage and green room communications
- B. Installation requirements shall be:
 - 1. Supply equipment specified on drawings and in Theatre Audio/AV Bills of Materials
 - 2. Assemble into complete properly functioning systems
 - 3. Install as per specifications and drawings.
 - a. Provide all high voltage and low voltage wiring and complete all high voltage terminations
 - b. Provide all low voltage terminations.
 - 4. Assemble racks fully prewired and tested prior to delivery to job site.
 - 5. Assume full responsibility for providing and installing systems that meet the performance and functional requirements stated notwithstanding detailed information within this specification or on accompanying drawings.
 - 6. Provide programming of system presets including equalization and other control settings
 - 7. Provide customer training of the installed system(s)
 - 8. Provide all and any components necessary that may not be shown or listed but are required for a fully functioning system(s) to the intent of the specification.
- C. Related Work
 - 1. Division 26
- D. Electrical Contractor (EC) shall:
 - 1. Provide and install all conduits, pull boxes, back boxes and raceways.
 - a. Custom back boxes for custom Audio and AV panels.
 - 2. Provide and install all wire and cable between panels, boxes, connection plates, audio devices and racks.
 - 3. Install and terminate of all high voltage wiring and devices.

- 4. Theatre speakers shall be installed, mounted and rigged by a certified theatrical rigger engaged by the contractor.
- E. All terminations testing and system testing by contractor.
- F. Where equipment components, materials, hardware and or services have been omitted from the drawings and specifications, but are required for a fully functional system, they shall be assumed to be included and shall be provided without claim for change to the Contract price by the contractor.
- G. Contractor shall provide on site warranty including all labor and materials service contract for one year from date of system demonstration.
- H. Contractor shall provide on site warranty including all labor and materials for one year for all equipment mounting, wiring and terminations.

1.04 REFERENCE STANDARDS

- A. The CONTRACTOR is responsible for the provision of material and methods for installation of equipment conforming to the currently applicable standards of:
 - 1. ADA -Americans with Disabilities Act
 - 2. AISC -American Institute of Steel Construction
 - 3. AISI -American Iron and Steel Institute
 - 4. ANSI -American National Standards Institute
 - 5. ASME -American Society of Mechanical Engineers
 - 6. ASTM -American Society for Testing Materials
 - 7. FCC -Federal Communications Commission
 - 8. IEC -International Electronics Commission
 - 9. NEC -The National Electric Code
 - 10. NEMA -National Electrical Manufacturers Association
 - 11. NFPA -National Fire Protection Association
 - 12. OSHA -Occupational Safety and Health Association
 - 13. SAE -Society of Automotive Engineers
 - 14. SMPTE -Society of Motion Picture and Television Engineers
- B. UL -Underwriters Laboratories. All electrical components, devices and accessories shall bear a UL label where applicable. UL listed and labeled as defined by NFPA70, article 100, by a testing agency acceptable to authorities having jurisdiction and marked for intended use.
- C. USITT-United States Institute for Theater Technology "Recommended Guidelines for stage rigging and stage machinery-specifications and practices".
- D. Provide certification and labels where applicable. Comply with Federal, State, and Local regulations and applicable union regulations where required. All equipment will be furnished with the proper labels for New York State.
- E. Provide only equipment that is standard new equipment, the latest model of regular stock product, and is furnished with all parts regularly used with the equipment offered for the purpose intended. The contractor guarantees that no modification of the equipment has been made contrary to the manufacturer's regular practice.
- F. Review all materials and equipment prior to installation and notify owner as to any changes or discrepancies between published specifications and the actual material and equipment to be installed.
- G. Applicable codes, standards, regulations and guidelines shall be adhered to in both spirit and letter of intent.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Provide a complete bill of materials listing all components, quantities, manufacturers and model numbers.

- C. Submit technical data specification sheets on all items including cables, wire types, multi-pin connectors, snakes, etc. Specification sheets shall be complete, clear and legible.
- D. Submit outline drawing(s) of fixed equipment and portable equipment racks showing the relative position of all major components, thermal management, etc. Drawing(s) shall be created using a program similar to Visio. Hand drawn drawings are not acceptable and will be rejected.
- E. Submit shop drawing(s) in plan view indicating floorplans, physical location of all equipment, wiring paths, speaker placements, aiming, connections and controls. Drawing(s) shall be created using a CAD program. Hand drawn drawings are not acceptable and will be rejected.
- F. Submit shop drawing(s) of system one-line riser, showing entire system, components, point-to-point wiring, connectors and field connections. Riser must clearly identify all interconnections between equipment, wire types and connectors to be used. Drawing(s) shall be created using a CAD program. Hand drawn drawings and modified copies of the original construction documents are not acceptable and will be rejected.
- G. Submit shop drawing(s) of all loudspeaker rigging to be used. Rigging submittal to include all of the following: bill of materials, cluster drawings, assembly drawings, weights and calculations, tilt cable geometry and proof and method of attachment to the building structure. Rigging submittal must be approved and stamped by a professional structural engineer licensed in the state of New York.
- H. Quality Control Submittals
 - 1. To ensure a quality project and proper warranty coverage for the system specified, the Contractor must submit the following:
 - a. Provide evidence that the Contractor who will furnish and install the equipment has been in the business of installing commercial sound systems for at least five (5) years.
 - b. Provide references of at least three (3) installations of comparable scope performed by the Contractor, including location, system description and names, addresses and telephone numbers of the Architects, Consultants and Owners, with contact names for each.
 - c. Provide written proof that Contractor's personnel are properly trained and certified to install rigging.
 - d. Provide written proof that Contractor's personnel are properly trained and certified to install, test and program digital signal processors (DSP's).
 - e. Provide evidence of the ability and intent to meet the guarantee and service requirements included in this specification.
 - f. Provide documentation that Contractor who will furnish and install system maintains service facilities and will have service personnel available on-site within 24 hours.
 - 2. Contractor who will furnish and install system must be a factory authorized dealer for all products submitted and must submit such proof in writing or in the form of authorized agreements with the various manufacturers.

