

SECTION 27 41 31 – AUDITORIUM AUDIO VISUAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Related Sections
 - a. System Descriptions
 - b. General Requirements
 - c. Audio Equipment
 - d. Video Equipment
 - e. Control Equipment
 - f. Production Intercom Equipment
 - g. Infrastructure Equipment
 - h. Coordination
 - i. Installation
- B. The following systems are included:
 - 1. Auditorium AV Systems

1.2 RELATED SECTIONS

- A. Sections
 - 1. 27 41 01 - General Conditions – Audio Visual Systems

1.3 SYSTEM DESCRIPTION AND OPERATION

- A. Auditorium Audio Visual System
 - 1. The systems shall support the following uses
 - a. Band, choral and ensemble performances
 - b. Theatrical performances
 - c. Simple audio presentations
- B. Generally, the system shall feature the following physical items
 - 1. Main loudspeakers
 - 2. Audio mixing station
 - 3. Stage connectivity
 - 4. Video Projector
 - 5. Lectern
 - 6. House ceiling connectivity for recording microphones
 - 7. Powered monitor/EFX loudspeakers

8. Main equipment racks
9. Mix position desktop rack
10. Electronics
11. Loose equipment
12. Control stations located at stage and in the Control Booth

1.4 ITEMS PROVIDED BY OTHERS

- A. Projection Screens
- B. Fire Alarm override signal
- C. Paging signals
- D. Connectivity to building LAN/WAN

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Audio Visual Equipment
 1. This specification and plan set provide a diagrammatic concept of the system. Provide miscellaneous items as required to achieve an operating systems, this to include but not be limited to:
 - a. Mounting equipment
 - 1) Provide mounting kits for equipment as required to achieve the mounting configuration noted or detailed on plan
 - b. Adapters
 - 1) Provide adapter cables/connectors to achieve signal chain as shown on plan.
 - c. Power Supplies
 - 1) Provide manufacturers approved power supplies and cords for all equipment.
 - 2) Where power supply size and capacity is variable, confirm calculations with the manufacturer and provide appropriate size product with 20% capacity for future growth.

2.2 AUDIO EQUIPMENT

- A. Wireless Microphone Systems
 1. Designation: **WM1**
 2. Product: Shure Model No. QLXD124/85 Combination package
 3. Features
 - a. QLXD4 Receiver
 - b. QLXD2/SM58 Transmitter
 - c. QLXD1 Bodypack Transmitter

- d. WL185 Cardioid Lav Microphone
 - e. 64 MHz tuning bandwidth
 - f. AES 256-bit encryption
 - g. Aluminum Construction
 - 4. Accessories
 - a. Batteries
 - 1) Provide (2) rechargeable batteries for each wireless microphone transmitter
 - a) Fischer Amps or equal
 - 2) Confirm compatibility of batteries
 - 3) Provide (12) spare batteries
 - 4) Include (1) 16 bay rack mount recharging stations.
 - a) Fischer Amps Model No. ALC161 or equal
 - b. Antenna splitter(s)
 - c. Remote Antennas
 - 5. Adjustments
 - a. Provide a site survey to determine available frequencies and coordination with other wireless equipment in the facility.
 - b. Adjust Frequency of each unit as needed.
- B. Audio Rack
- 1. Designation: **AR1**
 - 2. Product: Allen and Heath Model No. AR2412
 - 3. Features:
 - a. 24 Mic/Line inputs
 - b. Expander Port
 - c. Monitor Port
 - d. dSNAKE Transport portal
 - e. 3RU Mounting
 - 4. Equal Manufacturers
 - a. By substitution. Refer to General Conditions
- C. Mixer
- 1. Designation: **MX1**
 - 2. Product: Allen and Heath GLD-112
 - 3. Features;
 - a. 48 Input processing channels

