AUDIO AND VIDEO SYSTEM
FOR THE GATEWAY PROJECT
TALA Project# 11700-1
Date: 2-4-16

PART 1 GENERAL

1.01 DECSRIPTION OF THE WORK

A. The complete Audio and Video Systems include the following area and items.
   1. Lobby with a sound system, ceiling speakers, signage monitors, display monitor, auxiliary AV inputs on columns, Kiosk for library content and information, cameras for video exchange, a control system for controlling shades and integrating AV content with the video wall and throughout the building.
   2. Training room with sound system, ceiling speakers, video monitors and podium that contains a control system, computer, AV connections, microphones and VTC (Video Teleconferencing).
   3. Children's room with sound system, ceiling speakers and interactive multi-touch tables.
   4. Coffee Shop with sound system, overhead speakers, remote panel for selecting sound sources and TV monitor.
   5. Small work room with overhead sound and a camera for viewing 3D printer
   6. Large work room with overhead sound, content monitor and table work monitors
   7. Outside speakers.
   8. Integrate entire Audiovisual system with Video Walls
   9. Programming is comprehensive and is to be coordinated with the AV Designer and owner. It will include all programming associated with the AV controller, AV switcher, All-in-Presentation, Audio DSP, all monitors, input devices, wireless touch panels, shade control and any other devices that are considered part of the AV System.
   10. All necessary cables and accessories that are not included in the drawings must be anticipated and included on with the bid.

1.02 RELATED DOCUMENTS

A. General Conditions and Requirements, Special Provisions, and applicable portions of this Division of general contract are hereby made a part of this section and drawings.
B. Architectural, Structural, mechanical, electrical, and other applicable documents are considered a part of the AV documents insofar as they apply as if referred to in full.

1.03 SCOPE OF THE WORK

A. Providing the equipment listed, drawings and line diagrams for the completed (as built) AV System.
B. Work with contractor to furnish, deliver, erect, install and connect completely all of the equipment and materials described in specifications and drawings.
C. Performance check on all assembly of equipment, wiring and inter-connection and soldering of wires to jacks, devices, terminals or equipment. Coordinate final rough-in locations with actual equipment furnished.

1.04 QUALITY ASSURRANCE

A. The Specifications require a complete AV system of the highest professional quality and reliability. The professional performance by the AV contractor will be monitored by the AV Designer.
B. The Owner and AV Designer shall determine the acceptability of the work based upon the visits, observations and reports.

1.05 MATERIALS

A. All materials shall be new, and UL approved where a standard has been established
B. Manufactures' names and model numbers shown on the plans and in the specifications are given to indicate the type and general quality of items to be provided. Equal products by other manufacturers will be considered.
C. Materials substitutions will be considered only when evidence of equality and suitability, satisfactory to the AV Designer has been presented in writing, with samples if requested by the AV Designer/owner.
D. It shall be understood that the AV Designer/owner has the authority to reject any material or equipment used which is not specified or approved, or showing defects of manufacture or workmanship, before or after such material or equipment is installed.

1.06 SUBSTITUTIONS

A. There are items in the specifications by the manufacturer's type or model number, without a detailed performance specification, and my not include the phrase "or approved equal". Where this is the case, no substitutions will be accepted, without a written request from the installer and the written consent of the Consultant.
B. Where the phrase "or approved equal" appears, the item specified shall set a standard of quality and performance, based on the published specifications of the manufacturer and on the actual performance as known by the Consultant.
C. Requests for substitution, when forwarded by the Installer to the AV Designer, are understood to mean that the installer represents that he has personally investigated the proposed substitute product and determined that it is equal to or superior in all respect to that specified, that the same guarantee will be provided for the substitution as for the specified product, and that the Installer will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.
D. Space allocations and rough-ins have been designed on the basis of equipment items named by manufacturer and model number. If any equipment not so named is offered which differs substantially in dimension or configuration from the named equipment, provide scaled shop drawings showing that the substitute can be installed in the space available without interfering with other trades or with access for operation and maintenance in the completed project. The Installer shall coordinate final utility rough-ins locations with actual equipment furnished.
E. All requests for substitutions shall be submitted before the bid opening date. Substitutions shall be requested and approved in writing only, based upon these criteria.

1.07 INSTALLER QUALIFICATIONS

A. The work performed under this Section shall be performed by an AV Contractor, normally engaged in the business of Audio visual installation. The prospective contractor shall show proof, as part of the bid that the contractor has been in the AV Systems installation business for a period of not less than five years and has successfully completed projects of similar size and scope.
B. Each bidder shall hold a current, valid franchise for the major lines of Sound Equipment furnished by him under these Specifications
C. The bidder must hold a current Alabama State Contractor's license for the amount of work to be performed.
D. Obtain and pay for all permits and deposits, and arrange for inspections as required
E. After completion of the work, submit certificate of final inspection and approval from the local electrical inspector, certifying that the installation complies with all regulations governing same.
F. Contractor must have a full-time Crestron Programmer(s) on staff.
G. The programmer must hold a Crestron DMC-D and Crestron DMC-E certifications and provide the certificates with the bid.
H. The vendor must have at least one (1) certified CTS-D and provide the certificate with the bid.
I. If vendor is to use subcontractors, vendor must provide a list of subcontractors and detail their function, percentage work to be performed by subcontractor, and manufacturer's certifications attained to support that function in the bid response.