1.06 QUALITY ASSURANCE

- A. Work shall be performed by labor skilled in Professional Audio and Multimedia System installations. AV technicians shall all be CSA certified. No Exceptions
- B. The equipment specified herein has been selected for its operational, functional, maintenance, and or aesthetic suitability for this project. Equivalents must meet or exceed all of the qualifications of the specified equipment to be considered.
- C. The contractor shall be an authorized representative for the specified manufacturers. This contractor shall provide all services related to the work specified and shall exercise technical and engineering supervision over the completed installation.

1.07 WARRANTY

- A. Special Warranty: Guarantee system against defective materials, design, workmanship, and improper adjustment for period of (1) year from date of final acceptance.
 - 1. Provide restoration of service within 24 hours of report of malfunction, weekends and holidays included, at no additional cost to Owner during guarantee period. Provide approved temporary alternate equipment and facilities, complete and operational, at no additional cost to Owner within 24 hours if defects cannot be corrected within that period.
 - 2. The Theatre System Integrator shall warrant systems to be free of defective components or workmanship for a period of one year from the date of system demonstration and training.
 - 3. The field supervisor and project manager shall be present at the systems turn on, checkout and testing and owner training sessions. Make necessary repairs and advise on Field installation nuances at time of training.
 - 4. Training shall consist of a four-hour session at a time mutually agreeable to the Owner.
 - 5. For the first (30) days after final acceptance of the system, the contractor shall be required to answer all service calls within twenty-four hours of a request being made. After the (30) day period, the contractor shall meet all requirements established by the one-year warranty.
 - 6. Permanently replace any equipment that exhibit similar failures 3 times within guarantee period.
 - 7. Provide (2) semi-annual preventive maintenance service visits during guarantee period at no additional cost. Schedule visits with and solicit information regarding failures, intermittences, and other matters from Owner. Confirm proper equipment operation and perform manufacturer recommended maintenance work during these visits.
 - a. Allow for (2) additional onsite visits (2 hours each not inclusive of travel time) to clarify misunderstandings regarding proper system operation on part of Owner's operating personnel at no additional cost to Owner.

1.08 SYSTEMS DESCRIPTIONS

- A. Auditorium Sound System
 - 1. Sound system shall be dual-function: a mixing console for manual control of the system and an automatic mixer for automatic control. A DSP will provide signal processing and routing, signal delay, compression, limiting, filtering, feedback suppression, and graphic and parametric equalization.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Where equipment, components, support devices, anchoring systems or internal rack wiring systems have been omitted from the specifications or drawings, but are necessary for the operation of the system, they shall be provided and installed without claim for additional payment or time.
 - 1. Structural supports, anchoring surfaces, or steel behind walls and above finished ceilings shall be provided.
 - 2. All interconnecting conduit, pull boxes, wire troughs, wire and cable shall be provided.
- B. Items, materials and equipment shall be new and undamaged. Uniform materials shall be used throughout. All steelwork shall be cleaned, primed with rust inhibitor and painted with epoxy resin or baked enamel finish. Repair damage to factory finishes. All touch-up paint shall match the manufacturer's color identically. Performance Requirements
- C. Performance Requirements
 - 1. The requirements of the referenced equipment are not generic in nature. Specific performance, control and routing capabilities are necessary for any alternate equipment. The details herein of the functional description and manufacturers descriptions of the system components are the critical criteria for selection of each piece of equipment.

2. In bidding equipment from different manufacturer of those specified herein, be aware that specifications, physical size, serviceability, warranty terms, product availability, and other non technical issues will be used in determining the factors in product equivalents. Final judgment as to an equivalency will be solely that of the owner, architect and consultant.
3. Substitution Criteria:
 - a. Loudspeakers substitutions require proof that the substituted product meets all performance requirements including but not limited to:
 - 1) Frequency Response -On and off axis
 - 2) Directivity by frequency
 - 3) Distortion
 - 4) Phase response
 - 5) Number of Drivers
 - 6) Power Handling Capacity and Maximum Output
 - 7) Weight
 - 8) Powering Method
 - b. Amplifiers require proof substitutions require proof that the substituted product meets all performance requirements including but not limited to:
 - 1) Power at all impedances
 - 2) Damping Factor
 - 3) Slew rate
 - 4) Terminal Types
 - 5) Indicator and control capabilities
 - 6) Ability to install with security covers
 - 7) Sonic Character
 - 8) Input Power requirements
 - 9) Cooling Method –Fan speed and air flow direction Heat Output
 - c. Digital Signal Processors substitutions require proof that the substituted product meets all performance requirements including but not limited to:
 - 1) A/D Converters type and sampling rate
 - 2) Number of Processors, Mixers, automixer, feedback Suppressors, equalizers, and dynamics devices.
 - 3) FIR Capability where required by design.
 - 4) Expandability where applicable
 - 5) Configuration Capability -Ability to configure as per the specified model.
 - 6) Interface to other devices digitally where applicable.
 - 7) Physical Size
 - 8) Terminals
 - 9) Control software and ability to be controlled via wireless.
 - d. Mixing Console substitutions require proof that the substituted product meets all performance requirements including but not limited to:
 - 1) A/D Converters type and sampling rate
 - 2) Number of inputs/outputs and types
 - 3) Number of EFX processors, equalizers, and dynamics devices.
 - 4) Ability to create custom pages and configuration via preset scene change.
 - 5) Input Delay
 - 6) Fade Rate by scene
 - 7) Expandability where applicable
 - 8) Configuration Capability -Ability to configure as per the specified model.
 - 9) Interface to other devices digitally where applicable.
 - 10) Physical Size
 - 11) Connect ability
 - 12) Control software and ability to be controlled via external computer and wireless.

