PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Related Sections:

Division 27 00 00 Section “Common Work Results for Communications” for project scope of work, contractor qualifications, definitions, substitutions, warranty, etc.

1.02 GENERAL

A. It is the intent of this specification that the Contractor delivers complete and working systems, fully tested, that meet the requirements of this specification and regulatory requirements including conformance with ANSI/NFPA 70. All systems shall be completed and ready for immediate use.

B. Furnished products shall be listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown. Comply with applicable requirements of NEC Articles 800 pertaining to communications equipment and signal distribution systems.

C. This equipment shall be purchased under provisions and conditions as set forth by the Construction Manager. This Contractor shall comply with all Construction Manager conditions and requirements.

1.03 SCOPE OF WORK

A. Provide all equipment and incidental hardware necessary for working public address system.

1. Cafeteria Dining Room
2. Gymnasium
3. Ball Field

B. This Contractor shall provide the cabling plant, systems, and the interfaces (i.e., software and hardware, if applicable) to meet the interactive requirements of the equipment as described herein.

1.04 MANDATORY PRE-BID SUBMITTAL AND SUBSTITUTIONS REQUESTS

A. Any manufacturer or provider desiring to provide systems for this project shall be required to provide a pre-bid submittal package for review by the Project Architect/Engineer (PA/E) prior to receipt of bids. Only those providers approved via written addendum shall be allowed to bid. Submit required information under provisions of the General Conditions and Supplementary General Conditions as set forth by the Construction Manager.

B. It shall be understood that review of pre-bid submittal packages by the PA/E does not supersede the requirement to provide shop drawings or a complete and functioning system in compliance with the Contract Documents.

C. Pre-bid submittal requirements shall be sufficient for the PA/E to comprehend the architecture (i.e., hardware and software) of the proposed system. If in the sole opinion of the PA/E, the information is not sufficient to adequately convey intent, the submittal may be rejected. The following items, at a minimum, shall be included in the pre-bid submittal:

1) An information flow block diagram delineating hardware and software functions, as required.

2) Where hardware is to be used to perform required functions, indicate the number of devices of each major type to be used.

3) Provide cut sheets of proposed hardware.

4) Specifically indicate any cabling plant requirements (cable and conduit) to be added necessary to make a complete and working system (note: added cabling plant items beyond those provided by Division 26 are to be the responsibility of this Contractor).

5) Provide a list of deviations from the requirements that are being requested (note: any deviations allowed shall be done so via addendum format).

1.05 SUBMITTALS

See requirements under Division 27 Section “Common Work Results for Communications.”

1.06 DELIVERY

A. The Contractor shall pay for all shipping and handling charges incurred in the delivery of the system components to the job site.

B. The Contractor shall provide proper protection and security for materials delivered to the job site until the installation is completed and the Owner has signed a receipt indicating that the system has been completed, but not necessarily accepted by the Owner.

1.07 QUALITY ASSURANCE

A. All manufacturer's components, installation, wiring, and testing shall be the responsibility of this Contractor.

B. Maintain the same person in charge of the work throughout the installation.

C. Supply and install any incidental equipment needed in order to provide a complete and operational system. Such equipment to be provided at no additional cost even if not depicted in the documents.

D. Verify correctness of parts lists and equipment model numbers and conformance of each component with manufacturer's specifications.

E. Unless otherwise specified, supply only new equipment, parts, and materials, and operate only as required for testing a part of installation procedure.

1.08 CONTRACTOR QUALIFICATIONS

A. This Contractor (installing the public address equipment herein specified) shall be experienced. "Experienced" meaning that the Contractor has personnel that have been trained and certified in the installation of similar equipment of similar equipment and project magnitude to that specified herein within the last year of bid submittal in the local area.

B. Prior to receipt of bids, this Contractor shall submit to the Owner or Owner's agent for approval, before work begins, three references of work of a similar type and scale. References must contain names and telephone numbers of contact personnel. Contractor shall also submit names of technicians that will perform work specified herein, with documentation indicating proficiency.

