Eastern Virginia Medical School

Request for Proposal

RFP #: EVMS AVWAITZER20-101

Waitzer Hall
Audiovisual Systems

July 11, 2019

TABLE OF CONTENTS

SECTION 1 – BIDDING REQUIREMENTS AND CONDITIONS OF THE CONTRACT

PART 1 - GENERAL

1.1 GENERAL

A. Invitation: Eastern Virginia Medical School invites Bids for a Single Prime Contract for Audiovisual Systems in the New Education and Academic Administration Building at the intersection of Colley Avenue and Brambleton Avenue, Norfolk, Virginia.

B. Project Number:
   1. Eastern Virginia Medical School project number 17118-00 TSG#
   2. The Sextant Group Project number P002960.00
   3. RFP number: EVMS WAITZER20-101

C. Project name: Eastern Virginia Medical School, New Education and Academic Administration Building.

D. Project Substantial Completion Date:
   1. Project shall be substantially complete with fully operational systems by May 31, 2020.

E. Project Final Completion Date:
   1. Project shall be finally completed no later than August 31, 2020.

1.2 INSTRUCTIONS TO BIDDERS

A. Definitions
   1. Bidding Documents, includes the following:
      a. Bidding Requirements and Conditions of the Contract
      b. General Conditions
      c. Design and Performance Requirements
      d. Appendices
      e. Project Drawings
      f. Addenda (Issued prior to receipt of bids).
   2. Bidder/Offeror: a person or entity who submits a Bid/Proposal
   3. Bids: is an offer or proposal.

B. Bidder Representation: Bidder, by submitting a Bid, represents that
   1. Bidder has read and understands the Bidding Documents, and Bid is based upon equipment, materials, labor, programming, training, documentation, and support as required by Bidding Documents without exception.
   2. Bidder has attended Pre-Bid meeting, if mandatory.
   3. Bidder has become familiar with local conditions under which the Work is to be performed within the requirements of the Bidding Documents.

C. Obtaining Bid Documents:

1. Bid Documents may be obtained on line at EVMS Solicitation page - https://www.evms.edu/about_evms/administrative_offices/materials_management/solicitations/ and at eVA - https://m.vendor.epro.cgipdc.com/Vendor/public/AllOpportunities.

D. Contractor Qualification Requirements: Bidder shall submit with bid documents evidence of his/her qualifications to perform the work specified. Contractor qualifications shall be the most current information available but not more than one year old. Submit one copy of documentation to both Owner and Consultant for review and approval. All contractor qualifications shall be communicated by way of the enclosed Contractor Qualification Requirements Form (APPENDIX C), and shall include the information listed below.
   1. Corporate Profile
      a. Location of Corporate Headquarters
      b. Number of offices and locations
      c. Location of office assigned to this project
      d. Corporate History
         1). How Many years in this business?
         2). Under what former names has your organization operated
         3). Date(s) of incorporation
         4). State of incorporation
         5). Officers names and addresses
         6). Detail merger/acquisition/ownership history
      e. Litigation Experiences Within the Last 5 Years
         1). Project Related:
            a). Nature of Litigation
            b). Plaintiff or Defendant
            c). Outcome
            d). Include all liens, claims and lawsuits adjudicated or pending involving your company.
         2). Non-Project Related
            a). Nature of Litigation
            b). Plaintiff or Defendant
            c). Outcome
   2. Financial
         1). Trade and Bank Credit References (List 3)
         2). Dunn & Bradstreet ranking
         3). Insurance Limits
         4). Name of Bonding Company
         5). Name and address of Agent
         6). Maximum Bonding Capacity
         7). Current Bonding Capacity
         8). Performance Bond ever exercised?
   3. Staffing
      a. Number and Type of Full-Time Staff
         1). Total number of employees
         2). Number of design staff

3). Number of installation staff
4). Number of project management staff
5). Number of software programming staff

b. Identify key personnel that will be assigned to this project including:
1). Project Executive
2). Project Manager
3). Systems Engineer/Designer
4). Lead Installer/Crew Chief/Superintendent/Lead Technician
5). Control Systems Programmer
6). Audio DSP Programmer
7). Commissioning Agent
8). Trainer

c. For each Individual listed above provide a resume that includes:
1). Office Location
2). Percentage of individual's time that will be allocated to this project
3). Work History
4). Previous Project Experience:
a). The assigned Project Manager shall have a minimum of five (5) years' experience in the fabrication, assembly, and installation of audiovisual systems of similar magnitude and quality to that indicated for this project.
b). The assigned Systems Engineer/Designer shall have a minimum of five (5) years' experience in the fabrication, assembly, and installation of audiovisual systems of similar magnitude and quality to that indicated for this project.
5). Length of Employment
6). Certifications: CTS, CTS-D, CTS-I, EST-L2, RCDD, PMP, Certified Control System Programmer, Certified DSP Programmer, CompTIA Network+, CCNA, other.
7). The project will utilize Digital Media (DVX and/or DGX) products by AMX by Harman. The Contractor's Systems Engineer/Designer shall hold a current AMX ACE-D (ACE Design Expert) certification. The Bidder shall submit the name of the Systems Engineer/Designer, certification expiration date and certification number.
8). The Contractor's Lead Installer shall hold a current CTS-I (Certified Technology Specialist – Installation) certification from AVIXA/InfoComm International, and/or a current EST-L2 (Electronic Systems Technician) certification from NSCA. The Bidder shall submit the name of the lead installer and certification expiration dates.
9). The project will utilize Digital Media (DVX and/or DGX) products by AMX by Harman. The Contractor's Lead Installer shall hold a current AMX ACE-I (ACE Installation Expert) certification. The Bidder shall submit the name of the Lead Installer, certification expiration date and certification number.
10). The project will utilize XTP products by Extron Electronics. The Contractor's Lead Installer shall hold a current Extron XTP Systems Technician Certification or Extron XTP Systems Design Engineer Certification. The Bidder shall submit the name of the Lead Installer, certification expiration date and certification number.
11). The project will utilize control system products by AMX by Harman. Due to the potential complexity of the control system, an AMX ACE-P (ACE Programming Expert) Programmer(s) with active certification shall be required to author the programming component of this project. The Bidder shall provide documentation

listing project team member(s) who will create the control system programming including a listing of years of experience, a statement of manufacturer authorization, certification type, date of certification and the certificate number.

12). The project may utilize DigitalMedia products by Crestron Electronics. The Contractor's Systems Engineer/Designer shall hold a current Crestron DMC-E-4K (Digital Media Certified Engineer) certification. The Bidder shall submit the name of the Systems Engineer/Designer, certification expiration date and certification number.

13). The project may utilize DigitalMedia products by Crestron Electronics. The Contractor's Lead Installer shall hold a current Crestron DMC-T-4K (Digital Media Certified Technician) or Crestron DMC-E-4K (Digital Media Certified Engineer) certification. The Bidder shall submit the name of the Lead Installer, certification expiration date and certification number.

14). The project may utilize control system products by Crestron Electronics. Due to the potential complexity of the control system, a Crestron Certified Programmer(s) with active certification shall be required to author the programming component of this project. The Bidder shall provide documentation listing project team member(s) who will create the control system programming including a listing of years of experience, a statement of manufacturer authorization, certification type, date of certification and the certificate number.

15). The project may utilize control system products by Extron Electronics. Due to the potential complexity of the control system, an Extron Certified Control Specialist(s) with active certification shall be required to author the programming component of this project. The Bidder shall provide documentation listing project team member(s) who will create the control system programming including a listing of years of experience, a statement of manufacturer authorization, certification type, date of certification and the certificate number.

16). This project will utilize Audio Digital Signal Processing (DSP) products by Biamp Systems. The Contractor's DSP Systems Designer/Programmer shall have completed formal training and hold current Biamp Tesira (SERVER line-up), TesiraFORTÉ, Vocia, and/or Audia certifications relevant to the platform(s) specified for the project. The Bidder shall submit the name of the trained/certified DSP Systems Designer/Programmer, along with a copy of his/her certificate, for verification purposes with the manufacturer. It will be expected that the person whose certification credentials are submitted will perform the programming as per the policies of Biamp Systems. Should the Contractor plan and/or expect to change the DSP Systems Designer/Programmer, and/or use multiple DSP Systems Designers/Programmers, on this project; then, multiple names and certificates for all intended DSP Systems Designers/Programmers shall be submitted as part of the bid package. Biamp Systems' policy does not tolerate programming of said certified products by non-trained/non-certified programmers.

4. Resources
   a. A manufacturers' line card for products in which the Bidder is an authorized Distributor or Dealer. Include date initially authorized.
   b. A list of any manufacturers' specialized technical certifications or designations held by the Bidder.
   c. A list of manufacturers for whom the Bidder is an authorized service center.
   d. A list of computer software and/or systems owned by the Bidder, which will be used to communicate, measure, draw, and/or document the project.
   e. A list of system test equipment owned and used by the Bidder, including manufacturer, model number and, where applicable, latest software revision.

5. References
   a. Include three project references, including:
      1). Contact name
      2). Institution name
      3). Phone number
      4). E-mail address
   b. Include three projects of:
      1). Similar scope and scale.
      2). Similar technology applications
      3). Provide Project cost for each
   c. List any past projects where Bidder has worked with the Owner, Consultant, Architects, or Construction Manager who are part of this project team.

E. Mandatory Pre-Bid Meeting: All Bidders are required to attend, and other interested parties are invited to attend, a Pre-Bid Meeting for distribution of information and tour of the Project Site.
   1. Time: 1:00 PM EST
   2. Date: Thursday, July 25, 2019
   3. Place: Andrews Hall, 721 Fairfax Ave, Norfolk, VA 23507, Conference Room 132
   4. Conferencing information:
      a. Joining from a desktop or laptop: https://bluejeans.com/335194282/0556.
      b. Joining via video conferencing system: 335194282.0556@199.48.152.152.
      c. Audio only via phone dial: 1.888.240.2560 enter meeting ID 335194282#
      d. use pass-code 0556# when prompted.

F. Pre-Bid Request for Information: All requests for information shall be communicated by way of the enclosed Request For Information Form (APPENDIX C). RFI forms may be e-mailed to the Consultant at mletsinger@thesextantgroup.com.Verbal requests for information shall be permitted only during the Pre-Bid meeting. All Bidder questions and responses to Bidder questions shall issued via Addenda and made public to all Bidders. All Requests for Information must be received by the date and time listed below. Requests for Information received after this date shall not be honored.
   1. Time: 12:00 PM EST
   2. Date: Friday, August 2, 2019

G. Pre-Bid Substitutions:
   1. Where Bidding Documents refer to any items, materials, products and equipment by means of one or more manufacturer's trade name, catalog reference or similar means of identification of manufacturer, such reference establishes standard of required quality, appearance, dimension or function. It is not an intention of this specification to limit or restrict Bid Responses to those containing products by specific manufacturers, but rather to set a baseline of operational performance and functionality that all Bid Responses must meet or exceed.
   2. Requests for proposed substitution shall be made in writing to the Consultant.
      a. Request shall be received by Consultant no later than
         1). Time: 12:00 PM EST
         2). Date: Friday, August 2, 2019
      b. Request shall include name of material, product or equipment to be substituted and a complete description of proposed substitution including drawings, performance and

test data and other information necessary to demonstrate that the substitution will meet all intentions of this Specification or required for a complete evaluation.

c. Bidder shall assume and bear all responsibility for coordinating and performing related changes in the Work necessitated by such substitution and has included such costs in the Bid.

d. Burden of proof of merit of proposed substitution is upon Bidder.

3. Some manufacturer's names and product descriptions used in this specification are product specific with no substitutions allowed. These “Brand Specific” products are required to meet compatibility with the Owner’s existing systems and to maintain continuity of support. Refer to Section 4-Appendices for a listing of Brand Specific products.

4. All approved substitutions shall be communicated by Addenda. No Bidder shall rely upon approvals made in any other manner.

5. No substitutions will be considered after award of Contract, unless otherwise approved by Owner.

H. Exceptions: The Contractor shall notify the Consultant, prior to bid submission, of any and all exceptions to these specifications and related drawings. This shall include any errors or omissions in the system design and/or any inconsistencies or ambiguities between package documents that, in the Contractor’s opinion, may impact costs to the Owner or prevent the systems from achieving all purposes of the Specification.

I. Addenda:

1. Written or graphic instruments issued by Consultant prior to execution of Contract, which modify or interpret Bidding Documents by additions, deletions, clarifications or corrections. Addenda shall be binding and become part of Contract Documents.

2. Prior to receipt of Bids, Addenda will be on line at EVMS Solicitation page - https://www.evms.edu/about_evms/administrative_offices/materials_management/solicitations/ and at eVA - https://m.vendor.epro.cgipdc.com/Vendor/public/AllOpportunities.

3. Bidder is responsible to verify with Consultant that Bidder has received all addenda. Failure to receive such addenda shall not relieve Bidder from any obligation under his/her Bid as submitted.

J. Subcontract Information: As part of the Bid Response, the Bidder shall indicate any portion of the project for which the Bidder intends to engage a Subcontractor. The Bidder shall further identify all responsibilities and all work to be performed by the Subcontractor. All work performed by the Subcontractor shall be under the supervision of the Contractor and shall be the responsibility of the Contractor.

K. Sales and Use Tax: Not applicable

L. Preparation of Bids:

1. Bids shall be submitted on Bid Form included in Bid Documents.

2. All blanks on Bid Form shall be filled in and executed with non-erasable ink product. Any alteration or erasure shall be initialed by the signer of Bid.

3. Bid Form shall state the legal name of Bidder and shall be signed by person or persons legally authorized to bind Bidder to a contract. Bid submitted by a corporation shall also give the state of incorporation and have corporate seal affixed. Bid submitted by an agent shall have a current power of attorney attached certifying agent’s authority to bind Bidder.

4. The Bidder shall provide line item pricing for all equipment as an attachment. All pricing is to be inclusive of any applicable taxes, shipping, handling, expenses, insurance or other miscellaneous charges. The Bidder agrees that the Owner may increase, decrease, or

delete entirely individual items, scheduled quantities of work to be done, or materials to be furnished after execution of the Contract.

M. Submission of Bids:
   1. Submit Bid Form provided and with Bid Security and any other required documents enclosed no later than 5:00 PM EST, Tuesday, August 13, 2019.
   2. Submit one (1) copy of all documentation.
   3. Bidder is responsible for method and timely delivery to location designated for receiving of Bids.

N. Modifications or Withdrawal: Bidder may modify or withdraw his/her Bid at any time prior to bid receiving deadline by notice to Owner at place designated for receipt of Bids.
   1. Notice shall be in writing and signed by authorized agent as indicated in original Bid Form.
   2. Notice of modification or withdrawal of Bid is invalid if transmitted by automated electronic methods.

O. Bid Receiving:
   1. Receiving Time: 5:00 PM EST
   2. Receiving Date: Tuesday, August 13, 2019
   3. Receiving Place: mletsinger@thesextantgroup.com
   4. Bids are valid only if deposited at designated location prior to receiving time. Bids deposited after receiving time will not be considered. Email responses preferred..

P. Rejection of Bids:
   1. Bidder acknowledges right of Owner to reject any or all Bids, to waive any informalities or irregularities in Bids received and to re-advertise for Bid.
   2. Bidder recognizes right of Owner to reject a Bid if Bidder failed to:
      a. Furnish the required Bid Security.
      b. Submit data required by Bidding Documents.
      c. Complete in any way the Bid Form.
      d. Attend the Pre-Bid meeting.

Q. Award of Contract: Intent of Owner is to award a Contract to best value Bidder. The Owner will select the Bid determined during the evaluation of the timely submitted Bids to be the most advantageous in meeting the specifications as outlined under this RFP. This may or may not be the Bidder, which presented the lowest costs/price. In determining the best value bidder, evaluation will be based on the following criteria:
   1. Price bid for the Work 35 points
   2. Ability, capacity and skill to comply with Specifications and perform the Work required 20 points
   3. Character, integrity, reputation, judgment, experience and efficiency 20 points
   4. Quality of performance of previous like projects in scope, size, and complexity 20 points
   5. Small, Women, and Minority Vendors (SWaM) - including Small Business Plan 05 points

R. Submission of Post Bid Information:
   1. Upon notification by Owner, apparent best value Bidder shall submit within 5 days:
      a. Designation of the Work to be performed by Bidder with his/her own forces.

b. List of names of subcontractors, other persons, organizations, or entities (include those who furnish materials or equipment fabricated to a special design) proposed for such portions of the Work designated in Bidding Documents or names of subcontractors proposed for principal portions of the Work.

c. Bidder shall establish to the satisfaction of Consultant and Owner, reliability and responsibility of persons or entities proposed to furnish and perform the Work described in Bidding Documents.

d. Prior to final determination of best value Bidder, Owner will notify apparent best value Bidder in writing if, Owner has reasonable or substantial objection to and refuses to accept any person or firm on list. If Owner has objection, Bidder may withdraw Bid or submit a substitute with adjustment in cost to cover any difference. Owner shall accept adjusted Bid price or disqualify Bidder. In either condition, Bid Security shall not be forfeited.

2. Subcontractors, other persons, organizations, or entities proposed by Bidder and accepted by Owner must be used on the Work for which they were proposed and accepted, and shall not be changed except with written approval of Owner.

S. Post-Bid Interview: Upon receipt of Bid Responses, the Owner, Architect, and Consultant may require Bidders to participate in a Post-Bid Interview in Norfolk, Virginia. Bidders should be prepared to attend, answer questions, and clarify any discrepancies in Bid Responses.

1.3 BONDS

A. By submitting a proposal, Bidder confirms that the company will provide the following:

1. Bid Security: A bid guarantee equivalent to five percent of bid price as assurance that the bidder upon acceptance of his bid, execute such contractual documents as may be required within the time specified.

2. Performance Bond: A performance bond on the part of the offeror for 100 percent of the contract price to secure fulfillment of all the offerors obligations under such contract.

3. A payment bond on the part of the offeror for 100 percent of the contract price to assure payment as required by statute of all persons supplying labor and material in the execution of the work provided for in the contract.

4. Bonds shall be obtained from companies holding certificates of authority as acceptable sureties pursuant to 31 CFR Part 223, “Surety Companies Doing Business with the United States”.

1.4 INSURANCE

A. Workers’ Compensation – Statutory requirements and benefits and employer’s liability at $1,000,000. To include a Waiver of Subrogation in favor of EVMS.

B. Coverage is compulsory for employers of three or more employees, to include the employer. Contractors who fail to notify the Medical School of increases in the number of employees that change their workers’ compensation requirements under the Code of Virginia during the course of the contract shall be in noncompliance with the contract.

C. Commercial General Liability - $1,000,000 per occurrence and $2,000,000 aggregate. Commercial General Liability is to include bodily injury and property damage, personal injury and advertising injury, products and completed operations coverage. The Medical School must be named as an additional insured to include both ongoing and completed operations and so endorsed on the policy. and a Wavier of Subrogation in favor of EVMS.

D. Automobile Liability - $1,000,000 per occurrence. (Only used if motor vehicle is to be used in the contract.)

E. Professional Liability - $1,000,000 per occurrence, $3,000,000 aggregate for successful bidder and all subcontractors involved in design and programming.

F. Cyber/Data Breach: Limits of $1,000,000 liability for privacy and network security.

1.5 PERMITS, FEES, AND LICENSING

A. All proposals submitted shall have included in price the cost of any business or professional licenses, permits or fees required by the Commonwealth of Virginia. The Offeror must have all necessary licenses to perform the services in Virginia, and, if practicing as a corporation, be authorized to do business in the Commonwealth of Virginia.

1.6 START OF CONSTRUCTION

A. Work shall not begin until Contractor has received written Notice to Proceed.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION 1

SECTION 2 – GENERAL CONDITIONS

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. The General Conditions, Requirements, and Special Provisions, of any larger body of specifications, of which this Specification may be a part, are hereby made a part of this Specification. In the event that any clauses or provisions of the larger body of specification conflict with the letter or intent of this Specification, the Contractor shall immediately notify the Consultant for clarification and direction.

1.2 THE SPECIFICATION

A. The “Specification” is defined as the body of documentation provided to the Contractor with the Request for Quotation, as well as all addenda to said documentation. Throughout this document, words such as “herein” refer to the entire Specification, and not just this written document.

B. The Specification includes, but is not limited to:
   1. This written specification document.
   2. All drawings, as listed in the List of Drawings.
   3. Additions and/or modifications as detailed in written addenda.
   4. Additions and/or modifications as detailed in drawing additions or reissues.

C. The purpose of the Specification is to provide sufficient detail for the Bidder to understand the functional requirements of the systems, the installation and performance standards that must be met, and the required scope of work, in order to generate and submit a complete and accurate bid.

1.3 DEFINITION OF TERMS

A. Within this section of the specification, the following definitions shall apply:
   1. The term “Owner” is used to indicate Eastern Virginia Medical School.
   2. The term “Architect” is used to indicate RRMM.
   3. The term “Consultant” is used to indicate: The Sextant Group, Inc., 2296 Henderson Mill Road NE, Suite 116, Atlanta GA 30345.
   4. The term “Bidder” is used to indicate that entity generating the bid response.
   5. The term “Contractor” is used to indicate the successful Bidder to whom the Owner has awarded the contract.
   6. The term “Furnish” is used to indicate the responsibility to procure and ship or deliver the item to the job site, freight prepaid, for receipt, staging and installation by others.
   7. The term “Install” or “Installation” is used to indicate the responsibility of receiving the item at the job site, assuring adequate storage, unpacking or uncrating the item, physically securing the item, configuring and testing the item, or otherwise making ready the item for its intended use by following the instructions and approved methods of the manufacturer and any additional requirements described herein.
   8. The term “Provide” is used to indicate the responsibility to both “Furnish” and “Install.”
   9. The term “Provided by Others” shall refer to material and work, which is related to this contract, but has been provided by parties other than the AV Contractor. An example might

be in reference to a projection screen installed during building construction but requiring interface to the AV control system.

10. The terms “NIC” and “Not In Contract” are equivalent to “Provided by Others.”
11. The term “OFCI” (Owner Furnished Contractor Installed) shall refer to equipment that will be furnished by the Owner for installation by the Contractor. The Contractor shall be responsible for coordinating with the Owner in regards to the specific requirements of the equipment as applicable to meet the functional requirements of the systems as specified. The Contractor shall be responsible for installing and integrating this equipment as required to produce a fully-functioning system. This may include the installation and configuration of software, PCI cards or other components within or attached to OFCI computers that are required by the AV systems.
12. The term “Contractor Selected” refers to ancillary items where no specific manufacturer and/or model number has been listed as the basis of design in the Bidding Equipment List. The Contractor shall select a product that meets the performance and functional requirements of the system, and submit the product as part of the line item pricing, Shop Drawings and Bill of Materials submittal process as defined herein.
13. The term “Installation Materials” shall reference installed cable, loose cable, terminations, signal extenders, cable management, voice/data/video patch cords, adapters, I/O panels, cable dressing, lacing bars, copper bus bars, labels, rack shelves, rack mounts, power supplies and adapters, power strips/distribution and other materials as needed to install the systems defined herein.
14. The term “Substantial Completion” is used to indicate the stage in the progress of the work where the systems are determined to be sufficiently complete in accordance with the Specification so that the Owner can utilize the systems for their intended use.
15. The term “Final Acceptance” is used to indicate the point in which all contract requirements have been met by the Contractor after Substantial Completion has been achieved. This includes, but is not limited to, the correction and acceptance of any remaining punch-list items, approval and delivery of all Final Documents, and user training as specified.
16. The term “shall” is mandatory; the term “will” is informative; and the term “should” is advisory.

1.4 SCOPE OF WORK

A. The Contractor shall provide complete, turnkey audiovisual systems performing all of the services and functions as described herein, together with all other apparatus, cable, materials, labor, tools, transportation, and any other resources necessary to provide a complete system.

B. Specifically, the work shall include, but is not limited to:
   1. Coordination
      a. Communicating and coordinating directly with the Consultant, Owner, Architect and other trades complying with all requirements as defined under this Scope of Work and elsewhere, to fulfill all requirements of this specification.
      b. Scheduling installation operations in sequence required in order to obtain best completion results.
      c. Coordinating installation of different components to assure maximum accessibility for required maintenance, service, and repair.
      d. Verifying required cable lengths for all bulk cable or manufactured cable assemblies prior to ordering as outlined in ‘Installation Practices’.
      e. Verifying the accuracy of Master Quote or other quotation numbers prior to ordering.

1). Where given, Master Quote numbers or other quotation numbers have been provided as a convenience to Bidders and are intended to be used for bidding purposes only.

2). Bidding Equipment List subsystem sections, where a Master Quote has been provided, may only show a small number of items to help convey the design intent of the subsystem. Refer to the Master Quote for the expanded list of subsystem components.

3). A Master Quote may not be inclusive of all components or accessory items necessary to provide for a complete, functioning and properly integrated subsystem. The Bidder shall include all miscellaneous materials that may be required to complete the subsystem.

4). Where discrepancies between a Master Quote and the Bidding Equipment List exist, the Master Quote shall rule.

2. Documentation
   a. Generating and submitting Shop Drawings as required for approvals and As-Built drawings as specified herein.
   b. Generating and Submitting “Progress Reports” as defined herein.
   c. Documenting the completed installed systems as defined herein.
3. Design Verification and Acceptance
   a. Verifying the accuracy of the system designs documented in the Specification and acceptance of responsibility. Any issues, discrepancies substitutions, or exceptions to the Specification by the Contractor shall be communicated to the Consultant prior to the purchase of any equipment or materials by way of the Shop Drawings Submittal process. Upon approval of the Contractor’s Shop Drawing Submittal by the Owner's designated representative, or if the Contractor fails to submit Shop Drawings, the Contractor shall assume all responsibility for supplying such materials and taking such actions as to satisfy the full intentions of the Specification without claim for additional compensation. This shall include providing any incidental equipment, Installation Materials and labor needed in order to result in a complete and operable system, even if such equipment, materials or labor are not listed in this Specification. Exceptions include Owner-requested changes, unexpected field issues due to work by other trades, or schedule changes initiated by others.
4. Cabling, Equipment, and Installation
   a. Providing all cable in conduits for the specified systems. Place pull string in all conduits after cable installation is complete to allow for future cable installation.
   b. Providing station cables for connection of IP-enabled audiovisual equipment to associated data network outlets, including but not limited to presenter’s computers, production computers, laptop connections, control system processors, codecs, and projectors. This applies to all equipment installed by the Contractor, including Owner-Furnished (OFCI) items. Coordinate station cable requirements with the greater building-wide structured cabling system.
   c. Coordinating and providing cable labels as stipulated by the Owner and/or specified herein.
   d. Furnishing and/or installing all equipment as specified.
   e. Installing Owner furnished equipment as specified.
   f. Providing speakers as complete assemblies with back boxes, grilles, tile bridges, wall mounts, hanging hardware and other installation hardware as required.

g. Coordinating with the Architect and Owner on final color selection, and/or the painting of any exposed loudspeakers and any/all exposed system components to match the room's aesthetics and finishes.

h. Coordinating with local entities as necessary (manufacturer, Owner, SBE, FCC, etc.) to determine final channel selection for all wireless devices and resolve conflicts where they may occur.

i. Providing to the Owner, upon completion, all accessories and ancillary items included with the manufacturer's equipment but not used for the physical installation of the device. This shall include all user manuals, remote controls, batteries, tools, installation hardware, carrying cases, protective covers, loose cables, etc. Batteries shall be provided for all battery-operated devices, even if not included by the manufacturer.

j. Furnishing all lifts, ladders, scaffolding or other resources as needed for proper safe installation. Coordinating with other trades as needed.

k. Interconnecting all components, both internal and external to rack cabinets.

l. Ensuring that all cabling, equipment, and terminations are installed in accordance with accepted industry standards, approved Shop Drawings, manufacturer's recommendations and as stipulated herein.

m. Providing cable management hardware as required including; that required internal to rack cabinets; that required between pieces of equipment not housed in rack cabinets; and that required to extend cabling from rack cabinets and equipment to the greater facility cabling infrastructure.

n. Providing equipment mounting hardware as required including; that required for mounting equipment behind flat panel displays; that required to mount equipment within equipment racks; that required for other locations where equipment will be housed.

o. Providing custom cover plates, wall plates, I/O connection plates, floor box insert plates as required. Coordinate with the Architect and/or Owner on the final selection of finishes.

p. Ensuring that all equipment, with the exception of portable equipment, is firmly fastened or attached in place. A safety factor of at least four shall be utilized for all brackets, fasteners and attachments. Provide safety retention cables for overhead equipment such as loudspeakers, projectors, etc.

q. Ensuring that all equipment mounting styles and locations comply with the 2010 ADA Standards for Accessible Design.

r. Providing all projector mounts, including guy wires, clamps, or support assemblies back to structural members. Obstructions vary from room to room; Contractor must pay close attention to this issue on a room-by-room basis.

s. Field verifying all projector locations and resolving any obstruction conflicts for optimal performance. The Contractor shall reference the infrastructure drawings for screen sizes and field verify measurements to confirm throw distances to determine the appropriate lens required prior to procurement.

t. Providing all projector lenses as required.

u. Mounting / aligning the projectors so that digital keystone correction is not required. Optical lens shift shall be employed, only if necessary, to align the image with the image area. Where possible all projectors mounted below the ceiling shall be mounted and adjusted to be perpendicular to the screen surface.

v. Coordinating with the General Contractor and/or Electrical Contractor on the audiovisual control system connection to the projection screens, as required

w. Performing final adjustments to motorized projection screens provided by Others to include:
   1). Screen travel limits as required optimizing the amount of black drop in conjunction with projection system geometry, field conditions and manufacturer recommendations. Refer to the Drawings for specified dimensions.
   2). Tab-tension systems (where specified) to ensure a flat projection surface free of wrinkles, waves or other anomalies which might indicate that the tensioning cables require adjustment.

x. Providing any/all patching, caulking, fire stopping, and painting required to restore damaged finishes during installation.

5. Furniture
   a. Providing audiovisual lecterns and technical furniture as specified.
   b. Coordinating with the Consultant, Architect and Owner on the final selection of all technical furniture including design details (make/model), available options, dimensions, cable management needs, color, laminate, metal finish, logo and finish.
   c. Coordinating with furniture manufacturer or others who are providing all necessary furniture/millwork modifications (“cut-outs” or other) as required allowing for a neat and professional installation of integrated technology system components. This includes, but is not limited to: integrated table/lectern “cubbies”, table-top microphones, cable management grommets, etc., and providing manufacturers’ cutout templates to others when requested.
   d. Coordinating with the furniture manufacturer, Owner, and Architect on cable management, thermal management, and equipment installation requirements in all spaces so equipped and as outlined in ‘Installation Practices’. Providing manufacturer’s product cut sheets and/or equipment samples where they may be needed to assist in the design by Others towards integrating such equipment into furniture systems or architectural features.
6. Coordination with Owner’s Network
   a. Securing from Owner private IP addresses for use by Ethernet equipped audiovisual devices. No Ethernet equipped device shall be connected to Owner’s network without the express permission of Owner. This shall include, but is not limited to configuration parameters such as DHCP, IP addresses, subnet information, VLAN setup and authorization.
   b. Confirming with the Consultant that coordination with the Owner regarding Ethernet equipped audiovisual devices as outlined in ‘Submittals – Software’.
7. Programming and Software
   a. Developing and installing all custom control programming code as required and/or as specified herein.
   b. Providing Control System design submittals and two Control System design revisions as outlined in ‘Submittals – Software’.
   c. Providing centralized media control systems including GUI (Graphical User Interface) and code development in order to satisfy the guidelines outlined herein.
   d. Developing Control System help-desk and system administrator functionality as defined herein.
   e. Coordinating with the Electrical Contractor and/or others on the control system interfaces to mechanical systems including motorized screens, as specified.
   f. Coordinating with the Electrical Contractor and/or others on the low voltage control system interfaces to facility lighting where specified.

g. Providing the executable (uncompiled) programming control code as defined herein.
h. Developing and installing all custom software for DSP devices as required to optimize system performance.
i. Installing, configuring, and testing all manufacturer provided software applications included with the specified equipment.
j. Participate in a Software Deployment kick off meeting with the Owner and Consultant.
k. Coordinating Audio DSP settings with Consultant for the purposes of integrating any necessary recalls into the control software.
l. Coordinating with Consultant to communicate any conditions or circumstances that do not satisfy the functionality described herein.
m. Loading and testing any control programming code updates prior to Substantial Completion and during the Warranty period.

8. Testing, Training, Acceptance, and Warranty
   a. Ensuring that all individual components function as intended by this Specification.
   b. Ensuring that the entire audiovisual systems function as intended by this Specification.
   c. Testing, adjusting, and fine-tuning the completed systems and components.
   d. Coordinating and participating in a Systems Performance Verification review with the Owner and/or Consultant.
   e. Coordinating and conducting an acceptance walk-through and sign-off session with the Owner and/or Consultant.
   f. Providing “sign-off” documents for each space and/or space type as defined herein.
   g. Conducting training in systems operation for the Owner’s designated representative(s).
   h. Providing a warranty service contract as defined herein.

C. Work Excluded: Work not included under this contract shall be:
   1. Providing conduit, power receptacles, junction boxes, cable raceways, electrical back-boxes, and floor boxes.
   2. Providing lighting fixtures, lighting dimming systems, lighting controllers, and lighting system low voltage AV interfaces at the dimmer side.
   3. Providing millwork except where otherwise specified herein.
   4. Providing wall or ceiling mounted projection screens.
   5. Providing recessed wall boxes for video cameras.
   6. Providing blocking as required to support wall-mounted audiovisual components.
   7. Providing window treatments and motorized shade system low voltage AV interfaces at the controller side.
   8. Providing telecommunications structured cabling systems, including horizontal and backbone cabling and termination, voice and data face plates, associated racks and cabinets, raceway, and cable management.

1.5 SITE CONDITIONS

A. Conflicts: The Bidder shall be responsible for investigating any potential conflicts with site-related or union-related issues regarding use of personnel, scheduling, access to the site, storage of tools and equipment on-site, and other areas of potential conflict. If these issues impact the Bidder’s Bid Response, the impacts on cost and schedule should be clearly noted in the Bid Response

B. Coordination: In the interest of a coordinated and professional project, the Contractor shall:
   1. Coordinate his/her work with that of other trades. The Contractor should anticipate attending approximately twelve (12) project coordination meetings with the Owner, Architect, General Contractor, Consultant or other trades as required.
   2. Afford other trades reasonable opportunity for installation work and for storage of materials.
   3. Staff the job to keep pace with other Trades.

C. Equipment Delivery and Storage: Costs of all shipping to the site, and of all unusual storage requirements, shall be borne by the Contractor. It shall be the responsibility of the Contractor to make appropriate arrangements, and to coordinate with the authorized personnel at the site, for the proper acceptance, handling, protections, and storage of equipment so delivered.

D. Refuse / Cleaning Up:
   1. The Contractor shall keep the site and building free of all debris and clutter, to the satisfaction of the Owner or site manager. On a daily basis, the Contractor shall remove refuse and rubbish related to the specified work from the site and shall leave the relevant areas and equipment clean and in an operational state. The Contractor shall be responsible for repairing any damage caused to the premises by the Contractor's installation activities, at no cost to the Owner.
   2. At completion of the Work, the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.
   3. If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

E. Use of Site:
   1. Contractor shall adhere to the Owner's instructions regarding non-smoking, noise, signs, advertisements, and fires.
   2. The Contractor shall confine operations at the site to areas permitted by the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

F. Cutting and Patching:
   1. The Contractor shall be responsible for cutting, fitting or patching as required to complete the Work or to make its parts fit together properly.
   2. The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

G. Access to Work: The Contractor shall provide the Owner and Consultant access to the Work in preparation and progress wherever located.

1.6 JOB CONDITIONS

A. Space Conditions:
   1. Architectural reference drawings provided to the Contractor for bidding purposes may not reflect construction site as-built conditions. It shall be the responsibility of the Contractor to field-verify all site conditions relevant to his/her work.

