Attachment 3

COUNTY OF SANTA BARBARA

Project 8798 GS CSBTV Modernization

Hearing Rooms/MCR Technology Refresh

95% CD DRAFT FOR OWNER REVIEW

December 30, 2019

Table of Contents

00 10 00 - Notice to Bidders
00 20 00 - Bidders Instructions Bid Forms-with OCIP Certification
00 50 00 - Agreement Bonds Workers Comp Insurance
00 70 00 - General Conditions
00 80 00 - Supplemental Conditions
00 85 00 - OCIP Exhibit B-1
01 11 00 - Summary of Work
01 12 00 - Multiple Contracts
01 23 00 - Alternates
01 25 13 - Product Substitution Procedures
01 29 00 - Payment Procedures
01 31 00.2 - Project Management and Coordination
01 31 19 - Project Meetings
01 32 00.4 - Construction Progress Documentation
01 33 00 - Submittal Procedures
01 33 24 - Coordination Drawings and Coordination
01 33 27 - Submittal Log and Distribution
01 41 27 - Inspection by the Building Official
01 45 16.13 - Contractor's Quality Control (QC) Systems
01 45 23 - Testing and Inspection Services
01 60 00 - Product Requirements
01 64 00 - Owner Furnished Contractor Installed (OFCI)
01 73 29 - Cutting and Patching
01 74 00 - Cleaning and Waste Disposal
01 74 20 - Solid Waste Management and Recycling Plan
01 77 00 - Closeout Procedures
01 78 23.2 - Operation and Maintenance Data
01 78 36 - Guarantees and Warranties
01 78 39 - As-Built Documents
01 79 00.2 - Demonstration and Training
01 81 13 - Sustainable Design Requirements
01 91 13.2 - General Commissioning Requirements

Section 00 10 00 - **NOTICE TO BIDDERS**

Notice is hereby given to prequalified bidders that the General Services Department, County of Santa Barbara will receive bids for:

Santa Barbara County – Hearing Rooms/MCR Technology Refresh
Project No.8798

MANDATORY PRE-BID CONFERENCE:

Monday October 14, 2019
11:00 AM

BID OPENING DATE:

Thursday November 21, 2019
3:00 PM

CONSTRUCTION COST ESTIMATE: $1,275,000.00

PROJECT LOCATIONS:

1. **105 East Anapamu Street, Santa Barbara - Basement and 4th Floor (Master Control and BOS Hearing Room)**
2. **123 East Anapamu Street, Santa Barbara -1st Floor (Planning Commission Hearing Room)**
3. **511 Lakeside Parkway, Santa Maria (BOS Hearing Room)**

MANDATORY PRE-BID CONFERENCE: There will be a MANDATORY pre-bid conference at the Board of Supervisors Conference Room located 105 East Anapamu Street, 4th Floor, Santa Barbara, CA 93101. This will be followed by a site tour. The pre-bid conference will begin promptly at 11:00 AM on Monday October 14, 2019. **ONLY THOSE PREQUALIFIED PRIME CONTRACTORS ATTENDING THE PRE-BID CONFERENCE SHALL BE PERMITTED TO BID THE WORK.**

EXAMINATION OF SITE: Each bidder shall examine the sites of work before bidding and shall be responsible for having acquired full knowledge of the job and of all conditions affecting it. No variations or allowances from the contract sum will be made because of lack of such examination.

PROJECT DESCRIPTION: The County operates three hearing rooms with associated adjacent conference rooms for the purpose of public interaction with decision makers. Each hearing room is configured for live television broadcasting form a Master Control Room. The Master Control Room is equipment to support live and re-broadcast technology. This project upgrades and refreshes the television broadcasting equipment in these hearing rooms and the Master Control Room. The full scope of this project can be found in Section X of the specifications and associated drawings. Each bidder is fully responsible for understanding the full scope of the project. No variations or allowances from the contract sum will be made because of lack of such understanding.

CONTRACTOR'S LICENSE: The Contractor shall possess a valid California Class B license at the time this Project is bid. In addition, the Prime Contractor shall provide the contractor license number for each listed sub-contractor as required by Public Contracts Code § 4104. If the Prime Contractor makes an inadvertent error in listing the sub-contractor's license number; it will have 24 hours after the opening of bids to provide the correct information; if it does, the error shall not be grounds for filing a bid protest or for the subject bid to be found non-responsive by the County.

QUESTIONS: All contractual and technical questions should be directed to the Project Manager, Ashton Ellis, General Services Capital Project via email ONLY: aellis@countyofsb.org.

BID DOCUMENTS: Prequalified Contractors may request plans, specifications, and proposal forms for bidding this project from Leann Anderson, Jail Project Coordinator, at (805) 568-3063 or andersonl@countyofsb.org.

BID SUBMITTAL INSTRUCTIONS: Each bid shall be in accordance with the plans and specifications dated September 14, 2015 approved by the General Services Department. The bid shall be sealed and received at the General Services Department, Facilities Services office at 1105 Santa Barbara St., Courthouse East Wing, 2nd Floor, Santa Barbara, California 93101, on or before **3:00 PM, November 21, 2019** at which time each bid will be opened. The Official Time will be determined by the Facilities Services Bid Clock, located at the address indicated above. **BIDS SHALL ONLY BE ACCEPTED FROM CONTRACTORS WHO WERE NOTIFIED THAT THEY WERE SUCCESSFULLY PREQUALIFIED, AND SUBSEQUENTLY ATTENDED THE MANDATORY PRE-BID CONFERENCE.**

SUBSTITUTION OF SECURITIES: Pursuant to Section §22300 of the Public Contract Code and the project specifications, the CONTRACTOR may substitute securities or request that the County make payment of retentions to an escrow agent for any money held by the COUNTY to ensure contract performance.

PAYMENT AND PERFORMANCE BOND: A Payment Bond and a Performance Bond, each in the amount of 100% of the contract amount, will be required of Contractor.

PREVAILING WAGES: Pursuant to the provisions of Section 1770 et seq. of the California Labor Code, the CONTRACTOR shall pay not less than the prevailing rate of per diem wages as determined by the Director of the Department of Industrial Relations. A copy of the prevailing rate of per diem wages is on file at the General Services Department.

REGISTRATION: No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code § 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code § 1771.1(a)]; no contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code § 1725.5; and this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

WITHDRAWAL OF BIDS: The COUNTY reserves the right to reject any and/or all bids or waive any informality in a bid. No bidder may withdraw his/her bid for a period of one hundred and twenty (120) days after the date set for the opening thereof.

BID SELECTION: The COUNTY will select the lowest responsive bidder on the basis of the base bid.

BID PROTEST: The County of Santa Barbara Bid Protest Procedures are outlined in Section 00 20 00-Instruction to Bidders, which is included in the bid documents.

CONSTRUCTION TIME: The successful Contractor shall have **three hundred five** (305) calendar days from the start date in the Notice to Proceed to achieve **Substantial Completion** and shall have **sixty** (60) calendar days from Substantial Completion to complete all work called for under the Contract Documents to achieve **Final Completion**.

LIQUIDATED DAMAGES: The Contractor has three hundred five (305) calendar days from the start date in the Notice to Proceed to achieve Substantial Completion as determined by the County. The Contractor is subject to liquidated damages at **$**1,000.00 per day if Substantial Completion is not achieved within three hundred five (305) calendar days following the start date in the Notice to Proceed. The Contractor has sixty (60) calendar days

from the date of Substantial Completion to achieve Final Completion. The Contractor is subject to liquidated damages at $500 per day if Final Completion is not achieved within sixty (60) calendar days following the date of Substantial Completion.

INSURANCE: This project is included in County's Owner Controlled Insurance Program (OCIP). Insurance covered under OCIP shall be excluded from CONTRACTOR's bid.

END OF SECTION 00 10 00

SECTION 00 20 00 - INSTRUCTIONS TO BIDDERS

Index

Article		Page
1.	General	2
2.	Competence of Bidders	2
3.	Compliance with Contractor's License Law	2
4.	Prior Disqualification	2
5.	Examination of Bid Documents and Project Site	2
6.	Discrepancies, Conflicts, Omissions, or Errors	3
7.	Bidder's Security	3
8.	Bid Form	4
9.	Not Used	4
10.	Submission of Bid Forms	4
11.	Withdrawal of Bid Forms	5
12.	Public Opening of Bids	5
13.	Rejection of Irregular Bids	5
14.	Competitive Bidding	5
15.	Estimated Quantities	5
16.	Substitution of Alternative Materials, Articles, or Equipment	6
17.	Return of Bidder's Security	6
18.	Relief of Bidders	6
19.	Award of Contract	6
20.	Contract Bonds	7
21.	Insurance	7
22.	Execution of Contract Agreement	7
23.	Failure to Execute Contract Agreement	8
24.	No Oral Agreements	8
25.	Bid Protest	8
26.	Form- Contractor Request for Clarification	
27.	Form – Substitution Request Form	
28.	Form – Contractor Qualifications Requirements Forms	12

1.1 ARTICLE 1 - GENERAL

A. Bidder must examine these Instructions to Bidders carefully and respond to all requirements and conditions.

B. Bidders must be aware of the requirements of codes, statutes, regulations and ordinances referenced in the Bid Documents.

1.2 ARTICLE 2 - COMPETENCE OF BIDDERS

A. Bidders must meet all qualification requirements contained in the Bid Documents.

B. Any Bidder may be required to furnish evidence satisfactory to Owner that the Bidder and its proposed Subcontractors have sufficient means and experience in the type of Work required to assure satisfactory completion of all the requirements of the Contract Documents.

1.3 ARTICLE 3 - COMPLIANCE WITH CONTRACTOR'S LICENSE LAWS

A. Bidder's attention is directed to the provisions of Chapter 9 of Division 3 of the California Business and Professions Code ("Contractors"), and §3300 of the California Public Contract Code. The Contractor must possess the required classification of Contractor's License at the time the Bid is submitted (per Business and Professions Code §7028.15). If federal funds are involved in this project, the Contractor must possess the required classification of Contractor's License at the time of the Contract Award (per Public Contract Code §20103.5).

B. If a Bidder does not possess the required Contractor's License at the time a Bid is submitted, in accordance with Business and Professions Code §7028.15, the Bid will be considered non-responsive and will be rejected by the Owner. The Owner may require forfeiture of the Bidder's Bond.

C. Joint venture Bidders must possess a joint venture license. Each party to a joint venture must be properly licensed for the Work of this Project.

ARTICLE 1 — PRIOR DISQUALIFICATION

1.01 Bid may be rejected on the basis of a Bidder, any officer of such Bidder, or any employee of such Bidder who has a proprietary interest in such Bidder, having been disqualified, removed or otherwise prevented from Bidding on, or completing a federal, state or local project because of a violation of a law or a safety regulation.

1.02 The Owner will review the circumstances presented in the Bid Form certification. The County will determine if acceptance of the Bid is in its best interest.

ARTICLE 2 — EXAMINATION OF BID DOCUMENTS AND PROJECT SITE

2.01 The Bidder must carefully examine the site of the Work and Bid Documents.

2.02 The submission of a Bid will be conclusive evidence that the Bidder has investigated and is fully aware of the conditions and difficulties that may be encountered including the availability of labor and materials to be provided, of the character, quality and quantities of Work to be performed, and of the requirements of all Bid Documents.

2.03 Where investigation of subsurface conditions has been made by Owner in respect to foundation or other design, Bidders may inspect Owner's records of such investigation, including examination of samples and drill cores, if any.

2.04 When logs of test borings indicating a record of the data obtained by Owner's investigation of subsurface conditions are made available, said logs represent only the investigator's opinion as to the character of material encountered in test borings and are made available only for the convenience of Bidders.

2.05 Investigation of subsurface conditions is made for the purpose of design, and Owner assumes no responsibility, whatsoever, in respect to the sufficiency of test borings, accuracy of the log of test borings,

of other preliminary investigations, or in the interpretation thereof. There is no warranty or guarantee, express or implied, that the conditions indicated are representative of those existing throughout the Work or Work site, or any part of it, or that unforeseen conditions may not be encountered.

2.06 Making information available to Bidders is not to be construed in any way as a waiver of the aforesaid provisions, and Bidders must satisfy themselves through their own investigations as to conditions to be encountered.

2.07 No information derived from such inspection of records of preliminary investigations made by Owner, or from the maps, Drawings or Contract Documents relieve Contractor from any risk or from properly fulfilling all the terms of the Contract. Records of such preliminary investigations as may have been made by Owner may be inspected by contacting the Owner's Project Manager identified in the Notice to Bidders.

2.08 Failure by Bidder to educate itself with available information will not relieve Bidder from responsibility for estimating properly the difficulty or cost of successfully performing the Work.

2.09 Bidders are required to inform themselves fully of the conditions relating to the construction and labor under which the Work will be or is now performed, and, so far as possible, the successful Bidder must employ such means and methods in carrying out its Work as will not cause any interruption or interference with any other contractor.

ARTICLE 3 — DISCREPANCIES, CONFLICTS, OMISSIONS, OR ERRORS

3.01 If any person contemplating submitting a Bid is in doubt as to the intended meaning of any part of the Bid Documents, or finds discrepancies in, or omissions in the Bid Documents, that person must submit a written request for an interpretation or correction thereof at least ten (10) calendar Days before the deadline for receipt of Bids.

3.02 Inquiries must be addressed to the Project Manager identified in the Notice to Bidders.

3.03 Inquiries must be submitted on "Contractors Request for Clarification Form" included at the end of this section. All requests for information must include this form.

3.04 Any request received fewer than ten (10) calendar Days before the said deadline may not be answered. The person submitting the request will be responsible for its prompt delivery.

3.05 Any interpretation or correction of the Bid Documents will be made only by Addendum and will be mailed or delivered to each person included on the Owner's plan holders list for the Project.

3.06 Owner is not responsible for any explanation or interpretation of the Bid Documents not communicated to Bidders in an Addendum. If no Addenda are issued relating to supposed discrepancy, conflict, omissions or errors in figuring the Work, the supposed discrepancies, conflicts, or omissions are governed by Document 00700, Article 1.05, "Conflicts in the Contract Documents."

ARTICLE 4 — BIDDER'S SECURITY

4.01 Each Bid must be accompanied by cash, a certified or cashier's check, or an original Bidders Bond in an amount not less than ten percent (10%) of the total aggregate of the Bid including all additive Bid items, indicated in the Notice to Bidders, to be used in determining the low Bid for the Project.

4.02 A Bid will be considered non-responsive if not accompanied by proper Bidder's Security.

4.03 The original Bid Bond must be provided by an admitted Surety insurer, authorized to issue Surety bonds in the State of California, and it must execute the Bid Bond.

4.04 Bonds and checks must be made payable to **"The County of Santa Barbara".**

4.05 All bonds must be provided on the forms included with the Bid Documents or the Bid will be considered non-responsive.

ARTICLE 5 — BID FORM

5.01 Prospective Bidders are furnished Bid Forms (Document 00 41 00). A Bid Form may contain a schedule of items requesting lump sum prices. It may also state estimated quantities of various kinds of Work to be performed, or materials to be provided, with a schedule of items for which unit prices are

required. Additional Forms are provided requesting information on the Bidders' Company and proposed personnel that are intended to work on the project. The Bidder shall complete all forms provided.

