NORTH IOWA AREA COMMUNITY COLLEGE
AUDITORIUM LOUDSPEAKER REPLACEMENT

REQUEST FOR PROPOSAL

Project Title:

North Iowa Area Community College Auditorium Loudspeaker Replacement

Location of Project:

North Iowa Community Auditorium, 500 College Drive, Mason City, Iowa 50401

Request for Proposal:

North Iowa Area Community College is seeking proposals for the replacement of the main loudspeakers in the North Iowa Community Auditorium on the NIACC campus in Mason City, Iowa.

Each interested contractor is asked to provide a proposal for each of the three loudspeaker systems as described in the attached Bid Documents (specification and drawings).

Proposals shall be provided electronically in PDF format to the following recipients:

- Mindy Eastman, Vice President for Administrative Services, NIACC
  - Mindy.Eastman@niacc.edu
- Lindsay Dalrymple, Executive Director, Performing Arts & Leadership Series, NIACC
  - Lindsay.Dalrymple@niacc.edu
- Mark Turpin, Senior Associate, Acoustic Distinctions
  - MTurpin@AD-NY.com

Deadline for submission of proposals: **May 6, 2024, 1:00 PM CDT**.

Receipt of proposals will be acknowledged by reply e-mail. If you do not receive confirmation of receipt within 24 hours, please contact Mark Turpin by telephone, **646.948.2139.**

NIACC expects to review submissions and decide on contract award by **May 10, 2024**.

Additional Information:

Deadline for requests for information regarding the Bid Documents: **April 29, 2024, 5:00 PM CDT**.

Responses to RFI's from any contractor will be shared with all contractors considering bidding. Please e-mail us if you plan to bid so we can share any RFI responses with your firm.

NIACC will issue a purchase order as the contract for this work. The terms of the purchase order will be negotiated with the awarded contractor.

NIACC reserves the right to award this contract based on a best-value analysis of the proposals received. The lowest bid will not necessarily be the determined to be the best value to NIACC.

For proposals to be considered, the contractor must meet the minimum quality control requirements as described in Section 1.8 of the specification. Please do not provide a proposal if your firm does not materially meet these requirements.

NORTH IOWA AREA COMMUNITY COLLEGE
AUDITORIUM LOUDSPEAKER REPLACEMENT

BID FORM

--- ATTACH THIS FORM (3 PAGES) AS A COVER TO YOUR BID ---

Project Title:

North Iowa Area Community College Auditorium Loudspeaker Replacement

Location of Project:

North Iowa Community Auditorium, 500 College Drive, Mason City, Iowa 50401

Project Timeline:

It is assumed the work will begin upon notice to proceed and be finished by 8/21/24. A detailed schedule will be produced by the selected bidder in consultation with the Owner.

Bid Details:

Having read and examined the Contract Documents (specification and drawings) the undersigned Bidder proposes to perform all Work for the applicable Contract, in accordance with the Contract Documents, for the following sums:

Option 1 Loudspeaker replacement per contract documents:

ALL COSTS for the sum of: $ _____

As written: _____

Above sum generally broken down as follows:

Materials $_____

Labor $_____

Other (transportation, shipping, etc.) $_____

Please attach an itemized spreadsheet of components and costs as part of the Bid.

Option 2 Loudspeaker replacement per contract documents:

ALL COSTS for the sum of: $ _____

As written: _____

Above sum generally broken down as follows:

Materials $_____

Labor $_____

Other (transportation, shipping, etc.) $_____

Please attach an itemized spreadsheet of components and costs as part of the Bid.

Option 3 Loudspeaker replacement per contract documents:

ALL COSTS for the sum of: $ _____

As written: _____

Above sum generally broken down as follows:

Materials $_____

Labor $_____

Other (transportation, shipping, etc.) $_____

Please attach an itemized spreadsheet of components and costs as part of the Bid.

Contractor Exceptions to Bid Documents (if any):

_____

_____

_____

_____

_____

_____

BIDDER'S CERTIFICATION

The Bidder hereby acknowledges that the following representations in this bid are material and not mere recitals:

1. Bidder has read and understands the Contract Documents. The Contract Documents include this bid form and the Design Drawings and System Specification. The Bidder agrees to comply with all requirements of the Contract Documents, regardless of whether the Bidder has actual knowledge of the requirements and regardless of any statement or omission made by the Bidder which might indicate a contrary intention.
2. The Bidder represents that the bid is based upon the Standards specified by the Contract Documents.
3. The Bidder understands that NIACC is a tax-exempt organization and has not included sales tax on applicable materials.
4. The Bidder's pricing for each alternate is for a complete loudspeaker system including all elements in the Contract Documents.
5. The Bidder is familiar with local conditions and has correlated personal observations about the requirements of the Contract Documents. The Bidder has no outstanding questions regarding the interpretation or clarification of the Contract Documents, except as noted under Contractor Exceptions to Bid Documents, above.

6. The Bidder and each person signing on behalf of the Bidder certifies, and in the case of a joint or combined bid, each party thereto certifies as to such party's organization, under penalty of perjury, that to the best of the undersigned's knowledge and belief: (a) the Base Bid, any Unit Prices and any Alternate Bids in the bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition as to any matter relating to such Base Bid, Unit Prices or Alternate bids with any other Bidder; (b) unless otherwise required by law, the Base Bid, any Unit Prices and any Alternate bid in the bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to the bid deadline, directly or indirectly, to any other Bidder who would have any interest in the Base Bid, Unit Prices or Alternate bid; (c) no attempt has been made or will be made by the Bidder to induce any other individual, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
7. Bidder understands that the total cost of this contract is subject to approval by the Board of NIACC and that once the total cost has been approved the not to exceed sum will be binding, including any change order work authorized by the owner after the approval of this bid.
8. Bidder will enter into and execute the Contract with the Owner, if a Contract is awarded on the basis of this bid, and if the Bidder does not execute a Contract for any reason, other than as authorized by the Contract Document, the Bidder and the Bidder's Surety are liable to the Owner.
9. Bidder certifies that upon the award of a Contract, the Contractor will make a good faith effort to ensure that all of the Contractor’s agents, subcontractors, employees and representatives, while working on the Project, will abide by all applicable laws of the State of Iowa, Cerro Gordo County and the City of Mason City. These include but are not limited to laws and regulations governing prevailing wage, workers compensation, taxation, workplace safety, and substance abuse. Failure of the Contractor to demonstrate compliance with these laws may invalidate any contract awarded.
10. Bidder agrees to furnish any information requested by the Owner to evaluate the qualifications of the Bidder. If the Bidder is a corporation, partnership or sole proprietorship, an officer, partner or principal of the Bidder, as applicable, shall print or type the legal name of the Bidder on the line provided and sign the Bid Form. If the Bidder is a joint venture, an officer, partner or principal, as applicable, each member of the joint venture shall print or type the legal name of the applicable member on the line provided and sign the Bid Form.

BIDDER SIGNATURE AND INFORMATION

Bidder's Authorized Signature: _____

Please print or type the following:

Name of Bidder's Authorized Signatory: _____

Title: _____

Company Name: _____

Mailing Address: _____

_____

Telephone: _____

E-Mail Address: _____

Where Incorporated: _____

Federal Tax Identification Number: _____

Contact person for Contract processing: _____

President or Primary Officer Name and Title: _____

SECTION 274100

PERFORMANCE AUDIO SYSTEMS

PART 1 -- GENERAL

1.1 RELATED DOCUMENTS

A. Any provisions of the North Iowa Area Community College purchasing authority supplied as part of this bid request.

B. AV series large-format drawings as listed in Appendix E.

1.2 REFERENCES

A. American National Safety Institute (ANSI)

B. Electronics Industries Association (EIA)

C. Fiber Optic Association (FOA)

D. National Electrical Code (NEC)

E. National Fire Protection Association (NFPA)

F. Telecommunications Industry Association (TIA)

1.3 RESPONSIBILITY AND RELATED WORK

A. This written specification and the large-format AV drawings shall be collectively referred to herein as the AV Systems Documents.

B. Contractor shall provide, based on the AV Systems Documents, a complete, turnkey system, tested and ready for acceptance testing. The AV Systems Documents are developed to the extent required to properly convey design intent, signal flow, and system infrastructure. It is understood by the Contractor they are responsible for additional equipment as required to provide a complete and working system.

C. System features or devices which are mentioned in one part of the AV Systems Documents may not be shown in the other. In case of conflict between the written specifications and the drawings, Contractor must seek clarification from the Designer. In the event the Contractor fails to obtain such clarification the interpretation of the Designer will prevail.

D. Contractor shall obtain all licenses and permits necessary for the execution of any work pertaining to the installation within this scope of work.

E. The overall intent of this upgrade work is to replace the North Iowa Community Auditorium (NICA) main audio loudspeakers and amplifiers with improved AV connectivity at the amplifier rack. NICA is an existing theatre with extensive AV systems already in place. Contractor will exercise due caution in protecting existing systems so other functions unrelated to the main loudspeaker systems are undisturbed.

1.4 DEFINITION OF TERMS & ABBREVIATIONS:

A. Systems: AV systems.

B. Contractor: Specialty contractor (integrator) performing work of this Section.

C. Designer: Designer of the AV systems.

D. Furnish: To purchase and deliver to project site.

E. Install: To unload at project site and perform necessary operations for proper mounting and correct operation.

F. Provide: To furnish and install.

G. OFE: Owner Furnished Equipment. Equipment will be furnished to Contractor for installation.

H. NIC: Not In Contract. Refers to items that are not included in the scope of work outlined in this Section but may be shown for coordination purposes or reference.

I. New: Manufactured within the past year and never before used.

J. Future: Equipment that will be provided by Owner at a later date. Accommodations shall be provided for future equipment as shown on the drawings.

1.5 SCOPE OF WORK

A. Furnish all materials, labor, and required engineering services to provide complete and professionally installed Systems in working order as described herein. Labor furnished shall be specialized and experienced in Systems installation.

~~B. Furnish all back boxes and enclosures.~~ (not applicable)

~~C. Deliver to the job site all back boxes which are to be installed by others.~~ (not applicable)

D. Furnish and install all low voltage wire and cable.

E. Furnish any additional items, not specifically mentioned herein, to meet system requirements as specified, without claim for additional payment. Such items may include hardware, transformers, line/distribution amplifiers and other devices for proper installation, interface, isolation, or gain structure.

F. Furnish shop drawings and receive approval prior to fabrication and installation.

G. Perform initial adjustments and verification tests. Submit verification test report.

H. Participate in acceptance tests and perform final adjustments.

I. Participate in user training.

J. Provide system documentation including copies of all relevant drawings and equipment manuals.

K. Guarantee all equipment and components for the specified period from the date of acceptance.

L. Provide maintenance services for the specified period from the date of acceptance.

~~M. Coordinate with the Division 26 Contractor to assure correct Systems conduit routing, Systems backbox locations, and clean power circuit locations as specified in Division 26. Division 26 work is being handled by the Owner under a separate contract.~~ (not applicable)

N. Work scope does not include the AC power system except as shown in the drawings.

O. ***Note on installation timing:*** *To meet the requirements of the upcoming season, the work under this contract must be substantially complete by* ***August 21, 2024****. If manufacturer lead times make this completion unrealistic, an option may (in consultation with the owner) be available for installation to be done in January 2025.*

1.6 SUMMARY DESCRIPTION

A. This Section includes the following:

1. Main audio loudspeaker systems and AV connectivity. The objective is to provide professional systems, installed, acceptance tested, and ready for use.

1.7 EXPANDED DESCRIPTION

A. Main Center Voice Array. Replace the existing center loudspeaker array and associated processing and amplification.

B. Main Left/Right Music Arrays. Replace the existing left and right loudspeaker arrays and associated processing and amplification.

C. Music Subwoofers. Add a center array of cardioid subwoofers and associated processing and amplification.

D. Processing. Replace the system digital signal processor in support of the new loudspeaker arrays.

E. Connectivity. Repurpose two existing Category cables to allow the new processor and amplifiers to connect to the AV (Dante) network.

1.8 QUALITY CONTROL

A. Comply with all requirements of Specification Division 01 and any stipulations of NIACC purchasing.

B. Any Contractor performing work described in this Section shall have the following qualifications:
   1. Contractor shall maintain a fully staffed and equipped service facility; shall be a franchised dealer and authorized service facility for the major brands specified; and shall be properly licensed to work on this project.
   2. Contractor shall have had at least five years' experience in the programming, fabrication, assembly, installation, and testing of AV systems, including experience in rigging performance line array systems.
   3. Contractor shall have successfully installed at least three projects of comparable magnitude and complexity, completed within the last five years. Comparable projects must be in venues requiring large-scale reinforcement, such as stadiums, arenas, theatres, or larger houses of worship.
   4. Contractor's technicians shall be fully trained, qualified, and certified by the respective equipment manufacturers on the engineering, installation, programming, testing, and operation of the systems. At least one technician shall have valid CTS-D certification, and at least one shall have valid CTS-I certification from InfoComm International, or equivalent.

1.9 BID SUBMITTALS

A. Bid submittals to comply with Division 01 requirements and any purchasing requirements stipulated by the NIACC purchasing department.

B. The bid documents include three completely separate systems. Bidders are asked to bid all three systems with a separate total price for each system. If there is any reason a bidder cannot bid all three systems, please contact the System Designer for additional direction. (Note that each equipment list is complete with all required components, so some elements are duplicated between the three equipment lists.)

C. Include the following information with the bid submittal:
   1. Summary of professional qualifications for performing work in this Section.
   2. Three separate total contract prices, reflecting the three alternate loudspeaker systems under consideration.
   3. An itemized equipment list for each option including Unit Pricing provided in Microsoft Excel format utilizing the following column headings:
      a. Function
      b. Description
      c. Manufacturer
      d. Model
      e. Quantity
      f. Unit Price
      g. Totals
   4. The number of labor hours for each option estimated for each of the following:
      a. Project management
      b. Engineering and programming
      c. Fabrication and assembly
      d. Wire pull labor
      e. On site labor
      f. Verification and acceptance testing
      g. Documentation

D. Contractor is responsible for reading and understanding all information presented in this Section. Discrepancies between drawings and specifications or other errors or omissions shall be brought to the Designer's attention a minimum of 5 days prior to bid date. Failure to do so does not relieve the Contractor from the requirement to provide a fully operational and turnkey system as outlined.

1.10 PROJECT SUBMITTALS

A. Submittal packages shall be coordinated and complete with all required information, unless issuance of a partial or interim set has been previously approved by the Designer. Uncoordinated sets will be returned without review.

B. Submittal package of cut sheets shall be provided for review as soon as possible after contract award. Equipment approval is required ASAP because of potential delivery delays due to manufacturer lead times. This package will include PDF copies of the manufacturer's product data sheets for each item of equipment that will be provided as part of this contract, including a table of contents.