2. The Contractor shall verify dimensions of equipment, equipment arrangements, space availability (including any millwork or cabinetry provided by others) and provide systems that work within the constraints of the space available. The Contractor shall notify the Consultant of any situation where space constraints are a problem, prior to the submission of shop drawings or the ordering or purchase of equipment. The Contractor shall bear the expense of providing alternate equipment, which will work within the available space, if space availability problems are discovered after shop drawings are submitted and approved.
3. If new or changed space condition issues are identified by the Contractor or others after the approval of shop drawings, the Contractor shall provide a proposed solution for the identified issue. The proposed solution shall include any potential impact to cost and/or schedule. Proposed solutions will be reviewed and approved by the Owner, Architect and/or Consultant, or alternate solutions will be recommended.
4. Drawings indicate locations of equipment and components. Changes in the location, and offsets of same to accommodate building conditions, and coordination with the work of other trades shall be made prior to initial installation, without additional cost to the Owner.
5. The Contractor shall ensure during installation that access is provided to equipment and components requiring operation, service or maintenance within the life of the system.
6. It shall be the responsibility of the Contractor to identify any condition where the recommended environmental and/or electrical operating parameters for specified equipment/products cannot be assured. Should such condition exist, it shall further be the responsibility of the Contractor to notify the Architect and Consultant of any such condition.

1.7 POST-AWARD REQUEST FOR INFORMATION

A. All requests for information (RFIs) shall be communicated by way of the enclosed Request For Information Form (APPENDIX D). RFI forms may be e-mailed to the Consultant at mletsinger@thesextantgroup.com.

B. The Contractor shall receive written response within 5 working days of receipt of the RFI by the Owner/Consultant.

1.8 LAWS AND REGULATIONS

A. All equipment, cabling, materials, and installation methodology shall conform to the requirements of the National Board of Fire Underwriters, the current published edition of the National Electrical Code, and all other applicable laws and regulations. The Contractor shall obtain and pay for any additional permits and inspections required by all legal authorities and agencies having jurisdiction over the Contractor’s work.

1.9 QUALITY ASSURANCE

A. Unless otherwise stated, all equipment for this installation will be new, less than one year from the date of manufacture, and without blemish or defect.
   1. All electrical, electronic and optical equipment provided by the Contractor shall be a product of companies regularly engaged in the manufacture of electrical, electronic or optical equipment.
   2. All equipment must be purchased from a manufacturer-approved distributer or reseller. Purchase of equipment from a non-approved reseller is prohibited.
   3. The equipment shall be the latest model or type offered which meets the applicable specifications at the time of the submittal. Discontinued items replaced by newer models or versions are prohibited from use in the project. It shall be the Contractor’s responsibility to

provide the Consultant with information regarding discontinued products listed in the specification. If a product listed is discontinued prior to installation, the Contractor shall submit a substitution request.

a. Request shall include name of material, product or equipment to be substituted and a complete description of proposed substitution including drawings, performance and test data and other information necessary to demonstrate that the substitution will meet all intentions of this Specification or required for a complete evaluation.

b. Contractor shall assume and bear all responsibility for coordinating and/or performing related changes in the Work necessitated by such substitution. This includes, but is not limited to, changes to other related audiovisual components, Installation Materials, architectural integration details, software programming, and required infrastructure.

c. The Contractor shall receive written response within 5 working days of receipt of the Substitution Request by the Owner/Consultant.

4. Where applicable, all equipment must have the manufacturer's latest firmware version installed prior to Testing and Systems Performance Verification.

B. Quality of workmanship and fabrication of all equipment and components, which are custom fabricated shall be comparable to professional equipment produced by specialized manufacturers of the trade involved and shall be verified by observation. Only firms having 10 years' experience in all aspects of the fabrication and installation of similar systems shall be allowed to perform the work.

C. The work specified herein, and in each of the allied sections, shall be accomplished by a single Audiovisual Contractor experienced in the design, fabrication, installation, checkout and warranty contract management of systems such as those described in each section.

1. The Audiovisual Contractor shall have complete responsibility for the systems described herein and shall be the single contract point for the Architect, the Consultant and/or the Owner with respect to all work specified herein.

2. The Contractor shall maintain the same project manager and field supervisor throughout the installation, and where practical, maintain the same installers.

D. The Contractor shall supply and install any incidental equipment needed in order to result in a complete and operable system without claim for additional payment, even if such equipment is not listed in this Specification.

E. All work related to this Specification shall be completed in a professional manner by fully qualified workers.

1.10 RELIABILITY

A. General: The systems are designed to provide professional quality operation over a period of several years without the need for continual maintenance. Equipment that has a high failure rate is not acceptable for installation as part of the systems.

B. Warranty: The Bidder shall make known, in writing, at time of Bid any exceptions that might exist between conditions described herein and Bidders policy of warranty. After acceptance of bid, all conditions and requirements of warranty described herein shall apply.

1. The Contractor shall guarantee all equipment, materials, and labor for a period of 1 year from the date of Substantial Completion.

2. Bidders shall maintain permanent fabrication, service and support facilities within (100) miles of the Project site during the Work and Warranty period.

3. During the warranty period, within 24 hours of notification, the Contractor shall answer all service calls and requests for information.
4. During the warranty period, within 96 hours of original notification, the Contractor shall provide emergency service to restore operation of the system, replacing defective materials, repairing faulty workmanship, making temporary repairs, and providing loaner equipment as necessary, all at no charge.
5. The Contractor shall notify the Owner before any service call whether such call is or is not covered under warranty. The Owner may be billed for non-warranty calls. The Contractor shall notify the Owner of any service call or work to be performed for which charges may be incurred before such work commences.
6. Improper functioning, for warranty purposes, means failure of the system to meet the intentions of the specification because of internal defects. It does not include Owner caused malfunctions such as re-adjustment of the controls, re-tuning of the system, or injury to the system beyond normal wear. Nor does the warranty cover paint, exterior finishes, fuses, lamps (including projection lamps) or associated labor, unless the damage or failure results from defective materials or workmanship covered by the warranty.
7. The Contractor shall take such actions at the time of installation to ensure that all equipment is installed in accordance with the manufacturer recommended environmental and electrical operating conditions and requirements. After installation, the Contractor shall be responsible for the repair or replacement of said equipment that the Contractor installs which fails due to environmental or electrical conditions, even if not covered by the manufacturer's warranty. The Contractor shall not be held responsible for damages due to changes in environmental conditions, which occur after the date of Substantial Completion.
8. Unless otherwise directed, the Contractor shall activate all manufacturer warranties in the Owner's name. The start date of the warranties shall be the date of Substantial Completion.
9. If the Contractor has modified certain components, the manufacturer warranty may be void. In this case, the Contractor is responsible for providing warranty coverage equal to that of the manufacturer.
10. Certain subsystems and system components may require installation by authorized representatives in order for the complete manufacturer warranty to apply. If this pertains to any subsystem or component for this project, it is the Contractor's responsibility to make arrangements for the complete manufacturer warranty to apply. These arrangements are to be at no additional cost to the Owner.
11. As part of the Bid Response, the Contractor shall provide the Owner with a proposal to extend the Warranty to cover Year 2, Year 3, and Year 4 of operation. These offerings are to include all parts and all labor; all conditions and restrictions listed above apply.

1.11 PROTECTION OF PERSONS AND PROPERTY

A. Safety Precautions and Programs: The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. This requirement applies continuously 24 hours per day during construction of the Project.

B. Safety of Persons and Property: The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to
   1. employees on the Work and other persons who may be affected thereby;
   2. The Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors and vendors.

C. Weapons Policy: Possession of dangerous weapons (concealed or unconcealed) on the Owner's property, on the work site, in Owner vehicles, or in personal vehicles when on the Owner's property shall be a violation of the Owner's policy. A dangerous weapon shall include guns, knives, explosives, or any other device as determined by the Owner, which in the manner used or intended is capable of producing death or bodily injury. Devices authorized by the Owner and/or provided to its employees for the purpose of carrying out work responsibilities shall not be deemed dangerous weapons for the purpose of this policy. Violations of this policy shall make the offender subject to appropriate disciplinary action.

1.12 OFF-SITE STORED MATERIALS

A. This Section specifies administrative and procedural requirements for handling requests for approval of partial payments for certain materials stored off-site.

B. The Owner will handle each request individually and in consideration of deployment and resources.

1.13 DELAY IN COMPLETION AGREEMENT

A. The Owner and the Contractor agree that it would be impossible to accurately fix the actual damages sustained by the Owner due to the Contractor's failure to place the systems into service by the Substantial Completion Date or as otherwise amended by mutual agreement of the parties. Therefore, in the event that the systems are not substantially installed and available for use by such Substantial Completion Date, liquidated damages of Five Hundred Dollars ($500) per day shall be owed by the Contractor to the Owner for each day of delay caused solely by the Contractor, excluding any delay caused by the Owner, or an event beyond the Contractor's control.

B. If systems are not finally completed by the Final Completion Date, the Contractor shall owe to the Owner, not as a penalty but as liquidated damages, the sum of Five Hundred Dollars ($500) per day for each and every calendar day of delay in final completion of the systems into service.

1.14 LIMITATION OF LIABILITY

A. The Contractor's entire liability under the Delay In Completion Agreement, including liability arising out of the Products purchased or services performed shall be limited to the total value of the Agreement. Regardless of the legal or equitable basis of any claim or of actual notice, neither the Contractor nor the Contractor's suppliers shall be liable for indirect, special, consequential, or incidental damages. Any claim by the Owner shall be brought within one year of the date of the circumstance of event giving rise to the claim. If the Contractor's performance under this Agreement, or of any obligation here under, is interfered with by reason of any circumstances beyond the Contractor's reasonable control, including, without limitation, fire, explosion, power failure, acts of God, war, revolution, civil commotion, or acts of public enemies, any law, order, regulation, ordinance, or requirement of any government or legal body or any representative of any government or legal body; labor unrest, including, without limitation, strikes, slowdowns, picketing or boycotts; then the, Contractor shall be excused from its performance on a day-for-day basis to the extent of such interference.

1.15 SUBMISSION FOR PUBLICATION

A. Prior written consent from the Owner is required before submitting any information about this project for publication or award. This shall include, but not be limited to, photographs, descriptions, drawings, renderings, equipment lists, or any other information regarding the

project. If written consent is provided by the Owner, any submission for publication or award must properly credit the Owner, Architect, and Consultant.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION 2

SECTION 3 – DESIGN AND PERFORMANCE REQUIREMENTS

PART 1 - GENERAL

1.1 PROJECT OVERVIEW

A. Eastern Virginia Medical School is currently constructing the new New Education and Academic Administration Building in Norfolk, VA. The building will contain technology enabled meeting spaces supporting both video conferencing and presentation systems. The building will also include three 170 seat classroom spaces, two 60 seat classrooms, all supporting multimedia enhanced presentation and instruction, and distance learning. A wellness center and a testing facility is also included. A master control facility will provide the operations and monitoring of building-wide routing, streaming, conferencing and helpdesk.

B. Eastern Virginia Medical School is seeking a turn-key job to be provided by one vendor to supply equipment, labor, installation materials, programming, testing, training, and follow-up support for the audiovisual systems as described in this Specification.

C. All video projection screens, junction boxes, floor boxes, conduit, power receptacles and network outlets (for connection to Owner's network) have been provided by Others during the project construction phase unless otherwise noted.

1.2 SYSTEMS DESCRIPTIONS – BASE BID

A. SY-01 and SY-02 - 170 Seat Classrooms RM100, 200

1. The 170-Seat Classrooms will accommodate class lectures and team-based learning and group collaboration enhanced by audiovisual presentation, rich media capture, and synchronous distance learning. Occasionally, the rooms will be used for special events. Student tables and chairs will be moveable to accommodate reconfiguration although this may be infrequent.
2. Four high lumen ceiling-mounted projectors with large motorized ceiling-recessed projection screens will be provided in each half of the room. The screens can be used to show independent images or the same content.
3. The instructor will have access to a variety of audiovisual source devices and functionalities from a mobile custom instructor lectern including a dedicated instructor computer with touch screen monitor for annotation, high resolution ceiling-mounted document camera, cable inputs for a walk-in laptop, wireless presentation, and auxiliary inputs for other equipment. The instructor lectern will plug into a floor box for connectivity to power, network, and to the greater audiovisual system. Instructor floor boxes will be located near the teaching wall in a central position. It is anticipated that instructors will interact with student teams at the tables and walk around the room.
4. A wireless microphone will be provided for the instructor lectern to support voice reinforcement and recording. Multiple wireless microphones will be available to support group presentations and guest speakers. Student tables will be equipped with a wireless push-to-talk delegate microphone system. When not in use, the wireless microphones will be stored in two charging carts as one per sub-divided space.
5. Ceiling-mounted loudspeakers are planned for program audio and speech reinforcement. A wireless hearing assist system will be integrated into the system to meet the needs of the hearing impaired in line with 2010 ADA standards for accessible design.
6. The system will operate with the instructor's station as the "master console." Lights and motorized shades for the overall space will be controlled from a single button push and audio will be distributed across all loudspeakers.

7. Wall-mounted video cameras will support distance learning as well as rich media capture with a dedicated vvideoconference CODEC and streaming capture recorder. Camera and audio feeds will tie back to a centralized AV Control Room for operator monitoring, control, and capture. The system can also be used to broadcast lectures as overflow to another room.
8. Two Owner furnished displays will be available at the instructor lectern in each space for use in confidence monitoring and viewing the dedicated PC.
9. A large color touch panel will be located on the instructor's station and used for control of audio, display, source selection, and control of dimmable lighting and motorized shades within the space. The Graphical User Interface will follow the campus standard.
10. All equipment that does not need to be accessed on a regular basis will be housed in two gangable audiovisual equipment racks in an adjacent Audio Visual Rack Room (AVRR). One rack per divided venue.

B. SY-03 - 170 Seat Tiered Classroom RM300

1. The tiered 170-seat Classroom is located on the third floor. The room will be arranged to support case study lecture and team learning with fixed team tables for collaboration. This room will accommodate large-group presentations enhanced by a multimedia presentation system and will include equipment for lecture capture and videoconferencing. The room will feature a high resolution dual projector single blended front projection image system.
2. Two confidence monitors on rolling carts for the instructor's use shall be provided. AV and power connections for displays will be at a floorbox.
3. The instructor will have access to a variety of audiovisual source devices and functionalities from a fixed custom instructor lectern including a dedicated instructor computer with touch screen monitor for annotation, high resolution ceiling-mounted document camera, cable inputs for a walk-in laptop, wireless presentation, and auxiliary inputs for other equipment. The instructor lectern will plug into a floor box for connectivity to power, network, and to the greater audiovisual system. An additional separate floor box will be located in the front of the room with multiple microphone inputs to support seated panel discussions.
4. A wireless microphone will be provided at the custom instructor lectern to support voice reinforcement and recording. Multiple wireless microphones will be available to support group presentations and guest speakers. Student tables shall be equipped with a wired push-to-talk microphone systems with camera tracking.
5. A five-zone ceiling-mounted loudspeaker system shall provide speech reinforcement. A wireless hearing assist system will be integrated into the system to meet the needs of the hearing impaired in line with 2010 ADA standards for accessible design. Lights and motorized shades for the overall space will be controlled from a single button push.
6. Wall-mounted video cameras will support distance learning as well as rich media capture with a dedicated videoconference CODEC and streaming capture recorder. These cameras will have microphone activated position preset recall (approximately 25 presets to cover the student tables). Camera and audio feeds will tie back to a centralized AV Control Room for operator monitoring, control, and capture.
7. Two Owner furnished displays will be available at the instructor lectern in each space for use in confidence monitoring and viewing the dedicated PC.
8. A color touch panel shall be located on the instructor's station and will be used for control of audio, display, source selections, dimmable lighting and motorized shades within the space. The Graphical User Interface will follow the campus standard.
9. All equipment that does not need to be accessed on a regular basis will be housed in adjacent audiovisual equipment racks. A separate Audio Visual Rack Room (AVRR) will house two gangable AV racks of equipment consolidating core hardware.

10. In the back of the tiered classroom will be an additional touch panel. Also, at this location will be additional power, wired network, and audiovisual connectivity to serve as a staging area for the support of a remote operator. A portable video camera and other equipment can then be brought in and connected to the wall plates for additional event support as needed. These audiovisual connections will tie to the floor box at the front of the room and to the central AV Control Room (RM138).

C. SY-04 and SY-05 - 60-Seat Classroom RM131, 133

1. Two 60-seat classrooms are located side-by-side on the ground floor. The classrooms will be furnished with moveable student tables and chairs to support alternate configurations for lectures, active learning, and group-based collaboration. Both rooms shall be equipped identically for ease in operation and support.
2. The 60-seat classrooms shall accommodate dual screen presentations and support lecture capture and videoconferencing. The rooms will feature high resolution dual front projection system and ceiling-recessed motorized projection screens. The projectors can be used to show independent images or the same content.
3. The instructor will have access to a variety of audiovisual source devices and functionalities from a mobile instructor lectern including a dedicated instructor computer with touch screen monitor for annotation, high resolution ceiling-mounted document camera, cable inputs for a walk-in laptop, and auxiliary inputs for other equipment. The instructor lectern will plug into a floor box at the teaching wall for connectivity to power, network, and to the greater audiovisual system. An additional separate floor box will be located in the front center of the room to support alternate room configurations.
4. Wireless microphones will be provided to support voice reinforcement and recording. Additional microphones will be available to support group presentations and guest speakers. In-ceiling microphones will supplement lecture capture and video conferencing.
5. Ceiling-mounted loudspeakers are planned for speech reinforcement. A wireless hearing assist system will be integrated into the system to meet the needs of the hearing impaired in line with 2010 ADA standards for accessible design. Lights and motorized shades for the overall space will be controlled from a single button push.
6. Wall-mounted video cameras will support distance learning and videoconferencing, as well as rich media capture. Camera and audio feeds will tie back to a centralized AV Control Room for operator monitoring, control, and capture. Streaming capture recorders will be centralized in the AV Control Room as a sharable resource.
7. Two Owner furnished displays will be available at the instructor lectern in each space for use as confidence monitors and viewing the dedicated PC.
8. A large color touch panel will be located on the instructor’s station and used for control of audio, display, source selection, and control of dimmable lighting and motorized shades within the space. The Graphical User Interface will follow the campus standard.
9. All equipment that does not need to be accessed on a regular basis will be housed in audiovisual equipment racks. A separate Audio Visual Rack Room (AVRR) will house a single AV rack of equipment consolidating core hardware. The AVRR is located adjacent to one of the adjoining 60-seat classrooms. It will support both venues with access into the rack space from the hallway to allow technical support to occur without class interruption.

D. SY-06 - AV Support RM140 / Rack RM138

1. An IT-AV Control Room will include a rack room, storage/workshop, and the main control room space. Staff passively monitor lecture capture recordings and videoconferences live across venues and provide active support including adjustments to cameras and audio resulting in a high-quality end product. All classrooms in the new building will have ties to the IT-AV Control Room.

2. There are four staff positions within the control room. Multiple flat panel displays are used for monitoring each venue with assignable routing to large displays and individual windows on the displays for active monitoring. Visual audio meters and headphones support audio monitoring of each venue with assignable routing to in-room loudspeakers for active monitoring. A small collaboration area within the room will include a table against the wall, a wall mounted flat panel display, a USB camera and laptop connections from the table to the display.
3. A separate Audio Visual Rack Room (RM138) will house five racks of equipment consolidating core hardware for all venues.
4. Control room will be used for both passive and active support of lecture halls. With active support, feeds from the room are routed through control for:
    a. Seamless on screen switching,
    b. Seamless switching to video conferencing and/or recording,
    c. Moderating of multipoint videoconferencing calls.
    d. Fine camera control and switching.
    e. Direct to record, high quality recording and/or streaming.
5. When supporting Distance Education (DE) classes, a key requirement is individual microphone control. Specifically control over what audio is being heard by distance students. DE classes have a dedicated director, actively controlling microphone volume in addition to video control noted above.
6. Additional master control functions at the three staff positions include:
    a. Routing media signals within the building
    b. Monitoring routable media signals within the building
    c. Full control of all audiovisual systems within the building
    d. Visual monitoring of classrooms
    e. Media streaming and storage control
    f. Help desk functions
    g. Digital signage control

E. SY-07 - Testing Center RM122
1. A large testing center will be located on the ground floor. The Center will have multiple owner provided surveillance cameras with PC workstations at the Proctor's station. Multiple wall-mounted flat panel displays will be used for announcements. Digital signage will be provided at the check-in desk/receiving area. A microphone and pre-recorded messaging playback device will be provided for making pre-exam announcements over a distributed ceiling speaker system.
2. Three OFE PC workstations will be provided for camera monitoring, recording playback, and digital signage. These workstations will also be sources for the flat panel displays in the testing room.
3. A touch panel at the check-in desk and one in the proctor room shall serve as the interfaces for controlling the audiovisual system. Supporting equipment shall be located in a rack in the proctor room.
    a. Controls included: display power, video mute, signal switching, audio volume and mute.

F. SY-08 – Wellness Center RM212 / Flex RM210

4. Several wall-mounted flat panel displays will provide entertainment to students and staff using the exercise equipment. Each display will have a cable TV connection and the ability change channels.
5. An Owner furnished Visix digital signage player will be installed behind a single display and can be selected as a viewable source.
6. A distributed ceiling loudspeaker system will provide for wireless microphone voice reinforcement and program audio.
7. Control of the displays and sound system shall be from two wall mounted touch panels.

G. SY-18 - 4 Seat Study Rooms RM105, 107, 205, 207, 211, 213, 305, 307, 311, 313
1. There are several 4-seat Group Study Rooms located throughout the new building. Each room will function as a meeting and collaboration space. Although the size and shape of each room may differ, the audiovisual technology is common among them.
2. The display system will consist of a wall-mounted flat panel display. Users will be able to connect the video output of their laptop/tablet to the display via a wall plate. The program audio will come through the flat panel displays integrated speakers
3. Laptop or personal device connectivity will power on the displays. The displays will power off or go into standby after a device is disconnected. Audio volume and mute control is to be provided by the user device.

H. SY-19 - 6 Seat Study Rooms RM112, 114, 115, 116, 314, 316
1. There are several 6-seat Group Study Rooms located throughout the new building. Each room will function as a meeting and collaboration space. Although the size and shape of each room may differ, the audiovisual technology is common among them.
2. The display system will consist of a wall-mounted flat panel display. Users will be able to connect the video output of their laptop/tablet to the display via a wall plate. The program and video conference audio will come through the flat panel displays integrated speakers
3. Laptop or personal device connectivity will power on the displays. The displays will power off or go into standby after a device is disconnected. Audio volume and mute control is to be provided by the user device.

I. SY-20 and SY-21 - Conference Rooms RM943, 944, 989
1. Each conference room will function as a meeting and collaboration space for mid-size groups. Although the size and shape of each room may differ, the audiovisual technology is common among them.
2. The display system will consist of a ceiling mounted projector (projection screen provided by others). Users will be able to connect the video output of their laptop/tablet to the display via a wall plate or a wireless gateway device. A dedicated PC located in the millwork will be an additional presentation source. The sound system will support program audio through in-ceiling loudspeakers.
3. A dedicated video conference CODEC and camera will allow for users to make video calls.

J. SY-25 - Large Conference RM1031
1. This conference room will function as a meeting and collaboration space for large-size groups.
2. The display system will consist of a ceiling mounted projector (projection screen provided by others). Users will be able to connect the video output of their laptop/tablet to the display via a wall plate or a wireless gateway device. A dedicated PC located in the millwork will be an additional presentation source. The sound system will support program audio through in-ceiling loudspeakers.

3. A dedicated video conference CODEC and two cameras will allow for users to make video calls.
4. A tabletop touch panel control system shall serve as the interface for controlling the audiovisual system. Supporting equipment shall be housed a small rack located in millwork.

K. SY-26 – Large Conference RM1075

1. This conference room will function as a meeting and collaboration space for mid-size groups.
2. The display system will consist of a large wall-mounted flat panel display. Users will be able to connect the video output of their laptop/tablet to the display via a wall plate or a wireless gateway device. A dedicated PC located in the millwork will be an additional presentation source. The sound system will support program audio through in-ceiling loudspeakers.
3. A dedicated video conference CODEC and two cameras will allow for users to make video calls.
4. A tabletop touch panel control system shall serve as the interface for controlling the audiovisual system. Supporting equipment shall be housed a small rack located in millwork.

L. SY-30 - Board RM1161

1. A Board Room will be adjacent to the President's Office and will function as a meeting and collaboration space for executive groups.
2. The display system will consist of a ceiling mounted projector (projection screen provided by others). A dedicated Polycom CODEC and camera will allow users to make video conference calls. Users will be able to connect wirelessly via the Polycom CODEC as well as HDMI connections at the floor plates. A dedicated PC located in the millwork will be an additional presentation source.
3. The zoned mix-minus in-ceiling loudspeakers sound system will support program audio, videoconference, and voice reinforcement. Ceiling microphones will support in-room voice reinforcement and video conferencing.
4. An integrated RF assistive listening system with wireless receivers shall be provided.
5. A tabletop touch panel control system shall serve as the interface for controlling the audiovisual system. Supporting equipment shall be housed a small rack located in millwork.

M. SY-31 - Small Conference RM 1166

1. This conference room will function as a meeting and collaboration space for small-size groups.
2. The display system will consist of a large wall-mounted flat panel display. Users will be able to connect the video output of their laptop/tablet to the display via a wall plate or a wireless gateway device. A dedicated PC located in the millwork will be an additional presentation source. The sound system will support program audio through in-ceiling loudspeakers.
3. A dedicated video conference CODEC and two cameras will allow for users to make video calls.
4. A tabletop touch panel control system shall serve as the interface for controlling the audiovisual system. Supporting equipment shall be housed a small rack located in millwork.

N. SY-32 - Small Conference RM1143, 1110

1. This conference room will function as a meeting and collaboration space for small-size groups.
2. The display system will consist of a large wall-mounted flat panel display. Users will be able to connect the video output of their laptop/tablet to the display via a wall plate or a wireless

gateway device. A dedicated PC located in the millwork will be an additional presentation source. The sound system will support program audio through in-ceiling loudspeakers.

3. A dedicated video conference CODEC and camera will allow for users to make video calls.
4. A wall-mounted touch panel control system shall serve as the interface for controlling the audiovisual system. Supporting equipment shall be housed a small rack located in millwork.

P. Digital Signage

1. Systems: SY-09, SY-10, SY-11, SY-12, SY-13, SY-15, SY-16, SY-17, SY-23, SY-24, SY-28, SY-29, SY-33, SY-34, SY-35
2. A single wall-mounted flat panel display will provide information via an Owner furnished Visix digital signage player installed remotely. This location varies depending on the location of the digital signage display. Remote control of each display is possible via an AMX EXB-COM2 installed at the same location as the digital signage player. Operational control of all digital signage displays shall be done via the master control in AV Support 140.
3. Visix player licenses shall be provided by the Contractor. The players will be configured by the Owner and then installed by the Contractor

1.3 SUBMITTALS

A. General:

1. The Consultant shall review the Submittals and Shop Drawings listed below. Submittal and Shop Drawing approval shall be based on conformance to the Specification and adherence to the design intent of the Specification. The Consultant's approval of the Contractor's Submittal shall not constitute a certification of accuracy or completeness in regards to equipment, quantities, installation techniques and details, software programming, equipment interoperability, safety factors, scheduling, coordination with other trades, or any other aspects of the work which are the responsibility of the Contractor. The Consultant shall perform no more than two reviews per submittal listed below. The Contractor shall be responsible for providing any incidental equipment, Installation Materials and labor needed in order to result in complete and operable systems, even if such equipment, materials or labor are not listed in this Specification.
2. The Contractor shall maintain a Master Set of this entire Specification, including all drawings and addenda, at the site at all times during the installation. Any deviations from the Specification made during the installation shall be marked on this Master Set. The Master Set along with all relevant support documentation shall be provided as part of the As Built submittal in the format outlined under Final Documentation.

B. Submittal Format:

1. All documents, configuration files and drawings shall be submitted in the following format:
   a. Electronically in PDF format.
   b. Executable configuration file (where applicable).
   c. Other formats may be acceptable upon prior approval by the Consultant and/or Owner.
   d. All .PDF files shall be submitted at the documents' native scale. For example, a PDF created from a drawing whose native format was standard 'E' size (42"x30") shall be created at 42"x30" (full size) to ensure that there is no loss of resolution should the file be viewed or printed at a later date by the Owner.

C. Schedule:

1. The Contractor shall obtain from the Owner, Architect, or Consultant a project master timeline schedule showing projected dates when the relevant areas will be available to the Contractor for the on-site installation.
2. Within 15 days of notification of contract award, the Contractor shall provide a schedule of major project milestones to the Owner, Architect, or Consultant. The schedule shall show the following milestones, but may include others as required for overall site-work coordination:
    a. Shop Drawings and Submittals
    b. Order and receipt of materials
    c. In-shop testing to validate software functionality prior to on-site installation.
    d. Delivery of materials to the work site for installation by Others
    e. Delivery of major system components to the work site
    f. Receipt of Owner furnished equipment for installation by the Contractor
    g. Development and submittal of control system GUI submittals
    h. Development and submittal of DSP submittals
    i. 50% completion of work by area
    j. 95% completion of work by area
    k. Installation of control system code
    l. 100% completion of work by area
    m. Testing and debugging on-site
    n. Final punch list
    o. Submittal of Final Documentation
    p. Training
3. If the Contractor feels that he will have any problems with meeting the scheduled project milestone deadlines, he must inform the Owner, Architect, and Consultant at the earliest possible opportunity.

D. Progress Reports:
    1. Contractor shall submit a brief Progress Report via e-mail to the Consultant. The Progress Reports should be concise, utilizing bullet points or other efficient format.
    2. The reports shall be submitted by noon on Fridays to mletsinger@thesextantgroup.com, at the following intervals:
        a. After contract award, while working off-site: every two weeks
        b. While working on-site: every week.
    3. Progress Reports shall list the following information in three sections:
        a. Progress: List the tasks accomplished since the previous report. This is to include both completed tasks and work-in-progress.
        b. Work Planned: List the tasks scheduled for the time period extending until the next report. This section should also include both completed tasks and work-in-progress.
        c. Issues. List any factors that are delaying progress or have the potential to delay progress that involve the Owner, Architect and/or Consultant.
            1). Provide a proposed solution for each issue listed. The proposed solution shall include any potential impact to cost and/or schedule. Proposed solutions will be reviewed and approved by the Owner, Architect and/or Consultant, or alternate solutions will be recommended.

2). For equipment related issues, include a manufacturer's service ticket number, service log number, or similar means of documenting communications between the Contractor and manufacturer.

E. Shop Drawings:

1. The Contractor must receive written approval from the Owner or an authorized representative of the Owner, in writing, prior to purchasing, fabricating or installing any equipment or materials. Approval to proceed will be given based upon Shop Drawings. The Shop Drawings shall be submitted no later than 15 working days prior to installation. NOTE: The Shop Drawing review period is 10 working days
2. The Shop Drawings shall indicate complete details of work to be performed.
3. The Contractor shall provide one electronic copy (two copies, if printed) of the Shop Drawings each to the Owner and to the Consultant for review and approval.
    a. Drawings shall include a title block naming the Project, Consultant, and Contractor, shall include a drawing title, drawing number, revision number if applicable and date.
    b. Unless otherwise agreed to in writing, Contractor shall meet with the Owner and Owner's designated representative to review the Shop Drawing submittal. The Contractor shall be prepared to review the functional capabilities and characteristics of the systems for compliance with Owner requirements.
4. The Shop Drawings listed below are required of the Contractor. Submit all Shop Drawings complete as a single submission. Isolated items will not be accepted, except with prior approval.
    a. System Signal Flow – Complete functional system signal flow drawings of all systems described herein and meeting the functions indicated in the Specification. System Signal Flow drawings to illustrate and identify each major component indicating signal flow; signal type and equipment interconnectivity; all used and unused input/output connections for all devices; connector types; specific manufacturer and model number labels for each component; physical location callout indicating the components physical location (i.e. equipment rack #, lectern, wall mounted, etc.); cable fan-outs; wire/cable tags; 70 volt loudspeaker tap settings; amplifier/loudspeaker zone assignments; and other details as needed to accurately document the signal interconnectivity of the systems.
    b. Cabling Schedule – Document complete wire run information, including the cable type, cable marker identifier, and origination and destination location and connector types for each cable. Wire run information shall be conveyed:
        1). Within the System Signal Flow drawings, and/or
        2). A separate list containing all wire run information
    c. Examples representative of the Contractor's final cable marking technique for each cable type.
    d. Loudspeaker Layouts – Scaled ceiling and/or floor plan drawings showing loudspeaker locations, including coverage patterns for ceiling-mounted loudspeakers. Loudspeaker zone groups shall be identified such that they are relatable to the System Signal Flow drawings.
    e. Loudspeaker Mounting Details – Scaled drawings of complete loudspeaker mounting details, hardware and support surfaces, including details on all load requirements, safety factors, safety cables and structural materials.
    f. Projector Mounting Details – Scaled drawings of complete projector mounting details, hardware and support surfaces, including details on all load requirements, safety factors, structural materials and any required safety cables.

g. Microphone Layouts - Scaled ceiling and/or floor plan drawings showing microphone locations and orientation within tables or fixed in ceilings.

h. Optical Systems – The Contractor shall be responsible for field verification of the on-site conditions and submit scaled drawings to verify that the proposed projection devices, lenses and related optical systems will provide the desired image size without distortion, vignetting or any other image aberrations.

i. Panels – Scaled drawings of interconnect panels, control surfaces, and other custom interfaces.

j. Peripheral Equipment – Scaled drawings of mounting arrangements of any peripheral equipment, which may be included in this Specification.

k. Equipment Rack Layouts – Fully detailed rack drawings indicating equipment orientation within the equipment rack.

l. Technical Furniture – Scaled drawings of all technical furniture indicating the furniture dimensions, materials, finishes, equipment locations and orientation within the furniture, cable management accommodations, and all other details necessary to convey the physical and functional aspects of the furniture as it will be installed in each individual room space.

m. Others, as may be required by the Architect, Consultant or Owner.

1). Inquire with the Architect and Consultant whether submissions of finishes/materials which will be visible to the public are required and submit accordingly.

2). Typical sample items of interest include: receptacles and controls with associated trim plate and each type of loudspeaker baffle and/or grille.

5. Approval: The Contractor shall receive written response indicating approval to proceed, or changes required to the Shop Drawings submittal, within 10 working days of receipt of the submittal by the Owner/Consultant.

6. Modifications: The Contractor shall be responsible for updating the Shop Drawing package throughout the course of the project to document any Owner-requested changes, approved product changes, changes due to field conditions, or any other changes to the approved Shop Drawing package. Drawing modifications may be reviewed by the Consultant as-required, and the Contractor shall make current Shop Drawings available to the Consultant within seven calendar days of request.

7. Product Cut Sheets: Unless otherwise agreed to in writing, the Contractor shall prepare a package of product cut sheets for review with the Owner at the time of the Shop Drawings review meeting. The package shall include manufacturer's cut sheets for all user interfaces, all exposed items not mounted in equipment racks, and all items requiring color or finish selection. The Product Cut Sheets package is not a formal submittal to be reviewed by the Consultant, and is not a means for proposing product substitutions. Requested substitutions shall be submitted via a 'Substitution Request Form' (Appendix D) including drawings, performance and test data, and other information necessary to demonstrate that the substitution will meet all intentions of the Specification.

F. Bill of Materials: The Contractor shall submit a Bill of Materials concurrent with the Shop Drawing submittal. The Bill of Materials shall be organized by room or system type and submitted electronically in Microsoft Excel .xls format, unless an alternate format is approved in writing by the Consultant, Architect, or Owner.

G. Cabling: The Contractor shall submit specifications for each cable type to be used for the project. The Contractor shall receive written approval from the Owner or an authorized representative of the Owner, in writing, prior to purchasing or installing any cabling.

H. Wireless Frequency Table: The Contractor shall submit a table of wireless devices including wireless microphones and intercom transceivers. Each device shall be listed individually along with the manufacturer recommended frequency setting per the location of the installation.

I. Equipment Rack Digital Photographs: The Contractor shall submit digital photographs of completed equipment racks for approval prior to delivering the racks to the project site.
   1. All photographs must be properly exposed and focused, clearly showing the rear and front of each equipment rack. The rear photos must clearly show internal rack cabling, terminations, and cable management such as lacing bars and support brackets. Front photos must show equipment front-panels, labels, vent panels, blank panels, drawers, etc.
   2. Subject areas must be free from glare as a result of flashes or other ambient lighting. Subject areas shall fill the image frame in a suitable manner. For large equipment racks, multiple exposures may be required, each indicating a separate portion of the rack.
   3. All digital images shall be submitted in JPEG file format unless an alternate format is approved in writing by the Consultant, Architect, or Owner.