5.02 The unit prices or lump sum pricing must include full compensation for Providing all labor, materials, services, tools, equipment and whatever else is required to perform all Work in accordance with the requirements of the Bid Documents.

5.03 All Bids must be submitted on the forms furnished by the Owner. A Bid not submitted on the forms furnished by the Owner will be considered non-responsive.

5.04 Completing the Bid Form:

1. Bidder's name must be the same as listed on Bidder's California State Contractor's license.
2. Bid price(s) must be in the manner required by the Bid Form.
3. Bid Form must be signed by Bidder or duly authorized representative.
   - A. If Bidder is an individual, name must be stated.
   - B. If Bidder is a partnership, name of the partnership must be stated and one or more partners must sign the Bid Form.
   - C. If Bidder is a corporation, name of the corporation must be stated, the state of incorporation must be listed, the title of the person with authority to sign and bind corporation, must be stated, and the corporate seal must be affixed.
   - D. Bidder's business and mailing address must be stated.

5.05 Required Listing of Proposed Subcontractors:

1. For each Subcontractor, failure to list name, location, license number or division of Work for Bid is cause for Bid to be rejected as non-responsive.
2. Bidders' attention is directed to the provisions of the Subletting and Subcontracting Fair Practices Act, beginning with Public Contract Code §4100, related to penalties for use of unauthorized Subcontractors or by making unauthorized substitutions.

ARTICLE 6 — NOT USED

ARTICLE 7 — SUBMISSION OF BID FORMS

7.01 Bid Forms must be **completed in ink**, completely filled out, and submitted on the Bid Form furnished as part of the Bid Documents. Completed Bid Forms may be submitted in person or mailed. Faxed or emailed bids or modifications will not be considered by Owner.

7.02 It is the sole responsibility of the Bidder to ensure that its Bid is received at the proper time and at the proper location. Bids received after the time fixed for receiving them will not be considered.

7.03 Late Bids will be returned by the Owner to the Bidder unopened.

7.04 Each bid shall be in accordance with the plans and specifications approved by the General Services Department. The bid shall be sealed and received at the General Services Department, Support Services office at 1105 Santa Barbara St., Courthouse East Wing, 2nd Floor, Santa Barbara, California 93101, as stated in the Notice to Bidders, at which time each bid will be opened. The Official Time will be determined by the Support Services Bid Clock, located at the address indicated above.

7.05 Each Bid must be enclosed in a sealed envelope bearing the title of the Project, Project Number, the name of the Bidder and the date and time of the opening. Failure to do so may result in a premature opening of, or failure to open, such bid. Bid Forms improperly marked may be disregarded.

ARTICLE 8 — WITHDRAWAL OF BID FORMS

8.01 Any Bid may be withdrawn at any time before the time fixed in the Notice to Bidders for the opening of Bids only by written request of the Bidder or a duly authorized representative.

8.02 Withdrawal of a Bid does not prejudice the right of the Bidder to file a new Bid at any time prior to the time

fixed for receiving Bids in the Notice to Bidders.

8.03 Whether or not Bids are opened exactly at the time stated in the Notice to Bidders, a Bid will not be accepted after the time stated.

8.04 After the opening of Bids, Bids may only be withdrawn in accordance with the provisions of Public Contract Code § 5100-5107.

ARTICLE 9 — PUBLIC OPENING OF BIDS

9.01 Bids will be opened and read publicly at the time and place indicated in the Notice to Bidders. Bidders or their authorized agents are invited to be present.

ARTICLE 10 — REJECTION OF IRREGULAR BIDS

10.01 The Owner may reject any Bid if there appears to be any alteration of the Bid Form, any addition or condition not called for, or any incompleteness, erasure or irregularity of any kind.

10.02 Bids not completed in **Ink** will be rejected.

10.03 If the Bid amount or other material information is changed, the **change must be initialed.**

ARTICLE 11 — COMPETITIVE BIDDING

11.01 More than one Bid from an individual, firm, partnership, corporation, or combination thereof, as a principal, under the same or different names will not be considered. Reasonable basis for believing that any individual, firm, partnership, corporation, or combination thereof is a principal in more than one Bid for the Work contemplated may cause the rejection of all Bids in which such individual, firm, partnership, corporation, or combination thereof is a principal.

11.02 If there is a reason for believing that collusion exists among the Bidders, any or all Bids may be rejected.

11.03 A person, firm, or corporation submitting a sub-bid to a Bidder, or who quoted prices on materials to a Bidder, is not thereby disqualified from submitting a sub-bid or quoting prices to other Bidders or from being a principal Bidder for the same Work.

11.04 Bids in which unit prices are obviously unbalanced may be rejected.

11.05 Bidders are put on notice that any collusive agreement fixing the prices to be Bid so as to control or affect Awarding of the Contract is in violation of competitive bidding requirements of the Public Contract Code and may render void any Contract let under such circumstances.

ARTICLE 12 — ESTIMATED QUANTITIES

12.01 The quantities stated in a schedule of items for which unit prices are asked to be Bid are approximate only.

12.02 The quantities are given as a basis for the comparison of Bids.

12.03 Owner does not, expressly or by implication, represent that the actual amount of Work will correspond with quantities given and reserves the right to increase or decrease the quantities of Work for any Bid item, or to omit portions of the Work, as Owner may deem necessary or advisable.

ARTICLE 13 — SUBSTITUTION OF ALTERNATIVE MATERIALS, ARTICLES, OR EQUIPMENT

13.01 **Bids must be based upon use of items named in the Bid Documents.**

13.02 In certain cases, specific items have been named (Named Products) because of operational or maintenance considerations; approval of proposed equals should not be assumed.

13.03 Pursuant to Public Contract Code § 3400, alternative material(s), article(s), or equipment that are of equal quality and of required characteristics for the purpose intended may be proposed provided the Bidder complies with the following requirements:

1. The proposal will not be considered unless the submittal is accompanied by complete information and descriptive data necessary to determine equality of offered material(s), article(s) or equipment.

2. Samples must be submitted when requested by the Owner.
3. Bidder is required to prove comparative quality, suitability, and performance of offered material(s), article(s), or equipment.
4. Requests for approval must comply with the requirements of Section 01 25 13, "Product Substitution Procedures."

13.04 Owner's Authorized Representative is the sole judge as to such matters. In the event Owner's Authorized Representative rejects the use of such Alternative(s) submitted, then the Contractor must furnish one of the particular Named Products originally specified in the Bid Documents.

13.05 Proposals for Alternative material(s), process, article(s), or equipment will not be accepted during the bid period.

ARTICLE 14 — RETURN OF BIDDER'S SECURITY

14.01 If Owner does not accept the Bid within the period of Days after the Bid opening stated in Document 00410 - Bid Form, Owner will return Bidder's Security to all Bidders.

14.02 If the Bidder to whom the Contract is Awarded executes and delivers to Owner all the required documents, Owner will return Bidder's Security to all other Bidders no later than sixty (60) days from the time the award is made, in accordance with Public Contract Code § 20129.

ARTICLE 15 — RELIEF OF BIDDERS

15.01 Attention is directed to the provisions of California Public Contract Code § 5100 through § 5107 that set forth the criteria and procedures for relief of Bidders, and for authorizing Contract Award to another Bidder.

ARTICLE 16 — AWARD OF CONTRACT

16.01 The Contract, if Awarded, will be to that responsible Bidder as stated in the Notice to Bidders, subject to Owner's right to reject any or all Bids and to waive any informality or irregularity in the Bids or in the bidding procedures.

16.02 No Bidder may withdraw its Bid for the period of Days stated in Document 00410, "Bid Form", after the date set for the opening thereof, and the Bid will be subject to acceptance by Owner throughout this period.

16.03 The time period within which Award of Contract may be made is subject to an extension of such further period as may be agreed upon in writing between the Owner and the Bidder.

16.04 No Contract is formed until all Contract Bonds and Insurance documents have been accepted by the Owner, Agreement is signed by the Contractor; the Contractor submits the signed Contractor's Certification regarding Worker's Compensation; and the Agreement is signed by the Owner.

ARTICLE 17 — CONTRACT BONDS

17.01 The successful Bidder (hereinafter "Contractor") must pay all Contract Bond premiums, costs thereof, and incidental thereto.

17.02 Each Contract Bond must be signed by both Contractor and the Sureties.

17.03 As a condition to Owner signing the Agreement, the successful Bidder must file with Owner on the approved forms, the two surety bonds in the amounts and for the purposes noted below, duly executed by a Surety company meeting the requirements of Article 20 herein.

17.04 The "**payment bond** for public works" must be in an amount of one hundred percent (100%) of the Contract Sum as determined from the prices in the Bid Form, including the base Bid and all additive and/or deductive Bid items accepted by the Owner and identified in the Award, and shall inure to the benefit of the State, and persons performing labor or furnishing materials in connection with the Work. This bond must be maintained in full force and effect until all Work is completed and Accepted by Owner, and until all claims for materials and labor have been paid.

17.05 The "**performance bond**" must be in an amount of one hundred percent (100%) of the Contract Sum as determined from the prices in the Bid Form, including the base Bid and all additive and/or deductive

Bid items accepted by the Owner and identified in the Award, and must be so conditioned as to ensure the faithful performance by Contractor of all Work. It shall also include the replacing, or making acceptable, of any defective materials or faulty workmanship during the Guarantee period(s).

17.06 If any Surety or Sureties are deemed unsatisfactory at any time by Owner or the State, Owner will notify Contractor, and Contractor must forthwith substitute a new Surety or Sureties satisfactory to Owner. No further payment will be deemed due or made until the replacement Sureties qualify and are accepted by Owner.

17.07 All changes to the Contract Sum, Contract Time, or Contract Documents may be made without securing the consent of the Surety or Sureties on the Contract Bonds.

17.08 Sureties must be California admitted Sureties.

ARTICLE 18 — INSURANCE

18.01 Notwithstanding any of the provisions of OCIP, the Contractor will be required to furnish to Owner, concurrently with execution of the Agreement, insurance documents evidencing coverage as required by Document 00700, Article 11, "Indemnification and Insurance."

ARTICLE 19 — EXECUTION OF CONTRACT AGREEMENT

19.01 The form of Agreement which the successful Bidder, as Contractor, must execute, and the form of Contract Bonds and Insurance coverage that it must provide are included in the Bid Documents and must be carefully examined by each Bidder. All Contract Bonds, policies or certificates of insurance, and Insurance policy endorsements must be delivered with or before the delivery of the signed Agreement form, and must be acceptable to Owner.

19.02 The Bidder to whom the Contract is Awarded by Owner must, within fourteen (14) calendar Days after the Notice of Intent to Award, sign and deliver the following documents to NBJP, Project Manager, Capital Projects, General Services Department, at 1105 Santa Barbara Street, Santa Barbara, CA 93101:

1. Three (3) duplicate originals of the signed Agreement form furnished by Owner in the Bid Documents. (Document 00500, "Agreement");
2. One (1) original and two (2) copies of the Performance Bond. (Document 00611, "Performance Bond Form");
3. One (1) original and two (2) copies of the Payment Bond for Public Works. (Document 00612, "Payment Bond Form";
4. Policies of Insurance, Insurance certificates and endorsements as required by the Bid Documents and the Contractors Insurance Cost Worksheet in accordance with the OCIP Contractors Insurance Procedures Manual;
5. Worker's Compensation Certification document; and
6. Other Documents as required.

19.03 Should Contractor begin Work in advance of the start date for the Work, as stated in the Notice to Proceed, the Work will be considered as having been done at Contractor's risk as a volunteer.

ARTICLE 20 — FAILURE TO EXECUTE CONTRACT AGREEMENT

20.01 Failure of the successful Bidder to execute the Agreement and provide required Bonds and Insurance Documents in the form satisfactory to Owner and within the stipulated time frames may serve as just cause for the annulment of the Award and the forfeiture of the Bidder's Security.

20.02 If the Bidder to whom the Contract is awarded does not file the documents required by the Bid Documents, files unsatisfactory documents, or refuses to enter into a Contract within the specified time, the Bidder is liable for any difference by which the cost of procuring the Work exceeds the amount of its Bid. The Bidder's Security will be used to offset such difference.

ARTICLE 21 — NO ORAL AGREEMENTS

21.01 No conversation with any officer, employee, agent or Consultant of Owner, either before, during, or after

the execution of the Agreement, affects or modifies any terms or obligations contained in the Contract Documents, nor entitle Contractor to any adjustment in the Contract Time or Contract Sum whatsoever.

ARTICLE 22 — BID PROTEST

22.01 Overview

.A The County of Santa Barbara will endeavor to process Bid Protests in a timely and consistent manner to assure that all prospective contractors are accorded fair and equal consideration for the award of County contracts.

.B Eligible Protestors- Only Project Bidders may submit a Protest.

.C Basis for Protest - The grounds for a Protest may include any grounds a Protestor may have for contesting or challenging the award of a construction contract to any Bidder.

.D Timely Protests – All Protests must be received by the deadline included in this Section.

22.02 Protest Format

.A Content - All Protests shall reference any pertinent County, State, Federal, or local laws or regulations that are relied upon in support of the Protest. Any documents relevant to the Protest must be submitted at the time that the Protest is filed. The County, in its sole discretion, may decide the Protest without requesting further submittal(s) from the party submitting the Protest. Thus, the Protest should include all matters that the party wishes the County to consider in deciding the Protest outcome.

At a minimum, the following must be included in the Protest:

1. The name and address of the Protesting party and its relationship to the bid.
2. The signature of the Protestor or its representative.
3. Identification of the proposed contract/project.
4. Description of the nature of the Protest.
5. Identification of the provision(s) of the solicitation, regulations, or laws upon which the Protest is based (i.e., identification of the technical specifications or item of content in the bid).
   A. The Protest must contain a complete statement of all grounds for the Protest and must refer to the specific portion of the Contract Documents that are the basis of the Protest.
   B. The Protest must set forth all supporting facts and documentation.
6. Copies of all (or any) documentation supporting the allegations in the Protest.
7. Statement of the specific relief requested.

22.03 Protest Procedures

.A Timeline for filing a Protest

1. All Protests related to Contract Award must be submitted in writing via e-mail to the Owner's Authorized Representative (OAR) no later than 5 p.m. PST of the fifth (5) business Day following the date upon which the bids were opened.
2. If a Protestor objects to a Construction Contract being awarded to the Protestor on the grounds that the Protestor made a mistake in its bid that entitles the Protestor to be relieved of its bid under Public Contract Code Sections 5100 *et seq*., the Protest must be submitted in writing to the OAR before 5 p.m. PST of the fifth (5) business Day following the date upon which the bids were opened pursuant to Public Contract Code § 5103.

.B Method for Submission

1. Protests must be submitted in writing via e-mail to the OAR in a cohesive manner, with all content and supporting facts presented in the form of PDF attachment(s).
2. It is the Protestor's responsibility to ensure that the OAR receives its Protest. The County is

not responsible for e-mail transmission failures due to error, file size, or any other factor and encourages Protestors to adequately confirm receipt.

3. Protestor must also submit, in writing, a copy of the Protest directly to all Bidders.

.C Responses, Replies and Additional Information

1. Responses and Replies- All responses and replies must be in writing.

A. If any Bidder desires to respond to the Protest, the Response must be submitted in writing via e-mail to the OAR within five (5) business Days of the date the Protest was first delivered to all Bidders.