- e. Wire substitutions require proof that the substituted product meets all performance requirements including but not limited to:
 - 1) UL rating
 - 2) Jacket Type
 - 3) Number of Conductors
 - 4) Conductor arrangement and shielding type
 - 5) Jacket shape-round, twisted etc
 - 6) Number of strands and gauge
 - 7) Flexibility Capacitance and resistance conductor-to-conductor as well as single conductor
 - 8) Fire Code rating
 - 9) Voltage rating

D. Items not indicated on drawings or listed herein but necessary for the project shall be included at no additional cost to the owner.

2.02 SYSTEM EQUIPMENT LISTING

- A. Supply the following
 - 1. Equipment listed in the Theatre Audio and AV Bill of Materials:
 - 2. 48 Input Channels
 - 3. 32 Onboard Preamps
 - 4. 12 Stereo Mixes + LR
 - 5. 3 Stereo Matrix
 - 6. 8 Stereo FX Engines + Dedicated Returns
 - 7. 64ch I/O Port for Audio Networking
 - 8. 32x32 USB Audio Interface
 - 9. 96kHz FPGA Processing
 - 10. 48 Input Channels
 - 11. 32 Onboard Preamps
 - 12. DEEP Processing Ready
 - 13. 12 Stereo Mixes + LR
 - 14. 3 Stereo Matrix
 - 15. 8 Stereo FX Engines + Dedicated Returns
 - 16. 64ch I/O Port for Audio Networking
 - 17. 32x32 USB Audio Interface
 - 18. 96kHz FPGA Processing
 - 19. 48 Input Channels
 - 20. 32 Onboard Preamps
 - 21. DEEP Processing Ready
 - 22. 12 Stereo Mixes + LR
 - 23. 3 Stereo Matrix
 - 24. 8 Stereo FX Engines + Dedicated Returns
 - 25. 64ch I/O Port for Audio Networking
 - 26. 32x32 USB Audio Interface
 - 27. Equipment shown on drawings and referenced in specifications.
 - 28. Additional equipment necessary to provide a fully functioning system as outlined in the drawings, specifications and theatre audio and Av bill of materials.
 - 29. 2 Speaker array as specified herein
 - 30. ALL ACCESS CONTROL MATERIALS ARE PROVIDED BY OTHERS, EC TO INSTALL BOXES AND WIRING, THEN WILL BE REQUIRED TO INSTALL DEVICES ONCE CONSTRUCTION IS NEARING COMPLETION. ALL TERMINATIONS AT CONTROL PANEL AND PROGRAMMING BY OTHERS.

Theater AV Sound System Bill of Materials			
Qty Base	Manufacturer	Model #	Description

Bid			
Speakers			
6	Renkus-Heinz	VA101-22/75A-RN With (2) RHANG-VA101H Rigging Frames	Left Array
6	Renkus-Heinz	VA101-22/75A-RN With (2) RHANG-VA101H Rigging Frames	Right Array
3	Renkus-Heinz	TA61-RN With UBRKT/CT61 U-Brackets	Front Fill Loudspeakers
2	Renkus-Heinz	PN212-SUB-RN	Subwoofer
Speaker Rigging Frame			
3	Renkus-Heinz	See Above for types	Mounting Hardware
Speaker Processing			
1	Yamaha	DME24N	Rack Mount
Consoles and Mixers			
1	Allen & Heath	SQ-7	48 x 36, 48 Channel Auto Mic Mixing, 96kHz 96 Bit
2	Allen & Heath	SQ SLink	DSnake, DX, GigaSnake
Mics and Wireless			
8	Shure	DH5-TAN	DuraPlex Omnidirectional Subminiature Headset Microphone
8	Shure	DH5-COCOA	DuraPlex Omnidirectional Subminiature Headset Microphone
Panels and Snakes			
4	Allen & Heath	DX164W	I/O Expander
1	N/A	50 Foot Stage Snake with 12 Channels and 4 Return all XLR	
Video Switchers, Distro, and Controls			
1	Crestron	DM Card Chassis DM-MD8X8-CPU3 With (3) DMC-4KZ-C, (2) DMC-4KZ-HD, (2) DMC-4KZ-	Audio/Video Server