J. Network Coordination
   1. The Contractor shall provide a private wired control network that shall function independently of the Owner's network.
      a. The Contractor shall coordinate with the Owner and verify which system components, if any, shall be connected to the Owner's network.
   2. The Contractor shall work with the Owner's IT department to identify all PoE, VLAN, firewall and other networking requirements to provide a fully functioning AV system. The Contractor shall generate a schedule of all AV components that will be connected to the building LAN and submit it to the Owner's IT department for implementation.
   3. The Contractor shall, as required, obtain from the Owner's IT department blocks of static IP addresses sufficient for current system implementation as well as future system growth.
   4. The IP Addressing schedule shall list, at minimum, for each connected device:
      a. Product make and model
      b. LAN port connection location
      c. VLAN Assignment – If applicable
      d. Assigned Static IP address
      e. Product MAC address
      f. Host Name
   5. The IP Addressing schedule shall be submitted electronically in Microsoft Excel .xls format, compatible with Windows 7 or newer operating systems, unless an alternate format is approved in writing by the Consultant or Owner.
   6. Approval: The Contractor shall receive written response indicating approval to proceed, or changes required to the IP Addressing Schedule, within 10 working days of receipt of the submittal by the Owner/Consultant.

K. Software: The Contractor shall secure from the Owner or Owner's Representative, in writing, approval for all customized software applications prior to installation, including but not limited to:
   1. Audio Digital Signal Processing (DSP):
      a. The Contractor's Audio DSP submittal shall communicate the internal signal flow, preliminary setup and the configuration of the Audio DSP processors that is required to meet the AV systems functional and performance requirements. Final level settings

and internal preset configurations shall be the Contractor's responsibility during system setup and commissioning.

b. Format: The preferred Audio DSP Systems submittal is the manufacturer's DSP software configuration files. If requested, the submittal may be provided in the form of signal flow drawings.

c. Audio DSP Software Configuration File Submittal Format:

1). Provide the manufacturer's software configuration files, custom designed for each unique system type, compatible with Windows 7 or newer operating systems.

2). DSP configuration files shall include custom labeling of all internal DSP device inputs and outputs provided with labeling capability. Labeling of the external hardware interface points shall match the externally connected devices as shown in the signal flow drawings.

3). The Contractor shall provide one copy of the electronic files to the Owner and one to the Consultant for review.

4). DSP signal flow submittals may be sized to match the AV signal flow drawings, in the form of JPEG image files (maximum 1920x1080 pixels) or PDF files.

5). The Contractor shall provide one copy each of the submittal to the Owner and to the Consultant for review.

d. The Contractor shall receive written response indicating approval to proceed, or changes required to the DSP submittal, within 10 working days of receipt of the submittal by the Owner/Consultant.

2. Control System Control Surfaces / GUI Prototype submittal

a. The intent of the Control System Control Surfaces / GUI Prototype Submittal is to create a base level collaboration process whereby the Programmer can solicit direction from the Owner and Consultant towards a mutually agreeable design. Unless otherwise agreed to in writing the Contractor shall meet with the Owner and Owner's designated representative to review the Control System Control Surfaces / GUI Prototype Submittal. The Contractor shall be prepared to review the functional capabilities as well as the aesthetic characteristics of the control surfaces for compliance with Owner preferences and standards.

b. The submittal is due no later than 30 days prior to installation.

c. Where Owner control surface or GUI standards are lacking, the Contractor shall provide:

1). Preliminary control surface layouts for all pushbutton panels, touch sensitive panels, PC based controllers or other control surfaces. The Programmer should make the preliminary layouts with a monochrome, basic, wireframe style to clearly demonstrate the functionality of control surface. The layouts should illustrate all pushbuttons, labels, bar graphs, timers, video windows, etc. for each control panel and each system page. The Programmer should include suggestions for color schemes and graphic styles where applicable. The touch panel control surface submittal shall be created utilizing a collaborative, browser based application allowing for live review and comment by the Owner and Consultant, such as InVision or Moqups (UX design software).

2). JPEG images (or PDF format file) of the finished look of all interface elements including but not limited to menu bars, buttons, down/up states of buttons, labels, bar graphs, timers, video windows, etc.

3). A sample touch panel page as a separate file, or in a PDF format so that all parties understand the finished aesthetic.

d. Where Owner control surface or GUI standards are made available, the Contractor shall provide:
   1). Preliminary control surface layouts for all pushbutton panels, touch sensitive panels, PC based controllers or other control surfaces. The Programmer shall develop the preliminary layouts utilizing the Owner's standards. The layouts should illustrate all pushbuttons, labels, bar graphs, timers, video windows, etc. for each control panel and each system page. The touch panel control surface submittal shall be created utilizing UX design software for live review and comment by the Owner and Consultant.

e. The Contractor shall receive written response indicating approval to proceed, or changes required to the control surfaces layouts, within 10 working days of receipt of the submittal by the Owner/Consultant.

3. Control System Control Surfaces/GUI Submittal
   a. The Contractor shall generate a revised control surfaces layout submittal to include the additions, changes or revisions generated by the prototype submittal review as well as to integrate the graphic style into the design. The form and quantity of the submittal shall be as complete as possible and ready to be programmed unless otherwise directed. The touch panel control surface submittal shall be created utilizing UX design software for live review and comment by the Owner and Consultant.
   b. If the revised control surfaces submittal reflects those additions, changes or revisions called for in the prototype submittal review, the Contractor shall receive written approval to proceed within 10 working days of receipt of the submittal by the Owner/Consultant.
4. Post-Integration Control Surfaces Adjustments
   a. If so requested by the Owner or Owner's representative, and within 90 days of Substantial Completion, the Contractor shall be prepared to make one visit to the site to make final minor adjustments to the control system code or programming without additional compensation. This could include, but may not be limited to, renaming or changing the size or location of buttons, page flip calls, or adjustments to code to provide a fully functioning system. If engraved control system panels require modification at a cost to the Owner, such cost information must be submitted to the Owner for approval prior to any work being performed.
   b. The Contractor shall be responsible for ensuring that any changes to the control system or control surfaces that are made post integration are appended to the Final System Documentation.

L. Cable Testing
1. The Contractor shall secure from the Owner or Owner's Representative, in writing, approval for all cable test reports prior to Final Testing and System Performance Verification. Test reports shall include testing of all systems cabling and shall include:
   a. Loudspeaker line testing:
      1). Low impedance loudspeaker lines:
         a). Impedance at 1000Hz.
         b). Polarity of installed loudspeakers.
      2). 70 volt loudspeaker lines:
         a). Watts load at 1000Hz.
         b). Polarity of installed loudspeakers.
   b. Analog audio microphone and line level cable testing:
      1). Continuity of each conductor.

2). Signal loss.
3). Signal polarity.
4). Shielding.

c. UTP, STP, F/UTP and S/FTP cable testing:
1). Category 5, 5e and 5e+ cables:
a). ANSI/TIA-568.2-D Category 5e Permalink test.
b). ANSI/TIA-568.2-D Category 5e Channel test.
2). Category 6 and 6+cables:
a). ANSI/TIA-568.2-D Category 6 Permalink test.
b). ANSI/TIA-568.2-D Category 6 Channel test.
3). Category 6a and 7a cables:
a). ANSI/TIA-568.2-D Category 6a Permalink test.
b). ANSI/TIA-568.2-D Category 6a Channel test.
4). Shield test (required for shielded cables only).
5). Nominal Velocity of Propagation test.
6). Testing to be performed using a Fluke DSX-5000, or equal.

d. Fiber Optic cable testing:
1). All fiber optic installed and patch cables shall be tested to meet loss and polarity standards:
a). ANSI/TIA-568-C.3 Cable Link test.
b). ANSI/TIA-568-C.3 Cable Channel test.

e. 2K HDMI and Digital Signal cable testing:
1). Wire test function.
2). Testing to be performed using a Quantum Data 780a, or equal.

f. 4K HDMI and Digital Signal cable testing:
1). Wire test function.
2). Testing to be performed using a Quantum Data 780b, or equal.

g. Digital video coaxial cable testing:
1). EDH, CRC & Jitter tests
2). Eye pattern measurement

M. Preliminary As-Built Drawing Submittal
1. Upon completion of the work, and prior to Final Testing and System Performance Verification, the Contractor shall condense the Master Set along with any Shop Drawings into a single “As Built” drawing set. Any markings or deviations, which cannot be made clear on drawings, shall be accompanied by attached documentation, photos, or written addenda.

N. Final Documentation Submittals
1. Within 30 calendar days following Substantial Completion, the Contractor shall prepare and submit a Final Documentation set to the Consultant. The Final Documentation Submittal shall include any and all adjustments or changes identified during the Preliminary As-Built Drawing Submittal review. All documentation shall list the Owner, Project Name, Consultant, and Contractor. Any documentation appended and reissued during the Warranty period shall also include this information.

2. Format: All documents and drawings shall be submitted in the following format:
   a. Electronically in PDF format, submitted on indexed and searchable CDROMs.
   b. Other formats may be acceptable upon prior approval by the Consultant and/or Owner.
   c. All .PDF files shall be submitted at the documents' native scale. For example, a PDF created from a drawing whose native format was standard 'E' size (42"x30") shall be created at 42"x30" (full size) to ensure that there is no loss of resolution should the file be viewed or printed at a later date by the Owner.
3. Printed submittals
   a. If requested, provide (2) printed copies of all documents and drawings. The documentation shall be bound in three ring binders with covers and spines listing the Owner, Project Name, Consultant, and Contractor.
4. Documentation: The Final Documentation Submittal shall include:
   a. As-Built Drawings: The as-built drawings must reflect all changes to the system(s) made after the original bid documentation.
      1). The size of the as-built drawings shall be identical to the original drawings provided to Contractor.
      2). As-Built drawings shall conform to all of the requirements listed under "Submittals / Shop Drawings" listed above.
      3). Any markings or deviations, which cannot be made clear on drawings, shall be accompanied by attached documentation, photos, or written addenda.
      4). The Contractor shall include any additional drawings which are necessary to properly document the as-built systems, but not included in the bid documents, including:
         a). Rack elevations
         b). Custom panel details
         c). Patch bay layouts
         d). Cable pull lists
      5). Submission of digital As-Built drawings files, which are generated by the Contractor based on drawing files provided by the Consultant under separate agreement, shall be subject to submission by the Contractor as defined under said agreement.
   b. A schedule of IP and MAC Addresses for all Ethernet enabled AV devices, organized by room name and number.
   c. A complete cable testing schedule.
   d. A listing of each supplied item with manufacturer, model number and serial number, organized by room name and number.
   e. Operator's manuals for each piece of equipment supplied by the Contractor.
   f. Detailed digital photographs showing the front views of all equipment racks. The photographs shall accurately reflect equipment front-panel settings at the time of project sign-off. All photographs must be properly exposed and focused, clearly showing the final settings for every device's push buttons, rotary controls, slider controls, or indicators. Subject areas must be free from glare as a result of flashes or other ambient lighting. Subject areas shall fill the image frame in a suitable manner. For large equipment racks, multiple exposures may be required, each indicating a separate portion of the rack. NOTE: All digital images shall be comprised of at least 1600 x 1200 viewable pixels, 24-bit color depth, JPEG file format.

g. Quick Reference Guides
   1). The Contractor shall develop system operating instructions for the operations of all contractor-fabricated devices and installed equipment items as part of the work. These operating instructions shall include detailed descriptions of how to operate the system as a whole. Component manuals are not acceptable to meet this requirement unless approved by the Owner and Consultant.
   2). Quick Reference Guides shall be one page (front and back as necessary) heat-laminated cards or tents providing simplified instructions for operation of all major system functions.
   3). Content of the quick reference guide shall focus on the controls and must include high quality graphics / photos of the controls themselves with explanations and step by step instructions.
   4). Pages shall be appropriately sized for the content required. (Half or other sized pages are appropriate for simple rooms.)
   5). Described functions shall include as a minimum:
      a). Power on/off
      b). Source selection
      c). Volume control
      d). Connection of auxiliary sources
      e). Other functions as appropriate for the system, such as lighting and shade control.
      f). Coordinate with the Owner and the Audiovisual Consultant regarding additional content desired. For example, the Owner may wish to include instructions for contacting local support personnel.

h. Software
   1). Where custom software is developed by the Contractor as part of this project, the system source code, passwords, and any associated related files, referenced files, and development software (and all relevant documentation and license) used to compile, develop, and build, etc. the executable code must be provided. The source code should be well documented in accordance with industry software engineering practices.
   2). The software developer shall retain intellectual property rights; the Owner shall have a license for perpetuity for use as it applies solely to this project, including the right to modify/enhance. The software code may not be sold or used, in part or in whole, in any other project or application other than that intended by this specification, in part or in whole, by the Owner or any other party.
   3). If a Subcontractor is used to write the software, the Contractor shall include, as part of the Final Documentation submittal, a signed letter on Subcontractor letterhead, granting the Owner ownership, use, and modification rights of the code and documentation as defined herein. The software shall be provided to the Owner on CD-ROM, inserted into a plastic sleeve appropriate for each media type, and included in the binders.
   4). The Owner may supply the Contractor or allow the Contractor to use certain proprietary information, including service marks, logos, graphics, software, documents and business information and plans that have been authored or pre-owned by the Owner. All such intellectual property shall remain the exclusive property of the Owner and shall not be used by the Contractor for any purposes other than those associated with delivery of the systems specified herein.

i. Warranty Statement: A statement on the Contractor's letterhead listing the official start and end dates for the Contractor's warranty on all equipment, materials, and labor used in the project. The start date shall correspond with the established Substantial Completion date, and the end date shall be based on the timeframe of warranty coverage purchased by the Owner as part of the contract.

5. Delivery
   a. If the Final Documentation submittal is determined by the Consultant to be complete and accurate, the Consultant will approve the submittal and forward the Final Documentation package to the Owner.
   b. If the Final Documentation Submittal is determined by the Consultant to not be complete and/or inaccurate, the Consultant will return the package to the Contractor with a written listing of the required modifications. Upon completion of all of the required modifications, the Contractor shall resubmit the Final Documentation to the Consultant for approval. The Final Documentation Submittal, and therefore the project, shall not be considered to be complete until all required documentation modifications have been made and approved by the Consultant on behalf of the Owner.

1.4 TESTING AND SYSTEMS PERFORMANCE VERIFICATION

A. Final Tests
   1. System Performance Verification Scheduling
      a. Upon approval of the Contractor's test report and receipt of the "Systems Performance Verification Request" form, the Contractor shall assist the Consultant in final system tests. The Contractor shall allow two (2) days to perform the tests at a time that is mutually acceptable to the Contractor and Consultant. The Contractor's representatives assisting in the performance of these tests shall be thoroughly familiar with the details of the system and shall include the field supervisor responsible for installing, testing, programming and commissioning the system.
   2. System Performance Verification
      a. All control system, DSP and device programming shall be completed and in working order prior to the System Performance Verification.
      b. A physical inventory shall be taken of all equipment on site and justified against the Contractor's Bill of Materials submittal and the original Bidding Equipment Lists.
      c. The Consultant shall require tests completed by the Contractor which demonstrate the operation of all system components and to determine that the systems meet the criteria as outlined in 'Performance Standards'.
      d. The Contractor shall supply test equipment to be used during the System Performance Verification. The test equipment shall be present, in working order and connected prior to the System Performance Verification.
         1). Video Test Equipment
            a). Computer video signal generator(s) capable of outputting all signal types included in the system design. (Extron VTG 400DVI & Marshall Electronics V-SG4K-HDI or equivalent)
            b). HD-SDI and SD-SDI Generator/Monitor capable of outputting all signal types included in the system design and capable of embedded audio. (Harris HD-STAR or equivalent)
            c). Digital discs including both program content and test signals. DVD and Blu-Ray discs are both required.
            d). Adapters and interconnect cabling as necessary to complete testing.

2). Audio Test Equipment
a). Analog Audio Signal Generator, Impedance Meter and Line Analyzer: NTi MR-PRO (or equivalent).
b). Condenser microphone: Shure SM86 (or equivalent).
c). Active speaker: Fostex 6301NE (or equivalent).
d). Digital Audio Signal Analyzer: NTi DL1 (or equivalent).
e). Hardware-based Acoustic Analyzer: NTi AL1 or NTi XL2 (or equivalent).
f). Software-based Acoustic Analyzer: Smaart with reference microphones and all necessary accessories (or equivalent).
g). Compact Discs (CD's) including both program content and test signals.
h). Media as necessary to test all playback and recording functions of the system. I.E. compact flash card, MP3 Player, USB media.
i). Adapters and interconnect cabling as necessary to complete testing.
3). Video and Audio Teleconferencing:
a). Contractor shall coordinate a test call with a far-end site scheduled for the time the Consultant is performing the Systems Performance Verification.

e. Contractor shall have tools available on the day of the System Performance Verification for system inspection and adjustments.
f. Contractor shall coordinate with Owner so that all spaces are unlocked and available for inspection.
g. Preliminary As-Built documentation shall be available for reference and inspection.

3. Punch List Report and Correction
a. Following the completion of the Systems Performance Verification, the Owner and/or Consultant will issue a punch list report to the Contractor, identifying omissions, adjustments, and corrections to the work necessary to meet the requirements of the Specification.
b. The Contractor shall correct all punch list items resulting in fully functional systems that meet all requirements of the Specification and can be utilized by the Owner as-intended.

1.5 SUBSTANTIAL COMPLETION

A. The project shall be deemed substantially complete by the Consultant and/or Owner at the stage in the progress of the work where the systems are sufficiently complete in accordance with the Specification so that the Owner can utilize the systems for their intended use.

1.6 TRAINING

A. The Contractor shall provide a total of twelve (12) hours of on-site training for the Owner's staff at a time that is mutually agreeable for the Owner, Contractor, and Consultant. The Consultant will assist the Contractor in training for systems that have included Software Development provided by the Consultant.
1. The Contractor should anticipate six sessions of 120-minutes each.
2. The Owner may choose to have the sessions spread out over a maximum of six (6) different days.
3. Address in the training the general configuration of the system, basic functionality, correct operation procedures, routine maintenance and upkeep.

4. The Owner shall be permitted to video record the Contractor-provided training sessions for the future use of training faculty and staff.

1.7 EVENT TECHNICAL SERVICE

A. In addition to the training listed above, the Contractor shall provide a total of twelve (12) hours of on-site technical assistance for an Owner-defined event. It is expected that this event will occur within the first 90 days after Substantial Completion.

B. In addition to event support the Contractor will provide an audio engineer, for establishing up to eight (8) presets per classroom. These presets will be for key faculty, and programed during live lectures.

1.8 FINAL ACCEPTANCE

A. Final Acceptance shall be granted by the Owner based on the successful completion of the following activities:
   1. All items required to obtain Substantial Completion have been achieved.
   2. Any punch list corrections not required to obtain Substantial Completion have been completed by the Contractor and accepted by the Owner and/or Consultant.
   3. The Contractor's Final Documentation Submittals have been reviewed by the Consultant and deemed to be complete, and have been delivered to the Owner.
   4. The Contractor has provided all required training for the Owner as defined herein.
   5. Any remaining items required by the Specification, but not listed above, have been completed by the Contractor.

PART 2 - PRODUCTS

2.1 APPROVED CABLING

A. The following table lists cabling products and types that have been pre-approved for use. This is not an all-inclusive list of the cabling products and types required to complete this project. The Contractor shall reference the cabling products in this table as a baseline of performance for each cable category. The bidder may submit cable part numbers, models and manufacturer's product other than those listed in this table for consideration and approval per the substitution procedures defined in this Specification.

Type/Application	Description	Manufacturer	Model No.	Comment
Microphone or Line Level Audio	22 AWG STP	Belden	9451/ 9451P (Plenum)	or equal
Audio – Coax - Digital	19 AWG Coax	Belden	1694F	or equal
Audio Line – Digital Ready – Single Pair	24 AWG STP	Belden	1800B / 1801B (Plenum)	or equal
Audio Line – Digital Ready – Multi Pair (2)	24 AWG STP	Belden	1802B	or equal
Audio Line – Digital Ready – Multi Pair (4)	24 AWG STP	Belden	1803F	or equal
Audio Line – Digital Ready – Multi Pair (8)	24 AWG STP	Belden	1805F	or equal
Audio Line – Digital Ready – Multi Pair (12)	24 AWG STP	Belden	1806F	or equal

Type/Application	Description	Manufacturer	Model No.	Comment
Audio Line – Digital Ready – Multi Pair (16)	24 AWG STP	Belden	1850F	or equal
Audio Line – Digital Ready – Multi Pair (24)	24 AWG STP	Belden	1852F	or equal
Digital Audio – CAT6	23 AWG UTP	Belden	4812 / 4813 (Plenum)	or equal
Mic – 26 Pair Snake	22 AWG STP	Gepco	GA1826GFC	or equal
Mic – 32 Pair Snake	22 AWG STP	Gepco	GA1832GFC	or equal
Loudspeaker or LV Power Supply, 10 AWG	10 AWG UTP	Belden	5T00UP / 6T00UP (Plenum)	or equal
Loudspeaker or LV Power Supply, 12 AWG	12 AWG UTP	Belden	5000UE / 6000UE (Plenum)	or equal
Loudspeaker or LV Power Supply, 14 AWG	14 AWG UTP	Belden	5100UE / 6100UE (Plenum)	or equal
Loudspeaker or LV Power Supply, 16 AWG	16 AWG UTP	Belden	5200UE / 6200UE (Plenum)	or equal
Loudspeaker or LV Power Supply, 18 AWG	18 AWG UTP	Belden	5300UE / 6300UE (Plenum)	or equal
Digital Video (Up to 6GHz)	20 AWG Coax	Belden	1505A / 1506A (Plenum)	or equal
Digital Video (Up to 12GHz)	18 AWG Coax	Belden	4694R/ 4694P (Plenum)	or equal
HDBaseT Shielded CAT5e+	4-Pair CAT5e+ F/UTP 350 MHz	Belden	1212F / 1213F (Plenum)	or equal
HDBaseT Unshielded CAT6A	4-Pair CAT6A U/UTP 625 MHz	Belden	10GX12 / 10GX13 (Plenum)	or equal
4K Ultra-High-Definition Media Cable, Shielded	4-Pair F/UTP	Belden	2183R / 2183P (Plenum)	or equal
USB Extension Shielded CAT5e+	4-Pair CAT5e+ F/UTP 350 MHz	Belden	1212F / 1213F (Plenum)	or equal
Control (RS-232/422)	2-Pair 24 AWG Stranded TC	Belden	8102 / 82502 (Plenum)	or equal
Control (RS-232/422)	3-Pair 24 AWG Stranded TC	Belden	8103 / 82503 (Plenum)	or equal
Control (RS-232/422)	4-Pair 24 AWG Stranded TC	Belden	8104 / 82504 (Plenum)	or equal
Ethernet Control Unshielded CAT5e	4-Pair CAT 5e U/UTP 200 MHz	Belden	1583A / 1585A (Plenum)	or equal
Fiber Optic Cable, Multimode	2 Strand MM OM4 Fiber Riser Cable	Belden	FI4D002R9	or equal

Type/Application	Description	Manufacturer	Model No.	Comment
Fiber Optic Cable, Multimode	6 Strand MM OM4 Fiber Riser Cable	Belden	FI4D006R9	or equal
Fiber Optic Cable, Multimode	12 Strand MM OM4 Fiber Riser Cable	Belden	FI4D012R9	or equal
Fiber Optic Cable, Multimode	24 Strand MM OM4 Fiber Riser Cable	Belden	FI4D024R9	or equal
Fiber Optic Cable, Multimode	2 Strand MM OM4 Fiber Plenum Cable	Belden	FI4D002P9	or equal
Fiber Optic Cable, Multimode	6 Strand MM OM4 Fiber Plenum Cable	Belden	FI4D006P9	or equal
Fiber Optic Cable, Multimode	12 Strand MM OM4 Fiber Plenum Cable	Belden	FI4D012P9	or equal
Fiber Optic Cable, Multimode	24 Strand MM OM4 Fiber Plenum Cable	Belden	FI4D024P9	or equal
SMPTE 311M HDTV Cable	1 Channel SMTE 311M HDTV Fiber Cable	Belden	7804R / 7804P (Plenum)	or equal
SMPTE 311M HDTV Cable	3 Channel SMPTE 311M HDTV Fiber Cable	Belden	7824R / 7824P (Plenum)	or equal
AMX DXLink Shielded CAT5e+	4-Pair CAT5e+ F/UTP 350 MHz	Belden	1212F / 1213F (Plenum)	or equal
AMX DXLink Unshielded CAT6A	4-Pair CAT6A U/UTP 625 MHz	Belden	10GX12 / 10GX13 (Plenum)	or equal
AMX AXLink Cable	22AWG Shielded Pair 18AWG Power Pair	Belden	1502R / 1502P (Plenum)	or equal
Crestron DM 4K Ultra Cable Shielded CAT7a	4-Pair 7a S/FTP 1000 MHz	Crestron	DM-CBL-ULTRA-NP / DM-CBL-ULTRA-P (Plenum)	or equal
Crestron DM 4K Ultra Cable Shielded CAT7a	4-Pair 7a S/FTP 1000 MHz, Low Smoke	Crestron	DM-CBL-ULTRA-LSZH	or equal
Crestron DM 8G+ Shielded CAT5e+	4-Pair CAT5e+ F/UTP 350 MHz	Crestron	DM-CBL-8G-NP / DM-CBL-8G-P (Plenum)	or equal
Crestron Fiber Optic Cable, Multimode	8G Multimode Fiber Optic Cable, 50/125 x4	Crestron	CRESFIBER-8G-NP / CRESFIBER-8G-P (Plenum)	or equal
Crestron Fiber Optic Cable, Singlemode	8G Singlemode Fiber Optic Cable, x2 zip-cord construction plenum/non-plenum	Crestron	CRESFIBER-8G-SM-P	or equal

Type/Application	Description	Manufacturer	Model No.	Comment
Crestron (Cresnet) Cable	2-18 AWG UTP with 2-22 AWG STP	Crestron	CRESNET-NP / CRESNET-P (Plenum)	or equal
Extron XTP/DTP Shielded CAT6+	4-Pair CAT6+ SF/UTP 475 MHz	Extron	XTP DTP 24 / XTP DTP 24P (Plenum)	No Known Equal
Extron Skew-Free Unshielded	4-Pair CAT5e UTP Low Skew	Extron	Skew-Free UTP / Skew-Free UTP-P (Plenum)	or equal
Ampetronic Hearing Loop Copper Foil Tape	18mm x 0.25mm Single Conductor	Ampetronic	FB 1.8	No Known Equal
Ampetronic Hearing Loop Direct Burial Cable	1.0mm dia. (18 AWG) Single Conductor, Buriable	Ampetronic	DBC 1.0	No Known Equal
Ampetronic Hearing Loop Direct Burial Cable	2.5mm dia. (10 AWG) Single Conductor, Buriable	Ampetronic	DBC 2.5	No Known Equal
Williams Sound Hearing Loop Copper Foil Tape	0.75 in. x 0.010 in. Single Conductor	Williams Sound	PLW F	or equal
Williams Sound Hearing Loop Cable	18 AWG Single Conductor	Williams Sound	PLW 037	or equal
Williams Sound Hearing Loop Cable	14 AWG Single Conductor	Williams Sound	PLW 014	or equal

2.2 EQUIPMENT

A. Bidding Equipment List
   1. Bidding Equipment Lists are provided to the Contractor for use in preparing the bid response. These lists include major system components and peripherals, but should not be considered to be all inclusive. The complete equipment package bid response will take into account this document, all drawings, written addenda, any or all drawing additions or reissues, as well as implied system operability.
   2. Bidding Equipment Lists are included as an Appendix in this specification.

B. Connectors, Adapters and Assemblies
   1. Field terminated connectors shall be compatible and approved for use for a specific cable type and application by the cable and equipment manufacturer.
   2. Connectors shall be manufactured by Neutrik, Switchcraft, AMP, Amphenol, Kings, Canare, Crestron, Extron, or equal.
   3. Manufacturer constructed cable adapters and assemblies shall be provided by Crestron or Extron, or be of equal quality and durability.

C. Panels, Plates and Keypads
   1. The Contractor shall provide a cover panel for all junction boxes which comprise the audiovisual infrastructure (wall, floor and ceiling). This includes pull boxes, splice boxes and unused or abandoned junction box locations.

2. Custom Fabricated Panels and Plates
    a. Submit custom panel designs per Submittal requirements prior to fabrication or purchase.
    b. Custom panels and plates shall be machined aluminum, nominal thickness 0.125”, with beveled edges and a brushed, anodized finish. Confirm with the Architect required finish color for each panel location. Use of the pull-box manufacturer’s construction cover shall not be permitted.
    c. All panel connectors shall be labeled with engraved lettering, minimum 0.10” letter height, and provided with contrasting paint fill.
    d. Panels and plates for non-gang pull boxes shall extend past the height and width of the pull box by a minimum of one-half inch on each side.
    e. Cable access holes in cover plates shall not capture the cables and shall have a protective grommet to prevent cable damage.
3. Manufactured I/O Panels, Control Panels, Keypads and Plates
    a. Submit proposed panel designs per Submittal requirements prior to purchase.
    b. Panel functionality shall be as defined in the Specification.
    c. Coordinate color and style with the Architect and/or Consultant.
4. Abandonment Cover Plates at Future Use, Unused or Abandoned Audiovisual Junction Box Locations
    a. Submit proposed abandonment plate selections per Submittal requirements prior to fabrication or purchase.
    b. Contactor shall coordinate with the Architect and/or Consultant regarding the style, finish and paint color of abandonment cover plates.
    c. Cover plates for standard gang junction boxes shall match the manufacturer style and color of architectural cover plates used elsewhere on the project.
    d. For non-standard gang junction box locations provide the box manufacturer’s paintable abandonment finish plate.
    e. At non-standard gang sized junction box locations where a manufacturer’s abandonment finish plate is not available, a custom, paintable abandonment plate shall be provided. Custom abandonment plates shall be sized to extend past the height and width of the box by a minimum of one-half inch on each side to mask any gap between the box edge and wallboard.

D. AV Rack Accessories
1. Provide manufacturers’ rack mount adapters where available.
2. Where manufacturers’ rack mount adapters are not available, provide Middle Atlantic Products RSH4S-series custom rack shelf adapters, with –C clamping option as appropriate, or equal.
3. Blank rack panels: Flanged steel with black textured powder coat finish, Middle Atlantic Products, SB-series, or equal.
4. Vented rack panels: Middle Atlantic Products black powder coat finish VT-series, or equal.
5. Rack screws, lacer bars and accessories: Middle Atlantic Products, or equal.
6. Rack Drawers: Middle Atlantic Products, black textured powder coat finish, TD-series, or equal.
7. Rack ID Panel: Include single space (1 RU) rack ID panel, Panelcrafters, Inc. Part# SEXTG-26000-RevG at the top of each equipment rack, or group of racks per the Bidding

Equipment Lists. Panel shall be digitally printed with logo and contact information for Consultant and Contractor.

8. Confirm with the Owner any requirements for security-type rack rail screws, prior to rack fabrication and assembly. Rack rail security screws shall be Middle Atlantic Products, approved style and installation/removal tool type, or equal.
9. Where locking doors are provided, confirm with the Owner any requirements for keying and, if requested, provide locks keyed alike at no additional cost, if available.

E. AV Rack Power Distribution Equipment

1. Where the Technical Power supply to the rack is IG (isolated ground), provide a power distribution system within the rack that maintains the integrity of the IG system.
2. Where 20A power is specified, ensure that all power distribution products are rated for 20A.
3. Vertical power strips: Middle Atlantic Products PDT-series, or equal.
4. Rack rail power strips: Middle Atlantic Products PD-series, or equal.
5. Provide a sufficient number of AC convenience outlets to accommodate all installed equipment plus an extra 20% spare capacity.

PART 3 - EXECUTION

3.1 INSTALLATION PRACTICES

A. General

1. All equipment shall be installed in accordance with this Specification, approved Shop Drawings, and manufacturer's recommendations.
2. All equipment with the exception of portable equipment shall be firmly fastened or attached in place. A safety factor of at least four shall be utilized for all brackets, fasteners and attachments. Provide safety retention cables for overhead equipment such as loudspeakers, projectors, etc.
3. In the installation of equipment and cable, consideration shall be given not only to operational efficiency, but also to overall aesthetic factors.
4. Cables shall be bundled with Velcro straps. Nylon, or similar, cable ties are not to be installed.
5. The Contractor shall ensure that all equipment is installed such that proper cooling and ventilation is provided.
6. All equipment shall be installed in a manner, which prevents hum, RF/EMI/EMF interference, and mechanical vibration based noises (e.g. fan mounts, etc.)
7. Projectors, lenses, and mirrors shall be solidly mounted and braced so that there will be no observable movement in the image induced by motor vibration or other mechanical operations.
8. All equipment that includes keyed locks shall be keyed alike, per equipment category. This includes, but is not limited to equipment racks, lecterns, other technical furniture, security mechanisms, etc. The Contractor shall coordinate with the Owner on keying preferences before ordering equipment.
9. All equipment shall be protected from construction dust and debris until the date of Substantial Completion.
10. All equipment shall be protected from theft, damage, or vandalism until the date of Substantial Completion.

11. Any equipment designed for use by end-users in the facilities must be installed with theft deterrence/protection mountings and fasteners. Any tools required to mount/un-mount this equipment must be furnished to the Owner at the date of Final Acceptance.

B. Furniture
   1. The Contractor shall ensure that equipment or mounting hardware is compatible with and suitable for installation in furniture specified by the Architect, Consultant, or Furniture Supplier. It shall further be the Contractor's responsibility to ensure that such coordination with the Architect, Consultant, or Furniture Supplier occurs. The Contractor shall exchange with and follow such Shop Drawings as to ensure that dimensions and structural supports are adequate for the installation of specified equipment. In addition, the Contractor shall confirm that the furniture accommodates the audiovisual equipment's' environmental and electrical operating parameters. It is the Contractor's responsibility that the request and delivery of such critical coordination information is satisfactorily executed. In as much as the Contractor has control over the delivery of such information, he shall deliver it as requested by the Architect, Consultant, or Furniture Supplier.

C. Equipment Racks and Equipment Rack Cable Management
   1. Racks shall be installed in such a way so as to permit access to all equipment for service.
   2. Racks are considered complete components and should be completely assembled and tested at the Contractors facility prior to onsite installation.
   3. All equipment in racks shall be fitted with vent panels and/or fans as required to provide ventilation and cooling according to equipment manufacturer's recommendations.
   4. Unused front facing rack spaces shall be fitted with blank rack panels.
   5. Adjacent racks shall be bolted together with appropriate ganging hardware.
   6. Use rear and mid rails for intermediate terminations. Maintain accessibility to the rear of the equipment.
   7. Mid rails must be used to support equipment weighing more than 50 pounds.
   8. As a general practice, all power cables, control cables, and high-level cables shall be dressed to the left rear of an equipment rack. Audio and video cables shall be dressed to the right rear of the rack. Audio, video and control cables shall be bundled separately and spaced not less than three (3) inches apart.
   9. Internal equipment rack cabling shall be supported by lacing strips, support brackets, or other cable management systems as required to ensure that all cabling is supported in both the vertical and horizontal planes within the rack.
   10. With the exception of ganged equipment rack assemblies, cabling routed between equipment racks or pieces of equipment exterior to equipment racks, or extending to the greater facility cabling infrastructure, shall be completely protected, end-to-end, by a raceway, wire-way, or duct appropriately sized for the cable run.
   11. Cabling between rolling pieces of equipment not housed in rack cabinets or a rolling equipment rack and any device to which it is connected, shall be protected by a split-loom corrugated tubing wrap or other such flexible cable management system appropriately sized for the cable run.
   12. Any controls not to be adjusted by the user and accessible from the front of the equipment rack must be furnished with security panels.
   13. All audiovisual equipment rack rooms shall have a temperature sensor and two flood sensors: plenum ceiling and floor. The sensors shall be connected to a building wide environmental monitoring/alert system.