C. Submittal package of shop drawings shall be provided for review within thirty days of contract award. This package shall indicate the complete details and dimensions of work to be performed. At minimum, shop drawings shall include:
   1. Table of Contents.
   2. Loudspeaker location, orientation, and rigging detail drawings. Drawings to be submitted with a licensed professional engineer's stamp as appropriate for the type of work to be performed. Rigging drawings will include, at minimum, all structure attachment information, welding calculations, types of hardware to be used, mounting angles, and coordination with other trades.
   3. Complete, detailed wiring schematic for all systems, based on the AV Systems documents but including cable types, identification by number and color codes, and detailed wiring of connections, both at equipment and between equipment racks and wiring in conduit.
   4. Location of all equipment in racks, consoles, millwork, or enclosures. Include dimensions, wire routing, AC power outlets, terminal strips, and UPS locations.
   5. Schematic drawings of any custom circuitry or equipment modifications, including connector pinouts and component lists.
   6. Schedule of terminations for all systems.
   7. Rack AC Power schedule and circuiting information coordinated with Division 26. Provide circuiting detail for power distribution within the rack(s) both in the equipment rooms as well as at the control positions.
   8. Equipment room layouts coordinated with current architectural drawings and with site conditions.
   9. Panel Fabrication Details including a panel engraving schedule.
   10. Patchbay layouts.
   11. Details and dimensions of any custom fabricated devices, including materials, finishes, and labeling.
   12. Color information for all loudspeakers, brackets, and panels to be furnished or installed.

D. Shop drawings shall be submitted as bound, large-format PDF documents for Designer review. Submit additional copies or formats as required under Division 01 specification sections.

E. Failure to submit shop drawings in ample time for evaluation shall not entitle the Contractor to an extension of contract time. There will be no work authorized on site without the prior submittal (and subsequent approval) of a complete set of shop drawings. Any exceptions to this must be in writing and approved by the Designer.

F. Designer review of shop drawings is for general conformance with the design intent and general compliance with the AV Systems documents of the project. Corrections, comments, or markings made do not relieve the Contractor from compliance with the AV Systems Documents nor allow departure therefrom. Contractor remains responsible for detailing and accuracy, confirming and correlating quantities and dimensions, selecting fabrication processing and techniques of construction, coordinating work with that of other trades, and performing work in a safe a satisfactory manner.

G. *Due to the limited scope of work for this project, Contractor may, at their discretion, use suitably modified versions of the contract documents drawing set as the shop drawings.*

H. Contractor is responsible for all software programming for the AV systems. Coordination with the Designer is required for the development of this programming.
   1. Obtain loudspeaker settings from relevant manufacturers and load these settings into DSP/processors as needed.
   2. Provide for approval, at least six weeks prior to system commissioning, electronic copies of all custom control software including graphical interface.

I. Contractor is responsible for submitting a Final Inspection Notification Report no later than one week prior to system commissioning. This report shall include, at minimum:
   1. A complete listing of every piece of equipment including serial number, the date it was tested and by whom, the results and date retested (if failure occurred during any previous tests). The final report will not be acceptable until it indicates every device has tested successfully.
   2. A performance test report indicating the system meets all the Contractor testing requirements listed in Section 3.

1.11 CONTRACT CLOSEOUT SUBMITTALS

A. Comply with all requirements of Specification Division 01 and any stipulations of NIACC purchasing.

B. Submit all contract closeout documentation within thirty days after substantial completion, unless otherwise noted.

C. Contractor shall work from approved shop drawings only. Note changes made during installation on a single set of drawings.

D. Provide one hard copy of the project manual prior to acceptance testing. This manual shall contain the following information:
   1. Table of Contents.
   2. A complete list of equipment, both installed and loose gear. Include manufacturer, model number, and serial number for all devices.
   3. Operating manuals for each device.
   4. Service manuals for each device.
   5. Documentation of all testing results as outlined in Section 3.
   6. A USB flash drive containing all As-Built drawings in PDF format.

E. Provide all software manuals and license certificates for all software loaded on all PC's on portable media. Include a CD or other portable media with all original software installed, or downloaded, to devices in the system.

F. Produce compact system flow diagrams showing all components, cables, and wire numbers that will be mounted on the wall of each equipment rooms(s). A maximum of 2 flow diagrams will be mounted on any equipment room wall. Provide as-built wiring diagrams at a reduced scale that are easy to handle and fully legible. After approval, drawings will be mounted behind clear acetate and located with the equipment racks.

1.12 WARRANTY

A. Contractor shall warrant equipment to be free of defects in materials and workmanship for not less than one year after date of Substantial Completion. Defects occurring in labor or materials within one-year warranty shall be rectified by replacement or repair. Within the warranty period, provide answer to service calls and requests for information within a 24-hour period, and repair or replace any faulty item within a 72-hour period without charge, including parts and labor.

B. This warranty shall not void specific warranties issued by manufacturers for greater periods of time, nor shall it void any rights guaranteed to the Owner by law.

C. All Owner Furnished Equipment shall be covered under the same warranty conditions as other equipment in this Section.

D. Contractor to provide Owner with exact beginning and ending dates of the warranty period. Include the name of the person to call for service and telephone number. This information to be part of Project Record Drawings.

E. Contractor to provide a final site visit and verification that the system is operational, and all items are functioning correctly at the end of the warranty period. The Contractor shall not be responsible for correcting items that have obviously been changed by the Owner or end user.

PART 2 -- PRODUCTS

2.1 GENERAL

A. Equipment and materials shall be new, shall meet or exceed the latest published manufacturer specifications, and conform to applicable UL, CSA, or ANSI provisions.

B. Supply the latest model available at the time of bidding for each piece of equipment. The Owner may request, at their option, the latest model of equipment or new technology that is available at the time of installation be provided. If a later model is requested, adjustments will be made to cover cost changes between the cost at bid submittal and the cost of the latest model at the time of installation.

2.2 UNAUTHORIZED MATERIALS

A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the Owner.

2.3 ACCEPTABLE MANUFACTURERS AND EQUIPMENT

A. Manufacturers' names and model numbers are used in this Section to establish a performance standard. They are not intended to exclude other equipment of equal or greater performance. Other qualified manufacturers or equipment will be considered subject to review by the Owner and Designer.

B. Should the Contractor choose to offer a substitution for any equipment, the proposed substitution must meet all specifications of the specified equipment. The Contractor will furnish complete technical data sheets at the time of proposed substitution.

C. At the request of the Owner, the Contractor will arrange for a product demonstration and will pay shipping to and from the site, or to and from the Designer's office.

D. No product substitution will be accepted without written approval. The Owner reserves the right to accept or refuse any substitution without condition.

2.4 SPECIFIC EQUIPMENT

A. Refer to Appendices A, B, and C lists of major system components.
   1. Provide additional equipment and accessories as required to produce a complete and functional system consistent with the design intent.
   2. All bids shall include the equipment specified in Appendices A, B, and C, priced as three separate complete projects. Any substitutions must be provided as an alternate to the bid prices based on the specified equipment systems, not as part of any of the three base bids. Bids that do not include the specified base system components may be rejected.
   3. If there is any reason a bidder cannot bid all three systems, please contact the System Designer for additional direction.

B. Refer to Appendix D for a list of AV equipment manufacturers.

PART 3 -- EXECUTION

3.1 GENERAL

A. Contractor is responsible for all software programming for the AV systems. Coordination with the Designer is required for the development of this programming.
   1. Obtain loudspeaker settings from relevant manufacturers and load these settings into DSP/processors as needed.
   2. Provide for approval, at least six weeks prior to system commissioning, electronic copies of all custom control software including graphical interface.

B. Mount equipment and enclosures plumb and square. Permanently installed equipment to be firmly and safely held in place.

C. Cover edges of cable pass-through holes in chassis, racks, boxes, etc., with rubber grommets or nylon grommet edging.

D. Equipment Racks
   1. Mount equipment in racks. ~~and consoles and fully wire and test before delivery to job site. If field conditions prevent prior assembly of racks, notify Designer in writing that racks will be fabricated on site and the reasons for the change. Racks located on concrete floors in equipment rooms or non-finished spaces shall be mounted on a 4-inch wood or concrete riser.~~ (not applicable)
   2. Install rack mounted equipment with black 10-32 button head machine screws with ~~Allen~~ Phillips head drive (owner preference).
   3. Provide security covers on non-user operated equipment having front panel controls. Install covers at conclusion of Acceptance Testing.
   4. Provide ventilation adequate to keep temperature within the rack below 100 degrees Fahrenheit. Provide whisper type ventilation fan in each rack if temperature in rack rises above 100 degrees with power on for five continuous hours. This ventilation system must be temperature actuated.
   5. Looking at the rack from the rear, locate AC power, digital control, DC control, and loudspeaker wiring on the left; microphone, line level audio, and video wiring on the right. Panels or equipment mounted on the rear rack rails shall not block access to any front mounted components.

E. Rack Panels.
   1. Custom rack panels shall be 1/8-inch thick aluminum, standard EIA sizes, brushed black anodized finish, unless otherwise noted.
   2. Panels to be fabricated, engraved, and loaded with connectors as shown on the drawings.

F. Floor Boxes.
   1. Boxes to be flush mounted in location where shown on the drawings.
   2. Boxes to be loaded with panels and connectors as shown on the drawings.
   3. Supply box covers to the GC for coordination of flooring inserts.

G. Wall Panels.
   1. Custom wall panels shall be 1/8-inch thick aluminum, brushed black anodized finish, unless otherwise noted. Plastic plates will not be accepted.
   2. Panels to be fabricated, engraved, and loaded with connectors as shown on the drawings.
   3. Panels to be mounted in J-boxes in locations where shown on the drawings.
   4. Coordinate panel sizes with J-box dimensions. Panels mounted on surface mount boxes shall not protrude beyond the edge of the box and creating a sharp edge condition.

H. System Wiring
   1. Take precautions to prevent and guard against electromagnetic and electrostatic hum. Shields not connected to be folded back over cable jacket and covered with heat-shrink tubing. Do not cut off unused shields.

2. Exercise care in wiring; damaged cables or equipment will not be accepted. Isolate cables of different signals or different levels; and separate, organize, and route to restrict channel crosstalk or feedback oscillation in any amplifier section. Keep wiring separated into groups for microphone level circuits, line level circuits, loudspeaker circuits, and power circuits.
3. Make joints and connections with rosin-core solder or with mechanical connectors approved by the Owner; where spade lugs are used, crimp properly with ratchet type tool. Spade lugs mounted on 22 gauge or smaller cable to be soldered after crimping.
4. Route unbroken microphone, audio line, and control wiring from receptacle plate/chassis to patch panel/rack. Remove spliced cables and replace without additional charge to the Owner.
5. Connect cable to active components through screw terminal connections and spade lugs whenever available. Make connections to loudspeaker transformers with properly sized closed end connectors crimped with factory approved ratchet type tool. Wire nut or Scotchlock connectors are not acceptable. Do not wrap audio cable splices or connections with adhesive backed tape.
6. Execute wiring in strict adherence to standard broadcast practices, as excerpted from:
    a. Sound System Engineering, Davis and Patronis, ISBN: 9780240808307
    b. Handbook for Sound Engineers, Ballou, ISBN: 9780240809694
    c. Audio Systems Design and Installation, Giddings, ISBN 9780992024406
    d. Audio Wiring Guide, Hechtman, ISBN: 9780240520063
7. Run vertical wiring inside rack in properly sized plastic raceway with snap-on covers (Panduit Type E series). Mount raceways on full length 3/4-inch plywood backboards attached to rack sides. Horizontal wiring in rack to be neatly tied in manageable bundles with cable lengths cut to minimize excess cable slack but still allow for service and testing. Provide horizontal support bars if cable bundles sag. Neatly bundle excess AC power cable from rack mounted equipment with hook and loop straps. Rack wiring to be bundled with hook and loop straps or lacing twine. Electrical tape and adhesive backed anchors are not acceptable.
8. When local Authority Having Jurisdiction requires emergency shut-down of the AV systems, provide connection between AV power sequencing panel and master fire alarm panel.
9. Connect loudspeakers electrically in phase, using the same wire color code for loudspeaker wiring throughout the project.
10. Wiring and connections shall be completely visible and labeled in rack.

I. Cable and Control Wiring Terminations
1. Electrical conductors installed under this contract, except where otherwise specified, shall be soft drawn annealed stranded copper having a conductivity of not less than 98% of pure copper.
2. Panels shall be located in rack rooms for transition of wire and cable from building conduits to equipment racks.
3. Connections on panels to be DIN rail mounted barrier strip system.

J. Equipment and Cable Labeling
1. Provide engraved lamicoid labels at the front and rear of rack-mounted equipment. Mount labels on the equipment and attach in a neat, plumb, and permanent manner. Embossed labels will not be accepted. Provide engraved labels at the rear only of equipment mounted in furniture consoles.
2. Engraving shall be 1/8-inch block sans serif characters unless noted otherwise. On dark panels or pushbuttons, letters shall be white; on stainless steel or brushed natural aluminum plates, or light-colored pushbuttons, letters shall be black.
3. All cables within the system shall be labeled with a unique identifying number at each end of the cable. Use only pre-printed labels. Cover labels with clear heat shrink tubing. Self-adhesive labels will not be allowed without prior approval of Designer.
4. Label each terminal strip with a unique identification code in addition to a numerical label for each terminal. Show terminal strip codes on system schematic drawings included with Project Record Drawings.

3.2 CONTRACTOR VERIFICATION TESTS AND ADJUSTMENTS

A. Contractor shall prepare a final inspection report, submitted prior to system commissioning, indicating the system is ready for acceptance testing. This report shall include verification that all tests outlined below have been performed and include the results of those tests.

1. General
   a. Clean all control spaces, equipment rooms, productions rooms, and equipment racks so they are free from dust, debris, solder, boxes, etc.
   b. Clean air filters for all devices with operable fans (amplifiers, power supplies, etc.).
2. Electrical.
   a. Verify all circuits feeding the AV system are derived from a technical power panel.
   b. Verify isolated ground receptacles are used for the technical power systems at all locations as outlined in the grounding details of the AV drawings. Notify the Designer of any deviation of this immediately. Check all outlets for proper termination of the hot, neutral, and ground conductors.
3. ~~Grounding System Tests. Assist the Division 26 Contractor in providing the following grounding system tests.~~ (not applicable)
   a. ~~Measure and record the DC resistance between the technical ground in any equipment rack or console and the main building ground.~~
   b. ~~When the AV systems technical grounding system is complete, the Contractor will be required to demonstrate that this system is in no way bonded to the building safety grounding system except at the main service entry panel. With the power to the central distribution panel removed, the Contractor will disconnect the AV systems technical ground conductor from the main ground buss bar at the central distribution panel. At this point, an open circuit greater than 1.0 megohm shall be measurable between the AV systems technical ground and the building safety ground. Provide this information in pre-commissioning report to Designer~~. (not applicable)
4. Amplifiers. Where available, set all amplifier sensitivity switches to maximum gain.
5. Loudspeaker System Tests. Perform the following tests and adjustments. Make corrections necessary to bring system(s) into compliance with the specifications.
   a. Measure and record the impedance of each non-powered loudspeaker transducer at the equipment rack with the amplifier disconnected. Measurements shall be documented in a table that lists the impedance for each and every 1/3-octave band from 40 Hz to 10 kHz. Measurements shall be accurate to within one-tenth of an ohm. NOTE: This test is not required of constant voltage loudspeaker systems.
   b. Check polarity of loudspeakers with an electronic polarity checker and by applying music program or constant power per octave (pink noise) signal to system while walking through the transition areas of coverage from one loudspeaker to the next. Transition shall be smooth with no apparent shift in source from one loudspeaker to the next.
   c. Apply sine wave sweep signal to each loudspeaker system, sweeping from 50 Hz to 5k Hz and at a level 10 dB below full amplifier output, and listen for rattles or noise. Correct if apparent.
6. Signal Distribution. Confirm the following. Make corrections necessary to bring systems into compliance with the specifications.
   a. Proper circuits appearing at each termination location.
   b. Continuity of all conductors.
   c. Proper polarity is maintained.
   d. Absence of shorts between conductors.
   e. Absence of shorts between conductors and conduit.