1.08 DRAWINGS AND SPECIFICATIONS

A. Drawings and Specifications shall be considered as complementary each to the other. What is called for by one shall be as binding as if called for by both. Where conflicts occur, secure clarification from the AV Designer in advance of bidding; otherwise incorporate the more stringent conditions into the bid price.
B. The drawings indicate diagrammatically the extent, general character, and the approximate location of the work to be performed. In the interest of clearness, the work is not always shown to scale or exact location. Check all measurements, location of conduit, fixtures, outlets, and equipment with the detailed AV Designer, structural, and mechanical drawings, and lay out work so as to fit in with ceiling grids, ductwork, sprinkler piping and heads, and other parts. Take finish dimensions at the job site in preference to using scale dimensions.
C. Omissions from the drawings and specifications or the mis-description of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omissions and details of work, but they shall be performed as if fully and correctly set forth and described in the drawings and specifications.
D. Where the work is indicated but with minor details omitted, furnish and install the work complete so as to perform its intended functions.
E. Where doubt arises as to the meaning of the plans and specifications, obtain the AV Designer's decision before proceeding with parts affected; otherwise the contractor assumes liability for damage to other work and for making necessary corrections to work in question.
F. Except as noted above, make no changes in or deviations from the work as shown or specified except on written order of the AV Designer.

1.09 SUBMITTALS: PROCEDUREs OUTLINED IN DIVISION I.

A. Submittals shall be bound together and shall include a coversheet indicating the following:
   1. Project name
   2. Trade contractor's name
   3. Supplier's name
   4. Name and phone number of supplier's contact person
   5. A list of each item submitted with manufacturer and model number
B. Within 5 days of award of contract and prior to beginning any work on the project submit six (6) copies of manufacturer' drawings/data sheets for each piece of equipment forming a part of the Audio/Video System to the AV Designer for review.
C. Submittal shall include items as necessary to demonstrate the selection of equipment, quality of equipment, and items as necessary to demonstrate the details of the system and shall include, but are not limited to, the following:
   1. Complete schedule of all equipment and materials to be used.
   2. Sample of intended cable markings methods
   3. Sample of intended equipment and plate labeling
   4. Shop drawings indicating exact details, dimensions, and/or configuration for:
      a. Point-to-point wiring diagram showing detailed numbered wiring between all devices, connections, plates, etc.
      b. Rigging diagrams for all loudspeakers showing hardware selection and sizing and including stamped drawings or a letter of approval by the structural engineer.
   5. Labeling artwork indicating designations and details.
D. Submit samples upon request.
E. Closeout submittals:
   1. Copies: The AV contractor shall assemble and provide four (4) copies of the AV System O&M Manual. One complete copy of the Manual shall be provided to AV Designer before their inspection of the system.
   2. System Manual: The system manual shall be an indexed; three ring notebook(s) containing the following.
      a. Front cover and spine label indicating the contents, project name, and project location.
      b. Cover sheet indicating Architect, AV Designer and Contractor and their respective address and phone numbers.
      c. Accurate as built drawings including both Engineering drawings and Contractor's Shop drawings. Oversized drawings shall be neatly folded and inserted individually into Mylar sheet protectors designed to be used in a three ring notebook.

d. Manufacturer's operating maintenance manuals for all equipment supplied.
   1. Use manufacturer's original documents whenever possible.
   2. Photocopies shall be as legible as the originals.

1.10 WORKMANSHIP

A. Execute all work so as to present a neat and workmanlike appearance when completed.

1.11 PROGRESS OF WORK

A. Schedule work as necessary to cooperate with other trades, Do Not delay other trades. Maintain necessary competent technicians and supervision to provide an orderly progression of the work.

1.12 PROTECTION OF PERSONS AND PROPERTY DURING CONSTRUCTION

A. Take all precautions necessary to provide safety and protection to persons and the protection of materials and property. Any damage caused by the contractor during their installation work is the reponsibility of the contractor to correct or repair. The owner may have correetive work performed by others and charge the cost to the contractor, including dry wall damage and re-painting as needed.
B. Protect items of equipment from stains, corrosion, scratches, and any other damage or dirt, whether in storage, at job site or installed. No damaged or dirty equipment, lenses, or reflectors will be accepted.
C. Live enclosures, outlets, switches, junction boxes, etc., shall be protected against contact of live parts and conductors by personnel.

1.13 CLEANING UP

A. During the progress of work, keep the Owner's premises in a neat and orderly condition, free from accumulation of debris resulting from this work. At the completion of the work, remove all material, scrap, etc. not a part of this Contract.

1.14 TESTING

A. Upon completion of the work, conduct a thorough test in the presence of owner and AV Designer or his representative, and demonstrate that all systems are in perfect working condition.

1.15 INSPECTIONS

A. The contractor shall have all systems ready for operation at the final inspection and any other scheduled inspections.

1.16 DEMONSTRATION

A. By on-off, stop-start operation, demonstrate to the AV Designer and Owner or his representative, the use, working, resetting, and adjusting of each and every system. Submit statement initialed by the AV Designer and Owner that such demonstration has been made.

1.17 WARRANTY

A. General Warranty: The AV contractor shall warrant the AV system against defects in materials and workmanship, including required labor and parts, for a period of one year from the date of Final Acceptance of the system.
   1. The AV Contractor shall not be liable for damage caused by improper use, negligence, or acts of God.
   2. Any equipment found defective during the installation or warranty period shall be repaired not to exceed two times and then must be replaced with a new unit.
   3. Provide the owner with two bound copies of all manufacturers' warranties.