14. All audiovisual equipment racks in furniture or millwork shall have a temperature sensor and connected to the same building wide environmental monitoring/alert system.
15. The Contractor shall provide, dress and install an enterprise grade 12 port PoE Cisco switch. Two redundant power supplies must be included with this hardware, connected to separate USP. No GBICs are required, as this will be an isolated network for ICSLAN. Tower ICSLAN switches will be housed in telecom closets.

D. Video Displays
   1. All permanently mounted projectors shall be installed with the center line of the projector perpendicular to the projection screen. All projected images shall be squarely converged to the projection screen. Keystone or geometric correction shall not be employed without the written consent of the Consultant.
   2. Turn off or disable all eco, green or energy saving modes on all flat panel and projector displays where displays are to be controlled by an external control system
   3. Video settings should be adjusted on all flat panel displays to optimize color and contrast. Settings should be identical between multiple displays within the same room, area, or room type. Any dynamic contrast modes within flat panel displays shall be disabled.

E. Video Cameras
   1. Configure all video cameras with proper output resolution, network settings, physical positioning and white balancing. White balancing of cameras shall occur after the camera is installed, the room finishing is complete with the room lighting and shades properly set.
   2. Program no less than four presets for all PTZ cameras.
   3. Prior to installation, the Contractor shall work in close coordination with the Owner to determine the optimal locations for all video cameras to ensure that the camera positions meet the requirements of the Owner for the field of view.

F. Cabling
   1. All cabling and termination shall be executed in adherence to standard industry practices and as outlined in:
      a. AV Installation Handbook: Best Practices for Quality Audiovisual Systems: AVIXA/InfoComm International, latest edition.
      b. Philip Giddings - Audio Systems Design and Installation: Boston Focal Press, latest edition.
      c. Kenneth T. Deschler - Cable System Design and Installation: McGraw-Hill, Inc. latest edition.
   2. Cable Length Verification: Cable lengths where given in the Specification, for bulk or manufactured cable assemblies, have been provided to assist the Contractor in the bidding process. Cable run lengths, where specified, are end-point-to-end-point estimates and include consideration for tails. Estimates may be based upon cable tray systems; raceways, conduit runs, and furniture layouts indicated on construction drawings and may vary from the actual installed cable pathways. It is responsibility of the Contractor to field verify required cable lengths for bulk cable or manufactured cable assemblies prior to ordering.
   3. Cable Installation
      a. Non-contiguous cable support mechanisms such as hangers, rings, and hooks shall not be spaced farther than four (4) feet apart. All manufactured raceways used for cables shall be installed according to the raceway manufacturer’s specifications
      b. Cable runs shall be supported with devices designed for this purpose and are to be installed independent of any other structural component.

c. Cables routed vertically up walls, or between floors as vertical riser, shall be supported with clamps or other mechanisms. These supports shall occur at least three times per floor.

d. The Contractor shall maintain, or where not already existing, provide through penetration fire stop systems to prevent the spread of fire through openings made in fire-rated walls or floors to accommodate penetrating items such as conduit, cables or other pathway. Fire stop shall restore floor and wall to the original fire rated integrity. The fire stop systems and products shall have been tested in accordance with the procedures of U.L. and material shall be U.L. classified as materials for use in through-penetration fire stops.

e. The fire stop system shall comply with the NEC and with NFPA 101-Life Safety Code (latest edition) and shall be made available for inspection by the local inspection authorities prior to cable system acceptance. The Contractor shall be responsible for verifying the fire rating of all walls and floors affected by his/her work.

f. Cables shall not be exposed to paint or paint remover, which may degrade the performance of the cable, void the manufacturer's warranty, alter the flame and/or smoke characteristics of the cable, or obscure the flame rating designations printed on the jacket. Cables exposed to paint or paint remover shall be replaced by the Contractor.

g. Cable pulling tension may not exceed manufacturer recommendations. Where cable-pulling lubricant is used, the lubricant must be compatible (non-damaging) with the conduit and cable sleeve materials and must not harden over time to prevent future pulls.

h. Cable stapling of any recognized media type shall not be permitted.

i. Cables shall be dressed in conveniently sized bundles and either laced or banded. Lacing or banding shall not be so tight as to deform cable bundles.

j. Cabling installed with a bend radius less than that recommended by the cabling manufacturer is not acceptable.

k. Cables and bundles terminating at equipment or connector panels shall be supported so as not to put strain on connections or connectors.

l. All cabling between mobile equipment and connection panels must be prefabricated, tactical cabling.

m. All cabling between network ports, jacks, patch panels and equipment must utilize prefabricated CAT6a, or better as required by the application, patch cables of appropriate length.

n. All cables, with the exception of video or pulse cables, which must be cut to an electrical length, shall be cut to the length dictated by the run. No splices shall be permitted in any pull boxes without prior approval of the Consultant.

o. Cabling for equipment mounted in drawers or on slides shall be provided with a service loop of appropriate length. A cable management support for the service loop shall be provided to prevent the service loop travel from interfering with the operation of the drawer or slide or snagging on adjacent cabling.

p. Microphone level, line level, loudspeaker level, and video lines shall be run in separate conduits, trough, raceway divider, and cable bundles. Low voltage DC and control may be run along with any but microphone or line level audio runs.

4. Termination

a. All termination components must meet or exceed all specifications for given media type and application as described in this document and system drawings.

b. Crimp on connectors shall be installed only on the appropriate size cable using the manufacturer recommended crimp tool and die set.
c. Connections to electronic devices providing screw terminals shall be terminated using the appropriate gauge insulated spade or ring crimp terminal connector and crimp tool.
d. All mechanical solder-on connectors shall be attached to cable ends using rosin core solder.
e. Audio signal cable shields shall be protected with the appropriate gauge Teflon or heat-shrinkable tubing. The jacket end of each audio cable shall be fitted with the appropriate gauge heat shrinkable tubing to provide additional protection to the base of the shield or shield foil. This also applies to the inside of mechanical connectors and cables that terminate at partitioned barrier strips.

5. Analog Audio Microphone and Line Level Systems
   a. General
      1). All analog audio microphone and line level cabling installed by the Contractor to support AV Systems connectivity shall meet the equipment manufacturer's specifications for cable and connector types, installation methods and routing, separation distance from adjacent services, maximum number of disconnect points and maximum overall cable run lengths required to meet the systems design performance criteria. The cabling system shall be tested, verified and documented.
   b. Test for continuity of each conductor, polarity, signal loss and proper shield grounding and integrity.
   c. Testing to be performed using an NTi MR-PRO Audio Generator and Impedance Meter, or equal.
6. Analog Audio Loudspeaker Line Level Systems
   a. General
      1). All analog audio loudspeaker line level cabling installed by the Contractor to support AV Systems connectivity shall meet the equipment manufacturer's specifications for cable and connector types, installation methods and routing, separation distance from adjacent services, maximum number of disconnect points and maximum overall cable run lengths required to meet the systems design performance criteria. The cabling system shall be tested, verified and documented.
   b. Test for continuity, polarity, impedance, signal loss and (if required) proper shield grounding and integrity.
   c. Low impedance loudspeaker lines:
      1). Test impedance at 1000Hz.
      2). Test polarity of installed loudspeakers.
   d. 70 volt loudspeaker lines:
      1). Test watts load at 1000Hz.
      2). Test polarity of installed loudspeakers.
   e. Testing to be performed using an NTi MR-PRO Audio Generator and Impedance Meter, or equal.
7. Category Cabling and Connectors for AV Systems
   a. General
      1). All category cabling installed by the Contractor to support AV Systems connectivity shall meet the equipment manufacturer's specifications for cable and

connector types, installation methods and routing, separation distance from adjacent services, maximum number of disconnect points and maximum overall cable run lengths required to meet the systems design performance criteria. Cables shall be bundled in groups of 24 cables maximum. The category cabling system shall be tested, verified and documented to meet the ANSI/TIA-568.2-D Standard, including all applicable Addenda.

b. Digital Media Distribution Systems

1). AV Contractor provided signal distribution equipment that requires RJ-45 style connectors at room boundary wall panel or floor box panel connections, with the exception of those connecting a piece of AV equipment to the Owner's LAN, shall be color-coded Neutrik EtherCON CatX rated shielded panel connectors and DM compliant shielded CatX rated inline connectors in the appropriate color-coded Neutrik EtherCON connector carrier and specified to keep the CatX rating of the signal cable. Manufacturer approved RJ45 cable connectors shall be used at all manufacturer equipment connections. All wires within the cable must be connected and shielded.

2). Each digital AV over RJ-45 receptacle, permanently installed cable, equipment cord, patch cord and patch panel will be of a color or have markings that are non-standard with the voice/data system, and be plainly and permanently labeled "AV ONLY".

c. AV Control Ethernet Systems and Network Audio

1). AV Contractor provided signal distribution equipment that requires RJ-45 style connectors at room boundary wall panel or floor box panel connections, with the exception of those connecting a piece of AV equipment to the Owner's LAN, shall be color-coded Neutrik EtherCON CatX rated shielded panel connectors and DM compliant shielded CatX rated inline connectors in the appropriate color-coded Neutrik EtherCON connector carrier and specified to keep the CatX rating of the signal cable. Manufacturer approved RJ45 cable connectors shall be used at all manufacturer equipment connections. All wires within the cable must be connected and shielded.

2). Each digital AV permanently installed category cable, equipment cord patch cord and patch panel will be of a color or have markings that are non-standard with the voice/data system, and be plainly and permanently labeled "AV ONLY – NOT DATA".

d. Category Cabling Systems Installation and Testing

1). Where indicated, the Contractor will be required to provide a dedicated system of category cabling to support the transmission of digital AV signals. Depending upon the application, the cabling system topology may be point-to-point or be comprised of a system of work area outlets terminated at patch panels.

2). The Contractor shall test, verify and document the length, wire map and transmission performance of each Channel Link (Permanent Link + Station Cables) using a Fluke DSX-5000 Cable Analyzer System, including DSX-5000 Versiv Mainframe and Remote, LinkWare PC Software, CAT 6A/Class EA Permanent Link Adaptors and CAT 6A/Class EA Channel Adapters. This tester shall be used during testing of this project. Included features shall include the ability to integrate with labeling and cable management software, which yields downloadable 606-A cable IDs, ensuring data accuracy. Channel tests are the only acceptable test format for testing Category cabling. Link tests will not be sufficient.

3). All category cable Channel and Permanent Links shall be tested to prove compliance with the current industry standard, ANSI/TIA-568.2-D and any subsequent addenda. The field test equipment shall meet the requirements of ANSI/TIA/EIA-568-C including applicable Technical Service Bulletins and amendments. The appropriate level III tester shall be used to verify each individual type of category cabling systems.

4). Category 6A and 7a testing of channel, permanent link and twisted pair cables shall be performed using the recommended test equipment specifically designed to test cables for all ANSI/TIA-568.2-D Category 6A parameters from 1 – 500 MHz. Testers shall be loaded with the most recent test values per the above referenced standard. The Contractor may be required to provide documentation (or demonstration) that the testers used are properly programmed as described above.

8. Optical Fiber Cabling and Connectors for AV Systems
   a. General
      1). All optical fiber cabling installed by the Contractor to support AV Systems connectivity shall meet the equipment manufacturer's specifications for cable and connector types, installation methods and routing, separation distance from adjacent services, maximum number of disconnect points and maximum overall cable run lengths required to meet the systems design performance criteria. The optical fiber cabling system shall be tested, verified and documented to meet the ANSI/TIA-568-C.3 Standard, including all applicable Addenda.
   b. Digital Media Distribution Systems
      1). AV Contractor provided signal distribution equipment that requires optical fiber connectors at room boundary wall panel or floor box panel connections, with the exception of those connecting a piece of AV equipment to the Owner's LAN, shall be color-coded Neutrik opticalCON panel connectors and Neutrik opticalCON inline connectors in the appropriate color-coded Neutrik opticalCON connector carrier. Manufacturer approved optical fiber cable connectors shall be used at all manufacturer equipment connections.
      2). Each digital AV over optical fiber receptacle, permanently installed cable, equipment cord, patch cord and patch panel will be of a color or have markings that are non-standard with the voice/data system, and be plainly and permanently labeled "AV ONLY".
   c. AV Control Ethernet Systems
      1). AV Contractor provided network equipment and connections for AV equipment control over Ethernet: all optical fiber style room boundary wall panel or floor box panel connections provided by the AV Contractor shall be mechanically keyed with color-specific positive and negative keying features to prevent unintentional mating with unlike keyed or non-keyed patch cables.
      2). Each digital AV permanently installed optical fiber cable, equipment cord patch cord and patch panel will be of a color or have markings that are non-standard with the voice/data system, and be plainly and permanently labeled "AV ONLY – NOT DATA".
   d. Optical Fiber Cabling Systems Installation and Testing
      1). Where indicated, the Contractor will be required to provide a dedicated system of fiber optic cabling to support the transmission of digital AV signals. Depending upon the application, the cabling system topology may be point-to-point or be comprised of a system of work area outlets terminated at patch panels.

2). Testing shall be carried out in accordance with this document. This includes testing the attenuation and polarity of the installed cable plant with an optical loss test set (OLTS) and the installed condition of the cabling system and its components with an optical time domain reflectometer (OTDR). The condition of the fiber end faces shall also be verified.

3). Testing shall be performed on each cabling link (connector to connector).

4). Testing shall be performed on each cabling channel (equipment to equipment) that is identified by the Owner.

5). Testing shall not include any active devices or passive devices within the link or channel other than cable, connectors, and splices, i.e. link attenuation does not include such devices as optical bypass switches, couplers, repeaters, or optical amplifiers.

6). All tests shall be documented including OLTS dual wavelength attenuation measurements for multimode and single mode links and channels and OTDR traces and event tables for multimode and single mode links and channels.

7). All testing procedures and field-test instruments shall comply with applicable requirements of:

a). ANSI Z136.2, ANS For Safe Use Of Optical Fiber Communication Systems Utilizing Laser Diode And LED Sources

b). ANSI/EIA/TIA-455 50B, Light Launch Conditions For Long-Length Graded-Index Optical Fiber Spectral Attenuation Measurements

c). ANSI/TIA/EIA-455-59A, Measurement of Fiber Point Discontinuities Using an OTDR.

d). ANSI/TIA/EIA-455 60A, Measurement of Fiber or Cable Length Using an OTDR.

e). ANSI/TIA/EIA-455 61A, Measurement of Fiber or Cable Attenuation Using an OTDR.

f). ANSI/TIA/EIA-526 7, Optical Power Loss Measurements of Installed Single mode Fiber Cable Plant.

g). ANSI/TIA/EIA-526 14 A, Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant.

h). ANSI/TIA-568-C.0, Generic Telecommunications Cabling for Customer Premises.

i). ANSI/TIA-568-C.3, Optical Fiber Cabling Components Standard.

j). ANSI/TIA/EIA-606-A, Administration Standard for Commercial Telecommunications Infrastructure, including the requirements specified by the customer, unless the customer specifies their own labeling requirements.

8). Trained technicians who have successfully attended an appropriate training program, which includes testing with an OLTS and an OTDR and have obtained a certificate as proof thereof shall execute the tests. These certificates may have been issued by any of the following organizations or an equivalent organization:

a). Manufacturer of the fiber optic cable and/or the fiber optic connectors.

b). Manufacturer of the test equipment used for the field certification.

c). Training organizations (e.g., BICSI, A Telecommunications Association headquarters in Tampa, Florida; ACP [Association of Cabling Professionals™] Cabling Business Institute located in Dallas, Texas)

9. Digital Video Cable Installation and Testing:

a. General

1). All digital video cabling installed by the Contractor to support AV Systems connectivity shall meet the equipment manufacturer's specifications for cable and connector types, installation methods and routing, separation distance from adjacent services, maximum number of disconnect points and maximum overall cable run lengths required to meet the systems design performance criteria. The cabling system shall be tested, verified and documented.

b. When issues (such as cable length) compromise specifications or the integrity of the AV system, active cable equalization, twisted pair extenders, or fiber-optic extenders shall be employed as appropriate.
   1). When using twisted pair extenders, the type of cable used and its shielding must comply with the extender manufacturer's recommendations for optimum performance.
   2). When using products that draw power from the +5V line, the system must be configured to ensure that source power is not overdrawn.

c. The bend radius of each cable shall not be less than the minimum recommended by the cable manufacturer.
   1). System interconnects shall not exceed the minimum required for system functionality.
   2). Cable splices, joiners, and gender changers shall not be used.

d. Test for continuity of each conductor, signal loss and proper shield grounding and integrity.

e. Perform EDH, CRC & Jitter tests.

f. Perform Eye Pattern Measurement test.

g. Testing to be performed using a Phabrix SxE, or equal.

G. Labels / Wire Markers
1. For cable labeling, reference ANSI/INFOCOMM Standard F501.01:2015, Cable Labeling for Audiovisual Systems (CLAS)
2. Except where otherwise indicated, all rack-mounted equipment, switches, controls, and interface panels shall be clearly labeled.
   a. Panels and plates shall be a minimum 1/8" thick anodized aluminum etched and epoxy filled unless otherwise specified.
   b. Rack mounted equipment shall be labeled with engraved and filled plastic laminate. Where appropriate, the function of, or the input, output, or loudspeaker(s), served by each device shall be indicated. Other methods of labeling rack mounted equipment may be accepted pending prior approval by the Consultant and/or Owner.
   c. All cables shall be permanently identified at each end by machine printed cable markers.
      1). Every cable shall have a unique tag number identifier for each cable. The Contractor shall include this unique tag number on the As-Built signal flow documentation.
      2). Cable markers shall be placed two (2) inches from where the cable exits the strain relief of the connector, but never within a cable bundle.
      3). Each cable marker shall include, in addition to the unique tag number identifier, the name of the origination and destination equipment termination at each cable end (see example below).

(DVD Wire End) (Router Wire End)

H. Technical Power

1. Separate electrical power for media systems has been provided at this site and is designated as “technical power.” The technical power grid incorporates a grounding system utilizing a dedicated insulated ground cable for each receptacle, each of which is connected to the main technical power distribution panel. The Contractor shall be responsible for verifying that all media systems electronics, racks, and components derive their power from technical power receptacles only.
    a. All AC power distribution within equipment racks shall utilize a star grounding topology and isolated ground receptacles.
    b. Equipment rack power distribution systems shall be grounded by way of the 3-conductor AC line cord(s) provided with such equipment.

I. Grounding

1. To avoid system noise, data errors, safety hazards, and equipment damage, all devices and cabling shall be installed using a consistent grounding scheme. This section offers guidelines for grounding and shielding methodology. Grounding and shielding methodology may need to be augmented or modified for certain pieces of equipment or interconnections in order to meet the requirements of other sections of this specification. The Contractor shall be responsible for making necessary alterations in accordance with industry practices and such that the Performance Standards detailed in ‘Performance Standards’ are met.
    a. Grounding and shielding systems shall be executed in adherence to standard industry practices and as outlined in:
        1). AV Installation Handbook: Best Practices for Quality Audiovisual Systems – Second Edition: AVIXA/InfoComm International, 2009
        2). Basics of Audio and Visual Systems Design handbook: Section 10, “Technical Power and Grounding Systems” – Revised Edition: AVIXA/InfoComm International 2003
    b. Ground conductors referred to in this section shall be 10AWG insulated solid copper cable. Ground conductors shall be terminated using a closed ring lug, of proper size for each application, which shall be connected to system electronic components and the equipment rack master bus using nuts, bolts, and lock washers.
    c. Under no circumstances shall an AC neutral conductor be used to ground equipment.
    d. Power Distribution
        1). Active components having a grounded AC line cord shall be grounded using the supplied AC line cord connected to the equipment rack power distribution system. Removing the ground pin from a 3-conductor equipment power cord, or the use of ground defeat plugs is prohibited.
        2). For passive signal carrying components, which have no AC line cord, the component’s chassis shall be connected to the master ground bus bar using a ground conductor.
    e. Patch Fields
        a). Unless otherwise specified, all patch fields shall be configured such that device outputs appear on the top row connectors of the patch field, and device

inputs appear on the bottom row. Any exceptions to this rule require the prior approval of the Consultant.

b). All connectors used on patch fields shall be of such design that they are electrically isolated from the patch field panel.

f. Interconnection

1). All audio interconnections with cable lengths greater than 10 feet shall use balanced (symmetrical) signaling.

2). All connectors used on system I/O panels shall be electrically isolated from the panel and provide a pass through (uninterrupted) ground connection.

3). All audio signal cable shields shall be grounded only at the output connection of each device. Signal cable shields, both connected to devices and floating, shall be protected by the appropriate gauge heat shrinkable tubing. Cable shields at the input connector end of the cable shall be folded back over the cable jacket and covered with heat-shrinkable tubing. Do not cut off unused shields.

4). Microphone cable shields shall be connected at both ends.

5). Coaxial video and RF shields shall be connected at both ends.

J. Pull Strings

1. A nylon pull string shall be left in every conduit. In the event additional cables are pulled in after the initial cable pull, a nylon pull string shall be pulled with the added cable.

3.2 CONTROL SYSTEM SOFTWARE DESIGN & DEVELOPMENT

A. Control System Overview

1. AMX control system processors shall provide local audiovisual systems and supplemental architectural device control for each of the controlled spaces.
2. AMX touch panels, button panels and software applications shall be provided as the human interface devices for each of the control systems.
3. AMX existing meta-control software and database servers shall provide asset management, control scheduling, help desk, messaging, system administration and reporting functionality for the local audiovisual control systems.

B. Meta Control System

1. Where specified, the Contractor shall integrate the control systems into an existing AMX server-based meta-control system currently utilized by the Owner to provide capabilities that include Asset Management and Scheduling, Control System Help Desk and Messaging, and System Administration and Reporting.
2. The Contractor shall secure private IP addresses from the Owner for use by Ethernet equipped control system processors and control panels. The Contractor shall coordinate with the Owner, or representative of the Owner, to develop the required services, determine system user level access rights, and to establish control system network standards for TCP/IP addressing.
3. Meta control server software shall feature multiple user-access levels, assignable to any number of user logon accounts. Less-restricted accounts will be assigned to system administrators and security personnel, enabling them to monitor overall and equipment-specific status, take direct control over any control processor or control panel and generate statistical usage reports. More restricted accounts will be assigned to typical end users or presenters, enabling them to schedule a room, make equipment reservations, and specify the equipment “environment” for a room prior to the start of a meeting.

4. AMX control system processors and associated control panels will provide local control for all of the spaces. Each processor shall be equipped with either integral Ethernet port(s) and/or Ethernet expansion cards and memory expansion as required to support their operation. A connection between each processor and the building LAN will provide communications between the device and the Meta Control System.
5. Meta Control functionality shall include, but not be limited in the ability to:
    a. View real-time power status for all A/V systems facility-wide.
    b. Manually turn on/off A/V systems power in any room.
    c. Schedule A/V systems power on/off for individual rooms.
    d. Provide real-time status of video projector lamps.
    e. Provide self-generated equipment failure notifications.
    f. Create a database of equipment for asset management, tracking, and maintenance.
    g. Create reports, either scheduled or on-demand, indicating room and equipment usage.
    h. Schedule rooms, if desired, based on functionality, location, and availability.
    i. Provide Help Desk functions including chat and service notifications sent via e-mail.
6. Control system processors shall feature password protected remote login capability via a web-based interface, enabling the end user to directly monitor and control the processor via the LAN.
7. Where requested by the Owner, touch panel pages shall be converted, formatted, and exported for use with Apple® and/or Android® and/or Windows mobile devices.

C. Graphical User Interface / Touch Panels
    1. General
        a. The following guidelines are not intended to limit the creativity of the Programmer when designing the software nor are they all-inclusive. Rather, they are concepts and guidelines to ensure that a fully functional, easy to operate control system for the Owner is provided.
        b. The Control System shall employ an easy to use, intuitive, touch panel graphical user interface. Touch panel control shall be icon based and utilize graphical representations that mimic the actual device for all devices under control. In every case where the device under control offers feedback, the Control System shall provide indication on the touch panel(s) of individual component control state conditions.
        c. A “Quit”, “System Shutdown” or similar button shall be available from the Main Menu. When the User has selected this button, a confirmation screen indicating that the shutdown sequence has been selected, and a message will pop-up reminding the User to remove all media such as DVD or Blu-Ray discs. A second button press shall be required to initiate the power down sequence. If a lamp-based component such as a video projector has a significant cool down and warm-up time between its on and off state, the warning should indicate that this particular device will be unavailable for a specified period of time. This might be done using a graphical representation of a clock, a countdown timer, bar graph, etc.
        d. All pages shall maintain a consistent graphical “look and feel.”
        e. The opening page should have, at a minimum, an Owner logo, a large button to start the system, and the ability to control the lighting system (and motorized shades if so equipped) without powering up the entire system.
        f. After system start-up, the primary page or main menu in each presentation space shall display (at a minimum) a room identifier; all relevant input sources grouped together,

all environmental controls grouped together, a quit option, a date icon displaying the current date, and a clock indicating current local time

g. The AV Contractor will determine with the Owner those control panels requiring passwords and limited access.

h. Each touch panel shall provide a method for service personnel to access detailed system information and configuration menus. This information might be accessed by service personnel via a hidden button and/or by entering a password. Configuration menus should include projector zoom and focus, and other control functions useful to service personnel.

i. The information page should include the following: “System Designed by The Sextant Group, Inc. ph.(412)-323-8580 http://www.thesextantgroup.com”; “System Installed by _____, ph. (xxx) xxx-xxxx, and website address; “Programming Supplied by _____“Program Name”; “Compiler Version X.0”; “Panel File #” ; and other relevant system software information.

2. Video Preview Function

a. Where specified components permit, a video preview function shall be provided on the touch panel.

b. The video preview function shall operate such that, when any video source is selected, its output will be automatically routed to a video preview window on the touch panel.

c. Touching the video preview window on the touch panel will toggle the video display between a predetermined sized video window and full screen display on the touch panel.

d. Control buttons for the selected video source device shall always be present below the video preview window and/or overlaid onto the full screen display.

e. Switching and control shall be such that a user may preview and cue video on the touch panel from a selected video source device at the same time that program material is running, uninterrupted, on the systems primary display device and sound reinforcement system.

f. Pressing a video source device button followed by pressing a ‘display’ (or similarly labeled) button will route the source’s video signal to the primary display.

3. Audio Control

a. A volume control icon shall be available to the User at any time there is an audio enabled system.

b. Program audio: provide both level up/down and mute controls.

c. Speech audio: provide both level up/down and mute controls separate from the Program audio.

d. Microphone levels: when multiple microphone level control is required, provide a separate gain and mute control for each microphone in the mix. Microphone mix controls shall be on a separate, password protected setup page.

e. A clearly visible mute button with positive feedback to an on/off indicator on the touch panel shall also be included.

f. The AV Contractor shall set the system’s master gain control such that the user has a reasonable range of audio level, but the maximum level is set below that which could allow the user to inadvertently cause harm to system components or cause feedback in the system.

g. The control system shall automatically reset the audio levels to an indexed preset level each time the system is shut down or restarted.

h. Pressing a video source device button followed by pressing a ‘display’ (or similarly labeled) button will route the source’s video signal to the primary display. The source device’s audio will be simultaneously routed to the room’s sound reinforcement system (audio follow).

i. In systems with multiple assignable video displays:

1). The video preview window shall include a button, or buttons, representing each assignable video display connected to the system. Where touch panel size permits, this should take the form of a graphical representation of the room with a display assignment button showing the relative location of each display.

2). Pressing a video source device button followed by pressing a display assignment button will route the source’s video signal to that display. This process can be repeated to assign a single video source to multiple displays.

j. In systems with multiple assignable video displays and a single sound reinforcement system:

1). A method shall be provided by which users may select which video source’s audio signal is to be routed to the room’s sound reinforcement system (audio break away).

k. In systems with multiple assignable video displays and a multiple sound reinforcement systems:

1). A method shall be provided by which users may select which video source’s audio signal is to be routed to each sound reinforcement system (audio break away). An example might be a room with a projection screen that also contains multiple collaboration pods served by flat panel displays with integral loudspeakers.

4. Lighting Control

a. Touch panel layouts will include lighting preset recalls in each room. A minimum of eight scene presets should be provided. For lighting zones where a dimming system is employed, the touch panel shall include “Brighter” and “Dimmer” or “Plus” and “Minus” buttons allowing the User to increase or decrease the level of lighting for any given preset.

b. If so requested by the Owner, an Auto-Lights feature may also be provided for all or select spaces. The Auto-Lights feature, when enabled, would recall a specific lighting preset when, for instance, projection or video conferencing is called for.

D. Controlled Devices

1. Where specified components permit, the Control System shall provide positive feedback of individual component control-state conditions to the touch panel.

2. Where specified, the AV Contractor shall provide a Control System interface to mechanical or electronic devices such as screens, window shades, or room lighting. Wherever such operation is available at the mechanical device under control, a stop or halt button shall always be provided in addition to buttons to drive normal equipment operation.

3. Remote power relays, when employed, shall be used to switch AC power to those devices whose power on/off function is otherwise not controllable. When such devices are audio power amplifiers, the Contractor shall program system control such that the audio power amplifiers are the last components to turn on during power up, and the first devices to turn off during power down.

4. If so requested by the Owner, all or select control system processors shall be programmed with an Auto Shutdown feature. Auto Shutdown will automatically power down a system at a given time unless overridden by the local User or System Administrator. The Auto Shutdown feature shall function as follows: For any given room, when Auto Shutdown is set to “On”, the system will power down at a time specified by the Owner, 10:00 PM for

example. Ten minutes prior to the specified time, the touch panel shall display a warning message and beep indicating that the system will shut down unless the local defeat button on the panel is pressed within the ten-minute time limit. Pressing the local defeat button will delay the Auto Shutdown sequence by one-hour, or other set length of time as requested by the Owner. Fifty minutes after the one-hour delay button has been pressed, the warning message and beep indicating that the system will shut down unless the local defeat button on the panel is pressed within the ten-minute time limit will appear. This sequence shall continue so long as the operator continues to press the delay button.

5. Resident PCs should be connected to constant power sources, not switched power, and should never be powered down from the control system.
6. As previously mentioned, each media playback device shall have its transport controls duplicated on the touch panel video preview page, or in the case of an audio-only device, a dedicated control page. The control functionality for each device shall closely mimic the control functions on the device itself. For example, a Blu-Ray player, DVD player, VCR, or cassette deck shall have, at minimum, the five basic transport functions, play, stop, fast-forward, rewind, and pause. The Play and Stop buttons should be prominent. All transport buttons should change state when active.
7. If a device can play multiple types of media, has bi-directional communication with the control system, and its API permits, the system shall read the media type and adjust the screen options as appropriate for the playback option selected. For example, if a particular DVD player is able to play both DVDs and CDs and has RS-232 control, the system shall display different options when a DVD is detected by the unit versus when a CD is detected by the unit (such as a video preview window and the ability to route the signal to a display device versus just audio playback transport controls). In this example, “graying out” the inappropriate buttons for options is acceptable.
8. For a video projector with an automatic set-up, auto image adjust or similar button, control of this feature should be provided on every logical page, such as VGA analog input pages.
9. For devices that require keypad-style dialing, such as audio or video conferencing, mimic a telephone keypad display to allow dialing from the touch panel. Provide a display above the keypad to display the number being dialed. This should be similar to an LCD screen on a desktop telephone with a small LCD screen above the keypad, which indicates the key-presses of the number dialed. If a “9”, an access code or other prefix is required to dial an outside line, leave this prefix as a default. Provide a backspace key to modify dialed numbers. Provide a button to provide dial tone, a button to dial the number, and a button to terminate the call (similar to a cell phone).
10. For systems involving a video projector or similar lamp-based device, control the power to these devices separately. Users should be able to operate audio only playback devices, or control lighting or room dimming systems without automatically powering the projectors. If the system is initially started without projection, and the user subsequently attempts to project a source, the system should then ask if the user would like to power-up the projector(s) and if selected, display a progress bar during the warm-up process and then return to the current touch panel page.

E. Videoconferencers and Cameras

1. Videoconferencing units shall be controlled via RS-232 interface from the control system touch panel in each room. In addition to dialing control, a touch panel layout similar in look to the manufacturer handheld remote shall be provided. Minimum features shall include local camera control, far end cameral control, phone-add (where applicable), and privacy function. The privacy function shall mute the near end audio and the control system shall provide a large icon to indicate that privacy is enabled.

2. The AV Contractor shall establish 4-6 go-to camera presets and provide a simple scheme whereby the User may easily recall these presets during a presentation. The Contractor shall determine all camera presets in coordination with the Owner. The setup of the camera presets shall be on a password protected technician's page, with provisions for naming each preset with variable text. This will allow the Owner to use descriptive text for preset labeling rather than simple numbering.
3. Manual camera control functions shall include zoom, pan and tilt. For camera zoom, indicate the lens control with a "Plus/Minus" or similar graphical icon based labels. For pan and tilt functions, use left, right, up, and down directional arrows mimicking the manufacturer handheld remote.

3.3 Audio DSP User Interface - Biamp Canvas

A. The Contractor shall provide programming on an Owner provided laptop or tablet

B. Venue audio controls on the virtual Canvas layouts shall include the following for each room outfitted with Biamp DSP:
   1. Standard control panel(s) with the following features:
   2. Full metering of individual channels
   3. Individual channel volume
   4. Individual channel gain
   5. Individual channel mute
   6. Muting of individual program audio sources
   7. Zone/speaker output volume controls – room, group, and individual.
   8. Microphone audio presets EQ, gate/limiter, compressor, ducking, etc.
   9. Multiple recallable presets, available building wide, on individual channels and DSP chains.
   10. Videoconferencing & control room audio mix down:
   11. Establish separate control panel for audio feeds, into recording and VTC.
   12. Full metering of individual channels
   13. Individual channel volume
   14. Individual channel mute
   15. Muting of individual program audio sources
   16. Control room audio panels, assignable pulling all feeds from any of the five classrooms.

3.4 PERFORMANCE STANDARDS

A. Audio
   1. Speech Signal
      a. The system shall provide a speech signal in the audience seating area that meets or exceeds the following requirements:
         1). Frequency response within ±3 dB from 500 Hz to 15,000 Hz.
         2). Overall SPL variance of ±3 dB.
         3). Measured Alcons of 10% or lower.
         4). Minimum average SPL of 87 dB Z-weighted (flat), with 10 dB of undistorted headroom available.
   2. Music Signal

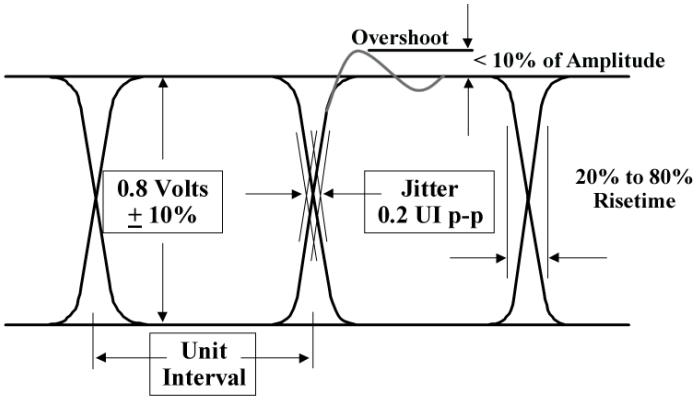
a. The system shall provide a music signal in the audience seating area that meets or exceeds the following requirements:
   1). Frequency response within ±3 dB from 200 Hz to 17,000 Hz.
   2). Overall SPL variance of ±3 dB.
   3). Minimum average SPL of 93 dB Z-weighted (flat), with 10 dB of undistorted headroom available.

