



**ACKNOWLEDGMENT OF RECEIPT
IFB # 2955-9**

Description: CGCC MEDIA SYSTEMS

Please provide the requested information below as acknowledgment that you have received our Invitation for Bid noted above. It is **strongly recommended** that interested Bidders complete this acknowledgment and return via Fax to MCCCCD Purchasing at (480) 731-8190. **Only by doing this, will we be able to provide you notification of any amendments to this Bid.**

Bids from firms **not** acknowledging amendments may be considered incomplete and subject to disqualification.

Name of Firm: _____

Address: _____

Fax #: _____ Tel. #: _____

e-mail: _____

Name:(Print) _____ Title: _____

Signature: _____ Date: _____



MARICOPA COUNTY COMMUNITY COLLEGE DISTRICT

**INVITATION FOR BID
IFB #2955-9**

MEDIA SYSTEMS

**CHANDLER-GILBERT COMMUNITY COLLEGE
Ironwood Hall**

BIDS DUE: 3:00:00 PM (MST), TUESDAY, NOVEMBER 3, 2009

MARICOPA COUNTY COMMUNITY COLLEGE DISTRICT
 IFB #2955-9
 CGCC MEDIA SYSTEMS

1.0 It is the intent of Maricopa County Community College District (MCCCD or the District) to select an AV Contractor to provide and install Media Systems in the new Ironwood Hall Building on the campus of Chandler-Gilbert Community College (CGCC), 2626 E. Pecos, Chandler, AZ 85225. The purchase award will be made to the responsible and responsive Bidder submitting the lowest Total Price (not including applicable taxes). This IS an all or nothing bid.

1.1 SCOPE OF WORK The Contractor shall provide all equipment, materials, labor, parts, insurance and supervision for the installation of a fully functional, turnkey system, per the project specifications detailed in Section 5, Project Specifications (Digital Media Design, LLC of 9/30/09), and accompanying drawings.

1.2 SCHEDULE OF EVENTS (Dates subject to amendment)

<u>Deadline for Submission of Substitute Equip. and QUESTIONS</u>	4:00 P.M. (MST) Monday, October 26, 2009
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<u>Bids Due</u>	No later than 3:00:00 P.M. (MST), TUESDAY, NOV. 3, 2009
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<u>Notice of Award (estimated)</u>	November 5, 2009
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Purchase Order will be issued only after the Acceptance of Notice of Award has been signed and returned along with the Payment and Performance Bonds and Certificates of Insurance/Workman's Comp.

Project Start Date	December 1, 2009
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Substantial Completion/Begin Testing	January 7, 2010
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Final Acceptance/ Beginning of Warranty Period followed closely by Training of Personnel	January 13, 2010
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2. INSTRUCTIONS TO BIDDERS

2.1 **BID SUBMITTAL** It shall be the responsibility of the Bidder to assure that Bids as described in the BID REQUIREMENTS section are received as follows:

Bids must be received at the First Floor Lobby Reception Desk, MCCCCD, 2411 W. 14th Street, Tempe, Arizona, 85281, no later than **3:00:00 P.M. (MST), TUESDAY, NOVEMBER 3, 2009**. When delivering the Bid, Bidders should allow sufficient time to check in with Security.

The bid must be delivered sealed with the following information clearly visible on the packaging: IFB #2955-9, CGCC Media Systems, 3:00 P.M., Nov. 3, 2009

Bids received after this time and date shall not be considered and will be returned unopened. Bids will be opened after the hour at: District Office, 2411 W. 14th St., Tempe, AZ - 5th Floor Purchasing Conference Room, and the prices read aloud and recorded; no award will be made at this time. Any subsequent contract will be awarded only after review of the bid results by MCCCCD Purchasing.

2.2 **QUESTIONS** All questions regarding this solicitation are to be submitted **IN WRITING** by fax or e-mail to: Digital Media Design, LLC, Attn: James Chalifoux, CTS
Fax: 480.588.7692 E-mail: dmdllc@cox.net

DEADLINE FOR QUESTIONS is 4:00 PM (MST), Monday, October 26, 2009. Questions received after this time will not be acknowledged. Answers to questions requiring an amendment to the IFB, including any resultant change of Bid Due Date, will be addressed per section 2.8 below.

2.3 **SITE VISITS** Interested Bidders may make an appointment to schedule a site walkthru by contacting Mr. Tim Keefe at 480.732.7033.

2.4 **BID EVALUATION** This Invitation for Bid does not constitute a commitment by the District to award a contract. The District reserves the right to waive any informality and to reject any or all Bids and/or to cancel this IFB when MCCCCD determines it is in the best interest of the District to do so. MCCCCD shall have the right to reject a Bid not accompanied by any data required by the IFB. Bids which are in any way incomplete or irregular as well as conditional Bids may not be accepted. No contract shall exist until executed in writing.

2.5 **BID FORM** All Bids must be submitted in writing. No oral or telephone Bids, modifications, or amendments will be considered. Facsimile (fax machine) or computer data transfer submittals will not be accepted. A Bidder by submitting a Bid represents that the IFB has been read and understood and that the Bid is made in accordance therewith. All documents submitted with the Bid which require a signature must be signed by an individual authorized to submit a formal bid. Bids that are not signed may be rejected.

It is agreed that the discovery of any significant inaccuracy in information given by the Bidder may constitute good and sufficient cause for rejection of the bid.

2.6 AWARD WITHOUT DISCUSSION MCCCCD reserves the right to make a contract award without further discussion of the bids received. It is therefore critical that all bids be submitted initially in the most favorable terms possible, both economically and technically.

2.7 MODIFICATION OR WITHDRAWAL OF A BID Prior to the time and date designated for receipt of Bids, Bids may be modified or withdrawn only by notice to MCCCCD. Modification or withdrawal must be in writing, signed and received by MCCCCD prior to the time designated for receipt of bids by MCCCCD at the address provided herein. Withdrawn bids may be resubmitted up to the time designated for the receipt of bids provided that they are fully in conformance with Bid Requirements.

2.8 MCCCCD MODIFICATION TO IFB Any interpretation, correction, or change of this Invitation for Bid will be made by written Amendment issued by MCCCCD. Interpretations, corrections, or changes made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections, and changes. Amendments will be forwarded to all Bidders who have completed and mailed or faxed the attached Acknowledgment of Receipt to MCCCCD Purchasing. Since failure to submit an amendment with a Bid may be cause for rejection, Bidders are strongly encouraged to return the Acknowledgment.

2.9 NON-COLLUSION MCCCCD encourages free and open competition. Whenever possible, specifications, Proposal or Bid invitations and conditions are designed to accomplish this objective, consistent with the necessity to satisfy MCCCCD's needs and the accomplishment of a sound economical operation. By signing this document, the Bidder guarantees that the prices offered have been established without collusion with other eligible Bidders and without effort to preclude MCCCCD from obtaining the lowest possible competitive price.

2.10 COST OF PREPARING BIDS Any and all costs associated with the preparation of responses to this IFB including site visits, oral presentations or any other costs shall be entirely the responsibility of the Bidder and shall not be reimbursable in any manner by the MCCCCD.

2.11 PROPRIETARY INFORMATION In the event any Bidder shall include in the Bid any information deemed "proprietary" or "protected", such information shall be separately packaged from the balance of the Bid and clearly marked as to any proprietary claim. The District discourages the submission of such information and undertakes to provide no more than reasonable efforts to protect the proprietary nature of such information. The District, as a public entity, cannot and does not warrant that proprietary information will not be disclosed. The District shall have the right to use any or all information included in the Bids submitted unless the information is expressly restricted by the Bidder. Pricing is not considered proprietary information.

2.12 BID REQUIREMENTS This IS an all or nothing Bid.

2.12.1 Bidders shall only submit one (1) bid. It is therefore critical that Bidders carefully review all bid documents to ensure that the Bid submitted reflects the most favorable terms possible, both economically and technically. Multiple bids shall result in all bids by the Bidder being rejected.

2.12.2 BID PRICING BID PRICE IS TO REMAIN FIXED FIRM FOR SIXTY (60) DAYS FROM BID DUE DATE to allow time for evaluation and award. Price increases after issuance of the Purchase Order is not allowed. Bid price must include ALL requirements satisfying the Media Systems for Chandler-Gilbert Community College, Ironwood Hall project detailed in Section 5, Project Specifications, including warranty (Part 1.8), training (Part 1.7), and all shipping and delivery charges. Warranty period will begin from the date of final acceptance by CGCC. Items bid are to be brand new from manufacturer including all manuals, if any, and product literature provided by manufacturer with new equipment.

2.12.3 Substitute Items Except as mentioned below, any manufacturers' names, trade name or model number shown are for the purpose of establishing minimum levels regarding capability, quality, and function. Except as mentioned below, whenever such brand name is shown, it is understood to mean OR ACCEPTABLE SUBSTITUTE. Bids will be considered for brand names meeting the minimum levels with the following stipulations:

A. All submissions for approval of Substitute equipment must be received at:

Digital Media Design, LLC
Attn: James Chalifoux, CTS
3165 S. Alma School Rd., Suite 29-246
Chandler, AZ 85248
Fax: 480.588.7692
E-mail: dmdllc@cox.net

on or before **4:00 PM (MST), Monday, October 26, 2009.** (Reference IFB Number on the submission) **Submissions must be accompanied by:**

- 1) Manufacturer's product data sheets on both the specified product and proposed substitute product
- 2) Written comparison for equivalency based on at least the following criteria:
 - a. Performance specifications
 - b. Product and installation costs
 - c. Physical dimensions and weight
 - d. Maintenance costs and product life-span
 - e. Warranty period.

Substitute Items (continued)

B. MCCCCD will make the sole determination as to the suitability of the substitute item bid with regard to compliance to minimum levels, characteristics/features which may affect minimum levels, performance, and budgetary considerations.

C. Items approved as substitutes after review will be identified by Written Amendment prior to the Bid Due date to all Bidders acknowledging receipt of this IFB. Substitute items bid which were not approved by prior written amendment will NOT be accepted.

D. The item bid as an acceptable substitute must clearly be identified as such on the Itemized Price list.

E. In certain instances, MCCCCD has determined that only certain items shall be acceptable:

The Chandler Gilbert Community College employs Crestron's Room View management software campus-wide. No substitutions will be accepted for Crestron products. Additionally, CGCC has standardized on NEC projectors and no substitutes will be accepted for the NEC projectors.

F. The fact that a manufacturer whose product line is supplied by the Bidder chooses not to manufacture a product equal in function and quality, the same being in the sole control and discretion of the manufacturer, shall in no way relieve the Bidder of responsibility to comply fully with requirements of these specifications.

2.12.4 THE COMPLETE RESPONSE TO THIS IFB MUST INCLUDE ONE (1) ORIGINAL (CLEARLY MARKED AS SUCH) AND (2) COPIES OF :

- 1) The completed and signed Price Totals Sheet included with this IFB.
- 2) The completed CGCC Ironwood Hall Media Systems Price List included with this IFB. Bids not including this List shall be deemed non-responsive.
- 4) The completed and signed Signature Page Attachment A included with this IFB.
- 5) QUALIFICATIONS STATEMENT Provide complete and detailed information satisfying the requirements of Section 5, Part 1.2.
- 6) Service Contract, including pricing, for extended annual service and maintenance contract to run after the warranty period. MCCCCD reserves the right to purchase the service and maintenance contract at the price submitted at any time during the warranty period.
- 7) An exceptions/comments sheet (if any exception is taken with this IFB, or additional comments are necessary).

Bid Response (continued)

8) Signed Amendments, if any. Amendments submitted after the original Bid is submitted must also be sealed.

9) **BID SECURITY**: Bid security shall be made payable to, Maricopa County Community College District, in the amount of ten percent (10%) of the total amount of the purchase award. Security shall be either certified check or bid bond issued by a surety company licensed to conduct business in the State of Arizona. The successful Bidder's security shall be retained until the Notice of Award Acceptance is signed and the required Performance and Payment Bonds have been furnished. If any Bidder refuses to enter into a contract, the District will retain the Bid Security as liquidated damages but not as a penalty. Sample Bid Bond is attached as Attachment B to this IFB.

2.13 **PERFORMANCE AND PAYMENT BONDS**: The successful Bidder shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of this Contract and also a Labor and Material Payment Bond in an amount not less than one hundred percent (100%) of the Contract Sum, as a security for the payment of all persons performing labor and furnishing materials for this Contract. **The cost of these Bonds shall be borne by the Contractor and the amount shall be included in the Bid Price.** Bonds shall be made payable to Maricopa County Community College District. Sample Bonds are attached as Attachments C & D to this IFB.

2.14 SELECTION CRITERIA

- 1) Compliance with Bid requirements.
- 2) Total Cost submitted on the Price Totals Sheet, not including taxes.
- 3) Ability to Perform. MCCCCD may make investigations to determine the ability of the Bidder to complete the project in an excellent manner. MCCCCD reserves the right to reject any Bid if MCCCCD is not satisfied that the Bidder is properly qualified to carry out the obligations of the contract. MCCCCD shall make the final decision as to the Bidder's ability to perform.
- 4) MCCCCD reserves the right to consider historic experience with the Bidder in the selection process, including past performance on similar contracts at MCCCCD locations.

2.15 **DEVIATIONS FROM BID** Bidders must specifically provide a separate listing, by section number, of each circumstance in which the Bid submitted differs from any terms or specifications of the IFB. Failure to list such a deviation will result in that terms of the Bid submitted being disregarded in favor of the correlative term(s) of the IFB. Deviations must be clearly detailed as an attachment to the Bid. MCCCCD will make the sole determination as to the suitability of the deviation with regard to the Project.

3. GENERAL TERMS AND CONDITIONS

3.0 The following General Terms and Conditions constitute the provisions of the contract to be executed between the District and the successful Bidder.

3.1 PARTIES TO AGREEMENT The contract shall be between the Maricopa County Community College District, (MCCCD or the District), and the successful Bidder, hereafter referred to as Contractor.