B. Service Calls: The AV Contractor shall respond to service calls as requested by the Owner for specific problems. These service visits shall be available within twenty-four hours. The AV Contractor shall provide telephone contact numbers to the Owner to enable contact with a representative.
C. Equipment Repair: The AV Contractor shall provide temporary replacement equipment of a similar nature if repairs to the defective equipment cannot be completed within 24 hours. Use temporary labels to match the original labeling nomenclature. Always replace the temporary item with the original unit after repair.

D. Scheduled Visits: The AV Contractor shall make two scheduled visits to the site for functional checks of equipment and installation. The first visit shall occur approximately six months after the final acceptance and the second visit just prior to the end of the warranty period.

PART 2-EQUIPMENT AND MATERIALS

2.1 GENERAL

A. This section includes equipment and materials for the AV system as required for a complete installation.
B. All equipment shall be new and listed by the Underwriters Laboratories. Material substitutions will be considered only when evidence of equality and suitability to the AV Designer has been presented and accepted in writing, with samples if requested by the AV Designer.
C. It shall be understood that the AV Designer/owner has the authority to reject any material or equipment used which is not specified or approved, or showing defects of manufacture or workmanship, before or after such material or equipment is installed.
D. Provide a technical specifications cut sheets for major equipment items included in the bid. These technical specifications cut sheets must be included in the bid response.

2.2 CONDUITS

A. All conduits will be installed by others and with a pull string.

2.3 WIRE AND CABLE

A. All wire and cables shall be new and unused
B. Constant voltage (70.7-volt) loudspeaker cable: West Penn 224 stranded 18 AWG jacketed twisted pair, or approved equal
C. Line-level audio cable and all inter-rack audio cable: West Penn 421 stranded 22AWG jacketed shielded twisted pair, or approved equal.
D. Control cable: West Penn 222 22/2 Stranded bare copper conductors, non-shielded with an overall jacket.
E. DigitalMedia Ultra Cable, Non-Plenum Type CMR DM-CBL-ULTRA-NP for control system.
F. RGBHV Cable: Liberty or Rapid run with BNC or VGA connectors, or approved equal.
G. Other equipment control cables shall be stranded wire, appropriately shielded and number of conductors required by the manufacturer for proper operation of the system or equipment items furnished.
H. Wire and cable for all other devices shall be supplied in accordance with the recommendations of the device manufacturer and the National Electrical Code.

2.4 AUDIO VIDEO EQUIPMENT RACK AND POWER DISTRIBUTION

A. Equipment racks for use in housing equipment including, but not limited to, power amplifiers, signal processors, playback equipment, etc. will be furnished by owner
B. Equipment rack colors shall be satin black
C. Power distribution within racks shall be supplied by owner.

2.5 MICROPHONES & ACCESSORIES

A. Furnish and install the following Wireless Microphone System
   1. The Wireless Combo Microphone Systems shall be equal to Shure SLX Wireless System composed of: (Qty 2)
      a. Shure ULXS4 rack mount receiver with rack ears
      b. Shure ULXS24/Beta58 hand held transmitter
      c. Shure ULXS1 Body Pack Transmitter
      d. Shure WL185 Lavaliere Microphone

      Approved equal
      Audix
      Sennheiser
      Electro-Voice

2. Active Directional Antenna (Location to be determined by AV Designer)
   a. Shure UA874 (Qty 2)
      Approved equal
      Audix
      Sennheiser
      Electro-Voice

3. A podium style gooseneck microphone
   a. Shure MX415/C (Qty 1)
   b. R185B
      Approved equal
      Audix
      Sennheiser
      Electro-Voice

2.6 DIGIAL SIGNAL PROCESSING

A. Furnish Digital Signal Processor (DSP) for using in controlling the various audio signals for playback of devices.
B. The DSP system shall provide twelve balanced mic/line inputs and eight balanced mic/line outputs on plug-in barrier-strip connectors. Inputs and outputs shall be analog, with internal 24-bit A.D & D/A converters operating at a sample rate of 48k Hz. All internal processing shall be digital (DSP). NexLink connections shall allow sharing of digital audio within multi-unit systems and provide for VOIP conferencing capability.
C. The DSP shall provide the following:
   1. Ethernet port for software configuration/control
   2. Serial port for third-party remote control
   3. Remote control bus for dedicated control panels
   4. Pre-configured I/O with definable processing
   5. Mix, route, combine, EQ, delay, control, etc.
   6. UL listed
D. Furnish and install the following
   1. Biamp Tesira VI (Qty 1)
      Approved equal
      Symetrix
      Ashly

2.7 AMPLIFIER(POWER AMP)

4 Channel Power Amp

A. General: Amplifier to be mounted in the equipment rack. The amplifier will perform to these minimal specifications. The amplifier shall contain all solid state circuitry, using complementary silicon output devices. The amplifier shall operate from 50-60 Hz AC power.
B. Each power amplifier shall have an input connector which is either a screw-type barrier strip or XLR type. Output connections shall be barrier strip. Other types of connectors shall not be accepted.
C. Furnish and install the following in the Rack Room 111:
   1. QSC CX204V four channel 220w 70v amp (Qty2)
      Approved equal
      Crown
      Electro-Voice