~~7. Intercom systems. Confirm the following. Make corrections necessary to bring systems into compliance with the specifications.~~

~~a. All base stations, remote stations, and plates are wired with proper channel configurations.~~

~~b. There is no cross-talk between channels.~~

~~c. Call lights are operational.~~

~~d. Audio is free from hums and buzzes.~~

8. Category Wiring. Confirm the following end-to-end and bi-directionally:
   a. Continuity and proper polarity.
   b. Attenuation up to and including 300MHz.
   c. Near end crosstalk pair to pair up to and including 300MHz.
   d. Power sum near end crosstalk up to and including 300MHz.
   e. Impedance up to and including 300MHz.
   f. Conformance to the most current TIA wiring standards.
   g. Provide all manufacture test reports.
9. Fiber Optics. Confirm the following end-to-end and bi-directionally for:
   a. Continuity, length, and fiber damage with an optical time-domain reflectometer.
   b. Attenuation does not exceed the expected loss value. Use all appropriate wavelengths to the fiber under test to determine attenuation.
   c. Conformance to the most current FOA wiring standards.
   d. Provide all manufacture test reports.

3.3 TEST EQUIPMENT

A. For final acceptance testing, provide all equipment necessary to adequately demonstrate the functionality of all systems. Equipment to be available for the entire period through final system acceptance. Prior to start of testing, provide a list to the Owner of test equipment make and model numbers that will be used. Test equipment will consist of, at minimum:
   1. Four walkie-talkie radios with spare batteries
   2. Access to WLAN (provide temporary Wi-Fi router if necessary)
   3. Laptop computer capable of addressing system components over Wi-Fi
   4. Audio oscillator with adjustable output level, 20 to 20k Hz at 0 dBm
   5. VGA test pattern generator
   6. HDMI test pattern generator with EDID and HDCP adjustment capability
   7. Impedance meter, 0 to 20k ohms
   8. Audio and video sources on CD and Blu-ray
   9. Dual-trace oscilloscope, 20 MHz bandwidth
   10. Digital multimeter, 1% accuracy
   11. Polarity checker for cables and loudspeakers
   12. Optical range finder
   13. Level and angle finder
   14. Assorted hand tools
   15. Category cable certification tester
   16. Fiber optic cable certification tester

   Note: Designer may choose to supply some of their own test equipment.

3.4 ACCEPTANCE

A. The process of acceptance testing is estimated to take a minimum of 12 hours. During this time, the Contractor shall have 2 technicians available to assist the Designer and make adjustments/corrections to the system as required. Contractor shall be responsible for providing test equipment as outlined in Section 3 for the duration of the acceptance testing. Testing will be performed by the Designer in consultation with the Owner.

B. The following procedures will be performed by the Designer on each System:
   1. The audio fidelity test shall consist of driving the system with pink noise and measuring the response from 40 Hz to 16k Hz. Digital Signal Processing will be used to adjust the response of the system(s) to fit the requirements of the space.
   2. Control functions shall be checked for proper operation, from controlling devices to controlled devices.
   3. Adjust, balance, and align equipment for optimum quality and to meet the manufacturer's published specifications. Establish and mark normal settings for each level control, and record these settings, in the System Operation and Maintenance Manual.
   4. Installed and loose equipment will be inventoried for correct quantity.
   5. Any other test on any piece of equipment or system deemed appropriate.

C. The process of acceptance testing the System may necessitate moving and adjusting loudspeaker aiming. Contractor to make changes without claim for additional payment. If the construction timeline or architecture interferes with the ability to make changes during acceptance testing, notify Designer in writing prior to loudspeakers becoming inaccessible so that final on-site aiming may be accomplished.

D. In the event the need for further adjustment or work becomes evident during optimization or acceptance testing, the Contractor will continue his work until the system is acceptable at no addition to the contract price. If approval is delayed because of defective equipment, or failure of equipment or installation to meet the requirements of these specifications, the Contractor will pay for additional time and expenses of the Designer at their standard rate in effect at that time, during any extension of the acceptance testing period.

3.5 SYSTEM DOCUMENTATION

A. Within thirty (30) days of the Acceptance Testing, prepare and submit one USB flash drive of the preliminary systems documentation manual for approval by the Designer. Manual to include, at minimum, the following documents in PDF format:
   1. Table of contents
   2. Written Guarantee and service policy
   3. Basic power on/off and operational procedure
   4. List of all equipment with manufacturer, model, and serial number.
   5. Copy of the Verification Test results
   6. Copies of all shop drawings which have been updated to include any changes made during the installation process
   7. One-line signal flow diagram with all cable runs and patch points identified by alpha-numeric character
   8. All available manufacturers' operation and service literature for each major system component
   9. Copy of conduit riser diagram
   10. Copy of the tuning settings as of commissioning

B. Designer will review the above system documentation. Upon approval, Contractor shall prepare and submit to the Owner:
   1. Five (5) copies of the final Operation and Maintenance manual on USB flash drive, CD, or DVD.
   2. Two (2) hard copies of the final Operation and Maintenance manual printed and neatly bound

C. Provide laminated copy of the as-built signal flow diagrams to be mounted in the control room. This diagram shall have all cable runs and patch points identified by alpha-numeric character.

3.6 INSTRUCTION OF OWNER PERSONNEL

A. Provide minimum of four hours instruction to Owner designated personnel on the use and operation of the System, scheduled as one session, by an instructor fully knowledgeable and qualified in system operation. The System Reference Manuals shall be complete and on site at the time of this instruction. This training session shall be videotaped by the Contractor and two sets of DVD copies shall be provided to Owner.

B. The lead technician for the project installation shall be present at the first formal use of the main system.

APPENDIX A – MAJOR SYSTEM COMPONENTS FOR LOUDSPEAKER OPTION 1

#	Description	Mfr	Model	Qty
1	**LOUDSPEAKERS**			
2	Loudspeaker, Array Module	LAC	KARA IIi	14
3	Loudspeaker, Array Module	LAC	KIVA II	8
4	Left, right, and center arrays install on existing lift systems. Remove existing loudspeaker arrays and hardware and deliver to owner.			
5	Loudspeaker, Subwoofer	FCA	CS218L	3
6				
1	**LOUDSPEAKER RIGGING & CONNECTIVITY**			
2	Array Top Frame (mounts to Polar Focus rigging, see below)	LAC	M-BUMP	2
3	Mounts to Polar Focus rigging, see below for additional components needed.			
4	Array Top Frame	LAC	KIBU II	1
5	Mounts to existing Polar Focus spine frame adapter.			
6	Left/Right Array Rigging	PFS	SFA-16-1100	2
7	Other Array Components	PFS	As needed	Lot
8	Axle kits, PY1 suspension yokes, and other parts as determined by Polar Focus that are needed to attach to the SFA-16 to safely suspend the left/right arrays with full pan and tilt control. *Always reference project number H02657 (the contract for the original rigging) when contacting Polar Focus.*			
9	Subwoofer Rigging	CUS	Per drawings	Lot
10	Includes structural strut (Unistrut or equal) and rated forged hardware as needed to safely suspend the subwoofer array per the drawings, including (but not limited to) shackles, turnbuckles, cable stingers, and threaded eye-bolts.			
11	Cables	CUS	As needed	Lot
12	Includes #10 loudspeaker installation cable, 13/8 SO drop cable, and Neutrik NL8 and NL4 connectors, as needed.			
13				
1	**RACK EQUIPMENT**			
2	DSP, Open Architecture	SMX	Prism 12X12	1
3	Dante , Internal Card	SMX	Dante option	1
4	Format Converter, Dante-AES3	ADN	AVIO AES3	2
5	Switch, POE L2-L3, 24-port	LXL	AMS-2624P	1
6	Amplifier, w processing, 4chan	LAC	LA4X	5
7	Amplifier, w processing, 4chan	LAC	LA12X	3
8	Amplifier, w processing, 4chan	PSF	Quattrocanali 4804DSP+D	2
9	All rack equipment installs in the existing system amplifier rack, using interconnection cabling as specified in the drawings. Relocate or remove existing rack equipment as indicated in the drawings to provide space for new equipment. Return all removed rack equipment to the owner.			
10				

APPENDIX B – MAJOR SYSTEM COMPONENTS FOR LOUDSPEAKER OPTION 2

#	Description	Mfr	Model	Qty
1	**LOUDSPEAKERS**			
2	Loudspeaker, Array Module	ADM	IS10n	6
3	Loudspeaker, Array Module	ADM	IS10	8
4	Loudspeaker, Array Module	ADM	IS7	8
5	Left, right, and center arrays install on existing lift systems. Remove existing loudspeaker arrays and hardware and deliver to owner.			
6	Loudspeaker, Subwoofer	FCA	CS218L	3
7				
1	**LOUDSPEAKER RIGGING & CONNECTIVITY**			
2	Array Top Frame (mounts to Polar Focus rigging, see below)	ADM	IS10 Support Frame 930-0028	2
3	Mounts to Polar Focus rigging, see below for additional components needed.			
4	Array Top Frame	ADM	IS7 Support Frame 930-0026	1
5	Mounts to existing Polar Focus spine frame adapter.			
6	Left/Right Array Rigging	PFS	SFA-16-1100	2
7	Other Array Components	PFS	As needed	Lot
8	Axle kits, PY1 suspension yokes, and other parts as determined by Polar Focus that are needed to attach to the SFA-16 to safely suspend the left/right arrays with full pan and tilt control. *Always reference project number H02657 (the contract for the original rigging) when contacting Polar Focus.*			
9	Subwoofer Rigging	CUS	Per drawings	Lot
10	Includes structural strut (Unistrut or equal) and rated forged hardware as needed to safely suspend the subwoofer array per the drawings, including (but not limited to) shackles, turnbuckles, cable stingers, and threaded eye-bolts.			
11	Cables	CUS	As needed	Lot
12	Includes #10 loudspeaker installation cable, 13/8 SO drop cable, and Neutrik NL8 and NL4 connectors, as needed.			
13				
1	**RACK EQUIPMENT**			
2	DSP, Open Architecture	SMX	Prism 12X12	1
3	Dante , Internal Card	SMX	Dante option	1
4	Switch, POE L2-L3, 24-port	LXL	AMS-1816P	1
5	Amplifier, w processing, 4chan	LGP	D120:4L	5
6	Amplifier, w processing, 4chan	LGP	D80:4L	2
7	All rack equipment installs in the existing system amplifier rack, using interconnection cabling as specified in the drawings. Relocate or remove existing rack equipment as indicated in the drawings to provide space for new equipment. Return all removed rack equipment to the owner.			

APPENDIX C – MAJOR SYSTEM COMPONENTS FOR LOUDSPEAKER OPTION 3

#	Description	Mfr	Model	Qty
1	**LOUDSPEAKERS**			
2	Loudspeaker, Array Module	MRT	WPS	14
3	Loudspeaker, Array Module	MRT	WPM	8
4	Left, right, and center arrays install on existing lift systems. Remove existing loudspeaker arrays and hardware and deliver to owner.			
5	Loudspeaker, Subwoofer	FCA	CS218L	3
6				
1	**LOUDSPEAKER RIGGING & CONNECTIVITY**			
2	Array Top Frame (mounts to Polar Focus rigging, see below)	MRT	WPSGRIDI	2
3	Mounts to Polar Focus rigging, see below for additional components needed.			
4	Array Top Frame	MRT	WPMGRIDI	1
5	Mounts to existing Polar Focus spine frame adapter.			
6	Left/Right Array Rigging	PFS	SFA-16-1100	2
7	Other Array Components	PFS	As needed	Lot
8	Axle kits, PY1 suspension yokes, and other parts as determined by Polar Focus that are needed to attach to the SFA-16 to safely suspend the left/right arrays with full pan and tilt control. *Always reference project number H02657 (the contract for the original rigging) when contacting Polar Focus.*			
9	Subwoofer Rigging	CUS	Per drawings	Lot
10	Includes structural strut (Unistrut or equal) and rated forged hardware as needed to safely suspend the subwoofer array per the drawings, including (but not limited to) shackles, turnbuckles, cable stingers, and threaded eye-bolts.			
11	Cables	CUS	As needed	Lot
12	Includes #10 loudspeaker installation cable, 13/8 SO drop cable, and Neutrik NL8 and NL4 connectors, as needed.			
13				
1	**RACK EQUIPMENT**			
2	DSP, Open Architecture	SMX	Prism 12X12	1
3	Dante , Internal Card	SMX	Dante option	1
4	Switch, POE L2-L3, 24-port	LXL	AMS-1816P	1
5	Amplifier, w processing, 4chan	MRT	Ikon IK42-D	2
6	Amplifier, w processing, 8chan	MRT	Ikon IK81-D	1
7	Amplifier, w processing, 4chan	PSF	Quattrocanali 4804DSP+D	2
8	All rack equipment installs in the existing system amplifier rack, using interconnection cabling as specified in the drawings. Relocate or remove existing rack equipment as indicated in the drawings to provide space for new equipment. Return all removed rack equipment to the owner.			
9				

APPENDIX D – EQUIPMENT MANUFACTURERS

#	Code	Manufacturer	Web Site
1	AAI	Audio Accessories	www.patchbays.com
2	ACN	Alcons Audio	www.alconsaudio.com
3	ADX	Audix Corporation	www.audixusa.com
4	ADM	Adamson Engineering	www.adamson.ai
5	ADN	Audinate	www.audinate.com
6	AKG	AKG Acoustics	www.akg.com
7	ALN	Allen Products Company Inc.	www.allenproducts.com
8	ALS	Alesis Studio Electronics	www.alesis.com
9	AMX	AMX	www.amx.com
10	APB	APB Dynasonics	www.apb-dynasonics.com
11	APL	Apple Computer	www.apple.com
12	ARG	Argosy Studio Furniture	www.argosyconsole.com
13	ASH	Ashly Audio	www.ashly.com
14	ATH	Attero Tech	www.atterotech.com
15	ATL	Atlas Sound	www.atlassound.com
16	ATM	ATM Fly-Ware	www.atmflyware.com
17	ATN	Audio-Technica	www.audiotechnica.com
18	AVM	Aviom	www.aviom.com
19	BEL	Belden Wire and Cable	www.belden.com
20	BEY	Beyerdynamic	www.beyerdynamic.com
21	BMD	Black Magic Designs	www.blackmagicdesign.com
22	BRT	BrightSign	www.brightsign.biz
23	BSS	BSS Audio USA	www.bss.co.uk
24	BTL	Blonder-Tongue Laboratories	www.blondertongue.com
25	CAG	CAIG Laboratories	www.caig.com
26	CDU	C-Ducer	www.c-ducer.com
27	CHF	Chief Manufacturing	www.chiefmfg.com
28	CIS	Cisco Systems	www.cisco.com
29	CLC	Clear-Com	www.clearcom.com
30	CST	Crestron Electronics	www.crestron.com
31	CTE	Christie Digital	www.christiedigital.com
32	CTM	Countryman Associates	www.countryman.com
33	CUS	Custom Built by Audio Contractor	
34	DBX	dbx Professional Products	www.dbxpro.com
35	DDI	Display Devices	www.displaydevices.com
36	DEL	Dell Computer	www.dell.com
37	DEN	Denon Corporation	www.usa.denon.com
38	DGC	DiGiCo	www.digico.biz
39	DLT	Da-Lite Screen Company	www.da-lite.com
40	DNB	d&b Audiotechnik Corp.	www.dbaudio.com
41	DPA	DPA Microphones	www.dpamicrophones.com
42	DPI	Digital Projection	www.digitalprojection.com
43	DRA	Draper	www.draperinc.com
44	EAW	Eastern Acoustic Works	www.eaw.com
45	ERG	Ergotron	www.ergotron.com