		CO-HD AND (2) DMC-4KZ-HDO Cards	
1	Crestron	CP4N	Control System
2	Crestron	DM-RMC-4KZ-SCALER-C	DM Receiver
2	Crestron	DM-TX-4K-302-C	DM Transmitter
1	Crestron	AM-3200	Presentation Gateway
2	Crestron	TS-1070	Touch Panel
1	U-Line	7825	Lecturn
Video Projectors			
0	Christie	DWU-1100-GS	Digital Projector
CD Player/Recorder			
0	Tascam	CD-400U	CD/SD/USB Player with Bluetooth
Auditorium Intercom			
1	Williams Sound Digi-Wave	DWS COM 6 300	Wireless Intercom System is a simultaneous, two-way, wireless intercom system in the 2.4 GHz band
6	Williams Sound Digi-Wave	DLT 300	Transceivers
6	Williams Sound Digi-Wave	MIC 044	2P headset microphones
6	Williams Sound Digi-Wave	CCS 044	Silicone skins
1	Williams Sound Digi-Wave	CCS 030	DW system carry case

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Examine conditions under which sound system is to be installed in coordination with Installer of materials and components specified in this Section and notify affected Prime Contractors and Architect in writing of any conditions detrimental to proper and timely installation. Do not proceed with installation until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
- B. 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 Architect written confirmation from applicable Installer. Failure to submit written confirmation and subsequent installation will be assumed to indicate conditions are acceptable to Installer.

3.02 INSTALLATION

- A. Conduit: Use separate steel conduits for microphone level circuits (below -20 dBm), line-level circuits (up to +30 dBm), loudspeaker circuits (above +30 dBm), control lines, and AC power circuits. Space audio conduits well away from the power conduit system. Insulate all conduits from the equipment rack; ground conduit only to power system ground.

- B. Cable: Do not exceed 30 percent fill or splice lines in conduit. Connect each input receptacle by individual, insulated line to system equipment rack. Exercise care to avoid damage to cables and equipment. Do not splice lines in conduit. Provide all microphone and loudspeaker wiring in continuous runs without intervening splices.
- C. System Shielding and Grounding: Ground each shield at only one point. Insulate shields at the floating end with heat-shrink or wedge-on collars. Connect all audio grounds to isolated grounding bus bar in equipment rack. Ground this point and track to building main service ground point using ground cable sized for DC resistance of 0.1 ohm or less. Use isolated ground receptacles for all audio system power. Connect these receptacle grounds together and terminate them only to equipment rack ground.
- D. Connectors: Terminate three-pin/socket connectors for Pin 1 = shield, Pin 2 = high, Pin 3 = low. Make all joints and connections with rosin core solder or approved mechanical connectors.
- E. Provide all wiring in strict conformance with standard broadcast practices. Dress cables in conveniently sized bundles of cables, combed into parallel runs, either laced or banded with sufficient plastic ties. Cabling to each piece of equipment neatly incorporates "service loop" of sufficient length to permit equipment to be pulled forward from rack for servicing. Cables and cable bundles supported with sufficient plastic ties and support bars to ensure that strain is not placed on any connections or connectors. Cables and cable bundles behind patch bays sufficiently well organized to permit easy access to patch panels to add or remove cables.
- F. Audio Patch Panels: Wire normal pairs of jacks together located vertically adjacent except as indicated. Locate output jacks in top row and input jacks in bottom row except as indicated. Label each horizontal row of jacks by letter and each jack by number. Also label each jack according to function (i.e. "Automix Main Out").
- G. Labels:
 - 1. Label all equipment items, device plates, equipment rack panels, devices, receptacles and cables, and all controls not protected by security covers as to function performed and area served.
 - 2. Identify all wires and cables at every termination and connection point. Place cable markers within 6 inches of each termination. Use identical designations at each end of cable and carry designations through any intermediate terminations. Protect all cable markings beneath clear heat-shrink.
 - 3. Label manufactured equipment items as to their function and all unsecured controls as to areas and receptacles served. Employ panels with black or colored background to match finish of equipment item and white contrasting engraved Helvetica lettering. Mark nominal operating positions of all unsecured controls.
- H. Equipment Racks:
 - 1. Install equipment in rack to permit access to all equipment for service. Do not allow transformers, relays, terminal blocks mounted in rear of rack behind other equipment to prevent access to other equipment connections or mounted on hinged panels to permit access.
 - 2. Arrange equipment to prevent temperatures from rising above 100 degrees Fahrenheit with ambient room temperature of 70 degrees F. Allow one rack unit between amplifiers. Use ventilating panels as required.
 - 3. Wire rack completely in supplier's shop. Use one-pair, 22AWG, stranded, foil-shielded and jacketed cable for all internal microphone and line level wiring and one pair 16AWG, stranded and jacketed cable for internal loudspeaker level wiring. Separate microphone, line, loudspeaker, and AC power level cables in rack as much as possible, crossing lines only at right angles. Use rosin-core solder and/or approved connectors for all equipment terminations.