Two Channel Power Amplifier

A. General: Amplifier to be mounted in the equipment rack. The amplifier will perform to these minimal specifications. The amplifier shall contain all solid state circuitry, using complementary silicon output devices. The amplifier shall operate from 50-60 Hz AC power.
B. Each power amplifier shall have an input connector which is either a screw-type barrier strip or XLR type. Output connections shall be barrier strip. Other types of connectors shall not be accepted.
C. Furnish and install the following in the Rack Room 111:

1. QSC CX302 two channels 200w for lobby full-range. (Qty1)
   Approved equal
   Crown
   Electro-Voice

2.8 PLAYBACK DEVICES FOR LOBBY AND TRAINING ROOM:

A. Furnish Digital Video Disc (Blu-Ray) playback equipment in Rack Room 111 and in podium.
B. Units shall be furnished with HDMI and component inputs and outputs. Controllable with RS-232C or IP. Supports Blu-Ray, DVD and audio CD formats.
C. Furnish and install the following:
   1. Denon DN-500BD Blu-Ray player with rack mounting ears. (Qty 2)
      Approved equal
      Marantz
      Yamaha

2.9 OUTSIDE SPEAKERS

A. Furnish 70v speakers installed outside the two exits.
B. Each speaker will be installed with the bracket recommended by manufacture.
C. Tap the transformers at 2.5v.
D. Color: Black
E. Furnish and install the following
   1, Soundtube SM400IW outdoor speakers (Qty 4)
      Approved equal
      SA
      Atlas
      Owi

2.10 CEILING MOUNTED LOUSDPEAKER ASSEMBLIES

A. Furnish ceiling mounted loudspeakers at the locations noted on the drawings.
B. Each speaker shall be installed in a recessed enclosure. Furnish braces designed to provide additional support to the weight of the speaker and prevent tile sag. Coordinate exact locations with the Architect. Baffles shall be painted a color selected by the AV Designer prior to installation. Connect the loudspeakers as indicated in the drawings.
C. Tap the transformers as indicated. Measure and record the impedance at 1000Hz of each home run at the amplifier terminals. Include the measurements in the final documentation.
D. Color: Off white
E. Furnish and install the following:
   1. Electro-voice EVID 8.2LP coaxial 8" loudspeaker. (Qty 10)
      a. Approved Equal
         Altas
         Tannoy

1.11 HANGING LOUDSPEAKER ASSEMBLIES

A. Hanging mounted speaker at the locations noted on the drawings.
B. Each speaker shall be hung 10ft off floor. Install with approval cabling to support the weight of the speaker and prevent any snags. Coordinate exact locations with the AV Designer and Architect. Cables shall be painted and coordinated with the AV Designer prior to installation. Connect the loudspeakers as indicated in the drawings
C. Tap the transformers as indicated. Measure and record the impedance at 1000Hz of each home run at the amplifier terminals. Include the measurements in the final documentation.
D. Color: Off White
E. Furnish and install the following:
   1. Soundtube RS500iw 5.2" polypropylene woofer and one 1.0" titanium tweeter (Qty 11)

a. Approved Equal
Atlas

1.12 MAIN LOUDSPEAKERS IN LOBBY

A. Speakers shall be mounted to columns nearest to Video Wall, to be determined by the AV Designer. Use manufacture's mounting hardware and mount in such a way as to facilitate minor angle adjustments. Secure any loose hardware to prevent vibration and rattling. Coordinate location and angles position with the AV Designer. Make minor adjustments as required to provide even sound distribution.
B. Measure and record the impedance of each driver at the amplifier terminals. High frequency drivers shall be measured at 1000Hz; low frequency drivers shall be measured at 250Hz. Include the measurements in the final documentation.
C. Color: Off White
D. Furnish and install the following assemblies in Lobby
   1. Electro-voice Zx1 White 8" LF transducer and 1" Compression Driver or approved equal (Qty 2)
      a. Approved equal
         Tannoy
         JBL

2.16 VOLUME CONTROL

F. Furnish and install volume control **2 work lounges and Children's room**
G. Volume controls must be mounted as indicated in the drawings.
H. Minimal 25 watts for use with 100/70/23V
I. Color: Off White
J. Furnish and install the following
   1. Lowell 25W Attenuator (Qty 3)
      a. Approved equal
         Atlas
         Quam

2.17 MONITORS FOR TRAINING ROOM

A. Furnish and install LCD Flat Screen in Training room 121.
B. Screens are to be mounted as indicated in the drawings.
C. HDMI In and Controllable by RS232
D. Furnish and install the following:
   1. Sharp LC60LE661 60" TV monitor (Qty 4)
      a. Approved equal
         Samsung
         LG
         Sony
   1. ProMount UT-PRO310 tilt wall mount for TV monitor. (Qty 4)
      b. Approved Equal
         Chief
         Peerless

2.18 MONITORS FOR WORK LOUNGE 2

Wall mounted

A. Furnish and install monitors in the Work Lounge room 104.
B. Screens are to be mounted as indicated in the drawings.
C. HDMI In and Controllable by RS232
D. Furnish and install the following:
   2. Samsung LED JU6400 42" TV monitor (Qty 1)
      a. Approved equal
         Samsung
         LG

