

ADDENDUM NO. 2

TO: PLANS AND SPECIFICATIONS FOR STATE OF MISSOURI

**Auditorium Renovation
Missouri School for the Blind
St. Louis, Missouri
PROJECT NO. E2005-01**

New Bid Opening Date: 1:30 PM, Tuesday, November 2, 2021 (CHANGED)

Bidders are hereby informed that the Construction Plans and/or Specifications are modified as follows:

SPECIFICATION CHANGES:

1. **SECTION 001116 – INVITATION FOR BID**
 - a. REVISE Paragraph 3.0-A as follows:
 - A. Until: 1:30 PM, Tuesday, November 2, 2021.
2. **SECTION 274100 – AUDIO-VIDEO SYSTEMS**
 - a. ADD new specification SECTION 274100

DRAWING CHANGES:

1. None

GENERAL COMMENTS:

1. Bidders needing additional site inspection should contact Steve Schlereth, OA/FMDC Physical Plant Supervisor at (314) 633-1563 to schedule a time.
2. Please contact Paul Girouard, Contract Specialist, at 573-751-4797 or paul.girouard@oa.mo.gov for questions regarding bidding procedures and MBE/WBE/SDVE goals and submittal requirements.
3. The deadline for technical questions was Wednesday, October 20, 2021 at noon. All technical questions will be answered by Megan Griffith, Patterhn Ives LLC and will be addressed by addendum if required.
4. Changes to, or clarification of, the Bid Documents are only made as issued in the Addenda.
5. Current Planholders list is available at American Document Solutions website - <https://www.oafmdcplanroom.com/jobs/1089/details/e2005-01-auditorium-renovation-missouri-school-for-the-blind>
6. Prospective bidders contact American Document Solutions, 1400 Forum Blvd Suite 1C, Columbia MO 65201, 573-446-7768 to order official plans and specifications.
7. **All bids shall be submitted on the bid form without additional terms and conditions,**

modifications, or stipulations. Each space on the bid form shall be properly filled including bid amounts for each alternate. Failure to do so will result in rejection of the bid.

8. MBE/WBE/SDVE participation requirements can be found in DIVISION 00. The MBE/WBE/SDVE participation goals are 10%/10%/3%, respectively. Only certified firms as of the bid opening date can be used to satisfy the MBE/WBE/SDVE participation goals for this project. If a bidder is unable to meet a participation goal, a Good Faith Effort Determination Form must be completed. Failure to complete this process will result in rejection of the bid.

ATTACHMENTS:

1. Specification SECTION 274100

October 26, 2021

END OF ADDENDUM NO. 2

SECTION 27 41 00 - AUDIO-VIDEO SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This project is for the renovation of the Audio-Visual Systems serving the auditorium for the Missouri School for the Blind. The design, defined by the Project Documents, provides for the installation, programming and testing, and owner training of the Audio-Visual Systems for the Auditorium.
- B. Equipment manufacturers and model numbers used as Basis of Design shown on project drawings. Contractor shall submit substitution requests during bidding and must be equal in quality (or better) and functionality.

1.3 SYSTEM DESCRIPTIONS

- A. Auditorium 101

The sound reinforcement system for the Auditorium House will produce high-quality sound for speech and music for the entire seating area. The speakers will consist of the following: left and right digitally steerable full-range column arrays, main and delayed center speakers, low frequency subwoofer, side and rear surround speakers.

NOTE: Add Alternate shall be provided for Top-Surround speakers, along with associated cabling, amplifiers and miscellaneous rigging hardware.

Monitor speaker jacks feeding “floor wedge” style monitor speakers will be included at various wall-plate locations to allow stage performers to hear themselves with a separate audio mix that is different from the main house audio mix. A hearing assistance system will be included to meet federal ADA requirements, along with a separate closed captioning system that generates text automatically from all audio sound system sources, and then streams over WiFi network to dedicated mobile devices (such as iPad, etc.) running accompanying app. Closed-captioning text shall also broadcast to large format house projection screen. Contractor to coordinate best location on the screen and size preference with the owner.