3.2 CONTRACT AWARD Any contract (s) awarded will consist of: all sections and attachments to this IFB including amendments, if any are generated prior to the IFB due date; the Bid submitted by prospective Contractor; and an executed Purchase Order issued from MCCCD Purchasing Department. By submitting a Bid, it is assumed that the Bidder is familiar with, and has the ability to perform, all contract requirements.

3.3 LICENSE AND PERMITS The Contractor shall be financially responsible for obtaining all required permits, licenses, and bonding to comply with all pertinent municipal, county, state and federal laws.

Each Bidder shall be an Arizona licensed Contractor and be appropriately licensed for the intended work at the time of bid submission. It is the Contractor's responsibility to assure that the State of Arizona Registrar of Contractor's license proposed for this project allow the Contractor to perform the full scope of work if it is not a B-01 or B-02 General Commercial Contractor license. In general interpretation, a Specialty Commercial Contracting license will allow a minor amount of subcontracted work to trades outside the specialty license if that work is both directly related to the main work of the project, does not represent a significant percentage of the total contract value (usually 15% or less) and is, in itself, not significant. Examples of what has been allowed is subcontracting of concrete work for concrete patching or concrete pole bases for an exterior electrical lighting contract, or extension of or new electrical circuits from existing circuit breakers needed in an HVAC renovation project. Examples of what has not been allowed to be subcontracted under a Specialty Commercial Contractor license would be providing new electrical panels in the same HVAC renovation project, installing new lay-in ceiling tile throughout a large area when only a small portion was needed in the immediate area of a small replacement air handler, etc.) Contractor must submit the name(s) and AZ ROC license number of all Sub-contractors to be used on this project.

No municipal building permit is required for any District work.

3.4 CONTRACT ASSIGNMENT This Contract, in part or in whole, **shall not** be assigned **without prior written permission of the MCCCD Purchasing Department.**

3.5 SUB-CONTRACTING The Contractor should utilize its own equipment and personnel on MCCCD's projects as much as possible. Reliance on subcontractors should be limited. Where subcontractors are used, the Contractor shall be fully responsible for the performance of the subcontractor, and use requires written approval.

3.6 LIABILITY FOR TAXES The Contractor assumes complete liability for all taxes applicable to the operations, income, and transactions of the Contractor. The District shall not be liable and will not make reimbursement to the Contractor for any tax imposed either directly or indirectly upon the Contractor by any authority by reason of the contract or otherwise.

3.7 PROVISION OF SUPPLIES, MATERIALS AND LABOR The Contractor shall furnish all supplies, equipment, materials, vehicles, and all management and labor necessary for the efficient and sound performance of all requirements of this contract.

3.8 CATASTROPHE If, because of riots, war, public emergency or calamity, fire, earthquake, Act of God, government restriction, labor disturbance or strike, business operations at the District shall be interrupted or stopped, performance of this contract, with the exception of moneys already due and owing, shall be suspended and excused to the extent commensurate with such interfering occurrence; and the expiration date of this contract may by mutual agreement of both parties be extended for a period of time equal to the time that such default in performance is excused.

3.9 CONFLICT OF INTEREST The District may cancel this contract under ARS 38-511 for a violation of that statute.

3.10 INSURANCE When required, the Contractor shall maintain during the term of this Contract the following insurance policies issued by companies licensed in Arizona with a current A. M. Best rating of A:VII or better. Prior to commencing work or services, Contractor shall furnish the District Risk Manager with certificates of insurance evidencing the required coverages, conditions and limits required by this Contract. The insurance policies, except Workers' Compensation and Professional Liability, shall be endorsed to name the Maricopa County Community College District, its agents, officers, officials, employees, and volunteers as additional insureds. In the event any insurance policy(ies) required by this Contract is (are) written on a "claims made" basis, coverage shall extend for two years past completion and acceptance of the Contractor's work or services and must be evidenced by annual certificates of insurance. The insurance policies shall be endorsed stating that they shall not expire, be cancelled, suspended, voided or materially changed without 30 days written notice by certified mail to the District Risk Manager. The Contractor's insurance must be primary, and any insurance or self-insurance maintained by the District shall not contribute to it. If any part of this Contract is subcontracted, these insurance requirements also apply to all subcontractors.

1. **Commercial General Liability** insurance with a limit of not less than \$1,000,000 per occurrence for bodily injury, property damage, personal injury, products and completed operations, and blanket contractual coverage, including but not limited to, the liability assumed under the indemnification provisions of this Contract.

2. **Automobile Liability** insurance with a combined single limit for bodily injury and property damage of not less than \$1,000,000 each occurrence with respect to the Contractor's owned, hired, and non-owned vehicles.

3. **Workers' Compensation** insurance with limits statutorily required by any Federal or state law and **Employer's Liability** insurance of not less than \$100,000 for each accident, \$100,000 disease for each employee, and \$500,000 disease policy limit.

3.11 INDEMNIFICATION To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the District, its agents, officers, officials, employees, and volunteers from and against all claims, damages, losses, and expenses (including but not limited to attorney fees and court costs) arising from the acts, errors, mistakes, omissions, work or service of the Contractor, its agents, employees, or any tier of Contractor's subcontractors in the performance of this Contract. The amount and type of insurance coverage requirements set forth above will in no way be construed as limiting the scope of indemnification in this paragraph.

3.12 COMPLIANCE WITH LAWS The Contractor shall at all times comply with the Federal Immigration Reform and Control Act of 1986 (and by any subsequent amendments thereto) and shall indemnify and hold harmless the District from any and all costs or expenses whatsoever arising out of the Contractor's compliance or noncompliance therewith.

3.13 ADVERTISING No advertising or publicity concerning MCCCCD using the Contractors services shall be made without prior written approval of such advertising or publicity by MCCCCD.

3.14 DELIVERY/FOB All prices shall be F.O.B. Destination and shall include all delivery and unloading at the destination identified in this IFB.

3.15 NON-DISCRIMINATION In connection with the performance of work under this contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of age, race, religion, color, sex, physical condition, developmental disability, or national origin. This provision shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rate of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor further agrees to take affirmative action to insure equal employment opportunities for persons with disabilities.

3.16 CONTRACT TERMINATION MCCCCD may terminate this contract for failure to perform according to the Contract. For termination, MCCCCD may consider such factors as: insufficient insurance coverage, failure to keep wage payments to employees current, quality of service is unsatisfactory to MCCCCD, or actual or possible bankruptcy, insolvency or reorganization. This may include any cessation or diminution of service included but not limited to failure to maintain adequate personnel, whether arising from labor disputes, or otherwise any substantial change in ownership or proprietorship of the Contractor which in the opinion of MCCCCD is not in its best interest or failure to comply with the terms of this contract. MCCCCD may terminate contractor for a combination of factors that results in poor contract performance.

MCCCCD shall provide ten (10) days written notice of non-compliance, and unless within ten (10) days non-compliance has been cured, MCCCCD may terminate the contract by giving thirty (30) days notice in writing by registered or certified mail of its intention to cancel this contract for non-compliance. Contractor will have no further recourse against MCCCCD.

3.17 FERPA If Contractor has access to students' educational records, Contractor shall limit its employees' access to the records to those persons for whom access is essential to the performance of this contract. At all times during this contract, Contractor shall comply with the terms of the Family Educational Rights and Privacy Act of 1974 in all respects. (20 U.S.C. § 1232g; 34 CFR Part 99).

3.18 LEGAL WORKER REQUIREMENTS: As mandated by Arizona Revised Statutes § 41-4401, MCCCDC is prohibited after September 30, 2008 from awarding a contract to any contractor who fails, or whose subcontractors fail, to comply with Arizona Revised Statutes §23-214-A. That statute requires that employers verify the employment eligibility of their employees through the federal E-verify system. An “employer” is an independent contractor, a self-employed person, the State of Arizona or any of its political subdivisions, or any individual or type of organization that transacts business in the State of Arizona, that has a license issued by an agency in the State and that employs one or more employees in the State. (See A.R.S. §23-211-4.) Therefore, in signing or performing any contract for MCCCDC, the Contractor fully understands that:

- A. It warrants that both it and any subcontractors it may use comply with all federal immigration laws and regulations that relate to their employees and with A.R.S. § 23-214-A;
- B. Any breach of that warranty is material and is subject to penalties up to and including immediate termination of the contract; and
- C. MCCCDC or its designee is authorized by law to randomly inspect the records relating to an employee of the Contractor or any of its subcontractors who works on the contract to ensure compliance with the warranty made in Paragraph A above.

3.19 CERTIFICATION Pursuant to Arizona Revised Statutes §35-397, Contractor certifies that it does not have a scrutinized business operation in either Sudan or Iran.

3.20 PAYMENT Payment will be requested by submitting an invoice referencing the Purchase Order number. MCCCDC shall make every effort to process payment within thirty (30) days after receipt of a correct invoice, unless a good faith dispute exists as to any obligation to pay any or all of the invoice. **IN NO INSTANCE, HOWEVER, SHALL SUPPLIES OR SERVICES BE PROVIDED BY THE CONTRACTOR WITHOUT A SIGNED PURCHASE ORDER HAVING BEEN ISSUED BY MCCCDC PURCHASING.** Payment may be withheld for supplies or services provided without a valid Purchase Order.

4. GENERAL CONTRACTOR REQUIREMENTS

4.0 The Contractor agrees that all work performed under this contract shall be done in a manner consistent with industry standards.

4.1 The Contractor shall maintain the same person in charge of work throughout the Project.

4.2 The Contractor shall take all necessary precautions for the safety of students, employees or the public and comply with all applicable provisions of Federal, State, Tribal and Municipal Safety requirements. The Contractor shall confine his equipment, materials and operations of his workmen to the area limited by the Site Coordinator or an authorized designee. The Contractor shall perform the work so as to minimize disruption of the normal operations of the site. .

4.3 No alcohol, weapons, or illegal drugs are allowed on MCCCCD property, nor is any worker to be allowed on the site while under the influence of alcohol or drugs.

4.4 The Contractor assumes all risk as to the nature of the project and difficulties that may be due to any unfavorable conditions that may be encountered in the work whether apparent on inspection or discovered after work begins.

4.5 No disconnection of a utility shall be made by the Contractor or any subcontractor without forty-eight (48) hours notice to the site Buildings & Grounds Director.

4.6 Upon completion of service, all debris shall be promptly removed from the site and the Contractor shall leave the site in a neat and orderly condition.

4.7 The Contractor agrees to utilize only TRAINED, experienced, responsible and capable people in the performance of the work. Employees shall perform their duties with safe work habits. The Contractor shall ensure that employees are trained on OSHA requirements. MCCCCD may require that the Contractor remove from the job site, employees who endanger persons or property.

4.8 No one except authorized employees of the Contractor are allowed on MCCCCD property. Employees are not to be accompanied in the work area by acquaintances, family members or any other persons who are not authorized Contract employees.

4.9 The Contractor will assure that all Contractor employees are properly documented and are legally eligible to work in the United States. If MCCCCD becomes aware that any Contractor employee does not meet these requirements, the Contractor shall immediately remove the employee from the premise and provide a replacement. If Contractor persists in using undocumented, or employees ineligible to work legally in the United States, it shall be grounds to terminate the Contract.

4.10 The Contractor is required to provide MCCCCD with assurances that every effort has been made, to the extent provided by law, that all persons proposed by the Contractor for employment under the terms of this contract have not been convicted of any felony, sex crime, crime of moral turpitude, or any crime against a child, including but not limited to sexual misconduct with a minor, child abuse and/or child abduction.

SECTION 5. PROJECT SPECIFICATIONS

Maricopa County Community College District
Ironwood Hall Media Systems
Audio-Visual System Specifications

Digital Media Design, LLC
Chandler, AZ
Issue Date: 9/30/2009

PART 1 – GENERAL SPECIFICATIONS

1.1 SUMMARY

- A. Scope of Work: This specification defines the audiovisual systems to be installed at the new Ironwood Hall Building at Chandler Gilbert Community College- Pecos Campus.
- B. Definition of Terms:
 - 1. The term "Owner" shall refer to Maricopa County Community College District (MCCCD).
 - 2. The term "Consultant" shall refer to Digital Media Design, LLC.
 - 3. The term "Contractor" shall refer to the AV systems contractor who has responsibility for performance of the work specified herein.
 - 4. The term "custom" indicates systems or components that shall be fabricated by the Contractor based on these specifications and drawings.
 - 5. The term "OFE" refers to Owner Furnished Equipment.
 - 6. The term "OF/OI" refers to Owner Furnished/ Owner Installed Equipment.
 - 7. The term "A/R" indicates components quantities "as required".
 - 8. The term "NIC" refers to Not in Contract. These items will be provided and installed by the Owner.
 - 9. The term "Future" refers to equipment which will be provided and installed at a future time but provisions for this equipment, i.e. cable, conduit, boxes and plates shall be provided and installed as part of the specifications as shown on the drawings.
- C. Project requirements:
 - 1. Provide all labor, materials, transportation and equipment to complete the furnishing, installation, assembly, set up, and testing of the Audio-Visual Systems work indicated on the drawings and specifications herein. Notwithstanding any detailed information in this specification provide complete, working systems.
 - 2. Generate all submittal information for the complete fabrication, installation and wiring of the system. Provide the on-site installation and wiring and provide on-going supervision and coordination during the implementation phase.
 - 3. Provide for the initial adjustment of the systems as described and provide all test equipment for the system checkout and acceptance tests.
 - 4. Provide staff training in the operation and maintenance of the systems for personnel designated by the Owner.
 - 5. Provide warranty for all systems installed, as specified in section 1.8.