Sony

3. ProMount UT-PRO310 tilt wall mount for TV monitor. (Qty 1)
   c. Approved Equal
      Chief
      Peerless

Table mounted

a. Furnish and install LCD Flat Screen in the Work Lounge Room 104.
b. Screens are to be mounted as indicated in the drawings.
c. HDMI In and Controllable by RS232
d. Furnish and install the following (mount furnished by owner):
   1. Samsung LED JU6400 42" TV monitor (Qty 2)
      a. Approved equal
         Samsung
         LG
         Sony

   2. RMF2 Medium FIT™ Fixed Wall Display Mount (Qty 2)
      a. Approved equal
         Samsung
         LG

2.19 LCD MONITOR FOR LOBBY AREA AND COFFE SHOP

Signage Monitor

A. Furnish and install in vertical position on the wall across from information center.
B. Articulating and Full Motion
C. Monitors placement is to be coordinated with the AV Designer.
D. Furnish and install the following:
E. HDMI In and Controllable by RS232
F. Furnish and install the following:
   1. Samsung LED J5500 50" TV monitor (Qty 1)

      a. Approved equal
         a. LG
         b. Sony
         c. Samsung

      Samsung LED JU6400 42" TV monitor (Qty 1)

   2. ProMount UT-PRO310 tilt wall mount for TV monitor. (Qty 2)
      a. Approved Equal
         Chief
         Peerless

2.20 Display monitors at Exit

1. Furnish and install LCD Flat Screen at left and right side of side Exit.
B. Monitor placement are to be coordinated with the AV Designer.
C. Furnish and install the following.
   1. Samsung LED J5500 32" TV Monitor (Qty 2)
      A. Approved Equal
         LG
         Samsung
   2. ProMount FT2222 wall mount for TV monitor. (Qty 2)
         b. Approved Equal

Chief
Peerless

2.21 CAMERA MONITORING FOR VIDEO WALLS AND 3D PRINTER

A. Furnish and install IP cameras for the 2 video wall and 3D Printers
B. Cameras are to be mounted with manufacturer's hardware.
C. Minimal resolution 1280x720
D. PTZ capabilities
E. Power over internet
F. Furnish and install the following
   1. Axis P5514 PTZ camera (Qty 3)
      a. Approved equal
         Sony
         Vaddio

1.22 ALL-IN-ONE PRESENTATION SWITCHER FOR PODIUM

A. Furnish a presentation controller/Switcher inside the mobile podium
B. Capabilities for switching 6 HDMI, 3VGA, and 4 mic/5 line inputs
C. 7 IR/serial and 2 com ports
D. Digital Media and HDMI outputs
E. Furnish and install the following
   1. Crestron Presentation System 200 (Qty 1)

1.23 HOUSE CONTROL SYSTEM

A. Furnish and install in Rack room 111.
B. The controller is to manage AV system in building.
C. Capabilities of controlling switcher, Audio and video system.
D. 8 relay and serial outputs, 3 com ports and 10 I/O
E. Furnish and install the following:
   1. Crestron CP3N (Qty 1)

1.24 VIDEO SWITCHER

A. Furnish a 16x16 switcher be installed in Rack room 111.
B. Configurable to handle up to 16 AV sources.
C. Outputs are configurable to provide up to 16 DM, HDBaseT and /or HDMI outputs.
D. Selectable input and output cards, Transmitters and receivers.
E. Integrated Ethernet networking and USB distribution for managing the displays and other room devices without necessitating any additional wiring.
F. Furnish and install the following:
   1. Crestron DM-MD16x16 Switcher (Qty 1)

1.25 INPUT CARDS FOR SWITCHER

A. Furnish input cards as designated in drawings for proper input configuration.
B. Card must be configurable for Digital Media distribution
C. Handles up to 4K and Ultra HD.
D. Provides an HDMI and analog audio pass through.
E. Furnish and install into switcher the following:
   1. DMC-4K-HD (Qty 6)
   2. DMC-4K-C (Qty 9)
   3. DMC-STR (Qty 1)

1.26 OUTPUT CARDS FOR SWITCHER

A. Furnish output as designated in drawings for proper output configuration
B. Card must be configurable for Digital Media distribution
C. Handles up to 4K and Ultra HD

D. Furnish and install into switcher the following.
   1. DMC-4K-CO-HD (Qty 8)

1.27 DM WALL PLATES FOR COLUMNS

A. Finish Stainless steel wall plates with HDMI connectors on columns as designated in drawings
B. DigitalMedia 8G HDBaseT transmitter.
C. Plate with RJ 45 for HDBaseT transmission.
D. Plate colors are to be determined by AV Designer/owner.
E. Furnish and install the following
   1. Crestron DM-TX-4K-100-C HDBT (Qty 5)
   2. RJ45 DM wall plate (Qty 11)

1.28 DIGITAL RECEIVERS FOR TV MONITORS

A. Furnish receiver for each TV Monitors that is routed from the switcher
B. DigitalMedial 8G HDBaseT receiver
C. RS 232 control and HDMI output
D. 2 channel outputs
E. Upscales the input signal to match the native resolution of an screen-including 4K and Ultra HD displays
F. Furnish and install the following
   1. Crestron DM-RMC-4K-Scaller (Qty 10)

1.29 WIRELESS TOUCH PANELS

1. Furnish wireless touch panels for controlling audiovisual system
2. Dual mode FM wireless
3. 8.7" LED backlit color LCD display
4. Touch Screen
5. High-performance H.264 streaming video
6. Furnish and install the following
   1. Crestron TST-902 (Qty 2)

