

SECTION 27 41 17

AUDIOVISUAL INFRASTRUCTURE

PART 1 – GENERAL

1.1 PURPOSE

- A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 LESSONS LEARNED AND DESIGN CONSIDERATIONS

- A. **Contractor shall review and adhere to all of University of Texas at Arlington Educational Technology Support Services.**

1.3 SUMMARY

- A. Infrastructure for Audio and Video (AV) systems will be installed in a professional manner using standard industry practices. Furnish and install all materials to provide functioning AV systems in accordance with performance requirements specified, and any modifications resulting from reviewed shop and field coordinated drawings.
- B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.4 REFERENCES

- A. Execute work in accordance with standard sound and audio video system installation practices, National Electrical Code, and applicable state and local codes.
- B. Comply with terms and conditions of Americans with Disabilities Act, especially regarding provisions for hearing impaired and wheelchair access in control areas.

1.5 COORDINATION

- A. Coordinate installation of audio and video infrastructure with other trades in order to follow project schedule.

1.6 STORAGE AND HANDLING

- A. Ensure that materials (especially electronic and electro-acoustic devices) are protected against physical, environmental, and electronic damage during transport to and installation at job site.
- B. Schedule delivery to minimize delays in the project.
- C. Provide storage protection against temperature and humidity extremes, theft, vandalism, physical damage, and environmental damage.

1.7 SUBMITTALS

- A. Refer to Division 1.
- B. Initial Test Data – Submit results of Initial Tests and Adjustments for approval prior to scheduling Final Tests and Adjustments with Owner.
- C. Project Record Documents – Submit record documents in quantities, format, and timetable as required by General Conditions.
- D. Operation and Maintenance Manuals
 - 1. Number of Sets: four (4).
 - 2. Bind Operation and Maintenance Manuals using either GBC or 3-ring type binders
 - 3. Format and Minimum Information below.
 - a. Section 1 - System Operation.
 - b. Section 2 - System Documentation.
 - c. Section 3 - Manufacturer's Documentation.
 - d. Section 4 - Maintenance Information.

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4. Provide 3 sets on CD-R that include all material in Operation and Maintenance Manuals in PDF format except for copyrighted material.
- E. Timetable
1. Submit 1 set of Operation and Maintenance Manuals at least 10 days before Final Tests and Adjustments procedures (minus data from Final Tests and Adjustments). This set will be reviewed by Owner and returned to Contractor. Re-submit after Final Tests and Adjustments and include data. NOTE: Do not schedule Final Tests and Adjustments or perform training of Owner personnel before submitting Operation and Maintenance Manual.
 2. Leave 1 set of Operation and Maintenance Manuals with Owner's representative immediately following Final Tests and Adjustments procedures (minus data from Final Tests and Adjustments). Owner will utilize this set during initial use of the system. Following Final Tests and Adjustments, update this set of manuals at the project site as necessary so that it will match other completed sets of manuals.
 3. Submit remaining number of complete manuals as required by General Conditions within 10 days after return of reviewed set(s). Include Final Tests and Adjustment data, warranty period letter, and any other data not included in first submission.
- 1.8 WARRANTY
- A. Refer to Division 1.
 - B. Warranty completed work, including all materials and labor to be free from defects in design, workmanship and materials for a minimum period of one (1) year from final AV system acceptance date.
 - C. Warranty - Submit letter providing warranty covering labor and materials supplied under this contract. Bind in Operation and Maintenance Manuals. Terms as described in General Conditions. Minimum terms as follows.
 1. System Warranty Period - Systems to be free of manufacturing or installation defects for a minimum period of one year from the date of final acceptance. Clearly designate begin and end dates of system warranty period.
 2. Parts and Labor - Provide parts and labor to repair defects in materials and workmanship during system warranty period.
 3. Response Time - Within system warranty period, provide initial on-site service response within one business day of service call.
 4. Replacement Products - If any item must be removed for repair during system warranty period, provide replacement item of similar quality at no charge.
 5. Repair Limit - Do not repair any piece of equipment found defective during installation or system warranty period more than 2 times. After second repair, replace defective item with similar approved item at no additional cost to Owner.
 6. Extended Manufacturer's Warranties - Identify products with manufacturer's warranties extending beyond one year. Provide terms and conditions of such warranties.
 7. Service Personnel Information - Provide name(s) and telephone number(s) of service personnel to be contacted regarding repair and maintenance.
- 1.9 OWNER TRAINING
- A. Provide owner training as described in General Conditions. As a minimum, provide 4 hours total instruction (within two trips to site) regarding AV Systems operation to Owner-designated personnel. Schedule instruction time(s) with Owner to occur after completion of Final Tests and Adjustments. Coordinate with Owner in advance to schedule instruction time. Document date, time, and attendees of the training session and include documentation in Operation and Maintenance Manuals to serve as record of trained personnel.
- 1.10 QUALITY ASSURANCE
- A. AV Contractor Qualifications.
 1. Be established AV System Contractor, regularly engaged in furnishing and installing AV systems. NOTE: Electrical or general contracting firms responsible for completion of this work, but not meeting above requirement, shall employ services of approved AV Contractor as subcontractor to perform Work described herein.
 2. Be experienced in installations of similar size and scope within last five years. Submit list of 4 (minimum) installed jobs of similar magnitude, completed within last five years. For verification, submit complete information, including project name, project address, contact person, and daytime telephone number. At Owner's request, accompany Owner or Owner's representative on visit to any or all example