2. Additional Information- Owner, including, but not limited to, the OAR, Protest Resolution Committee (PRC), or any other County representative, may request additional written information from Protestor or other Bidders or any other source. All follow-up information is to be transmitted in the same manner as indicated in this Section.

.D Proof of Transmittal- All Protests, Responses, Replies, and Additional Information shall include documentation evidencing that all Bidders were concurrently sent a complete copy of the respective Protest, Response or Reply.

22.04 Protest Resolution

.A Summary Dismissal of Protest – OAR may summarily dismiss a Protest, at any time, if the Protest is without merit, untimely, fails to include the required Protest Format contents in accordance with Article 25.02A, was not submitted in accordance with Article 25.03B, or is submitted by a non-Bidder. OAR will issue a notice of summary dismissal to all Bidders.

.B The OAR shall decide all Protests based upon the written information submitted by the Protestor in accordance with Articles 25.02 and 25.03 above. The OAR may request additional written information in accordance with Article 25.03 above. Protestors will not be allowed to make oral presentations to the OAR, and any oral representations made to the OAR will not be considered in the OAR's decision.

.C The OAR shall attempt to resolve the Protest in a fair and equitable manner and shall render a written decision to the Protestor within fifteen (15) Days of the date the OAR determined he/she is in receipt of all information deemed to be pertinent to the Protest. The decision will be transmitted via e-mail to the Protestor and all Bidders. The County reserves the right to extend the deadline for good cause.

.D OAR's decision may be appealed to the Protest Resolution Committee (PRC) in accordance with Article 25.05. OAR's decision will be final if no appeal has been filed pursuant to Article 25.05.

22.05 Protest Appeal and Resolution

.A Appeal of OAR decision-

1. The Protestor may appeal the OAR's decision by delivering written notice of appeal of the decision no later than 5:00 p.m. PST on the fifth (5) full business Day after the date of the written decision. The appeal should be e-mailed to the OAR, and clearly noted as an appeal of the OAR's Decision. The written Notice of Appeal shall also be submitted to all Bidders with Proof of Transmittal provided to OAR.

2. The notice of appeal shall include the complete record of the Protest for review, which includes the Protest, any and all Responses, Replies, Additional Information, Proof of Transmittal, and Notice of Appeal.

.B Protest Resolution Committee (PRC) - Upon review of the appeal and confirmation that it is in conformance with all Protest requirements, a Protest Resolution Committee (PRC), comprised of County administration, and others at the discretion of the County, shall have the authority to resolve the appeal. The OAR shall not be a member of the PRC but shall administer the appeal.

.C Oral Presentations – Once the PRC is presented with a complete record of the Protest and appeal for review, then oral presentations will be scheduled and shall be conducted in accordance with

the following procedure:

1. Notice of Oral Presentation - The OAR will set a date, time, and place for an oral presentation. Written notice will be sent to Bidders not less than five (5) business Days in advance of the oral presentation unless it is agreeable to all parties that an earlier date be established. Continuances may be granted by the County for good cause.
2. Guidelines for Oral Presentation –
   A. Oral presentations are informal in nature and shall be made by the Protestor or its authorized representative.
   B. The OAR will determine the format of the oral presentations and may set time limits for the presentation.
   C. At the request of the PRC, the OAR may request additional documentation or information prior to, during or after the oral presentation. Unless requested by the PRC, additional documentation or information may not be accepted.
   D. Technical rules of evidence shall not apply.
   E. The PRC members may question the Protestor and all Bidders or provide an opportunity for Bidders to make an oral presentation.
3. Record of Oral Presentation - Any Bidder may request, and, at the County's sole discretion, the PRC may allow transcription or audio recording of the presentation. If the PRC allows the presentation to be recorded or transcribed, the Bidder requesting that the presentation be recorded must pay the cost of recording or transcription, including the costs to make and distribute copies of the recording to the Committee and other Bidders. There shall be no cost to the County.

.D Final Decisions - The OAR will issue to all Bidders the PRC's written decision. The PRC's written decision will be based on the information submitted by the Protestor and other Bidders and any oral presentations heard by the PRC and issued within fifteen (15) calendar days of the oral presentation; however, the time for issuing the written decision may be extended at the County's sole discretion for good cause. The decision shall be the final decision of the County with no provision for reconsideration or appeal to the Board.

22.06 Additional Protest Information

.A Suspension of Process for Proposed Rejection of all Bids - At any time during the processing of a Protest, General Services may elect to indefinitely suspend any further processing of the Protest by providing written Notice of Suspension to all Bidders. The Notice of Suspension shall state that General Services intends to recommend to the Board that all bids be rejected. All time deadlines provided in this Section shall be tolled during any such suspension period. If the Board decides to not reject all bids or if General Services otherwise decides to lift the suspension, the requirements of this Policy shall be reactivated upon the OAR providing all Bidders with written Notice of Reactivation.

.B Protest Remedies – Protestors must exhaust any remedies under this Section before instituting litigation. Protest remedies will not include attorney's fees.

.C Administration of Protests - The Owner may assign staff to conduct the administrative processing of Protests filed with the County. Assigned staff shall be responsible for proper distribution of Protest submittals and responses, coordination of staff evaluation of the Protest, compliance with the time limits stated herein, and maintenance of all documents related to the Protest.

.D Right to Continue Award of Contract – In the event of a timely Protest, the County may delay the solicitation or award until such time as a decision is rendered but, the County, in its sole discretion, reserves the right to award the contract without delay if it is deemed in the best interest of the County.

ARTICLE 26 – FORM – CONTRACTOR REQUEST FOR INFORMATION FORM

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

Request:

Response by:		**Date:**	

Response:

1.4 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:

1.5 CONTRACTOR QUALIFICATIONS REQUIREMENTS FORMS

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	

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

Name	
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

Name	
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

Name	
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
Creston DMC-E-4K certification number and expiration date	
Crestron DM-NVX and DM-NVX-N certification numbers and expiration dates	

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

Lead Installer Resume

Name	
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	
Creston DMC-T-4K or DMC-E-4K certification number and expiration date	

☐

Control Systems Programmer Resume

Name	
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
Crestron Certified Programmer certification number and expiration date	

Audio DSP Programmer Resume

Name	
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
Harmon Professional University HCAP-P or Other Current Professional Certification number and expiration date	

Commissioning Agent Resume

Name	
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

Name	
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	

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: _____

END OF SECTION 00 20 00

SECTION 00 41 00 - **BID FORMS**

1. Pursuant to and in compliance with your Notice to Bidders and the Contract Documents relating to the construction of:

County of Santa Barbara
Hearing Room/Master Control Technology Refresh
Project No. 8798
Bid Date: November 21, 2019

including Addendum No(s). ___, ___, ___, ___,___, ___, ___, ___, ___,___, ___, ___, the undersigned bidder, having become thoroughly familiar with the terms and conditions of the Contract Documents and with local conditions affecting the performance and the costs of the Work at the place where the Work is to be done, hereby proposes and agrees to fully perform the Work within the time stated in and in strict accordance with the Contract Documents (including the furnishing of any and all labor, materials, tools, expendable equipment and utility and transportation services necessary to fully perform the work and complete it in a workmanlike manner) for the total lump sum bid provided in number 2.

2. LUMP SUM BID

$ | | | , | | | | , | | | | . | | |

(Place figures in appropriate boxes.)

3. ALTERNATES

In order for a Bid to be responsive, Bidder must submit an additive bid, a deductive bid, or a "no change" bid, for each Alternate listed below. The failure to do so shall result in the Bid being rejected as non-responsive. The failure to quote an amount, unless the bidder marks the "no change" box, will result in the bid being rejected as non-responsive.

The County reserves the right to accept any of these Alternates within 120 calendar days after the Notice to Proceed is issued. No extension of time will be granted if any of these Alternates is accepted.

Bid Alternates are defined in Section 01 23 00.

Alternate No. 1:

Description: Upgrading of Santa Barbara Planning Commission Hearing Room

Bid for Alternate No. 1

If "Add" or "Deduct" is intended, indicate by placing figures in the corresponding boxes. If "No Change" is intended, indicate by marking the "No Change" box

Add $ ☐ , ☐☐☐ , ☐☐☐ . ☐☐

Deduct $ ☐ , ☐☐☐ , ☐☐☐ . ☐☐

☐ No Change: Bidder will perform this Alternate without change to Contract Sum.

Alternate No. 2:

Description: Adding electronic nameplates at all Dais locations in Hearing Rooms

Bid for Alternate No. 2

Add $ ☐ , ☐☐☐ , ☐☐☐ . ☐☐

4. **Basis for Award of Contract: The lowest bid shall be determined on the basis of the base bid only.**

   BASE BID ONLY = BASIS FOR DETERMINING LOWEST BID

5. It is understood that Owner reserves the right to reject the proposal and that it shall remain open and not be withdrawn for a period of one hundred twenty (120) calendar Days from the date prescribed for its opening. Additionally, Santa Barbara County reserves the right to take any of the Alternates, in any order, or in any combination, as a change order at the bid prices listed for a period of one hundred and twenty (120) Days after the Notice to Proceed is issued. County also reserves the right to accept none of the Alternates.

6. Attached hereto and incorporated herein is the complete and entire list of subcontractors to be employed by the undersigned and in the performance of the Work.

7. It is understood and agreed that if written notice of the acceptance of this proposal is mailed or delivered personally to the undersigned bidder within one hundred and twenty (120) calendar Days after the opening of the proposal, or at any time thereafter before it is withdrawn, the undersigned bidder will execute and deliver the Contract Documents to Owner in accordance with the proposal as accepted, and will also furnish and deliver to Owner any Payment Bond required under the provisions of California Civil Code and Performance Bond as required under the provisions of the California Government Code and/or California Public Contract Code all within fourteen (14) calendar Days after personal delivery or deposit in the mails, as the case may be, of the Notice of Intent to Award. The work under the contract shall be commenced by the undersigned bidder on the date stated in COUNTY'S written Notice to Proceed and shall be completed within 790 calendar Days thereafter.
8. Notice of acceptance or request for additional information may be addressed to the undersigned bidder at the business address set forth below.
9. Contract Bonds and Insurance must be satisfactory to, and on forms acceptable to Owner.
10. Notice of acceptance of Bonds and Insurance or request for additional information may be addressed to the

undersigned bidder at the business address set forth below. In accordance with the provisions of Sections 1860 and 1861 of the California Labor Code, every CONTRACTOR will be required to secure the payment of compensation of his or her employees. Each CONTRACTOR to whom a public works contract is awarded shall sign the following certification prior to performing the work of the contract: "I am aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

11. Bidder certifies that he/she has thoroughly read and understands the Bid Documents and Addenda. Bidder hereby incorporates by reference the Bid Documents and Addenda as though set out in full, and all provisions of the Notice to Bidders published by Owner pertaining to the Work described in this Bid.
12. Protests of any bid(s) received must be in writing, must specify all grounds for the protest in accordance with Document 00200 Article 25 “Instructions to Bidders- Bid Protests”.

BIDDER SIGNATURE

SIGNATURE BLOCK (***Signature Block must be completed in ink& changes must be initialed.***)

_____ IRS No.: _____
Company

_____ License Classification(s): _____
Street Address

_____ Phone Number: _____
City

BY: _____ _____
Signature Printed Name, Title

A. 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	
	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:	$
ADD ALTERNATE 1 - Planning Commission Hearing Room	
Total Equipment and Materials	$
Total Additional Labor, Freight, G & A, Warranty	$
Total Additional Taxes	$
TOTAL ADD ALT. 1	$
ADD ALTERNATE - Electronic Nameplates for Hearing Rooms	
Total Equipment and Materials	$
Total Additional Labor, Freight, G & A, Warranty	$
Total Additional Taxes	$
TOTAL ADD ALT. 2	$
Additional Warranties	
Year Two Warranty	$
Year Three Warranty	$
Year Four Warranty	$

Bid Form	
Hourly Rates for Additional Work	**Per Hour Rates**
Project Engineer/Designer	$
Project Manager	$
Technician	$
Programmer	$
Trainer	$

Bidder Company Name _____

Authorized Signature _____

Print Name _____

Date: _____

DESIGNATION OF SUBCONTRACTORS

This Designation of Subcontractors form must be completed in compliance with the State of California Subletting and Subcontracting Fair Practices Act, Public Contract Code § 4100 *et seq*., and any amendment thereof. Bidder must complete the form below for each Subcontract that exceeds one-half of one percent (1/2%) of the Bidder's total Bid. A Subcontractor is one who: (1) performs Work or labor; or (2) provides a service to the Bidder; or (3) specially Fabricates and Installs a portion of the Work according to the Contract Documents. Bidders failure to list a Subcontractor for any portion of the Work in excess of 1/2% of Bidder's total Bid signifies Bidder will self perform that portion of the Work with its own forces. (Note: If more than one Subcontractor is designated for the same kind of Work, state the portion that each will perform.)

DIVISION OF WORK	SUBCONTRACTOR	CAL. LICENSE NO.	LOCATION

SIGNATURE BLOCK (***Signature Block must be completed in ink& changes must be initialed.***)

Bidder's Signature: _____Date:_____

Bidder's Name & Title (Print): _____

DESIGNATION OF SUBCONTRACTORS (CONT'D)

DIVISION OF WORK	SUBCONTRACTOR	CAL. LICENSE NO.	LOCATION

SIGNATURE BLOCK (***Signature Block must be completed in ink& changes must be initialed.***)

Bidder's Signature:_____**Date:**_____

Bidder's Name & Title (Print):_____

NOTE: **To list additional Subcontractors, submit completed copies of this form as needed.**

BIDDER'S CERTIFICATIONS

1. DESIGNATION OF INSURANCE COMPANY(IES) & AGENT OR BROKER

Bidder hereby certifies that he/she has reviewed the insurance coverage requirements specified in the Contract Specifications. Should he/she be awarded the contract for the work, Bidder further certifies that he/she can meet all the Contract Specification requirements for insurance including insurance coverage of his/her subcontractors. The following insurance company(ies) and agent or broker will provide policies of insurance or insurance certificates as required by the Contract Documents:

Insurance Company(ies) _____

_____

Admitted in California: YES_____ NO _____

Agent or Broker: _____

_____

Street City Zip

Phone:( ) _____

2. DESIGNATION OF BONDING COMPANY & AGENT OR BROKER

The following Surety Company and agent or broker will provide Payment and Performance Bonds as required by the Contract Documents:

Surety Company Providing Bonds: _____

Admitted in California: YES_____ NO_____

Agent or Broker: _____

_____

Street City Zip

Phone:( ) _____

BIDDER'S CERTIFICATIONS (CONT'D)

3. NONCOLLUSION AFFIDAVIT

In accordance with Public Contract Code § 7106. _____
(Bidder's full name)

being first duly sworn, deposes and says that he or she is _____
(Bidder's title)

of _____
(Company's name)

the party making the foregoing Bid, that the Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham Bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any Bidder or anyone else to put in a sham Bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the Bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the Bid price, or of that of any other Bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed Contract; that all statements contained in the Bid are true; and further, that the Bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham Bid and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

SIGNATURE BLOCK (*Signature Block **must be completed in** ink**& changes must be** initialed.*)
Bidder's Signature: _____Date: _____
Bidder's Name & Title (Print): _____
At CITY: _____ STATE: _____

BIDDER'S CERTIFICATIONS (CONT'D)

4. STATEMENT OF BIDDER REGARDING PUBLIC CONTRACT CODE SECTION 10162

Has the Bidder, or any officer of the Bidder or any employee of the Bidder who may have a proprietary interest in the Bid, ever been disqualified, removed, or otherwise prevented from bidding on or completing any federal, state, or local governmental project because of a violation of law or safety regulations?