B. Video
   1. Analog VGA Video, RGB Video, RGBS Video, and RGBHV Video
      a. At the points of interconnection, the input and output impedance of each link shall be unbalanced to ground, nominally 75 Ohms ±0.5% resistive.
      b. The nominal signal amplitude shall be 1.0 volt peak-to-peak (140 IRE units). The polarity of the signal shall be "positive," i.e., such that black-to-white transitions are positive going.
      c. The Contractor shall test the video system to ensure that it meets all VESA standards for video signals from VGA (640x480) resolution up through and including WUXGA (1920x1200) resolution.
   2. Digital Video
      a. Based on the connectivity requirements provided by the AV systems design, the Contractor shall test the digital video system to ensure that it meets the following standards, as applicable:
         1). CEA-861-F
         2). Single-link DVI
         3). Dual-link DVI
         4). HDMI 1.4b
         5). DisplayPort 1.2
         6). Thunderbolt v1.2
         7). Mini DisplayPort v1.2
   3. Serial Digital Video Signals
      a. At the points of interconnection, the input and output impedance of each link shall be unbalanced to ground, nominally 75 Ohms ±0.5% resistive.
      b. The Contractor shall test the video system to ensure that it meets the Engineering Standards of the appropriate SMPTE standards including:
         1). SMPTE 259M for Standard Definition systems (SD-SDI).
         2). SMPTE 292M for High Definition systems (HD-SDI)
         3). SMPTE 424M for 3 Gigabit/second High Definition systems (3G-SDI)
         4). SMPTE 2081-1 for 6 Gigabit/second 6G Ultra High Definition systems (6G-UHDTV)
         5). SMPTE 2082-1 for 12 Gigabit/second 12G Ultra High Definition systems (12G-UHDTV)
      c. A SMPTE Color Bars test signal shall be utilized for confirming proper video levels throughout the signal system.
      d. A SDI Check Field (pathological signal) test signal shall be utilized for stress testing the signal system.

1). Test signal format shall be selected based on video standard to be used in the normal operation of the system under test. Examples of the formats are 525i/29.97, 1080i/59.94, 720p/59.94, or 1080p/59.94.

2). The eye pattern of the test signal at the injection point in the system shall meet the specifications of the appropriate SMPTE specification as outlined in the following table:

Description	SD-SDI	HD-SDI	3G-SDI
Amplitude	0.8 Volts, ± 10%	0.8 Volts, ± 10%	0.8 Volts, ± 10%
Overshoot	< 10% of Amplitude	< 10% of Amplitude	< 10% of Amplitude
Rise & Fall Time	≥ 0.4ns and ≤ 1.5ns	≤ 270ps	≤ 135ps
Rise & Fall Time Difference	≤ 0.5ns	≤ 100ps	≤ 50ps
Jitter Timing	0.2UI (740ps)	1.0UI (673.4ps @ 1.485Gb/s)	≤ 2.0UI above 10Hz
Jitter Alignment	0.2UI (740ps) @ 1kHz	0.2UI (135ps) @ 100kHz	≤ 0.3UI above 100kHz
Unit Interval	3.7ns	673.4ps	336.7ps



e. The signal at the input to the destination device shall exhibit no cyclic redundancy check (CRC) errors as analyzed by an appropriate waveform monitor and shall contain no observable artifacts such as macro-blocking or sparkling in the video signal.

4. Digital Visual Interface (DVI)

a. The Contractor shall test the video system to ensure that it meets the Engineering Standards of Version 1.0 of the Digital Visual Interface DVI specification document as released by Digital Display Working Group (DDWG), April 1999, which applies to digital and analog video signals with DVI connectivity. This Performance Standard applies mainly to DVI-D and DVI-I digital video connectivity. For DVI-A or DVI-I analog video connectivity, refer also to the Analog VGA Video paragraph herein.

b. At the points of interconnection, the input and output impedance of each link shall be balanced to ground, nominally 100 ohms ± 10 ohms.

c. Single link DVI shall support up to and including:

1). 4.95 Gbps data rate

2). 1920x1200 @60Hz resolution

3). 60Hz vertical frequency

d. Dual link DVI shall support up to and including:
   1). 10.2 Gbps data rate
   2). 2560x1600 @60Hz resolution
   3). 60Hz vertical frequency

e. The proper shape of the digital video's RGB channels, or "eye pattern", as it appears on an oscilloscope, must be maintained. Refer to the DVI specification document by DDWG for required eye opening values and minimum standards for signal integrity

5. High-Definition Multimedia Interface (HDMI)
   a. The Contractor shall test the video system to ensure that it meets the Engineering Standards of the HDMI2.0 Specification as administered by HDMI Licensing, LLC.
   b. At the points of interconnection, the input and output impedance of each link shall be balanced to ground, nominally 100 ohms ± 10 ohms.
   c. The proper shape of the digital video's RGB channels, or "eye pattern", as it appears on an oscilloscope, must be maintained. Refer to the HDMI Specification by HDMI Licensing, LLC for required eye opening values and minimum standards for signal integrity.
6. Display Port
   a. The Contractor shall test the video system to ensure that it meets the Engineering Standards of Version 1.2a of the DisplayPort Standards as administered by the Video Electronics Standards Association (VESA).
   b. At the points of interconnection, the input and output impedance of each link shall be balanced to ground, nominally 100 ohms ± 10 ohms.
   c. System shall support up to and including:
      1). 10.8 Gbps data rate
      2). 2560x1600 @60Hz resolution
      3). 60Hz vertical frequency
   d. The proper shape of the digital video's RGB channels, or "eye pattern", as it appears on an oscilloscope, must be maintained. Refer to the DisplayPort Standards by VESA for required eye opening values and minimum standards for signal integrity.
7. High-Bandwidth Digital Content Protection (HDCP)
   a. All digital video sources, sinks, and repeaters shall comply with the Digital Content Protection LLC DCP 2.2 specifications.
   b. All digital video sources, sinks, and repeaters shall scan for the presence of HDCP and if present, perform all HDCP stages according to the HDCP specification, with no more than 5 seconds total time delay between source selection or input and video appearing:
      1). Authentication and Key Exchange – Keys are exchanged and verified. The hardware will store / cache the Key Selection Vector (KSV) k_m to speed up video switching.
      2). If receiver is a repeater, data about downstream devices is sent to transmitter.
      3). Information is sent to transmitter every two seconds during entire HDCP session to ensure encryption is in sync between all transmitter/receiver pairs in the tree.
   c. The distribution system shall authenticate all cached KSVs with each source up to the source's KSV limit, so that authentication does not need to be re-started each time content is routed to a new output.
   d. The distribution system shall not send a source more KSVs than it supports.

8. Extended Display Identification Data (EDID)
    a. All system components generating or accepting certain digital video signals shall provide the following information within the EDID transmission.
        1). Product make, model, and serial number
        2). Current EDID version and revision
        3). Maximum image size
        4). A table of supported input/output resolutions and timings
        5). 3D support status for each input/output
        6). Supported color formats
        7). Supported audio formats for each input/output
9. Serial Bus Communications
    a. Based on the connectivity requirements provided by the AV systems design, the Contractor shall test all serial bus communications links to ensure that they meet the following standards, as applicable:
        1). USB 3.0
        2). IEEE-1394b
        3). Thunderbolt v1.2
10. Digital AV Over Category Cabling Systems:
    a. UTP, STP, F/UTP and S/FTP cables installed for digital AV systems shall meet the following performance standards:
        1). Category 5, 5e and 5e+ cables:
            a). ANSI/TIA-568.2-D Category 5e Permalink Specifications.
            b). ANSI/TIA-568.2-D Category 5e Channel Specifications.
        2). Category 6 and 6+cables:
            a). ANSI/TIA-568.2-D Category 6 Permalink Specifications.
            b). ANSI/TIA-568.2-D Category 6 Channel Specifications.
        3). Category 6a and 7a cables:
            a). ANSI/TIA-568.2-D Category 6A Permalink Specifications.
            b). ANSI/TIA-568.2-D Category 6A Channel Specifications
    b. Cable performance definitions
        1). NEXT: Near-End Crosstalk
        2). PSNEXT: Powersum Near-End Crosstalk
        3). ACRF: Attenuation to Crosstalk Ratio, Far-End
        4). PSACRF: Powersum Alien Crosstalk Ratio, Far-End
        5). ELFEXT: Equal-Level Far-End Crosstalk
        6). PSELFEXT: Powersum Equal-Level Far-End Crosstalk
        7). PSANEXT: Powersum Alien Near-End Crosstalk
        8). PSAACRF: Powersum Insertion Loss to Alien Crosstalk Ratio, Far-End
    c. Test Results
        1). Submission: Prior to Final Testing and Systems Performance Verification, the Contractor shall submit a copy of all applicable test results to the Owner/Technology Consultant in both electronic (file) and paper form.
        2). Category cables: The test results submitted for category cables shall include the following:

3). Graphical/numerical data: Both graphical data plots and numerical data are required for the test parameters listed above.

4). The Category Cable Certification reports shall have complete testing of Permanent Links and Channel Links at frequency increments up to 500MHz as indicated in ANSI/TIA-568.2-D and shall include the following:

a). Cable/Faceplate Number -- matching faceplate numbers on patch panels

b). Test Date

c). Cable Length

d). Wire-Map

e). Return Loss

f). Insertion Loss

g). NEXT Loss

h). PSNEXT Loss

i). ACRF

j). PSACRF

k). Propagation Delay Skew

l). PSANEXT (Category 6A only)

m). PSAACRF (Category 6A only)

5). Provide Category Cable Certification report and include as a minimum the following information:

a). Test equipment make and model number.

b). Test equipment calibration date.

C. Fiber Optic Cable

a. Unless otherwise specified by the Owner or the Owners representative, each cabling link shall be in compliance with the ANSI/TIA-568-C.3 standards and the following test limits:

1). Optical loss testing

a). Multimode and Single mode links

2). The link attenuation shall be calculated by the following formulas as specified in ANSI/TIA-568-C.0.

a). Link Attenuation (dB) = Cable Attn (dB) + Connector Attn (dB) + Splice Attn (dB)

b). Cable Attn (dB) = Attenuation Coefficient (dB/km) * Length (Km)

c). Connector Attn (dB) = number of connector pairs * connector loss (dB)

d). Maximum allowable connector loss = 0.75 dB

e). Splice Attn (dB) = number of splices * splice loss (dB)

f). Maximum allowable splice loss = 0.3 dB

g). The values for the Attenuation Coefficient (dB/km) are listed in the table below:

Type of Optical Fiber	Wavelength (nm)	Attenuation coefficient (dB/km)	Wavelength (nm)	Attenuation coefficient (dB/km)
Multimode 62.5/125 µm	850	3.5	1300	1.5

Multimode 50/125 µm	850	3.5	1300	1.5
Single-mode (Inside plant)	1310	1.0	1550	1.0
Single-mode (Outside plant)	1310	0.5	1550	0.5

3). OTDR testing
   a). Reflective events (connections) shall not exceed 0.75 dB.
   b). Non-reflective events (splices) shall not exceed 0.3 dB.
   c). Magnified end face inspection
   d). Fiber connections shall be visually inspected for end face quality.
   e). Scratched, pitted or dirty connectors shall be diagnosed and corrected.
   f). Note: High Bandwidth applications such as 1000BASE-SX, 10GBASE-S, and FC1200 impose stringent channel loss limits. Where practical, certification should consider loss length limits that meet maximum channel (transmitter to receiver) loss.
4). Performance specification for MM fiber at 850 nm

Fiber Type		Bandwidth	1000BASE-SX		10GBASE-SR		FibreChannel 1200-MX-SN-I	
	µm	MHz (Km)	Length (m)	Loss (dB)	Length (m)	Loss (dB)	Length (m)	Loss (dB)
OM1	62.5	200	275	2.38	33	2.5	33	2.4
OM2	50	500	550	3.56	82	2.3	82	2.2
OM3	50	2000	1000	3.56	300	2.6	300	2.6

5). The optical fiber cable field-test instrument shall be within the calibration period recommended by the manufacturer.
6). Optical loss test set (OLTS)
   a). Multimode optical fiber light source
   b). Provide dual LED light sources with central wavelengths of 850 nm (±30 nm) and 1300 nm (±20 nm)
   c). Output power of –20 dBm minimum.
   d). The light source shall meet the launch requirements of ANSI/EIA/TIA 455 50B, Method A. This launch condition can be achieved either within the field test equipment or by use of an external mandrel wrap (as described in clause E.7 of ANSI/TIA-568-C.0) with a Category 1 light source.
   e). Acceptable manufacturers: Fluke Networks or Noyes Fiber Products, a division of AFL Telecommunications
7). Single mode optical fiber light source
   a). Provide dual laser light sources with central wavelengths of 1310 nm (±20 nm) and 1550 nm (±20 nm).
   b). Output power of –10 dBm minimum.
   c). Acceptable manufacturers: Fluke Networks or Noyes Fiber Products, a division of AFL Telecommunications

8). Power Meter
   a). Provide 850 nm, 1300/1310 nm, and 1550 nm wavelength test capability.
   b). Power measurement uncertainty of ±0.25 dB.
   c). Store reference power measurement.
   d). Save at least 100 results in internal memory.
   e). PC interface (serial or USB)
   f). Acceptable manufacturers: Fluke Networks or Noyes Fiber Products, a division of AFL Telecommunications
9). Optical Time Domain Reflectometer (OTDR)
   a). Shall have a bright, color transmissive LCD display with backlight.
   b). Shall have rechargeable Li-Ion battery for 8 hours of normal operation.
   c). Weight with battery and module of not more than 4.5 lb. and volume of not more 200 in^3.
   d). Internal non-volatile memory and removable memory device with at least 16 MB capacity for results storage.
   e). Serial and USB ports to transfer data to a PC.
   f). Multimode OTDR
   g). Wavelengths of 850 nm (± 20 nm) and 1300 nm (± 20 nm).
   h). Event dead zones of 3.7 m maximum at 850 nm and 1300 nm.
   i). Attenuation dead zones of 10 m maximum at 850 nm and 13 m maximum at 1300 nm.
   j). Distance range not less than 2000 m.
   k). Dynamic range at least 10 dB at 850 nm and 1300 nm
   l). Acceptable manufacturers: Fluke Networks or Noyes Fiber Products, a division of AFL Telecommunications
10). Single mode OTDR
   a). Wavelengths of 1310 nm (±20 nm) and 1550 nm (±20 nm).
   b). Event dead zones of 3.5 m maximum at 1310 nm and 1550 nm.
   c). Attenuation dead zones of 10 m maximum at 1310 nm and 12 m maximum at 1550 nm.
   d). Distance range not less than 10000 m.
   e). Dynamic range at least 10 dB at 1310 nm and 1550 nm
   f). Acceptable manufacturers: Fluke Networks or Noyes Fiber Products, a division of AFL Telecommunications
11). Administration of the documentation shall include test results of each fiber link and channel.
   a). The test result information for each link shall be recorded in the memory of the field-test instrument upon completion of the test.
   b). The test result records saved within the field-test instrument shall be transferred into a Windows™-based database utility that allows for the maintenance, inspection and archiving of these test records.
12). All tests performed on optical fiber cabling that use a laser or LED in a test set shall be carried out with safety precautions in accordance with ANSI Z136.2.

13). All outlets, cables, patch panels and associated components shall be fully assembled and labeled prior to field-testing. Any testing performed on incomplete systems shall be redone on completion of the work.

b. Optical Fiber Cable Testing
   1). Field-test instruments shall have the latest software and firmware installed.
   2). Link and channel test results from the OLTS and OTDR shall be recorded in the test instrument upon completion of each test for subsequent uploading to a PC in which the administrative documentation (reports) may be generated.
   3). Fiber end faces shall be inspected at 200X or 400X magnification. 200X magnification is suitable for inspecting multimode and single mode fibers. 400X magnification may be used for detailed examination of single mode fibers. Scratched, pitted or dirty connectors shall be diagnosed and corrected.
      a). It is preferable that the end face images be recorded in the memory of the test instrument for subsequent uploading to a PC and reporting.
   4). Testing shall be performed on each cabling segment (connector to connector).
   5). Testing shall be performed on each cabling channel (equipment to equipment) that is planned for use per the Owner's instructions.
   6). Testing of the cabling shall be performed using high-quality test cords of the same fiber type as the cabling under test. The test cords for OLTS testing shall be between 1 m and 5 m in length. The test cords for OTDR testing shall be approximately 100 m for the launch cable and at least 25 m for the receive cable.
   7). OTDR Testing
      a). Fiber links shall be tested at the appropriate operating wavelengths for anomalies and to ensure uniformity of cable attenuation and connector insertion loss: Multimode: 850 nm and 1300 nm. Single mode: 1310 nm and 1550 nm. Each fiber link and channel shall be tested in both directions. A launch cable shall be installed between the OTDR and the first link connection. A receive cable shall be installed after the last link connection.
   8). Length Measurement: The length of each fiber shall be recorded. It is preferable that the optical length be measured using an OLTS or OTDR.
   9). Polarity Testing: Paired duplex fibers in multi-fiber cables shall be tested to verify polarity in accordance with Clause E.5.3 of ANSI/TIA 568 C.0. The polarity of the paired duplex fibers shall be verified using an OLTS.

c. The detailed test results documentation data is to be provided in an electronic test report for each tested optical fiber and shall contain the following information
   1). The fiber identification number
   2). The length for each optical fiber: Optionally the index of refraction used for length calculation when using a length capable OLTS
   3). Test results to include OLTS attenuation link and channel measurements at the appropriate wavelength(s) and the margin (difference between the measured attenuation and the test limit value).
   4). Test results to include OTDR link and channel traces and event tables at the appropriate wavelength(s).
   5). The length for each optical fiber as calculated by the OTDR.
   6). The overall Pass/Fail evaluation of the link-under-test for OLTS and OTDR measurements
   7). Optional: A picture or image of each fiber end-face, or a pass/fail status of the end-face based upon visual inspection.

D. Optical Systems
   1. Reference ANSI/INFOCOMM Standard 3M-2011, Projected Image System Contrast Ratio
   2. All video projection systems shall meet the following performance standards:
      a. The total averaged light output from a video projector, in ANSI lumens, shall be tested by the Contractor and certified to be within ±15% of that specified by the projector manufacturer.

3.5 SYSTEM SETUP, TUNING AND TESTING

A. The Contractor shall install, configure, adjust, program, and calibrate all components in order to optimize the performance of all individual subsystems and the system as a whole

B. Once the system is installed, the Contractor shall complete the following preliminary tests.
   1. Equipment Racks
      a. Unless otherwise agreed in writing, equipment rack(s) shall be completely assembled, tested and programmed in the Audiovisual Contractor's shop. No rack assembly shall be performed at the project site. After the equipment racks are tested the Audiovisual Contractor shall notify the Owner's Representative in writing that the equipment rack assemblies are ready for observation and approval. Allow adequate time for any modifications necessary to satisfy the contract drawings and specifications.
   2. Device Configuration
      a. Configure all devices as necessary for a complete and working system and as directed by the Owner or Consultant.
   3. Network
      a. All network device firmware must be updated prior to arrival and installation.
      b. Unless otherwise specified, all hardware must be set to DCHP prior to install.
      c. Information on all hardware being attached to Owner network: Make, Model, Serial Number, Part Number & Mac Address(es) is due to the Owner 30 days prior to install.
      d. Configure all networked devices in coordination with the Owner and/or Consultant including the assignment of IP address, subnet, gateway, security settings, and host names.
      e. Apply host name for all devices within each device’s setup utility.
      f. Verify all networked devices are configured and registered to their respective network and free of any device to device communication errors and are reachable from the necessary devices.
      g. Verify all networked devices are registered to each manufacturers’ respective software or web-based configuration tool.
   4. Audio
      a. Prior to the termination of audio amplifiers to speakers, the Contractor shall measure the resistance of the speaker line with reference to ground to determine that no short circuits or paths to ground exist in the line. The Contractor shall connect the speaker to the cable and measure the impedance of each speaker line using a 1,000Hz signal applied to the line. The Contractor shall submit a list, to the Consultant, by cable number, of the impedance of each speaker line. This test shall be performed with the amplifier disconnected from the speaker line and the speaker connected to the speaker line.
      b. Verify all loudspeakers are working.
      c. Verify that the system meets all Performance Standards as outlined in ‘Performance Standards’.

d. Verify that all equipment, panels, and cables are labeled correctly.
e. Verify each item of equipment is functioning as intended.
f. Verify the installation is the same as specified.
g. Loudspeaker Installation:
    1). Verify the aiming and positioning of all loudspeakers with the Consultant.
    2). If the Consultant has developed an EASE software model, obtain the coverage plots from the Consultant and confirm the performance of the loudspeaker system meets or exceeds the coverage indicated in such model.

5. Additional Audio System Processing Adjustments
    a. Where applicable, the Contractor shall program the DSP system to include filters adjusted such that the loudspeaker zone(s) effected by same are measured to exhibit uniform (flat) frequency response (less than +/- 3 dB) at the listening location for the frequencies the transducer is designed/intended to address. The exception to this rule shall be in speech reinforcement systems where additional adjustments shall be made to ensure maximum gain with minimum feedback.
    b. Measurements utilized for determining filter adjustments shall be made on axis with respect to a single transducer (representative of the zone) in its intended field of coverage. Loudspeaker cross-over filters shall be provided first for all actively crossed transducers per loudspeaker manufacturer's instructions. Additional filters will still be required to achieve uniform frequency response measured at the various listening locations.
    c. For loudspeaker zones of small transducers, utilize high-pass filters first and foremost and then utilize parametric EQ filters to flatten the measured response.
    d. For loudspeaker zones of large transducers, where other transducers in the system will address higher frequencies, utilize low-pass filters first and foremost and then utilize parametric EQ filters to flatten the measured response.
    e. The Consultant may request additional filters and delay (as required) to address 'tuning preferences', but such 'tuning preferences' shall not be considered as part of the base line requirements for determining substantial completion of the audio system. Flat frequency response and time alignment of the direct sound from the loudspeakers will be considered a base line requirement for determining substantial completion of the audio system.
    f. Dante Audio Network
        1). Configure Dante network within Dante Controller or if specified within the project, Dante Domain Manager labeling all devices as their product host names and labeling all utilized audio channels. All unused channels shall retain their respective channel number.
        2). Properly designate and configure a master clock source and latency settings.
        3). Route audio as required.

6. Computer Configuration – OFCI (Owner Furnished Contractor Installed)
    a. The Contractor shall be responsible for coordinating with the Owner in regards to the specific requirements of Owner furnished computers and/or servers as applicable to meet the functional requirements of the audiovisual systems as specified.
    b. Coordination shall ensure that the computers and/or servers meet the recommended hardware configuration required by the Audiovisual Systems as well as for all software applications, including any software provided as part of this Specification, Owner furnished software integral to the functionality of the audiovisual system, and custom software that is developed through a 3rd-party for use within the audiovisual system.

c. Contractor coordination with the Owner on the requirements of OFCI computers shall include but may not be limited to:
   1). Form factor
   2). Firmware
   3). Operating System (OS)
   4). Memory
   5). Hardware versus firmware, versus OS, versus software compatibility
   6). Video output quantity and type
   7). Audio output quantity and type
   8). Network connection(s) quantity and type
   9). USB port quantity and type
   10). Power supply(s)
   11). Display type, resolution, size and quantity
   12). Peripherals, including but not limited to:
      a). Keyboard
      b). Mouse
      c). Cameras
      d). Microphones
      e). USB enabled devices
      f). Others as specified

d. The Contractor shall further coordinate with the Owner's IT department to:
   1). Install and configure the furnished computer hardware to function within the audiovisual system as intended by this Specification. This includes but is not limited to the configuration of the following:
      a). Display Settings
      b). Audio settings
      c). Network settings
      d). USB devices and drivers
      e). Others as specified
   2). Install and configure any software provided as part of this Specification.
   3). Configure any Owner provided software that is integral to the functionality of the audiovisual system.

e. The Contractor shall provide to the Owner a date by which all computers must be available to the Contractor for final installation and configuration.

7. Analog VGA Video, RGB Video, RGBS Video, RGBHV Video
   a. To establish that the facility cabling and terminations meet the specifications defined in 'Performance Standards', a video test signal shall be applied to each input cable and passed through the system switching and distribution networks with test patterns observed at each system display.
   b. Test signals shall be generated using an Extron VTG 400DVI programmable video and audio test generator (or equal).
   c. The following test patterns (at a minimum) shall be observed:
      1). Circles – no visible deviation from image geometry and linearity
      2). Safe area – no visible horizontal or vertical over or under scan

3). Focus – proper image delineation in all areas
4). Coarse Crosshatch – no vertical or horizontal bowing
5). Fine Crosshatch – no vertical or horizontal bowing
6). PLUGE – properly set black level (brightness) and display gain (contrast)
7). 32-Level Split Grayscale – even transition from black to white, no color shift
8). SMPTE Color Bars with PLUGE pattern – no color or pattern deviations
9). Flat Field – uniform white field with no color, hot or dark spotting
10). Hum Bar Detect – no visible hum bars

8. Serial Digital Video
   a. During all testing, twenty meters (20M) of the same type cable used in the system under test shall be added at the input of the waveform monitor to establish a signal system headroom margin.
   b. The Contractor shall perform stress testing on every signal path within the facility. For purposes of this section, signal path shall be defined as:
      1). From the cable connecting to the output of the source device to the cable connecting to the input of the final destination device in the system.
      2). From the cable connecting to the output of the source device to the cable connecting to the input of the first destination device in the system that re-clocks the SDI signal. In this case, the next signal path shall be defined as starting at the output of the re-clocking device.
      3). For tielines or other cable paths not connected to active outputs, the signal path shall be the cable from the points of operation connection at each end of the path.
   c. Stress testing shall be performed on each signal path by injecting the test signal at the output cable of the source device and connecting the waveform monitor to the input cable at the destination device.
      1). The Contractor may choose to test individual cable segments within the system however stress testing shall be conducted on each signal path as defined earlier in this section.
   d. The Contractor shall verify proper system operation by observing the video signal on a high-quality video monitor and an appropriate waveform monitor. Contractor shall verify:
      1). No CRC errors present as analyzed by an appropriate waveform monitor.
      2). Proper video levels as analyzed by an appropriate waveform monitor.
      3). No observable artifacts such as macro-blocking or sparkling in the video signal as observed on the video monitor.
9. DVI, HDMI, DisplayPort, Mini DisplayPort and Thunderbolt Digital Video
   a. To establish that the facility cabling and terminations meet the specifications defined in ‘Performance Standards’, a video test signal shall be applied to each input cable and passed through the system switching and distribution networks with test patterns observed at each system display.
   b. Test signals shall be generated using a Quantum Data 780 (or equal).
   c. Execute at a minimum, the following functional sink tests:
      1). HDCP verification
      2). EDID emulation
      3). Video pattern testing. The following test patterns (at a minimum) shall be observed:

a). Circles – no visible deviation from image geometry and linearity
b). Safe area – no visible horizontal or vertical over or under scan
c). Focus – proper image delineation in all areas
d). Coarse Crosshatch – no vertical or horizontal bowing
e). Fine Crosshatch – no vertical or horizontal bowing
f). PLUGE – properly set black level (brightness) and display gain (contrast)
g). 32-Level Split Grayscale – even transition from black to white, no color shift
h). SMPTE Color Bars with PLUGE pattern – no color or pattern deviations
i). Flat Field – uniform white field with no color, hot or dark spotting
j). Hum Bar Detect – no visible hum bars

d. Execute at a minimum, the following functional source tests:
1). Status bar showing HDMI In
2). View incoming video
3). Monitor incoming audio
4). EDID emulation

10. High-Bandwidth Digital Content Protection (HDCP)
a. Use a Quantum Data QD-882EA video test generator or similar to verify a “Pass” test that HDCP is performing to specification for source tests using a sink emulator and/or protocol analyzer; and sink devices using source emulators or protocol generators including the following parameters:
1). Protocol adherence
2). Audio/Video Format Switching
3). Media Switching
4). Force AVMUTE
5). Link Integrity (Pj) Check Repeat Rate
6). Pj Mismatch Response
7). Number of Keys (source test with sink emulator)

11. Extended Display Identification Data (EDID)
a. The Contractor shall ensure that all devices capable of generating or accepting EDID information have been updated with the latest version of the EDID standard.
b. The Contractor shall modify all EDID tables to ensure that the highest common resolution is used by each device within a given system.
c. The Contractor shall modify the EDID tables to include the most common computer/laptop resolutions used within the facility. Coordination with the Owner shall be required.
d. The Contractor shall ensure that EDID information is maintained thought the signal chain and that intermediary devices that pass or modify the EDID information conform to the other requirements stated within this Specification.

12. Computer / Video Display Devices
a. The Contractor shall optimize projection equipment for the following minimum standard scan rates and resolutions:
1). NTSC
2). HDTV: 720p/60, 1080i/60 and 1080p/60
3). XGA: 1024 x 768, 60Hz, 70Hz, 72Hz and 75Hz.

4). WXGA: 1280 x 800, 60Hz.
5). WXGA: 1360 x 768, 60Hz.
6). WXGA: 1366 x 768, 60Hz.
7). WXGA+: 1440 x 900, 60Hz.
8). SXGA: 1280 x 1024, 60Hz.
9). SXGA+: 1400 x 1050, 60Hz.
10). WSXGA+: 1680 x 1050, 60Hz.
11). UXGA: 1600 x 1200, 60Hz and 75Hz.
12). WUXGA: 1920 x 1200, 60Hz.
13). UHD: 3840 X 2160, 120Hz.
14). 4K: 4096 X 2160, 120Hz.

13. Control
    a. Upon completion of installation, the Contractor shall test each function of each control station, push-button panel, touch screen panel, computer control interface, and all components connected to or interfaced to the Control System to verify proper operation and that each switch and indicator operates as intended.
14. Systems Overview
    a. In addition, the Contractor shall:
        1). Verify each item of equipment is functioning as intended.
        2). Verify the installation is the same as specified.

END OF SECTION 3

SECTION 4 – APPENDICES

APPENDIX A

3.2 LIST OF DRAWINGS

Drawing No.	Description
SY01	170-Seat Classroom RM100
SY02	170-Seat Classroom RM200
SY03	170-Seat Classroom RM300
SY04	60-Seat Classroom RM131
SY05	60-Seat Classroom RM133
SY06	AV Support RM140 / Rack RM138
SY07	Testing Center RM122
SY08	Wellness Center RM212 / Flex RM210
SY09	Prefunction RM106
SY10	Student Lounge RM123
SY11	Prefunction RM111
SY12	Prefunction RM206
SY13	Corridor C201
SY15	Prefunction 306
SY16	Student Commons 310
SY17	Circulation C301
SY18	4 Seat Study RM105, 107, 205, 207, 211, 213, 305, 307, 311, 313
SY19	6 Seat Study RM,112, 114, 115, 116, 314, 316
SY20	Small Conference RM943, 944
SY21	Large Conference RM989
SY24	Break RM925
SY23	Elevator Lobby V902
SY25	Large Conference RM1031
SY26	Conference RM1075
SY28	Break RM1029
SY29	Elevator Lobby V1002
SY30	Board RM1161
SY31	Conference RM1166
SY32	Small Conference RM1143, 1110
SY33	Prefunction 1159
SY34	Elevator Lobby V1102
SY35	Elevator Lobby V102

3.3 REFERENCE DRAWINGS

A. The following drawings have been included for the Bidders reference in bidding the work called for by the Contract Documents. Reference drawings may not reflect as-built conditions. It shall be the responsibility of the Contractor to field verify all site conditions.

Drawing No.	Description
T-001	TECHNOLOGY INFRASTRUCTURE LEGENDS AND SYMBOLS
T-002	TECHNOLOGY INFRASTRUCTURE SCHEDULES AND NOTES
T-101	TECHNOLOGY INFRASTRUCTURE LEVEL 1 FLOOR PLAN
T-102	TECHNOLOGY INFRASTRUCTURE LEVEL 2 / PARKING LEVEL P1 FLOOR PLAN
T-103	TECHNOLOGY INFRASTRUCTURE PARKING LEVEL P2 FLOOR PLAN
T-104	TECHNOLOGY INFRASTRUCTURE LEVEL 3 / PARKING LEVEL P3 FLOOR PLAN
T-105	TECHNOLOGY INFRASTRUCTURE PARKING LEVEL P4 FLOOR PLAN
T-106	TECHNOLOGY INFRASTRUCTURE PARKING LEVEL P5 - P7 FLOOR PLAN
T-107	TECHNOLOGY INFRASTRUCTURE PARKING LEVEL P8 FLOOR PLAN
T-108	TECHNOLOGY INFRASTRUCTURE LEVEL 9 FLOOR PLAN
T-109	TECHNOLOGY INFRASTRUCTURE LEVEL 10 FLOOR PLAN
T-110	TECHNOLOGY INFRASTRUCTURE LEVEL 11 FLOOR PLAN
T-111	TECHNOLOGY INFRASTRUCTURE LEVEL 12 FLOOR PLAN
T-112	TECHNOLOGY INFRASTRUCTURE LEVEL 13 FLOOR PLAN
T-113	TECHNOLOGY INFRASTRUCTURE ROOF FLOOR PLAN
T-151	TECHNOLOGY INFRASTRUCTURE LEVEL 1 REFLECTED CEILING PLAN
T-152	TECHNOLOGY INFRASTRUCTURE LEVEL 2 REFLECTED CEILING PLAN
T-153	TECHNOLOGY INFRASTRUCTURE LEVEL 3 REFLECTED CEILING PLAN
T-154	TECHNOLOGY INFRASTRUCTURE LEVEL 9 REFLECTED CEILING PLAN
T-155	TECHNOLOGY INFRASTRUCTURE LEVEL 10 REFLECTED CEILING PLAN
T-156	TECHNOLOGY INFRASTRUCTURE LEVEL 11 REFLECTED CEILING PLAN
T-158	TECHNOLOGY INFRASTRUCTURE LEVEL 12 REFLECTED CEILING PLAN
T-201	TECHNOLOGY INFRASTRUCTURE ELEVATIONS
T-202	TECHNOLOGY INFRASTRUCTURE ELEVATIONS
T-203	TECHNOLOGY INFRASTRUCTURE ELEVATIONS
T-204	TECHNOLOGY INFRASTRUCTURE ELEVATIONS
T-205	TECHNOLOGY INFRASTRUCTURE ELEVATIONS
T-206	TECHNOLOGY INFRASTRUCTURE ELEVATIONS
T-501	TECHNOLOGY INFRASTRUCTRUE DETAILS
T-502	TECHNOLOGY INFRASTRUCTRUE DETAILS

Drawing No.	Description
T-503	TECHNOLOGY INFRASTRUCTRUE DETAILS
T-504	TECHNOLOGY INFRASTRUCTRUE DETAILS

APPENDIX B

3.4 SUMMARY OF AUDIOVISUAL SYSTEMS SUBMITTALS

Description	**Deadline**
Contractor Qualifications	Per Section 1
Request for Information (Pre-Bid)	Per Section 1
Substitution Requests	Per Section 1
Line item pricing	Per Section 1
Bonds	Per Section 1
Schedule	Within 15 days of notification of contract award
Progress Reports	While working off-site: every two weeks While working on-site: every week.
Shop Drawings	Prior to equipment and materials purchase, fabrication, or installation
Bill of Materials	Prior to equipment and materials purchase, fabrication, or installation
Equipment Rack Digital Photographs	Prior to delivering racks to the project site
Audio Digital Signal Processing (DSP)	Per Contractor's published schedule
Control System Control Surfaces / GUI Prototype submittal	Per Contractor's published schedule
Control System Control Surfaces/GUI Submittal	Per Contractor's published schedule
Preliminary As-Built Drawing Submittal	Prior to Final Testing and System Performance Verification
Final Documentation	Within 30 days of Substantial Completion
Post-Integration Control Surfaces Adjustments	Within 90 days of Substantial Completion

APPENDIX C: PRE-BID FORMS

3.5 CONTRACTOR QUALIFICATIONS REQUIREMENTS

Corporate Profile

Location of Corporate Headquarters	
Number of Offices & Locations	
Location of Office Assigned to this Project	

Corporate History

Number of Years in Business	
Any Former Names of the Organization	
Date(s) of Incorporation	
State of Incorporation	
Officer Names & Addresses	
Detail merger / acquisition / ownership history	

Litigation Experiences (Last 5 Years)

Project Related	
Nature of Litigation	
Plaintiff or Defendant	
Outcome	
Include all liens, claims and lawsuits adjudicated or pending involving your company.	
Non-Project Related	
Nature of Litigation	
Plaintiff or Defendant	
Outcome	

Financial

Trade & Bank References (List 3)	
Dunn & Bradstreet Ranking	
Insurance Limits	
Name of Bonding Company	
Name & Address of Agent	
Maximum Bonding Capacity	
Current Bonding Capacity	
Performance Bond Ever Exercised?	