- b. 4 local Mic/Line inputs
 - c. 2 local Stereo inputs
 - d. 2 local unbalanced outputs
 - e. 1 local SPDIF output
 - f. 1 local AES output
 - g. 30 assignable busses
 - h. On-board touch panel control
 - i. Remote control (with owner provided Ipad device)
 - j. Motorized Faders
 - k. On-board effects
 - l. USB streaming to Owner provided computer for recording
- 4. Equal Manufacturers
 - a. By substitution. Refer to General Conditions
- D. Audio Recorder
 - 1. Designation: **RR1**
 - 2. Product: Denon Model No. DN-500R
 - 3. Features:
 - a. Records to SD/SDHC and USB Media in MP3 and WAV
 - b. Dual record feature
 - c. Balanced outputs
 - d. Rack mounts
 - 4. Media
 - a. Provide (4) Memory Cards
 - b. Product: SanDisk Model No. SDSDB-016G
 - 5. Equal Manufacturers
 - a. By substitution. Refer to General Conditions
- E. Audio Processor
 - 1. Designation: **DSP1**
 - 2. Product: Symetrix Model No. Radius 12x8
 - 3. Features:
 - a. Open architecture, custom programming
 - b. 12 by 8 output
 - c. Control input/outputs including RS232
 - d. Embedded 1000 Ethernet Switch

- e. Dante capable
 - 4. Equal Manufacturers
 - a. By substitution. Refer to General Conditions
- F. Amplifier Type 1
 - 1. Designation: **AMP1**
 - 2. Product: QSC CXD4.2
 - 3. Features
 - a. 4 Channel x 700w at 8 ohms
 - b. Class D
 - 4. Equal Manufacturers
 - a. By substitution. Refer to General Conditions
- G. Amplifier Type 2
 - 1. Designation: **AMP2**
 - 2. Product: QSC Model No. CX702
 - 3. Features
 - a. 2 Channel x 425w at 8 ohms
 - 4. Equal Manufacturers
 - a. By substitution. Refer to General Conditions
- H. Amplifier Type 3
 - 1. Designation: **AMP3**
 - 2. Product: QSC CX108V
 - 3. Features
 - a. 8 Channel x 100w at 70v ohms
 - 4. Equal Manufacturers
 - a. By substitution. Refer to General Conditions
- I. Loudspeaker Type 1
 - 1. Designation: **LS1**
 - 2. Product: Fulcrum Acoustics AH65
 - 3. Features:
 - a. Bi-amped Full Range
 - b. 60x45 coverage pattern
 - c. (2) 10" Woofer with 4" compression driver
 - d. Operating Range: 94 Hz to 19kHz
 - e. Sensitivity:109 dB @2.83V

- f. Finish: Black
 - 4. Rigging
 - a. Refer to section 274114 for rigging hardware information
 - 5. Equal Manufacturers
 - a. By substitution. Refer to General Conditions
- J. Loudspeaker Type 2
 - 1. Designation: **LS2**
 - 2. Product: Fulcrum Acoustics CX1295
 - 3. Features:
 - a. Passive Full Range
 - b. 90x45 coverage pattern
 - c. (2) 10" Woofer with 2" compression driver
 - d. Operating Range: 68 Hz to 19kHz
 - e. Sensitivity:104 dB @2.83V
 - f. Finish: Black
 - 4. Rigging
 - a. Refer to section 274114 for rigging hardware information
 - 5. Equal Manufacturers
 - a. By substitution. Refer to General Conditions
- K. Subwoofers
 - 1. Designation: **SW1**
 - 2. Product: Fulcrum Acoustics SUB218
 - 3. Features:
 - a. Sub Bass
 - b. (2) 18" Woofer
 - c. Operating Range: 25 Hz to 154 Hz
 - d. Sensitivity:98 dB @2.00V
 - e. Finish: Black
 - 4. Rigging
 - a. Refer to section 274114 for rigging hardware information
 - 5. Equal Manufacturers
 - a. By substitution. Refer to General Conditions

L. Hearing Assistance

1. Designation: **HA1**
2. Product: Listen Model No. LS-43
3. Features:
 - a. Installation kit that includes:
 - 1) FM transmitter
 - 2) Universal remote antenna
 - 3) Rack mounting kit
 - 4) (4) Receivers
 - 5) (4) ear speakers
 - 6) Charging case
 - 7) Batteries
 - 8) Signage kit
4. Equal Manufacturers
 - a. By substitution. Refer to General Conditions