YES ___ NO ___

(If the answer is yes, explain the circumstances on a separate sheet of paper and attach to proposal)

5. STATEMENT OF BIDDER REGARDING PUBLIC CONTRACT CODE SECTION 10232

In accordance with Public Contract Code Section 10232, the Contractor hereby states, under penalty of perjury, that no more than one final non-appealable finding of contempt of court by a Federal Court has been issued against the Contractor within the immediately preceding two year period because of the Contractor's failure to comply with an order of a Federal Court which orders the Contractor to comply with an order of the National Labor Relations Board.

I declare under penalty of perjury under the laws of the State of California that the information supplied in Paragraphs 4 and 5 above is true and correct:

SIGNATURE BLOCK (*Signature Block must be completed in ink& changes must be initialed*.)
Bidder's Signature: _____Date: _____
Bidder's Name & Title (Print): _____

BIDDER'S CERTIFICATIONS (CONT'D)

6. ANTI-FRAUD CERTIFICATION

In accordance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury that the bidder **has __, has not __**, been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or federal antitrust law in connection with the bidding upon award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or Trustees of the California State University.

The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

NOTE: The bidder must place a check mark after "has" or "has not" in one of the blank spaces provided.

I declare under penalty of perjury under the laws of the State of California that the information supplied in Paragraph 6 above is true and correct:

SIGNATURE BLOCK (*Signature Block **must be completed in** ink**& changes must be** initialed.*)
Bidder's Signature: _____Date:_____
Bidder's Name & Title (Print): _____

7. CERTIFICATION OF EXCLUSION OF OCIP INSURANCE COSTS

Bidder hereby certifies under penalty of perjury that it has read and is aware of the provisions of the Bid Documents addressing the Owner Controlled Insurance Program ("OCIP"), and is aware that Bidder is required to exclude from its bid for the Project the "Costs of OCIP Coverages" as described more fully in the Bid Documents, specifically at Exhibit B-1, Article 11, Document 00700. Bidder further certifies that it has not included in its bid, either directly or indirectly, Bidder's "Costs of OCIP Coverages", as defined in Exhibit B-1, Article 11, Document 00700, and shall not include the "Costs of OCIP Coverages" in any change order request, claim, invoice, or any other application for payment on the Project.

I declare under penalty of perjury under the laws of the State of California that the information supplied in Paragraph 7 above is true and correct:

SIGNATURE BLOCK (*Signature Block must be completed in ink& changes must be initialed.*)
Bidder's Signature: _____Date: _____
Bidder's Name & Title (Print): _____

BIDDER'S CERTIFICATIONS (CONT'D)

8. CERTIFICATION OF IRAN CONTRACTING ACT OF 2010 COMPLIANCE

In accordance with Public Contract Code §§ 2200-2208, Bidder must complete **ONE** of the options provided below:

OPTION #1: CERTIFICATION

Bidder is not on the current California Department of General Services (DGS) list of persons engaged in investment activities in Iran as described in Public Contract Code § 2202.5 and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person or vendor, for 45 days or more, if that other person or vendor will use the credit to provide goods or services in the energy sector in Iran and is identified on the current DSG list of persons engaged in investment activities in Iran.

I declare under penalty of perjury under the laws of the State of California that the above information supplied in Paragraph 8, Option # 1 above is true and correct:

SIGNATURE BLOCK **(***Signature Block must be completed in ink& changes must be initialed***.)**

Bidder's Signature: _____Date: _____

Bidder's Name & Title (Print): _____

OPTION #2: EXEMPTION

Pursuant to Public Contract Code § 2203 (c) and (d), a public entity may permit a bidder or financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit a proposal for, or enter into, or renew, a contract for goods and services. If Bidder has obtained an exemption from the certification requirement under the Iran Contracting Act of 2010, Bidder shall complete and sign below and attach documentation demonstrating the exemption approval.

I declare under penalty of perjury under the laws of the State of California that the above information supplied in Paragraph 8, Option # 2 above is true and correct:

SIGNATURE BLOCK **(***Signature Block must be completed in ink& changes must be initialed***.)**

Bidder's Signature: _____Date: _____

Bidder's Name & Title (Print): _____

BIDDER'S CERTIFICATIONS (CONT'D)

I am authorized to complete this form on behalf of:

_____
Name of Contractor

I have reviewed and understand the requirements of (See 00700, Article 3.31 "Compliance With Laws and Regulations")

SIGNATURE BLOCK (*Signature Block must be completed in ink& changes must be initialed.*)
Bidder's Signature: _____Date: _____ **Bidder's Name & Title (Print): _____**

STOP PAYMENT NOTICE INFORMATION

PROJECT NAME: _____ **NO.:** _____

COUNTY PROJECT MANAGER: _____

COUNTY DEPARTMENT: _____

CONTRACTOR'S NAME: _____

CONTRACTOR'S ADDRESS: _____

Reference: California Civil Code, Division 4, Part 6, Title 3, Chapter 1

The following is furnished for the information of contractors, Subcontractors and suppliers of labor, materials, equipment, and services under County Public Works contracts (Reference: California Civil Code, Division 4, Part 6, Title 3, Chapter 1), and is not intended as legal advice. Advice of legal counsel should be obtained to ensure compliance with legal requirements relating to public works stop notices.

WHERE TO FILE: All original stop payment notices and preliminary-20 day notices (if required by California Civil Code §9300) must be filed with the County of Santa Barbara Project Manager named in the Notice to Bidders, address (General Service Capital Projects, 1105 Santa Barbara St, Santa Barbara, CA 93101).

STOP NOTICE CONTENTS: See California Civil Code §9352. Written notice, signed and verified by the claimant and including information such as the kind of labor, equipment, materials or services provided or agreed to be provided by the claimant; the name of the person/entity to or for whom the same was done or provided; the amount in value of that already done or provided and/or agreed to be done or provided. Blank Stop Payment Notice forms are commercially available.

WHO MAY SERVE STOP PAYMENT NOTICE: See California Civil Code §9100. A person that provides work for a public works contract, if the work is authorized by a direct contractor, subcontractor, architect, project manager, or other person having charge of all or part of the public works contract; a laborer; a person described in Section 4107.7 of the Public Contract Code.

HOW THE STOP PAYMENT NOTICE IS SERVED: See California Code §9354. Served by personal delivery, registered mail, certified mail, express mail, or overnight delivery by an express service carrier; leaving the notice and mailing a copy in the manner provided in Section 415.20 of the Code of Civil Procedure for service of summons and complaint in a civil action.

TIME FOR SERVICE: See California Civil Code §9356. Stop payment notices must be served before the expiration of: 30 days after recording of a notice of completion, acceptance, or cessation, if such notice is recorded. If no notice of completion, acceptance, or cessation is recorded, 90 days after completion or cessation.

STOP NOTICE INFORMATION (CONT'D)

NOTICE OF COMPLETION: See California Civil Code §9362. Provided that a stop payment notice claimant has paid to the County Project Manager the sum of $10.00 at the time of filing a stop payment notice, not later than 10 days after each of the following events the Clerk shall provide that claimant with notice: filing of a notice of completion, or cessation, or after the completion of a public works contract, whether by acceptance or cessation. The Clerk shall provide notice by personal delivery, registered mail, certified mail, express mail, or overnight delivery by an express service carrier; leaving the notice and mailing a copy in the manner provided in Section 415.20 of the Code of Civil Procedure for service of summons and complaint in a civil action.

RELEASE OF STOP PAYMENT NOTICE: See California Civil Code §8000 and following. A public entity may, in its discretion, permit the direct contractor to give the public entity a release bond. The bond shall be executed by an admitted surety insurer, in an amount equal to 125 percent of the claim stated in the stop payment notice, conditioned for the payment of any amount the claimant recovers in an action on the claim, together with court costs if the claimant prevails. Alternatively, the original contractor may initiate a Summary Proceeding for Release of Funds pursuant to California Civil Code § 9400 through § 9414. Alternatively, the Stop Payment Notice claimant may file a Release in a form which substantially complies with California Civil Code §8128.

STOP PAYMENT NOTICE LAWSUIT: See California Civil Code §9500 through §9510. These sections provide that a stop payment notice is perfected only by the filing of a lawsuit. A lawsuit must be filed no sooner than 10 days after service of a stop notice and **no later than 90 days after the expiration of the time for filing stop notices**. Notice of suit must be given to the County Project Manager within 5 days after commencement. The Court has the discretionary right to dismiss the lawsuit if it is not brought to trial within 2 years.

I HEREBY ACKNOWLEDGE THAT I HAVE RECEIVED AND READ THE ABOVE STOP PAYMENT NOTICE INFORMATION AND IF I AM AWARDED THIS CONTRACT, I AGREE TO INCLUDE A COPY OF THIS PAGE(s) IN ALL SUBCONTRACTS AND CONTRACTS FOR LABOR, MATERIALS, EQUIPMENT AND SERVICES THAT I ENTER INTO FOR THIS PROJECT:

SIGNATURE BLOCK (*Signature Block must be completed in ink& changes must be initialed.*)

Bidder's Signature: _____Date:_____

Bidder's Name & Title (Print): _____

ATTENTION!!

SIGNATURE(S) REQUIRED

ON ALL BID FORM SIGNATURE BLOCKS AT TIME OF SUBMITTAL OF BID

SIGNATURE MUST ALSO APPEAR ON BIDDERS BOND AT THE TIME OF SUBMITTAL OF BID

ANY UNSIGNED BID FORM SIGNATURE BLOCKS MAY BE CAUSE FOR REJECTION OF BID

END SECTION 00 41 00

DOCUMENT 00430
BIDDER'S BOND FORM

BIDDER'S BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principal, and _____ as Surety (hereinafter referred to as Surety), are held firmly bound unto the County of Santa Barbara, State of California (hereinafter called "Owner") in the penal sum of Ten Percent (10%) of the total aggregate amount of the bid of the Principal above named, submitted by said Principal to Owner for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents. Surety shall be and hereby warrants that it is listed in the Insurance Organizations Authorized by the Insurance Commissioner to Transact Business of Insurance in the State of California, published by the Department of Insurance, State of California or successor publications.

In no case shall the liability of the Surety hereunder exceed the sum of _____ _____ DOLLARS ($_____).

The condition of this obligation is such that a bid to Owner for certain construction specifically described as follows:

County of Santa Barbara
Hearing Room/Master Control Technology Refresh
County Project No. 8798

for which bids are to be opened on_____, has been submitted by Principal to Owner.

NOW, THEREFORE, if the aforesaid Principal shall not withdraw said bid within the period therein after the opening of the same, or, if no period be specified within one hundred twenty (120) days after said opening and shall within the period specified therefore, or, if no period be specified, within eight (8) days after the prescribed forms are presented to him for signature, enter into a written Contract with Owner, in the prescribed form, in accordance with the bid as accepted, and file the two Bonds with Owner, one to guarantee faithful performance and the other to guarantee payment for labor and materials, as required by law, then this obligation shall be null and void; otherwise, it shall remain in full force, virtue and affect.

Said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, deletion or addition to the terms of said Contract or to the work to be performed thereunder or the Specifications accompanying the same shall in any manner affects its obligations on this bond, and it does hereby waive notice of any change, extension, alteration, deletion or addition.

It is hereby agreed that any progress payment made after the scheduled completion date will not constitute a waiver of any liquidated damages heretofore agreed upon.

In the event suit is brought upon said Bond by Owner and judgment is recovered, the Surety shall pay all costs incurred by Owner in such suit, including a reasonable attorney's fee to be fixed by the Court, even if payment in full of those costs causes Surety's obligation to exceed the stated amount of this bond.

Death, illness, bankruptcy, receivership, going out of business for any reason, or incompetence of the Principal shall not relieve the Surety of its obligations hereunder.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and Surety above named on this _____ day of _____, 20_____.

PRINCIPAL:	**SURETY:**
_____	_____
Signature	Signature by Attorney-In-Fact
_____	_____
Name	Name
_____	_____
Title	Title
_____	_____
Address	Address
_____	_____
City, State & Zip Code	City, State & Zip Code
_____	_____
Dated	Dated

Surety's Agent for Service of Process (located within the State of California):

_____
Name of Agent

_____
Address

_____
City, State & Zip Code

_____
Telephone Number

_____
FAX Number

NOTE: Corporate seals of Principal and Surety must be attached.
Signature of those executing for Surety must be properly acknowledged.

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF SANTA BARBARA ss.

On _____, before me, _____, personally
appeared_____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS MY HAND AND OFFICIAL SEAL:

(SEAL)

_____
Notary Public for the State of California

END OF DOCUMENT 00 43 00

SECTION 00 70 00 – GENERAL CONDITIONS

PART 1 - ARTICLE 1 GENERAL

1.6 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.

1.7 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.

SECTION 01 11 00 - SUMMARY OF WORK

ARTICLE 1 - GENERAL

1.8 SUMMARY

A. This Section includes:

1. Part 1 - General
    a. 1.01 - Summary
    b. 1.02 - Related Documents
    c. 1.03 – Definitions
    d. 1.04 – Project Description
    e. 1.05 - Summary of Work
    f. 1.06 - Use of Premises
    g. 1.07 – Site Conditions
    h. 1.08 – Job Conditions
    i. 1.09 - Quality Assurance
    j. 1.10 – Reliability
    k. 1.11 – Protection of Persons and Property
2. Part 2 – Products (Not Used)
3. Part 3 – Execution
4. Part 4 – Forms (Not Used)

1.9 RELATED DOCUMENTS

A. Drawings and Project Manual apply to this Section.

1.10 DEFINITIONS

A. Within this section of the specification, the following definitions shall apply:

1. The term “Owner” is used to indicate the County of Santa Barbara.
2. The term “Architect” is used to indicate the County of Santa Barbara Architect.
3. The term “Consultant” is used to indicate: The Sextant Group, Inc.
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.

1.11 PROJECT DESCRIPTION

A. Project Title: Hearing Room/Master Control Technology Refresh

B. Project Number: 8798

C. Project Description: The broadcast technology in each hearing room located in Santa Barbara and Santa Maria will be upgraded and well as each associated Master Control Room. This includes (but not limited to) replacement of cameras, microphones, displays, wiring, timers/clocks and lighting in accordance with the approved plans and specifications.

1.12 SUMMARY OF WORK, PRIMARY (BASE) BID.

A. This Summary describes the work to be bid for this bid package.

B. Project will be constructed under a single prime contract.

C. The scope of Work of this Contract consists of, but may not be limited to the following:

D. The replacement of broadcast technology in the following areas:

1. Santa Barbara Hearing Room. The replacement of cameras, microphones, public displays, installation of displays at Dias and staff locations; upgrading of lighting and sound equipment.
2. Santa Maria Hearing Room. The replacement of cameras, microphones, public displays, installation of displays at Dias and staff locations; upgrading of lighting and sound equipment.
3. Upgrading of the small BOS conference room broadcast technology.
4. Upgrading of the Master Control Room technology.