Mixing system shall include digital snake hardware to support wired field jacks along with digital mixing console control surface. System shall include support for forty-eight (48) input channels with a minimum of twenty-five (25) assignable faders and four (4) fader layers. The digital mixing system will also integrate thirty-two (32) bi-directional network audio (Dante) channels, left-right panning, USB recording, and signal processing for each channel input and auxiliary output/bus sends. Additional portable digital audio snake-boxes will be provided that each sup-

port 24 x 8 input/output channels of audio from any wall plate location, allowing a concentrated number of system inputs and outputs from one location. The mixing console system shall have support for mobile app to allow the sound operator to roam throughout the house, listen and make console adjustments wirelessly. (Wireless access point provided by owner.) AV contractor to support owner in initial set up of wireless mobile device.

A flexible audio signal processor with network audio support integrated into system for loud-speaker signal processing requirements, limiting and protection circuits, signal distribution, interface with AV control system and automated controls, and miscellaneous feeds such as media outputs and overflow spaces. Dante digital audio bus included with audio processor allowing the system to add additional inputs and outputs as required to accommodate future changes or additions.

Input/output plates distributed on the stage, and to miscellaneous house locations that will provide a combination of microphone inputs, tie lines, monitor speakers (line-level for powered units), AV/network data, and HDMI video. Wireless content sharing/collaboration shall be included and include features such as sending multiple devices to the screen.

Ten (10) wireless microphone systems with miniature lavalier microphone elements included for performances, along with one (1) lapel and one (1) handheld system for various programs such as presentations. Eight (8) existing systems shall be reused and incorporated into the new system. AV contractor shall inventory existing frequencies and use Shure Workbench software (or equivalent) to determine frequency selections for all new units prior to submittals.

A single-chip, laser-phosphor DLP projector with 1080p resolution and 10,000 (min) lumens will be mounted to the ceiling of the house. Motorized drop-down projection screen with low-voltage controls on stage and at mix locations will lower the screen from the stage side of the proscenium wall. Camera with pan, tilt, and zoom capability will be mounted to the rear wall and will send general stage shot to Green (Band) room and AV control location on stage with local monitor. A stereo microphone will be mounted to the ceiling above the front section of audience seating.

AV rack on stage will include a paging microphone for backstage/Green (Band) Room, AV input and outputs, and an AV touch panel. Touch panel controller will include two system mode preset buttons that switch system between automatic and manual control. The automatic, or “no-AV Tech” preset shall include integrated control of system power for projector and other select AV equipment, AV source selection and program volume control, video mute, camera presets and pan-tilt-zoom, blu-ray transport controls, volume control of select wired microphone input jacks, along with two (2) wireless microphones. Manual mode shall include all automatic control functions, with all audio inputs assigned to the mixing console. An additional portable touch panel with cable pigtail shall also be included that is programmed with identical functions as rack-mounted unit with connectivity at both house mix locations.

All AV inputs shall be capable of being assigned to all video endpoints including projector, stage monitor and Green room (Band) monitor locations in any combination or matrix.

Video wall processor programmed with presets for three aspect ratios including 1.85 for film, 1.77 (standard or “HD”) and 1.6 (PC/taskbar) with black masking applied from signal generator as required to screen for unused sections. Preset also included to show or not closed-captioning text on output. AV contractor shall coordinate with the owner for the final preferred location and size of captioning.

House camera with pan-tilt-zoom capability installed to capture stage performers and send to backstage, overflow and remote (streaming) participants. Recording unit at AV rack on stage shall allow instructors and students to capture performances, and then play back on local video monitor. Touch panels programmed with pan-tilt-zoom (PTZ) camera controls, along with user-defined presets allowing the camera operator to save favorite PTZ settings. Joystick controller provided to allow smooth camera control over PTZ functions.

AV contractor shall install owner provided computer and assist with the setup and programming of web conferencing application (WebEx, Teams, Zoom, etc.) using installed hardware as shown on system drawings. Audio processor shall incorporate AEC channels and apply to soft codec inputs with the appropriate reference signals, etc.

Programming allowance shall be made to modify touch screen pages after review by the owner without additional compensation. The touch screen sheet layouts should be submitted prior to shop drawing approval.