46	EVI	Electro-Voice	www.electrovoice.com
47	EWK	Earthworks	www.earthworksaudio.com
48	EXT	Extron Electronics	www.extron.com
49	FCA	Fulcrum Acoustic	www.fulcrum-acoustic.com
50	FLK	John Fluke Manufacturing Company	www.fluke.com
51	FOC	Focusrite	www.focusrite.com
52	FSR	FSR	www.fsrinc.com
53	FUR	Furman Sound	www.furmansound.com
54	GKD	Geekdesk	www.geekdesk.com
55	GLX	Galaxy Audio	www.galaxyaudio.com
56	GNL	Genelec Inc.	www.genelec.com
57	GRD	Grace Design	www.gracedesign.com
58	HRT	Hear Technologies	www.heartechnologies.com
59	HNR	Henry Engineering	www.henryeng.com
60	HOF	Hoffman Engineering Company	www.hoffmanonline.com
61	IVX	Innovox Audio	www.innovoxaudio.com
62	JBL	JBL Professional Products	www.jblpro.com
63	JEN	Jensen Tools	www.jensentools.com
64	KAR	K-Array	www.k-array.com
65	KNM	Koenig & Meyer	www.k-m.de
66	LAC	L-Acoustics US	www.l-acoustics-us.com
67	LEX	Lexicon	www.lexicon.com
68	LGE	LG Electronics	www.lge.com
69	LGP	Lab Gruppen	www.labgruppen.se
70	LGT	LogiTech	www.logitech.com
71	LIT	Littlite/CAE	www.littlite.com
72	LLP	Lilliput	www.lilliputweb.net
73	LSN	Listen Technologies Corporation	www.listentech.com
74	LYN	LynTec	www.lyntec.com
75	LXL	Luxul	www.legrand.us/luxul
76	MAP	Middle Atlantic Products	www.middleatlantic.com
77	MNF	Manfrotto	www.manfrotto.us
78	MOX	Moxa	www.moxa.com
79	MRE	Marshall Electronics	www.marshall-usa.com
80	MRT	Martin Audio	www.martin-audio.com
81	MSC	Matrix Switch Corporation	www.matrixswitchcorp.com
82	NEC	NEC	www.necdisplay.com
83	NEU	Neumann USA	www.neumann.com
84	NTK	Neutrik USA	www.neutrik.com
85	OKT	Oktava Microphones	www.oktava-microphones.com
86	OMN	Omnimount Systems	www.omnimount.com
87	PAN	Panasonic USA	www.panasonic.com
88	PER	Peerless Industries	www.peerlessmounts.com
89	PFS	Polar Focus	www.polarfocus.com
90	PND	Panduit	www.panduit.com
91	PNR	Planar	www.planar.com
92	PRM	ProMounts	www.promounts.com
93	PSA	Point Source Audio	www.point-sourceaudio.com
94	PSF	Powersoft	www.powersoft.com

95	QSC	QSC Audio Products	www.qscaudio.com
96	RDL	Radio Design Labs	www.rdlnet.com
97	RHZ	Renkus-Heinz	www.renkus-heinz.com
98	RPG	RPG Diffusor Systems	www.rpginc.com
99	SCR	Soundcraft USA	www.soundcraft.com
100	SEN	Sennheiser Electronic Corporation	www.sennheiserusa.com
101	SGX	Surgex	www.surgex.com
102	SHU	Shure	www.shure.com
103	SKB	SKB Corporation	www.skbcases.com
104	SMG	Samsung	www.samsung.com
105	SMX	Symetrix	www.symetrixaudio.com
106	SMT	Smart Technologies	www.smarttech.com
107	SON	Sonos	www.sonos.com
108	SNS	Studio Network Solutions	www.studionetworksolutions.com
109	SNY	Sony Electronics	www.sony.com
110	SNT	Sonnet Technologies	www.sonnettech.com
111	SQD	Square D Company	www.squared.com
112	SRP	Sharp Electronics	www.sharpusa.com
113	STW	Stewart Audio	www.stewartaudio.com
114	SWC	Switchcraft	www.switchcraft.com
115	TAN	Tannoy North America	www.tannoy.com
116	TAS	Tascam	www.tascam.com
117	TCE	TC Electronic of Denmark	www.tcelectronic.com
118	TPL	Tripp Lite	www.tripplite.com
119	TTS	Titus Labs	www.tituslabs.com
120	UNC	Union Connector Company	www.unionconnector.com
121	USS	Ultimate Support Systems	www.ultimatesupport.com
122	VAD	Vaddio	www.vaddio.com
123	WPW	West Penn Wire/CDT	www.westpenn-cdt.com
124	WRM	Wiremold Company	www.wiremold.com
125	WWD	Whirlwind Music	www.whirlwindusa.com
126	XED	Xedit	www.servoreelers.com
127	YAM	Yamaha Commercial Audio	www.yamaha.com

APPENDIX E – LARGE-FORMAT DRAWINGS

#	***Drawing Number***	***Drawing Title***
1	AV010	PERFORMANCE AV SYSTEMS: GENERAL NOTES & SCHEDULES
2	AV102	PERFORMANCE AV SYSTEMS: BOOTH LEVEL TERMINATIONS
3	AV103	PERFORMANCE AV SYSTEMS: CATWALK LEVEL TERMINATIONS
4	AV401	PERFORMANCE AV SYSTEMS: RACK ELEVATIONS
5	AV601	PERFORMANCE AV SYSTEMS: AUDITORIUM PRIMARY DEVICES
6	AV602	PERFORMANCE AV SYSTEMS: SUBWOOFER ARRAY RIGGING
7	AV701	PERFORMANCE AV SYSTEMS: LOUDSPEAKER OPTION 1 SIGNAL FLOW
8	AV702	PERFORMANCE AV SYSTEMS: LOUDSPEAKER OPTION 2 SIGNAL FLOW
9	AV703	PERFORMANCE AV SYSTEMS: LOUDSPEAKER OPTION 3 SIGNAL FLOW

END OF SECTION

NTK NC3MDL	XLR MALE	NEUTRIK	NC3MD-LX-BAG
NTK NC3FDL	XLR FEMALE	NEUTRIK	NC3FD-LX-BAG
NTK XLR - COMBO	XLR FEMALE COMBO	NEUTRIK	XLR COMBO
#	1/8" FEMALE	SWITCHRAFT	EH35MMSSCB
#	HDMI CONNECTOR	NEUTRIK	NAHDMI-W-B
#	DVI CONNECTOR		
# DXX	ETHERCON CAT6A	NEUTRIK	NE8FDX-P6-B
#	BNC	CANARE	BCJ-RUDBC1
#	FIREWIRE CHASSIS	NEUTRIK	NA1394-6-W
# NLT4MP	4 POLE MALE SPEAKON CHASSIS	NEUTRIK	NLT4MP-BAG
#	SPDT MOMENTARY PUSHBUTTON	SWITCHCRAFT	EHPBSMBB (BLACK BUTTON)
#	SPDT MOMENTARY PUSHBUTTON	SWITCHCRAFT	EHPBSMRB (RED BUTTON)
#	RCA	NEUTRIK	
#	USB CHASSIS	NEUTRIK	NAUSB-W
#	OPTICALCON DUO CHASSIS	NEUTRIK	NO2-4FDW-1-A
	7-PIN XLR	NEUTRIK	NC7MD-LX
DXX	CAT6 RJ-45	REFER TO SPEC	REFER TO SPEC

5 TYPICAL AUDIO CONNECTORS USED ON PANELS
SCALE: NTS

AV CABLE SCHEDULE

TYPE	MANUFACTURER	MODEL	DESCRIPTION	OD INCHES	SIGNAL GROUP
MIC	BELDEN	9451	22 AWG STRANDED, TWISTED PAIR, FOIL SHIELD BONDED TO ORANGE PVC JACKET	0.135	A
AES	BELDEN	1696A	22 AWG STRANDED, TWISTED PAIR, FOIL AND BRAID SHIELD, PVC JACKET	0.235	B
C16/4	WEST PENN	245	16 AWG STRANDED, 4 CONDUCTORS, UNSHIELDED, PVC JACKET	0.217	B
C18/2	WEST PENN	224	18 AWG STRANDED, TWISTED PAIR, UNSHIELDED, PVC JACKET	0.156	B
C18/4	WEST PENN	244	18 AWG STRANDED, 4 CONDUCTORS, UNSHIELDED, PVC JACKET	0.183	B
C22/6	WEST PENN	270	22 AWG STRANDED, 6 CONDUCTORS, UNSHIELDED, PVC JACKET	0.163	B
S-CAT	BELDEN	1351A	23 AWG SOLID, 4 TWISTED PAIRS, OVERALL FOIL SHIELD, PVC JACKET	0.290	B
S-CAT+	BELDEN	10GX62F	23 AWG SOLID, 4 TWISTED PAIRS, OVERALL FOIL SHIELD, PVC JACKET	0.295	B
U-CAT	BELDEN	10GXS32	23 AWG SOLID, 4 TWISTED BONDED PAIRS, UNSHIELDED, PVC JACKET	0.230	B
COM	BELDEN	9460	18 AWG STRANDED, TWISTED PAIR, FOIL SHIELD BONDED TO CHROME PVC JACKET	0.230	B
COM2	BELDEN	9460	18 AWG STRANDED, TWISTED PAIR, FOIL SHIELD BONDED TO BLACK PVC JACKET	0.230	B
DM	CRESTRON	DM-CBL-ULTRA-NP	22 AWG SOLID, 4 TWISTED PAIRS, INDIVIDUALLY SHIELDED, OVERALL BRAID SHIELD, PVC JACKET	0.311	B
LINE	BELDEN	9451	22 AWG STRANDED, TWISTED PAIR, FOIL SHIELD BONDED TO GREEN PVC JACKET	0.135	B
RG6	BELDEN	1694A	18 AWG SOLID CONDUCTOR, FOIL AND BRAID SHIELD, PVC JACKET, 75Ω, RG-6/U	0.232	B
RG6+	BELDEN	4794R	16 AWG SOLID CONDUCTOR, TRI-SHIELD, PVC JACKET, 75Ω, RG-6/U FOR 12G SDI	0.320	B
RG8	BELDEN	7810A	10 AWG SOLID CONDUCTOR, FOIL AND BRAID SHIELD, POLYETHYLENE JACKET, 50Ω, RG-8	0.403	B
RG58	BELDEN	9311	20 AWG STRANDED CONDUCTOR, FOIL AND BRAID SHIELD, PVC JACKET, 50Ω, RG-58A/U	0.193	B
RG59	BELDEN	1857A	22 AWG STRANDED, DOUBLE BRAID SHIELD, HIGH FLEX PVC JACKET, 75Ω, RG-59/U	0.360	B
SERL	BELDEN	1419A	24 AWG STRANDED, 2 TWISTED PAIRS, OVERALL FOIL SHIELD, PVC JACKET	0.248	B
XTP	EXTRON	XTP-DTP-24	24 AWG SOLID, 4 TWISTED PAIRS, UNSHIELDED, OVERALL FOIL AND BRAID SHIELD, PVC JACKET	0.276	B
XGA	BELDEN	7796A	20 AWG SOLID, 5 CONDUCTORS, FOIL AND BRAID SHIELDS, OVERALL PVC JACKET, RG-59/U	0.790	B
S10	WEST PENN	HA210	10 AWG STRANDED, TWISTED PAIR, UNSHIELDED, PVC JACKET	0.325	C
S12	WEST PENN	227	12 AWG STRANDED, TWISTED PAIR, UNSHIELDED, PVC JACKET	0.264	C
S14	WEST PENN	226	14 AWG STRANDED, TWISTED PAIR, UNSHIELDED, PVC JACKET	0.230	C
S16	WEST PENN	225	16 AWG STRANDED, TWISTED PAIR, UNSHIELDED, PVC JACKET	0.182	C
HYBF	BELDEN	2804RW	2S SINGLEMODE + 2 EA. 24 AWG STRANDED + 4 EA. 20 AWG STRANDED	0.362	D
FB2M	CORNING	002T6F-31390-29	2 STRAND, MULTIMODE FIBER, PLENUM	0.280	D
FB2S	CORNING	002E6F-31331-29	2 STRAND, SINGLEMODE FIBER, RISER FAN	0.280	D
FB12S	CORNING	012E8B-33131-A3	12 STRAND, SINGLEMODE FIBER, RISER FAN	0.440	D
AVTP	TRADE	#10 THHN	AUDIO VIDEO TECHNICAL POWER, 120V IG CIRCUIT AS SPECIFIED BY ELECTRIC		E
GND2	TRADE	#2 THHN	2 AWG STRANDED CONDUCTOR, UNSHIELDED, NYLON JACKET	0.386	E
DSP	DISPLAY PORT		DO NOT FIELD-TERMINATE THESE CABLE TYPES. USE CERTIFIED PRE-MANUFACTURED CABLES FOR RUNS <= 10ft. USE PRE-APPROVED CATEGORY OR FIBER EXTENDERS FOR RUNS > 10ft.		B
HDMI	HIGH DEFINITION MULTIMEDIA INTERFACE				B
TDBT	THUNDERBOLT				B
USB	UNIVERSAL SERIAL BUS				B

4 AV CABLE SCHEDULE
SCALE: NTS

AV TERMINATION SYMBOLS

AV SYMBOLS		ELECTRICAL SYMBOLS	
XX YY MNT ##"	DEVICE TERMINATION, WALL/SURFACE: RECTANGLE IS BOX LOCATION IN PLAN "XX" IS TERMINATION ID "YY" IS TERMINATION NUMBER "MNT" IS MOUNTING TYPE "##" IS MOUNTING HEIGHT		AC DUPLEX, FLOOR
			AC QUAD, FLOOR
XX YY MNT ##"	DEVICE TERMINATION, FLOOR BOX: SQUARE IS BOX LOCATION IN PLAN "XX" IS TERMINATION ID "YY" IS TERMINATION NUMBER "MNT" IS MOUNTING TYPE "##" IS MOUNTING HEIGHT		AC DUPLEX, WALL
			AC QUAD, WALL
XX YY MNT ##"	DEVICE TERMINATION, CEILING CAN: CIRCLE IS BOX LOCATION IN PLAN "XX" IS TERMINATION ID "YY" IS TERMINATION NUMBER "MNT" IS MOUNTING TYPE "##" IS MOUNTING HEIGHT		AC DUPLEX, CEILING
			AC QUAD, CEILING
XX YY MNT ## XX YY MNT ## XX YY MNT ##	TERMINATIONS CONNECTED AS SHOWN ARE PARALLELED ON THE SAME CIRCUIT		

NOTES:
1. ELECTRICAL/I.T. SYMBOLS ARE N.I.C. AND WHEN USED ARE SHOWN FOR REFERENCE ONLY.