4. Connect all microphone, line, loudspeaker level and DC control cables to equipment rack using specified terminal blocks. Label screw positions as to cable served and conductors of that cable. External lines connected to patch bays terminated directly to patch bay terminal blocks.
 5. Locate equipment having operator controls and indicators centered at 60 inches above floor. Locate patch bays no lower than 30 inches above floor.
 6. Fill all unused rack space with black blank or vent panels.
- I. Equipment Installation
1. Loudspeaker Cluster:
 - a. Assemble indicated loudspeakers into center cluster assembly and mount close to ceiling in front center of cafetorium.
 - b. Rigidly fasten elements of speaker cluster to each other and to building roof structure above ceiling.
 - c. In addition to rigid fastening system provided for cluster assembly, provide back-up support system (safety cable) attached at building roof structure.
 - d. Fasten all parts of cluster to each other and to building structure using materials and methods with safety factor of (5) or greater. Weight of loudspeaker elements borne by structural supports; designs relying on integrity of horn/loudspeaker cabinets in their support not acceptable.
 - e. Loudspeakers may not be field modified by the contractor for installation by suspension. Speaker hanging and mounting hardware must be supplied by an approved rigging hardware manufacturer and/or the loudspeaker manufacturer.
 - f. All rigging and related fastening methods must be treated as permanent. All threads must be treated with vibration compounds per manufacturer's recommendations.
 - g. All rigging hardware must be load rated, with the load rating or approval stamped on each piece of hardware.
 - h. Chain of any type, plastic or fabric will not be acceptable for the hanging or backup support of any equipment.
 - i. Stainless steel rope shall not be secured with threaded compression type fittings alone. Compression type closures such as Nicopress shall be utilized. Each closure must have a backup closure. All wire rope shall have strain relief thimbles installed. Neatly tape down all loose ends after Nicopress is installed and crimped.
 - j. Contractor shall have personnel properly trained to install rigging. Documentation must be supplied to verify proper training.
 2. Audio Equipment Cabinets: Coordinate with Architect and Owner exact location of equipment cabinets and exact location of conduit systems and AC receptacles required.
 3. Supply, install and terminate, all low voltage wire and connections to all speakers, audio input and output plates, boxes, racks and panels.
 4. Provide cable requirements and specifications.
 5. Provide cable ID information to affix to pulled wires and cables.
 6. Provide and install final permanent labels to each termination upon completion of installation.
 7. Provide all mounting brackets, rigging and hardware for speakers and install all support assemblies.
 - a. All structural members and attachment mounting plates in walls and ceilings.
 8. Drawings are diagrammatic and indicate general arrangement of systems and work included. Follow drawings in laying out work and check drawings of other trades relating to work to verify spaces in which work will be installed. Maintain headroom and space conditions to all points.
 9. Final location of all equipment shall be as shown on approved shop drawings, or as located in the field by the Architect.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.

B. System Performance Tests And Adjustments:

1. Test Equipment:
 - a. Provide following test equipment for initial test and adjustments and during acceptance testing and final adjustments to system: ANSI standard sound level meter, calibrated test microphone, sine wave generator, pink noise generator, A.C. impedance bridge, audio oscilloscope, 1/3 octave real-time spectrum analyzer, reverberation time analyzer, RMS-responding voltmeter, phase checker, graphic level recorder, and connecting cables sufficient to terminate test equipment to system.
 - b. Provide suitable portable mounting surface for temporary set up of test equipment.
 - c. Provide test equipment manufactured by Bruel & Kjaer, GenRad, Hewlett-Packard, Fluke, Tektronix, Ivie, and similar manufacturers. Non-professional equipment and shop-assembled its are not acceptable.
2. Set initial adjustments of loudspeakers, equalizers and other signal processing equipment. Make final adjustments to these items if so directed. Assist as requested in confirming that performance requirements are met. Provide additional field assembled resistive pads and/or resistor-capacitor networks as requested.
3. Execute moderate moves or changes necessary to accommodate other equipment or preserve symmetry and pleasing appearance without claim for additional payment.
4. Shop Tests:
 - a. Measure to confirm each components conformance with its manufacturer=s published specifications for functional capabilities and control, electrical gain, self-generated noise, frequency response, distortion, and freedom from RFI, EMI and other interference. Rectify any defects and record the final measurements.
 - b. Test all rack-assembled subsystems and all fabricated subassemblies for proper function and performance levels. Rectify any defects.
5. Initial Post-Completion Tests and Adjustments
 - a. Loudspeaker Line Impedance: Disconnect loudspeaker lines from their amplifiers. Measure resistance and impedance of each loudspeaker line leaving equipment rack at center of load's passband or at least one octave removed from crossover frequency. Verify that values are within +/- 10 percent of value calculated for that circuit based upon parallel impedances of loudspeakers connected plus the resistance of loudspeaker line. Correct any discrepancies and record final measurements.
 - b. Loudspeaker Polarity:
 - 1) Inspect loudspeaker line polarities with phase checker or with multi-meter and DC signal source. Polarize all loudspeaker liens identically with respect to color-coding.
 - 2) Inspect high frequency loudspeaker polarities with respect to one another with phase checker and bring all units into common polarity. Confirm appropriateness of polarization through listening tests using speech and music program material. Move slowly from coverage of one high frequency loudspeaker to next with loudspeakers connected in and out of polarity. No degradation of program material should be heard in overlap zone with loudspeakers in proper polarity. Similarly inspect and set polarities of high frequency and low frequency loudspeakers, reversing polarity and one frequency range to confirm initial observations. Restore initial polarities as appropriate.
 - c. Field Wiring Integrity: Measure DC resistance of all microphone field input lines, measuring each conductor pair and each conductor/shield pair both open and shorted. Measure resistance of each conductor and shield with reference to building ground to confirm open circuits. Correct any shorts, erroneous opens, or unusual resistances. Record final measurements.