1.30 KEYPAD FOR COFFEE SHOP

A. Furnish a keypad for changing program setting and volume for Coffee Shop
B. Configurable for 2 to 8 pushbuttons
C. Programmable for Normal, Tap, Double-Tap, and Press and Hold
D. Single gang mount
E. Color: Off White
F. Includes 2 large, 3 medium 5 small and 2 pair split small button caps
   1. Furnish and install the following
      a. Crestron C2N-CBD-P (Qty 1)

1.31DIGITALMEDIA (DM) CABLE

A. Furnish DigitalMedia cabling with connectors to all HDBaseT inputs and output as indicated on drawings
B. 8G ultra high-performance CAT5e connecting all
C. HDBaseT rated.
D. Furnish and install the following
   1. DM-CBL-8G.NP
   2. DM-8G-CONN

~~1.32 LOW VOLTAGE CONTROL FOR SHADES~~ (Deleted for Bid)

~~A. Furnish a low voltage box for controlling the shades through the Crestron system.~~
~~B. Two-way serial communication with RS232 and low voltage Dry contact Wall Switch~~
~~C. Furnish and install the following~~
   ~~1. Draper LVC-III (Qty 4)~~

2.33. LOCAL AV CONNECTION PANEL FOR TABLE MONITORS

A. Furnish a connectivity panel for desk top mounting for training room.

B. Inputs – HDMI, VGA, Audio, and composite.
C. HDMI scaler output.
D. Furnish and install the following
1. Altinex – TNP328S. (Qty 1)

2.34. LOCAL AV CONNECTION PANEL FOR TRAINING ROOM

A. Furnish a single gang wall plate
B. Inputs-HDMI, VGA and 1/8" Audio
C. Furnish and install the following
1. Philmore 75-647 Stainless steel wall Plate (Qty 4)

2.35. ENTERTAINMENT SMART BOX

A. Furnish a devise that includes iTunes apps
B. Allow the ability to view movies iTunes movies, Netflix Hulu and other entertainment channels
C. Furnish and install the following (Qty. 1)
1. Apple TV

2.36. MISCELLANEOUS CABLES

A. 3' HDMI Cables (Qty. 5)
B. 6' HDMI Cables (Qty. 10)
C. VGA cables – 6' (Qty. 8)
D. 1/8" Mini Jack Cable – 6' (Qty. 8)
E. 6' Surge Protector – Mold or equal (Qty. 8)

2.37 CONTROL SYSTEM WIRELESS NETWORK

A. Furnish and install wireless network for touch panels
B. Multipurpose 2-way RF wireless gateway
C. Simultaneously supports Crestron ER wireless devices
D. PoE networked powered
E. Provides built-in RF network Diagnostics
F. Furnish and install the following
1. Crestron Gateway CEN-RFGW-EX

2.38 TERMINATION BLOCK

A. Furnish and install a parallel distribution block for termination of multiple Cresnet Cables
B. Connects Cresnet devices and Control system
C. Eight (8) 4-pin 3.5mm detachable terminal blocks
D. Five (5) 4-pin 5mm detachable terminal blocks
E. Three (3) 6-pin RJ11 female
F. Furnish and install the following:
1. Crestron C2N-HBLOCK

PART 3 – EXECUTION

1.1 GENERAL:

A. Installation: Installation shall be performed by only experienced AV installers. Each installer shall have access to a complete copy of the AV system plans, specifications, and approved shop drawings at the job site.
B. Equipment and Material installation: All equipment and materials are to be installed in accordance with all applicable standards of the National Electric Code and any other applicable codes including local municipality codes, safety codes, and ordinances.

C. Construction coordination: Contractor shall coordinate all work with other trades to avoid causing delays in construction schedule. Contractor shall take whatever steps necessary to meet construction schedule including, but not limited to, expediting the delivery of materials and/or providing additional labor.
   1. Contractor shall especially coordinate work schedule for installation of ceiling loudspeakers boxes and wiring above any and all ceilings.
   2. Failure to coordinate shall not relieve AV contractor from any design or installation requirements as described in this document.

D. Notification: If any of the above items is not correct or acceptable, contractor shall immediately notify Architect and AV Designer in writing.

1.2 PREPARATION:

A. Site Inspection: Contractor shall visit the project site prior to schedule installation and inspect the following:
   1. All conduits, raceways, boxes, junctions, etc. are installed according the documents and required local building codes
   2. All AC power and grounding provisions are installed according to documents and required local building codes and will interface with Contractor power distribution system.
   3. All support and structural constructions and provisions are installed according to documents and are compatible with the Contractor's intended rigging details.
   4. Any construction or condition either indicated in the documents or changed in the field that may prevent the installation of the system as indicated in this document.

B. Notification: If any of the above items is not correct or acceptable, contractor shall immediately notify Architect and AV Designer in writing.

1.3 INSTALLATION

A. General: All equipment, except that designated as movable or portable equipment, shall be installed permanently attached to structure. This is not an exhaustive list. Contractor must use accepted industry standards and practices in determining if additional items are needed.