1.2 QUALITY ASSURANCE

- A. Comply with the following requirements:
1. Company: work of this specification shall be performed by an Audio-Visual Systems Integrator who has at least three (3) years direct experience with the equipment and systems of the type and scope specified herein, and who has a fully staffed and equipped maintenance and repair facility, and who is licensed to perform work of this type. Submit the following as part of the acceptance of contractor qualifications process:
 - a) Reference list of at least 3 projects of similar scope to the work of this specification, at least 1 of which has been completed in the last 12 months. Listings are to include key client contact and telephone numbers.
 - b) Examples of post-award submittal documentation similar in scope to the specifications contained herein.
 2. Personnel: Use adequate numbers of skilled workers who are thoroughly trained and experienced with the specified requirements and the methods needed for proper performance of the AV systems installation work specified herein. Supervisors shall have at least three (3) years direct experience in similar work.
 3. Custom Control System Programmer: Provide at least one (1) full time programmer on staff or Crestron Authorized Independent Programmer (CAIP) capable of on-site custom programming of the custom remote control system specified herein.
 4. Designated Project Manager: Provide a designated Project Manager in responsible charge of the fabrication shop and on the Project Site during all phases of installation and testing of the work of this specification. This Project Manager shall be the same individual through the execution of the work unless illness, loss of personnel, or other circumstances reasonably beyond the control of the Contractor intervene.
- B. Coordination: Coordinate the work of this specification with the work of all sections being provided by any separate General Construction Contract or the Owner.
- C. Verification: Verify dimensions and conditions at the Project Site. Submit any conflicts in timely manner for resolution.
- D. Project Site Installation and Testing: Install as specified herein. Perform specified adjustment procedures. Provide test equipment and test according to procedures specified herein.
- E. Verification of Submitted Test Data: Re-test in presence of designated representative(s) of the Owner at reasonable mutual convenience. Provide services of a technician familiar with work of this specification. Provide all test equipment. Provide complete set of latest stamped, Submittals of Record for reference. Provide a complete set of manufacturer's original operation manuals for each piece of equipment as reference.
- F. Reference/Project Record Documents: Maintain at the workplace a complete set of manufacturer's original operation manuals for each equipment item for reference.
- G. Schedule: Comply with the submitted Project schedule. Make all Submittals specified herein in a timely manner. Failure to make timely submittals complete as specified herein is considered to be a lack of substantial progress of the work of this specification.

1.3 DIVISION OF RESPONSIBILITY

A. Work provided by the AV Contractor:

1. Post award engineering, documentation and supervision as defined herein.
2. Installation, labeling and testing of all low voltage AV system cable.
3. AV rack fabrication, testing and termination.
4. Installation and termination of the specified AV equipment, wall plates and structural mounting at the locations shown on the AV system drawings.
5. AV Contractor shall furnish blank covers to any unused low-voltage boxes.
6. AV control system programming and training as defined herein and in the AV system drawings and supplemental documentation.
7. AV Contractor is required to replace any damaged ceiling tiles during AV installation:
Armstrong Ultima
9/16" Beveled Tegular
Items No. 1912 and 1915 (2 x2 or 2x4 depending on location)

B. Work provided by Others (N.I.C.):

1. Client shall provide LAN connection to computer workstations.
2. Furnish and install all A.C. power conduit and junction boxes as required by the AV system.
3. Furnish and install all millwork as required for installation of the AV equipment.
4. General Contractor shall install all of the Projection Screens and Low Voltage Interfaces.
5. Furnishing, installation, cabling, termination and programming of all lighting dimmer equipment and required low voltage interfaces.
6. Furnishing, installation, cabling, termination and programming of all computers and computer peripheral equipment.
7. Furnishing, installation, cabling and termination of all telephone and data distribution equipment.

1.4 PROJECT DESIGN COORDINATION

A. The AV Contractor will provide the following drawings and engineering services. Acceptance and sign-off will be required for each of the following major project design and engineering phases:

1. Installation, purchasing and engineering production schedules
2. Construction drawings, equipment lists and product data
3. Control system programming layouts and functionality
4. As-built drawings, operations manuals and maintenance data

1.5 SUBSTITUTIONS

- A. The specific manufacturers and model numbers of all equipment specified are required to meet the design criteria developed by the Owner. Proposed substitutions must meet the following procedures and criteria:
 - 1. Prior acceptance by Consultant or Owner to proceed with demonstration of equivalency:
 - a) Provide manufacturer's product data sheets on both the specified product and proposed substitute product
 - b) Provide a written comparison for equivalency based on at least the following criteria:
 - (1) Performance specifications
 - (2) Product and installation costs
 - (3) Physical dimensions and weight
 - (4) Maintenance costs and product life-span
- B. The Chandler Gilbert Community College employs Crestron's Room View management software campus-wide. There are no substitutions for Crestron products.

1.6 SYSTEM DESCRIPTION

A. Project Overview

- 1. The Ironwood Hall building contains a total of twelve Medium Classrooms (22'x30' approx.), ten Large Classrooms (22'x34' approx.), eight Labs (30'x34' approx.), a Lecture Room (36'x30' approx.), a Tiered-Auditorium (36'x44' approx.) and a Ceramics studio (32'x46' approx.). With the exception of the tiered auditorium and the ceramics studio the ceiling height is 9-feet. The auditorium ceiling transitions from 9' to 10.5'. The ceramics studio ceiling is 16' with a perforated cloud ceiling at 14'-9" A.F.F.
- 2. Sources
 - a) All of the rooms shall have a PC workstation, a combo DVD/VCR, an auxiliary VGA & audio input for a laptop, a LCD projector and screen, a control system and a sound system.
 - b) The Large Classrooms, the Ceramics Studio and six of the eight Labs (none in Chemistry Labs) shall have platform document cameras.
 - c) The Lecture Room and Auditorium shall have ceiling mounted document cameras.
- 3. Room Configurations
 - a) All of the Medium Classrooms, the Large Classrooms and two (2) Engineering Labs (Rm. 104 & 106) shall be supplied with a Euro Design Presenter's Station (OFE). The media equipment shall be rack mounted in the Presenter's Station. The cable bundle from the Presenter's Station shall be wrapped in an expandable sleeve and connect to a wall plate adjacent to the Presenter's Station. The wall plate is mounted to a 5-gang extra deep work box located in the wall with three (3) 1-1/4" conduits extending above the finished ceiling.
 - b) The two (2) Physics Labs (Rm. 107 & 108), the two (2) Geology Labs (Rm. 101 & 103) and the Ceramics Labs have custom built casework (OFE) that serves as the Instructor's Desk. The media equipment shall be mounted in a small self-contained 12RU rack that shall be installed within the casework. A cable bundle from the small rack shall be wrapped in an expandable sleeve and connect to a plate attached to a floor box

1.6 (continued)

- c) (Wiremold RFB-9). The 5-gang floor box shall have three (3) 1-1/4" conduits extending above the finished ceiling.
- d) The two (2) Chemistry Labs (Rm. 203 & 205) have no Instructor's Desk. The media equipment shall be mounted in a small self-contained 12RU rack that shall be installed within the casework. A cable bundle from the small rack shall be wrapped in an expandable sleeve and connect to a wall plate inside the casework. The wall plate is mounted to a 5-gang extra deep work box located in the wall with three (3) 1-1/4" conduits extending above the finished ceiling.
- e) The Lecture Room (Rm. 219) shall be supplied with a Euro Design Presenter's Station (OFE). The media equipment shall be rack mounted in the Presenter's Station. A cable bundle from the Presenter's Station shall be wrapped in an expandable sleeve and connect to a plate attached to a floor box (Wiremold RFB-9). The 5-gang floor box shall have three (3) 1-1/4" conduits extending above the finished ceiling. The Lecture Room shall be equipped with two LCD projectors.
- f) The Auditorium (Rm. 120) shall be supplied with a custom Presenter's Station (OFE). The combo DVD/VCR shall be rack mounted in the Presenter's Station. A cable bundle from the Presenter's Station shall be wrapped in an expandable sleeve and connect to a plate attached to a floor box (Wiremold RFB-9). The 5-gang floor box shall have three (3) 1-1/4" conduits extending above the finished ceiling. The rest of the media equipment shall be located in a rack located in the control room (Rm. 122). The Auditorium shall be equipped with two LCD projectors.
- g) In addition to the classrooms, there are two (2) Campus Information Displays located in a corridor on the first and second floor. Each display shall be a wall mounted 50" plasma screen. A thin client PC (OFE) shall be attached to display information over the network.

B. Presenter's Station / Instructor's Desk

1. The Presenter's Station is equipped with an OFE Main PC (CPU101), OFE Guest Laptop (CPU102), a Combo VCR/DVD (VCRDVDD01) and in some rooms a Progressive Scan Document Camera (DOCCAM101). The combo DVD/VCR shall be secured in the upper most position for easy access by the faculty. The video signal from the DVD/VCR shall be the component output. The computers and document camera shall utilize the VGA outputs.
2. The Presenter's Station shall be equipped with a 1x2 VGA Distribution Amp (VGADA201) that will route the Main PC output to a 17" LCD Monitor (MON01) on the Presenter's Station as well as the Crestron MPS Media System (MEDIASYS01). The MPS Media System's inputs are: 1- DVD/VCR, 3-Main PC, 4-Guest Laptop, 5-Document Camera. All inputs shall have audio connections as well as video connections. The Guest Laptop shall have a HD15 & Stereo Mini plug cable attached to the MPS Media System and routed through a cut-out on the desktop.
3. A 15-button control panel (CTRLPANEL01) shall be mounted in a slope mount case and affixed to the desktop with a swivel mount. The control wires shall pass through the swivel mount.
4. The RGBHV 1 output and the Composite 1 output of the MPS Media System shall be connected to the projector inputs. RS232 control is also sent from the MPS Media System (COM A) to the projector.
5. The Medium Classrooms utilize the 70V speaker output directly from the MPS Media System. The larger rooms are connected to a separate amplifier (P_AMP01).

C. Display Systems

1. All rooms with the exception of the Auditorium shall be equipped with 3000 ANSI lumen, wide-screen video projectors (PRJ01). The projectors must have the capability of auto-sensing either a RGBHV signal or a component signal from the HD15 connector.
2. The Auditorium shall be equipped with two (2) 4000 ANSI lumen, wide-screen video projectors (PRJ02). The projectors must have the capability of auto-sensing either a RGBHV signal or a component signal from the HD15 connector.
3. The Lecture Room and the Auditorium will each have two (2) video projectors. In the Lecture Room, the first projector will receive analog RGBHV and Composite signals from Output 1 of the MPS Media System. The second projector will receive the Crestron Quick Media signal from Output 2 of the MPS Media System and a Crestron Quick Media Receiver (QMRX01). In the Auditorium both projectors will be fed Crestron Quick Media signals from the MPS Media System QM Outputs 6 & 7 and their respective Quick Media Receivers. Both rooms shall have the capability of displaying different sources on each projector.
4. The projectors shall be ceiling mounted in a secure, theft proof BMS bracket. The College has a master key for the existing installations on campus. The new brackets must use the same lock. The Ceramics Lab, Lecture Room and Auditorium shall be equipped with the BMS LOCIV mount that has accommodation for the Quick Media Receivers.
5. Screens- All rooms with the exception of the Auditorium are equipped with Draper Access V, 16x9, manual projection screens (OF/OI). The sizes are as follows:
 - a) Medium Classrooms- (12) 96" diagonal
 - b) Labs & Ceramics Studio- (9) 119" diagonal
 - c) Large Classrooms & Lecture Room- (12) 106" diagonal
 - d) Auditorium- Draper Access/ Series V Electric w/ LVC, 133" diagonal
6. The Ceramics Studio shall have one (1) video projector and one (1) wall-mounted 50" Plasma Display (PLASMA01). The Plasma Screen will receive analog RGBHV signals from Output 1 of the MPS Media System. The projector will receive the Crestron Quick Media signal from Output 2 of the MPS Media System and a Crestron Quick Media Receiver (QMRX01).
7. In anticipation of future upgrades to digital signals there shall be two (2) runs of CAT6-A shielded twisted pair cables terminated with RJ45 plugs at the projector and RJ 45 jacks on the wall or floor plates.

D. Audio Systems

1. The audio system is designed around utilizing the MPS Media System as a mixer/preamplifier.
 - a) In the Medium Classrooms, four (4) 70v ceiling speakers shall be connected to the MPS Media System speaker terminal.
 - b) In the Large Classrooms and Labs, the line output of the MPS Media System will feed a separate 200W, 70v power amp. Six (6) 70v ceiling speakers shall be connected to the 200W power amp.
 - c) Audio for the Ceramics Studio shall include a Wireless Microphone System (WIRELESS MIC01). To accommodate separate speech control for this room, the MPS 200 (MEDIASYS02) shall be used instead of the MPS100. The Wireless Receiver shall be mounted at the Presenter's Station. The Ceramics Studio shall have only a lavalier microphone. Both speech and audio shall be mixed down to the program out and sent to the separate 200W Power Amplifier. The Ceramics Studio shall be equipped with five (5) of the Tannoy Di8 Wall Mounted 70v Speakers (SPK03).
 - d) Audio for the Lecture Room shall include a Wireless Microphone System (WIRELESS MIC01). To accommodate separate speech control for this room the MPS 200 (MEDIASYS02) shall also be used. The wireless receiver shall be mounted at the Presenter's Station. The Lecture Room shall be equipped with a lavalier and handheld microphone (either/or usage). Both speech and audio shall be mixed down to the program out and sent to the separate 200W Power Amplifier. Six (6) 70v ceiling speakers shall be connected to the 200W power amp.
 - e) The Lecture Room shall also include an Assisted Listening System (HATX01). Both speech and audio shall be mixed down to the record out terminal of the MPS Media System and be connected to the hearing assist transmitter.
 - f) Audio for the Auditorium shall include a two Wireless Microphone Systems (WIRELESS MIC01). To accommodate separate speech control for this room the MPS 300 (MEDIASYS03) shall be used. The wireless receivers shall be mounted in the Equipment Rack (RACK02) located in the Control Room. The Auditorium shall be equipped with two (2) sets of lavalier and handheld microphones (either/or usage per receiver). The balanced outputs of the receivers shall be connected to the balanced inputs 1 & 2 of the Nexia Presentation Mixer (DPS-MIX01). The wireless microphone antennas shall be mounted above the finished ceiling in the Auditorium. Stereo program audio sources shall be routed through the MPS 300 to preserve audio-follow-video switching. Balanced stereo program out from the MPS shall be connected to the balanced inputs 3 & 4 of the Nexia Presentation Mixer (DPS-MIX01). A Crestron iDOCV (IPOD DOCK01) shall be affixed to the Presenter's Station in the Auditorium. The iDOCV connects via CAT5E cable to a Crestron ABAR-1 (A_BALUN01) audio receiver located in the Equipment Rack (RACK02). The unbalanced stereo outputs of the ABAR-1 shall be connected to the stereo line input-5 of the Presentation Mixer. Stereo program audio from Outputs 1 & 2 of the Presentation Mixer shall connect to inputs 1 & 2 of the 3-Channel Combo 200W Power Amplifier (P_AMP). Speech audio output-3 of the Presentation Mixer shall connect to input-3 of the 3-Channel Combo 200W Power Amplifier (P_AMP02). The 8-ohm stereo speaker outputs of the Power Amplifier shall connect to two (2) of the Tannoy Di8 Wall Mounted Speakers (SPK03) located in the front of the Auditorium. Nine (9) of the 70v, dual-concentric ceiling speakers (SPK02) shall be connected to the 70v output of the 200W Power Amplifier. The Auditorium shall also include an Assisted Listening System (HATX01). Both speech and audio shall be mixed down to output-4 of the Presentation Mixer and be connected to the hearing assist transmitter.