C. This Contractor shall have been actively engaged in designing, supplying, and maintaining a minimum of ten public address equipment for a minimum period of three years and shall be prepared, upon demand, to provide names and addresses where those systems have been installed.

D. This Contractor shall maintain sales and service presence in the area of adequate size and quality to assure the Owner of rapid response. Service personnel shall arrive on site within 72 hours of receiving a request for service.

PART 2 - PRODUCTS

2.01 GENERAL

Systems shall have page priority. In the event of zone page, public address system shall mute.

2.02 CAFETERIA

A. Wall-Mount Modular Amplifier

1) Provide amplifier with eight module bays for plug-in input modules with two of the bays also capable of handling plug-in signal processing output modules. Provide quantities modules to accommodate designated inputs.

2) The amplifier shall include an adjustable output level limiter with indicator LED. Provide a tape output jack on the front panel and a front panel input combo jack with 1/4" stereo phone and female XLR.

3) Each of the eight module bays shall have an associated independent volume control. Each independent volume control shall have a signal/clip LED to indicate if a clipping condition is occurring at the module’s output. Each amplifier shall, also, include detented bass and treble controls, as well as a motorized master volume control, which can be remotely operated (provide Bogen Model #RVCP accessory for remote operation).

4) Provide equipment (i.e., CD, cards, cable, etc.) for playing of CD music.

5) The amplifier shall be compatible with both high- (70/25V) and low- (4/8- ohm) impedance speakers, with the capability of 100 watts. The amplifier shall operate on line voltages of 120V, 60Hz AC, and include an AC line circuit breaker.

6) The amplifier shall be installed flush with the wall (Bogen Model # BBF back box) in location indicated on drawings. The box shall have provisions for entry of power cable and for all input and output lines. The front cover shall be designed so that it may not be removed without access to the area behind its locking panel (Bogen Model #WMAD).

7) An 11-segment LED output level meter shall register either the average or peak level of the amplifier’s output level, determined by an Average/Peak switch. Each amplifier shall have a Tone Control Bypass switch and a Low-Cut Filter switch located on the rear of the amplifier a module bay.

8) Provide A/V cut-out switch for Multipurpose Area

Acceptable Manufacturer:

1. Bogen WV250
2. Pre-Approved Equal

B. Equalizer

1) Provide equalizer module for above specified amplifier. Module shall provide control over the center frequency ‘Q’ (bandwidth) of the two parametric filters with a frequency range of 200 Hz to 4 kHz (Lo-Mid) and 1 kHz to 8 kHz (Hi-Mid). The ‘Q’ shall be continuously adjustable from 1.5 octaves to 1/6 octave in order to meet both wideband and narrow-band equalization requirements.

2) The parametric bands shall have a gain control that shall allow 14 dB of cut or boost. The module shall have bass and treble controls with a gain range of 12 dB cut or boost at 100 Hz for the bass and at 10 kHz for the treble. Module shall have an equalizer bypass switch that shall provide instant comparison between equalization and no equalization during the tuning of the system.

3) Module shall have an unbalanced RCA input that provides a 20 k-ohm input impedance. The unbalanced input shall connect to the amplifier’s front level control for the bay in which it is installed so that the input shall not be forfeited when using the output module. Aux inputs shall have the ability to be muted by higher priority modules. It shall have a gradual fade back from mute when the mute control is deactivated.

4) Acceptable Manufacturer:

1. Bogen PEQ1R
2. Pre-Approved Equal

C. Speakers

1) Provide public address speakers, as shown on drawings. (Prior to installation, Contractor to verify equipment quantities and locations needed in order to meet coverage requirements of area.)