B. Wiring;
   1. All wiring must be executed by contractor to meet or exceed accepted industry standard and practices.
   2. All necessary cables and accessories that are not included in the drawings must be anticipated and included on in the bid.
   3. As per IEC-268, all XLR type connectors shall be wired with Pin 1 as shield, Pin 2 as high signal, and Pin 3 as low signal.
   4. Patch bay connections and associated cables shall be wired with sleeve as shield, tip as high signal, and ring as low signal.
   5. All audio circuits shall be wired with white or red as high signal and black as low signal.
   6. All audio equipment input and output wiring shall be configured as balanced, low impedance, and floating lines as shown on drawings.
   7. Circuits shall not be spliced except as shown or approved.
   8. Observe proper polarity when wiring loudspeakers. Observe the specified wiring color code for loudspeaker wiring to maintain uniformity throughout the project.
   9. Only one cable or set of wires should be installed into any single connector; do not loop cable in and out of a connector. Provide terminal block to parallel connect audio signal wiring.
   10. Contractor is responsible for ensuring that a proper number of each type of conductor is installed for the desired operation of the system. Any discrepancy between the drawings and the needs of the system should be brought to the attention of the Architect.
   11. Contractor may install extra or spare cables at their discretion. Any extra cable that is discarded due to improper performance should be trimmed back and labeled as not usable with a red colored tag. All usable spares should be labeled as spares.
   12. All terminal blocks, splitters, and outlets shall be installed as shown.

C. Wiring Segregation: All wiring in racks and within conduit systems shall be segregated according to signal level and/or function as follow:
   1. Microphone level circuits (lower than -20 dBm)
   2. Line level circuits (-20dBm & DC control circuits)
   3. AC power circuits

D. Connections: All connections shall be made in compliance with industry standards, according to manufacturer of connector, and as follows:
   1. Spade lugs used for speaker level lines shall be insulated type. All other spade lugs shall be un-insulated.
E. Connector Options: If option of multiple connector types are available on a given piece of equipment, the preferences are as follows:
   1. Terminal blocks and spade lugs
   2. XLR type connector
   3. Phone plug connector
F. All equipment and enclosures described in this specification shall be installed plumb and square. All equipment, except that designated as movable or portable equipment, shall be installed permanently attached to structure.
G. Loudspeakers: Loudspeakers shall be mounted to or suspended from the structure as shown in the drawings or indicated in the specifications.
   1. Any openings required for loudspeakers shall be cut and finished
   2. Provide back box, baffles, and tile bridges as necessary for all ceiling speakers.

H. Equipment Racks: All racks shall be assembled as indicated and as follows:
   1. All electronic equipment, except those shown otherwise, rack fans, and vent panels shall be housed in the equipment racks as shown and using black 10-32 Phillips or Allen head screw with black fiber washer.
   2. All unused spaces shall be filled with solid blank panels. Blank panels shall be mounted with same screws and washers as equipment in the rack.
   3. Provide security covers for and /or knob locks on all non user operation controls and equipment.

3.4 WIRING PRACTICES:

A. Connections: All connections shall be made in compliance with industry standards, according to manufacturer of connector, and as follows:
   1. All solder connections shall be made with rosin core solder, be neat, and show no signs of cold solder joint. Shrink wrap tubing shall not be used to cover any solder connections.
   2. Connections to screw type terminal blocks shall be made using crimped, non-insulated spade lugs selected for the wire size
   3. All crimp connections shall be made in accordance with connector manufacturer's requirements and using connector manufacturer's approved crimping tool.

3.4 GROUNDING:

A. All necessary precautions shall be taken to minimize electromagnetic and electrostatic interference in the completed AV system.

3.5 LABELING:

A. Wiring Labels: At all connection points for all types of cable & wiring, a label strip shall be attached indicating the name/number of that cable or wire as follows.
   1. At internal locations (inside racks, cabinets, or boxes), use a pressure sensitive label.
   2. At external locations, use a printed label covered with clear shrink wrap or approved labeling system.
B. Equipment Labels: All active components shall engraved lamicoid labels at the front and rear.
   1. Labels shall be mounted plumb and neat and shall not cover any equipment lights, recessed controls, or control labels.
   2. Front labels shall indicate functional used of equipment.
   3. Rear labels shall indicate system schematic reference designation.
C. Contractor Label: Engineer and Contractor name plate shall be attached to a blank panel inside each equipment rack or group of racks.
   1. Name plate shall be printed, self-adhesive type and shall be no larger than 1-3/4" high by 6" wide.
   2. Name plate shall contain Engineer's name & city/state address and Contractor's name, city/state address, & phone number.

3.7 PAINTING:

A. General: All exposed and otherwise visible hardware, loudspeakers, grilles, etc. shall be painted. Color shall be as specified by Architect.

3.8 SYSTEM TESTING:

A. General: Contractor shall be responsible for testing the completed system prior to the time scheduled for the final inspection of the system. The purpose of these tests is to ensure that all equipment is functioning according to specifications and that the installation is free of workman defects.

B. System installation testing: The procedure for system installation testing shall include, but not limited to, the following:
   1. Verify functional and operational performance of all equipment and wiring.
   2. Test polarity of all equipment and wiring.
   3. Test continuity of all outlets, inputs and outputs, for shorts, open connections, or poor connections.
   4. Measure the frequency (amplitude versus frequency) of each device from system input through power amplifier outputs.
      a. Source signal shall be pink noise inserted at the earliest point in the signal path.
   5. Check all loudspeakers to check for rattles, bussing, and/or functional problems using a sweep test signal as follows:
      a. Sweeps shall not exceed the manufacturers rated bandwidth.
      b. Sweep signal should be amplified to one-quarter the rated power handling capacity of the loudspeaker under test.
   6. Check for oscillations or radio frequency interference with an oscilloscope at the output of the power amplifiers.
      a. Check systems operating at idle operations.
      b. Check systems operating with a 100 hertz sine wave driving the system at one-quarter maximum rated power capacity of the loudspeaker operating at that frequency.