2.3 VIDEO EQUIPMENT

A. Lectern

1. Designation: **LEC1**
2. Product: Video Furniture International Model No. LEX-PB-MIC18
3. Features
 - a. MDF construction
 - b. 2" casters
 - c. Cable pass through
 - d. Finish: Standard finish to be selected by Architect
4. Accessories
 - a. Six outlet power strip
 - b. Gooseneck microphone
5. Equal Manufacturers
 - a. By substitution. Refer to General Conditions

B. Switcher Type 1

1. Designation: **SW1**
 2. Product: Extron Model No. DTP T USW 333
 3. Features:
 - a. Inputs
 - 1) 1-VGA with stereo audio
 - 2) 2-HDMI
 - b. HDCP Compliant
 - c. Rack mount
- C. Switcher Type 2
1. Designation: **SW2**
 2. Product: Extron Model No. MPS602
 3. Features:
 - a. Inputs
 - 1) 2-VGA with stereo audio
 - 2) 3-HDMI
 - 3) 1-DTP transport input
 - b. HDCP Compliant
 - c. Rack mount
- D. HDMI Distribution Amplifier
1. Designation: **HDA1**
 2. Product: Extron Model No. HDMI DA6
 3. Features:
 - a. 1x6 distribution amplifier
 - b. HDCP Compliant
- E. Video Recorder
1. Designation: VR1
 2. Product: Epiphan Model No. Pearl
 3. Features:
 - a. HD Video Recording
 - b. Touch Screen control panel and confidence monitor
 - c. Record to FTP Server
 - d. Dual input recording
 - e. AVI and MOV format
 - f. On board storage – 1 TB

F. Video Projector

1. Designation: **VP1**
2. Product: Epson Model No. Z8455WU
3. Features
 - a. 3LCD Technology
 - b. 7000 lumen
 - c. 16:9 Aspect ratio support
 - d. 1080P support
 - e. Contrast ration – 5000:1
4. Accessories
 - a. ELPLL07 Long Throw Lens
 - b. Provide custom protection cage as detailed on plan

2.4 CONTROL EQUIPMENT

A. Tablet

1. Designation: **TB1**
2. Product: Apple Model No IPAD AIR2 16GB
3. Features
 - a. Wireless network connectivity
 - b. 16 GB storage
4. Accessories
 - a. Tablet Mount – Extron Model No. TLM 100T
 - 1) TLM-100A Security Bezel
 - 2) SMA-1 Swivel Mount

B. Network Switch

1. Designation: NSW1
2. Product: Linksys Model No. SE3008
3. Features
 - a. Gigabit
 - b. 8 port

C. Wireless Router

1. Designation: **WR1**
2. Product: Linksys Model No. EA6900 AV1900
3. Features:
 - a. Wireless N & AC

- b. Bands 2.4 & 5 GHz
 - c. 4 Gigabit LAN ports
 - d. Management software
 - D. Touch Panel
 - 1. Designation: TP1
 - 2. Product: Extron Model No. TLP PRO 720 T
 - 3. Features
 - a. 7" display
 - b. 800x480 Resolution
 - c. Desktop mount
 - E. Control Processor Type 1
 - 1. Designation: **CP1**
 - 2. Product: Extron Model No. IPL PRO S6
 - 3. Features
 - a. 6 – Bidirectional COM ports
 - F. Control Processor Type 2
 - 1. Designation: **CP2**
 - 2. Product: Extron Model No. IPA T RLY4
 - 3. Features
 - a. 4 – Relay ports
- 2.5 PRODUCTION INTERCOM
 - A. Main Station
 - 1. Designation: **MS1**
 - 2. Product: ClearCom Model No. MS-702
 - 3. Features:
 - a. For operation of up to 40 belt packs and 10 wall stations
 - b. 2 Channel
 - c. Announce output
 - d. Built-in Power Supply UL Listed
 - e. Rack Mount
 - B. Chime Module
 - 1. Designation: **CM1**
 - 2. Product: Radio Design Labs Model No. FP-CH8
 - 3. Features:

- a. 8 individually selectable electronic chimes
 - b. Remote trigger
 - c. Input for background music or paging
 - 4. Accessories
 - a. Power Supply
 - C. Wall Stations
 - 1. Designation: **IC W**
 - 2. Product: ClearCom Model No. KB-701
 - 3. Features:
 - a. 1 Channel
 - b. Flush Mount
 - c. Push-to-talk button
 - d. Microphone
 - e. Half-duplex mode operation
 - D. Wall Plates
 - 1. Refer to Section 27 41 21 Technical Panels
 - E. Loose Equipment
 - 1. Refer to plan for Loose Equipment Schedule
- 2.6 DATA EQUIPMENT
- A. Patch Panels
 - 1. Designation: **PP1, PP2, PP3**
 - 2. Product: Hubbell Model No. HP6A24US
 - 3. Features:
 - a. Category 6A
 - b. 24 port
 - c. 1U
 - d. Black Finish
- 2.7 LOOSE EQUIPMENT
- A. Definition
 - 1. Loose Equipment are items furnished as part of this Section for use with the AV system.
 - B. Equipment Schedule
 - 1. Refer to plan for Loose Equipment Schedule
 - C. Delivery and Record Keeping
 - 1. The AV contractor to generate a Bill of Materials

2. The Owner to take possession of the Materials
3. As confirmation of Owners possession. A copy of the materials list to be signed (by the Owner Representative) and submitted to the AV Consultant as part of the record document submission.

2.8 INFRASTRUCTURE EQUIPMENT

A. Wall Plates and Rack Panels

1. Refer to Section 27 41 21 Technical Panels

B. Wire and Cable

1. Refer to Section 27 41 23 Wire and Cable

C. Power Distribution

1. Refer to Section 27 41 25 Power Distribution

D. Wall Mounted Equipment Rack with Floor Base

1. Designation: **ER1**
2. Product: Middle Atlantic Model No. SR-40-28
3. Features:
 - a. Welded Construction
 - b. Back pan and floor base
 - c. 40 space, 28" deep center section
 - d. Pivoting center section for rear access to equipment
 - e. Key-lock and Padlock capable
 - f. No front door
4. Accessories
 - a. Rear rack
 - b. Ground Lug
 - c. (2) Sets center section keys
 - d. Lacing bars
 - e. Provide blank covers for all open unused rack spaces

E. Floor Standing Equipment Rack

1. Designation: **ER2**
2. Product: Middle Atlantic Model No. WRK-44SA-32
3. Features:
 - a. Welded Construction
 - b. Front and rear solid door with keyed lock
4. Accessories
 - a. Rear rack

- b. Ground Lug
 - c. (2) Sets front door and center section keys
 - d. Lacing bars
 - e. Provide blank covers for all open unused rack spaces
- F. Desk Top Equipment Rack
 - 1. Designation: **ER3**
 - 2. Product: Middle Atlantic Model No. 2-10M
 - 3. Features:
 - a. MDF construction with black laminate finish
 - b. 10 Rack space
 - 4. Accessories
 - a. Rear rack rail
 - b. Lacing bars
 - c. Provide blank covers for all open unused rack spaces
- G. Rack Accessories
 - 1. Blank Panels
 - a. Finish: Textured Black
 - 2. Drawers
 - a. Full extension textured black
 - 3. Shelves
 - a. Provide Height to match component to nearest rack unit.
 - b. Provide shelves with brackets to secure component into place.
 - 4. Ventilation
 - a. Determine ventilation requirements to maintain proper operating temperatures.
 - b. Provide vent blockers to facilitate proper air movement.
- H. Equal Manufacturers
 - 1. Middle Atlantic
 - 2. Atlas
 - 3. Chief
- I. Work Table
 - 1. Designation: **WT1**
 - 2. Product: Balt Model No. 89961
 - 3. Features
 - a. 60" x 30" x 29.5" tall

- b. Casters
- c. Qty 2

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to section 27 41 01 General Conditions

END OF SECTION