2) Acceptable Manufacturers:

a) Wall: Atlas Sound HD72W (package containing Soundolier 8" Model C10A-T72, wall flush mounted with Model 95-8 back box, and Model 51-8 baffle finish white).

b) Ceiling: Atlas Sound HD72W (package containing Soundolier 8" Model C10A-T72, ceiling flush mounted with Model 81-8R tile bridge, and Model 51-8 baffle finish white).

c) Pre-Approved Equal.

D. Audio Speaker Cabling

1) Provide 18 GA, two conductor, stranded, unshielded speaker cable.

2) Acceptable Manufacturers:

1. Belden #6300UE
2. West Penn #25224B
3. Pre-Approved Equal

E. Microphones and Cabling

1) Provide listed microphones, accessories, associated cabling, and connection hardware. (Prior to installation Contractor to verify equipment quantities, lengths, and locations needed in order to meet performance criteria.) All sound cable (except speaker cables) shall be 100% shielded.

2) Adjacent to wall mounted amplifier, provide lockable cabinet to house microphones and miscellaneous items.

3) Microphone - Hand Held

a) Provide two dynamic cardioid microphones, shall not weigh more than 9-1/2 ounces.

b) The frequency response shall be 40 Hz to 16 kHz, with output level at 1,000 Hz as follows: open circuit voltage, 75 dB and power level, 55 dB. Front-to-back ratio shall be 25 dB. Impedance of 250 Ohms shall be provided.

c) The microphone shall be equipped with a three-pin XLR type connector and a 5/8" 27 thread quick-release stand adapter. The microphone case shall be die-cast.

d) Acceptable Manufacturer:

1. Shure SM58
2. Pre-Approved Equal

4) Microphone Cables (XLR to XLR)

a) Each microphone shall be supplied with one detachable 25 foot and one detachable 50 foot heavy-duty two-conductor shielded cable equipped with a black A3F connector at the microphone.

b) Acceptable Manufacturer:

1. ProCo
2. ProAudio
3. Pre-Approved Equal

5) Floor Stands

a) Provide two floor stands for hand held microphones.

b) Acceptable Manufacturer:

1. Atlas MS-12CE
2. Pre-Approved Equal

6) Wireless Microphone (Samson AirLine 77 Headset)

a) Receiver

1. Wireless receiver unit with two, independent receivers.
2. Samson wireless CR77 or pre-approved equal.

b) Headset Transmitter

1. Provide two, headset microphones.
2. Samson wireless AH1 or pre-approved equal.

F. Audio Microphone Cabling

1) Provide single twisted pair, shielded cable with 20 GA stranded conductors and 22 GA drain wire.

2) Acceptable Manufacturers:

1. Belden 9154
2. West Penn 292

G. Miscellaneous Equipment

As per the needs of the installation, miscellaneous equipment shall be required at the Contractor’s expense. It is the Contractor’s responsibility to identify and bid all miscellaneous equipment necessary to provide a complete and properly functioning system.

2.03 GYMNASIUM

A. Equipment Rack

1) Provide EIA compliant 19" pivoting, equipment rack. Support weight of rack on floor and conceal conduit stubs and boxes, as necessary. At bottom of rack, provide cable entry platform with removable front access cover.

a) Provide three, vented, cantilevered, 17 ¾" deep, 16 Ga., rack mount shelves (Middle Atlantic U317, black). One for assistive listening base transmitter and storage of receivers (see Assisted Listening System specification in this section). One for microphones and storage of user manuals. One for low voltage power supplies. Reference detail for placement and spacing.

b) Provide vented, blank panels (2 RUs) in required quantities (Middle Atlantic VTP-2, black). Provide solid, blank panel (2 RUs) for master power switch (Middle Atlantic BL2, black). Reference detail for placement and spacing.

2) All structural elements shall be finished in a black powder coat.

3) Rack shall be constructed of 14-gauge steel for top and base and 16-gauge steel for center section and backpan. Rackrail shall be 11-gauge steel with tapped 10-32 holes in universal EIA spacing, with marked rackspaces.