E. Remote Control Systems

1. Programmable control systems shall provide manual and semi-automatic control of specific AV system functions as specified herein and on the system drawings. The recommended Crestron products interact with the Crestron Room View services already installed on the campus; therefore no substitutions are allowed for the control system. AV Contractor's may reference Crestron Master Quote #46612 .Touch panel and remote control button functionality and graphical layout shall be furnished by the Owner to ensure consistency with a control dashboard already accepted campus. Suggestions or modifications to the touch panel layout by the AV Contractor are permitted, however final approval shall serve as part of the AV contract submittal process. Programming shall include an automatic shutdown of equipment t a set time every night. AV Contractor shall provide 8 hours of re-programming of control system functionality and graphical layout within the first 6 months of system use as requested by the Owner. Vendor shall furnish all electronic copies of all source codes, touch panel files and XPanel IE web browser based programming prior to final sign-off of the project.
2. Control of the AV Systems for all Medium Classrooms, Large Classrooms and Labs consist of the following equipment and functions:
 - a) Crestron MPS-100 Media System
 - b) Crestron MP-B20 15-button control panel
 - c) Crestron TTK-MP/MPC/IPAC-B-T angled table top enclosure
 - d) Crestron SMK-MP/MPC/IPAC-B-T swivel mount
 - e) Crestron IRP-2 infrared emitters
 - f) Projector control: Power, Mute
 - g) Source select: PC, Laptop, DVD/VCR, Doc Cam (where installed)
 - h) DVD/VCR: DVD select, VCR select, Play, Pause, Stop, FF, Rew, Skip Fwd, Skip Rev, Menu (via navigational buttons)
 - i) Master Volume; Up/Down (via knob)
3. Control of the AV Systems for the Ceramics Studio and Lecture Room consist of the following equipment and functions:
 - a) Crestron MPS-200 Media System
 - b) Crestron MP-B20 15-button control panel
 - c) Crestron TTK-MP/MPC/IPAC-B-T angled table top enclosure
 - d) Crestron SMK-MP/MPC/IPAC-B-T swivel mount
 - e) Crestron IRP-2 infrared emitters
 - f) Crestron QM-RX Quick Media receiver
 - g) Crestron CresCAT QM-P plenum control/CAT5E cable
 - h) Projector control: Power, Mute
 - i) Projector 1 Source select: PC, Laptop, DVD/VCR, Doc Cam
 - j) Projector 2 Source select: PC, Laptop, DVD/VCR, Doc Cam
 - k) Document camera (Lecture Room): Zoom +/-, Focus +/-

1.6 E (continued)

- DVD/VCR: DVD select, VCR select, Play, Pause, Stop, FF, Rew, Skip Fwd, Skip Rev, Menu (via navigational buttons)
 - l) Master Volume: Up/Down (via knob)
4. Control of the AV Systems for the Auditorium consist of the following equipment and functions:
- a) Crestron MPS-300 Media System
 - b) Crestron TPS-6LB-T KIT Color Touch Panel
 - c) Crestron RMK-6L rack mount kit
 - d) Crestron TPS-6L-FP-BKLT-B-T-B button engraving
 - e) Crestron TPS-6X-B-T-KIT Color Touch Panel kit
 - f) Crestron TPS-6X-FPB-T –FRONT B button engraving
 - g) Crestron CEN-HPRFGW wireless gateway
 - h) Crestron CEN-IDOCV-B-S-P WE KI iPod docking station
 - i) Crestron ABAR-1 audio receiver
 - j) Crestron IRP-2 infrared emitters
 - k) Crestron QM-RX Quick Media receiver (Qty. 2)
 - l) Crestron CresCAT QM-P plenum control/CAT5E cable
 - m) Projector control: Power, Mute, Menu
 - n) Projector 1 Source select: PC, Laptop, DVD/VCR, Doc Cam
 - o) Projector 2 Source select: PC, Laptop, DVD/VCR, Doc Cam
 - p) DVD/VCR: DVD select, VCR select, Play, Pause, Stop, FF, Rew, Skip Fwd, Skip Rev, Menu (via navigational buttons)
 - q) iPod: Play, Pause, Stop, FF, Rew, Skip Fwd, Skip Rev
 - r) Master Volume: Up/Down/Mute
 - s) Program Volume: Up/Down/Mute
 - t) Speech Volume: Up/Down/Mute
5. The Control Room Control PC shall have “Technician Level” menus to control room combining configurations, manual over-ride of source/destination ties to the three matrix switchers and interface to and provide control of the following:
- a) VCR (play, stop, fwd, rewind, pause)
 - b) DVD player (play, stop, skip fwd, skip back, search fwd, search back, pause)
 - c) Document camera (zoom in/out, focus in/out)
 - d) Electric screen (up/down/stop)
 - e) VP Lift (up/down 1/down 2)
 - f) LCD data projector (power on/off, zoom, focus)
 - g) Lighting control panel (NIC) and AV interface (NIC) (up to 5 lighting presets)
 - h) Program level control and muting

1.6 E (continued)

- i) Microphone levels, control and muting
- j) Digital VCR (play, stop, ffwd, rewind, pause, record)
- k) DVD Recorder (play, stop, skip fwd, skip back, search fwd, search back, pause, record)
- l) S-VHS VCR (play, stop, ffwd, rewind, pause, record)
- m) Plasma (power on/off, source select)

1.7 DEMONSTRATION AND TRAINING

- A. At a time mutually agreeable between the AV Contractor and the Owner, provide 6 hours of demonstration and instruction to the Owner's employees on the use of the system.
- B. Obtain written acknowledgment of instruction to Owner's employees at the time of instruction.
- C. Initial Use Support: Provide standby trainer/ system engineer during initial use of the Auditorium
- D. Provide 8 hours of follow-up instruction as needed during the warranty period, as follows: 2 to 3 hours per quarter, not to exceed 8 hours total.

1.8 WARRANTY SERVICE

- A. Warranty: Warrant the system to be free from defects in materials and workmanship for a period of twelve (12) months from the date of Owner Acceptance.
- B. AV Contractor is required to respond by phone or e-mail within 24 hours.
- C. Equipment warranties will be limited to the manufacturer's warranties.
- D. Furnish the Owner with a proposal for an extended annual service and maintenance contract to run after the one year warranty period.

1.9 REGULATORY REQUIREMENTS

- A. Codes and Regulations: perform all work in strict accordance with all applicable Federal, State, County and City Codes, regulations and ordinances.
- B. Applicable Codes and Regulations: Codes and regulations include, but are not limited to, the following:
 - 1. City Building Code
 - 2. City Fire Code
 - 3. City Mechanical Code
 - 4. City Plumbing Code
 - 5. City Electrical Code
 - 6. City Energy Code
 - 7. State Regulations for Barrier -Free Access
 - 8. State Industrial Safety & Health Act
- C. Publication Dates: Except as otherwise indicated, comply with the latest editions of Codes and Regulations in effect as of date of Contract Documents.

1.10 APPLICABLE STANDARDS AND AGENCIES

- A. AES Audio Engineering Society.
- B. EIA Electrical Industries Associations of America.
- C. EIAJ Electrical Industries Associations of Japan.
- D. FCC Federal Communications Commission.
- E. NAB National Association of Broadcasters.
- F. NEC National Electrical Code.
- G. NFPA National Fire Protection Association.
- H. SMPTE Society of Motion Picture and Television Engineers.
- I. UBC Uniform Building Code.
- J. UL Underwriters Laboratories.

1.11 CONFLICTS

- A. Present any conflicts between codes, regulations, specifications and/or requirements at least ten (10) days prior to the commencement of the scheduled work.

1.12 DELIVERY, STORAGE AND HANDLING

- A. Deliver completed, wired, tested equipment racks to associated equipment rooms at the Project site when major work of all other Sections is complete and storage is secure.

1.13 DEFINITIONS

- A. Definitions of Terms: The following definitions and conditions apply to each of the respective parameters and the measurements of those parameters, unless specifically stated otherwise:
 - 1. Frequency Response: The minimum acceptable frequency band over which the amplitude response is within 3 dB (or any specified range), or the specified limits of the response relative to the reference frequency (1 kHz for audio) under design load conditions, at any operating level up to and including the specified maximum output while fully in compliance with all other performance specifications.
 - 2. Maximum Output Level: The minimum acceptable maximum signal output level (voltage, current or power) attained under design load conditions attained while fully in compliance with all other performance specifications.
 - 3. Harmonic Distortion: The maximum acceptable harmonic distortion measured at any operating level, up to and including the specified maximum output, with an applied sine wave signal of any frequency in the range of the specified frequency response.
 - 4. Signal to Noise Ratio: The minimum acceptable ratio of signal to noise levels derived from broadband measurements under design load at maximum output over the entire range of the specified frequency response.
 - 5. Clipping Level: The minimum acceptable maximum level of signal applied to the device under design load conditions while fully in compliance with all other performance specifications.
 - 6. Sensitivity: The maximum acceptable level of input signal applied to the device that is necessary to provide the maximum output under design load conditions.
 - 7. Design Load: The load (in ohms) specified by usage of the particular device input or output.

1.13 (continued)

8. Signal Levels: The following voltage levels shall be considered the standard operating levels for the particular circuitry, unless specifically noted otherwise (0.775 Volt = 0 dBu = 0 dBm for a 600 ohm terminated circuit):
 - a) Microphone Level Circuits: -30 dBu or less.
 - b) Audio Line Level Circuits: -30 dBu to +24 dBu; equivalent to -30 dBm to +24 dBm for a 600 ohm terminated circuit.
 - c) Loudspeaker Level Circuits: More than +24 dBu.
 - d) Radio Frequency (RF), Television (MATV) Circuits: +6 to +72 dBmV (0 dBmV = 1,000 microvolts).
 - e) Video Level Circuits: nominal 1.0 V peak-to-peak
9. Characteristic Impedances: The following operating impedances shall be considered to be the standard operating impedances for the particular circuitry, unless specifically noted otherwise:
 - a) Microphone Circuits: 50-250 ohms source, 150-1500 ohms terminating, electrostatically and electromagnetically balanced to ground.
 - b) Audio Line Level Circuits: 600 ohms maximum source, 600 ohms minimum terminating, line-to-line, electrostatically and electromagnetically balanced to ground.
 - c) Radio Frequency (RF) Television Circuits: 75 ohms nominal to shield and signal ground, with Vertical Standing Wave Ratio (VSWR) not to exceed 1.2.
 - d) Video Level Circuits: 75 ohms nominal to shield and signal ground, terminated.

1.14 SYSTEM PERFORMANCE REQUIREMENTS

A. Audio Systems:

1. Electrical Performance: Source Input to Power Amplifier Output:
 - a) Frequency response (Equalizer flat): +/- 0.5 dB, 30 Hz to 15 kHz.
 - b) Total harmonic distortion (THD): Less than 0.5%, 30 Hz to 15 kHz + 4 dBm line level.
 - c) Signal-to-Noise: At least 70 dB, 30 Hz to 15 kHz, referenced to input of +4 dBm.
 - d) Crosstalk: at least -60 dB, 30 Hz to 15 kHz
2. Electro/Acoustic Performance; Loudspeaker System:
 - a) Uniformity of Coverage: +/-3 dBA.
 - b) Frequency Response: Program speakers:
 - (1) On axis: +/-3 dB, 80 Hz to 8 kHz.
 - (2) Overall: +/- 3 dB, 80 Hz to 6 kHz.
 - c) Frequency Response: Ceiling speakers:
 - (1) On axis: +/-3 dB, 125 Hz to 8 kHz.
 - (2) Overall: +/- 3 dB, 125 Hz to 6 kHz.
 - d) SPL output capability, in seating area; not less than: 90 dBA program, 85 dBA speech reinforcement.
3. Acoustic Signal to Noise: at least 55 dB.