- d. Hum and Noise Level: Disconnect loudspeaker lines from amplifier outputs and power resistors matching amplifiers= rated load impedance and output power. Adjust system=s gain controls for optimum signal-to-noise ratio and for full amplifier outputs with + 4 dBm amplifier input signals. Terminate system inputs with shielded 600-ohm resistors and measure hum and noise levels of overall system. Record measurements.
- e. Power Output and Distortion: Adjust gain controls as for hum and noise tests, set equalization for flat response and terminate amplifier outputs with power resistors having values equal to nominal impedance of assigned loudspeaker lines. Apply 1,000 Hz sine wave signal to selected system input at level required to produce full amplifier outputs. Use distortion analyzer to measure output level and total harmonic distortion of system from all rack inputs through all amplifier outputs. Record final measurements.
- f. Parasitic Oscillation and RF Pickup: Inspect system using oscilloscope for freedom from spurious oscillation and radio frequency pick up, both in absence of any audio input signal and also with system driven to full output at 100 Hz. Record the findings.
- g. Equalization: Measure system acoustical performance using calibrated ANSI standard type 1 or IEC precision sound level meter set for “slow” meter damping except as otherwise noted, and flat response with random incidence at 4 to 5 feet height. Ensure all interior finishes and furnishings are in place, and system gain is adjusted to provide levels of 70 to 80 dB and at least 10 dB above background noise at measuring locations for these tests, except as otherwise noted. Response curves directly recorded from calibrated real time analyzer. Point-by-point measurements, averaging estimates, and other non-real-time dynamic measurements not acceptable. Include following tests and adjustments in equalization process:
 - 1) House Curve Equalization: Measure loudspeaker frequency response with all control equalization set for flat response, using 1/3 octave bands of filtered pink noise centered on ANSI preferred frequencies, or broadband calibrated pink noise measured in 1/3 octave bands using calibrated real time analyzer. Record acoustic amplitude response appearing on real time analyzer screen. Point-by-point measurements, averaging estimates, and other non real time dynamic measurements not acceptable. After recording un-equalized acoustic amplitude response, adjust equalization to bring observed acoustic amplitude within +/- 1 dB uniformity and to conform to predetermined high frequency roll-off dictated by combined effects of humidity, air absorption, and random incidence of measuring microphone. Once this response is attained, record acoustic response of system and record electrical response of equalizer used to achieve this response. Document control settings used to achieve this response.
 - 2) Feedback Corrections: Connect microphone into sound system, and place in normal operating position closet to loudspeaker system. Adjust sound system gain until it reaches regeneration (feedback). Determine frequency of regeneration by observing response of real time audio spectrum analyzer and adjust appropriate filter until observed regeneration ceases. Continue procedure until the required potential acoustic gain (PAG) is achieved. Record resulting acoustic response of sound system, and record electrical response of equalizer. Document control settings used to achieve this response.
 - 3) Proximity Stability: Suppress tendency of sound system microphone to become unstable when approached by talker. Identify 1/3 octave band affected by approach of a person and provide enough attenuation to ensure stability. Record resulting acoustic response of sound system and record electrical response of equalizer. Document control settings used to achieve this response.
 - 4) Uniformity of Coverage: Measure and record acoustic distribution of loudspeakers in sound system throughout entire seating area. Record location of all positions in seating and where any 1/3-octave band from 250 to 5000 Hz, deviates more than +/- 3 dB from desired curve.

- h. Maximum Output Level: Measure and record maximum output level of system, using standard "fast" meter damping and employing wideband-recorded music at test signal. System should be capable of providing 90 dB SPL in audience area on axis of any high frequency loudspeaker.
 - i. Buzzes, Rattles and Other Noises: Apply slow, sine-wave sweep from 50 to 5000 Hz at level to produce amplifier outputs to 6 dB below their nominal ratings. Listen carefully for buzzes, rattles and other noises. Correct all defects in system. Advise of any noises that are clearly external to system.
 - j. Gain Control Settings: Establish tentative normal settings for all gain controls after adjusting all gain controls for optimum signal-to-noise ration and signal balance. Record settings.
 - k. Freedom from Switching Transient Noise: Eliminate audible clicks or pops produced by operation of any controls.
 - l. Listening Test: Listen to normal program material, including both speech and music, at both normal and at maximum volume levels to be sure that there are no remaining defects.
 - m. Test Report and Certificates: Submit 2 copies of test results, including numerical values, upon completion of initial test and adjustments. Include written certification that installation conforms to requirements of specifications, that it is complete in all respects, and that it is ready for demonstration and acceptance testing.
- C. Demonstration And Acceptance Testing
- 1. Demonstration: Demonstrate operation of each major component and of complete installation following approval of test report and at time mutually agreed upon by Architect/Engineer, Owner's representative and contractor responsible for installation of sound system.
 - 2. Acceptance Tests: Assist as required during acceptance tests and adjustments that follow demonstration. Provide all labor, materials, tools, and measurement equipment necessary for those tests and adjustments, except as otherwise specified. Ensure contractor's representative assisting in performance of these tests is thoroughly familiar with all details of system, and include field supervisor in overall charge during course of installation work. Budget 16 working hours (not inclusive of travel time) for performance of these tests and adjustments. If final acceptance is delayed beyond this period because installation is not in accordance with specified requirements, pay for all additional time and expenses of Architect/Engineer and Owner's representative during any resultant extension of acceptance testing period.
 - 3. Listening Tests: Assist subjective evaluation of system by observers listening at various positions under various operating conditions, using speech, music, and live or recorded materials.
 - 4. Equipment Tests: Perform any measurements of frequency response, distortion, noise of other characteristics and any operation tests deemed necessary by Architect/Engineer or Owner's representative to determine conformance of system and its installation with specified requirements. Make any adjustments to system or its installation required to ensure system operates properly as directed by Architect/Engineer or Owner's representative. This may include, but is not limited to, changes to equalization or level balance, and changes to or installation of resistive pads and RC networks. Record final control settings and final values of any installed components.