4) Provide knockout on backpan (no less than 12-1/2" x 12-1/2" opening) for electrical pull-box.

5) Provide locking, reinforced 16-gauge, solid steel, front door (Middle Atlantic FD-40).

6) Provide rear rail kit (Middle Atlantic DWR-RR40).

7) Provide 15 amp, high density, slim, vertical power strip (Middle Atlantic PD-2415SC) with 24 outlets and nine foot cord. Strip shall contain MOV surge, EMI filter, and circuit breaker. Mount in rack/cabinet on rear rail and plug into sequence switch system’s remote power outlet (see specification this section).

8) Acceptable Manufacturers:

1. Middle Atlantic SR-40-28 with above listed accessories.
2. Or Pre-Approved Equal.

B. Mixer

1) Provide one, 16 channel, mono/stereo mixer with XDR2 Extended Dynamic Range mic preamps with:

a) Ultra wide 60db gain range.

b) Distortion under 0.0007% THD (20Hz-20kHz).

c) Phantom Power.

d) 16 high-headroom line inputs (4 stereo pairs, 8 mono).

e) Balanced ¼" inputs and outputs.

f) 4 Aux Sends, level, pan, 20db/solo and OL/Mute LEDs on each channel.

g) 4 stereo Aux Returns, 8 Direct out, 4 stereo Groups/Bus outputs.

2) Acceptable Manufacturer:

1. Mackie #1642-VLZ4
2. Or Pre- Approved Equal

C. Amplifier

1) Provide solid state, rack mountable, power amplifier with capability for stereo or mono-bridged operation. Rated output with four channels driven in Dual Mode with less than 0.35% THD (20 Hz to 20 kHz) shall be 1,000 watts per channel (70V Dual).

2) The amplifier shall contain protection from shorted, open, and mismatched loads, general overheating, DC, high-frequency overloads, under/over voltage, and internal faults.

3) The amplifier shall contain FIT (Fault Isolation Topology), which shall isolate channel-specific faults and prevent them from affecting remaining channels.

4) If an amplifier channel starts to overheat, the Thermal Level Control (TLC) circuit shall engage that channel’s input compressor in an amount proportional to the amount of overheating, in order to generate less heat. If the channel becomes too hot for safe operation, the channel shall shut off, and the Thermal Indicator for that channel shall fl ash brightly to alert the user that a state of thermal stress or overload has caused the channel to shut down.

5) The front-panel control shall include a power switch.

6) Rear-mounted controls shall include Channel Level Controls, High Pass Filter Switches (one per channel), and a Mode Switch. The High Pass Filter Switch shall select between fl at and two position of rolloff. The two-position Mode Switch shall select between Dual or Bridge-Mono operation.

7) Rear-mounted output connector shall be one, four-pole, touch-proof terminal strip. Rear-mounted input connectors shall be 3-pin balanced barrier connectors on the standard PIP2-BBY module. This module shall include a “Y” Input Switch which shall combine both input signals.

8) Frequency Response at 1 watt, 20 Hz to 20 kHz: ±0.25 dB. Signal to Noise Ratio below rated power (20 Hz to 20 kHz): better than 105 dB A-weighted. Total Harmonic Distortion at full rated power from 20 Hz to 20 kHz: less than 0.35%. Signal to Noise Ratio below rated power (20 Hz to 20 kHz): better than 105 dB A-weighted.

9) Provide a three year warranty (minimum).

10) Acceptable Manufacturer:

1. Crown #CTs 2000
2. Or Pre-Approved Equal

D. Processor

1) Provide a rack mountable, fully programmable, audio processing and control system, which shall include advanced parallel DSP processing, a multi-layer front panel display, and multiple interface and control options. Signal processing shall be accomplished using two, 24-bit parallel SHARC processors with a combined power of 132 MIPS.

