

**SECTION 267610  
AV ROUGH IN REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 GENERAL**

- A. This specification covers the procurement, installation and maintenance of conduit, raceway, and electrical power as required for the Overlook Conference Room project at the Pennsylvania Convention Center Audio Video Systems.
- B. The intent of this section is to define the products, methods and scope of services required to provide a first class, professionally installed, conduit, raceway and power system meeting the needs of the work associated with Section 115201 Audio Video Systems drawings and specifications.
- C. This specification establishes requirements necessary to achieve the intended performance and function of the specified Audio Video Systems Rough-in Requirements. Therefore, all materials and labor that are specified are necessary to meet these requirements.
- D. Provide all coordination, engineering and labor as required to assure that the rough-in system installation fulfills the requirements defined herein.
- E. All work associated with this section shall be provided in a professional, workman-like manner consistent with relevant industry standards and applicable code requirements.
- F. The specification text as well as any drawings provided with the bid documents are detailed only to the extent necessary to define the design intent and anticipated performance requirements.
- G. Equipment not cited herein nor shown on drawings, but necessary to meet the defined requirements shall be provided without claim for additional payment.
- H. Drawings pertaining to this specification shall be considered part of this specification and shall be part of the contract documents.
- I. Electrical Requirements for the Audio Video Systems:
  - 1. Breaker panels, transformers and related electrical requirements serving audio video systems are defined within the project electrical drawings.
  - 2. All low voltage conduits, raceways, stub-up conduits, junction boxes and related appurtenances required for the owner's Section 115201 AV Systems Contractor/Integrator shall be provided by the project Electrical Contractor.

**1.2 RELATED DOCUMENTS**

- A. Stipulations

The specifications section "General Conditions" or other correspondence provided by the owner with this document and related amendments, form a part of this specification by this reference thereto and shall have the same force and effect as if printed herewith in full.
- B. Section 115201 Audio Video Systems
- C. Construction Documents

The Construction Document drawings for the project include all drawings prepared by the project architect, engineers, and related design professionals, as well as the AV System Drawing set dated October 10, 2022.

The electrical contractor's responsibilities for the audio video systems on the project are identified within this section and shown within various device legends shown on the AV drawings. Delineation of the scope of work associated with each audio video system device is stated within the "Scope Notes" portion of the various AV device legends shown throughout the AV drawing set.

### 1.3 SCOPE OF SPECIFICATION

This specification covers all AV systems shown within the construction documents

The intent of this section is to define the responsibilities of the project electrical contractor relative to the audio video systems that will be provided by the owner's selected audio video system integrator.

Provide the electrical requirements for the project AV Systems as shown on the AV drawings.

Provide the low-voltage rough-in including low-voltage back-boxes and related cable pathways as shown on the AV drawings.

### 1.3 SYSTEM DESCRIPTIONS

Refer to the systems descriptions provided within Section 115201.

### 1.4 NOT USED

### 1.6 REFERENCES & ABBREVIATIONS

A. All work included in this specification is to be performed within the guidelines of the following standards:

1. NEC (National Electric Code)
2. ASTM (American Society of Tests and Measurements)
3. IEEE (Institute of Electrical and Electronic Engineers)
4. AES (Audio Engineering Society)
5. NAB (National Association of Broadcasters)
6. AVIXA/InfoComm (International Communications Industry Association)
7. ADA (Americans with Disabilities Act)
8. ANSI (American National Standards Institute)
9. BICSI (Building Industry Consulting Service International)

B. Abbreviations

1. AVC = Audio Video System Contractor/Integrator
2. GC = General Contractor
3. CM = Construction Manager
4. LVC = Low Voltage Contractor
5. EC = Electrical Contractor
6. HRSS = Hard Rock Support Services

### 1.7 NOT USED

### 1.8 QUALITY ASSURANCE

- A. All work shall be provided in close coordination with the owner's AV Contractor.
- B. All work shall be performed in compliance with all applicable codes, conditions and requirements as described within the project electrical drawings.

1.9 NOT USED

1.10. SCOPE OF WORK

All labor, equipment, apparatus, wiring devices, conduit and wireway, as required to provide the systems with a complete raceway and electrical system in excellent working order, as specified herein, and as specified by relevant drawings, including:

- A. Furnish and install all conduit, raceway and related appurtenances as shown on the project Audio Video Systems and electrical systems drawings. This includes:
  - 1. All conduit, back boxes and related items associated with AV items as shown on the AV drawing set. Work required by this section is defined within the drawing details titled "Device Legend."  
  