E. 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.

F. 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.
    1). Note - The Consultant is under no obligation to provide the Contractor with digital drawing files. However, digital drawing files may be provided to the Contractor at no cost for use in the development of Shop Drawings or As-Built drawings under separate agreement between Contractor and Consultant.

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.

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, 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 helpdesk 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. 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.

G. 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 recessed wall boxes for video cameras.
   5. Providing blocking as required to support wall-mounted audiovisual components.
   6. Providing window treatments and motorized shade system low voltage AV interfaces at the controller side.
   7. 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.
   8. The intent and meaning of the Contract Documents is that the Contractor, under the General Conditions and other terms of the Contract, shall take all actions necessary and required to provide all labor, materials, supplies, equipment, tools, machinery, utilities,

transportation, facilities, services and appurtenances necessary and required for the proper construction and completion of the described Project

1.13 SUMMARY OF WORK, ALTERNATE 1

A. This Summary describes the work to be performed as an alternate to the base contract.

B. Project will be constructed under a single prime contract.

C. The scope of Work consists of:

1. Santa Barbara Planning Commission Hearing Room: The replacement of cameras, microphones, public displays, installation of displays at Dias and staff locations; upgrading of lighting and sound equipment.

2. Integrate broadcast technology with the Master Control Room.

D. The intent and meaning of the Contract Documents is that the Contractor, under the General Conditions and other terms of the Contract Documents, shall take all actions necessary and required to provide all labor, materials, supplies, equipment, tools, machinery, utilities, transportation, facilities, services and appurtenances necessary and required for the proper construction and completion of the described Project

1.14 SUMMARY OF WORK, ALTERNATE 2

A. This Summary describes the work to be performed as an alternate to the base contract.

B. Project will be constructed under a single prime contract.

C. The scope of Work consists of:

1. Providing electronic nameplates for all Hearing Rooms. Nameplates shall be e-ink style displays capable of being programmed with 2-lines of text and may include graphic capability. Names may be input via remote access via a connection or via a scan card read into the device.

1.15 USE OF PREMISES

A. Confine operations within the limits of designated construction areas unless otherwise Approved by Owner’s Authorized Representative.

B. Confine material storage, shop areas, equipment yards, and employee parking within designated areas unless otherwise Directed by Owner’s Authorized Representative.

C. Lay down Area:

1. Lay down area must be coordinated with and Approved by the Owner’s Authorized Representative.

1.16 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 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. 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.

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

1.17 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.

1.18 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.

1.19 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.

1.20 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.

SECTION 3 – DESIGN AND PERFORMANCE REQUIREMENTS

1.1 GENERAL

1.2 PROJECT OVERVIEW

A. The County of Santa Barbara is modernizing the Santa Barbara and Santa Maria Board of Supervisors Hearing Rooms and the Santa Barbara Planning Commission Hearing Room and Conference Rooms in both locations with new, state-of-the-art audiovisual and lighting equipment. In addition, the SBCTV capture and production equipment for all events will be upgraded to digital high definition. Remote testimony capabilities will be upgraded via the new equipment being planned. A new voting, tally and display system will be integrated into the Hearing Rooms. Included in the scope of work for the project are current audiovisual systems, multimedia systems, technical lighting and room control systems.

1.1 SYSTEMS DESCRIPTIONS – BASE BID

A. AVS01- Conference Room (405). This room will accommodate up to 10-12 participants. The installed audiovisual system shall provide for synchronous videoconferencing and multimedia presentation, including the following:

1. The video system of the room shall consist of a wall-mounted 86” display aligned with the conference table to ensure proper viewing of content for all participants. A single high definition pan/tilt/zoom camera shall be mounted below the display to facilitate videoconferencing.
2. Audio reproduction for presentations and videoconferencing shall be from two ceiling mounted loudspeakers. Wireless table microphones shall be provided. A charging station for the wireless microphones shall be provided. Wireless microphone shall be Revo Labs (Yamaha Corp.) HD or approved equal.
3. An ALS system with 1 body pack shall be provided to meet current ADA requirements.
4. Wireless presentation capabilities shall be available via a Barco Clickshare or equal device to enable presenters to show content on the display wirelessly from their laptops, tablets or other portable devices.
5. A Polycom Group 500 high definition videoconferencing codec (coder/decoder) shall provide video and audio conferencing. Note: Polycom products shall be used to comply with current Santa Barbara County devices.
6. Dedicated source devices shall include an Owner-provided computer.
7. A flip-top cable interface shall be located at the conference table. The interface will include power connections for laptops and USB devices. No AV connectivity is required at the flip top. Note: Contractor shall coordinate with the owner the location and cutout hole in the table for the flip top interface.
8. Operation of the display will be via Polycom handheld remote. The Remote Control shall be programmed to turn the display on and off and control room volume.
9. Remote control of room functions shall also be available from the remote Master AV Control Room.
10. All rack-mounted equipment shall be housed within the built-in millwork cabinet located at the side of the room. Note that minor millwork alterations shall be made to the millwork to provide adequate ventilation for the equipment housed inside the cabinet. The Contractor shall coordinate with the owner any changes to the existing cabinet prior to making any modifications to the existing cabinet. An exhaust cooling fan shall be provided in the existing credenza to promote adequate ventilation in the top of the door.

B. AVS02- Santa Barbara Hearing Room (433). This space will be enhanced by audiovisual presentation technologies featuring capabilities for presentation, two-way conferencing, web streaming and audio / video recording. The Hearing Room shall include the following:

1. The video display system shall consist of two wall mounted 80” flat panel displays wall-mounted near the Dais on the left and right side of the room. Two additional wall mounted 65” flat panel displays shall provide current presentation content as well as other information to the audience seating area.
2. In the Lobby, a kiosk shall be provided that will provide a place for users to fill-out a Speaker Slip. The Speaker Slip data shall be electronically collected and made available to the County Clerk’s computer located in the Hearing Room. Note that this system will be owner furnished and owner installed.
3. At each Board Member location on the Dais, 17” self-standing displays shall show the same content that is shown on the large displays to enable each participant excellent individual viewing of all content. Voting members seated at the staff seats will have microphones and voting devices but no content displays as they can view the larger room displays.
4. The Hearing Room shall also include a high-definition document camera located in the ceiling above the audience right side staff table. This camera shall be listed as a source on the Control touch panels for use by the end user. When selected, zoom and focus controls shall appear.
5. Two owner-furnished dedicated computers with wireless keyboard and mouse shall be placed in the presentation location and Clerk’s desk locations. An audio and video feed to the Master Control Room shall be provided from the Presenter’s computer.
6. Wireless presentation capabilities shall be included that will allow presenters to share content to the displays.
7. The audio system shall consist of wired lectern and Dais microphones, a wireless 2-channel microphone system including lavaliere and handheld microphones, and line array loudspeakers for speech reinforcement and program audio located in the front of the room.
8. Press feeds shall be provided at the rear wall of the Hearing Room via a wall panel. The feed shall include line-level audio and SDI video connectivity.
9. The existing ADA hearing assist loop system shall be re-used.
10. A presentation count-down timer shall be included so presenters can see the remaining time available for their presentations. The displayed time for each presentation shall be shown on the main display screens in a Picture in Picture window. The window shall be turned on and off by the Master Control Room location. The viewing system for the Dais members shall include the countdown timer.
11. An annotation tablet shall be provided in the presentation / lectern space to enable presenters to annotate projected content.
12. The existing PTZ cameras and mounts shall be replaced with new cameras.
13. Control of the systems shall be via a wired touch panel at the Clerk’s location and a wireless touch panel at the presentation station. A touch panel for a system operator will be located in the Master Control Room. iPad / tablet control shall supplement above.
14. At the Clerk’s location – Several input and displays shall be provided. A PC with display shall be provided to allow the Clerk to start / stop and control voting procedures. A separate display shall display all microphone locations and allow the Clerk to control overall

selection of speaker, muting and request to speak (next speaker) control. The Chairman location on the Dais also shall be able to manage request to speak and muting functions.

15. In the Presentation area a touch panel with a simplified interface – shall be provided to enable presenters to share content and view timer of remaining time for their presentations.
16. A closed-captioning system shall be added.
17. A Broadcast television tuner/receiver shall be added as an input to this system to present outside video content such as current news footage or television broadcasted events. The Contractor shall coordinate with the Owner and Cox to determine the format of the signals sent and received from the Cox Network or any other third-party network provider selected by the Owner.
18. Ad hoc remote participation through the production switcher (Tricaster) shall enable up to three additional remote locations to join any enabled room via a Microsoft Skype interface.
19. A microphone / voting system shall be included. At each seat in the Dais and in the overflow seating in the front of the room, voting / microphone stations shall be provided. The Contractor shall coordinate mounting and altering the Dais with the owner prior to making any modifications. In the overflow seating in the front of the room, the microphones shall be free standing and sit at each location without being permanently affixed to the tables. All microphone stations shall be directly wired.
20. Each voting / microphone station shall have three buttons available for voting. Buttons for “Yes”, “No” and “Abstain” shall be provided along with additional buttons for microphone push to speak, microphone mute and volume control up and down for the integrated headset jack housed in the unit.
21. Software shall be provided that shall control the voting process of collecting votes and delivering the results to the Clerk.

C. Bid Alternate No. 1 - AVS03 - Santa Barbara Planning Commission Hearing Room. This room will provide a full-featured audiovisual system upgrade, including capabilities for presentation, two-way conferencing, web streaming and audio / video recording.

1. The new video display system shall feature dual 86” professional grade LED flat panels mounted on the front wall of the room adjacent to the Dais. In addition, two 65” wall-mounted displays shall be added to the rear seating areas to enhance viewing for the audience area.
2. A 50” display showing the current agenda item or other messaging shall be added to the wall in the front of the room.
3. The existing PTZ cameras and mounts shall be replaced with new cameras.
4. The existing Assistive Listening System (ALS) loop system shall be re-used.
5. A closed-captioning system shall be added.
6. A ceiling-mounted high-definition (HD) document camera shall be added above the presentation area to view large drawings and other documents brought in by presenters.
7. Auxiliary HDMI connections shall be added in the presentation station.
8. The Clerk PC and Presentation PC shall have HDMI connections for display of content.
9. A presentation count-down timer shall be included so presenters can see the remaining time available for their presentations. The displayed time for each presentation shall be shown on the main display screens in a Picture in Picture window. The window shall be turned on and off by the Master Control Room location. The viewing system for the Dais members shall include the countdown timer.

10. Annotation capabilities for the presenters to interact with presentation content shall be added to the presentation area.
11. At each location on the Dais, desk mounted displays shall show the same content that is shown on the large displays to enable each participant excellent viewing of all content.
12. The audio system shall be upgraded by replacing the existing distributed ceiling loudspeakers with new loudspeakers. The audio system shall also consist of wired lectern and Dais microphones, a wireless 2-channel microphone system including lavaliere and handheld microphones,
13. Control of all systems shall be via a wired touch panel at the Clerk location for simplified control of audio, display and lighting systems as well as via a touch panel for a system operator in the Master Control Room temporarily being located on the fourth floor. iPad / tablet control shall supplement above.
14. A microphone / voting system shall be included. At each seat in the Dais and in the overflow seating in the right front of the room, voting / microphone stations shall be provided. On the Dais, the microphones shall be flush mounted into the Dais. The Contractor shall coordinate mounting and altering the Dais with the owner prior to making any modifications to the existing Dais.
    a. In the overflow seating in the front of the room, the microphones shall be free standing and sit at each location without being permanently affixed to the tables. All microphone stations shall be directly wired.
15. Each voting / microphone station shall have three buttons available for voting. Buttons for “Yes”, “No” and “Abstain” shall be provided along with additional buttons for microphone push to speak, microphone mute and volume control up and down for the integrated loudspeaker housed in the unit.
16. Software shall be provided to control the voting process of collecting votes and delivering the results to the Clerk.

D. AVS04 - Santa Barbara and Santa Maria Master Control Rooms. The Master Control Rooms in Santa Barbara and Santa Maria will provide redundant support to all spaces for the recording and production of live televised meetings and events and act as a space for broadcast scenarios. Both Hearing Rooms and the Planning Commission Room shall be capable of being controlled from the Master Control Room in Santa Barbara or Santa Maria.
    1. The TriCaster video production switcher in the Santa Barbara Control Room shall be replaced.
    2. A new equipment rack shall be located in the Master Control Room temporarily being housed on the 4th floor. A more permanent location for the Master Control Room will be determined at a later date.
    3. For recording of meetings and programming, a Leightronix video playback server shall be provided.
    4. The existing Closed Captioning Link encoder shall be replaced with an HD version. Both HD and SD signals to support legacy video recorders and distribution shall be maintained.
    5. New HD recording and archiving equipment shall be provided. Currently archives are recorded to DVD and to a Granicus video server.
    6. The new equipment shall provide a SD input to support legacy source devices.
    7. The Contractor shall coordinate with Cox Communications to provide an HD signal.

8. All audiovisual signals shall work with and be distributed to the County's two Granicus video streaming encoders.
9. Existing and/or dark fiber shall provide link between the Santa Barbara and Santa Maria control rooms such that either can serve as redundant control points for events in either or both locations. Contractor shall coordinate with the Owner's IT Department to provide and utilize the fiber connection between sites.

E. AVS05 - Santa Maria Conference Room (109). This room will be a meeting room accommodating up to 10-12 participants. The installed audiovisual system will provide for synchronous videoconferencing and multimedia presentation, including the following:

1. A large 86" professional LED display shall be mounted on the wall.
2. A single high-definition pan/tilt/zoom camera shall be mounted below the display to facilitate videoconferencing.
1. Audio reproduction for presentations and videoconferencing shall be from ceiling-recessed loudspeakers.
2. A high definition videoconferencing codec (coder/decoder) shall provide video and audio conferencing.
3. Wireless presentation capabilities shall be available to enable presenters to show content on the display wirelessly from their laptops, tablets or other portable devices.
4. The existing lectern shall include a gooseneck microphone.
5. A countdown timer shall be provided at the lectern.
6. Wireless table microphones shall be provided on the conference table. The County wishes to utilize Yamaha Revo-Labs HD microphones and charging stations or approved equal.
7. A flip-top cable enclosure shall be located at the conference room table, with inputs for a laptop computer and portable AV source devices.
8. The existing ADA hearing assist loop system shall be re-used.
9. Control of the complete system shall be from a touch panel located on the conference table.
10. All rack-mounted equipment shall be housed within the local Control Room.

F. AVS06 - Santa Maria Hearing Room 108. This space will be enhanced by audiovisual presentation technologies featuring capabilities for presentation, two-way conferencing, web streaming and audio / video recording. The Santa Maria Hearing Room shall include the following:

1. The main video display system shall consist of a 98" flat panel display wall mounted on the front wall to the right of the Dais.
2. Four additional wall mounted 65" flat panel displays shall be added throughout the sides of the room to show the current presentation to the audience seating.
3. A wall-mounted 55" flat panel display shall be installed to show the current agenda items and other information.
4. In the Lobby, a kiosk shall be provided that will provide a place for users to fill-out a Speaker Slip. The Speaker Slip data shall be electronically collected and made available to the County Clerk's computer located in the Hearing Room.
5. Every Dais, staff seat and overflow staff seat shall have desk mounted displays showing the same content on the large displays.