Staffing

Total Number of Employees	
Number of Design Staff	
Number of Installation Staff	
Number of Project Management Staff	
Number of Software Programming Staff	

Project Key Personnel

Project Executive	
Project Manager	
Systems Engineer/Designer	
Lead Installer	
Control Systems Programmer	
Audio DSP Programmer	
Commissioning Agent	
Trainer	

Project Executive Resume

Office Location	
Percentage of Individual's Time Allocated to this Project	
Work History	
Previous Project Experience	
Length of Employment	
Certifications	☐ CTS ☐ CTS-D ☐ CTS-I ☐ RCDD ☐ PMP ☐ Certified Control System Programmer ☐ Certified DSP Programmer ☐ Others

Project Manager Resume

Office Location	
Percentage of Individual's Time Allocated to this Project	
Work History	
Previous Project Experience*	
Length of Employment	
Certifications	☐ CTS ☐ CTS-D ☐ CTS-I ☐ RCDD ☐ PMP ☐ Certified Control System Programmer ☐ Certified DSP Programmer ☐ Others

** The assigned Project Manager shall have at least 5 years experience with audiovisual projects of similar scope & scale.*

Systems Engineer/Designer Resume

Office Location	
Percentage of Individual's Time Allocated to this Project	
Work History	
Previous Project Experience*	
Length of Employment	
Certifications	☐ CTS ☐ CTS-D ☐ CTS-I ☐ RCDD ☐ PMP ☐ Certified Control System Programmer ☐ Certified DSP Programmer ☐ Others
AMX ACE-D certification number and expiration date	

** The assigned Systems Engineer/Designer shall have at least 5 years experience with audiovisual projects of similar scope & scale.*

Lead Installer Resume

Office Location	
Percentage of Individual's Time Allocated to this Project	
Work History	
Previous Project Experience*	
Length of Employment	
Certifications	☐ CTS ☐ CTS-D ☐ CTS-I ☐ RCDD ☐ PMP ☐ Certified Control System Programmer ☐ Certified DSP Programmer ☐ Others
AVIXA/InfoComm International CTS-I certification or NSCA EST-L2 (Electronic Systems Technician) certification, number and expiration date	
AMX ACE-I certification number and expiration date.	
Extron XTP Systems Technician or XTP Systems Design Engineer certification number and expiration date	

Control Systems Programmer Resume

Office Location	
Percentage of Individual's Time Allocated to this Project	
Work History	
Previous Project Experience*	
Length of Employment	
Certifications	☐ CTS ☐ CTS-D ☐ CTS-I ☐ RCDD ☐ PMP ☐ Certified Control System Programmer ☐ Certified DSP Programmer ☐ Others
AMX ACE-P certification number and expiration date	

Audio DSP Programmer Resume

Office Location	
Percentage of Individual's Time Allocated to this Project	
Work History	
Previous Project Experience*	
Length of Employment	
Certifications	☐ CTS ☐ CTS-D ☐ CTS-I ☐ RCDD ☐ PMP ☐ Certified Control System Programmer ☐ Certified DSP Programmer ☐ Others
Biamp Tesira (SERVER line-up), TesiraFORTÉ, Vocia, and/or Audia certification number and expiration date	

Commissioning Agent Resume

Office Location	
Percentage of Individual's Time Allocated to this Project	
Work History	
Previous Project Experience	
Length of Employment	
Certifications	☐ CTS ☐ CTS-D ☐ CTS-I ☐ RCDD ☐ PMP ☐ Certified Control System Programmer ☐ Certified DSP Programmer ☐ Others

Trainer Resume

Office Location	
Percentage of Individual's Time Allocated to this Project	
Work History	
Previous Project Experience	
Length of Employment	
Certifications	☐ CTS ☐ CTS-D ☐ CTS-I ☐ RCDD ☐ PMP ☐ Certified Control System Programmer ☐ Certified DSP Programmer ☐ Others

Resources

Manufacturers' Line Card for products Company is an authorized distributor or dealer. Include authorization date	Provide this as an attachment
List of Manufacturers' Technical Certifications or Designations	
List of Manufacturers' for Whom the Company is an Authorized Service Center	Provide this as an attachment
List of Computer Software and/or Systems that Will Be Used on the Project	
List of Contractor Owned Test Equipment. Include Manufacturer, Model, and Software Version	

References – Three Projects

1. Project Reference 1:

Institute and Project Name	
Contact Name	
Phone Number	
E-Mail Address	
Similar Scope & Scale	
Similar Technology Application	
Project Costs	

2. Project Reference 2:

Institute and Project Name	
Contact Name	
Phone Number	
E-Mail Address	
Similar Scope & Scale	
Similar Technology Application	
Project Costs	

3. Project Reference 3:

Institute and Project Name	
Contact Name	
Phone Number	
E-Mail Address	
Similar Scope & Scale	
Similar Technology Application	
Project Costs	

List Any Previous Projects with Eastern Virginia Medical School, The Sextant Group, Inc., or RRMM	

Small Business Subcontracting Plan

SMALL BUSINESS SUBCONTRACTING PLAN

Offeror: _____

Address: _____

_____

Solicitation Number: _____

Supplies or services offered: _____

Total estimated cost of subcontract to Small Businesses: $ _____

Period of Performance From: _____ To: _____

1. We plan to subcontract the following principal types of supplies and services to SDB, WOSB, VOSB, MOSB, HSB, SDVOSB, SB(reference Attachment B – Section12)

Types of Supplies and Service	Type of SB

**It is the policy of the Medical School to facilitate the establishment, preservation, and strengthening of small businesses and businesses owned by woman and minorities and service disabled veterans and to encourage their participation in the Medical School's procurement activities. Toward that end the Medical School encourages these firms to compete and encourages other firms to provide for the participation of these firms through partnerships, joint ventures, subcontracts, or other contractual opportunities. Offeror are asked, as part of their submission, to describe any planned use of such business in fulfilling this contract.

2. We developed the small business subcontracting principles in 1 above by the following methods. Explain how they are to be used and identify any source list used.

3. Identify the overall goals you plan to accomplish by instating this small business subcontracting plan.

4. The employee who will administer our subcontracting program is:

   Name: _____
   Title: _____
   Address: _____
   _____
   Telephone: _____

   The administrator's duties include:

5. We will make the following internal/external efforts to ensure that SDB, WOSB, VOSB, MOSB, HSB, SDVOSB, SB have an equitable opportunity to compete for subcontracts by:

6. We will maintain the following types of records to document our efforts to solicit small businesses as it relates to this small business subcontracting plan:

3.6 REQUEST FOR INFORMATION FORM

A. Bidders requesting information shall utilize this process and form. No verbal questions or phone communications shall be permitted during bid process.

B. All requests for information shall be submitted to the Consultant via e-mail.

Bidder _____

Name / Title _____

Date_____

E-mail Address_____

Phone / Fax _____

Spec Section/Article # _____

Drawing # _____

Detailed question:

3.7 SUBSTITUTION REQUEST FORM

A. Bidders proposing product substitutions shall utilize this form. No verbal requests or phone communications shall be permitted during bid process.

B. All substitution requests shall adhere to the procedures and policies defined herein.

C. In addition to this form, all requests shall include drawings, performance and test data, and other information necessary to demonstrate that the substitution will meet all intentions of the Specification or required for a complete evaluation.

D. All substitution requests shall be submitted to the Consultant via e-mail.

Bidder _____

Name / Title _____

Date_____

E-mail Address_____

Phone _____

Drawing # _____

System Type/Item #___ _____

Originally Specified item: _____

Requested Substitution: _____

Description:

3.8 BID RESPONSE FORM

A. The Bidder shall complete and return this form. This document, as well as all submittals outlined herein, shall be considered to be the bid.

B. The Bidder shall provide line item pricing for all equipment as an attachment. All pricing is to be inclusive of any applicable taxes, shipping, handling, expenses, insurance or other miscellaneous charges.

Bid Form **Eastern Virginia Medical School - Waitzer HallNew Education and Academic Administration Building**	
	Totals
BASE BID	
Equipment and Materials	$
Shop Drawings and Submittals	$
In-Shop Fabrication Labor	$
On-Site Installation Labor	$
Software Development	$
Final Testing and Systems Performance Verification	$
Training and Closeout Documentation	$
Project Management and Coordination	$
Freight & General Administration	$
Year One Warranty	$
SUBTOTAL:	$
Applicable Taxes	$
BASE BID TOTAL:	$
Additional Warranties	
Year Two Warranty	$
Year Three Warranty	$
Year Four Warranty	$
Hourly Rates for Additional Work	**Per Hour Rates**
Project Engineer/Designer	$
Project Manager	$
Technician	$
Programmer	$

Bid Form

Eastern Virginia Medical School - Waitzer HallNew Education and Academic Administration Building

Trainer	$

Bidder Company Name: _____

Authorized Signature: _____

Print Name: _____

Date: _____

APPENDIX D: POST-AWARD FORMS

3.9 REQUEST FOR INFORMATION FORM

RFI #:		**Date:**	
To:		**From:**	
Specification Section / Article:		**Drawing # / Detail:**	
System Type:		**Room name / #:**	

Request:

Response by:		**Date:**	

Response:

3.10 SUBSTITUTION REQUEST FORM

A. Post-award substitution requests shall utilize this form.

B. In addition to this form, all requests shall include drawings, performance and test data, and other information necessary to demonstrate that the substitution will meet all intentions of the Specification or required for a complete evaluation.

C. All substitution requests shall be submitted to the Consultant via e-mail.

Date_____

Drawing # _____

System Type/Item #_____

Originally Specified item: _____

Requested Substitution: _____

Cost impact/Credit to Owner: _____

Description/reason for post-award substitution request:

3.11 PROGRESS REPORT FORM

Project Name:	
Date:	
From:	

Progress (Tasks accomplished since the previous report; both completed tasks and work-in-progress.)

Work Planned (Tasks scheduled for the time period extending until the next report)

Issues (Factors delaying progress or have the potential to delay progress involving the Owner, Architect and/or Consultant.)

3.12 SYSTEMS PERFORMANCE VERIFICATION REQUEST FORM

Contractor:	
Project:	

The Contractor requests a Systems Performance Verification appointment by completing this form and returning it to The Sextant Group, Inc. By signing below, the Contractor indicates that

1. The work on this contract, as defined in the Audiovisual Systems Specification, is complete and ready for the Consultant's final Systems Performance Verification.
2. All required field tests have been performed and project documentation is on-site.
3. A computer/video signal generator or generators, capable of outputting all signal types included in the system designs, will be available onsite at the time of Systems Performance Verification.
4. Physical media (DVD, Blu-Ray disc, etc.) will be available onsite to verify the performance of all applicable source devices.

Any incomplete items, deviations, or exceptions to the requirements of the Audiovisual Systems Specification shall be listed by the Contractor below, or provided as an attachment:

If the Contractor's work is found to be incomplete, and subsequent visits to the site by the Consultant are required by the Owner, the Owner may elect to have the Consultant's travel costs, billable time, and all other related travel expenses be deducted from the Contractor's final payment.

By signing below, Contractor verifies that the job site is ready for final Systems Performance Verification and accepts the conditions of this agreement.

Signature: _____ Print Name: _____

Title: _____Date: _____

APPENDIX E: BIDDING EQUIPMENT LISTS

A. Bidding Equipment Lists can be found on the following pages.

B. Bidding Equipment Lists show quantities per room. The quantity of rooms for each system type is listed at the top of each page.

C. Bidding Equipment Lists include manufacturers and model numbers where appropriate. Additional identification or ordering information may vary according to supplier, and the Bidder shall cross-reference with an individual supplier if required.

3.13 MASTER QUOTE NUMBERS

A. As a convenience to the Contractor in preparing the bid response, Master Quote numbers have been provided for several equipment groups. Where given, Master Quote numbers or other quotation numbers have been provided for bidding purposes only. It shall be the responsibility of the Contactor to verify that they have received the latest versions of the Master Quotes prior to bidding, and to establish the accuracy of the quotes prior to ordering.
   1. Extron – Master Quote #TBD
   2. AMX – Master Quote #TBD

3.14 KEYED BIDDING NOTES

A - OFCI (Owner Furnished Contractor Installed)
B - OFOI (Owner Furnished Owner Installed, or Provided by Others)
C - Included with above package
D - Coordinate stock color/finish with architect
E - Custom painted. Coordinate with architect
F - Field verify prior to submittals
G - Special or noteworthy installation requirements – Refer to System Description for details
H - Reference manufacturer’s Master Quote

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems

Audiovisual Systems Bidding Equipment List

Number : **100**

Type : **SY01**

Name : **170-Seat Classroom RM100**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	Panasonic	PT-RZ21KU	20,000 Lumens, 3-Chip DLP, Laser Light Source, 1920x1200, Lens Not Included	4	F
2	Contractor Select	Contractor Select Zoom Lens	Contractor Selected Projector Lens for Above	4	F
3	Chief	Projector Mounting Hardware	Contractor Selected Projector Mounting Hardware as Needed	4	F
4	Surge-X	EV-20820 IC	enVision Power Condition Monitor	4	-
5	Surge-X	RPIP	IP Connectivity for enVision Power Condition Monitor	4	-
6	Owner Furnished	22" Monitor	22" LCD Monitor, 1920x1080 Native	1	-
7	Owner Furnished	22" Monitor	22" LCD Touch Monitor, 1920x1080 Native	1	-
8	Extron	XTP SR HD 4K	XTP Twisted Pair 4K HDMI Scaling Receiver	6	H
Source Devices					
9	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
10	Wolfvision	VZ-8plus4	HD Professional Desktop/Portable Visualizer - LCD Display - 14x Zoom - HDMI Output - 1080p/60 Native	1	-
Video Capture, Streaming and Conferencing					
11	Polycom	7200-65466-001	Group 700 Codec Only SKU - 720p, NTSC/PAL. CALA Includes Service in Price. ROW Require Purchase of Separate Service Product ID.	1	-
12	Polycom	4870-65466-112	Premier, One Year, Codec Only. RealPresence Group 700 HD codec -720p	1	-
13	Vaddio	RoboSHOT 30 OneLINK Bridge System	HD PTZ Camera - 30x Optical Zoom - 65Deg. FOV-HDBT OneLINK Bridge System	4	D
14	Contractor Select	Camera Wall Mount	Contractor Selected Camera Wall Mount	4	-
15	Polycom	5150-65082-001	1080p People and Content License	1	-
Signal Processing, Routing, and Distribution					
16	Extron	XTP II CrossPoint 3200 Frame	32x32 HDBT Router Frame	1	H
17	Extron	XTP CP 4i 4K	XTP 4K Twisted Pair Input Board	2	H
18	Extron	XTP II CP 4i HD 4K Plus	XTP 4K HDMI Input Board	3	H
19	Extron	XTP CP 4o 4K	XTP 4K Twisted Pair Output Board	3	H
20	Extron	XTP II CP 4o HD 4K Plus	XTP 4K HDMI Output Board	1	H
21	Extron	XTP CP 4i Fiber 4K MM	XTP Multimode Fiber Input Board	1	H
22	Extron	XTP CP 4o Fiber 4K MM	XTP Multimode Fiber Output Board	2	H
23	Extron	XTP T HD 4K	XTP Twisted Pair 4K HDMI Transmitter	2	H
24	Extron	USB Extender Plus R	Twisted Pair Receiver (Remote) for USB	1	-
25	Extron	USB Extender Plus T	Twisted Pair Transmitter (Local) for USB	2	-
Speech Reinforcement System/Audio Conferencing				18	
26	Shure	ULXD4Q	Quad Channel Digital Wireless Receiver	2	-
27	Shure	UA221	Passive Antenna Splitter/Combiner Kit	2	-
28	Shure	UA864US	Wall/Ceiling Mount Active Directional Antenna	2	-
29	Shure	ULXD2/B58	Handheld Digital Wireless Microphone Transmitter	4	-
30	Shure	ULXD1	Wireless Bodypack Transmitter	4	-
31	Shure	WCE6TD	Tan, Directional Earset Microphone	4	-
32	Shure	SBC200-US	Dual Docking Charger (with power supply)	3	-
33	Biamp	Tesira SERVER-IO	DSP Server w/Up to 48 Channels of I/O, and 1 DSP-2 Card	1	-
34	Biamp	Tesira SEC-4	Tesira 4 Channel Mic/Line Input Card with AEC	5	-
35	Biamp	Tesira SOC-4	Tesira 4 Channel Mic/Line Output Card	4	-
36	Biamp	Tesira DAN-1	Tesira 64x64 Dante Module For Use in Server or Server-IO	1	-
37	Media Vision		Digital IR Wireless Delegate System (86 units) includes main unitt and transceivers	1	H
38	Listen Technologies	LT-82	Stationary Infrared Transmitter	2	-
39	Listen Technologies	LA-140-XX	Stationary Infrared Radiator	2	D

40	Listen Technologies	LR-42	IR Stethoscope 4-Channel Receiver	4	-
41	Listen Technologies	LA-401	Universal Ear Speaker	4	-
42	Listen Technologies	LR-44	IR Lanyard 4-Channel Receiver	4	-
43	Listen Technologies	LA-350	8-Unit IR Charging/Stroage Station	1	-
Sound Reinforcement System					
44	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	40	-
45	Extron	XPA 4002-70V	70 V Two Channel Amp - 400 Watts/Ch	3	H
Control System					
46	AMX	NX-4200	Integrated Controller, (8) RS-232, (8) I/O, (8) IR, (8) Relay, (4) PoE, AXLINK, LAN	1	H
47	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	1	D, H
48	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	2	-
49	Contractor Select		48 Port Network Switch	1	-
Rack, Panels, Misc.					
50	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
51	Middle Atlantic	BGR-4538	BGR-Series 45RU, 38"D Equipment Rack	2	-
52	Middle Atlantic	BFD-45	BGR-Series 45RU Solid front door	2	-
53	Middle Atlantic	BSPN-45-38	BGR-Series 45RU, 38"D Side Panels (Pair)	1	-
54	Middle Atlantic	BGR-552FT-FC	BGR-Series Fan top, 552 CFM, w/Controller	2	-
55	Middle Atlantic	BGR-RR38	BGR-Series 38RU, Rear Rack Rail Kit	2	-
56	AVTECH	RA12E-TH1-RAS	Room Alert 12ER Monitor	1	-
57	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	2	-
58	AVTECH	RMA-PS1-SEN	Power Sensor	1	-
59	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	2	-
60	Spectrum Industries	55289 - FMFMCMS1L0900000	Freedom XRS Elite Lectern. Including: (1) 95533, (2) 99051, (1) 95534	1	D,F,H
61	Extron	60-301-02	AAP 104	1	D,F,H
62	Extron	60-1472-22	USB Extender Plus AAP R	1	D,F,H
63	Extron	70-584-02	Dual US AC w/Power Cable	1	D,F,H
64	Extron	70-1219-02	Two HDMI Female to Female on 10" Pigtails	1	D,F,H
65	Extron	70-587-11	One 3.5mm Stereo Mini Jack to Solder Tabs	1	D,F,H
66	Extron	70-491-15	Two RJ-45 Female to Punch Down for CAT6	1	D,F,H
67	Extron	70-090-11	Blank Plate - Single	1	D,F,H
68	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	2	-
69	Spectrum Industries	55152 - FMFMCM201310002	Slim Lectern	1	D,F,H
70	Extron	60-300-02	AAP 102	1	D,F,H
71	Extron	60-1784-02	USB PowerPlate 311 AC AAP	1	D,F,H
72	Extron	70-1220-02	One HDMI Female to Female on 10" Pigtail, One RJ45 Female to Female Barrel - CAT 5e	1	D,F,H
73	Extron	70-587-11	One 3.5mm Stereo Mini Jack to Solder Tabs	1	D,F,H
74	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
75			Installation Materials as Defined in AV Systems Specification	Lot	
76			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
77			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
78			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
79			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
81			Power Supplies and Power Distribution as Needed	Lot	
82			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems

Audiovisual Systems Bidding Equipment List

Number : **200**

Type : **SY02**

Name : **170-Seat Classroom RM200**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	Panasonic	PT-RZ21KU	20,000 Lumens, 3-Chip DLP, Laser Light Source, 1920x1200, Lens Not Included	4	F
2	Contractor Select	Contractor Select Zoom Lens	Contractor Selected Projector Lens for Above	4	F
3	Chief	Projector Mounting Hardware	Contractor Selected Projector Mounting Hardware as Needed	4	F
4	Surge-X	EV-20820 IC	enVision Power Condition Monitor	4	-
5	Surge-X	RPIP	IP Connectivity for enVision Power Condition Monitor	4	-
6	Owner Furnished	22" Monitor	22" LCD Monitor, 1920x1080 Native	1	-
7	Owner Furnished	22" Monitor	22" LCD Touch Monitor, 1920x1080 Native	1	-
8	Extron	XTP SR HD 4K	XTP Twisted Pair 4K HDMI Scaling Receiver	6	H
Source Devices					
9	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
10	Wolfvision	VZ-8plus4	HD Professional Desktop/Portable Visualizer - LCD Display - 14x Zoom - HDMI Output - 1080p/60 Native	1	-
Video Capture, Streaming and Conferencing					
11	Polycom	7200-65466-001	Group 700 Codec Only SKU - 720p, NTSC/PAL. CALA Includes Service in Price. ROW Require Purchase of Separate Service Product ID.	1	-
12	Polycom	4870-65466-112	Premier, One Year, Codec Only. RealPresence Group 700 HD codec -720p	1	-
13	Vaddio	RoboSHOT 30 OneLINK Bridge System	HD PTZ Camera - 30x Optical Zoom - 65Deg. FOV-HDBT OneLINK Bridge System	4	D
14	Contractor Select	Camera Wall Mount	Contractor Selected Camera Wall Mount	4	-
15	Polycom	5150-65082-001	1080p People and Content License	1	-
Signal Processing, Routing, and Distribution					
16	Extron	XTP II CrossPoint 3200 Frame	32x32 HDBT Router Frame	1	H
17	Extron	XTP CP 4i 4K	XTP 4K Twisted Pair Input Board	2	H
18	Extron	XTP II CP 4i HD 4K Plus	XTP 4K HDMI Input Board	3	H
19	Extron	XTP CP 4o 4K	XTP 4K Twisted Pair Output Board	3	H
20	Extron	XTP II CP 4o HD 4K Plus	XTP 4K HDMI Output Board	1	H
21	Extron	XTP CP 4i Fiber 4K MM	XTP Multimode Fiber Input Board	1	H
22	Extron	XTP CP 4o Fiber 4K MM	XTP Multimode Fiber Output Board	2	H
23	Extron	XTP T HD 4K	XTP Twisted Pair 4K HDMI Transmitter	2	H
24	Extron	USB Extender Plus R	Twisted Pair Receiver (Remote) for USB	1	-
25	Extron	USB Extender Plus T	Twisted Pair Transmitter (Local) for USB	2	-
Speech Reinforcement System/Audio Conferencing					
26	Shure	ULXD4Q	Quad Channel Digital Wireless Receiver	2	-
27	Shure	UA221	Passive Antenna Splitter/Combiner Kit	2	-
28	Shure	UA864US	Wall/Ceiling Mount Active Directional Antenna	2	-
29	Shure	ULXD2/B58	Handheld Digital Wireless Microphone Transmitter	4	-
30	Shure	ULXD1	Wireless Bodypack Transmitter	4	-
31	Shure	WCE6TD	Tan, Directional Earset Microphone	4	-
32	Shure	SBC200-US	Dual Docking Charger (with power supply)	3	-
33	Biamp	Tesira SERVER-IO	DSP Server w/Up to 48 Channels of I/O, and 1 DSP-2 Card	1	-
34	Biamp	Tesira SEC-4	Tesira 4 Channel Mic/Line Input Card with AEC	5	-
35	Biamp	Tesira SOC-4	Tesira 4 Channel Mic/Line Output Card	4	-
36	Biamp	Tesira DAN-1	Tesira 64x64 Dante Module For Use in Server or Server-IO	1	-
37	Media Vision		Digital IR Wireless Delegate System (86 units) includes main unitt and transceivers	1	H
38	Listen Technologies	LT-82	Stationary Infrared Transmitter	2	-
39	Listen Technologies	LA-140-XX	Stationary Infrared Radiator	2	D

40	Listen Technologies	LR-42	IR Stethoscope 4-Channel Receiver	4	-
41	Listen Technologies	LA-401	Universal Ear Speaker	4	-
42	Listen Technologies	LR-44	IR Lanyard 4-Channel Receiver	4	-
43	Listen Technologies	LA-350	8-Unit IR Charging/Stroage Station	1	-
Sound Reinforcement System					
44	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	40	-
45	Extron	XPA 4002-70V	70 V Two Channel Amp - 400 Watts/Ch	3	H
Control System					
46	AMX	NX-4200	Integrated Controller, (8) RS-232, (8) I/O, (8) IR, (8) Relay, (4) PoE, AXLINK, LAN	1	H
47	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	1	D, H
48	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	2	-
49	Contractor Select		48 Port Network Switch	1	-
Rack, Panels, Misc.					
50	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
51	Middle Atlantic	BGR-4538	BGR-Series 45RU, 38"D Equipment Rack	2	-
52	Middle Atlantic	BFD-45	BGR-Series 45RU Solid front door	2	-
53	Middle Atlantic	BSPN-45-38	BGR-Series 45RU, 38"D Side Panels (Pair)	1	-
54	Middle Atlantic	BGR-552FT-FC	BGR-Series Fan top, 552 CFM, w/Controller	2	-
55	Middle Atlantic	BGR-RR38	BGR-Series 38RU, Rear Rack Rail Kit	2	-
56	AVTECH	RA12E-TH1-RAS	Room Alert 12ER Monitor	1	-
57	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	2	-
58	AVTECH	RMA-PS1-SEN	Power Sensor	1	-
59	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	2	-
60	Spectrum Industries	55289 - FMFMCMS1L0900000	Freedom XRS Elite Lectern. Including: (1) 95533, (2) 99051, (1) 95534	1	D,F,H
61	Extron	60-301-02	AAP 104	1	D,F,H
62	Extron	60-1472-22	USB Extender Plus AAP R	1	D,F,H
63	Extron	70-584-02	Dual US AC w/Power Cable	1	D,F,H
64	Extron	70-1219-02	Two HDMI Female to Female on 10" Pigtails	1	D,F,H
65	Extron	70-587-11	One 3.5mm Stereo Mini Jack to Solder Tabs	1	D,F,H
66	Extron	70-491-15	Two RJ-45 Female to Punch Down for CAT6	1	D,F,H
67	Extron	70-090-11	Blank Plate - Single	1	D,F,H
68	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	2	-
69	Spectrum Industries	55152 - FMFMCM201310002	Slim Lectern	1	D,F,H
70	Extron	60-300-02	AAP 102	1	D,F,H
71	Extron	60-1784-02	USB PowerPlate 311 AC AAP	1	D,F,H
72	Extron	70-1220-02	One HDMI Female to Female on 10" Pigtail, One RJ45 Female to Female Barrel - CAT 5e	1	D,F,H
73	Extron	70-587-11	One 3.5mm Stereo Mini Jack to Solder Tabs	1	D,F,H
74	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
75			Installation Materials as Defined in AV Systems Specification	Lot	
76			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
77			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
78			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
79			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
81			Power Supplies and Power Distribution as Needed	Lot	
82			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems

Audiovisual Systems Bidding Equipment List

Number : **300**

Type : **SY03**

Name : **170-Seat Classroom RM300**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	Panasonic	PT-RZ21KU	20,000 Lumens, 3-Chip DLP, Laser Light Source, 1920x1200, Lens Not Included	2	F
2	Contractor Select	Contractor Select Zoom Lens	Contractor Selected Projector Lens for Above	2	F
3	Chief	Projector Mounting Hardware	Contractor Selected Projector Mounting Hardware as Needed	2	F
4	Surge-X	EV-20820 IC	enVision Power Condition Monitor	2	-
5	Surge-X	RPIP	IP Connectivity for enVision Power Condition Monitor	2	-
6	Owner Furnished	22" Monitor	22" LCD Monitor, 1920x1080 Native	1	-
7	Owner Furnished	22" Monitor	22" LCD Touch Monitor, 1920x1080 Native	1	-
8	Extron	XTP SR HD 4K	XTP Twisted Pair 4K HDMI Scaling Receiver	6	H
9	NEC	E437Q	43" 4K UHD Display with Integrated ATSC/NTSC Tuner	2	-
10	Chief	MFMUB	Medium Confidence Monitor Cart	2	-
Source Devices					
11	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
12	Wolfvision	VZ-8plus4	HD Professional Desktop/Portable Visualizer - LCD Display - 14x Zoom - HDMI Output - 1080p/60 Native	1	-
Video Capture, Streaming and Conferencing					
13	Polycom	7200-65466-001	Group 700 Codec Only SKU - 720p, NTSC/PAL. CALA Includes Service in Price. ROW Require Purchase of Separate Service Product ID.	1	-
14	Polycom	4870-65466-112	Premier, One Year, Codec Only. RealPresence Group 700 HD codec -720p	1	-
15	Vaddio	RoboSHOT 30 OneLINK Bridge System	HD PTZ Camera - 30x Optical Zoom - 65Deg. FOV-HDBT OneLINK Bridge System	4	D
16	Contractor Select	Camera Wall Mount	Contractor Selected Camera Wall Mount	4	-
17	Polycom	5150-65082-001	1080p People and Content License	1	-
Signal Processing, Routing, and Distribution					
18	Extron	XTP II CrossPoint 3200 Frame	32x32 HDBT Router Frame	1	H
19	Extron	XTP CP 4i 4K	XTP 4K Twisted Pair Input Board	2	H
20	Extron	XTP II CP 4i HD 4K Plus	XTP 4K HDMI Input Board	3	H
21	Extron	XTP CP 4o 4K	XTP 4K Twisted Pair Output Board	3	H
22	Extron	XTP II CP 4o HD 4K Plus	XTP 4K HDMI Output Board	1	H
23	Extron	XTP CP 4i Fiber 4K MM	XTP Multimode Fiber Input Board	1	H
24	Extron	XTP CP 4o Fiber 4K MM	XTP Multimode Fiber Output Board	2	H
25	Extron	XTP T HD 4K	XTP Twisted Pair 4K HDMI Transmitter	2	H
26	Extron	USB Extender Plus R	Twisted Pair Receiver (Remote) for USB	1	-
27	Extron	USB Extender Plus T	Twisted Pair Transmitter (Local) for USB	1	-
Speech Reinforcement System/Audio Conferencing					
28	Shure	ULXD4Q	Quad Channel Digital Wireless Receiver	2	-
29	Shure	UA221	Passive Antenna Splitter/Combiner Kit	2	-
30	Shure	UA864US	Wall/Ceiling Mount Active Directional Antenna	2	-
31	Shure	ULXD2/B58	Handheld Digital Wireless Microphone Transmitter	4	-
32	Shure	ULXD1	Wireless Bodypack Transmitter	4	-
33	Shure	WCE6TD	Tan, Directional Earset Microphone	4	-
34	Shure	SBC200-US	Dual Docking Charger (with power supply)	3	-
35	Biamp	Tesira SERVER-IO	DSP Server w/Up to 48 Channels of I/O, and 1 DSP-2 Card	1	-
36	Biamp	Tesira SEC-4	Tesira 4 Channel Mic/Line Input Card with AEC	5	-
37	Biamp	Tesira SOC-4	Tesira 4 Channel Mic/Line Output Card	4	-
38	Biamp	Tesira DAN-1	Tesira 64x64 Dante Module For Use in Server or Server-IO	2	-
39	Clock Audio	C 35Ex-RF	Full Flex 24" Cardioid Gooseneck Microphone	86	D

40	Clock Audio	SWP2 RGB	Switch Plate with RGB LED For CRMF and ARMF black or nickel finish (to be coordinated)	86	D
41	Clock Audio	CDT 100 UDP MKII	Dante Transporter - 4 ch. Audio & Control Transport	47	-
42	Clock Audio	PSU1205	Power Supply for (6) CDT100	39	-
43	Listen Technologies	LT-82	Stationary Infrared Transmitter	1	-
44	Listen Technologies	LA-140-XX	Stationary Infrared Radiator	1	D
45	Listen Technologies	LR-42	IR Stethoscope 4-Channel Receiver	4	-
46	Listen Technologies	LA-401	Universal Ear Speaker	4	-
47	Listen Technologies	LR-44	IR Lanyard 4-Channel Receiver	4	-
48	Listen Technologies	LA-350	8-Unit IR Charging/Stroage Station	1	-
Sound Reinforcement System					
49	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	40	-
50	Extron	XPA 4002-70V	70 V Two Channel Amp - 400 Watts/Ch	3	H
51	Renkus-Heinz	IC8-RD-BK	IC8-RD Digitally Steerable Column with Dante - Black	2	D
52	Renkus-Heinz	IC-FCSC	ICONYX Factory Certified Installation Setup and Commissioning Support, Including Expenses	1	-
Control System					
53	AMX	NX-4200	Integrated Controller, (8) RS-232, (8) I/O, (8) IR, (8) Relay, (4) PoE, AXLINK, LAN	1	H
54	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	1	D, H
55	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	4	-
56	Contractor Select		48 Port Network Switch	2	-
Rack, Panels, Misc.					
57	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
58	Middle Atlantic	BGR-4538	BGR-Series 45RU, 38"D Equipment Rack	2	-
59	Middle Atlantic	BFD-45	BGR-Series 45RU Solid front door	2	-
60	Middle Atlantic	BSPN-45-38	BGR-Series 45RU, 38"D Side Panels (Pair)	1	-
61	Middle Atlantic	BGR-552FT-FC	BGR-Series Fan top, 552 CFM, w/Controller	2	-
62	Middle Atlantic	BGR-RR38	BGR-Series 38RU, Rear Rack Rail Kit	2	-
63	AVTECH	RA12E-TH1-RAS	Room Alert 12ER Monitor	1	-
64	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	2	-
65	AVTECH	RMA-PS1-SEN	Power Sensor	1	-
66	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	2	-
67	Spectrum Industries	55289 - FMFMCMS1L0900000	Freedom XRS Elite Lectern. Including: (1) 95533, (2) 99051, (1) 95534	1	D,F,H
68	Extron	60-301-02	AAP 104	1	D,F,H
69	Extron	60-1472-22	USB Extender Plus AAP R	1	D,F,H
70	Extron	70-584-02	Dual US AC w/Power Cable	1	D,F,H
71	Extron	70-1219-02	Two HDMI Female to Female on 10" Pigtails	1	D,F,H
72	Extron	70-587-11	One 3.5mm Stereo Mini Jack to Solder Tabs	1	D,F,H
73	Extron	70-491-15	Two RJ-45 Female to Punch Down for CAT6	1	D,F,H
74	Extron	70-090-11	Blank Plate - Single	1	D,F,H
75	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	4	-
76			Installation Materials as Defined in AV Systems Specification	Lot	
77			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
78			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
79			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
80			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
82			Power Supplies and Power Distribution as Needed	Lot	
83			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems

Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **131**					
Type : **SY04**					
Name : **60-Seat Classroom RM131**					
Display Devices					
1	Panasonic	PT-RZ970	10,000 ANSI Lumens, 1-Chip DLP, Laser Light Source, 1920x1200, Lens Included	2	F
2	Chief	Projector Mounting Hardware	Contractor Selected Projector Mounting Hardware as Needed	2	F
3	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	2	-
4	Owner Furnished	22" Monitor	22" LCD Monitor, 1920x1080 Native	1	-
5	Owner Furnished	22" Monitor	22" LCD Touch Monitor, 1920x1080 Native	1	-
6	Extron	XTP SR HD 4K	XTP Twisted Pair 4K HDMI Scaling Receiver	4	H
Source Devices					
7	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
8	Wolfvision	VZ-8plus4	HD Professional Desktop/Portable Visualizer - LCD Display - 14x Zoom - HDMI Output - 1080p/60 Native	1	-
Video Capture, Streaming and Conferencing					
9	Polycom	7200-65088-001	Group 500 Codec Only SKU - 720p, NTSC/PAL. CALA Includes Service in Price. ROW Require Purchase of Separate Service Product ID.	1	-
10	Polycom	4870-65466-112	Premier, One Year, Codec Only. RealPresence Group 700 HD codec -720p	1	-
11	Vaddio	RoboSHOT 30 OneLINK Bridge System	HD PTZ Camera - 30x Optical Zoom - 65Deg. FOV-HDBT OneLINK Bridge System	2	D
12	Contractor Select	Camera Wall Mount	Contractor Selected Camera Wall Mount	2	-
13	Polycom	5150-65082-001	1080p People and Content License	1	-
Signal Processing, Routing, and Distribution					
14	Extron	XTP II CrossPoint 1600 Frame	16x16 HDBT Router Frame	1	H
15	Extron	XTP CP 4i 4K	XTP 4K Twisted Pair Input Board	2	H
16	Extron	XTP II CP 4i HD 4K Plus	XTP 4K HDMI Input Board	2	H
17	Extron	XTP CP 4o 4K	XTP 4K Twisted Pair Output Board	2	H
18	Extron	XTP II CP 4o HD 4K Plus	XTP 4K HDMI Output Board	1	H
19	Extron	XTP CP 4i Fiber 4K MM	XTP Multimode Fiber Input Board	1	H
20	Extron	XTP CP 4o Fiber 4K MM	XTP Multimode Fiber Output Board	1	H
21	Extron	XTP T HD 4K	XTP Twisted Pair 4K HDMI Transmitter	2	H
22	Extron	USB Extender Plus R	Twisted Pair Receiver (Remote) for USB	1	-
23	Extron	USB Extender Plus T	Twisted Pair Transmitter (Local) for USB	1	-
Speech Reinforcement System/Audio Conferencing					
24	Shure	ULXD4Q	Quad Channel Digital Wireless Receiver	1	-
25	Shure	UA864US	Wall/Ceiling Mount Active Directional Antenna	1	-
26	Shure	ULXD2/B58	Handheld Digital Wireless Microphone Transmitter	1	-
27	Shure	ULXD1	Wireless Bodypack Transmitter	2	-
28	Shure	WCE6TD	Tan, Directional Earset Microphone	2	-
29	Shure	SBC200-US	Dual Docking Charger (with power supply)	2	-
30	Biamp	Tesira FORTE DAN CI	12 Mic/Line In x 8 Mic/Line Out Audio DSP - Dante Model	1	-
31	Shure	MXA910	Microflex Advance Ceiling Array Microphone	1	-
32	Listen Technologies	LT-82	Stationary Infrared Transmitter	1	-
33	Listen Technologies	LA-140-XX	Stationary Infrared Radiator	1	D
34	Listen Technologies	LR-42	IR Stethoscope 4-Channel Receiver	4	-
35	Listen Technologies	LA-401	Universal Ear Speaker	4	-
36	Listen Technologies	LR-44	IR Lanyard 4-Channel Receiver	4	-
37	Listen Technologies	LA-350	8-Unit IR Charging/Stroage Station	1	-
Sound Reinforcement System					
38	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	10	-
39	Extron	XPA 2002-70V	2-CH, 200W per @ 70V, Amplifier	3	H
Control System					

40	AMX	NX-4200	Integrated Controller, (8) RS-232, (8) I/O, (8) IR, (8) Relay, (4) PoE, AXLINK, LAN	1	H
41	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	1	D, H
42	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	2	-
43	Contractor Select		48 Port Network Switch	1	-
Rack, Panels, Misc.					
44	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
45	Middle Atlantic	BGR-4538	BGR-Series 45RU, 38"D Equipment Rack	1	-
46	Middle Atlantic	BFD-45	BGR-Series 45RU Solid front door	1	-
47	Middle Atlantic	BSPN-45-38	BGR-Series 45RU, 38"D Side Panels (Pair)	1	-
48	Middle Atlantic	BGR-552FT-FC	BGR-Series Fan top, 552 CFM, w/Controller	1	-
49	Middle Atlantic	BGR-RR38	BGR-Series 38RU, Rear Rack Rail Kit	1	-
50	AVTECH	RA12E-TH1-RAS	Room Alert 12ER Monitor	1	-
51	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	2	-
52	AVTECH	RMA-PS1-SEN	Power Sensor	1	-
53	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
54	Spectrum Industries	55178 - FMFMCMS1F40000	Honors Lectern. Including: (1) 95522, (2) 99051, (1) 95534	1	D,F,H
55	Extron	60-301-02	AAP 104	1	D,F,H
56	Extron	60-1472-22	USB Extender Plus AAP R	1	D,F,H
57	Extron	70-584-02	Dual US AC w/Power Cable	1	D,F,H
58	Extron	70-1219-02	Two HDMI Female to Female on 10" Pigtails	1	D,F,H
59	Extron	70-587-11	One 3.5mm Stereo Mini Jack to Solder Tabs	1	D,F,H
60	Extron	70-491-15	Two RJ-45 Female to Punch Down for CAT6	1	D,F,H
61	Extron	70-090-11	Blank Plate - Single	1	D,F,H
62	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	2	-
63			Installation Materials as Defined in AV Systems Specification	Lot	
64			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
65			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
66			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
67			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
69			Power Supplies and Power Distribution as Needed	Lot	
70			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems

Audiovisual Systems Bidding Equipment List

Number : **133**

Type : **SY05**

Name : **60-Seat Classroom RM133**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	Panasonic	PT-RZ970	10,000 ANSI Lumens, 1-Chip DLP, Laser Light Source, 1920x1200, Lens Included	2	F
2	Chief	Projector Mounting Hardware	Contractor Selected Projector Mounting Hardware as Needed	2	F
3	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	2	-
4	Owner Furnished	22" Monitor	22" LCD Monitor, 1920x1080 Native	1	-
5	Owner Furnished	22" Monitor	22" LCD Touch Monitor, 1920x1080 Native	1	-
6	Extron	XTP SR HD 4K	XTP Twisted Pair 4K HDMI Scaling Receiver	4	H
Source Devices					
7	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
8	Wolfvision	VZ-8plus4	HD Professional Desktop/Portable Visualizer - LCD Display - 14x Zoom - HDMI Output - 1080p/60 Native	1	-
Video Capture, Streaming and Conferencing					
9	Polycom	7200-65088-001	Group 500 Codec Only SKU - 720p, NTSC/PAL. CALA Includes Service in Price. ROW Require Purchase of Separate Service Product ID.	1	-
10	Polycom	4870-65466-112	Premier, One Year, Codec Only. RealPresence Group 700 HD codec -720p	1	-
11	Vaddio	RoboSHOT 30 OneLINK Bridge System	HD PTZ Camera - 30x Optical Zoom - 65Deg. FOV-HDBT OneLINK Bridge System	2	D
12	Contractor Select	Camera Wall Mount	Contractor Selected Camera Wall Mount	2	-
13	Polycom	5150-65082-001	1080p People and Content License	1	-
Signal Processing, Routing, and Distribution					
14	Extron	XTP II CrossPoint 1600 Frame	16x16 HDBT Router Frame	1	H
15	Extron	XTP CP 4i 4K	XTP 4K Twisted Pair Input Board	2	H
16	Extron	XTP II CP 4i HD 4K Plus	XTP 4K HDMI Input Board	2	H
17	Extron	XTP CP 4o 4K	XTP 4K Twisted Pair Output Board	2	H
18	Extron	XTP II CP 4o HD 4K Plus	XTP 4K HDMI Output Board	1	H
19	Extron	XTP CP 4i Fiber 4K MM	XTP Multimode Fiber Input Board	1	H
20	Extron	XTP CP 4o Fiber 4K MM	XTP Multimode Fiber Output Board	1	H
21	Extron	XTP T HD 4K	XTP Twisted Pair 4K HDMI Transmitter	2	H
22	Extron	USB Extender Plus R	Twisted Pair Receiver (Remote) for USB	1	-
23	Extron	USB Extender Plus T	Twisted Pair Transmitter (Local) for USB	1	-
Speech Reinforcement System/Audio Conferencing					
24	Shure	ULXD4Q	Quad Channel Digital Wireless Receiver	1	-
25	Shure	UA864US	Wall/Ceiling Mount Active Directional Antenna	1	-
26	Shure	ULXD2/B58	Handheld Digital Wireless Microphone Transmitter	1	-
27	Shure	ULXD1	Wireless Bodypack Transmitter	2	-
28	Shure	WCE6TD	Tan, Directional Earset Microphone	2	-
29	Shure	SBC200-US	Dual Docking Charger (with power supply)	2	-
30	Biamp	Tesira FORTE DAN CI	12 Mic/Line In x 8 Mic/Line Out Audio DSP - Dante Model	1	-
31	Shure	MXA910	Microflex Advance Ceiling Array Microphone	1	-
32	Listen Technologies	LT-82	Stationary Infrared Transmitter	1	-
33	Listen Technologies	LA-140-XX	Stationary Infrared Radiator	1	D
34	Listen Technologies	LR-42	IR Stethoscope 4-Channel Receiver	4	-
35	Listen Technologies	LA-401	Universal Ear Speaker	4	-
36	Listen Technologies	LR-44	IR Lanyard 4-Channel Receiver	4	-
37	Listen Technologies	LA-350	8-Unit IR Charging/Stroage Station	1	-
Sound Reinforcement System					
38	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	10	-
39	Extron	XPA 2002-70V	2-CH, 200W per @ 70V, Amplifier	3	H
Control System					

40	AMX	NX-4200	Integrated Controller, (8) RS-232, (8) I/O, (8) IR, (8) Relay, (4) PoE, AXLINK, LAN	1	H
41	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	1	D, H
42	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	2	-
43	Contractor Select		48 Port Network Switch	1	-
Rack, Panels, Misc.					
44	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
45	Middle Atlantic	BGR-4538	BGR-Series 45RU, 38"D Equipment Rack	1	-
46	Middle Atlantic	BFD-45	BGR-Series 45RU Solid front door	1	-
47	Middle Atlantic	BSPN-45-38	BGR-Series 45RU, 38"D Side Panels (Pair)	1	-
48	Middle Atlantic	BGR-552FT-FC	BGR-Series Fan top, 552 CFM, w/Controller	1	-
49	Middle Atlantic	BGR-RR38	BGR-Series 38RU, Rear Rack Rail Kit	1	-
50	AVTECH	RA12E-TH1-RAS	Room Alert 12ER Monitor	1	-
51	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	2	-
52	AVTECH	RMA-PS1-SEN	Power Sensor	1	-
53	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
54	Spectrum Industries	55178 - FMFMCMS1F40000	Honors Lectern. Including: (1) 95522, (2) 99051, (1) 95534	1	D,F,H
55	Extron	60-301-02	AAP 104	1	D,F,H
56	Extron	60-1472-22	USB Extender Plus AAP R	1	D,F,H
57	Extron	70-584-02	Dual US AC w/Power Cable	1	D,F,H
58	Extron	70-1219-02	Two HDMI Female to Female on 10" Pigtails	1	D,F,H
59	Extron	70-587-11	One 3.5mm Stereo Mini Jack to Solder Tabs	1	D,F,H
60	Extron	70-491-15	Two RJ-45 Female to Punch Down for CAT6	1	D,F,H
61	Extron	70-090-11	Blank Plate - Single	1	D,F,H
62	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	2	-
63			Installation Materials as Defined in AV Systems Specification	Lot	
64			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
65			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
66			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
67			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
69			Power Supplies and Power Distribution as Needed	Lot	
70			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Audiovisual Systems

Audiovisual Systems Bidding Equipment List

Number : **140 / 138**

Type : **SY06**

Name : **AV Support RM140 / Rack RM138**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	X555UNS	55" Ultra Narrow Bezel S-IPS Video Wall Display	4	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	4	F
3	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
4	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
5	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	5	-
6	Owner Furnished	22" Monitor	22" LCD Monitor, 1920x1080 Native	8	-
7	Extron	XTP SR HD 4K	XTP Twisted Pair 4K HDMI Scaling Receiver	14	H
Source Devices					
8	Owner Furnished	CATV	Cable TV Tuner	2	-
9	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
10	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	4	-
11	BrighSign	LS424	Digtial Graphic Player	1	-
Video Capture, Streaming and Conferencing					
12	Polycom	7200-65320-001	Polycom Group 310 720P Videoconference Codec and Acoustic Camera	4	-
13	Polycom	7200-68524-125	EagleEye Digital Breakout Adapter (DBA)-codec. Breaks out RealPresence Group HDCI input to HDMI and DB9. Includes: DBA-codec. Order min-HDCI to HDCI cable separately	4	-
14	Polycom	2457-63542-001	Serial Cable for the Group Series 300 and Group Series 500	4	-
15	BlackMagic	ATEM Television Studio HD	Video Processor	4	-
16	BlackMagic	UltraStudio HD Mini	Digital Vidio Recorder	4	-
17	Extron	DSC 3G-HD A	3G-SDI to HDMI Scaler with Audio Embedding	4	-
Signal Processing, Routing, and Distribution					
18	Extron	XTP II CrossPoint 6400 Frame	64x64 HDBT Router Frame	1	H
19	Extron	XTP CP 4i 4K	XTP 4K Twisted Pair Input Board	2	H
20	Extron	XTP II CP 4i HD 4K Plus	XTP 4K HDMI Input Board	5	H
21	Extron	XTP CP 4o 4K	XTP 4K Twisted Pair Output Board	4	H
22	Extron	XTP II CP 4o HD 4K Plus	XTP 4K HDMI Output Board	6	H
23	Extron	XTP CP 4i Fiber 4K MM	XTP Multimode Fiber Input Board	9	H
24	Extron	XTP CP 4o Fiber 4K MM	XTP Multimode Fiber Output Board	6	H
25	Extron	XTP T HD 4K	XTP Twisted Pair 4K HDMI Transmitter	9	H
26	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
27	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Sound Reinforcement System					
28	Attero Tech	unDNEMO-BT/HS	Dante™ Networked Audio Monitor with Bluetooth® Connectivity	4	-
29	Biamp	Tesira FORTE DAN CI	12 Mic/Line In x 8 Mic/Line Out Audio DSP - Dante Model	1	-
Control System					
30	AMX	NX-4200	Integrated Controller, (8) RS-232, (8) I/O, (8) IR, (8) Relay, (4) PoE, AXLINK, LAN	1	H
31	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	4	D, H
32	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	4	-
33	Contractor Select	0	48 Port Network Fiber Switch	1	-
34	Contractor Select		48 Port Network Switch	1	-
35	Vaddio	PCC Premier	Precision Controller with 3-Axis Joystick and 7" Touchscreen for Up to 16 PTZ Cameras - PoE+ - H.264 Decoder	3	-
36	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	4	H
Rack, Panels, Misc.					
37	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
38	Middle Atlantic	BGR-4538	BGR-Series 45RU, 38"D Equipment Rack	5	-
39	Middle Atlantic	BFD-45	BGR-Series 45RU Solid front door	5	-

40	Middle Atlantic	BSPN-45-38	BGR-Series 45RU, 38"D Side Panels (Pair)	1	-
41	Middle Atlantic	BGR-552FT-FC	BGR-Series Fan top, 552 CFM, w/Controller	5	-
42	Middle Atlantic	BGR-RR38	BGR-Series 38RU, Rear Rack Rail Kit	5	-
43	Tripp-Lite	SMART5000TEL3U	SmartPro 208V 5kVA 3.75kW Line-Interactive Sine Wave UPS, 3U Rack/Tower, Network Card Options, USB, DB9 Serial	1	-
44	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	5	-
45	AVTECH	RA12E-TH1-RAS	Room Alert 12ER Monitor	1	-
46	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	2	-
47	AVTECH	RMA-PS1-SEN	Power Sensor	1	-
48			Installation Materials as Defined in AV Systems Specification	Lot	
49			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
50			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
51			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
52			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
54			Power Supplies and Power Distribution as Needed	Lot	
55			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

End of System

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **122**
Type : **SY07**
Name : **Testing Center RM122**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	5	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	2	F
3	Chief	Flat Panel Display Ceiling Mount	Contractor Selected Flat Panel Display Ceiling Mount	3	F
4	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	5	H
5	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	5	-
Source Devices					
6	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
7	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	3	-
Signal Processing, Routing, and Distribution					
8	Extron	DTP HD DA8 4K 330	Long Distance (8 output) DTP Distribution Amp	1	H
9	Extron	SW6 HD 4K	Six Input 4K HDMI Switcher	1	H
Speech Reinforcement System/Audio Conferencing					
10	Biamp	Tesira FORTE DAN VT4	4 Mic/Line In x 4 Mic/Line Out Audio DSP w/AEC, Telco & VOIP - Dante Model	1	-
11	Shure	522	Voice Communication Microphone	1	-
12	Extron	ASA 111	Passive Audio Summing Adapter	3	-
Sound Reinforcement System					
13	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	21	-
14	Extron	MPA 601	1-CH, 60W @ 70 or 100V Amplifier	3	H
15	Extron	XPA 2001	1-CH, 200W @ 70 or 100V Amplifier	1	H
Control System					
16	AMX	NX-4200	Integrated Controller, (8) RS-232, (8) I/O, (8) IR, (8) Relay, (4) PoE, AXLINK, LAN	1	H
17	AMX	MD-1002	10" Modero G5 Wall Touch Panel	1	D
18	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	1	D, H
19	Contractor Select		10 Port Network Switch	1	-
Rack, Panels, Misc.					
20	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
21	Middle Atlantic	BGR-4538	BGR-Series 45RU, 38"D Equipment Rack	1	-
22	Middle Atlantic	BFD-45	BGR-Series 45RU Solid front door	1	-
23	Middle Atlantic	BSPN-45-38	BGR-Series 45RU, 38"D Side Panels (Pair)	1	-
24	Middle Atlantic	BGR-552FT-FC	BGR-Series Fan top, 552 CFM, w/Controller	1	-
25	Middle Atlantic	BGR-RR38	BGR-Series 38RU, Rear Rack Rail Kit	1	-
26	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
27	AVTECH	RA12E-TH1-RAS	Room Alert 12ER Monitor	1	-
28	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	2	-
29	AVTECH	RMA-PS1-SEN	Power Sensor	1	-
30			Installation Materials as Defined in AV Systems Specification	Lot	
31			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
32			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
33			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
34			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
36			Power Supplies and Power Distribution as Needed	Lot	
37			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems

Audiovisual Systems Bidding Equipment List

Number : **212 / 210**

Type : **SY08**

Name : **Welleness Center RM212 / Flex RM210**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	11	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	11	F
3	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	11	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
6	Owner Furnished	CATV	Cable TV Tuner	10	-
Signal Processing, Routing, and Distribution					
7	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	2	H
8	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	2	H
Speech Reinforcement System/Audio Conferencing					
9	Biamp	Tesira FORTE DAN VT4	4 Mic/Line In x 4 Mic/Line Out Audio DSP w/AEC, Telco & VOIP - Dante Model	1	-
10	Shure	QLXD124/85	Wireless Digital Microphone Single Channel Combo System w/ Handheld and Lavalier Mic	1	-
11	Shure	WCE6TD	Tan, Directional Earset Microphone	1	-
12	Attero Tech	unD6IO-BT	Dante™ Networked Audio Wall Plate - 4x2 Multi I/O with Bluetooth® Audio	2	-
Sound Reinforcement System					
13	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	18	-
14	Extron	MPA 601	1-CH, 60W @ 70 or 100V Amplifier	2	H
15	Extron	XPA 2001	1-CH, 200W @ 70 or 100V Amplifier	1	H
Control System					
16	AMX	NX-4200	Integrated Controller, (8) RS-232, (8) I/O, (8) IR, (8) Relay, (4) PoE, AXLINK, LAN	1	H
17	AMX	MD-1002	10" Modero G5 Wall Touch Panel	2	D
18	AMX	EXB-MP1	ICSLan Multi-Port, (1) COM, (1) IR/S, (2) I/O, (1) IR RX	11	H
19	Contractor Select		24 Port Network Switch	1	-
20	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	1	-
Rack, Panels, Misc.					
21	Middle Atlantic	CFR-14-18	CFR-Series 14RU, 18"D Rack	1	F
22	Middle Atlantic	5-RS18	Low Friction Bottom Runners for 18"D Rack (CFR)	1	-
23	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
24	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
25	AVTECH	RA12E-TH1-RAS	Room Alert 12ER Monitor	1	-
26	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	2	-
27	AVTECH	RMA-PS1-SEN	Power Sensor	1	-
28			Installation Materials as Defined in AV Systems Specification	Lot	
29			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
30			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
31			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
32			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
34			Power Supplies and Power Distribution as Needed	Lot	
35			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **106**
Type : **SY09**
Name : **Prefunction RM106**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	C861Q	86" Ultra High Definition Commercial Display	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **123**					
Type : **SY10**					
Name : **Student Lounge RM123**					
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **111**					
Type : **SY11**					
Name : **Prefunction RM111**					
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **206**
Type : **SY12**
Name : **Prefunction RM206**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	C861Q	86" Ultra High Definition Commercial Display	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **C201**					
Type : **SY13**					
Name : **Corridor C201**					
Display Devices					
1	NEC	C861Q	86" Ultra High Definition Commercial Display	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **306**
Type : **SY15**
Name : **Prefunction 306**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	C861Q	86" Ultra High Definition Commercial Display	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **310**					
Type : **SY16**					
Name : **Student Commons 310**					
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **C301**					
Type : **SY17**					
Name : **Circulation C301**					
Display Devices					
1	NEC	C861Q	86" Ultra High Definition Commercial Display	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **105, 107, 205, 207, 211, 213, 305, 307, 311, 313**
Type : **SY18**
Name : **4 Seat Study RM105, 107, 205, 207, 211, 213, 305, 307, 311, 313**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Signal Processing, Routing, and Distribution					
4	Extron	HC 402	Meeting Space Collaboration System – Decorator-Style Wallplate	1	D
Rack, Panels, Misc.					
5			Installation Materials as Defined in AV Systems Specification	Lot	
6			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
7			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
8			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
9			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
11			Power Supplies and Power Distribution as Needed	Lot	
12			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **112, 114, 115, 116, 314, 316**
Type : **SY19**
Name : **6 Seat Study RM,112, 114, 115, 116, 314, 316**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Signal Processing, Routing, and Distribution					
4	Extron	HC 402	Meeting Space Collaboration System – Decorator-Style Wallplate	1	D
Rack, Panels, Misc.					
5			Installation Materials as Defined in AV Systems Specification	Lot	
6			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
7			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
8			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
9			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
11			Power Supplies and Power Distribution as Needed	Lot	
12			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **943, 944**
Type : **SY20**
Name : **Small Conference RM943, 944**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	Panasonic	PT-RZ970	10,000 ANSI Lumens, 1-Chip DLP, Laser Light Source, 1920x1200, Lens Included	1	F
2	Contractor Select	Contractor Select Zoom Lens	Contractor Selected Projector Lens for Above	1	F
3	Chief	Projector Mounting Hardware	Contractor Selected Projector Mounting Hardware as Needed	1	F
4	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Source Devices					
5	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
Video Capture, Streaming and Conferencing					
6	Polycom	7200-65320-001	Polycom Group 310 720P Videoconference Codec and Acoustic Camera	1	-
7	Polycom	2200-23809-002	Ceiling Microphone Array - White	2	-
8	Polycom	2457-63542-001	Serial Cable for the Group Series 300 and Group Series 500	1	-
Signal Processing, Routing, and Distribution					
9	Extron	DTP CrossPoint 82 4K	8x2 Seamless 4K Scaling Presentation Matrix Switcher	1	-
10	Extron	DTP T HWP 4K 231 D	DTP (70m) HDMI Transmitter, 1G Decora Wallplate	2	D
11	Extron	DTP HDMI 4K 230 Rx	DTP 4K Receiver for HDMI	1	H
Sound Reinforcement System					
12	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	6	-
13	Extron	MPA 601	1-CH, 60W @ 70 or 100V Amplifier	2	H
Control System					
14	Contractor Select		10 Port Network Switch	1	-
15	AMX	NX-2200	Integrated Controller, (4) RS-232, (4) I/O, (4) IR, (4) Relay, AXLINK, LAN	1	H
16	AMX	MD-1002	10" Modero G5 Wall Touch Panel	1	D
Rack, Panels, Misc.					
17	Middle Atlantic	CFR-12-18	CFR-Series 12RU, 18"D Rack	1	F
18	Middle Atlantic	5-RS18	Low Friction Bottom Runners for 18"D Rack (CFR)	1	-
19	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
20	AVTECH	RA3E-ES0-BAS	Room Alert 3E Monitor	1	-
21	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	1	-
22	Extron	60-300-03	AAP 102	1	D,F,H
23	Extron	70-1076-63	AAP SuperPlate 160	1	-
24	Extron	70-1220-03	One HDMI Female to Female on 10" Pigtail, One RJ45 Female to Female Barrel - CAT 5e	1	D,F,H
25	Extron	70-382-13	Two USB A Female to Two USB B Female on 10" Pigtail	1	D,F,H
26	Spectrum Industries	99051	Cooling Fan for Millwork	2	-
27			Installation Materials as Defined in AV Systems Specification	Lot	
28			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
29			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
30			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
31			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
33			Power Supplies and Power Distribution as Needed	Lot	
34			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **989**					
Type : **SY21**					
Name : **Large Conference RM989**					
Display Devices					
1	Panasonic	PT-RZ970	10,000 ANSI Lumens, 1-Chip DLP, Laser Light Source, 1920x1200, Lens Included	1	F
2	Contractor Select	Contractor Select Zoom Lens	Contractor Selected Projector Lens for Above	1	F
3	Chief	Projector Mounting Hardware	Contractor Selected Projector Mounting Hardware as Needed	1	F
4	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Source Devices					
5	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
Video Capture, Streaming and Conferencing					
6	Polycom	7200-65320-001	Polycom Group 310 720P Videoconference Codec and Acoustic Camera	1	-
7	Polycom	2200-23809-002	Ceiling Microphone Array - White	2	-
8	Polycom	2457-63542-001	Serial Cable for the Group Series 300 and Group Series 500	1	-
Signal Processing, Routing, and Distribution					
9	Extron	DTP CrossPoint 82 4K	8x2 Seamless 4K Scaling Presentation Matrix Switcher	1	-
10	Extron	DTP T HWP 4K 231 D	DTP (70m) HDMI Transmitter, 1G Decora Wallplate	2	D
11	Extron	DTP HDMI 4K 230 Rx	DTP 4K Receiver for HDMI	1	H
Sound Reinforcement System					
12	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	8	-
13	Extron	MPA 601	1-CH, 60W @ 70 or 100V Amplifier	2	H
Control System					
14	Contractor Select		10 Port Network Switch	1	-
15	AMX	NX-2200	Integrated Controller, (4) RS-232, (4) I/O, (4) IR, (4) Relay, AXLINK, LAN	1	H
16	AMX	MD-1002	10" Modero G5 Wall Touch Panel	1	D
17	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	1	-
Rack, Panels, Misc.					
18	Middle Atlantic	CFR-12-18	CFR-Series 12RU, 18"D Rack	1	F
19	Middle Atlantic	5-RS18	Low Friction Bottom Runners for 18"D Rack (CFR)	1	-
20	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
21	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
22	AVTECH	RA3E-ES0-BAS	Room Alert 3E Monitor	1	-
23	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	1	-
24	Extron	60-300-03	AAP 102	1	D,F,H
25	Extron	70-1076-63	AAP SuperPlate 160	1	-
26	Extron	70-1220-03	One HDMI Female to Female on 10" Pigtail, One RJ45 Female to Female Barrel - CAT 5e	1	D,F,H
27	Extron	70-382-13	Two USB A Female to Two USB B Female on 10" Pigtail	1	D,F,H
28	Spectrum Industries	99051	Cooling Fan for Millwork	2	-
29			Installation Materials as Defined in AV Systems Specification	Lot	
30			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
31			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
32			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
33			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
35			Power Supplies and Power Distribution as Needed	Lot	
36			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **V902**					
Type : **SY23**					
Name : **Elevator Lobby V902**					
Display Devices					
1	NEC	E437Q	43" 4K UHD Display with Integrated ATSC/NTSC Tuner	2	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	2	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	2	-
5	Visix		Visix Player License	2	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	2	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	2	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	2	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **925**
Type : **SY24**
Name : **Break RM925**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **1031**
Type : **SY25**
Name : **Large Conference RM1031**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Surfaces					
1	Generic	Projection Screen	Projection Screen per Infrastructure Reference Drawings	1	-
Display Devices					
2	Panasonic	PT-RZ970	10,000 ANSI Lumens, 1-Chip DLP, Laser Light Source, 1920x1200, Lens Included	1	F
3	Contractor Select	Contractor Select Zoom Lens	Contractor Selected Projector Lens for Above	1	F
4	Chief	Projector Mounting Hardware	Contractor Selected Projector Mounting Hardware as Needed	1	F
5	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Source Devices					
6	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
Video Capture, Streaming and Conferencing					
7	Vaddio	RoboSHOT 12E OneLINK System	HD PTZ Camera - 12x Optical Zoom - 73 Deg FOV - HDBT OneLINK HDMI System	2	-
8	Polycom	7200-65088-001	Group 500 Codec Only SKU - 720p, NTSC/PAL. CALA Includes Service in Price. ROW Require Purchase of Separate Service Product ID.	1	-
9	Polycom	2200-23809-002	Ceiling Microphone Array - White	2	-
10	Polycom	7200-68524-125	EagleEye Digital Breakout Adapter (DBA)-codec. Breaks out RealPresence Group HDCI input to HDMI and DB9. Includes: DBA-codec. Order min-HDCI to HDCI cable separately	1	-
11	Polycom	2457-63542-001	Serial Cable for the Group Series 300 and Group Series 500	1	-
Signal Processing, Routing, and Distribution					
12	Extron	DTP CrossPoint 84 4K	8x4 Seamless 4K Scaling Presentation Matrix Switcher	1	-
13	Extron	DTP T HWP 4K 231 D	DTP (70m) HDMI Transmitter, 1G Decora Wallplate	2	D
14	Extron	DTP HDMI 4K 230 Rx	DTP 4K Receiver for HDMI	1	H
Sound Reinforcement System					
15	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	10	-
16	Extron	MPA 601	1-CH, 60W @ 70 or 100V Amplifier	2	H
Control System					
17	Contractor Select		10 Port Network Switch	1	-
18	AMX	NX-2200	Integrated Controller, (4) RS-232, (4) I/O, (4) IR, (4) Relay, AXLINK, LAN	1	H
19	AMX	MD-1002	10" Modero G5 Wall Touch Panel	1	D
20	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	1	D, H
21	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	1	-
Rack, Panels, Misc.					
22	Middle Atlantic	CFR-12-18	CFR-Series 12RU, 18"D Rack	1	F
23	Middle Atlantic	5-RS18	Low Friction Bottom Runners for 18"D Rack (CFR)	1	-
24	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
25	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
26	AVTECH	RA3E-ES0-BAS	Room Alert 3E Monitor	1	-
27	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	1	-
28	Extron	60-300-03	AAP 102	1	D,F,H
29	Extron	70-1076-63	AAP SuperPlate 160	1	-
30	Extron	70-1220-03	One HDMI Female to Female on 10" Pigtail, One RJ45 Female to Female Barrel - CAT 5e	1	D,F,H
31	Extron	70-382-13	Two USB A Female to Two USB B Female on 10" Pigtail	1	D,F,H
32	Spectrum Industries	99051	Cooling Fan for Millwork	2	-
33			Installation Materials as Defined in AV Systems Specification	Lot	
34			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	

35			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
36			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
37			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
39			Power Supplies and Power Distribution as Needed	Lot	
40			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

End of System

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **1075**
Type : **SY26**
Name : **Conference RM1075**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	C861Q	86" Ultra High Definition Commercial Display	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Source Devices					
4	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
Video Capture, Streaming and Conferencing					
5	Vaddio	RoboSHOT 12E OneLINK System	HD PTZ Camera - 12x Optical Zoom - 73 Deg FOV - HDBT OneLINK HDMI System	2	-
6	Polycom	7200-65088-001	Group 500 Codec Only SKU - 720p, NTSC/PAL. CALA Includes Service in Price. ROW Require Purchase of Separate Service Product ID.	1	-
7	Polycom	2200-23809-002	Ceiling Microphone Array - White	2	-
8	Polycom	7200-68524-125	EagleEye Digital Breakout Adapter (DBA)-codec. Breaks out RealPresence Group HDCI input to HDMI and DB9. Includes: DBA-codec. Order min-HDCI to HDCI cable separately	1	-
9	Polycom	2457-63542-001	Serial Cable for the Group Series 300 and Group Series 500	1	-
Signal Processing, Routing, and Distribution					
10	Extron	DTP CrossPoint 84 4K	8x4 Seamless 4K Scaling Presentation Matrix Switcher	1	-
11	Extron	DTP T HWP 4K 231 D	DTP (70m) HDMI Transmitter, 1G Decora Wallplate	2	D
12	Extron	DTP HDMI 4K 230 Rx	DTP 4K Receiver for HDMI	1	H
Sound Reinforcement System					
13	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	8	-
14	Extron	MPA 601	1-CH, 60W @ 70 or 100V Amplifier	2	H
Control System					
15	Contractor Select		10 Port Network Switch	1	-
16	AMX	NX-2200	Integrated Controller, (4) RS-232, (4) I/O, (4) IR, (4) Relay, AXLINK, LAN	1	H
17	AMX	MD-1002	10" Modero G5 Wall Touch Panel	1	D
18	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	1	D, H
19	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	1	-
Rack, Panels, Misc.					
20	Middle Atlantic	CFR-12-18	CFR-Series 12RU, 18"D Rack	1	F
21	Middle Atlantic	5-RS18	Low Friction Bottom Runners for 18"D Rack (CFR)	1	-
22	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
23	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
24	AVTECH	RA3E-ES0-BAS	Room Alert 3E Monitor	1	-
25	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	1	-
26	Extron	60-300-03	AAP 102	1	D,F,H
27	Extron	70-1076-63	AAP SuperPlate 160	1	-
28	Extron	70-1220-03	One HDMI Female to Female on 10" Pigtail, One RJ45 Female to Female Barrel - CAT 5e	1	D,F,H
29	Extron	70-382-13	Two USB A Female to Two USB B Female on 10" Pigtail	1	D,F,H
30	Spectrum Industries	99051	Cooling Fan for Millwork	2	-
31			Installation Materials as Defined in AV Systems Specification	Lot	
32			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
33			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
34			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
35			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
37			Power Supplies and Power Distribution as Needed	Lot	

38			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

End of System

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **1029**
Type : **SY28**
Name : **Break RM1029**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **V1002**
Type : **SY29**
Name : **Elevator Lobby V1002**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	E437Q	43" 4K UHD Display with Integrated ATSC/NTSC Tuner	2	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	2	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	2	-
5	Visix		Visix Player License	2	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	2	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	2	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	2	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates as Needed	Lot	
11			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
12			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **1161**
Type : **SY30**
Name : **Board RM1161**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Surfaces					
1	Generic	Projection Screen	Projection Screen per Infrastructure Reference Drawings	1	-
Display Devices					
2	Panasonic	PT-RZ970	10,000 ANSI Lumens, 1-Chip DLP, Laser Light Source, 1920x1200, Lens Included	1	F
3	Contractor Select	Contractor Select Zoom Lens	Contractor Selected Projector Lens for Above	1	F
4	Chief	Projector Mounting Hardware	Contractor Selected Projector Mounting Hardware as Needed	1	F
5	Extron	DTP HDMI 4K 230 Rx	DTP 4K Receiver for HDMI	1	H
6	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Source Devices					
7	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
Video Capture, Streaming and Conferencing					
8	Vaddio	RoboShot 30 HDBT OneLINK HDMI System	HD PTZ Camera - 30x Optical Zoom - 65Deg. FOV-HDBT OneLINK HDMI System	2	D
9	Polycom	7200-65466-001	Group 700 Codec Only SKU - 720p, NTSC/PAL. CALA Includes Service in Price. ROW Require Purchase of Separate Service Product ID.	1	-
10	Polycom	4870-65466-112	Premier, One Year, Codec Only. RealPresence Group 700 HD codec -720p	1	-
11	Polycom	5150-65082-001	1080p People and Content License	1	-
Signal Processing, Routing, and Distribution					
12	Extron	DTP CrossPoint 84 4K	8x4 Seamless 4K Scaling Presentation Matrix Switcher	1	H
13	Extron	DTP T HWP 4K 231 D	DTP (70m) HDMI Transmitter, 1G Decora Wallplate	3	D
14	Extron	DTP HDMI 4K 230 Rx	DTP 4K Receiver for HDMI	1	H
15	Extron	USB Extender Plus R	Twisted Pair Receiver (Remote) for USB	1	-
16	Extron	USB Extender Plus T	Twisted Pair Transmitter (Local) for USB	1	-
Speech Reinforcement System/Audio Conferencing					
17	Biamp	Tesira FORTE DAN VT	12 Mic/Line In x 8 Mic/Line Out Audio DSP w/AEC, Telco & VOIP - Dante Model	1	H
18	Shure	MXA910	Microflex Advance Ceiling Array Microphone	2	-
19	Listen Technologies	LT-82	Stationary Infrared Transmitter	1	-
20	Listen Technologies	LA-140-XX	Stationary Infrared Radiator	1	D
21	Listen Technologies	LR-42	IR Stethoscope 4-Channel Receiver	4	-
22	Listen Technologies	LA-401	Universal Ear Speaker	4	-
23	Listen Technologies	LR-44	IR Lanyard 4-Channel Receiver	4	-
24	Listen Technologies	LA-350	8-Unit IR Charging/Stroage Station	1	-
Sound Reinforcement System					
25	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	8	-
26	Extron	XPA U 358-70V	Eight Channel Amp, 35 watts at 70 volts	1	-
Control System					
27	Contractor Select		24 Port Network Switch	1	-
28	AMX	NX-4200	Integrated Controller, (8) RS-232, (8) I/O, (8) IR, (8) Relay, (4) PoE, AXLINK, LAN	1	H
29	AMX	MD-1002	10" Modero G5 Wall Touch Panel	1	D
30	AMX	MT-1002	10" Modero G5 Tabletop Touch Panel	1	D, H
31	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	1	-
Rack, Panels, Misc.					
32	Middle Atlantic	CFR-12-18	CFR-Series 12RU, 18"D Rack	1	F
33	Middle Atlantic	5-RS18	Low Friction Bottom Runners for 18"D Rack (CFR)	1	-
34	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
35	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
36	AVTECH	RA3E-ES0-BAS	Room Alert 3E Monitor	1	-
37	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	1	-