Within each Device Legend and within the description for each AV devices shown on the device legends, under the column titled "SCOPE NOTES," any reference made as "By EC" define work items required by this section.
  - 2. Pull strings in all empty conduit systems.
  - 3. Electrical conduit, back-boxes, junction boxes, receptacles and related items shown on the AV drawing set.
  - 4. Any information provided on the AV drawing set with respect to 110 volt or higher line voltage requirements are provided as Information Only. Formal direction for electrical system information is provided by the Project Electrical Engineer and the formal electrical drawings for the project.
- B. Provide breakers, wiring, outlets, and receptacles at locations shown on the AV drawings and/or electrical drawings.
- C. Furnish and Install Junction Boxes as shown for each AV Rack Location.
- D. Verification of dimensions and conditions at the job site.
- E. Close Coordination with the architect, general contractor, and Section 115201(AV) contractor.
- F. Installation of all specified materials in accordance with these specifications, manufacturer's recommendations, and all applicable code requirements. See Device Legends shown throughout the AV drawings wherein work required by the electrical contractor with regard to the specified Audio Video Systems is further defined.
- G. Provide manpower familiar with the rough-in installation as necessary for the Section 115201 (AV) contractor to verify that the raceway/rough-in requirements have been fulfilled.
- H. Life Safety Mute connection to Life Safety/Fire Alarm Systems. Life Safety mute termination shall occur at the AVR rack location.
- I. Procure and pay for all necessary permits, licenses and inspections and observe any requirements stipulated therein.
- J. Conform in all applicable trades with all local regulations and codes.
- K. Comply with federal, state, and local labor regulations and applicable union regulations.

- L. Also refer to the AV drawing set legends and scope related notes.
- M. The Construction Document drawings for the project include all drawings prepared by the project architect, engineers, and related design professionals as well as the AV System Drawings.

#### 1.11 RELATED WORK

##### A. Owner's AV Contractor/Integrator

The AV System integrator will be hired by the owner. Detailed specifications for the AV Integrator's work will be defined within Specification Section 115201. This specification section will be prepared and released to qualified, owner selected AV integration companies no sooner than after the project's release of Design Package D and no later than two weeks following the release of Design Package E.

Responsibilities of the AV integrator will include:

All labor, equipment, apparatus, and wiring devices, as required to provide the systems with AV quality in excellent working order, as specified herein, and as specified by relevant drawings, including:

1. Meet and coordinate with the construction manager, electrical contractor and low-voltage contractor .
2. Submission of drawings for approval by the owner's representative prior to fabrication and installation.
3. Prefabrication of the specified equipment rack assemblies prior to delivery and installation of the rack assembly on-site.
4. Provide, mount and terminate all AV devices defined within this section.
5. Verification of dimensions and conditions at the job site.
6. Coordination of electrical and physical requirements.
7. Installation of all specified materials in accordance with these specifications, manufacturer's recommendations and all applicable code requirements.
8. Initial tests and adjustments of the systems as well as final equalization and alignment of the systems.
9. Training
10. Maintenance services and warranty repair service for one year following acceptance of the systems.
11. Provision of as-built and Contract Closeout Documentation.
12. Provide all labor on-site as required to install the specified components and systems. On-site labor shall be performed in harmony with all other trades and trade jurisdictions working on the project site.
13. Provide all technical support and programming as necessary to ensure that the specified Digital Signal Processing System has been properly programmed to provide the features and functions as specified herein. The DSP programming must be provided by a qualified individual with significant and demonstrable experience with the specified or equivalent, DSP system.

14. Deliver all portable items of equipment that are subject to a “furnish” only condition to the project site. Hand over such items to the owner’s representative with complete, proof of delivery documentation, warranty information and related ownership documentation.
15. Procure and pay for all necessary permits, licenses and inspections and observe any requirements stipulated therein.
16. Conform in all applicable trades with all local regulations and codes.
17. Comply with federal, state and local labor regulations and applicable union regulations.
18. Provide miscellaneous AV cable assemblies as necessary to connect the specified devices to plates, panels and related devices.
19. Following substantial completion of the AV system installation and following the contractor’s effort to confirm that all systems have been installed and tested for compliance with the specified requirements, the AV system contractor shall provide a complete system demonstration where all features, functions and system capabilities are demonstrated to the owner, the construction manager and their AV consultant.
20. The AV system contractor’s proof of performance demonstration.
21. Furnish and Install all AV Plates, Panels and Connectors.
22. Provide life safety AV muting termination point at the MDF AV Racks.