3 PLAN SYMBOLS
SCALE: NTS

GENERAL NOTES

#	NOTE
1	SEE AV SYSTEMS WRITTEN SPECIFICATION FOR WORK SCOPE DETAILS.
2	ALL CONNECTORS ON CUSTOM PANELS SHALL BE NUMBERED ACCORDING TO AV SYSTEMS SIGNAL FLOW.
3	ALL AUDIO VIDEO TECHNICAL POWER (AVTP) AND COMMON POWER ARE SHOWN FOR REFERENCE ONLY. THEY ARE BY OTHERS AND NOT PART OF THE AV SYSTEMS INSTALLATION.
4	LINE VOLTAGE RECEPTACLES INDICATED AS PART OF CUSTOM AV PANELS ARE PROVIDED AND INSTALLED BY AV CONTRACTOR (AVC).
5	ALL LINE VOLTAGE RECEPTACLES AND WIRING ARE TO BE PHYSICALLY SEPARATED FROM THE LOW VOLTAGE CONNECTORS AND WIRING BY MEANS OF A METALLIC VOLTAGE BARRIER. IF BACK BOX SIZE INDICATED IN DETAIL DRAWINGS CANNOT ACCOMMODATE THE REQUIRED VOLTAGE BARRIER, RESIZE BACK BOX ACCORDINGLY.
6	CONFIRM FLUSH-MOUNT OR SURFACE-MOUNT WITH OWNER FOR ALL BACK BOX DEVICES PRIOR TO INSTALLATION.
7	PROVIDE ADEQUATE CABLE AT EACH LOCATION TO ALLOW FOR TERMINATION AND SERVICE LOOPS. TYPICALLY THIS IS A MINIMUM OF 3 FEET AT PLATES AND PANELS, AND A MINIMUM OF 20 FEET AT RACKS.
8	CONFIRM ANY CUSTOM COLOR REQUIREMENTS WITH OWNER PRIOR TO FABRICATION.
9	THE EXACT LOCATION OF ALL AV DEVICES SHALL BE COORDINATED WITH THE OWNER AND AV SYSTEM DESIGNER.
10	THE AV SYSTEM EQUIPMENT RACK LOCATION WILL REQUIRE SPACE TO ACCOMMODATE RACKS AS INDICATED IN THE DRAWINGS. A MINIMUM OF 36 INCHES OF CLEARANCE IS REQUIRED BOTH IN FRONT OF AND IN BACK OF THE EQUIPMENT RACKS.
11	DRAWINGS ARE FOR CONCEPT ONLY AND ARE DETAILED ONLY TO THE EXTENT NECESSARY TO SHOW DESIGN INTENT AND SIGNAL FLOW. IT IS UNDERSTOOD AND AGREED BY THE AVC THAT A COMPLETE WORKING SYSTEM SHALL BE SUPPLIED WHICH FULFILLS THE INTENT INDICATED IN THE DESIGN DOCUMENTS.

2 GENERAL NOTES
SCALE: NTS

1 AV DRAWING INDEX
SCALE: NTS

ACOUSTIC DISTINCTIONS
DESIGN IN HARMONY

NOTE:
1. THIS PROJECT REPLACES THE MAIN LEFT, RIGHT, AND CENTER LOUDSPEAKER ARRAYS IN N.I.C.A. & ADDS A FLOWN CENTER SUBWOOFER ARRAY. AMPLIFICATION AND PROCESSING ARE ALSO CHANGED TO BETTER CONNECT WITH THE N.I.C.A. MAIN AUDIO CONSOLE.
2. N.I.C.A. IS AN EXISTING THEATRE WITH EXTENSIVE AV SYSTEMS ALREADY IN PLACE. THESE DRAWINGS SHOW ONLY THE ADDITIONAL WORK TO BE ADDED AS PART OF THIS SCOPE, NOT THE EXISTING SYSTEMS IN PLACE. THE INTEGRATOR WILL EXERCISE DUE CAUTION IN PROTECTING EXISTING SYSTEMS SO OTHER FUNCTIONS UNRELATED TO THE MAIN LOUDSPEAKER SYSTEMS ARE UNDISTURBED.

REV:	DATE:

PERFORMANCE AV SYSTEMS
GENERAL NOTES & SCHEDULES

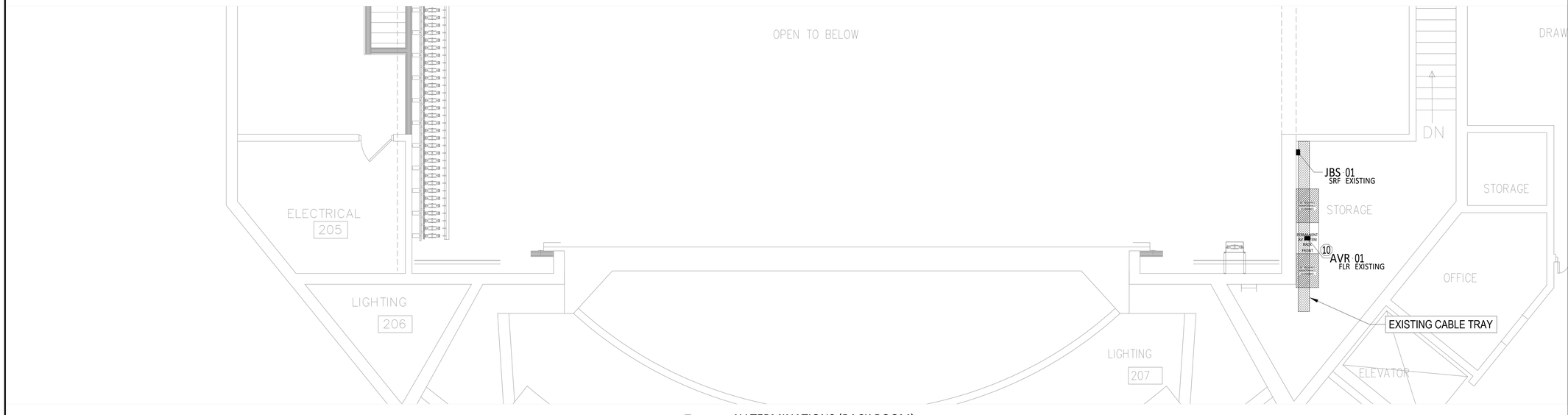
NORTH IOWA
COMMUNITY AUDITORIUM

2024.04.16

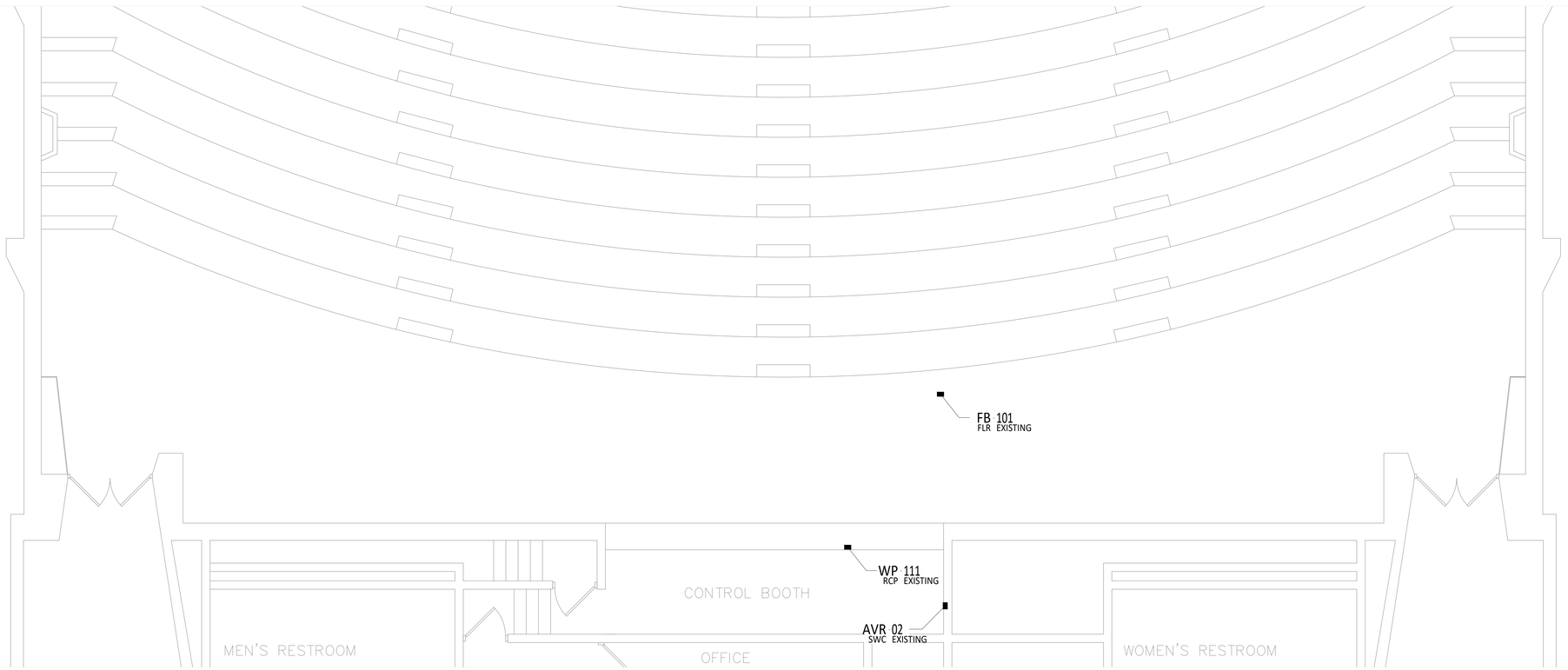
SCALE AS SHOWN

ADI #2024109

AV010



5 AV TERMINATIONS (RACK ROOM)
SCALE: 1/4" = 1'-0"



4 AV TERMINATIONS (BOOTH/HOUSE MIX)
SCALE: 1/4" = 1'-0"

AV TERMINATION SYMBOLS	
XX YY MNT ##	DEVICE TERMINATION, WALL/SURFACE: RECTANGLE IS BOX LOCATION IN PLAN "XX" IS TERMINATION ID "YY" IS TERMINATION NUMBER "MNT" IS MOUNTING TYPE "##" IS MOUNTING HEIGHT
XX YY MNT ##	DEVICE TERMINATION, FLOOR BOX: SQUARE IS BOX LOCATION IN PLAN "XX" IS TERMINATION ID "YY" IS TERMINATION NUMBER "MNT" IS MOUNTING TYPE "##" IS MOUNTING HEIGHT
XX YY MNT ##	DEVICE TERMINATION, CEILING CAN: CIRCLE IS BOX LOCATION IN PLAN "XX" IS TERMINATION ID "YY" IS TERMINATION NUMBER "MNT" IS MOUNTING TYPE "##" IS MOUNTING HEIGHT
XX YY MNT ## XX YY MNT ## XX YY MNT ##	TERMINATIONS CONNECTED AS SHOWN ARE PARALLELED ON THE SAME CIRCUIT
	AC DUPLEX, FLOOR
	AC QUAD, FLOOR
	AC DUPLEX, WALL
	AC QUAD, WALL
	AC DUPLEX, CEILING
	AC QUAD, CEILING

NOTES:
1. ELECTRICAL SYMBOLS ARE N.I.C. AND WHEN USED ARE SHOWN FOR REFERENCE ONLY.

3 TERMINATION SYMBOLS
SCALE: NTS

KEYED NOTES	
#	NOTE
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	EXISTING AV RACK, FLOOR-MOUNTED. ALL CABLE ENTRY IS FROM TRAY ABOVE.
11	CUT EXISTING 13/8 CABLES 18" BELOW BOX & INSTALL NLTBMXX-BAG CONNECTOR.
12	
13	
14	
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24	
25	
26	
27	
--	NOT ALL KEYED NOTES ARE USED ON ALL SHEETS

2 AV KEYED NOTES
SCALE: NTS

MOUNTING DESIGNATION	
CODE	MEANING
SRF	MOUNT TO SURFACE
RCS	MOUNT RECESSED BEHIND SURFACE
FLS	MOUNT WITH FACE FLUSH TO SURFACE
AF'	MOUNT AT SPECIFIED DISTANCE A.F.F. TO CENTER OF BOX
RCP	MOUNT AT SAME CENTERLINE HEIGHT AS ELECTRICAL RECEPTACLES
SWC	MOUNT AT SAME CENTERLINE HEIGHT AS LIGHT SWITCHES
FLR	DEVICE IN OR ON FLOOR
CLG	DEVICE IN OR ON CEILING
SPCL	NON-STANDARD MOUNTING -- SEE ASSOCIATED KEY NOTE

1 MOUNTING DESIGNATIONS
SCALE: NTS

NOTE:
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REV:	DATE:

ACOUSTIC DISTINCTIONS
DESIGN IN HARMONY

PERFORMANCE AV SYSTEMS
BOOTH LEVEL TERMINATIONS

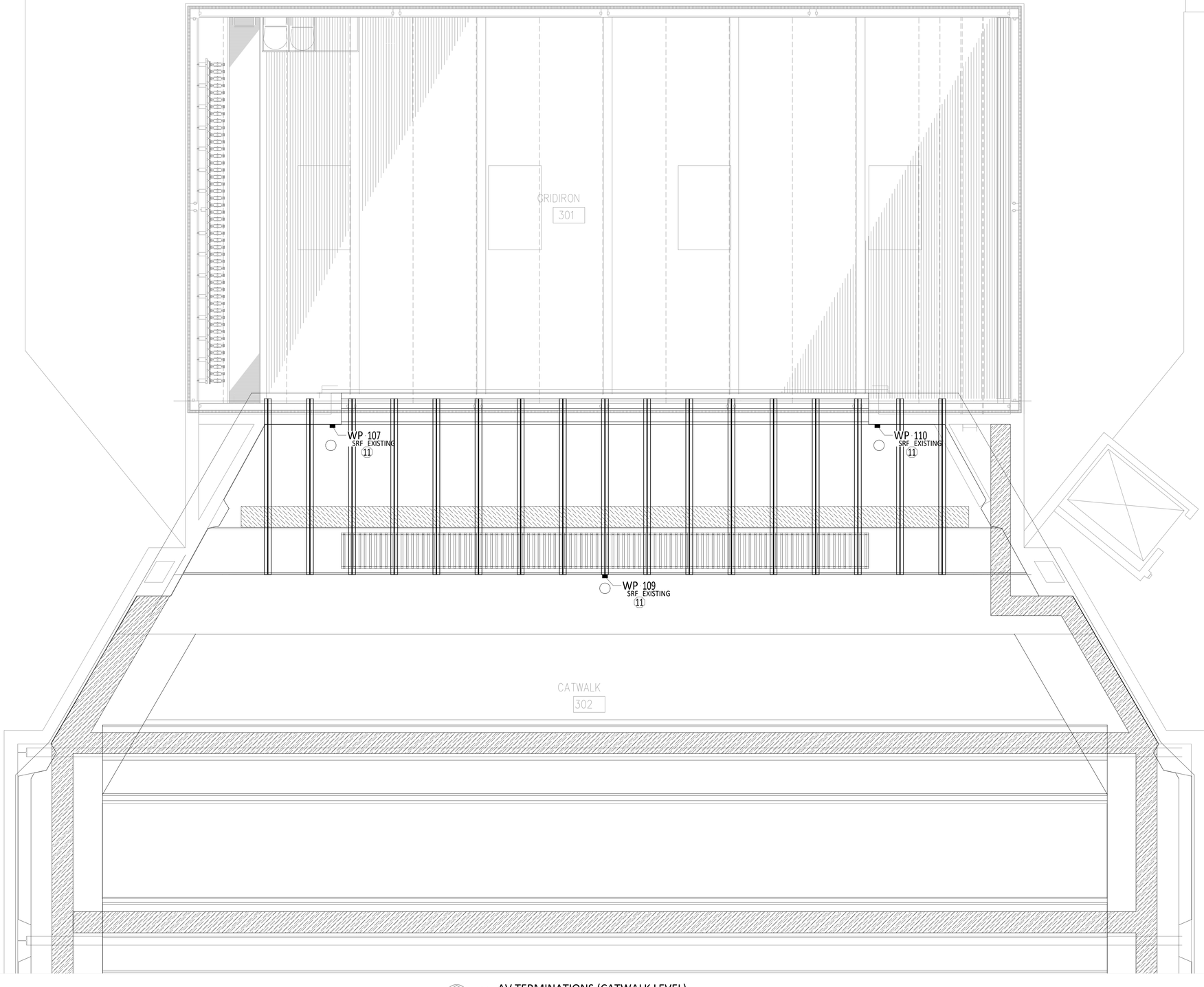
NORTH IOWA
COMMUNITY AUDITORIUM

2024.04.16

SCALE AS SHOWN

ADI #2024109

AV102



4 AV TERMINATIONS (CATWALK LEVEL)
SCALE: 1/4" = 1'-0"

AV TERMINATION SYMBOLS	
XX YY MNT ##"	DEVICE TERMINATION, WALL/SURFACE: RECTANGLE IS BOX LOCATION IN PLAN "XX" IS TERMINATION ID "YY" IS TERMINATION NUMBER "MNT" IS MOUNTING TYPE "##" IS MOUNTING HEIGHT
XX YY MNT ##"	DEVICE TERMINATION, FLOOR BOX: SQUARE IS BOX LOCATION IN PLAN "XX" IS TERMINATION ID "YY" IS TERMINATION NUMBER "MNT" IS MOUNTING TYPE "##" IS MOUNTING HEIGHT
XX YY MNT ##"	DEVICE TERMINATION, CEILING CAN: CIRCLE IS BOX LOCATION IN PLAN "XX" IS TERMINATION ID "YY" IS TERMINATION NUMBER "MNT" IS MOUNTING TYPE "##" IS MOUNTING HEIGHT
XX YY MNT ##" XX YY MNT ##" XX YY MNT ##"	TERMINATIONS CONNECTED AS SHOWN ARE PARALLELED ON THE SAME CIRCUIT
	AC DUPLEX, FLOOR
	AC QUAD, FLOOR
	AC DUPLEX, WALL
	AC QUAD, WALL
	AC DUPLEX, CEILING
	AC QUAD, CEILING

NOTES:
1. ELECTRICAL SYMBOLS ARE N.I.C. AND WHEN USED ARE SHOWN FOR REFERENCE ONLY.

3 TERMINATION SYMBOLS
SCALE: NTS

KEYED NOTES	
#	NOTE
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	EXISTING AV RACK, FLOOR-MOUNTED. ALL CABLE ENTRY IS FROM TRAY ABOVE.
11	CUT EXISTING 13/8 CABLES 18" BELOW BOX & INSTALL NLTBMXX-BAG CONNECTOR.
12	
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25	
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27	
–	NOT ALL KEYED NOTES ARE USED ON ALL SHEETS

2 AV KEYED NOTES
SCALE: NTS

MOUNTING DESIGNATION	
CODE	MEANING
SRF	MOUNT TO SURFACE
RCS	MOUNT RECESSED BEHIND SURFACE
FLS	MOUNT WITH FACE FLUSH TO SURFACE
XX"	MOUNT AT SPECIFIED DISTANCE A.F.F. TO CENTER OF BOX
RCP	MOUNT AT SAME CENTERLINE HEIGHT AS ELECTRICAL RECEPTACLES
SWC	MOUNT AT SAME CENTERLINE HEIGHT AS LIGHT SWITCHES
FLR	DEVICE IN OR ON FLOOR
CLG	DEVICE IN OR ON CEILING
SPCL	NON-STANDARD MOUNTING – SEE ASSOCIATED KEY NOTE

1 MOUNTING DESIGNATIONS
SCALE: NTS

ACOUSTIC DISTINCTIONS
DESIGN IN HARMONY

NOTE:
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REV:	DATE:

PERFORMANCE AV SYSTEMS
CATWALK LEVEL TERMINATIONS

NORTH IOWA
COMMUNITY AUDITORIUM

2024.04.16

SCALE AS SHOWN

ADI #2024109

AV103

EXISTING

AMPLIFIER RACK

CONTRACTOR ID PLATE	
M.A.P.	
BLANK	
M.A.P.	
BLANK	
FURMAN	POWER DISTRO
M.A.P.	BLANK
B.S.S.	AUDIO PROCESSOR
B.S.S.	AUDIO BREAK-OUT
LITTLITE	RL-10-D
AUDIO ACCESSORIES	
ANALOG AUDIO PATCH BAY	
AUDIO ACCESSORIES	
ANALOG AUDIO PATCH BAY	
LITTLITE	RL-10-D
CUSTOM	
AMPLIFIER OUTPUT PATCH	
M.A.P.	
BLANK	
CUSTOM	
LOUDSPEAKER DESTINATION PATCH	
M.A.P.	
RACK DRAWER	
M.A.P.	
RACK DRAWER	
M.A.P.	BLANK
M.A.P.	
BLANK	
LAB.GRUPPEN	
C 28:4 AMPLIFIER	
LAB.GRUPPEN	
C 48:4 AMPLIFIER	
LAB.GRUPPEN	
C 48:4 AMPLIFIER	
LAB.GRUPPEN	
C 48:4 AMPLIFIER	
LAB.GRUPPEN	
C 68:4 AMPLIFIER	
LAB.GRUPPEN	
C 28:4 AMPLIFIER	
LAB.GRUPPEN	
C 28:4 AMPLIFIER	

EXISTING

L'ACOUSTIC OPTION

UPDATED

AMPLIFIER RACK

CONTRACTOR ID PLATE	
FURMAN	POWER DISTRO
M.A.P.	BLANK
SYMETRIX	AUDIO PROCESSOR
LUXUL	A/V SWITCH
LITTLITE	RL-10-D
AUDIO ACCESSORIES	
ANALOG AUDIO PATCH BAY	
AUDIO ACCESSORIES	
ANALOG AUDIO PATCH BAY	
LITTLITE	RL-10-D
CUSTOM	
AMPLIFIER OUTPUT PATCH	
CUSTOM	
LOUDSPEAKER DESTINATION PATCH	
LAB.GRUPPEN	
CX 28:4 AMPLIFIER	
LAB.GRUPPEN	
CX 28:4 AMPLIFIER	
LAB.GRUPPEN	
C 68:4 AMPLIFIER	
M.A.P.	BLANK
L'ACOUSTIC	
LA4X	
L'ACOUSTIC	
LA12X	
L'ACOUSTIC	
LA4X	
L'ACOUSTIC	
LA4X	
L'ACOUSTIC	
LA12X	
L'ACOUSTIC	
LA4X	
M.A.P.	BLANK
L'ACOUSTIC	
LA12X	
L'ACOUSTIC	
LA4X	
M.A.P.	BLANK
POWERSOFT	QC4804 DSP+D
POWERSOFT	QC4804 DSP+D

UPDATED - L'ACOUSTIC OPTION

DELIVER ALL REMOVED EQUIPMENT TO OWNER FOR RE-USE

ADAMSON OPTION

UPDATED

AMPLIFIER RACK

CONTRACTOR ID PLATE	
M.A.P.	
BLANK	
M.A.P.	
BLANK	
FURMAN	POWER DISTRO
M.A.P.	BLANK
SYMETRIX	AUDIO PROCESSOR
LUXUL	A/V SWITCH
LITTLITE	RL-10-D
AUDIO ACCESSORIES	
ANALOG AUDIO PATCH BAY	
AUDIO ACCESSORIES	
ANALOG AUDIO PATCH BAY	
LITTLITE	RL-10-D
CUSTOM	
AMPLIFIER OUTPUT PATCH	
CUSTOM	
LOUDSPEAKER DESTINATION PATCH	
LAB.GRUPPEN	
D120:4L	
LAB.GRUPPEN	
D120:4L	
M.A.P.	BLANK
LAB.GRUPPEN	
D120:4L	
LAB.GRUPPEN	
D120:4L	
M.A.P.	BLANK
LAB.GRUPPEN	
D80:4L	
LAB.GRUPPEN	
D80:4L	
M.A.P.	BLANK
LAB.GRUPPEN	
D120:4L	
LAB.GRUPPEN	
C 68:4 AMPLIFIER	
LAB.GRUPPEN	
C 28:4 AMPLIFIER	
LAB.GRUPPEN	
C 28:4 AMPLIFIER	

UPDATED - ADAMSON OPTION

DELIVER ALL REMOVED EQUIPMENT TO OWNER FOR RE-USE

MARTIN OPTION

UPDATED

AMPLIFIER RACK

CONTRACTOR ID PLATE	
M.A.P.	
BLANK	
M.A.P.	
BLANK	
FURMAN	POWER DISTRO
M.A.P.	BLANK
SYMETRIX	AUDIO PROCESSOR
LUXUL	A/V SWITCH
LITTLITE	RL-10-D
AUDIO ACCESSORIES	
ANALOG AUDIO PATCH BAY	
AUDIO ACCESSORIES	
ANALOG AUDIO PATCH BAY	
LITTLITE	RL-10-D
CUSTOM	
AMPLIFIER OUTPUT PATCH	
M.A.P.	
BLANK	
CUSTOM	
LOUDSPEAKER DESTINATION PATCH	
M.A.P.	
RACK DRAWER	
M.A.P.	
RACK DRAWER	
M.A.P.	BLANK
MARTIN	
IK42-D	
MARTIN	
IK42-D	
M.A.P.	BLANK
MARTIN	
IK81-D	
POWERSOFT	QC4804 DSP+D
POWERSOFT	QC4804 DSP+D
M.A.P.	BLANK
LAB.GRUPPEN	
C 68:4 AMPLIFIER	
LAB.GRUPPEN	
C 28:4 AMPLIFIER	
LAB.GRUPPEN	
C 28:4 AMPLIFIER	

UPDATED - MARTIN OPTION

DELIVER ALL REMOVED EQUIPMENT TO OWNER FOR RE-USE

1 RACK AVR-01

SCALE: 1:4

NOTE:
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REV:	DATE:

PERFORMANCE AV SYSTEMS
RACK ELEVATIONS

NORTH IOWA
COMMUNITY AUDITORIUM

2024.04.16

SCALE AS SHOWN

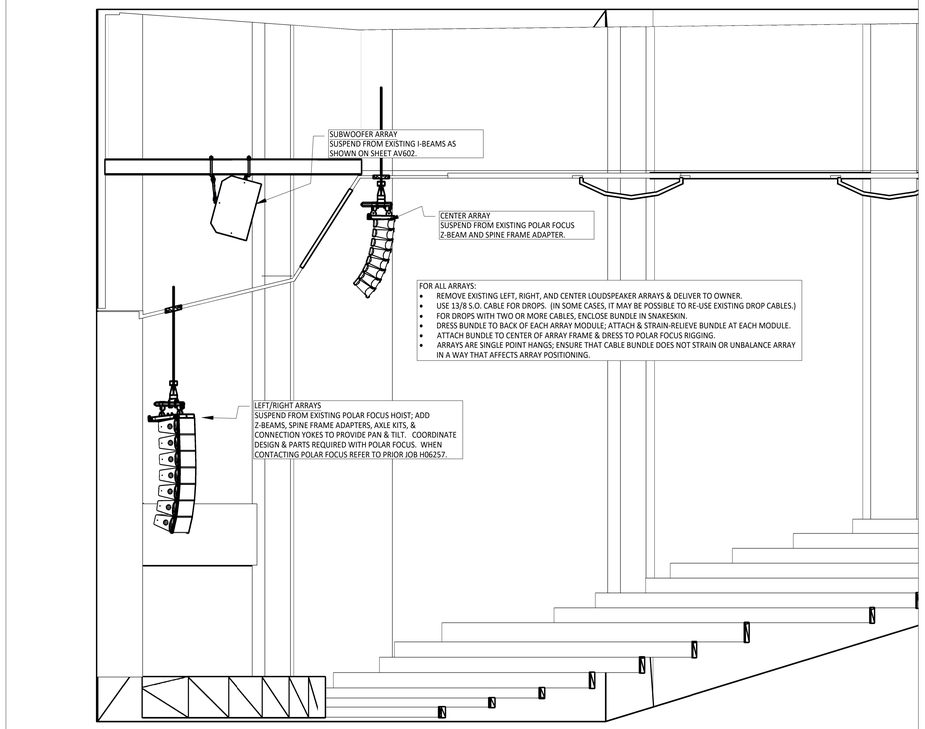
ADI #2024109

AV401

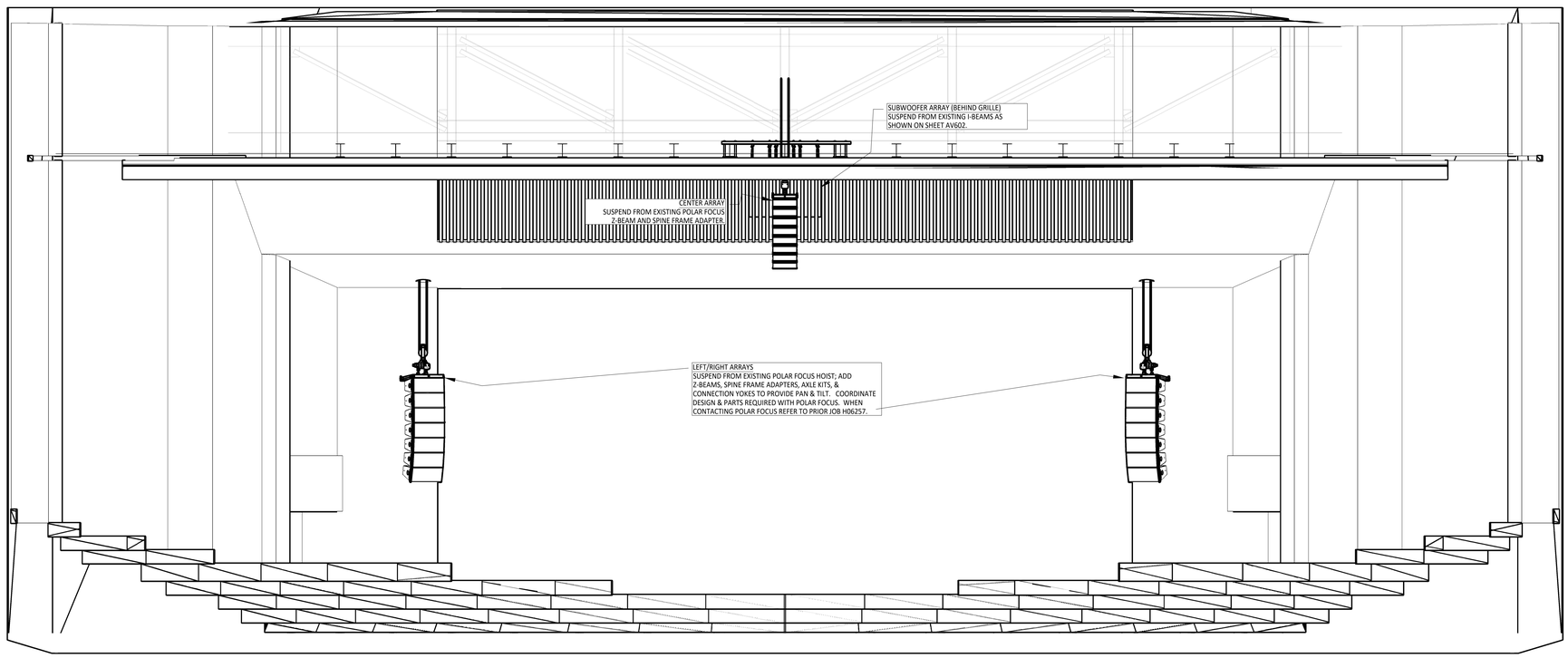
CENTER ARRAY OPTIONS		
PRODUCT	**FRAME ANGLE**	**SPLAYS**
8 EA. L'ACOUSTIC KIVA	TILT 0° / ALIGN TO ROOM CENTERLINE	(F0°)/2°/3°/5°/7.5°/10°/12.5°/15°
8 EA. ADAMSON IS7	TILT -1° / ALIGN TO ROOM CENTERLINE	(F4°)/2°/3°/4°/6°/8°/8°/8°
8 EA. MARTIN WPM	TILT -1° / ALIGN TO ROOM CENTERLINE	(F0°)/2°/4°/6.5°/10°/10°/10°/10°
LEFT/RIGHT ARRAY OPTIONS		
PRODUCT	**FRAME ANGLE**	**SPLAYS**
7 EA. L'ACOUSTIC KARA	TILT +6° / PAN 25° TOWARD ROOM CENTER	(F5°)/1°/1°/1°/3°/5°/7.5°
7 EA. ADAMSON IS10	TILT +6° / PAN 25° TOWARD ROOM CENTER	(F4°)/0°/1°/2°/3°/4°/6°
7 EA. MARTIN WPS	TILT +6° / PAN 25° TOWARD ROOM CENTER	(F0°)/1°/2°/2°/4°/4°/6.5°

NOTE: ALL LOUDSPEAKER OPTIONS ARE < 550 POUNDS PER ARRAY INCLUDING TOP FRAME AND CABLE

2 BID OPTIONS FOR LINE ARRAYS
SCALE: 1/4" = 1'-0"



2 PRIMARY DEVICES, SECTION VIEW
SCALE: 1/4" = 1'-0"



1 PRIMARY DEVICES, STAGE ELEVATION
SCALE: 1/4" = 1'-0"

NOTES:
1. DESIGN DRAWINGS ARE CONCEPTUAL. RIGGING METHODS, WHERE SHOWN, ARE TO INDICATE INTENT. AUDIO CONTRACTOR IS RESPONSIBLE FOR ENGINEERING AND INSTALLING SAFE, APPROPRIATE MOUNTING OR SUSPENSION FOR ALL DEVICES. SUBMIT SHOP DRAWINGS FOR ALL RIGGING.
2. CONFIRM AND COORDINATE ALL LOCATIONS WITH ARCHITECT. PRIOR TO ORDERING EQUIPMENT, COORDINATE WITH ARCHITECT TO CONFIRM FINISH COLOR FOR ALL DEVICES VISIBLE TO THE PUBLIC.
3. FIELD-PAINT DEVICES, IF REQUIRED TO MEET ARCHITECTURAL FINISH REQUIREMENTS.
4. AIMING INFORMATION IS PROVIDED AS A GUIDE TO INITIAL INSTALLATION. ALLOW A MINIMUM OF +/- 10° OF READILY AVAILABLE FIELD-ADJUSTMENT IN ALL DIRECTIONS FROM THE STATED VALUES.
5. AFTER FIELD-AIMING IS COMPLETE, ALL DEVICES MUST BE RIGIDLY LOCKED IN PLACE SUCH THAT NORMAL OPERATIONAL DISTURBANCES OR ENVIRONMENTAL FACTORS DO NOT AFFECT FUTURE DEVICE PERFORMANCE.
6. SEE LOCATION DRAWINGS FOR PLAN-VIEW LOCATIONS OF ALL DEVICES.

NOTE:
1. THIS PROJECT REPLACES THE MAIN LEFT, RIGHT, AND CENTER LOUDSPEAKER ARRAYS IN N.I.C.A. & ADDS A FLOWN CENTER SUBWOOFER ARRAY. AMPLIFICATION AND PROCESSING ARE ALSO CHANGED TO BETTER CONNECT WITH THE N.I.C.A. MAIN AUDIO CONSOLE.
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REV:	DATE:

PERFORMANCE AV SYSTEMS
AUDITORIUM PRIMARY DEVICES

NORTH IOWA
COMMUNITY AUDITORIUM

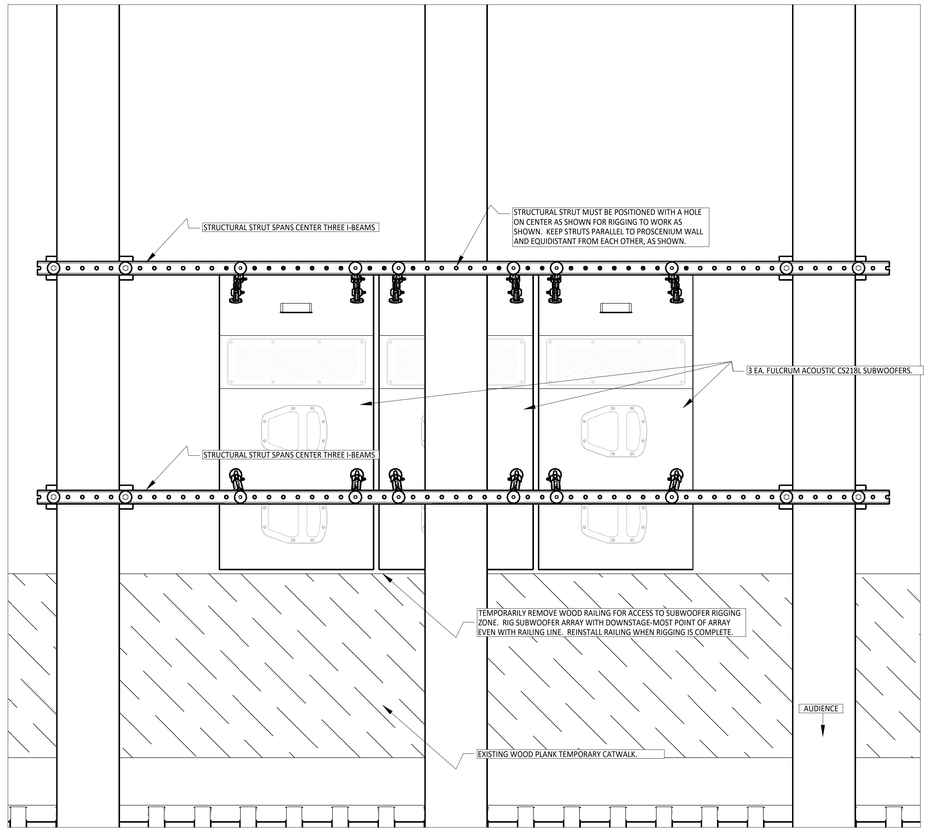
2024.04.16

SCALE AS SHOWN

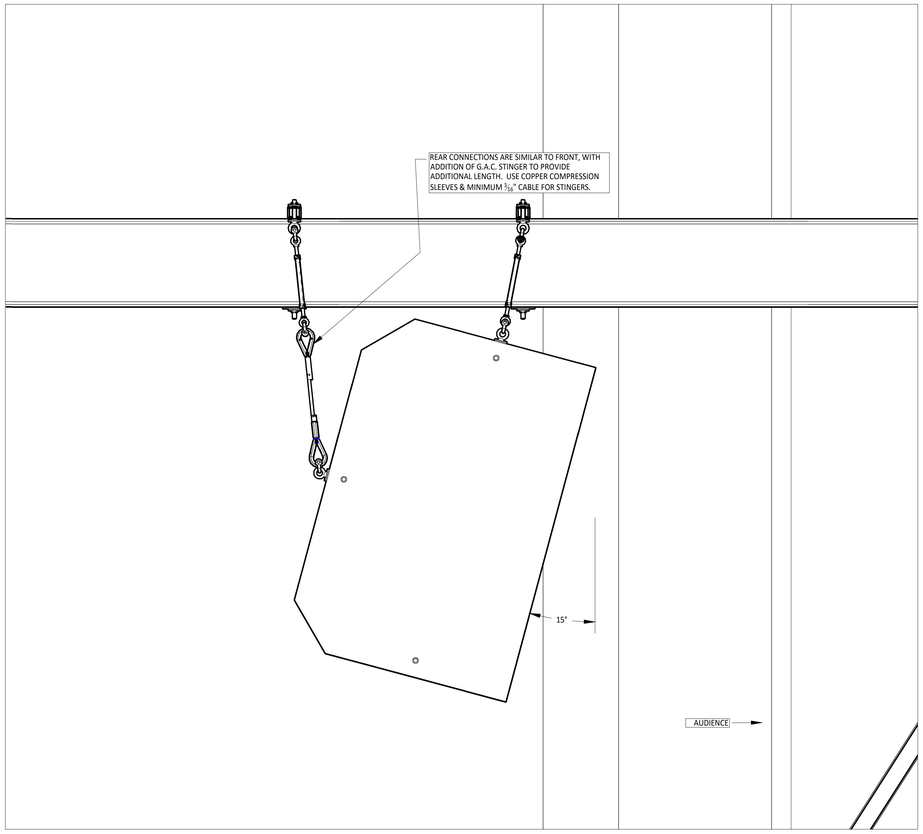
ADI #2024109

AV601

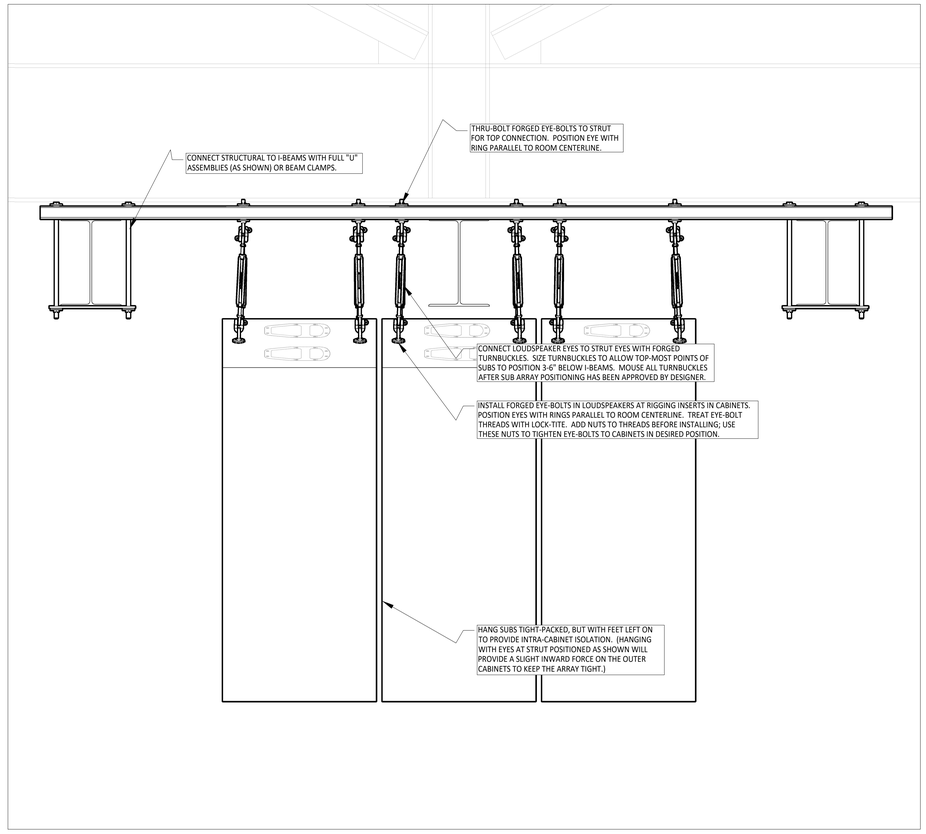
NOTES:
1. DESIGN DRAWINGS ARE CONCEPTUAL. RIGGING METHODS, WHERE SHOWN, ARE TO INDICATE INTENT. AUDIO CONTRACTOR IS RESPONSIBLE FOR ENGINEERING AND INSTALLING SAFE, APPROPRIATE MOUNTING OR SUSPENSION FOR ALL DEVICES. SUBMIT SHOP DRAWINGS FOR ALL RIGGING.
2. CONFIRM AND COORDINATE ALL LOCATIONS WITH ARCHITECT. PRIOR TO ORDERING EQUIPMENT, COORDINATE WITH ARCHITECT TO CONFIRM FINISH COLOR FOR ALL DEVICES VISIBLE TO THE PUBLIC.
3. FIELD-PAINT DEVICES, IF REQUIRED TO MEET ARCHITECTURAL FINISH REQUIREMENTS.
4. AIMING INFORMATION IS PROVIDED AS A GUIDE TO INITIAL INSTALLATION. ALLOW A MINIMUM OF +/- 10° OF READILY AVAILABLE FIELD-ADJUSTMENT IN ALL DIRECTIONS FROM THE STATED VALUES.
5. AFTER FIELD-AIMING IS COMPLETE, ALL DEVICES MUST BE RIGIDLY LOCKED IN PLACE SUCH THAT NORMAL OPERATIONAL DISTURBANCES OR ENVIRONMENTAL FACTORS DO NOT AFFECT FUTURE DEVICE PERFORMANCE.
6. SEE LOCATION DRAWINGS FOR PLAN-VIEW LOCATIONS OF ALL DEVICES.