1.14 (continued)

4. Acoustic Gain: At least unity.
5. Audio Signal Paths: Shall not degrade performance of connected equipment.

B. Video Systems:

1. Signal-to-Noise Ratio (RMS, unweighted, D.C. to 4.2 Mhz): 55dB, minimum.
2. Crosstalk (unweighted, D. C. to 4.2 Mhz): 45 dB, minimum.
3. Frequency Response: Within plus or minus 0.5 dB (D. C. to 4.2 Mhz).
4. Line and Field Tilt: 2.0% maximum.
5. Differential Gain: 3.0% maximum
6. Differential Phase: 2 degrees maximum
7. System Timing: Sync coincidence within 50 nanoseconds.
8. Color Timing: Within 2 degrees at 3.58 Mhz.
9. Video System Signals:
 - a) Video signals shall be generated and transmitted in accordance with the Electronics Industries Association (EIA) Recommended Standards and the Federal Communications Commission (FCC) Rules and Regulations listed below:
 - (1) EIA-RS-170 Electrical Performance Standards: Monochrome Television Studio Facilities.
 - (2) EIA-RS-170A Color Television Studio Picture Line Amplifier Output.
 - b) Differential gain and phase distortion throughout any video system path, excluding recording and playback equipment, shall not exceed 3% or 2.5 degrees, respectively, at 10% and 90% duty cycles. Included in the above requirements are clamping circuits. Tests for these characteristics shall be made in accordance with the Institute of Electrical and Electronic Engineers (IEEE) test procedures.

C. RF (Radio Frequency) Systems

1. Visual Carrier Level: +6 dBmV minimum and +16 dBmV maximum at all system outlets for all utilized channels.
2. Adjacent Channel Visual Carrier: 3 dB maximum differential at all systems outlets.
3. Non-Adjacent Channel Visual Carrier: 10 dB maximum differential at all systems outlets.
4. Carrier-to-Noise Ratio: 43 dB minimum.
5. Amplitude Response: Flat within plus or minus 1.0 dB.
6. Signal-to-Noise Ratio: 50 dB minimum for the maximum level of the signal and the interference resulting from cross modulation from all other signals on the system after demodulation.
7. Outlet-to-Outlet Isolation: 25 dB minimum.

1.14 (continued)

D. Optical: All optical projection systems shall meet the following performance standards:

1. The total averaged light output from a projector, in lumens, shall be within plus or minus 15% of that specified by the projector manufacturer.
2. Projected image must be level, fit the screen properly and be free of keystoneing.
3. Solidly mount and brace projectors, lenses and mirrors so that there will be no observable movement in the image induced by motor vibration or other mechanical operations.

E. Remote Control System:

1. Functional Requirements:
 - a) Coordinate with the Electrical Contractor to insure proper interface between line voltage and low voltage units.
 - b) Verify functional operation for specified control operations.
 - c) Wireless systems shall be neither the source of nor be affected by radio-frequency interference to or from external signal devices.
 - d) WEP ID for control system shall not be broadcasted.
2. Design Layout Requirements:
 - a) Provide illuminated feedback of the active functions via illuminated or shaded push buttons at operator and wired remote control stations.
3. Graphics:
 - a) Avoid abbreviations
 - b) Size lettering at 1/8" minimum
 - c) Maintain background-to-lettering contrast
4. Positive Logic: Avoid conditions that may cause command synchronization conflicts. Provide A. C. line level power switching and/or power sensing devices where necessary to insure that positive logic conditions are maintained.
5. Timing: Utilize control routines that avoid the possibility of two or more serial macros or control signals being sent simultaneously to the same piece of equipment.
6. Linking: Provide linking of functions to require the fewest number of user actions to effectively control the equipment.
7. Clearing: Ensure that each media selection clears both the previous audio and the previous visual selection to prevent source mixing.
8. Defaults: Establish default conditions for the system at power-up, including device audio levels, warm-up routine, power conditions and switcher status as well as any other default conditions required by the Owner.
9. System Auto-Off: Programming shall shut all systems off nightly at 10:30PM.
10. Audio Volume Memory: Provide easy-to-use memory for volume settings associated with each particular source device.
11. Fail-safe: No operation or sequence of operations of the Control System shall cause it to become inoperative or interfere with the further procession, execution of commands or correct operation of the system.

1.15 SUBMITTALS

- A. Submit all materials for review arranged in same order as Specifications, individually referenced to Specifications paragraph and Contract Drawing number. Submit three (2) copies of 8 1/2" x 11" material and three prints plus one reproducible of drawings in edge bound sets. Submit all drawings on sheets of the same size.
- B. Make each specified submittal as a coordinated package complete with all information specified herein. Incomplete or uncoordinated submittals will be returned with no review action.
- C. Should the AV Contractor proceed with the work of this specification in the Absence of submittals for such work submitted and returned with action "No Exception Taken" or "Make Corrections As Noted", the AV Contractor proceeds at the AV Contractor's sole risk.
- D. Progress Schedule: Include duration and milestones for at least the following:
 - 1. All submittals specified.
 - 2. Completion of equipment purchasing.
 - 3. Pre-wire.
 - 4. Structural work.
 - 5. Shop testing.
 - 6. Shipment to site.
 - 7. Installation.
 - 8. Field-testing.
 - 9. Training.
 - 10. First event date.
- E. Manufacturer's Product Data:
 - 1. List of Materials: For each item, include:
 - a) Specification paragraph.
 - b) Manufacturer.
 - c) Model number.
 - d) Quantity.
 - 2. Manufacturer's Product Data Sheets: In sequence of List of Materials, Data sheet for each item, including all accessories, marked for proposed product.
- F. Field and Shop Drawings:
 - 1. Field (Installation) Drawings: Collate in sequence:
 - a) Drawing index/symbol sheet.
 - b) Wiring conventions
 - c) Floor Plans. At scale of Contract Documents, show:
 - (1) Devices with circuit number.
 - (2) Rough-in.
 - (3) Mounting height.
 - (4) Wire Type.

1.15 (continued)

- d) Reflected Ceiling Plans. At scale of Contract Documents, show:
 - (1) Devices with circuit number.
 - (2) Rough-in.
 - (3) Mounting height.
 - (4) Wire Type.
 - e) Sections/Elevations. At scale of Contract Documents, show:
 - (1) Equipment mounting location reference.
 - f) Enlarged Plans. At scale of Contract Documents or larger as required for trade coordination, show:
 - (1) Architectural features.
 - (2) Rack cabinets.
 - (3) Clearances required by applicable Code.
 - (4) Mounting details:
 - (5) Provide details for:
 - (a) Equipment rack anchorage.
 - (b) Loudspeakers, including all means of support and attachment to building structure.
 - (c) Exact locations of mounted equipment.
 - g) Wire run sheets (if used). Show:
 - (1) Wire number.
 - (2) Source.
 - (3) Designation.
 - (4) Signal type.
 - (5) Wire type.
2. Shop (Fabrication) Drawings: Collate in sequence:
- a) Drawing index/symbol sheet (if separate set from Field Drawings).
 - b) Wiring conventions
 - c) System function drawings. Submit separate drawing for each system/subsystem. Show at least:
 - (1) Equipment: Function, make, model. Rack number, module frame and slot number.
 - (2) Wire number.
 - (3) Wire type.
 - (4) Shield condition at both ends (float, ground, location of ground).
 - (5) Connector wiring details, each type.
 - (6) Audio: Nominal operating level, Polarity.

1.15 (continued)

(7) Provide drawings for the following systems:

- (a) Audio
- (b) Video
- (c) Control

(d) Equipment rack elevations: Drawings at minimum 1/10 scale. Show:

d) Rack wiring drawings: For each rack, show:

- (1) Power strip: Receptacles, circuiting.
- (2) Equipment.
- (3) Grounding.
- (4) Wiring, all systems.

e) Fabrication details; submit for:

- (1) Receptacles.
- (2) Panels.
- (3) Special mounting provisions.

f) Legends/engraving details. Half or full size:

- (1) Receptacles.
- (2) Panels.

G. Shop and Project Site Test Reports:

1. Project Site test report: Submit following system completion and prior to and as condition precedent to Acceptance Review and Testing of the work of this specification.
2. Content: Include at least:
 - a) Time and date of test.
 - b) Test object.
 - c) Procedure used.
 - d) Results of test-numerical or graphical presentation.

1.16 OPERATING AND MAINTENANCE DATA

A. Manuals: Submit two (2) sets. Submit in three post binders or three ring binders with Tabs.

Include:

1. Index.
2. Systems operating instructions, custom:
 - a) Include custom written instructions to include:
 - (1) Table of contents and page index
 - (2) System description
 - (3) A "quick-start" guide for simple operation
 - (4) Touch screen layouts with descriptive operating text

1.16 (continued)

- (5) Components operating instructions with pictorial diagrams and descriptive text
 - b) Submit rough draft of custom written instructions for approval by the Representative of the Owner. Re-submit as required until approved.
 3. Reduced set of system Record Drawings.
 4. Key schedule (if required).
 5. Maintenance information and spare parts schedules.
 6. Shop and Field Test Reports.
 7. Equipment manuals. Collate alphabetically by manufacturer. Provide manufacturer's original operation, instruction and service manuals for each equipment item.
- B. Operating and maintenance Instructions: provide adjacent to each ensemble of equipment racks. Provide sturdy holder or non-scratching plastic cover. Provide permanent, non-fading media. Blueprints shall not be acceptable. Include:
1. Sequence for system start-up and shutdown.
 2. System Functional Diagrams.
 3. Signal levels and impedances at accessible system signal and test ports.

1.17 PROJECT RECORD DOCUMENTS

- A. Record Drawings: At all times when the work is in progress, maintain at the Project Site, a complete separate set of the submittals. As work progresses, maintain records of "as installed" conditions on this set in suitable red ink. After successful completion of Project Site testing specified herein, and after completion of Punch List corrections, copy all records of "as built" conditions on to the originals.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Quality of Products: Material and equipment specified herein have been selected as the basis of acceptance quality and performance and have been coordinated to function as components of the specified systems. Where a particular material, device, piece of equipment or system is specified directly, the current manufacturer's specification for the same shall be considered to be a part of these specifications, as if completely contained herein in every detail. Each material, device or piece of equipment provided hereunder shall comply with all of the manufacturer's published specifications for that item.
- B. Quantity: Provide quantity as shown on Appendix A- Equipment List/ Price Sheet.
- C. Preference: Where more than one manufacturer is listed herein as acceptable or equivalent, no preference is intended or implied by the order of listing.
- D. Post-award substitutions: Comply with provisions of the Contract. Burden of proof of equivalence is on the Contractor.
- E. Provide Complete: Provide all auxiliary and incidental materials and equipment necessary for the operation and protection of the work of this specification shall be new, shall be the manufacturer's latest design/model, and shall be permanently labeled with the manufacturer's name, model number and serial number,

2.1 (continued)

- F. Provide New: All materials provided under the work of this specification shall be new, shall be the manufacturer's latest design/model, and shall be permanently labeled with the manufacturer's name, model number and serial number.
- G. Inventory Control: All items with a value above \$1000.00 that will be ceiling mounted must be processed by Owner's inventory control before installation (unless impractical, i.e. circuit board or chip...).
- H. Similar: Similar devices shall be of the same manufacturer, unless specifically noted otherwise in these specifications.
- I. Power Rating: All devices provided under the work of this specification which are connected to the Project electrical system shall provide stable performance fully in accordance with these specifications when operated on main service which complies with ANSI standard tolerances for voltage, frequency, transients and related parameters.
- J. Circuit Protection: All active devices shall have integral fuse or circuit breaker protection.
 - 1. All circuit breakers shall be fully magnetic.
 - 2. Protection devices shall be located to facilitate examination, resetting and/or replacement without the need to disassemble or demount the associated device.
 - 3. Any contractor-fabricated items shall be provided with either indicating type circuit breakers or fuses of the clear glass cartridge type, mounted in fuse holders that will indicate a blown or defective fuse.
- K. Continuous Use: All active circuitry shall be solid state and shall be rated for continuous use. All circuit components shall be operated in full compliance with the manufacturer's recommendations and shall contain sufficient permanent identification to facilitate replacement.
- L. Identification: Provide permanent intelligible identification on, or adjacent to, all connectors, receptacles, controls, fuses, circuit breakers, patching jacks, and the like. The identification shall clearly and distinctly indicate the function of the item and shall be numbered or lettered to correspond with the function, circuit and location consistent with the field and shop drawings.
 - 1. Panels and Receptacles: Panel surfaces shall be engraved and filled or silk screened with identification, or shall be provided with 1/16 inch (min.) thick laminated plastic labels with engraved block characters at least 1/8 inch high fastened to the equipment by stainless steel screws or rivets. Provide white characters on black background unless otherwise noted. Embossed plastic labels shall not be acceptable.
- M. Construction: All electronic equipment shall be of the "dead-front" type and shall be designed for standard 19" EIA rack mounting, unless noted otherwise.
 - 1. Steel frames and enclosures shall be designed and wired to eliminate all induced currents with in both the units and the systems.
 - 2. Coordinate panels so that the general appearance is similar, or as directed by the representative of the Owner.
 - 3. All operating panels shall be at least 1/8" thick aluminum.
 - 4. Unless otherwise noted, receptacle or device plates subject to connection or operating force shall be stainless steel or hard anodized aluminum. Provide plates which general match the appearance of Project standard receptacle or device plates in view in the same area. For anodized aluminum, submit samples of standard colors for selection by the representative of the Owner.

2.1 (continued)

- N. Modular Products, General: The drawings show conventionally packaged components to convey design intent. Modular products meeting the design criteria are acceptable as alternates, provided:
 - 1. Card cages to have front closure panel to provide finished appearance.
 - 2. Except as noted below, where mechanically and electrically compatible, modules of different functional types are permitted to share the same card cage/mounting frame and/or power supplies as applicable.
- O. Keys: Key all boxes, cabinets, enclosures, panels, controls, doors and related provided for similar usage within a system identically. For each unique key type, provide quantity as specified in the Contract or quantity of ten (10), whichever is greater. Stamp each key with reference designation. Submit schedule of keying. Where so noted, provide Project Standard lock cylinders and keys; coordinate with the work of other Sections.