6. The Santa Maria Hearing Room shall also include a high-definition document camera located near the lectern / presentation area.
7. Two owner-furnished dedicated computers with wireless keyboard and mouse shall be placed in the presentation space and Clerk's desk locations.
8. Wireless presentation capabilities shall be included.
9. The audio system shall consist of wired lectern and Dais microphones, a wireless microphone system including lavaliere and handheld microphones, and distributed loudspeakers mounted throughout the ceiling for speech reinforcement and program audio playback.
10. The existing ADA hearing assist loop system shall be re-used.
11. A presentation count-down timer shall be included so presenters can see the remaining time available for their presentations. The displayed time for each presentation shall be shown on the main display screens in a Picture in Picture window. The window shall be turned on and off by the Master Control Room location. The viewing system for the Dais members shall include the countdown timer.
12. An annotation tablet shall be provided in the presentation / lectern space to enable presenters to overlay on content.
13. The existing PTZ cameras and mounts shall be replaced with new cameras.
14. Control of the systems shall be via a wired touch panel at the Clerk location for simplified control of audio, display and lighting systems as well as via a touch panel for a system operator in the Control Room. iPad / tablet control shall supplement above.
15. A closed-captioning system shall be added.
16. A broadcast television tuner/receiver shall be added to view video such as current news footage or television broadcasted events.
17. Ad hoc remote participation through the production switcher (Tricaster) shall enable up to three additional remote locations to join any enabled room via a Microsoft Skype interface.
18. The Master Control Room shall be capable of controlling all technology in the Hearing Room.

SECTION 01 23 00 - ALTERNATES

1.21 GENERAL

1.22 SUMMARY

A. This section includes:

1. ARTICLE 1 – General

a. 1.01 – Summary
b. 1.02 – Related Documents
c. 1.03 – Definitions
d. 1.04 – Procedures

2. ARTICLE 2 – Execution

a. 3.01 – Schedule of Alternates
b. 3.02 – Acceptance of Alternates

1.23 RELATED DOCUMENTS

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

B. Section 00 41 00, “Bid Form”

1.24 DEFINITIONS

A. Base Bid – The amount proposed by the bidders and stated on the Bid Form for the total work of the project without the amounts proposed for the contingent work of the Alternates described by this Specification Section.

B. Alternate – An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.

2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.25 PROCEDURES

A. The amounts proposed for all the Alternates shall be used as a basis upon which the Owner will decide to award the any alternate.

B. In accepting or rejecting the Alternate proposals the Owner reserves the right to choose none, some or all Alternate proposals in any order Owner desires. Additionally, Santa Barbara County reserves the right to take any of the alternates, in any order, or in any combination, as a change order at the bid prices listed for a period of one hundred and twenty (120) Days after the Notice to Proceed is issued.

C. Coordination: Contractor shall revise or adjust affected adjacent work as necessary to completely integrate work of the Alternate into Project.

1. Contractor shall include in their price for each Alternate miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of Alternate.

D. Notification: Immediately following award of the Contract, Contractor shall notify each party involved, in writing, of the status of each Alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to Alternates.

E. Contractor shall execute accepted alternates under the same conditions as other work of the Contract.

F. Schedule: A schedule of Alternates is included in Part 3 of this Section. Specification Sections referenced in the schedule contain requirements for materials necessary to achieve the work described under each Alternate.

1.26 ARTICLE 2 - EXECUTION

1.27 SCHEDULE OF ALTERNATES

A. Alternate No. 1 – AV Upgrades or Refresh of Planning Commission Hearing Room.
   a. Base Bid: Do not provide technology upgrades or refreshing of the Planning Commission Hearing Room. The room will remain in an as-is condition.
   b. Alternate: Provide upgrading and refreshing of the Planning Commission Hearing Room as described in the drawings and specifications.
   c. Base Bid: Do not provide lighting upgrades or refreshing of the Planning Commission Hearing Room. The room will remain in an as-is condition.
   d. Alternate: Provide lighting upgrading and refreshing of the Planning Commission Hearing Room as described in the drawings and specifications.

2. Alternate No. 2 – Addition of electronic nameplates in Hearing Rooms in Santa Barbara and Santa Maria.
   a. These nameplates shall connect to the voting system and take participants name and other pertinent information and send information to the voting system for recording. Provide a nameplate for every voting position.

1.28 ACCEPTANCE OF ALTERNATES

A. Determination of successful Bidder :

1. The Owner will base selection of the lowest and most responsive bidder on the basis of the base bid only.

B. Acceptance of Alternate Proposals:

1. The Owner reserves the right to select the Alternate Proposals or not at the time of award.

2. Pricing for the alternate shall remain good for a period of one hundred and twenty (120) Days after the Notice to Proceed is issued.

END OF SECTION 01 23 00

1.29 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 the Owner and the Consultant 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.
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.
4. 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.
5. 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.

6. 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.
    h. Structural Anchorage – If required by the Authority Having Jurisdiction, provide structural calculations, drawings and details for the anchorage of equipment racks, loudspeaker rigging hardware, and all other mounts or hardware that attach to structure. The design shall be reviewed and approved by a Structural Engineer registered in the state in which the installation work is performed.
    i. 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.
    j. Panels – Scaled drawings of interconnect panels, control surfaces, and other custom interfaces.
    k. Peripheral Equipment – Scaled drawings of mounting arrangements of any peripheral equipment, which may be included in this Specification.
    l. Equipment Rack Layouts – Fully detailed rack drawings indicating equipment orientation within the equipment rack.
    m. 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.

n. 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 are receptacles and controls with associated trim plate and each type of loudspeaker baffle and/or grille.

F. 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.

G. 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.

H. 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.

I. 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.

J. 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.

K. 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.

L. 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.

M. Network Coordination

1. 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.

N. 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.

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. 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.

    c. 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.

    d. 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 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.

O. 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

P. 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.

Q. 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. 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.

2. Software
    a. 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.

b. 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.

c. 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.

d. 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.

3. 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.

4. 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.

1.30 TESTING AND SYSTEMS PERFORMANCE VERIFICATION

A. System Performance Verification / Testing Scheduling

1. 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.

4). Contractor shall have tools available on the day of the System Performance Verification for system inspection and adjustments.

5). Contractor shall coordinate with Owner so that all spaces are unlocked and available for inspection.

6). 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.

1.31 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.

1.32 TRAINING

A. The Contractor shall provide a total of ten (10) hours of on-site training for the Owner's staff at a time that is mutually agreeable for the Owner and Contractor.

1.33 EVENT TECHNICAL SERVICE

A. In addition to the training listed above, the Contractor shall provide a total of eight (8) hours of on-site technical assistance for an Owner-defined event. It is expected that this event will occur within the first 60 days after Substantial Completion.

1.34 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 - SECTION 01 60 00 - PRODUCTS

1.1 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
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

Type/Application	Description	Manufacturer	Model No.	Comment
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
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

Type/Application	Description	Manufacturer	Model No.	Comment
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

Type/Application	Description	Manufacturer	Model No.	Comment
Crestron Fiber Optic Cable, Singlemode	8G Singlemode Fiber Optic Cable, x2 zip-cord construction plenum/non-plenum	Crestron	CRESFIBER-8G-SM-P	or equal
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

1.2 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-RJ-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 five 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. The Contractor shall ensure that all equipment is installed such that proper cooling and ventilation is provided.
5. 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.)

6. 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.
7. 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.
8. All equipment shall be protected from construction dust and debris until the date of Substantial Completion.
9. All equipment shall be protected from theft, damage, or vandalism until the date of Substantial Completion.
10. 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.

A. Seismic Restraints:

1. All hanging or free-standing equipment and cabinets furnished including but not limited to racks, loudspeakers, projection screens, and flat panel displays shall be secured to substantial building structures. The equipment described shall resist seismic acceleration in any direction up to a limit of the greater of 1.0 G or the limit prescribed by the local governing codes.
2. Maintain electrical isolation between the equipment racks and building steel.
3. Loudspeaker hanging details, rack bracing, and other seismic restraints are not shown on the contract drawings; it shall be the Audiovisual Contractor responsibility to develop these drawings.
4. Submit loudspeaker mounting (rigging) drawings to the Architect for review after they have been stamped and signed by a licensed structural engineer engaged in regular practice in the Project's State.

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.

D. Video Displays

1. Turn off or disable all eco, green or energy saving modes on all flat panel displays where displays are to be controlled by an external control system
2. 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, paint remover, water, or any liquids 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, paint remover, water, or any liquid 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 Cat6a rated shielded panel connectors and DM compliant shielded Cat6 rated inline connectors in the appropriate color-coded Neutrik EtherCON connector carrier and specified to keep the Cat6a 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

1). AV Contractor provided network equipment and connections for AV equipment control over Ethernet: all RJ-45 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 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 5, 5e and 5e+ 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 5e parameters from 1 – 100 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.

5). Category 6 and 6+ 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 6 parameters from 1 – 250 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.

6). 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).

A107 DVD-1 AUDIO IN L ROUTER AUDIO OUT 12L	A107 ROUTER AUDIO OUT 12L DVD-1 AUDIO IN L
(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.
e. Interconnection
    1). All audio interconnections with cable lengths greater than 10 feet shall use balanced (differential) 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. Crestron control system processors shall provide local audiovisual systems and supplemental architectural device control for each of the controlled spaces.

       Crestron touch panels, button panels and software applications shall be provided as the human interface devices for each of the control systems.

B. 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 lowering projector lifts to the service position, 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.

C. Controlled Devices

1. Where specified components permit, the Control System shall provide positive feedback of individual component control-state conditions to the touch panel. For example, the touch panel page to control a Blu-Ray or DVD player shall have a status window indicating the status of the device (such as “Play Mode”) or the absence of media (such as “No Disc”). If environmental controls are triggered with a particular device, the trigger for that environmental control should be feedback from the device rather than a simple button push. For example, if the control system is to automatically lower the lights when the DVD player is placed in “Play” mode, the control system should not directly trigger the lighting preset from the “Play” button press, but rather by first confirming that a disc is present in the player and that the player is in fact in “Play” mode.
2. 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.
3. 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.
4. Resident PCs should be connected to constant power sources, not switched power, and should never be powered down from the control system.
5. 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.
6. For a Blu-Ray or DVD player, the Programmer should provide the five basic transport functions plus chapter skip forward, chapter skip reverse, and where available, a button to access a sub-page providing more advanced control. The advanced controls sub-page might have, for example, buttons and tools, which would allow the user to navigate the menu structure of a DVD or Blu-Ray disc.
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 a tuner with RS-232 control, a dialing-style keypad that will mimic a telephone keypad display to allow selection from the touch panel. Provide a display above the keypad to display the selected channel. This should be similar to a desktop telephone with a small LCD screen above the keypad, which indicates the key-presses of the selected channel. The display above the keypad should indicate the current Function (AM, FM or TV) and channel. Provide Up and Down arrow buttons to allow scrolling through channels. If the Owner so desires, provide up to 8 channel preset recall buttons corresponding to the proprietary cable system.
10. 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).
11. 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.

D. 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 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)

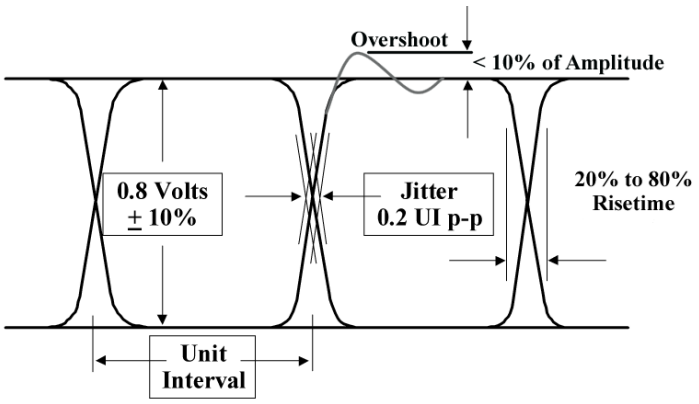
c. A SMPTE Color Bars test signal shall be utilized for confirming proper video levels throughout the signal system.

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 HDCP 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)
OM 1	62.5	200	275	2.38	33	2.5	33	2.4
OM 2	50	500	550	3.56	82	2.3	82	2.2
OM 3	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.

3.4 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. Configure all networked devices in coordination with the Owner and/or Consultant including the assignment of IP address, subnet, gateway, VLAN, security settings, and host names.
        b. Apply host name for all devices within each device’s setup utility.
        c. 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.

d. 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. In the Conference Rooms where loudspeaker zones of small transducers, utilize high-pass filters first and foremost and then utilize parametric EQ filters to flatten the measured response.
   d. In the Hearing Rooms where 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 Contractor shall program the DSP system to include delay settings adjusted so that the direct sound from the main loudspeaker clusters and the delay zone transducers in question arrives simultaneously at the listening plane served by the delay zone transducers.
   f. 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.

g. 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 regard 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

PART 4 - APPENDIX A

4.1 LIST OF DRAWINGS

Drawing No.	Description
AVS01	AUDIOVISUAL SYSTEMS DRAWING SANTA BARBARA HEARING ROOM 443
AVS02	AUDIOVISUAL SYSTEMS DRAWING SANTA BARBARA HEARING ROOM 443
AVS03	AUDIOVISUAL SYSTEMS DRAWING SANTA BARBARA HEARING ROOM 443
AVS04	AUDIOVISUAL SYSTEMS DRAWING SANTA BARBARA PLANNING COMMISSION HEARING ROOM
AVS05	AUDIOVISUAL SYSTEMS DRAWING SANTA BARBARA PLANNING COMMISSION HEARING ROOM
AVS06	AUDIOVISUAL SYSTEMS DRAWING SANTA BARBARA PLANNING COMMISSION HEARING ROOM
AVS07	AUDIOVISUAL SYSTEMS DRAWING SANTA BARBARA CONFERENCE ROOM 405
AVS08	AUDIOVISUAL SYSTEMS DRAWING SANTA MARIA HEARING ROOM 108
AVS09	AUDIOVISUAL SYSTEMS DRAWING SANTA MARIA HEARING ROOM 108
AVS10	AUDIOVISUAL SYSTEMS DRAWING SANTA MARIA HEARING ROOM 108
AVS11	AUDIOVISUAL SYSTEMS DRAWING SANTA MARIA CONFERENCE ROOM

4.2 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
AV001	AUDIOVISUAL INFRASTRUCTURE LEGENDS AND NOTES
AV002	AUDIOVISUAL INFRASTRUCTURE LEGENDS AND SCHEDULES
AV011	SANTA BARBARA AUDIOVISUAL HEARING ROOM EQUIPMENT PLAN
AV012	SANTA BARBARA AUDIOVISUAL PLANNING COMMISSION HEARING ROOM EQUIPMENT PLAN
AV013	SANTA BARBARA AUDIOVISUAL CONFERENCE ROOM 405 EQUIPMENT PLAN
AV014	SANTA BARBARA AUDIOVISUAL BASEMENT EQUIPMENT PLAN
AV015	SANTA MARIA AUDIOVISUAL ADMINISTRATION BUILDING EQUIPMENT PLAN
AV101	SANTA BARBARA AUDIOVISUAL INFRASTRUCTURE HEARING ROOM DEMO PLAN
AV102	SANTA BARBARA AUDIOVISUAL INFRASTRUCTURE PLANNING COMMISSION HEARING ROOM DEMO PLAN
AV0103	SANTA BARBARA AUDIOVISUAL INFRASTRUCTURE CONFERENCE ROOM 405 DEMO PLAN
AV105	SANTA MARIA AUDIOVISUAL INFRASTRUCTURE ADMINISTRATION BUILDING DEMO PLAN
AV201	SANTA BARBARA AUDIOVISUAL INFRASTRUCTURE HEARING ROOM PLANS
AV202	SANTA BARBARA AUDIOVISUAL INFRASTRUCTURE PLANNING COMMISSION HEARING ROOM PLANS
AV203	SANTA BARBARA AUDIOVISUAL INFRASTRUCTURE CONFERENCE ROOM 405 PLANS
AV204	SANTA MARIA AUDIOVISUAL INFRASTRUCTURE BASEMENT PLAN
AV205	SANTA BARBARA AUDIOVISUAL INFRASTRUCTURE ADMINISTRATION BUILDING FLOOR PLAN
AV305	SANTA MARIA AUDIOVISUAL INFRASTRUCTURE ADMINISTRATION REFLECTED CEILING PLAN
AV501	AUDIOVISUAL INFRASTRUCTURE ROOM RISERS
AV502	AUDIOVISUAL INFRASTRUCTURE ROOM RISERS
AV503	AUDIOVISUAL INFRASTRUCTURE ROOM RISERS
AV801	AUDIOVISUAL INFRASTRUCTURE DETAILS

PART 5 - APPENDIX B

5.1 SUMMARY OF AUDIOVISUAL SYSTEMS SUBMITTALS

Description	**Deadline**
Contractor Qualifications	*Per Section 1*
Request for Information (Pre-Bid)	*Per Owner documentation*
Substitution Requests	*Per Owner documentation*
Line item pricing	Post-bid, if requested
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
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: 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.