End of Part 1

PART 2 - PRODUCT SPECIFICATIONS

2.1 GENERAL

- A. All required conduit and raceway devices as defined on the AV drawings.
- B. Provide clear legible labels on all junction boxes and cover plates provided for work covered by this section.
- C. All conduit, raceways and electrical devices shall meet the requirements of division 26 and electrical drawings of this project.
- D. Provide all conduit and back-boxes as defined on AV Drawings.
- E. Junction boxes, back boxes and related devices shall be as manufactured by Hubbell, Raco or Equivalent manufacturers. Box dimensions are defined on the AV drawing set.

End of Part 2

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

**A. General:**

1. All materials and equipment are to be new and unused.
2. Fastenings and supports for all fixed equipment and components including conduit and cables, to provide a safety factor of 5 or better.
3. Installation with all precautions necessary to prevent against electromagnetic and electrostatic hum.
4. All precautions necessary to assure adequate ventilation.
5. Precautions to assure the safety of users shall be implemented as required by applicable codes.
6. All equipment installed neatly, with boxes and racks plumb, level and true to line and level.
7. Moderate moves or changes as necessary to accommodate aesthetics to preserve symmetry, and for pleasing appearance without claim for additional payment.
8. Cooperation with other trades to achieve well-coordinated and satisfactory order.
9. Job site and all equipment and materials left clean and free of marks and blemishes.

**B. Conduit and Raceway Separation**

1. Separate conduits or raceways for microphone-level circuits (less than 20 dBm), line-level circuits (-20 to +30 dBm), loudspeaker circuit (+30 dBm or greater), switching and power circuits.
2. Using the following guidelines, provide minimum conduit separation between conduits carrying wiring of the different groups as follows:

	MIC	LINE	SPEAKER	AC POWER
Microphone	ADJACENT	6 INCHES	12 INCHES	12 INCHES
Line	6 INCHES	ADJACENT	12 INCHES	6 INCHES
Speaker	12 INCHES	12 INCHES	ADJACENT	ADJACENT
AC Power	24 INCHES	12 INCHES	12 INCHES	ADJACENT

	MIC	LINE	SPEAKER	CONTROL
Dimmer Controlled Lighting	24 INCHES	12 INCHES	12 INCHES	6 INCHES
220/440 Volt	24 INCHES	6 INCHES	12 INCHES	ADJACENT
All Other	6 INCHES	6 INCHES	ADJACENT	ADJACENT

90-degree crossings in close proximity are acceptable.

3. Should the contractors work in this regard be limited by site conditions or physical limitations beyond his control, the contractor shall notify the architect of such conditions and/or limitations prior to proceeding with the conduit/raceway installation.
4. As it may not be possible to fulfill these requirements at the entry/exit of enclosures, boxes and related devices, the intent of these guidelines is for the contractor to provide the stated separation wherever physically possible and specifically where the path of adjacent conduit will be parallel for distances greater than 10 feet.

### 3.2 IDENTIFICATION

- A. Provide permanent intelligible identification on, or adjacent to all controls, fuses, circuit breakers, patching jacks, conduit receptacles, and the like. This identification will clearly and distinctly indicate the function of the item and will be numbered or lettered to correspond with the function, circuit and use consistent with the field and shop drawings.
  1. Identification of fuses and circuit breakers shall indicate protected circuitry, rating of protective device and voltage across open circuited protected device.
  2. Panel surfaces shall be engraved and filled, silk screened or shall be equipped with 1/16-inch laminated plastic labels with engraved characters at least 3/32" inch height (white characters on black background).
  3. Under no conditions will embossed plastic labels, transfer lettering (Chartpak, LetraSet, etc) or other make-shift labeling be considered acceptable. Engraving and other identification requirement specifically shown on the specification drawings prevail over this paragraph.3.2

### 3.3 GUARANTEE

- A. Labor and materials provided under this specification shall be warranted, commencing on the date of final acceptance of the installation by the owner, for a period of one year, to be free of defects and deficiencies, and to conform to the component specifications and this document as to kind, quality, function, and characteristics.
- B. Defects in labor, or materials, occurring within the warranty period will be rectified by replacement or repair without charge. Paint and exterior finishes, fuses, lamps, and tubes, are excluded from this warranty, unless damage or failure is the result of defective materials or workmanship covered by warranty, or work performed under warranty in the repairing of defects.
- C. Warranty service will be provided to the owner for the warranted items within 48 hours of notice to the contractor.

End of Part 3

END OF SECTION 26 76 10