2.2 PRODUCT LISTING

- A. See APPENDIX A- CGCC Ironwood Hall Media Systems Price List

2.3 WIRE AND CABLE (The following part Belden number are provided as reference only, approved substitutions are permissible.) However no substitutions are allowed for the EXTRON "Skew-Free" cable.

Quantities A/R:

Application	Part Number	Cable Description/Construction	Rating
AES/EBU Digital Audio	1800F	24/2 w/ drain Stranded, shielded	CM
AES/EBU Digital Audio	1802B	24/2 w/ drain Stranded, shielded	CMP
Antenna Coax	8240	20 AWG solid, copper shield	CM
Antenna Coax	88240	20 AWG solid, copper shield	CMP
Line Level Analog Audio	8451	22/2 Stranded, shielded	CM
Line Level Analog Audio	82761	22/2 Stranded, shielded	CMP
Microphone and Instrument	9398	24/3 Stranded, double shielded	CM
Stereo Audio	1504A	Dual 22/2, shielded	CM
Speaker 4-ohm	8477	12/2 Stranded	CM
Speaker 4-ohm		12/2 Stranded	CMP
Speaker 8-ohm	8473	14/2 Stranded	CM
Speaker 8-ohm	83752	14/2 Stranded	CMP
Speaker 70V.	8461	18/2 Stranded	CM
Speaker 70V.	82740	18/2 Stranded	CMP
RG6 Broadband Coax	1530A	18 AWG solid, aluminum shield	CM
RG6 Broadband Coax	1530AP	18 AWG solid, aluminum shield	CMP
RG11 Broadband Coax	9116	18 AWG solid, aluminum shield	CM
RG11 Broadband Coax	9116P	18 AWG solid, aluminum shield	CMP
RG11 Broadband Coax	9116R	18 AWG solid, aluminum shield	CMR
RG59 Broadband Coax	8241	23 AWG solid, copper shield	CM
RG59 Broadband Coax	88241	23 AWG solid, copper shield	CMP
RG59 SDI/HDTV Coax	1505A	20 AWG solid, copper shield	CM
RG59 SDI/HDTV Coax	1506A	20 AWG solid, copper shield	CMP
RG59 Video Triax	8232A	20 AWG solid, dual copper braids	CM
RG59 Video Triax - Flexible	1857A	22 AWG stranded, dual copper	CM
RG59 Video Triax	88232	20 AWG solid, dual copper braids	CMP
CAT5E	1583A	24 AWG solid unbonded pairs	CM
CAT5E	1585A	24 AWG solid unbonded pairs	CMP
CAT5E	1583R	24 AWG solid unbonded pairs	CMR
CAT6	1872A	23 AWG solid bonded pairs	CM
CAT6	1874A	23 AWG solid bonded pairs	CMP
Control	8489	18 AWG Stranded	CM
Control	82489	18 AWG Stranded	CMP
RGBHV	22-020-02	5x 26 AWG Stranded Coax	CM
RGBHV	22-103-02	5x 26 AWG Stranded Coax	CMP
Skew Free UTP	22-141-03	23 AWG Single stranded UTP	CM
Skew Free UTP	22-142-03	23 AWG Single stranded UTP	CMP

PART 3 - EXECUTION

3.1 GENERAL

- A. Perform the work of this specification in accordance with acknowledged industry and professional standards and practices, and the procedures specified herein.
- B. Furnish and install (herein, "provide") all materials, devices, components, and equipment required for complete, operational systems.
- C. Incorporate existing equipment indicated as Furnished by Owner into the work of this specification. Receive such existing equipment from the Owner at the Project site, or at other mutually agreed location. Test such equipment for proper operation in timely manner relative to the Project schedule. Notify the representative of the Owner if such equipment fails testing. Repair or replacement of such failed equipment, if required, shall be Change Order work; follow such procedures.

3.2 WIRING CLASSIFICATION AND RELATED

- A. Audio Signal Wiring Classification:
 - 1. Type A-1: Microphone level wiring less than -30 dBu, 20 Hz to 20 kHz.
 - 2. Type A-2: Line level wiring -30 dBu to +24 dBu, 20 Hz to 20 kHz.
 - 3. Type A-3: Loudspeaker level or circuit wiring greater than +24 dBu, from 20 Hz to 20 kHz.
- B. Video Signal Wiring Classification:
 - 1. Type V-1: NTSC video signal wiring at a nominal 1.0 Volt peak-to-peak level.
 - 2. Type V-2: RGBHV analog signal wiring at a nominal 1.0 Volt peak-to-peak level.
 - 3. Type V-3: SDI/HDTV precision video signal wiring at a nominal 1.0 Volt peak-to-peak level.
- C. RF Signal Wiring Classification:
 - 1. Type R-1: MATV signal wiring at a +6 to +72 dBmV level.
 - 2. Type R-2: Wireless communication transmission wiring at a +50 to +100 dBmV level.
- D. Control Signal Wiring Classifications:
 - 1. Type C-1: DC control wiring 0 to 50 volts.
 - 2. Type C-2: Synchronous control or data wiring 0 to 40 volts, peak-to-peak.
 - 3. Type C-3: AC control wiring 0 to 48 volts, 60 Hz.
- E. Additional Wiring Classifications:
 - 1. Type M-1: DC power wiring 0 to 48 volts.
 - 2. Type M-2: AC power wiring greater than 50 volts, 60 Hz.
- F. Wiring Combinations: Except as indicated herein, conduit, wireways and cable bundles shall contain only wiring of a single classification. The following combinations are acceptable in conduit, or cable harnesses. Additional acceptable combinations may be indicated on the Contract Drawings.
 - 1. Types A-1, C-1, and M-1
 - 2. Types A-2, C-1, C-2, and M-1, runs less than twenty (20) feet.
 - 3. Types A-2, C-1, and M-1
 - 4. Types A-3, C-1, C-2, and M-1.
 - 5. Types A-2, R-1, V-1, V-2, and V-3.
 - 6. Types R-2, M-1 and C-1.

3.3 WIRE AND CABLE INSTALLATION

- A. Provide permanent identification of run destination at all raceway terminations.
- B. All wire and cable shall be continuous and splice-free for the entire length of run between designated connections or terminations.
- C. All shielded cable shall be insulated. Do not permit shields to contact conduit, raceway, boxes, panels or equipment enclosures.
- D. Within buildings, make splices only in designated terminal cabinets and/or on designated equipment backboards. Outside buildings, make splices only in designated manholes and/or handholes. Protect splices outside of buildings with splicing kits equivalent to Scotchcast Re-entenable. Make splices only with connectors or terminal devices specified herein. Document all splices on Record Drawings.
- E. Verify that all raceway has been de-burred and properly joined, coupled, and terminated prior to installation of cables. Verify that all raceway is clear of foreign matter and substances prior to installation of wire or cable.
- F. Cable loops and bends shall not be bent at a radius greater than that recommended by the manufacturer.

3.4 SIGNAL POLARITY CONVENTION

- A. Maintain consistent absolute signal polarity at all connectors, patch points and connection points accessible in the system. Where applicable, a positive polarity electrical signal shall yield positive acoustic pressure from the loudspeakers.
- B. Audio signal connector convention: AES14-1992 (ANSI S4.48-1992) AES standard for professional audio equipment - Application of connectors, Part 1, XLR-type polarity and gender.

<u>Signal</u>	<u>Connector</u>	<u>Wire</u>
Signal Phase	Pin 2	Red or White
Signal Anti-Phase	Pin 3	Black
Signal Ground	Pin 1	Drain Wire

3.5 WIRING PRACTICE

- A. Land all non-coaxial field wiring entering each equipment rack either at the specified equipment within the racks or at specified terminal devices prior to connection to any equipment or devices within racks. At Contractor's option, such terminals may be located in the equipment racks or in the terminal cabinets provided. Coordinate such selection with Project construction sequence and test procedures specified herein.
- B. Identify all wire and cable clearly with permanent labels wrapped about the full circumference within one (1) inch of each connection. Indicate the number designated on the associated field or shop drawing or run sheet, as applies. Assign wire or cable designations consistently throughout a given system. Each wire or cable shall carry the same labeled designation over its entire run, regardless of intermediate terminations. Provide any of the following:
 - 1. Continuous permanent imprint; equivalent to Clifford of Vermont, Inc. "Quik-Pull".
 - 2. Direct hot stamp.
 - 3. Heat shrinkable factory hot stamped; equivalent to Bradysleeve Heatshrink.
 - 4. Adhesive strip printed labels wrapped the full circumference of the wire and sealed with clear heat shrink tubing; equivalent to Thomas and Betts or Panduit Insta-code with clear heat-shrunk tubing equivalent to Alpha.

3.5 (continued)

- C. Apply all crimp connectors only with manufacturer's recommended ratchet type tooling and correct crimp dies for connector and wire size. Plier type crimp tooling shall not be acceptable.
- D. Coordinate insulation displacement (quick connect) terminal devices with wire size and type. Comply with manufacturer's recommendations. Make connections with automatic impact type tooling set to recommended force.
- E. Make all connections to screw-type barrier blocks with insulated crimp-type spade lugs. Lugs are not required at captive compression terminal type blocks. Provide permanent designation strips designed for use with the terminal blocks provided. Make neat, intelligible markings with indelible markers equivalent to "Sharpie".
- F. Tin terminated shield drain wires and insulate with heat shrinkable tubing.
- G. Use only rosin core 60/40 tin/lead solder for all solder connections.
- H. Dress, lace or harness all wire and cable to prevent mechanical stress on electrical connections. No wire shall be supported by a connection point. Provide service loops where harnesses of different classes cross, or where hinged panels are to be interconnected.
- I. Termination and buildout resistors and related circuit correction components shall be visible. Do not install in connector shells or internally modify equipment. Show locations on Record Drawings.
- J. Correct any and all of the following unacceptable wiring conditions:
 - 1. Deformed, brittle or cracked insulation.
 - 2. Insulation shrunken or stripped further than 1/8-inch away from the actual point of connection within a connector, or on a punch block.
 - 3. Cold solder joints.
 - 4. Flux joints.
 - 5. Solder splatter.
 - 6. Non-insulated wire or cable entries without grommets.
 - 7. Deformation or improper radius of wire or cable.

3.6 SIGNAL GROUNDING PROCEDURES

- A. Comply with the National Electrical Code.
- B. Unless otherwise noted, maintain a unipoint ground scheme.
- C. Signal and electrical system grounds shall be isolated except at the Project ground field connection.

3.7 EQUIPMENT ENCLOSURE (RACK) AND EQUIPMENT BACKBOARD FABRICATION

- A. Within each equipment enclosure, provide a full-height multi-circuit ISOLATED GROUND outlet strip with branch circuit count as shown on drawings; located on the left side of the equipment enclosure, as viewed from the rear. In each enclosure provide number of receptacles required by present and future equipment indicated on drawings, plus at least two spare receptacles.
- B. Provide a permanent label on the front of each equipment rack including the rack designation, and the circuit breaker number an associated electrical distribution panel designation servicing same.

3.7 (continued)

- C. Maintain separation of wiring classifications as specified herein. Separately dress, route and land microphone and line level cables and related on the right side of the equipment enclosure, as viewed from the rear; dress, route, and land loudspeaker level and control cables on the left side of the equipment enclosure, as viewed from the rear.
- D. Provide permanent labels for all equipment and devices. Where possible, fasten such labels to the rack frame or to blank or vent panels, which will remain in place when active equipment is removed for possible service. Permanent labels to be either:
 - 1. Engraved plastic labels, minimum of 3/8" high with minimum 1/8" engraved letters, black with white contrasting letters, self adhesive or mechanically fastened.
 - 2. Professional printed mylar tape labels, equivalent to Brother "P-Touch", minimum of 3/8" high with minimum 1/8" letters:
 - a) Black/ dark grey equipment: black or matching background with white letters
 - b) Silver, white or light grey equipment: white or matching background with black letters

3.8 EQUIPMENT RACK TESTING AND ADJUSTING PROCEDURES

- A. Conduct procedures in fabrication shop. Verify safe and proper operation of all components, devices, or equipment, establish nominal signal levels within the systems and verify the absence of extraneous or degrading signals. Correct all non-conforming conditions prior to shipment to Project Site. Perform at least the following procedures:
 - 1. Preliminary: Verify:
 - a) Grounding of devices and equipment. Integrity of signal and electrical system ground connections.
 - b) Proper provision of power to devices and equipment.
 - c) Integrity of all insulation, shield terminations and connections.
 - d) Integrity of soldered connections. Absence of solder splatter, solder bridges.
 - e) Absence of debris of any kind, tools, etc.
 - f) Routing and dressing of wire and cable.
 - g) Mechanical integrity of all support provisions.
- B. Sound Systems:
 - 1. Gain control settings: Establish tentative normal settings for all gain controls. Set all equalizers flat. Set all automatic gain control devices to bypass. Adjust all gain controls on equipment for optimum signal-to-noise ratio and signal balance and, unless they are sub-panel mounted, cap them to prevent tampering. Unless specified or directed otherwise, adjust gains such that in a given system the "front end" operates at unity gain and maintains 10 dB of clip margin referenced to the first onset of clipping of the associated power amplifier(s). Measure system gains at 1kHz. Settings may require further adjustment by the Contractor, a result of testing by the representative the Owner.
 - 2. Freedom from parasitic oscillation and radio frequency pickup: Maintain previous setup. Set up for each mode of operation specified in the functional requirements; verify that all systems are free from spurious oscillation and radio frequency pickup using broadband oscilloscope. Correct any such defects.

3.8 (continued)

3. Hum and noise level/signal to noise level/signal to crosstalk level: Maintain previous setup. Terminate microphone and line-level inputs with shielded resistors of 150 and 600 ohms, respectively. Set available variable gain controls such that full power amplifier output would be achieved with -40 dBm input level at microphone input and +12 dBm at a line-level input. Measure the specified parameters of the systems overall for each microphone input channel and line-level input channel. Compare with nominal signal level.
4. Total Harmonic Distortion: Maintain previous setup. Measure at reference operating level at least at 63 Hz, 125 Hz, 1 kHz, and 10kHz.