3.04 SYSTEM PRESETS

- A. Provide loudspeaker presets per Owner's direction.

3.05 GROUNDING

- A. Microphone line shields shall be grounded only at the equipment rack(s) and shall be grounded only to the common ground of the equipment rack.
- B. All audio grounds in the equipment rack(s) shall be electrically grounded to the isolated ground buss bar mounted in each rack.

- C. Bus bars in each rack then shall be grounded to a single point at the isolated ground panel buss bar.
- D. Total resistance of the ground system from racks to the building ground shall not exceed .1 ohm.
- E. Other shields shall be grounded only at the power amplifier inputs or the console outputs, and shall be terminated at the "floating" end with "wedge on" collars, or with plastic tape. Continuity of shield shall be preserved at connecting points.
- F. Patch panels shall be wired so all signal sources (outputs from equipment), shall be connected to the top row. Any efficient combination of top and bottom rows shall be used for multiples.

3.06 DEMONSTRATION

- A. Training: In addition to demonstration specified above in "Demonstration and Acceptance Testing" Prime Contractor shall provide (8)-hour training sessions by experienced audio engineer over 6- month intervals, covering miking techniques for vocals and various instruments, operation of mixer, equalizer and amplifiers, and general system maintenance requirements and techniques. Training shall be conducted in (2) hours blocks with scheduling determined by the Owner. Training time shall not include travel time.
- B. Provide up to (8) hours support to tune the sound system after training is complete.
- C. Provide a shortcut manual (graphic documentation) indicating the position of all system settings to achieve owner-designated configurations (i.e. speech reinforcement during events, program material, etc.).

3.07 CLOSEOUT DOCUMENTATION

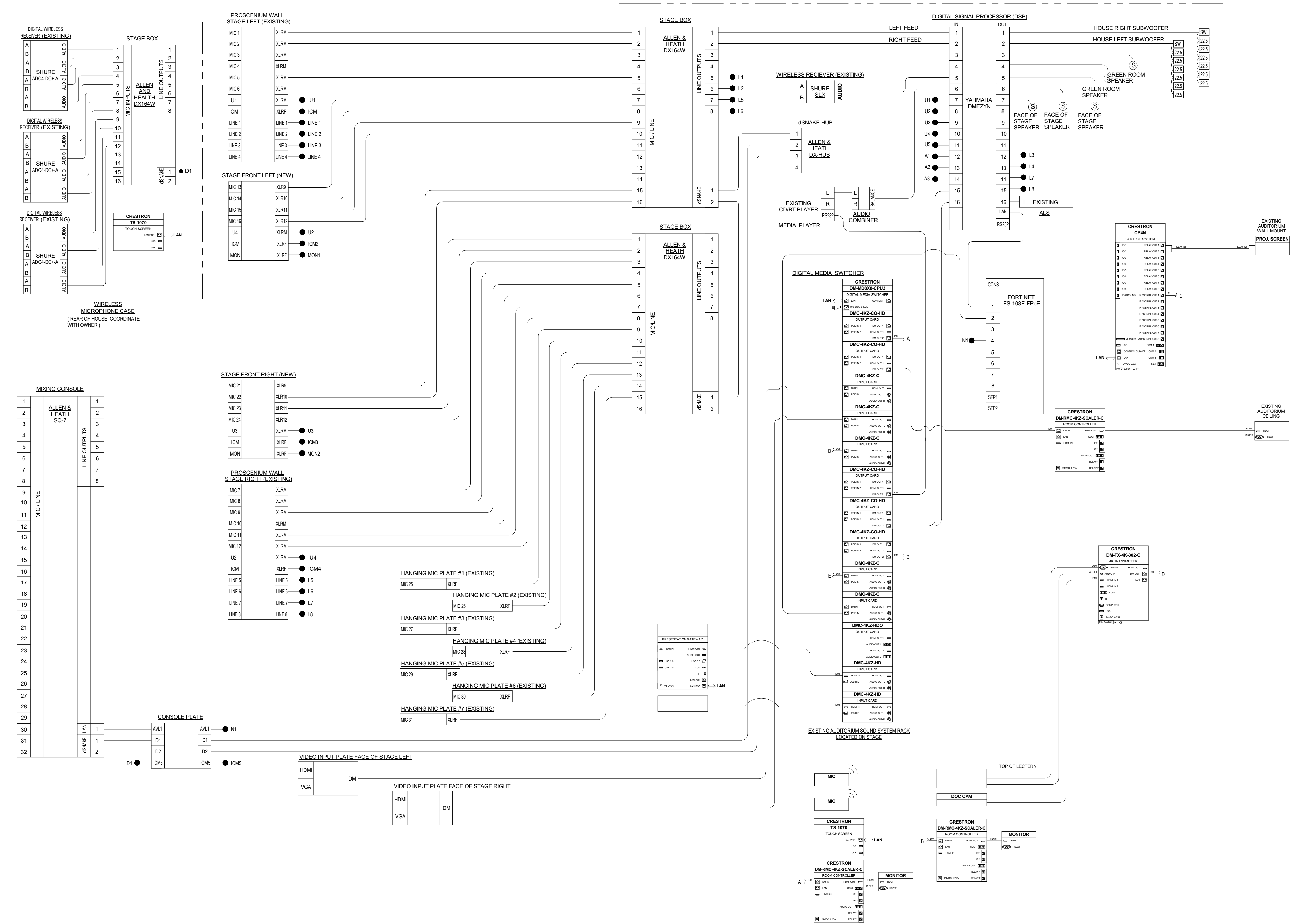
- A. Provide (7) copies of all of the following:
 - 1. System manual (bound) containing the following items:
 - a. Table of contents.
 - b. Specification sheets and technical manuals for all equipment.
 - c. Maintenance procedures for all installed equipment.
 - d. Color-coded wiring diagrams, indicating all wiring types, connections and paths.
 - e. 30 in. by 42 in. as-built drawings indicating location of all equipment and wiring, color-coded to match installation.
 - f. Shortcut tuning documentation as described under Training.
 - g. List of serial numbers of all equipment installed.
 - h. Copies of warranty cards for all equipment.
 - i. List of frequencies used for wireless equipment and copies of licenses.
 - j. Lists of consumable items and replacement parts for routine maintenance (fuses, etc.)
 - 2. Copy of the software presets and any operating software.