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- completed projects submitted.
3. Be Authorized Dealer for all major lines of equipment provided. Must have at least one permanent staff member who is factory trained in the installation and maintenance of each major product line offered.
 4. Employ personnel (at all levels of work) experienced in projects of similar scope and size. Provide list of key personnel to be responsible for each of the following aspects of work: Project Management, Technical Documentation, and Leadership of Field Work (one who is present for all field work). For each identified employee, indicate number of years employed by contractor, number of years experience in assigned responsibilities, and list of previously completed projects where similar responsibilities were required.
 5. Project manager assigned to this project must have a minimum of 5 years' experience in installing and integrating AV systems. If project manager has less than 5 years' experience, project manager then must have a minimum of 3 years' experience in installing and integrating AV systems and an InfoComm International-CTS certification.

PART 2 - PRODUCTS

2.1 GUIDELINES

- A. All active AV equipment, except infrastructure products listed below, is to be owner furnished, owner installed (OFOI).
- B. Design Parameters - System design is around products listed in Part Two. Intent of product specification is to provide standard of quality and function for installed materials. Certain performance specifications are given to clarify job requirements. No substitutions will be allowed without prior approval specific to proposed manufacturer and model numbers.
- C. Performance - Regardless of completeness of descriptive paragraphs herein, each device shall meet its manufacturer's published specifications. Verify performance.
- D. Quantities - Quantities given in these written specifications are for reference only; confirm quantities on final detail design drawings. If Contract Documents do not include quantities necessary to deliver complete working system, provide notification of disparity, and install required quantity of devices for complete working system.
- E. Small Parts - Systems are described in terms of major products. Even if not specifically mentioned, provide and install patch cables, connectors, hardware, labels, terminals, etc. necessary for complete and working system meeting design intent of specifications. Install shaft locks or security covers on rack-mounted equipment not normally adjusted by user.
- F. Keys - Provide 5 sets of keys for any AV system product requiring keys.
- G. Condition - Provide and install products listed in this section in factory new condition, conforming to applicable provisions of American National Standards Institute.
- H. Designations - Each major product item is given unique designation (such as MIX-1 for mixer number 1). The product designations are unique in this section only and may be repeated in other specification sections.
- I. AV Electrical Power - Ensure that "Star" ground configuration is properly implemented by the Electrical Contractor. Ensure that ground wires from each outlet are isolated from conduit, neutrals, and each other, and are each "home-run" back to the dedicated breaker panel for AV systems.
- J. AV Cables - All AV cables will be plenum rated per NEC.

2.2 AV INFRASTRUCTURE PRODUCTS

- A. Floor Box (FB) - (Quantity: As Indicated on Drawings).
 1. Type 1: Legrand Wiremold Evolution EFB8S-OG
 2. Type 2: Legrand Wiremold Evolution EFB8S-FC
 3. Verify edge height and finish with Architect.
- B. Poke Thru (PT) - Legrand Wiremold Evolution 8ATC
 1. Provide the following interior mounting plates:
 - a. Two (2) 68REC
 - b. One (1) 8ACT6A
 - c. One (1) 8AAP
 - d. One (1) 8CREST
 2. Provide the following bottom feed device plates:
 - a. Three (3) 1125CHA
 - b. One additional (1) 575CHA.