3.9 LOUDSPEAKER ASSEMBLY INSTALLATION

A. Loudspeakers, general:

1. Verify proper installation of loudspeaker enclosures and related support.
2. Pre-verify all ceiling speaker/ line transformer units for proper assembly polarity before assembly to the speaker grills using an appropriate DC test voltage and visual verification.
3. Verify that no loudspeaker assembly is subjected to stresses or loading effects in any way contributing to possible extraordinary failure.
4. Connect loudspeaker assemblies to the appropriate 70 volt-line transformer tap as applies. Verify specified polarity. Use insulated crimp connectors or insulated "bobtail" splices applied with manufacturer's recommended ratchet tooling.
5. Verify that loudspeaker grille openings and loudspeaker components are clear of paint after finishing.
6. Perform preliminary loudspeaker tests specified herein. Correct non-conforming conditions.
7. Adjust 70 volt-line transformer taps as required to realize uniform sound pressure level as specified herein. Document final 70 volt-line transformer taps on the Record Drawings.
8. Correct all conditions giving rise to noise, rattle or other extraneous sound owing to operation of a loudspeaker assembly under any specified operating condition.

B. Packaged Loudspeakers:

1. Design, engineer and provide complete, all means of support, suspension, attachment, fastening, bracing, and restraint (hereinafter "support") of packaged loudspeakers. Provide engineering of such support by parties licensed to perform work of this type in the Projection jurisdiction. Submit in timely manner.
 - a) Comply with applicable Code and the requirements of the Authorities having jurisdiction.
2. Mounting shall:
 - a) Permit each packaged loudspeaker to be re-oriented at least plus or minus 5 degrees from angles shown on the Contract Drawings for optimum coverage.
 - b) Maintain precise location and orientation of each packaged loudspeaker component after such adjustment when subject to vibration of loudspeaker components due to operation at full-specified system output level, and when subject to normal building motion and Code defined seismic induced building motion.
 - c) Use rigid metal support members, such as threaded rod with locking nuts.
3. Test each packaged loudspeaker prior to installation at design locations. Test at least polarity and freedom from buzzes, rattles and objectionable distortion, using procedures specified herein. Correct non-conforming conditions.

3.9 (continued)

4. Do not apply any load to building structure without first obtaining written approval by the representative of the Owner. Obtain per Project procedures.
5. During Acceptance Testing, adjust orientation of packaged loudspeakers as directed to achieve optimum coverage. Provide workers and ladders as required. Perform such adjustment with no claim for additional cost or time.

3.10 LOUDSPEAKER ASSEMBLY TESTING AND ADJUSTING PROCEDURES

- A. Upon completion of the installation of all loudspeakers in an area, perform the following tests and record results. Correct non-conforming conditions, unless the cause is clearly outside the work of this specification, in which case submit the apparent cause to the representative of the Owner.
- B. Loudspeaker Polarity: Test the acoustic polarity of all loudspeakers using either an Acoustic Polarity Tester or an appropriate DC voltage with visual confirmation of polarity.
- C. Freedom From Buzzes, Rattles and Objectionable Distortion: Individually apply to each loudspeaker line a slow sinewave sweep from 50 Hz to 5 kHz at a level of 6 dB below rated power amplifier output voltage. Listen carefully for buzzes, rattles and objectionable distortion.
- D. Uniformity of Coverage: Apply broadband Pink Noise. Adjust level to approximately 70-80 dBA at measurement locations. Measure in 4 kHz octave bank at ear level. Adjust loudspeaker aiming and amplifier level or 70 Volt loudspeaker tap as applies for uniformity of coverage.

3.11 SYSTEMS PERFORMANCE TESTING AND ADJUSTING PROCEDURES

- A. Upon completion of the installation of all equipment in an area, perform the following tests and record results. Verify safe and proper operation of all components, devices, or equipment, establish nominal signal levels within the systems and verify the absence of extraneous or degrading signals. Make all preliminary adjustments and document the setting of all controls, parameters of all corrective networks, voltages at key system interconnection points, gains and losses, as applicable. Submit test report. Correct all non-conforming conditions prior to requesting Acceptance Review and Testing. Perform at least the following procedures:
 1. Mechanical: Verify:
 - a) Integrity of all support provisions.
 - b) Absence of debris of any kind, tools, etc.
 2. Power and Isolated Ground: Verify:
 - a) Isolation of Isolated Ground system from raceway and related ground.
 - b) Grounding of devices and equipment. Integrity of signal and technical power system ground connections.
 - c) Proper provision of power to devices and equipment.
 3. Signal Wiring: Verify:
 - a) Integrity of all insulation, shield terminations and connections.
 - b) Integrity of soldered connections. Absence of solder splatter, solder bridges.
 - c) Routing and dressing of wire and cable.
 - d) Continuity, including conformance with wire designations on running sheets, field and shop drawings.
 - e) Absence of ground faults.
 - f) Polarity.
- B. Use the proper sequence of energizing systems to minimize the risk of damage. Energize.

C. Sound Systems:

1. Electronic Tests; confirm:
 - a) Gain at 1 kHz.
 - b) Maximum output.
 - c) Input clipping level.
 - d) Frequency response.
 - e) Total harmonic distortion.
 - f) Signal-to-Noise ratio.
 - g) Signal-to-Crosstalk ratio.

D. Data transmission system:

1. Test proper operation at all stations and receptacles.

E. Electro/Acoustic Tests:

1. Uniformity of coverage.
 - a) Electronic and acoustic frequency response/one-third octave equalization. Measure at ear level. Comply with applicable portions of ANSI (SMPTE) PH22.202M-1984, "B chain electro-acoustic response - control rooms and indoor theaters." Adjust to "curve X of B chain characteristic". Representative of the Owner will direct final adjustment.
 - b) Maximum continuous sound pressure level (in the reverberant field). Drive systems with broadband pink noise. Sustain for at least five minutes with no system damage. Measure for "A" and "C" weightings at ear level on loudspeaker axis. Turn off noise.
2. Acoustic signal-to-noise ratio referenced to the specified maximum continuous sound pressure level in the reverberant field. Measure for "A" and "C" weightings at ear level on loudspeaker axis with mechanical systems operating. Present comparison with previous measurement.
3. Acoustic gain before feedback. Locate acoustic source (4 inch loudspeaker / pink noise generator) two feet from system microphone. Measure at system microphone position and at most distant listener position at ear level. Present comparison.

F. Control System:

1. Verify the complete operation of all equipment under control of the system.
2. Verify the system to be free of control operation and/or logic conflicts.

G. Video System:

1. Factory trained personnel are to perform the setup and alignment of the video equipment according to the manufacturer's specifications.
2. Using the appropriate test equipment, verify that the video systems performance meets the design specifications.

H. System Overall:

1. Verify levels.
2. Provide permanent "wedge" type labels on all controls, as applies, to indicate correct settings after systems performance testing and adjustment procedures have been successfully completed.

3.12 ACCEPTANCE REVIEW AND TESTING PROCEDURES

- A. Complete all work of this specification. Submit Test Report. Submit review copies of Operating and Maintenance Manuals, less reduced set of Record Drawings. Notify the representative of the Owner in writing that the work of this specification is complete and fully complies with the Contract Documents. Request Acceptance Review and Testing. The representative of the Owner will conduct Verification of Submitted Test Data, and otherwise direct testing and adjustment of this Work. These Procedures may be performed at any hour of the day or night as required by the representative of the Owner to comply with the Project Schedule and avoid conflict with these procedures from possible ongoing work of other Sections. Provide all specified personnel and equipment at any time without claim for additional cost or time.
- B. Personnel: Provide services of the designated supervisor and additional technicians familiar with work of this specification. Provide quantity of technicians as required to comply with Project Schedule.
- C. In Addition, Provide:
 - 1. Set of hand and power tools appropriate for performance of adjustment of and corrections to this Work. Include spare wire and connectors and specified tooling for application.
 - 2. Ladders, scaffolding and / or lifts as required to access loudspeakers and other high devices.
 - 3. All test equipment.
 - 4. Complete set of latest stamped, actioned submittals of record for reference.
 - 5. Complete set of Shop and Project Site Test Reports.
 - 6. Complete set of manufacturer's original operation manuals for each equipment item for reference.
- D. Demonstrate: Complete operation of all systems and equipment, including Portable Equipment.
- E. Adjust: As directed by the representative of the Owner.
- F. Correct: In timely manner, failure to comply with the Contract Documents, as reasonable determined by the representative of the Owner.

3.13 CLOSEOUT

- A. Punch List: Perform any and all remedial work, at no claim for additional cost or time. Where required, retest and submit test report. Notify the representative of the Owner of completion of Punch List.
- B. Portable Equipment: Furnish all portable equipment and spares to the designated representative of the Owner, along with complete documentation of the materials presented. Where applicable, furnish portable equipment in the original manufacturer's packaging.
- C. Operating and Maintenance Data: Install framed operating and maintenance instructions. Submit Manuals.
- D. Project Record Documents: Submit.
- E. Keys: If applicable, replace construction locks with permanent locks. Transmit keys to the representative of the Owner.
- F. Training: Conduct specified training.
- G. Warranty: Submit Warranty dated to run from date of Acceptance of the work of this specification.

3.14 OWNER'S RIGHT TO USE EQUIPMENT

- A. Acceptance of the work of this specification will be after completion of corrections and adjustments required by the "Punch List" which results from Acceptance Review and Testing of the completed installation. The Owner reserves the right to use equipment, material and services provided as a part of the work of this specification prior to Acceptance without incurring any obligation to accept any equipment or completed systems until all "Punch List" work is complete and all systems comply with the Contract Documents; or accept any claim for additional cost or time.

End of Specification

APPENDIX A
CGCC IRONWOOD HALL MEDIA SYSTEMS
PRICE LIST

MEDIUM CLASSROOMS							
	Qty	Manufacturer	Model	Description	Price	Ext Price	
MC1	12	SONY	RDR-VX560	COMBO DVD/VCR W/ HDMI	\$	\$	
MC2	12	NEC	NP510W	LCD PROJECTOR, WIDESCREEN	\$	\$	
MC3	48	TANNOY	CMS601BM	CEILING SPEAKER 60W, 70V	\$	\$	
MC4	48	TANNOY	CMS601BM	CEILING SPEAKER 60W, 70V	\$	\$	
MC5	12	BMS	LCD LOC II	LOCKING PROJECTOR MOUNT	\$	\$	
MC6	12	BMS	DCP-ADJ-824	DROP CEILING PANEL	\$	\$	
MC7	12	CRESTRON	MPB20	15-BUTTON CONTROL PANEL	\$	\$	
MC8	12	CRESTRON	MPS100	AMPLIFIER/SWITCHER/CONTROL SYSTEM	\$	\$	
MC9	12	CRESTRON	TTK-MP/MPC/IPAC-B-T	ANGLED TABLE TOP ENCLOSURE FOR MPC	\$	\$	
MC10	12	CRESTRON	SMK-MP/MPC/IPAC	SWIVEL MOUNT FOR TTK	\$	\$	
MC11	12	COVID	CC-DM001	CUSTOM WALL PLATE	\$	\$	
MC12	12	KRAMER	VP-200	1X2 VGA/XGA D/A	\$	\$	
						Medium Classroom Total	\$

LARGE CLASSROOMS							
	Qty	Manufacturer	Model	Description	Price	Ext Price	
LC1	10	SONY	RDR-VX560	COMBO DVD/VCR W/ HDMI	\$	\$	
LC2	10	AVERMEDIA	SPB-350	VISUAL PRESENTER, HD	\$	\$	
LC3	10	NEC	NP510W	LCD PROJECTOR, WIDESCREEN	\$	\$	
LC4	10	EXTRON	XPA-2001-70V	POWER AMP, 70V, 200-W	\$	\$	
LC5	60	TANNOY	CMS601BM	CEILING SPEAKER 60W, 70V	\$	\$	
LC6	10	BMS	LCD LOC II	LOCKING PROJECTOR MOUNT	\$	\$	
LC7	10	BMS	DCP-ADJ-824	DROP CEILING PANEL	\$	\$	
LC8	10	CRESTRON	MPB20	15-BUTTON CONTROL PANEL	\$	\$	
LC9	10	CRESTRON	MPS100	AMPLIFIER/SWITCHER/CONTROL SYSTEM	\$	\$	
LC10	10	CRESTRON	TTK-MP/MPC/IPAC-B-T	ANGLED TABLE TOP ENCLOSURE FOR MPC	\$	\$	
LC11	10	CRESTRON	SMK-MP/MPC/IPAC	SWIVEL MOUNT FOR TTK	\$	\$	
LC12	10	COVID	CC-DM001	CUSTOM WALL PLATE	\$	\$	
LC13	10	KRAMER	VP-200	1X2 VGA/XGA D/A	\$	\$	
						Large Classroom Total	\$

LABS						
	Qty	Manufacturer	Model	Description	Price	Ext Price
L1	8	SONY	RDR-VX560	COMBO DVD/VCR W/ HDMI	\$	\$
L2	6	AVERMEDIA	SPB-350	VISUAL PRESENTER, HD	\$	\$
L3	8	NEC	NP510W	LCD PROJECTOR, WIDESCREEN	\$	\$
L4	8	EXTRON	XPA-2001-70V	POWER AMP, 70V, 200-W	\$	\$
L5	48	TANNOY	CMS601BM	CEILING SPEAKER 60W, 70V	\$	\$
L6	8	BMS	LCD LOC II	LOCKING PROJECTOR MOUNT	\$	\$
L7	8	BMS	DCP-ADJ-824	DROP CEILING PANEL	\$	\$
L8	8	CRESTRON	MPB20	15-BUTTON CONTROL PANEL	\$	\$
L9	8	CRESTRON	MPS100	AMPLIFIER/SWITCHER/CONTROL SYSTEM	\$	\$
L10	8	CRESTRON	TTK-MP/MPC/IPAC-B-T	ANGLED TABLE TOP ENCLOSURE FOR MPC	\$	\$
L11	8	CRESTRON	SMK-MP/MPC/IPAC	SWIVEL MOUNT FOR TTK	\$	\$
L12	8	COVID	CC-DM001	CUSTOM WALL PLATE	\$	\$
L13	8	KRAMER	VP-200	1X2 VGA/XGA D/A	\$	\$
					Labs Total	\$