5.2 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. <Manufacturer Name> – Master Quote #XXXXX
2. <Manufacturer Name> – Master Quote #XXXXX
3. <Manufacturer Name> – Master Quote #XXXXX

5.3 MANUFACTURER CONTACT INFORMATION

A. Certain products and/or equipment groups included in this specification will be customized by the manufacturer. The following contact information is provided as a convenience for bidding purposes.

<Manufacturer Name>	<Contact Person> <Phone Number> <E-mail>

5.4 LIST OF BRAND SPECIFIC PRODUCTS

A. Some manufacturer's names and product descriptions used in this specification are product specific with no substitutions allowed. The items listed as “Brand Specific” in this specification must be the manufacturer and type specified. These specific products are required for compatibility with the Owner’s existing systems and to maintain continuity of support. The Brand Specific Products specified for this project include those by:

1. Crestron
2. Tricaster
3. Shure
4. Bosch

County of Santa Barbara
CSBTV Upgrades

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Type : **AVS01, AVS02, AVS03**					
Name : **Santa Barbara Hearing Room**					
Display Surfaces					
1	NEC	EA223WM-BK	22" LED-Backlit Desktop Monitor w/ Adjustable Stand	8	-
3	NEC	C651Q	65" Professional LED Edge-Lit Display, 3840x2160 Native	2	-
4	NEC	C861Q	86" Professional LED Edge-Lit Display w/Built-In Speakers, 3840x2160 Native	2	-
5	Chief	LTM1U	Large FUSION Micro-Adjustable Tilt Wall Mount	4	-
Source Devices					
6	115-0001	OptiPlex 3070 Small Form Factor	Intel Core i5-9500, Windows 10 Pro 64bit, Includes Keyboard and Mouse	4	-
7	Barco	CSE-200+	4K Wireless Collaboration System Including Base and 2 Buttons	1	-
Video Capture, Streaming and Conferencing					
8	Panasonic	AW-HN130	Professional PTZ Camera w/ NDI HX	3	-
9	Vaddio	DocCam 20 HDBT OneLINK HDMI	Ceiling Mounted Document Camera OneLink HDMI System	1	-
Speech Reinforcement System/Audio Conferencing					
10	Bosch	DCMN-MMD2	Desktop Conferencing Unit; DICENTIS Multimedia Device, 2nd generation - this version is required for NFC identification feature (sold without mic) Replaces (DCNM-MMD F.01U.269.131)	22	-
11	Bosch	DCMN-APS2	DISCENTIS Audio Powering Switch - 2nd Generation (for DISCENTIS Conference System, including DISCENTI multimedia)	3	-
12	Bosch	DISCENTIS Software - System	Conference Management Software (Per System)	1	-
13	Bosch	DISCENTIS Software - Seat	Conference Management Software (Per Seat)	22	-
14	Bosch	DCMN-MICL	DICENTIS 18" Gooseneck Microphone	22	-
15	BSS	BLU-100	12 Mic/Line In x 8 Mic/Line Out Audio DSP w/ BLU Link	1	-
Assisted Listening					
16	Listen Technologies	LT-84	IR Transmitter/Radiator	1	-
17	Listen Technologies	LA-141	Listen IR Expansion Radiator	3	-
18	Listen	LR-5200-IR	Advanced Intelligent DSP IR Receiver	10	-
Sound Reinforcement System					
19	JBL	CBT 1000	High-Output Two-Way Line Array Column w/Pan/Tilt Bracket Included	2	-
20	Crown	DCi 4|300N	4-CH, 150W per @2ohm, 300W per @4ohm, 300W per @8ohm, 300W@70V, Networking Amplifier	1	-
21	Shure	ULXD1	Wireless Bodypack Transmitter	4	-
22	Shure	ULXD2/SM58	Handheld Digital Wireless Microphone Transmitter	2	-
23	Shure	WL93-6	Omni Lavalier Microphone w/6ft Cable for Shure Body Packs	2	-
24	Shure	ULXD4Q	Quad Channel Digital Wireless Receiver	1	-
Control System					

County of Santa Barbara
CSBTV Upgrades

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Type : **AVS01, AVS02, AVS03**					
Name : **Santa Barbara Hearing Room**					
25	Crestron	TWS-1060-B-S	10.1 in. Touch Screen, Black Smooth	3	-
26	Crestron	CEN-SWPOE-16	(16) Port Gigabit Managed PoE+ Switch	1	-
27	Crestron	MP-WP152	Media Presentation Wall Plate - HDMI	1	D
28	Crestron	DM-NVX-352	DM 4K60 4:4:4 HDR Network AV Encoder/Decoder, w/Dante, USB	19	-
29	Crestron	DM-TX-4K-302-C	4K DigitalMedia 8G+ Transmitter 302	1	-
30	Crestron	DMPS-4K-350-C	3 Series 4K DigitalMedia Presentation System 350	1	-
31	Cisco	FS350-48	Managed Network Switch, 48 Port	1	-
32	Cisco	FS350-10MP	Managed Network Switch, 10 Port	1	-
Production Switchers, Graphics, and Teleprompting					
33	NewTek	TC1	Tricaster TC1 16 Input 4k Production Switcher, 3RU, Redundant Power	1	-
34	NewTek	TC1LP	Tricaster TC1 Control Panel	2	-
35	Leightronix	ULTRANexus-HD Flex	Network Managed HD/SDI Digital Video Server, H.264, 1 TB Hard Drive	1	-
36	Ensemble Designs	Avenue 5035	3G/HD/SD SDI to HDMI Converter	1	-
37	NewTek	MediaDS	Media Distribution Center	1	-
38	NewTek	NC1	I/O IP Note: Purchase of Professional Service hours requied for setup of NC1. Exact amount of PSP hours may be determined after mandatory pre-sale consultation w/ NewTek.	1	-
39	NewTek	Talkshow VS 4000	NewTek Skype Control	1	-
40	Seagate	IronWolf Pro 4TB NAS	Internal Hard Rvice HDD w/ Data Recovery	1	-
41	Blackmagic	SMART VIDEOHUB 12X12	Smart Videohub 12X12 6G-SDI Video Router/Switcher	1	-
42	Blackmagic	ATEM Studio Converter	4x Optical Fiber Converters, 1 RU	1	-
43	Blackmagic	ATEM Camera Converter	Battery Powered Optical Fiber w/ Talkback, Tally, and Mic Inputs	1	-
44	Blackmagic	Duplicator 4K	Recorder and Duplicator, 25 SD Cards	1	-
45	Blackmagic	Multiviewer 4	Monitor SD, HD, Ultra HD	2	-
46	SKAARHOJ	Dual GPIO	Dual GPIO Controller	1	-
47	Cisco	FS350-28MP	Managed Network Switch, 28 Port	1	-
Power Distribution and Sequencing					
48	FSR	SF4	4" Round Poke Through Floor Box	5	-
49	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	4	-
50	FSR	WB-X1-GNG	Wallbox w/ Locking Door	1	-
Rack, Panels, Misc.					
51	Middle Atlantic	WRK-24SA-32	WRK-SA Series 24RU, 32"D Rack	2	-
52	Generic	Type A - 1 CAT6	Type A - 1 CAT6	10	-
53			Installation Materials as Defined in AV Systems Specification	Lot	
54			Custom Wall/Floor Box and Decorator-Style Plates as Needed	Lot	
55			Pre-Made Loose Cabling and Field Cabling as Needed	Lot	

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Type : **AVS01, AVS02, AVS03**					
Name : **Santa Barbara Hearing Room**					
56			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
57			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
58			Control System Accessories as Needed	Lot	
59			Power Supplies and Power Distribution as Needed	Lot	
60			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

County of Santa Barbara
CSBTV Upgrades

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number :					
Type : **AVS04, AVS05, AVS06**					
Name : **SB Planning Commissioning Room**					
Display Surfaces					
1	NEC	EA223WM-BK	22" LED-Backlit Desktop Monitor w/ Adjustable Stand	11	-
2	NEC	C501	50" Professional LED Edge-Lit Display w/Built-In Speakers, 1920x1080 Native	1	-
3	NEC	C651Q	65" Professional LED Edge-Lit Display, 3840x2160 Native	2	-
4	NEC	C751Q	75" Professional LED Edge-Lit Display w/Built-In Speakers, 3840x2160 Native	2	-
5	Chief	LTM1U	Large FUSION Micro-Adjustable Tilt Wall Mount	5	-
Source Devices					
6	Dell	OptiPlex 3070 Small Form Factor	Intel Core i5-9500, Windows 10 Pro 64bit, Includes Keyboard and Mouse	3	-
7	Barco	CSE-200+	4K Wireless Collaboration System Including Base and 2 Buttons	1	-
Video Capture, Streaming and Conferencing					
8	Panasonic	AW-HN130	Professional PTZ Camera w/ NDI HX	4	-
9	Vaddio	DocCam 20 HDBT OneLINK HDMI	Ceiling Mounted Document Camera OneLink HDMI System	1	-
10	Elmo	PX-30	4K Document Camera, 4k at 30fps and Full HD at 60fps, 12x Optical, 12x Digital oon, 2x SensorZoon, 5" High-Resolution LCD Preview Monitor w/Touch Screen, Outputs include: HDMI, VGA, USB, HDBaseT	1	-
Speech Reinforcement System/Audio Conferencing					
11	Bosch	DCMN-MMD2	Desktop Conferencing Unit; DICENTIS Multimedia Device, 2nd generation - this version is required for NFC identification feature (sold without mic) Replaces (DCNM-MMD F.01U.269.131)	10	-
12	Bosch	DCMN-APS2	DISCENTIS Audio Powering Switch - 2nd Generation (for DISCENTIS Conference System, including DISCENTI multimedia)	2	-
13	Bosch	DISCENTIS Software - System	Conference Management Software (Per System)	1	-
14	Bosch	DISCENTIS Software - Seat	Conference Management Software (Per Seat)	10	-
15	Bosch	DCMN-MICL	DICENTIS 18" Gooseneck Microphone	10	-
16	BSS	BLU-100	12 Mic/Line In x 8 Mic/Line Out Audio DSP w/ BLU Link	1	-
17	Listen Technologies	LT-84	IR Transmitter/Radiator	1	-
18	Listen Technologies	LA-141	Listen IR Expansion Radiator	3	-
19	Listen	LR-5200-IR	Advanced Intelligent DSP IR Receiver	1	-
Sound Reinforcement System					
20	JBL	Control 26CT	6.5" 2-way Ceiling Loudspeaker w/70V Transformer	7	-
21	Crown	DCi 4|600N	4-CH, 300W per @2ohm, 600W per @4ohm, 600W per @8ohm, 600W@70V, Networking Amplifier	1	-
22	Shure	ULXD1	Wireless Bodypack Transmitter	4	-
23	Shure	ULXD2/SM58	Handheld Digital Wireless Microphone Transmitter	2	-

County of Santa Barbara
CSBTV Upgrades

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number :					
Type : **AVS04, AVS05, AVS06**					
Name : **SB Planning Commissioning Room**					
24	Shure	WL93-6	Omni Lavalier Microphone w/6ft Cable for Shure Body Packs	2	-
25	Shure	ULXD4Q	Quad Channel Digital Wireless Receiver	1	-
Control System					
26	Crestron	TWS-1060-B-S	10.1 in. Touch Screen, Black Smooth	3	-
27	Crestron	CEN-SWPOE-16	(16) Port Gigabit Managed PoE+ Switch	1	-
28	Crestron	MP-WP152	Media Presentation Wall Plate - HDMI	1	D
29	Crestron	DM-NVX-352	DM 4K60 4:4:4 HDR Network AV Encoder/Decoder, w/Dante, USB	19	-
30	Crestron	DM-TX-4K-302-C	4K DigitalMedia 8G+ Transmitter 302	1	-
31	Crestron	DMPS-4K-350-C	3 Series 4K DigitalMedia Presentation System 350	1	-
32	Cisco	FS350-28MP	Managed Network Switch, 28 Port	1	-
33	Cisco	FS350-10MP	Managed Network Switch, 10 Port	1	-
Production Switchers, Graphics, and Teleprompting					
34	NewTek	NC1	I/O IP Note: Purchase of Professional Service hours requied for setup of NC1. Exact amount of PSP hours may be determined after mandatory pre-sale consultation w/ NewTek.	1	-
35	NewTek	Talkshow VS 4000	NewTek Skype Control	1	-
Power Distribution and Sequencing					
36	FSR	SF4	4" Round Poke Through Floor Box	2	-
37	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	4	-
Rack, Panels, Misc.					
38	Middle Atlantic	WRK-24SA-32	WRK-SA Series 24RU, 32"D Rack	2	-
39	Generic	Type A - 1 CAT6	Type A - 1 CAT6	10	-
40			Installation Materials as Defined in AV Systems Specification	Lot	
41			Custom Wall/Floor Box and Decorator-Style Plates as Needed	Lot	
42			Pre-Made Loose Cabling and Field Cabling as Needed	Lot	
43			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
44			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
45			Control System Accessories as Needed	Lot	
46			Power Supplies and Power Distribution as Needed	Lot	
47			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