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- c. Provide 8DIV divider plate.
 - d. Verify edge height and finish with Architect.
- C. Projector Mount (PRJ) – Provide mounting to structure as indicated in the drawings and include the following mounting hardware:
 - 1. Type 1
 - a. Chief CMA-100 Unistrut mounting plate with adjustable length extension column
 - b. Chief CMS-012018 extension column if additional column length required
 - c. Chief RSPMAU Universal Elite ceiling mount (RPM and SLBU)
 - d. Chief CMA-640 finishing ring
 - e. Chief CMA-275 cable cover
 - f. Deliver all loose or extra parts to UTA Educational Technology Support Services
 - 2. Type 2
 - a. Panasonic ET-PKD130B
 - b. Panasonic ET-PKD130H
- D. Projection Screen (SCREEN1) - Da-Lite (Size: As Indicated on Drawings) Tensioned Advantage Electrol projection screen (Quantity: As Indicated on Drawings).
 - 1. Provide Da-Mat projection surface.
 - 2. Provide additional black drop and set limits of each screen so that bottom of projected image is 48-inches above finished floor.
 - 3. Provide integrated low voltage control SCB-100 Serial Control Board for interface to control system, and 3-button wall control (SC-1) (Quantity: One per Projection Screen).
 - 4. Face plate for screen control to match building standard wall switch face plate in type and color.
- E. Fixed Projection Screen (SCREEN2) - Da-Lite (Size: As Indicated on Drawings) Cinema Contour fixed frame projection screen (Quantity: As Indicated on Drawings).
 - 1. Provide HD Progressive 1.3 projection surface.
 - 2. Mount screen so that bottom of projected image is 71.5-inches above finished floor.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General Guidelines

- 1. Quality of Work - Perform labor to accepted industry standards and state and local codes to accomplish complete and working system.
- 2. Material and Labor - Provide specified products and other incidental materials, appliances, tools, and transportation required for complete and functioning systems. Provide personnel to perform labor who are skilled in techniques and technical knowledge AV infrastructure system installations.
- 3. Documents at Job Site - Keep following documents at job site during entire construction period:
 - a. Complete Specifications and Drawings.
 - b. Approved Shop Drawings.
 - c. Approved Product Data.
 - d. Progress Set of Project Record Documents.
- 4. Mounting - Mount equipment and enclosures plumb and square. Ensure that permanently installed equipment is firmly and safely held in place. Design equipment supports to support loads imposed with project safety factor of five (5) or greater. For devices hung overhead, obtain review by Structural Engineer licensed by the appropriate governing authority prior to installation.
- 5. Dimension Verification - Verify dimensions and space requirements to assure that proper mounting, clearance, and maintenance access space is available for system components.
- 6. Coordination - Coordinate work with other trades to avoid delays in construction schedule. Meet construction schedule.
- 7. Clean-Up - Leave project clean each day. Place debris where designated by General Contractor. Debris includes but not limited to: solder splatter, cable ends, stripped insulation, spent crimp connectors, gypsum board and ceiling tile dust, and product wrappings and cartons. After completion of installation, thoroughly clean areas worked, including non-visible areas such as equipment rack interiors, rack top panels, and inside lockable floor and wall boxes.

B. Power and Grounding

- 1. Power Coordination - Contractor to coordinate final connection of power and ground wiring to rack. Electrical contractor will provide power to AV systems. Before installation, verify load requirements for

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- systems as accepted.
 - 2. Grounding - Ground and bond equipment chassis of each rack-mounted component without three-pin grounding plug to bus bars with #12 AWG insulated green wire using 6-32 or larger nuts, bolts, lock-washers, and appropriate NEMA connectors.
 - C. Equipment Racks
 - 1. Ventilation - Provide ventilation adequate to keep temperature in rack below 85 degrees Fahrenheit. Use “whisper” type ventilation fans in racks, adjusted to come on when temperature in rack rises above 85 degrees Fahrenheit, only if adequate cooling cannot be provided by Owner.
 - D. Provide specified products and other incidental materials, appliances, tools, and transportation required for complete and functioning systems.
- 3.2 FINAL ACCEPTANCE BY OWNER
- A. Certificate – Submit Certificate of Final Acceptance form signed by Owner verifying complete installation and proper operation of systems upon fulfillment of all requirements and upon recommendation by Owner.
 - B. General Adjustments – Adjust, balance, and align equipment for optimum quality, meeting manufacturers published specifications.
 - C. Inventory – Inventory all installed and portable equipment for correct quantities.
 - D. Functional Demonstration – Demonstrate operation of each function of each major piece of equipment.
 - E. Other Tests - Perform any other tests on any part of the AV system as requested by Owner.
 - F. Security Inspection – Inspect equipment for security from tampering (covers, shaft-locks, etc.).

END OF SECTION