LECTURE ROOM						
	Qty	Manufacturer	Model	Description	Price	Ext Price
LR1	1	SONY	RDR-VX560	COMBO DVD/VCR W/ HDMI	\$	\$
LR2	1	VADDIO	CEILING VIEW HD	DEILING MOUNTED DOCUMENT CAM, HD	\$	\$
LR3	2	NEC	NP510W	LCD PROJECTOR, WIDESCREEN	\$	\$
LR4	1	EXTRON	XPA-2001-70V	POWER AMP, 70V, 200-W	\$	\$
LR5	6	TANNOY	CMS601BM	CEILING SPEAKER DUAL CONC. 60W, 70V	\$	\$
LR6	2	BMS	LCD LOC IV	LOCKING PROJECTOR MOUNT	\$	\$
LR7	2	BMS	DCP-ADJ-824	DROP CEILING PANEL	\$	\$
LR8	1	CRESTRON	MPB20	15-BUTTON CONTROL PANEL	\$	\$
LR9	1	CRESTRON	MPS200	AMPLIFIER/SWITCHER/CONTROL SYSTEM	\$	\$
LR10	1	CRESTRON	TTK-MP/MPC/IPAC-B-T	ANGLED TABLE TOP ENCLOSURE FOR MPC	\$	\$
LR11	1	CRESTRON	SMK-MP/MPC/IPAC	SWIVEL MOUNT FOR TTK	\$	\$
LR12	1	COVID	CC-DM002	CUSTOM WALL PLATE	\$	\$
LR13	1	KRAMER	VP-200	1X2 VGA/XGA D/A	\$	\$
LR14	1	SENNHEISER	EW322	UHF WIRELESS SYSTEM W/LAV	\$	\$
LR15	1	SENNHEISER	SKM 300-845	G3 handheld transmitter	\$	\$
LR16	1	WILLIAMS	T800-SYS	HEARING ASSIST SYSTEM	\$	\$
LR17	1	CRESTRON	QM-RX	DVI/RGB Input Card for DM Switchers	\$	\$
					Lecture Room Total	\$

AUDITORIUM

	Qty	Manufacturer	Model	Description	Price	Ext Price
A1	1	SONY	RDR-VX560	COMBO DVD/VCR W/ HDMI	\$	\$
A2	1	VADDIO	CEILING VIEW HD	DEILING MOUNTED DOCUMENT CAM, HD	\$	\$
A3	2	NEC	NP3151W	LCD PROJECTOR, WIDESCREEN	\$	\$
A4	1	EXTRON	XPA-2003C-70V	POWER AMP, 1-CH 70V, 200-W; 2-ch 8 ohm	\$	\$
A5	9	TANNOY	CMS601DCBM	CEILING SPEAKER DUAL CONC. 60W, 70V	\$	\$
A6	2	TANNOY	Di8D	WALL MOUNT SPEAKER 8', 180-W	\$	\$
A7	2	TANNOY	8001 4191	WALL BRACKET	\$	\$
A8	2	BMS	LCD LOC IV	LOCKING PROJECTOR MOUNT	\$	\$
A9	2	BMS	DCP-ADJ-824	DROP CEILING PANEL	\$	\$
A10	2	SENNHEISER	EW322	UHF WIRELESS SYSTEM W/LAV	\$	\$
A11	2	SENNHEISER	SKM 300-845	G3 handheld transmitter	\$	\$
A12	1	BIAMP	NEXIA PM	DSP PRESENTATION MIXER	\$	\$
A13	1	WILLIAMS	T800-SYS	HEARING ASSIST SYSTEM	\$	\$
A14	1	CRESTRON	MPS300	AMPLIFIER/SWITCHER/CONTROL SYSTEM	\$	\$
A15	2	CRESTRON	QM-RX	DVI/RGB Input Card for DM Switchers	\$	\$
A16	1	CRESTRON	CEN-HPRFGW	RF GATEWAY FOR TPS-6X	\$	\$
A17	1	CRESTRON	TPS-6X	6" WIRELESS COLOR TOUCH PANEL	\$	\$
A18	1	CRESTRON	TPS-6LB-T	6" WIRED COLOR TOUCH OPANEL	\$	\$
A19	1	CRESTRON	RMK-6L	RACK MOUNT PANEL FOR TPS6L	\$	\$
A20	1	CRESTRON	CEN-IDOCV	IPOD DOCKING STATION	\$	\$
A21	1	CRESTRON	ABAR-1	AUDIO RECEIVER FOR IDOCV	\$	\$
A22	1	COVID	CC-DM002	CUSTOM FLOOR PLATE	\$	\$
A23	1	KRAMER	VP-200	1X2 VGA/XGA D/A	\$	\$
					Auditorium Total	\$

CERAMICS STUDIO

	Qty	Manufacturer	Model	Description	Price	Ext Price
CS1	1	SONY	RDR-VX560	COMBO DVD/VCR W/ HDMI	\$	\$
CS2	1	AVERMEDIA	SPB-350	VISUAL PRESENTER, HD	\$	\$
CS3	1	NEC	NP510W	LCD PROJECTOR, WIDESCREEN	\$	\$
CS4	1	EXTRON	XPA-2001-70V	POWER AMP, 70V, 200-W	\$	\$
CS5	5	TANNOY	Di8D	WALL MOUNT SPEAKER 8', 180-W	\$	\$
CS6	5	TANNOY	8001 4191	WALL BRACKET	\$	\$
CS7	1	BMS	LCD LOC IV	LOCKING PROJECTOR MOUNT	\$	\$
CS8	1	BMS	DCP-ADJ-824	DROP CEILING PANEL	\$	\$
CS9	1	CRESTRON	MPB20	15-BUTTON CONTROL PANEL	\$	\$
CS10	1	CRESTRON	MPS200	AMPLIFIER/SWITCHER/CONTROL SYSTEM	\$	\$
CS11	1	CRESTRON	TTK-MP/MPC/IPAC-B-T	ANGLED TABLE TOP ENCLOSURE FOR MPC	\$	\$
CS12	1	CRESTRON	SMK-MP/MPC/IPAC	SWIVEL MOUNT FOR TTK	\$	\$
CS13	1	COVID	CC-DM002	CUSTOM WALL PLATE	\$	\$
CS14	1	KRAMER	VP-200	1X2 VGA/XGA D/A	\$	\$
CS15	1	SENNHEISER	EW322	UHF WIRELESS SYSTEM W/LAV	\$	\$
CS16	1	CRESTRON	QM-RX	DVI/RGB Input Card for DM Switchers	\$	\$
CS17	1	PANASONIC	TH-50PH11UK	50" PLASMA DSPLAY	\$	\$
CS18	1	PREMIER	AM250	SWING-OUT PLASMA WALL MOUNT	\$	\$
					Ceramics Studio Total	\$

CAMPUS INFO DISPLAY

	Qty	Manufacturer	Model	Description	Price	Ext Price
CI1	2	PANASONIC	TH-50PH11UK	50" PLASMA DSPLAY	\$	\$
CI2	2	PREMIER	AM250	SWING-OUT PLASMA WALL MOUNT	\$	\$
					Info Display Total	\$

Racks, Plates and Misc.

Qty	Manufacturer	Model	Description	Price	Ext Price	
R1	1 Lot		Cables & Connectors	\$	\$	
R2	1 Lot		Installation Hardware and Materials	\$	\$	
R3	1 Lot		Rack kits, cable support buckets and harware	\$	\$	
R4	7	MIDDLEATLANTIC	RK12	EQUIPMENT RACK FOR CASEWORK 12R.U.	\$	\$
R5	1	MIDDLEATLANTIC	ISRK-12GY	UNDER DESK RACK WITH DOOR 12R.U.	\$	\$
R6	34	MIDDLEATLANTIC	PD-915R	RACK MOUNT POWER STRIP	\$	\$
R7	33	MIDDLEATLANTIC	RSH-4-VX350	RACK SHELF FOR DVD/VCR	\$	\$
				Misc. Total	\$	

Summary	Total
MEDIUM CLASSROOMS	\$
LARGE CLASSROOMS	\$
LABS	\$
LECTURE ROOM	\$
AUDITORIUM	\$
CERAMICS STUDIO	\$
CAMPUS INFO DISPLAY	\$
Racks, Plates and Misc.	\$
EQUIPMENT TOTAL	\$
INSTALLATION	\$
PROGRAMMING (Crestron & Biamp)	\$
ALL OTHER NON-EQUIPMENT (Warranty, Delivery, Training, Documentation, etc.)	\$
TOTAL PRICE	\$
SALES TAX	\$
GRAND TOTAL	\$

**ATTACHMENT A
SIGNATURE PAGE**

This page must be completed and signed and included with your Bid

SIGNATURE _____

(PRINTED NAME) _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY, STATE, ZIP _____

TELEPHONE _____

FAX NUMBER _____

E-MAIL _____

CONTRACTORS LICENSE NO(S):

TYPE	NUMBER
_____	_____
_____	_____

Is your firm a:

Corporation* Partnership Individual Joint Venture

* If a corporation, answer the following:

- (a) Where incorporated:
- (b) Date incorporated:

Have your Articles ever been suspended or revoked? Yes No

If yes, when, for what reason, and when were they reinstated:

Has your firm or its parent or subsidiaries ever been debarred or suspended from providing any goods or services to the Federal Government or other public entities? Yes No

If yes, when, for what reason, and when were they reinstated:

ATTACHMENT B
BID BOND
(Sample)

KNOW ALL MEN BY THESE PRESENTS, that we, _____
(Bidder's Name)

_____ of _____
(Street Address) (City, State, Zip)

hereinafter called the Principal, and _____
(Surety's Name)

a corporation organized and existing under the Laws of the State of _____ and authorized to transact business in the State of _____, as Surety, hereinafter called Surety, are held and firmly bound unto the hereinafter called Obligee, in the Penal sum of ten percent (10%) of the amount (Owner) bid, good and lawful money of the United States of America, for the payment of which the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The Condition of this Obligation is such, that, WHEREAS the Principal had submitted a proposal to the Obligee on a contract for the construction of:

(Contract, Name and Number)

NOW THEREFORE, If the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the Bidding or Contract Documents with good and sufficient surety for the faithful performance of such construction for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void; otherwise to remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our signatures and seal this

_____ day of _____, 20____, all pursuant to due authorization.

Principal: _____ Seal

By: _____

Surety: _____ Seal

Bond No. _____

By: _____

By _____
Attorney-in-fact in accordance with
the attached Power of Attorney

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public in and for the State and County aforesaid, do hereby certify that and _____, whose names are signed to the foregoing bond, this day personally appeared before me in my State and County aforesaid and acknowledged the same.

Given under my hand seal this _____ day of _____, 20____.

Notary Public (Seal)

My commission expires: _____

ATTACHMENT C
PAYMENT BOND
(Sample)

STATUTORY PAYMENT BOND PURSUANT TO A.R.S. 41-2574
(Penalty of this bond must be 100% of the Contract Amount.)

KNOWN ALL MEN BY THESE PRESENTS:

That, _____ (hereinafter called Principal), as Principal, and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ (hereinafter called the Surety), as Surety, are held and firmly bound unto _____ (hereinafter called the Obligee, in the amount of _____ Dollars (\$ _____) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated the _____ day of _____, 20____, to _____ which contract is hereby referred to and made a part hereof as fully and to the same extent as if copies at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if said Principal shall promptly pay all monies due to all persons, supply labor or materials to him or his subcontractors in the prosecution of the work provided for in and said contract, then this obligation shall be void, otherwise to remain in full force and effect;

PROVIDE, HOWEVER, that this bond having been required of the said Principal in order to comply with the provisions of A.R.S. 41-2574, all rights and remedies on this bond shall insure solely to such persons and shall be determined in accordance with the provisions, conditions, and limitations of said Title, Chapter, and Article, to the same extent as if they were copied at length herein.

The prevailing party in a suit on this bond shall recover as a part of his judgment such reasonable attorneys' fees as may be fixed by a judge of the Court.

Witness our hands this _____ day of _____, 20_____.

Principal	Seal
By:	
Surety	Seal
By:	
Agency of Record	
Agency Address	

ATTACHMENT D
PERFORMANCE BOND
(Sample)

STATUTORY PERFORMANCE BOND PURSUANT A.R.S. 41-2574
(Penalty of this bond must be 100% of the Contract Amount.)

KNOWN ALL MEN BY THESE PRESENTS:

That, _____(hereinafter called Principal), as Principal, and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____(hereinafter called the Surety), as Surety, are held and firmly bound unto _____(hereinafter called the Obligee) in the amount of _____ Dollars (_____), for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated the ___ day of _____, 20____, to _____ which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that is said Principal shall faithfully perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extension thereof, with or without notice of the Surety, and during the life of any guaranty required under the contract, and shall also perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereby be made notice, of which modifications to the Surety being hereby waived; than the above obligation shall be void, otherwise to remain in full force and effect.

PROVIDE, HOWEVER, that this bond is executed pursuant to the provisions of A.R.S. 41-2574, and all liabilities on this bond shall be determined in accordance with the provisions of said Title, Chapter, and Article, to the extent as if it were copied at length herein.

The prevailing party in suit on this bond shall recover as a part of his judgment such reasonable attorneys' fees as may be fixed by a judge of the Court. Witness our hands this _____ day of _____, 20_____.

Principal Seal

By:

Surety: Seal

Bond No.

By:

Agency of Record

Agency Address