38	Spectrum Industries	55178 - FMFMCMS1F40000	Honors Lectern. Including: (1) 95522, (2) 99051, (1) 95534	1	D,F,H
39	Extron	60-300-03	AAP 102	1	D,F,H
40	Extron	70-1076-63	AAP SuperPlate 160	1	-
41	Extron	70-1220-03	One HDMI Female to Female on 10" Pigtail, One RJ45 Female to Female Barrel - CAT 5e	1	D,F,H
42	Extron	70-382-13	Two USB A Female to Two USB B Female on 10" Pigtail	1	D,F,H
43	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	2	-
44	Spectrum Industries	99051	Cooling Fan for Millwork	2	-
45			Installation Materials as Defined in AV Systems Specification	Lot	
46			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
47			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
48			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
49			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
51			Power Supplies and Power Distribution as Needed	Lot	
52			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

End of System

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **1166**
Type : **SY31**
Name : **Conference RM1166**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	C861Q	86" Ultra High Definition Commercial Display	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Source Devices					
4	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
Video Capture, Streaming and Conferencing					
5	Vaddio	RoboSHOT 12E OneLINK System	HD PTZ Camera - 12x Optical Zoom - 73 Deg FOV - HDBT OneLINK HDMI System	2	-
6	Polycom	7200-65088-001	Group 500 Codec Only SKU - 720p, NTSC/PAL. CALA Includes Service in Price. ROW Require Purchase of Separate Service Product ID.	1	-
7	Polycom	2200-23809-002	Ceiling Microphone Array - White	2	-
8	Polycom	7200-68524-125	EagleEye Digital Breakout Adapter (DBA)-codec. Breaks out RealPresence Group HDCI input to HDMI and DB9. Includes: DBA-codec. Order min-HDCI to HDCI cable separately	1	-
9	Polycom	2457-63542-001	Serial Cable for the Group Series 300 and Group Series 500	1	-
Signal Processing, Routing, and Distribution					
10	Extron	DTP CrossPoint 84 4K	8x4 Seamless 4K Scaling Presentation Matrix Switcher	1	-
11	Extron	DTP T HWP 4K 231 D	DTP (70m) HDMI Transmitter, 1G Decora Wallplate	2	D
12	Extron	DTP HDMI 4K 230 Rx	DTP 4K Receiver for HDMI	1	H
Sound Reinforcement System					
13	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	6	-
14	Extron	MPA 601	1-CH, 60W @ 70 or 100V Amplifier	2	H
Control System					
15	Contractor Select		10 Port Network Switch	1	-
16	AMX	NX-2200	Integrated Controller, (4) RS-232, (4) I/O, (4) IR, (4) Relay, AXLINK, LAN	1	H
17	AMX	MD-1002	10" Modero G5 Wall Touch Panel	1	D
18	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	1	-
Rack, Panels, Misc.					
19	Middle Atlantic	CFR-12-18	CFR-Series 12RU, 18"D Rack	1	F
20	Middle Atlantic	5-RS18	Low Friction Bottom Runners for 18"D Rack (CFR)	1	-
21	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
22	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
23	AVTECH	RA3E-ES0-BAS	Room Alert 3E Monitor	1	-
24	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	1	-
25	Extron	60-300-03	AAP 102	1	D,F,H
26	Extron	70-1076-63	AAP SuperPlate 160	1	-
27	Extron	70-1220-03	One HDMI Female to Female on 10" Pigtail, One RJ45 Female to Female Barrel - CAT 5e	1	D,F,H
28	Extron	70-382-13	Two USB A Female to Two USB B Female on 10" Pigtail	1	D,F,H
29	Spectrum Industries	99051	Cooling Fan for Millwork	2	-
30			Installation Materials as Defined in AV Systems Specification	Lot	
31			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
32			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
33			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
34			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
36			Power Supplies and Power Distribution as Needed	Lot	
37			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

End of System

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **1143, 1110**
Type : **SY32**
Name : **Small Conference RM1143, 1110**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	C861Q	86" Ultra High Definition Commercial Display	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Source Devices					
4	Owner Furnished	Instructor Workstation	Owner Furnished Instructor's Workstation PC	1	-
Video Capture, Streaming and Conferencing					
5	Polycom	7200-65320-001	Polycom Group 310 720P Videoconference Codec and Acoustic Camera	1	-
6	Polycom	2200-23809-002	Ceiling Microphone Array - White	2	-
7	Polycom	2457-63542-001	Serial Cable for the Group Series 300 and Group Series 500	1	-
Signal Processing, Routing, and Distribution					
8	Extron	DTP CrossPoint 82 4K	8x2 Seamless 4K Scaling Presentation Matrix Switcher	1	-
9	Extron	DTP T HWP 4K 231 D	DTP (70m) HDMI Transmitter, 1G Decora Wallplate	2	D
10	Extron	DTP HDMI 4K 230 Rx	DTP 4K Receiver for HDMI	1	H
Sound Reinforcement System					
11	Klipsch	IC-650-T	Full-Range 6.5" 2-Way Ceiling Loudspeaker	6	-
12	Extron	MPA 601	1-CH, 60W @ 70 or 100V Amplifier	2	H
Control System					
13	Contractor Select		10 Port Network Switch	1	-
14	AMX	NX-2200	Integrated Controller, (4) RS-232, (4) I/O, (4) IR, (4) Relay, AXLINK, LAN	1	H
15	AMX	MD-1002	10" Modero G5 Wall Touch Panel	1	D
16	Panduit	CPPL24FMWBLY	24 Port Modular Patch Panel	1	-
Rack, Panels, Misc.					
17	Middle Atlantic	CFR-12-18	CFR-Series 12RU, 18"D Rack	1	F
18	Middle Atlantic	5-RS18	Low Friction Bottom Runners for 18"D Rack (CFR)	1	-
19	Panelcrafters	SEXTG-26000-RevG	Rack ID Panel	1	-
20	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	1	-
21	AVTECH	RA3E-ES0-BAS	Room Alert 3E Monitor	1	-
22	AVTECH	RMA-F024-SEN	Flood Sensor w/24' Cable	1	-
23	Extron	60-300-03	AAP 102	1	D,F,H
24	Extron	70-1076-63	AAP SuperPlate 160	1	-
25	Extron	70-1220-03	One HDMI Female to Female on 10" Pigtail, One RJ45 Female to Female Barrel - CAT 5e	1	D,F,H
26	Extron	70-382-13	Two USB A Female to Two USB B Female on 10" Pigtail	1	D,F,H
27	Spectrum Industries	99051	Cooling Fan for Millwork	2	-
28			Installation Materials as Defined in AV Systems Specification	Lot	
29			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
30			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
31			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
32			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
34			Power Supplies and Power Distribution as Needed	Lot	
35			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **1159**					
Type : **SY33**					
Name : **Prefunction 1159**					
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **V1102**
Type : **SY34**
Name : **Elevator Lobby V1102**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	E437Q	43" 4K UHD Display with Integrated ATSC/NTSC Tuner	2	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	2	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	2	-
5	Visix		Visix Player License	2	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	2	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	2	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	2	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **V102**					
Type : **SY35**					
Name : **Elevator Lobby V102**					
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Tripp-Lite	AV550SC	550VA Audio/Video Backup Power Block	1	-
Source Devices					
4	Owner Furnished	Digital Singage Player	Digital Signage Player	1	-
5	Visix		Visix Player License	1	-
Signal Processing, Routing, and Distribution					
6	Extron	DTP HDMI 4K 330 Rx	DTP (100m) HDMI Receiver	1	H
7	Extron	DTP HDMI 4K 330 Tx	DTP 4K Transmitter for HDMI	1	H
Control System					
8	AMX	EXB-COM2	ICSLan Serial Interface, (2) RS-232 Ports	1	H
Rack, Panels, Misc.					
9			Installation Materials as Defined in AV Systems Specification	Lot	
10			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
11			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
12			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
13			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
15			Power Supplies and Power Distribution as Needed	Lot	
16			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Eastern Virginia Medical School
Waitzer Hall

Audiovisual Systems
Audiovisual Systems Bidding Equipment List

Number : **922**
Type :
Name : **AV Director 922**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Devices					
1	NEC	E557Q	55" 4K UHD Display with Integrated ATSC/NTSC Tuner	1	-
2	Chief	Fusion Wall Tilt Series	Contractor Selected Flat Panel Display Wall Mount	1	F
3	Surge-X	SX-DS-154	Surge Suppressor w/ 4 Receptacles, w/ Mounting Brackets	1	-
Rack, Panels, Misc.					
4			Installation Materials as Defined in AV Systems Specification	Lot	
5			Custom Wall/Floor Box and Decorator-Style Plates with EtherCON connectors as Needed	Lot	
6			Pre-Made Loose Cabling and Field Cabling with EtherCON connectors as Needed	Lot	
7			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
8			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
10			Power Supplies and Power Distribution as Needed	Lot	
11			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	
End of System					

Section 5 – Owner's General Terms and Additional Provisions

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5.1 GENERAL TERMS AND CONDITIONS

A. Applicable Laws and Courts: This solicitation and any resulting contract shall be governed in all respects by the laws of the Commonwealth of Virginia and any litigation with respect thereto shall be brought in the courts of the Commonwealth. The Contractor/Bidder shall comply with all applicable federal, state and local laws, rules and regulations.

B. Anti-Discrimination: By submitting their proposals, offerors certify to the Medical School that they will conform to the provisions of the Civil Rights Act of 1964, as amended as well as the Virginia Fair Employment Contracting Act of 1975 as amended, where applicable. If the award is made to a faith-based organization, the organization shall not discriminate against any recipient of goods, services, or disbursements made pursuant to the contract on the basis of the recipient's religion, religious belief, refusal to participate in a religious practice, or on the basis of race, age, color, gender or national origin and may be subject to the same rules as other organizations that contract with public bodies to account for the use of the funds provided.

   In every contract, the provisions in 1 and 2 below apply:

   1. During the performance of this contract, the contractor agrees as follows:

      a. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

      b. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.

   2. The contract will include the provision of 1 above in every subcontract or purchase order, so that the provisions will be binding upon each subcontractor or vendor.

C. Ethics In Contracting: By submitting their proposal, offerors certify that their proposals are made without collusion or fraud and that they have not offered or received any kickbacks or inducements from any other offeror, supplier, manufacturer or subcontractor in connection with their proposal, and that they have not conferred on any Medical School employee having official responsibility for this procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

Section 5 – Owner's General Terms and Additional Provisions

D. Immigration Reform and Control Act of 1986: By submitting their proposals, offerors certify that they do not and will not during the performance of this contract employ illegal alien workers or otherwise violate the provisions of the federal Immigration Reform and Control Act of 1986.

E. Debarment Status: By submitting their proposals, offerors certify that they are not currently debarred by the Commonwealth of Virginia, from submitting bids or proposals on contracts for the type of goods and/or services covered by this solicitation, nor are they an agent of any person or entity that is currently so debarred. Also, offerors certify that they are not on the Department of Health and Human Services (HHS) and Office of Inspector General's (OIG) monthly list of excluded individuals/entities from providing medical services and supplies to Medicare, Medicaid or other federal health care program participants.

F. Antitrust: By entering into a contract, the contractor conveys, sells, assigns, and transfers to the Medical School all rights, title and interest in and to all causes of action it may now have or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular goods or services purchased or acquired by the Medical School under said contract.

G. Mandatory Use of Terms and Conditions for RFPs: Modification of or additions to the General Terms and Conditions of the solicitation may be cause for rejection of the proposal; however, the Medical School reserves the right to decide, on a case-by-case basis, in its sole discretion, whether to reject such a proposal.

H. Payment:

1. To Prime Contractor:

    a. Invoices for items ordered, delivered and accepted shall by submitted by the contractor directly to the payment address shown on the purchase order/contract. All invoices shall show the purchase order number and the contract number.

    b. Any payment terms requiring payment in less than 30 days will be regarded as requiring payment 30 days after invoice or delivery, whichever occurs last. This shall not affect offers of discounts for payment in less than 30 days, however.

    c. All goods and services provided under this contract/purchase order shall be billed by the contractor at the contract price, regardless of which department is being billed.

    d. The date of postmark shall be deemed to be the date of payment in all cases where payment is made by mail.

    e. Payments to vendor will be based upon milestones achieved and deliverables received.

f. **Unreasonable Charges.** Under certain emergency procurements and for most time and materials purchases, final job costs cannot be accurately determined at the time orders are placed. In such cases, contractors should be put on notice that final payment in full is contingent on a determination of reasonableness with respect to all invoiced charges. Charges which appear to be unreasonable will be researched and challenged, and that portion of the invoice held in abeyance until a settlement can be reached. Upon determining that invoiced charges are not reasonable, the Medical School shall promptly notify the contractor, in writing, as to those charges which it considers unreasonable and the basis for the determination. A contractor may not institute legal action unless a settlement cannot be reached within sixty (60) days of notification.

2. To Subcontractor:

a. A contractor awarded a contract under this solicitation is hereby obligated: To pay the subcontractor(s) within seven (7) days of the contractor's receipt of payment from the Medical School for the proportionate share of the payment received for work performed by the subcontractor(s) under the contract; or to notify the Medical School and the subcontractor(s), in writing, of the contractor's intention to withhold payment and the reason.

b. The contractor is obligated to pay the subcontractor(s) interest at the rate of one percent per month (unless otherwise provided under the terms of the contract) on all amounts owed by the contractor that remain unpaid seven (7) days following receipt of payment from the Medical School, except for amounts withheld as stated in (ii) above. The date of mailing of any payment by U.S. Mail is deemed to be payment to the addressee. These provisions apply to each sub-tier contractor performing under the primary contract. A contractor's obligation to pay an interest charge to a subcontractor may not be construed to be an obligation of the Medical School

I. Precedence of Terms: The following General Terms and Conditions APPLICABLE LAWS AND COURTS, ANTI-DISCRIMINATION, ETHICS IN CONTRACTING, IMMIGRATION REFORM AND CONTROL ACT OF 1986, DEBARMENT STATUS, ANTITRUST, MANDATORY USE OF TERMS AND CONDITIONS, CLARIFICATION OF TERMS, PAYMENT shall apply in all instances. In the event there is a conflict between any of the other General Terms and Conditions and any Special Terms and Conditions in this solicitation, the Special Terms and Conditions shall apply.

J. Qualifications of Offerors: The Medical School may make such reasonable investigations as deemed proper and necessary to determine the ability of the offeror to perform the services/furnish the goods and the offeror shall furnish to the Medical School all such information and data for this purpose as may be requested. The Medical School reserves the right to inspect offeror's physical facilities prior to award to satisfy questions regarding the offeror's capabilities. The Medical School further reserves the right to reject any proposal if the evidence submitted by, or investigations of, such offeror fails to satisfy the Medical

School that such offeror is properly qualified to carry out the obligations of the contract and to provide the services and/or furnish the goods contemplated therein.

K. Testing and Inspection: The Medical School reserves the right to conduct any test/inspection it may deem advisable to assure goods and services conform to the specifications.

L. Assignment of Contract: A contract shall not be assignable by the contractor in whole or in part without the written consent of the Medical School.

M. Changes to the Contract: Changes can be made to the contract in any of the following ways followed by a change order/revised purchase order:

1. The parties may agree in writing to modify the scope of the contract. An increase or decrease in the price of the contract resulting from such modification shall be agreed to by the parties as a part of their written agreement to modify the scope of the contract.

2. The Purchasing Department may order changes within the general scope of the contract at any time by written notice to the contractor. Changes within the scope of the contract include, but are not limited to, things such as services to be performed, the method of packing or shipment, and the place of delivery or installation. The contractor shall comply with the notice upon receipt. The contractor shall be compensated for any additional costs incurred as the result of such order and shall give the Purchasing Department a credit for any savings. Said compensation shall be determined by one of the following methods:

   a. By mutual agreement between the parties in writing; or

   b. By agreeing upon a unit price or using a unit price set forth in the contract, if the work to be done can be expressed in units, and the contractor accounts for the number of units of work performed subject to the Purchasing Department's right to audit the contractor's records and/or to determine the correct number of units independently; or

   c. By ordering the contractor to proceed with the work and keep a record of all costs incurred and savings realized. A markup for overhead and profit may be allowed if provided by the contract. The same markup shall be used for determining a decrease in price as the result of savings realized. The contractor shall present the Purchasing Department with all vouchers and records of expenses incurred and savings realized. The Purchasing Department shall have the right to audit the records of the contractor as it deems necessary to determine costs or savings. Any claim for an adjustment in price under this provision must be asserted by written notice to the Purchasing Department within thirty (30) days from the date of receipt of the written order from the Purchasing Department.

Section 5 – Owner's General Terms and Additional Provisions

N. Disputes: Neither the existence of a claim nor a dispute resolution process, litigation or any other provision of this contract shall excuse the contractor from promptly complying with the performance of the contract generally or with the changes ordered by the Purchasing Department.

O. Default: In case of failure to deliver goods or services in accordance with the contract terms and conditions, the Medical School, after due oral or written notice, may procure them from other sources and hold the contractor responsible for any resulting additional purchase and administrative costs. This remedy shall be in additional to any other remedies which the Medical School may have.

P. Taxes: Sales to the Medical School are normally exempt from State sales tax. State sales and use tax certificates of exemption, Form ST-12, will be issued upon request. Deliveries against this contract shall be free of excise or transportation taxes

Q. Transportation and Packaging: By submitting their proposals, all offerors certify and warrant that the price offered for FOB destination includes only the actual freight rate costs at the lowest and best rate and is based upon the actual weight of the goods to be shipped. Except as otherwise specified herein, standard commercial packaging, packing and shipping containers shall be used. All shipping containers shall be legibly marked or labeled on the outside with purchase order number.

R. Insurance: By signing and submitting a proposal under this solicitation, the offeror certifies that if awarded the contract, it will have the following insurance coverage at the time the contract is awarded. For construction contracts, if any subcontractors are involved, the subcontractor will have workers' compensation insurance in accordance with § 2.2-4332 and 65.2-800 et seq. of the *Code of Virginia*. The offeror further certifies that the contractor and any subcontractors will maintain these insurance coverages during the entire term of the contract and that all insurance coverage will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission.

MINIMUM INSURANCE COVERAGES AND LIMITS REQUIRED FOR MOST CONTRACTS:

1. *Workers' Compensation* – Statutory requirements and benefits and employer's liability at $1,000,000.. To include a Waiver of Subrogation in favor of EVMS .
2. Coverage is compulsory for employers of three or more employees, to include the employer. Contractors who fail to notify the Medical School of increases in the number of employees that change their workers' compensation requirements under the *Code of Virginia* during the course of the contract shall be in noncompliance with the contract.

3. *Commercial General Liability* - $1,000,000 per occurrence and $2,000,000 aggregate. Commercial General Liability is to include bodily injury and property damage, personal injury and advertising injury, products and completed operations coverage. The Medical

School must be named as an additional insured to include both ongoing and completed operations and so endorsed on the policy and a Wavier of Subrogation in favor of EVMS.

4. *Automobile Liability* - $1,000,000 per occurrence. (Only used if motor vehicle is to be used in the contract.)

5. *Professional Liability* - $1,000,000 per occurrence, $3,000,000 aggregate for successful bidder and all subcontractors involved in design and programming. The limits for professional liability can be met in combination of primary and umbrella/excess policies.

6. *Cyber/Data Breach:* Limits of $1,000,000 liability for privacy and network security.

S. Announcement of Award: Upon the award or the announcement of the decision to award a contract over $100,000, as a result of this solicitation, the Department of Materials Management will publicly post such notice on the EVMS Internet web site at www.evms.edu for a minimum of 10 days.

T. Drug-Free Workplace: During the performance of this contract, the contractor agrees to provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) includes the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

For the purpose of this section, "drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a contractor, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

U. Nondiscrimination of Contractors: An offeror or contractor shall not be discriminated against in the solicitation or award of this contract because of race religion, color, sex, national origin, age or disability, faith-based organizational status, any other basis prohibited by state law relating to discrimination in employment or because the bidder or offeror employs ex-offenders unless the Medical School has made a written determination that employing ex-offenders on the specific contract is not in its best interest. If the award of this contract is made to a faith-based organization and an individual, who applies for or receives goods, services, or disbursements provided pursuant to this contract objects to the religious character of the faith-based organization from which the individual receives or would receive the goods, services, or disbursements, the Medical School shall offer the individual, within a

reasonable period of time after the date of his objection, access to equivalent goods, services, or disbursements from an alternative provider.

V. Permits and Fees: All proposals submitted shall have included in price the cost of any business or professional licenses, permits or fees required by the Commonwealth of Virginia. The Offeror must have all necessary licenses to perform the services in Virginia, and, if practicing as a corporation, be authorized to do business in the Commonwealth of Virginia.

W. OSHA Standards: All contractors and subcontractors performing services for the Medical School are required and shall comply with all Occupational Safety and Health Administration (OSHA) State and City Safety and Occupational Health Standards and any other applicable rules and regulations. Also, all contractors and subcontractors shall be held responsible for the safety of their employees and any unsafe acts or conditions that may cause injury or damage to any persons or property within and around the work site area under this RFP.

X. Equal Employment Opportunity (EEO) Clause for Veterans: An offeror or contractor shall abide by the requirements of 41 CFR 60-300.5(a). This regulation prohibits discrimination against qualified protected veterans, and requires affirmative action by covered prime contractors and subcontractors to employ and advance in employment qualified protected veterans.

Y. Equal Employment Opportunity (EEO) Clause for Individuals with Disabilities: An offeror or contractor shall abide by the requirements of 41 CFR 60-741.5(a). This regulation prohibits discrimination against qualified individuals on the basis of disability, and requires affirmative action by covered prime contractors and subcontractors to employ and advance in employment qualified individuals with disabilities.

Z. Equal Employment Opportunity (EEO) Clause for Individuals based on Race, Color, Religion, Sex, or National Origin: An offeror or contractor shall abide by the requirements of 41 CFR 60-1.4(a). This regulation prohibits discrimination against qualified individuals on the basis of race, color, religion, sex, or national origin, and requires affirmative action by covered prime contractors and subcontractors to employ and advance in employment qualified individuals without regard to their race, color, religion, sex, or national origin.

5.2 SPECIAL TERMS and CONDITIONS

A. Advertising: In the event a contract is awarded for supplies, equipment, or services resulting from this proposal, no indication of such sales or services to the Medical School will be used in product literature or advertising. The contractor shall not state in any of its advertising or product literature that the Medical School has purchased or uses its products or services.

B. Audit: The contractor shall retain all books, records, and other documents relative to this contract for five (5) years after final payment, or until audited by the Medical School, whichever is sooner. The Medical School, its authorized agents, and/or auditors shall have full access to and the right to examine any of said materials during said period.

C. Best and Final Offer (BAFO): At the conclusion of negotiations, the offeror(s) may be asked to submit in writing, a Best and Final Offer (BAFO). After the BAFO is submitted, no further negotiations shall be conducted with the offeror(s). The offeror's proposal will be rescored to combine and include the information contained in the BAFO. The decision to award will be based on the final evaluation including the BAFO.

D. Proposal Acceptance Period: Any proposal in response to this solicitation shall be valid for 120 days. At the end of the 120 days the proposal may be withdrawn at the written request of the offeror. If the proposal is not withdrawn at that, it remains in effect until an award is made or the solicitation is canceled.

Proposals received after the proposal due date and time are late and will not be considered. Modifications received after the proposal due date are late and will not be considered. Letters of withdrawal received either after the proposal due date or time, or after contract date, whichever is applicable, are late or will not be considered.

E. RFP Postponement/Cancellation: The Medical School may, at its sole and absolute discretion, reject any and all, or parts of any or all proposals; readvertise this RFP; postpone or cancel at any time this RFP process; or waive any irregularities in this RFP or in the proposals received as a result of this RFP.

F. Cancellation of Contract: The Medical School reserves the right to cancel and terminate any resulting contract, in part or in whole, without penalty, upon 60 days written notice to the contractor. In the event the initial contract period is for more than 12 months, the resulting contract may be terminated by either party, without penalty, after the initial 12 months of the contract period upon 60 days written notice to the other party. Any contract cancellation notice shall not relieve the contractor of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation.

G. Indemnification: Contractor agrees to indemnify, defend and hold harmless the Medical School, its officers, agents, and employees from any claims, damages and actions of any kind or nature, whether at law or in equity, arising from or caused by the use of any materials, goods, or equipment of any kind or nature furnished by the contractor/any services of any kind or nature furnished by the contractor, provided that such liability is not attributable to the sole negligence of the Medical School or to failure of the Medical School to use the materials, goods, or equipment in the manner already and permanently described by the contractor on the materials, goods or equipment delivered.

H. Accuracy/Competition: By submitting a proposal, bidders certify that all information provided in response to this Bid Document is true and accurate. Failure to provide information required by this Bid may ultimately result in rejection of the proposal.

Furthermore, the Medical School has broad flexibility in fashioning the details of competition for this RFP. This may include conducting on-line Reverse Auctions for certain

products within this RFP or setting price targets as part of follow-on negotiations in order to determine the prices that will be used to evaluate the pricing part of your proposal.

I. Additional Cost: No service fees or additional costs will be invoiced to the Medical School by the contractor during the term of the contract except as allowed for in the contract.

J. Method of Payment: EVMS shall pay the selected vendor for services rendered pursuant to this RFP based upon successful completion of the Project milestones. The vendor shall submit monthly invoices itemizing the services performed as of the date of the statement and set forth a progress report, including work accomplished during the period, percent of each milestone/task completed, and planned efforts for the next period. Invoices shall identify personnel who have worked on the services provided, the number of hours each worked during the period covered by the invoice and the percent of the total project completed. The payments prescribed herein shall constitute all compensation to vendor for all costs of services, including, but not limited to, direct costs of labor of vendor's employees, travel and lodging expenses, telephone charges, copying and reproduction, computer time, and any and all other costs, expenses and charges of vendor, its agents and employees.

K. Bonds: By submitting a proposal, offerors confirm that the company and subcontractors involved in construction or facility improvements exceeding $100,000 will provide the following:

1. A bid guarantee equivalent to five percent of bid price as assurance that the bidder upon acceptance of his bid, execute such contractual documents as may be required within the time specified.

2. A performance bond on the part of the offeror for 100 percent of the contract price to secure fulfillment of all the offerors obligations under such contract.

3. A payment bond on the part of the offeror for 100 percent of the contract price to assure payment as required by statute of all persons supplying labor and material in the execution of the work provided for in the contract.

4. Bonds shall be obtained from companies holding certificates of authority as acceptable sureties pursuant to 31 CFR Part 223, "Surety Companies Doing Business with the United States".

5.3 CONTRACT NEGOTIATION

A. Based on evaluation of the Proposals, one or more successful Offerors will be selected. Award of the contract shall be made to the Offeror(s) deemed to be fully qualified and best suited for the project based on the evaluation criteria set forth herein. EVMS will select the Proposal determined during the evaluation of the timely submitted Proposals to be the most advantageous

in meeting the specifications as outlined under this RFP. This may or may not be the Offeror, which presented the lowest costs/price.

B. EVMS will request a copy of the contract from the Offeror. If the Offeror does not have a template, an EVMS contract will be provided.

C. General Terms and Conditions that are added or modified from EVMS approved terms and conditions shall require EVMS approval.

D. Special Terms and Conditions added to or deviating from EVMS approved terms and conditions shall require EVMS approval.

E. **NON-NEGOTIABLE TERMS AND CONDITIONS**

By submitting a response to this RFP the Offeror agrees that it, and any subcontractors that Offeror shall utilize to fulfill the Contract Workscope, shall be subject to mandatory standard provisions that flow-down from the prime award made to EVMS by the Federal Government or private funders applicable to that contract under the prime award and that it must certify compliance with certain federal laws/guidelines, as applicable, including, but not limited to the following:

1. ***Equal Employment Opportunity (EEO) Clause for Veterans***. An offeror or contractor shall abide by the requirements of *41 CFR 60-300.5(a).* This regulation prohibits discrimination against qualified protected veterans, and requires affirmative action by covered prime contractors and subcontractors to employ and advance in employment qualified protected veterans.

2. ***Equal Employment Opportunity (EEO) Clause for Individuals with Disabilities***. An offeror or contractor shall abide by the requirements of *41 CFR 60-741.5(a)*. This regulation prohibits discrimination against qualified individuals on the basis of disability, and requires affirmative action by covered prime contractors and subcontractors to employ and advance in employment qualified individuals with disabilities.

3. ***Equal Employment Opportunity (EEO) Clause for Individuals based on Race, Color, Religion, Sex, or National Origin***. An offeror or contractor shall abide by the requirements of *41 CFR 60-1.4(a)*. This regulation prohibits discrimination against qualified individuals on the basis of race, color, religion, sex, or national origin, and requires affirmative action by covered prime contractors and subcontractors to employ and advance in employment qualified individuals without regard to their race, color, religion, sex, or national origin;

4. ***Copeland "Anti-Kickback" Act*** (*18 U.S.C. 874 and 40 U.S.C. 276c*), as supplemented by Department of Labor regulations (*29 CFR part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States*"), prohibiting the Contractor from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part or compensation to which otherwise entitled;

5. ***Davis-Bacon Act***, as amended (*40 U.S.C. 276a to a-7*) and as supplemented by Department of Labor regulations (*29 CFR part 5, "Labor Standards Provisions applicable to Contracts*

Governing Federally Financed and Assisted Construction"), regulating wages to laborers and mechanics;

6. ***Contract Work Hours and Safety Standards Act*** (*40 U.S.C. 327-333*) as supplemented by Department of Labor regulations (*29 CFR part 5*), regulating laborer and mechanic work hours and safety standards;

7. ***Rights to Inventions Made Under a Contract or Agreement*** – (*37 CFR part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Grants, Contracts and Cooperative Agreements*," providing for the invention rights of the Parties and the Federal Government;

8. ***Clean Air Act*** (*42 U.S.C. et seq.)* and the Federal Water Pollution Control Act (*33 U.S.C 1251 et seq.*) as amended related to applicable standards under said regulations; and,

9. ***Worker's Compensation Insurance*** (*42 U.S.C. 1651, et seq*.) requiring worker's compensation insurance for contracts, which require performance outside the United States as applicable per the circumstance of each particular contract.

F. All EVMS contracts are subject to prime funding constraints and applicable federal and state laws, regulations, guidelines as well as EVMS policies and procedures. If EVMS and the Offeror(s) are unable to agree on the negotiated contract terms and conditions, EVMS may elect to terminate negotiations and begin negotiations with the second best-ranked Offeror and so forth. If those negotiations do not result in mutually acceptable contract terms and conditions, the negotiations with the next best-qualified Offeror(s) will continue until there is an executed contract, there are no more Offerors to negotiate with based on submitted/complete Proposals or EVMS, at its sole discretion, terminates the RFP. No Offeror shall have any claims and/or rights against EVMS arising from such negotiations and/or the RFP evaluation or overall process.

G. At the conclusion of negotiations, the Offeror(s) may be asked to submit in writing, a Best And Final Offer (BAFO) along with an executed copy of the negotiated contract with the understanding that all contracts funded under prime awards to EVMS by the United States Government, private foundations or other nonprofit organizations may be subject to availability of funds. Under these circumstances, there may be additional approval requirements required by the funding federal agency, private foundation or other organization. After submitting the BAFO and/or the Contract is fully executed, no further negotiations shall be conducted with the Offeror(s). In the case of BAFO submission, the Offeror's Proposal will be rescored to combine and include the information contained in the BAFO. EVMS will base its final decision regarding the contract award on the final evaluation, which will include the BAFO.

H. Cancellation of Contract:
EVMS reserves the right to cancel and terminate any resulting contract, in part or in whole, without penalty, unless otherwise negotiated under the contract, upon thirty (30) days prior written notice to the contractor. Any contract cancellation notice shall not relieve the Offeror of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation.

5.4 AWARD

A. Upon the announcement of the decision to award under this RFP, the EVMS Department of Materials Management will publicly post such notice on the EVMS Internet web site at https://www.evms.edu for a minimum of ten (10) days. EVMS will contact each successful Offeror with additional post-award information as deemed appropriate per award.

B. While it is the intent of EVMS to award only one contract. EVMS reserves the right to not make an award or to award multiple contracts, if deemed in the best interest of EVMS or as required under the applicable prime funding award. All decisions made by EVMS are final. In addition, EVMS reserves the right, in its sole and absolute discretion, to:

1. Issue or not reissue a subsequent RFP if no award is made;
2. Not select any Offeror that submitted a Proposals
3. Make a partial award;
4. Modify, change or reduce the scope of work for this RFP; and/or
5. Waive any irregularities in this RFP or in the Proposals received as a result of this RFP.

5.5 INSTRUCTIONS FOR COMPLETING THIS RFP

A. All bidders will submit their Proposals detail cost and pricing of the equipment list using a web-based system provided by Advantiv Solutions, LLC. Each Bidder will be provided with a secure, on-line response environment within the tool. Advantiv Solutions will provide each Bidder with all necessary instructions and support. Confirmation for receipt of proposal submissions using Advantiv will be provided by email only. Please email Advantiv at support@advantiv.com to obtain access to the Advantiv DecisionDirector System and note in the email subject line: **EVMS AV SYSTEMS RFP**. You will receive a response from Advantiv within one business day. The Bidder response environment will open upon the release of the RFP and will close at **5:00 PM EDT on the RFP due date, August 13, 2019.**

B. Bidder responses to the Bid requirements/specifications questions and relative forms will be collected and processed by Matt Letsinger at mletsinger@thesextantgroup.com by **5:00 PM EDT on the RFP due date, August 13, 2019.**

C. Late proposals will not be accepted and will be automatically disqualified from further consideration unless the Advantiv's System is found to be at fault. All proposals and any accompanying documentation become the property of EVMS and will not be returned.

Section 5 – Owner's General Terms and Additional Provisions

D. **Mandatory** Pre-Bid Meeting will be set up on July 25, 2019 at 1:00 PM in Andrews Hall room #132 for all bidders to attend for distribution of information, clarification, and questions. Remote attendance information is as follows:

Event Name: Waitzer Hall A/V Pre-Proposal Conference
Date of Event: 07/25/19 1:00:00 PM
EVMS Campus Location: Andrews Hall | 132, 721 Fairfax Avenue, Norfolk, VA 23507
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Conferencing information
Joining from a desktop or laptop: https://bluejeans.com/335194282/0556
Joining via video conferencing system: 335194282.0556@199.48.152.152
Audio only via phone dial: 1.888.240.2560
enter meeting ID 335194282#
use pass-code 0556# when prompted.