C. System Performance Testing: The procedure for system performance testing shall include the measurement and recording of system performances as follows:
   a. Measure and record the impedance of each loudspeaker line at 50 hertz, 500 hertz, and 5000 hertz with the loudspeakers installed and configured as called for in the designed documents.
   b. Measure and record the overall system hum and noise levels at a typical location within the room and with the following settings:
      a. A typical microphone input terminated at 200 ohms
      b. The console gain set so that a -300 dBm input signal produces a console output of 0 dBm
      c. All signal process equipment set to unity gain and flat equalization and
      d. Power amplifier set to provide maximum gain

D. Liability: Tests shall be made in conformance to equipment manufacturers recommendations and should not exceed the performance limitations as established by the manufacturers. Contractor shall replace or repair any piece of equipment damaged due to the testing.

E. Equipment: Contractor shall use only certified, professional test and measuring equipment.
   1. Tests using non-professional equipment will not be acceptable.
   2. All testing equipment should be field calibrated before and after tests.

F. Corrections: Contractor shall resolve any malfunctions and performances not within equipment specifications or design parameters.
   1. Contractor shall retest as necessary to confirm correction of problems
   2. If an individual piece of equipment, after having been repaired twice, fails to perform as per manufacturer's specifications, then the unit is to be replaced.
   3. AV contractor shall notify AV Designer of any unresolved malfunctions encountered and of any equipment shortages sufficiently prior to the scheduled time of the final inspection.

G. Test Report: Contractor shall submit the written records and final results of the system testing and system performance testing to the AV Designer for review.
   1. The test report should include the following:
      a. The date of the tests, persons involved in the tests, and test equipment used (make, model, & serial number)
      b. Statements indicating that each preliminary test was conducted and the results were found to be acceptable.

c. The measurement results of the system performance testing.

2. The test report must be submitted to the Engineer a week before the scheduled system adjustment.

H. AV Designer Review: The AV Designer may require additional tests and corrections to the system if the submitted records and results indicate an error of problems with the system.

3.9 FINAL INSPECTION:

A. General:
   1. Contractor shall provide one technician having thorough knowledge of the systems as installed, to assist the AV Designer, during the period of time scheduled for the inspection.
   2. This period of time scheduled for system inspection does not include any time for troubleshooting or correction of installation errors. The AV Contactor shall make provision for any additional personnel and time required for correction of such problems.

B. Contractor shall have the system completed and ready for inspection as scheduled by the AV Project Manager and shall have complied with the following items.
   1. All tests conducted by Contractor should be completed and the results submitted to AV Designer before this time.
   2. A working copy of the closeout submittal is available on site during the inspection.

C. During the inspection, the AV Designer shall conduct tests of the system to verify that the system is functional and installed correctly.
   1. If, during the visit, the AV Designer determines that the system is not substantially completed so as to allow for an inspection of the whole system, then the Contractor must pay for the visit including all of the AV Designer's expenses and time.
   2. If, in the opinion of the AV Designer any piece of equipment does not appear to be functioning properly, the AV Contractor may be requested to perform testing to assure conformance to the manufacturer'
   3. Contractor shall endeavor to repair or complete any and all items found defective or not in compliance with the contract documents or submittals before the final inspection and adjustment of the system.

D. Inspection Report: After the inspection, the AV Designer shall prepare and submit to the Contractor a report listing all deficiencies, errors and non-compliance with contract documents.
   1. Contractor shall correct or remedy all items on the list to the satisfaction of the AV Designer. When not specifically mentioned, the Contractor shall consult with AV Designer as to the acceptability of the remedy.

PART 4 CHECKLIST

All bidders should carefully read and follow "all" instructions and include "all" required documents and forms described in the bid documents. This list is presented to assist with the process however the bidder is fully responsible for reading the complete bid documents and drawings and responding in the appropriate manner.

Bid Response Checklist: Gateway – AV Hardware and Installation

1. Form 1 and Form 2 of bid documents completed
2. Form 3 and Form 4 Completed
3. Current copy of Bid Bond.
4. Current copy of liability Insurance.
5. Completed Bid document signed in all appropriate places.
6. Proof doing business as an Audiovisual Contract for 5 or more years and has successful completed projects of similar size and scope.
7. Documentation from manufacturer (Representative firm) as a direct distributor for the major lines of audio and video equipment.
8. Copy of current Alabama State contractor's license for the amount of work to be performed and GC License Number.
9. Copy of certificates for staff programmer(s) holding a Crestron DMC-D and Crestron DMC-E certification.
10. Copy of certificates for staff installer(s) holding a CTS-D Certification.
11. If the bidder is to use subcontractors, bidder must provide a list of subcontractors and detail their function, percentage of work to be performed by subcontractor, and manufacturer's certifications attained to support that function in the bid response.
12. Provide technical specifications cut sheets for major equipment items included in the bid. These technical specifications cut sheets must be included in the bid response.

END OF SECTION