Upon initiation of the fire alarm voice EVAC system, the fire alarm message shall mute the auditorium sound system.

1.4 SUBMITTALS

- A. Prior to shop drawing submittal, contractor will submit touch screen sheet layouts to the owner for review. Programming allowance shall be made to modify touch screen pages without additional compensation.
- B. Product Data: For each type of product indicated.
- C. Shop Drawings: Shop drawings and submittal data shall contain sufficient information to describe the work to be performed. Prepare drawings at an appropriate scale and submit the required number of copies (see Division 1) of the submittal package neatly bound in sets. The required information shall include but not be limited to:
 - 1. Detail equipment assemblies and indicate dimensions, weights, required clearances.
 - 2. Written verification of the Audio-Visual Contractor's qualifications as required in this section.
 - 3. Wiring diagrams for each system including wire types.
 - 4. Rack drawings showing proposed rack layout.
 - 5. Speaker cluster mounting details. (Note: It is the responsibility of the Audio-Visual Contractor to assure the structural integrity of the speaker hanging method and hardware only.)
 - 6. All rough-in information including junction and back boxes.
 - 7. Layout of all custom plates outlet plates/panels.
 - 8. A material list of all equipment to be furnished.
 - 9. Manufacturers specification sheets of all equipment to be provided. (bound in a neat and orderly fashion with an index listing the manufacturer's specification sheets in specification order)..
- D. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and spe-

cial moldings are shown and coordinated with each other, using input from installers of the items involved.

- E. Operation and Maintenance Data

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: The Audio-Visual Systems Contractor shall be a contractor who has been continuously engaged in furnishing and installing commercial audio and video systems of the type specified for at least five (5) years.
- B. The Audio-Visual Systems Contractor shall maintain a suitably staffed and equipped service organization and shall regularly offer maintenance services for systems of this type and size.
- C. The Audio-Visual Systems Contractor shall be an authorized dealer of all equipment provided with this system. Given the inherent warranty difficulties which occur when products are provided from contractors who participate in trans-shipping or two-stepped equipment sales, this dealership requirement will be strictly adhered to. At the owner's request, any contractor responding to this bid proposal must provide proof of dealership status for all listed system components or approved alternates. Failure to comply with this request will be grounds for bid rejection.
- D. At the request of the Owner, Architect or Engineer, an inspection of the Audio-Visual Systems Contractor's place of business shall be scheduled to demonstrate that the contractor possesses adequate plant and equipment to complete the work properly and in a timely manner, adequate staff with sufficient technical experience, and suitable financial status to meet the obligations of the contract.
- E. The Audio-Visual Systems Contractor shall supply technicians who have received training from a nationally recognized training organization in the last 5 years on "speaker rigging methods" and "rigging safety".
- F. An Electrical Contractor who does not meet the requirements listed above who intends to bid on this work shall be required to employ the services of a qualified Audio-Visual Systems Sub-Contractor. The Audio-Visual Systems Contractor must be named in the shop drawing submittal information along with written documentation verifying that the sub-contractor fulfills all requirements listed in 119690.

1.6 COORDINATION

- A. Coordinate layout and installation of system components and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. Refer to the Audio-Visual Drawings for all required equipment.

PART 3 - EXECUTION

3.1 WIRING METHODS

- A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters, and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used]. Conceal raceway and cables except in unfinished spaces.
 - 1. Install plenum cable in environmental air spaces, including plenum ceilings.
 - 2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."
- B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.
- C. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.2 INSTALLATION OF RACEWAYS

- A. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.
- B. Install manufactured conduit sweeps and long-radius elbows whenever possible.

3.3 INSTALLATION OF CABLES

- A. Comply with NECA 1.
- B. General Cable Installation Requirements: All work shall be performed under the supervision of a Audio-Visual equipment supplier accredited by the factory of the system manufacturer. Satisfactory performance of the equipment shall be the responsibility of the equipment supplier. The final connections and shall be by the Audio-Visual Systems Contractor.
 - 1. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at outlets and terminals.
 - 2. Splices, Taps, and Terminations: Arrange on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Cables may not be spliced.

3. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
4. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
5. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
6. Precautions shall be taken to prevent electromagnetic and electrostatic hum pickup in the system wiring. For line level audio signals, float cable shields at the output of the source device. Shields not connected are to be folded back over the cable jacket and covered with heat shrink tubing for future use. Do not cut off unused shields.
7. Furnish and install minimum (1) one cable penetration EZDP33FWS, as manufactured by Specified Technologies, Inc. or equivalent, through fire rated partitions and floors, as indicated on the drawings.

C. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in equipment room spaces with terminating hardware and interconnection equipment.
2. Suspend speaker cable not in a wireway or pathway a minimum of 8 inches above ceiling by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or be in contact with pipes, ducts, or other potentially damaging items.

D. Separation of Wires: Separate speaker level, line-level, microphone-level, control, video and power wiring runs. Install in separate raceways or, where exposed or in same enclosure, separate parallel audio-visual system conductors from power runs by at least 12 inches. Separate other intercommunication equipment conductors as recommended by equipment manufacturer.

3.4 INSTALLATION

- A. Bridged connections should be applied at microphone and line-level signal interfaces to maximize voltage transfer.
- B. Identification of Conductors and Cables: Color-code conductors and apply wire and cable marking tape to designate wires and cables so they identify media in coordination with system wiring diagrams.
- C. Mount equipment and enclosures plumb and square. Permanently installed equipment to be firmly and safely held in place, with extra safety cable used where possible. Design equipment supports with a minimum safety factor of five for any overhead loudspeakers. Provide speaker mounting hardware with $\pm 5^\circ$ adjustability from the specified aiming angle and perform such adjustments upon request without claim for additional payment.
- D. Metallic speaker back boxes will be required on all ceiling or wall mount flush speakers.
- E. Each cable shall be properly identified at each end using suitable wrap-around or other permanent labeling method. All cable numbers shall be marked on the record drawings for future reference.

F. Equipment Cabinets and Racks:

1. Group items of same function together and arrange controls symmetrically.
2. Arrange all inputs, outputs, interconnections, and test points so they are accessible at rear of rack for maintenance and testing, with each item removable from rack without disturbing other items or connections.
3. Blank Panels: Cover empty space in equipment racks so entire front of rack is occupied by panels.
4. Provide engraved lamacoid or adhesive backed laminated labels on the front and rear of all active equipment mounted in the racks. Hand-written or embossed "ROTEX" or "DYMO" type labels shall not be accepted. Mark controls for easy operation by an operator unfamiliar with the system.

G. Limiter/Compressor: Program digital signal processors serving each speaker output with a limiter/compressor to avoid damage to speakers from system overloads.

H. Wall-Mounted Outlets: Flush mounted.

I. Floor-Mounted Outlets: Conceal in floor and install cable nozzles through outlet covers. Secure outlet covers in place. Trim with carpet in carpeted areas.

J. Conductor Sizing: Unless otherwise indicated, size speaker circuit conductors from racks to loudspeaker outlets not smaller than No. 18 AWG and conductors from microphone receptacles to amplifiers not smaller than No. 22 AWG.

3.5 GROUNDING

A. Ground cable shields and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.

B. Terminate equipment racks and other audio-visual equipment with properly grounded receptacles (no isolated grounds).

3.6 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Schedule tests with at least seven days' advance notice of test performance.
2. After installing the Audio-Visual systems, test for compliance with requirements.
3. Operational Test: Perform tests that include originating program at microphone outlets, preamplifier program inputs, and other inputs. Verify proper routing and volume levels and that system is free of noise and distortion.
4. Acoustic Coverage Test: Measure system response to ensure variation of sound pressure levels in audience areas is plus or minus 2 dB.

B. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified

3.7 DEMONSTRATION

- A. Owner's operating personnel in the proper set up, operating and maintenance procedures, installed under this contract, and shall include at least three (3) service calls of 4 hours minimum during the warranty period for service or instructions as required by the Owner, at a time mutually agreeable to the Owner and Contractor.
- B. Provide minimum of two four-hour training sessions for system operation of the Auditorium Audio-Visual system.

END OF SECTION 274100