County of Santa Barbara
CSBTV Upgrades

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

Number : **405**

Type : **AVS07**

Name : **SB Conference Room**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Surfaces					
1	NEC	C861Q	86" Professional LED Edge-Lit Display w/Built-In Speakers, 3840x2160 Native	1	-
2	Chief	LTM1U	Large FUSION Micro-Adjustable Tilt Wall Mount	1	-
Source Devices					
3	Owner Furnished	Laptop	Owner Furnished Laptop	2	-
Video Capture, Streaming and Conferencing					
4	Polycom	7200-65320-001	Polycom Group 310 720P Videoconference Codec and Acoustic Camera	1	-
5	Barco	CSE-200+	4K Wireless Collaboration System Including Base and 2 Buttons (OFCI)	1	A
Signal Processing, Routing, and Distribution					
6	Cisco	SG350-10MP	10-Port PoE Managed Switch (124W PoE)	1	-
Sound Reinforcement System					
7	JBL	Control 26CT	6.5" 2-way Ceiling Loudspeaker w/70V Transformer	2	-
8	Crown	DCi 4|300N	4-CH, 150W per @2ohm, 300W per @4ohm, 300W per @8ohm, 300W@70V, Networking Amplifier	1	-
9	BSS	BLU-100	12 Mic/Line In x 8 Mic/Line Out Audio DSP w/ BLU Link	1	-
10	Shure	ULXD1	Wireless Bodypack Transmitter	2	-
11	Shure	ULXD2/SM58	Handheld Digital Wireless Microphone Transmitter	1	-
12	Shure	WL93-6	Omni Lavalier Microphone w/6ft Cable for Shure Body Packs	1	-
13	Shure	ULXD4D	Dual Channel Digital Wireless Receiver	1	-
Control System					
14	Crestron	FT-TS600X	FlipTop 5" Touch Screen. Cable Cubby with Configurable Cable and Power Outlets.	1	-
15	Crestron	DM-NVX-352	DM 4K60 4:4:4 HDR Network AV Encoder/Decoder, w/Dante, USB	2	-
16	Crestron	CEN-SWPOE-5	(5) Port Gigabit Unmanaged PoE Switch	1	-
17	Crestron	MP-WP152	Media Presentation Wall Plate - HDMI	1	D
18	Crestron	TWS-1060-B-S	10.1 in. Touch Screen, Black Smooth	1	-
19	Crestron	DM-TX-4K-302-C	4K DigitalMedia 8G+ Transmitter 302	1	-
20	Crestron	DMPS-4K-350-C	3 Series 4K DigitalMedia Presentation System 350	1	-
Power Distribution & Sequencing					
21	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	2	-
22	FSR	SF4	4" Round Poke Through Floor Box	1	-
Rack, Panels, Misc.					
23	Generic	Type A - 1 CAT6	Type A - 1 CAT6	2	-
24	Middle Atlantic	C5-FF27-1	C5-Series Frame, (1) Bay, 27"D	1	-
25			Installation Materials as Defined in AV Systems Specification	Lot	
26			Custom Wall/Floor Box and Decorator-Style Plates as Needed	Lot	

County of Santa Barbara
CSBTV Upgrades

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **405**					
Type : **AVS07**					
Name : **SB Conference Room**					
27			Pre-Made Loose Cabling and Field Cabling as Needed	Lot	
28			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
29			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
30			Control System Accessories as Needed	Lot	
31			Power Supplies and Power Distribution as Needed	Lot	
32			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

County of Santa Barbara
CSBTV Upgrades

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

Number : **108**

Type : **AVS06**

Name : **SM Hearing Room**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Surfaces					
1	NEC	EA223WM-BK	22" LED-Backlit Desktop Monitor w/ Adjustable Stand	9	-
2	NEC	C501	50" Professional LED Edge-Lit Display w/Built-In Speakers, 1920x1080 Native	1	-
3	NEC	C551	55" Thin-Depth Commercial Display, 1920x1080	1	-
4	NEC	C651Q	65" Professional LED Edge-Lit Display, 3840x2160 Native	5	-
5	NEC	C861Q-AVT2	86" 4K UHD Display with Integrated ATSC Tuner	1	-
6	NEC	C981Q	98" Professional LED Edge-Lit Display w/Built-In Speakers, 3840x2160 Native	1	-
7	Chief	LTM1U	Large FUSION Micro-Adjustable Tilt Wall Mount	7	-
8	Chief	XTM1U	X-Large FUSION Micro-Adjustable Tilt Wall Mount	2	-
Source Devices					
9	Barco	CSE-200+	4K Wireless Collaboration System Including Base and 2 Buttons	1	-
10	Dell	OptiPlex 3070 Small Form Factor	Intel Core i5-9500, Windows 10 Pro 64bit, Includes Keyboard and Mouse	3	-
11	Elmo	PX-30	4K Document Camera, 4k at 30fps and Full HD at 60fps, 12x Optical, 12x Digital oon, 2x SensorZoon, 5" High-Resolution LCD Preview Monitor w/Touch Screen, Outputs include: HDMI, VGA, USB, HDBaseT	1	-
Video Capture, Streaming and Conferencing					
12	Panasonic	AW-HN130	Professional PTZ Camera w/ NDI HX	3	-
13	Elmo	PX-30	4K Document Camera, 4k at 30fps and Full HD at 60fps, 12x Optical, 12x Digital oon, 2x SensorZoon, 5" High-Resolution LCD Preview Monitor w/Touch Screen, Outputs include: HDMI, VGA, USB, HDBaseT	1	-
Speech Reinforcement System/Audio Conferencing					
14	Bosch	DCMN-MMD2	Desktop Conferencing Unit; DICENTIS Multimedia Device, 2nd generation - this version is required for NFC identification feature (sold without mic) Replaces (DCNM-MMD F.01U.269.131)	16	-
15	Bosch	DCMN-APS2	DISCENTIS Audio Powering Switch - 2nd Generation (for DISCENTIS Conference System, including DISCENTI multimedia)	2	-
16	Bosch	DISCENTIS Software - System	Conference Management Software (Per System)	1	-
17	Bosch	DISCENTIS Software - Seat	Conference Management Software (Per Seat)	16	-
18	Bosch	DCMN-MICL	DICENTIS 18" Gooseneck Microphone	16	-
Sound Reinforcement System					
19	JBL	Control 26CT	6.5" 2-way Ceiling Loudspeaker w/70V Transformer	13	-
20	Crown	DCi 4|600N	4-CH, 300W per @2ohm, 600W per @4ohm, 600W per @8ohm, 600W@70V, Networking Amplifier	1	-
21	Shure	ULXD1	Wireless Bodypack Transmitter	4	-
22	Shure	ULXD2/SM58	Handheld Digital Wireless Microphone Transmitter	2	-

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **108**					
Type : **AVS06**					
Name : **SM Hearing Room**					
23	Shure	WL93-6	Omni Lavalier Microphone w/6ft Cable for Shure Body Packs	2	-
24	Shure	ULXD4Q	Quad Channel Digital Wireless Receiver	1	-
25	BSS	BLU-100	12 Mic/Line In x 8 Mic/Line Out Audio DSP w/ BLU Link	1	-
Assisted Listening System					
26	Listen Technologies	LT-84	IR Transmitter/Radiator	1	-
27	Listen Technologies	LA-141	Listen IR Expansion Radiator	3	-
28	Listen	LR-5200-IR	Advanced Intelligent DSP IR Receiver	10	-
Control System					
29	Crestron	TWS-1060-B-S	10.1 in. Touch Screen, Black Smooth	3	-
30	Cisco	FS350-48	Managed Network Switch, 48 Port	1	-
31	Crestron	CEN-SWPOE-16	(16) Port Gigabit Managed PoE+ Switch	1	-
32	Crestron	MP-WP152	Media Presentation Wall Plate - HDMI	6	D
33	Crestron	DM-NVX-352	DM 4K60 4:4:4 HDR Network AV Encoder/Decoder, w/Dante, USB	31	-
34	Crestron	DM-TX-4K-302-C	4K DigitalMedia 8G+ Transmitter 302	1	-
35	Crestron	DMPS-4K-350-C	3 Series 4K DigitalMedia Presentation System 350	1	-
36	Cisco	FS350-10MP	Managed Network Switch, 10 Port	1	-
Production Switchers, Graphics, and Teleprompting					
37	NewTek	TC1	Tricaster TC1 16 Input 4k Production Switcher, 3RU, Redundant Power	1	-
38	NewTek	TC1LP	Tricaster TC1 Control Panel	1	-
39	Leightronix	ULTRANexus-HD Flex	Network Managed HD/SDI Digital Video Server, H.264, 1 TB Hard Drive	1	-
40	Ensemble Designs	Avenue 5035	3G/HD/SD SDI to HDMI Converter	1	-
41	NewTek	MediaDS	Media Distribution Center	1	-
42	NewTek	NC1	I/O IP Note: Purchase of Professional Service hours requied for setup of NC1. Exact amount of PSP hours may be determined after mandatory pre-sale consultation w/ NewTek.	1	-
43	NewTek	Talkshow VS 4000	NewTek Skype Control	1	-
44	Seagate	IronWolf Pro 4TB NAS	Internal Hard Rvice HDD w/ Data Recovery	1	-
45	Blackmagic	SMART VIDEOHUB 12X12	Smart Videohub 12X12 6G-SDI Video Router/Switcher	1	-
46	Blackmagic	ATEM Studio Converter	4x Optical Fiber Converters, 1 RU	1	-
47	Blackmagic	ATEM Camera Converter	Battery Powered Optical Fiber w/ Talkback, Tally, and Mic Inputs	1	-
48	Blackmagic	Duplicator 4K	Recorder and Duplicator, 25 SD Cards	1	-
49	Blackmagic	Multiviewer 4	Monitor SD, HD, Ultra HD	1	-
50	SKAARHOJ	ETH-GPI Link	GPIO Controller	1	-
51	Cisco	FS350-28MP	Managed Network Switch, 28 Port	1	-
Power Distribution and Sequencing					

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Number : **108**					
Type : **AVS06**					
Name : **SM Hearing Room**					
52	FSR	SF4	4" Round Poke Through Floor Box	1	-
53	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	4	-
54	FSR	WB-X1-GNG	Wallbox w/ Locking Door	1	-
Rack, Panels, Misc.					
55	Middle Atlantic	WRK-24SA-32	WRK-SA Series 24RU, 32"D Rack	2	-
56	Generic	Type A - 1 CAT6	Type A - 1 CAT6	10	-
57			Installation Materials as Defined in AV Systems Specification	Lot	
58			Custom Wall/Floor Box and Decorator-Style Plates as Needed	Lot	
59			Pre-Made Loose Cabling and Field Cabling as Needed	Lot	
60			Rack Panels, Vents, Mounts, Shelves, Other Equipment Rack Materials as Needed	Lot	
61			Wall, Ceiling Mounts and Mounting Hardware as Needed	Lot	
62			Control System Accessories as Needed	Lot	
63			Power Supplies and Power Distribution as Needed	Lot	
64			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

County of Santa Barbara
CSBTV Upgrades

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

Number : **109**
Type : **AVS05**
Name : **SM Conference Room**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Display Surfaces					
1	NEC	C651Q	65" Professional LED Edge-Lit Display, 3840x2160 Native	1	-
2	Chief	LTM1U	Large FUSION Micro-Adjustable Tilt Wall Mount	1	-
Source Devices					
3	Owner Furnished	Laptop	Owner Furnished Laptop (OFCI)	2	A
Video Capture, Streaming and Conferencing					
4	Polycom	7200-65320-001	Polycom Group 310 720P Videoconference Codec and Acoustic Camera	1	-
5	Barco	CSE-200+	4K Wireless Collaboration System Including Base and 2 Buttons	1	-
Signal Processing, Routing, and Distribution					
6	Cisco	SG350-10MP	10-Port PoE Managed Switch (124W PoE)	1	-
Speech Reinforcement System/Audio Conferencing					
7	Bosch	DCMN-APS2	DISCENTIS Audio Powering Switch - 2nd Generation (for DISCENTIS Conference System, including DISCENTI multimedia)	2	-
8	Bosch	DCMN-MICL	DICENTIS 18" Gooseneck Microphone	1	-
Sound Reinforcement System					
9	JBL	Control 26CT	6.5" 2-way Ceiling Loudspeaker w/70V Transformer	2	-
10	Crown	DCi 4|300N	4-CH, 150W per @2ohm, 300W per @4ohm, 300W per @8ohm, 300W@70V, Networking Amplifier	1	-
11	BSS	BLU-100	12 Mic/Line In x 8 Mic/Line Out Audio DSP w/ BLU Link	1	-
12	Shure	ULXD1	Wireless Bodypack Transmitter	2	-
13	Shure	ULXD2/SM58	Handheld Digital Wireless Microphone Transmitter	1	-
14	Shure	WL93-6	Omni Lavalier Microphone w/6ft Cable for Shure Body Packs	1	-
15	Shure	ULXD4D	Dual Channel Digital Wireless Receiver	1	-
Control System					
16	Crestron	FT-TS600X	FlipTop 5" Touch Screen. Cable Cubby with Configurable Cable and Power Outlets.	1	-
17	Crestron	DM-NVX-352	DM 4K60 4:4:4 HDR Network AV Encoder/Decoder, w/Dante, USB	2	-
18	Crestron	CEN-SWPOE-5	(5) Port Gigabit Unmanaged PoE Switch	1	-
19	Crestron	MP-WP152	Media Presentation Wall Plate - HDMI	2	D
20	Crestron	DM-TX-4K-302-C	4K DigitalMedia 8G+ Transmitter 302	2	-
21	Crestron	DMPS-4K-350-C	3 Series 4K DigitalMedia Presentation System 350	1	-
22	Crestron	TWS-1060-B-S	10.1 in. Touch Screen, Black Smooth	1	-
Power Distribution and Sequencing					
23	Tripp-Lite	SMART2600RM2U	Uninterruptible Power Supply, 2200VA/1920W, Networkable, Rack-mountable	2	-
24	FSR	SF4	4" Round Poke Through Floor Box	1	-

County of Santa Barbara
CSBTV Upgrades

Audiovisual Systems

Audiovisual Systems Opinion of Probable Cost

Number : **109**

Type : **AVS05**

Name : **SM Conference Room**

ID	Manufacturer	Model	Item / Description	Unit Qty	Bidding Notes
Rack, Panels, Misc.					
25	Generic	Type A - 1 CAT6	Type A - 1 CAT6	2	-
26	Middle Atlantic	C5-FF27-1	C5-Series Frame, (1) Bay, 27"D	1	-
27			Installation Materials as Defined in AV Systems Specification	Lot	
28			Custom Wall/Floor Box and Decorator-Style Plates as Needed	Lot	
29			Pre-Made Loose Cabling and Field Cabling 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	
32			Control System Accessories as Needed	Lot	
33			Power Supplies and Power Distribution as Needed	Lot	
34			Cable Terminations, Cable Dressing, Labels, Ties, Cable Management as Needed	Lot	

Keyed Bidding Notes

A. OFCI (Owner Furnished Contractor Installed)
B. OFOI (Owner Furnished Other Installed)
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