3.08 FIELD QUALITY CONTROL

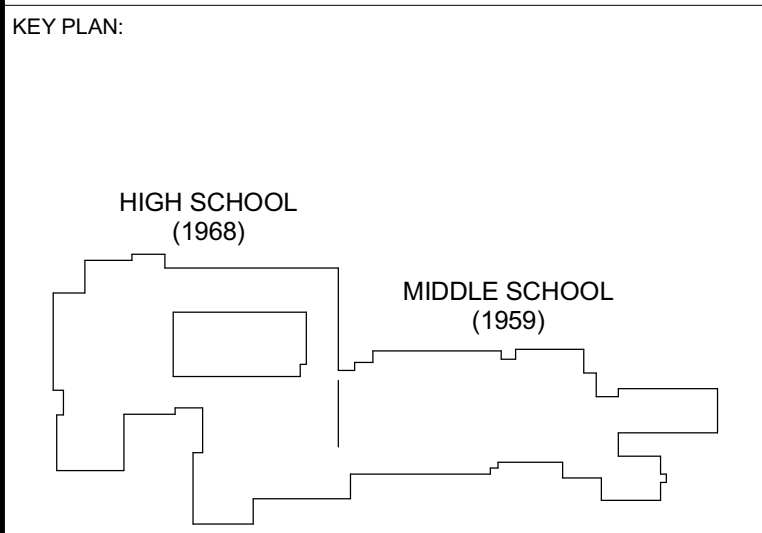
- A. Submit written test report from authorized representative of equipment manufacturer that system has been tested and is in working order prior to final inspection by Architect/Engineer.

END OF SECTION

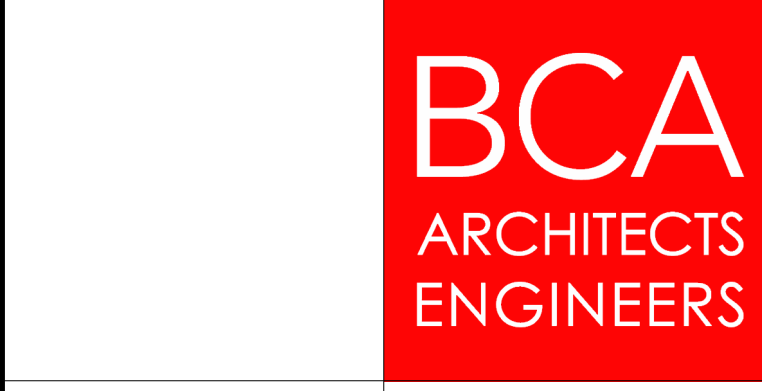
GENERAL NOTES:
 1. SEE DRAWING E600 FOR APPLICABLE GENERAL NOTES, ABBREVIATIONS, SYMBOLS AND LEGENDS



1 AUDITORIUM SOUND SYSTEM RISER DIAGRAM
 SCALE: NOT TO SCALE
 DRAWING RE-ISSUED BY BID ADDENDUM NO. 2



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PORT JERVIS CITY SCHOOL DISTRICT
 ALTERATIONS TO: PORT JERVIS HIGH SCHOOL

Port Jervis - Orange County - New York	
REV DATE	DESCRIPTION
03/29/2024	BID ADDENDUM #2
DRAWN BY	PROJECT NUMBER
SMG, TMF	2022-143
CHECKED BY	DATE
SGV	10/16/2023

ELECTRICAL SCHEDULES	
BUILDING NUMBER	SHEET NUMBER
HS	E601

3/29/2024 3:39:27 PM