2 SUB ARRAY, TOP VIEW
SCALE: 1:8



3 SUB ARRAY, SECTION VIEW
SCALE: 1:8



1 SUB ARRAY, FRONT ELEVATION
SCALE: 1:8

NOTE:
1. THIS PROJECT REPLACES THE MAIN LEFT, RIGHT, AND CENTER LOUDSPEAKER ARRAYS IN N.I.C.A. & ADDS A FLOWN CENTER SUBWOOFER ARRAY. AMPLIFICATION AND PROCESSING ARE ALSO CHANGED TO BETTER CONNECT WITH THE N.I.C.A. MAIN AUDIO CONSOLE.
2. N.I.C.A. IS AN EXISTING THEATRE WITH EXTENSIVE AV SYSTEMS ALREADY IN PLACE. THESE DRAWINGS SHOW ONLY THE ADDITIONAL WORK TO BE ADDED AS PART OF THIS SCOPE, NOT THE EXISTING SYSTEMS IN PLACE. THE INTEGRATOR WILL EXERCISE DUE CAUTION IN PROTECTING EXISTING SYSTEMS SO OTHER FUNCTIONS UNRELATED TO THE MAIN LOUDSPEAKER SYSTEMS ARE UNDISTURBED.

REV:	DATE:

PERFORMANCE AV SYSTEMS
SUBWOOFER ARRAY

NORTH IOWA
COMMUNITY AUDITORIUM

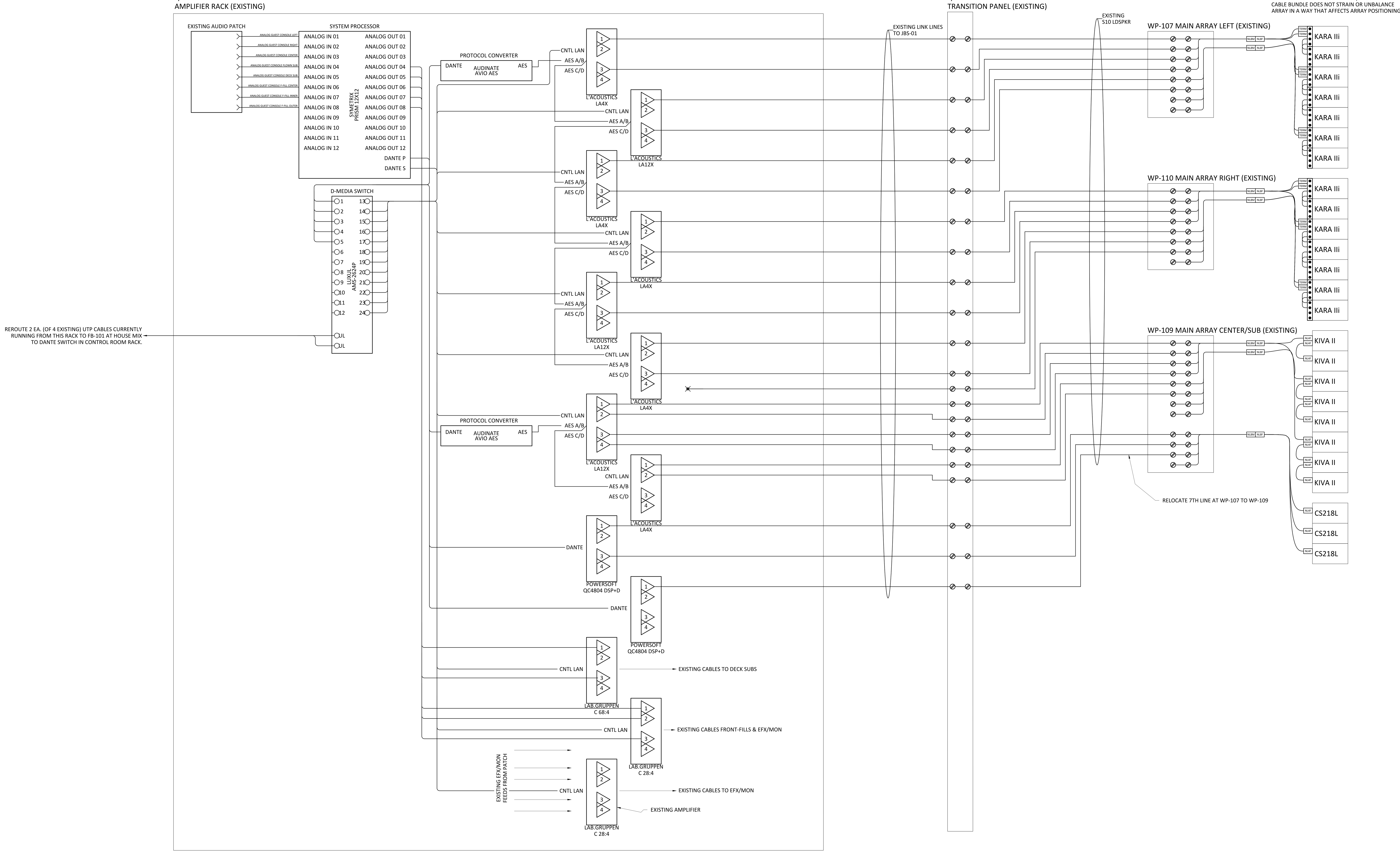
2024.04.16

SCALE AS SHOWN

ADI #2024109

AV602

FOR ALL ARRAYS:
- USE 13/8 S.O. CABLE FOR DROPS.
- SNAKESKIN CABLE BUNDLE FOR DROPS WITH TWO OR MORE CABLES.
- DRESS BUNDLE TO BACK OF EACH ARRAY MODULE; ATTACH & STRAIN-RELIEVE BUNDLE AT EACH MODULE.
- ATTACH BUNDLE TOP END TO CENTER OF ARRAY FRAME & DRESS TO POLAR FOCUS RIGGING.
- ARRAYS ARE SINGLE POINT HANGS; ENSURE THAT CABLE BUNDLE DOES NOT STRAIN OR UNBALANCE ARRAY IN A WAY THAT AFFECTS ARRAY POSITIONING.



NOTE:
1. THIS PROJECT REPLACES THE MAIN LEFT, RIGHT, AND CENTER LOUDSPEAKER ARRAYS IN N.I.C.A. & ADDS A FLOWN CENTER SUBWOOFER ARRAY. AMPLIFICATION AND PROCESSING ARE ALSO CHANGED TO BETTER CONNECT WITH THE N.I.C.A. MAIN AUDIO CONSOLE.
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REV:	DATE:

PERFORMANCE AV SYSTEMS
LOUDSPEAKER OPTION 1 SIGNAL FLOW

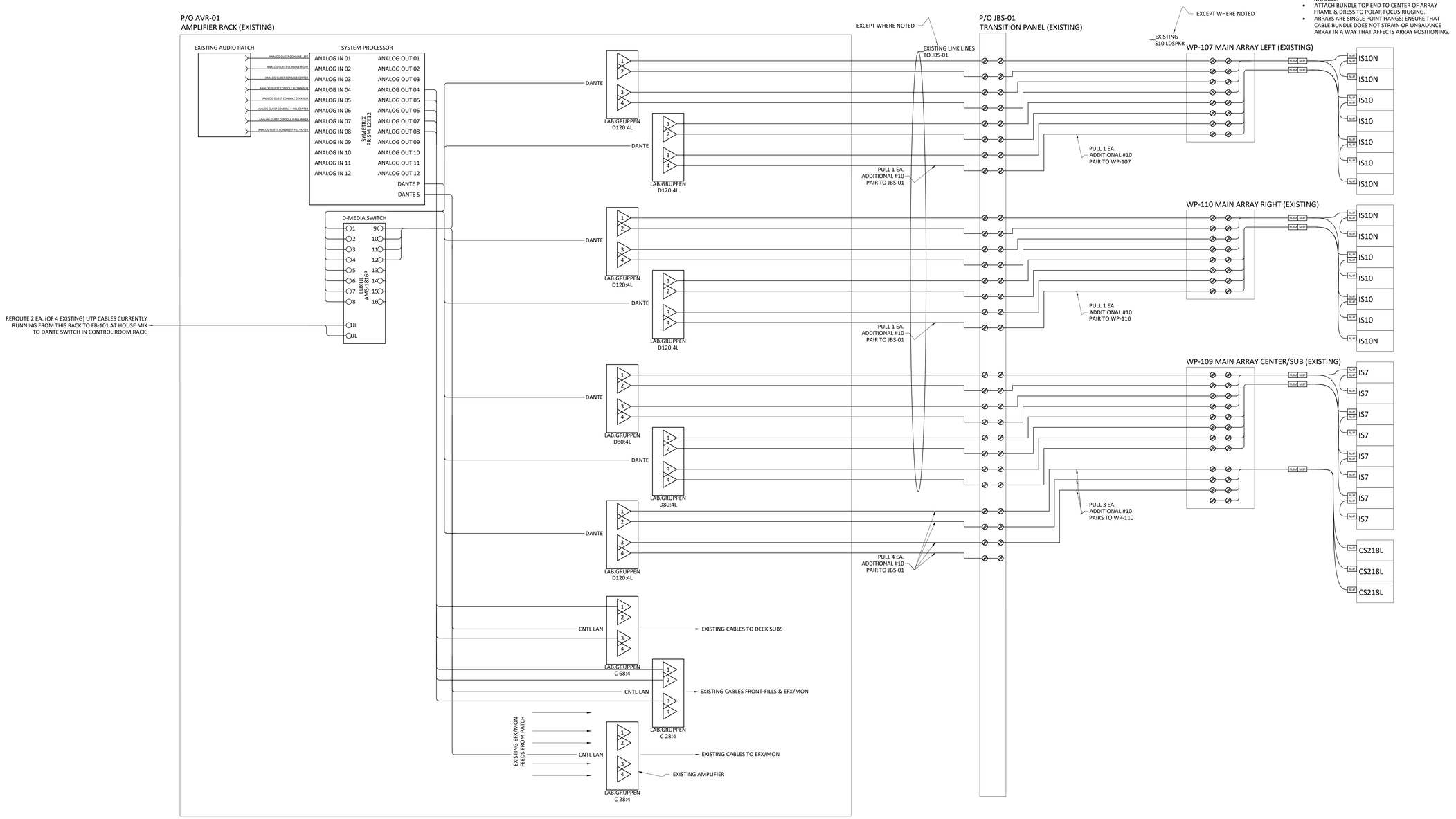
NORTH IOWA
COMMUNITY AUDITORIUM

2024.04.16

SCALE AS SHOWN

ADI #2024109

AV701



FOR ALL ARRAYS:

- USE 13/8 S.O. CABLE FOR DROPS.
- SNAKESKIN CABLE BUNDLE FOR DROPS WITH TWO OR MORE CABLES.
- DRESS BUNDLE TO BACK OF EACH ARRAY MODULE; ATTACH & STRAIN-RELIEVE BUNDLE AT EACH MODULE.
- ATTACH BUNDLE TOP END TO CENTER OF ARRAY FRAME & DRESS TO POLAR FOCUS RIGGING.
- ARRAYS ARE SINGLE POINT HANGS; ENSURE THAT CABLE BUNDLE DOES NOT STRAIN OR UNBALANCE ARRAY IN A WAY THAT AFFECTS ARRAY POSITIONING.

NOTE:

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REV:	DATE:

PERFORMANCE AV SYSTEMS
LOUDSPEAKER OPTION 2 SIGNAL FLOW

NORTH IOWA
COMMUNITY AUDITORIUM

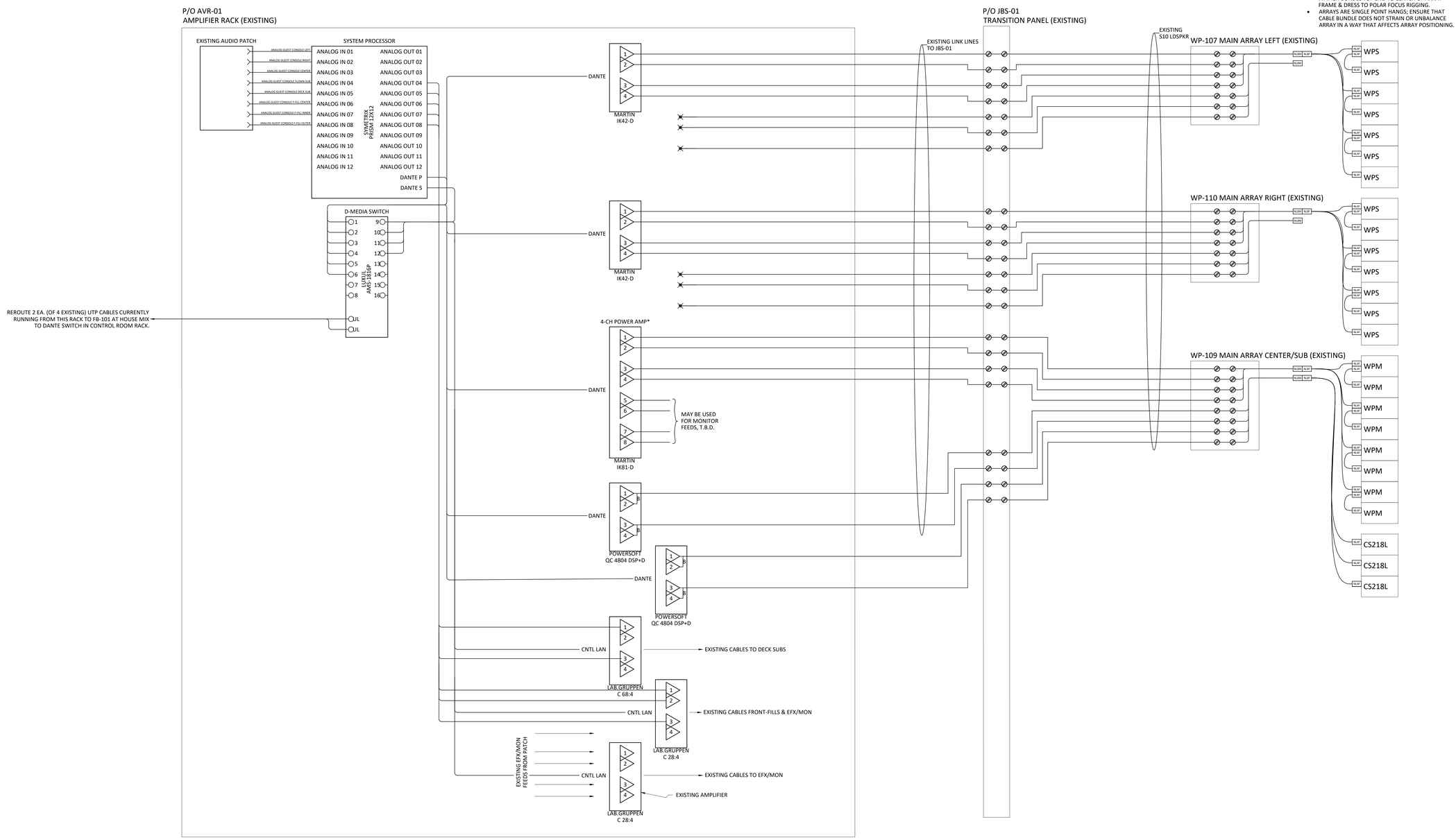
2024.04.16

SCALE AS SHOWN

ADI #2024109

AV702

ACOUSTIC DISTINCTIONS
DESIGN IN HARMONY



NOTE:
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REV:	DATE:

PERFORMANCE AV SYSTEMS
LOUDSPEAKER OPTION 3 SIGNAL FLOW

NORTH IOWA
COMMUNITY AUDITORIUM

2024.04.16

SCALE AS SHOWN

ADI #2024109

AV703