2) Processor shall contain eight, balanced analog line/mic inputs; phantom power; eight, balanced analog line outputs; 24-bit A/D and D/A converters; remote control bus connector; 16, front panel, dual-color LED indicators (eight input, eight output); three, front panel, parameter controls; display with back light; RS-232 connections; RS-485 connection for remote serial functions; and four control input ports (analog 0-10 VDC range for external potentiometer).

3) Frequency response shall be +0/-0.5dB at 1 kHz from 20Hz to 20 kHz. Total Harmonic Distortion and Noise shall be less than 0.01% from 20 Hz to 20K Hz. Dynamic Range shall be less than 15 watts.

4) Acceptable Manufacturers:

1. Architectural Acoustics by Peavy #Digitool MX.
2. Or Pre-Approved Equal.

E. CD Player

1) Provide one rack mount, single tray CD/MPE player.

2) Acceptable Manufacturers:

1. D&M Denon # DN-C615
2. Or Pre-Approved Equal

F. Speakers and Cabling

1) Provide loudspeaker quantities per drawings. (Prior to installation, Contractor to verify equipment quantities and locations needed in order to meet coverage requirements of area.). The loudspeaker shall be self-contained, wide frequency range device with a hemispherical coverage pattern with subwoofer. Provide electronic crossover (Q-CX). Each junction box location shall have a homerun 3/4" conduit back to cabinet. Provide cable per manufacturer’s recommendations back to cabinet. Cable shall be concealed along beams and other exposed surface areas.

2) Acceptable Manufacturers:

1. Soundsphere Model Q-12A Combo 5 with Q Combo Kit Hardware and Boom Kit
2. Pre-Approved Equal

G. Microphones and Cabling

1) Provide listed microphones, accessories, associated cabling, and connection hardware. (Prior to installation Contractor to verify equipment quantities, lengths, and locations needed in order to meet performance criteria.) All sound cable (except speaker cables) shall be 100% shielded. Provide single, twisted pair, shielded cable with 22 GA stranded conductors and 24 GA drain wire (West Penn #452).

2) Hand Held Microphone - Quantity of Four

a) Provide dynamic cardioid microphones. The overall size of the microphone in length, nor shall it weigh more than 9-1/2 ounces.

b) The frequency response shall be 40 Hz to 16 kHz, with output level at 1000 Hz as follows: open circuit voltage, 75 dB and power level, 55 dB. Front-to-back ratio shall be 25 dB. Impedance of 250 ohms shall be provided.

c) The microphone shall be equipped with a three-pin XLR type connector and a 5/8" 27 thread quick-release stand adapter. The microphone case shall be die-cast.

d) Acceptable Manufacturer:

1. Shure #SM58
2. Or Pre-Approved Equal

3) Microphone Cables (XLR to XLR)

a) Each microphone shall be supplied with one detachable twenty-five foot (25') and one detachable fifty-foot (50') heavy-duty cables. Cables shall be 2-conductor, 23 gauge wire with a 94% braided shield.

b) Acceptable Manufacturer:

1. Pro Co Mastermike
2. Or Pre-Approved Equal

4) Floor Stands – Quantity of Two

a) Provide floor stands for hand held microphones

b) Acceptable Manufacturer:

1. Atlas MS-12CE
2. Or Pre-Approved Equal

5) Lavalier Wireless System – Quantity of Two

a) Provide a condenser lavalier microphone with transmitter and receiver.

b) Acceptable Manufacturer:

1. Shure #PG14/PG185 Wireless Lavalier System
2. Or Pre-Approved Equal

6) Dual Wireless Handheld System – Quantity of One

a) Provide two, condenser handheld microphones (transmitter) and one dual vocal receiver.

b) Acceptable Manufacturer:

1. Shure #PG288/PG58 Wireless Handheld System.
2. Or Pre-Approved Equal

7) Assisted Listening System (Wireless) – Quantity of One

a) Provide a base transmitter with 17 user-selectable frequencies controlled by front-mounted control buttons and LCD display, a headphone jack with adjustable level for input signal monitoring, and a peak reading on the LCD display for visual input monitoring. On the back of the unit, provide a balanced XLR-3F with selectable mic line, and 70 volt input options, as well as an unbalanced 1/4" input. The input selection and attenuation shall be done from the controls on the front panel; no special tweaker shall be required. Included rack hardware and necessary antennas.

b) Provide a single channel receiver which operates on one of 17 fixed narrow-band frequencies in the 72 to 76 MHz band. Provide ergonomically raised volume control knob for level adjustments by feel. Provide recessed headphone jack.

c) Provide headphones for use with this system.

d) Provide sign to be mounted is a visible place (coordinate final location with Owner prior to installation). Sign shall indicate availability of assistive listening system.

e) Acceptable Manufacturer:

(1) Telex SoundMate™ #SMP-2 (with #ST-300 base transmitter; one PST-170 portable belt pack transmitter, one HM-2 head worn microphone, six #SR-50 single channel receivers; six #HEB-2 collapsible headphones; and wall plaque. Provide new, AA batteries in quantities necessary and system carrying case.

(2) Or Pre-Approved Equal

H. Rack Power System

1) Provide 24 V system-controlling relays to turn the entire system on or off. Activation to be by one of two separate switches: one switch to be located on the equipment cabinet (see next paragraph); the second switch to be located in the remote control box (location will be established with Owner—this Contractor to provide cabling, box, and interface components). Provide sufficient quantity of relays for the correct AC current. Relays shall be solid state.

2) Mount switch securely to outside of cabinet in user accessible location and as to not interfere with the operation of the door. Switch to be three positions to function with remote control.

I. Remote Power Switch and Level Control

Provide in existing lockable box (coordinate location with Owner, sized to house a double gang box) the required controls and faceplates. The face plates are to provide for two each—pushbuttons or center rocker switches. Buttons or switches shall remotely control volume up, volume down, mute, and power on/off (low voltage power on/off switch as described in item 7 above). Provide permanent labeling - typed. Level control to be per amplifier manufacturer's recommendation and shall be fabricated by sound contractor, to use VCA of the mixer.

2.04 BALL FIELD

A. General: Mount equipment on wall shelving.

B. Mixer/Amplifier

1) System Description:

1. 5 Mic Inputs with Phantom Power
2. 1 Stereo Aux Line Input
3. VOX and Remote Mute
4. Tape Output
5. Dual Line Output
6. Pre-Out/Power In Patch
7. Remote and VOX Activated Mute
8. Zone 2 (MOH Out) 1W @ 8Ω and 1.5V @ 600Ω
9. VCA Level Control
10. Bridge I/O (Mix Bus Combining)
11. Special Low Cut Filter is 6 dBu/octave at 400 Hz and also bypasses front panel bass control to allow use with paging horns like the Atlas Sound APX40TN and AP-15T

2) System Requirements

a) Power Rating: 120W RMS @ 70.7V (maximum average power @ 50 Hz to 20 kHz with 0.5% THD)

b) Inputs:

1. Input #1 Mic/Line/Tel (optional transformer available)
2. Inputs #2-5: Mic/Line
3. Input #6: Unbalanced RCA Summing line level

c) Outputs:

1. Main: 120W RMS 8 Ohm, 25V, 70.7V, and 100V
2. Zone 2: 1 Watts @ 8 Ohms & 1.5V @ 600 Ohm line level

3) Acceptable Manufacturer:

1. Atlas Sound AA120
2. Pre-Approved Equal

C. Speakers and Cabling

1) Provide outdoor, 2-way, stadium horns, quantities per drawings. Prior to installation, Contractor to verify equipment quantities and locations needed in order to meet coverage requirements of area.

2) Provide the following capabilities:

a) 100 watts power handling.

b) Constant directivity design offers controlled coverage of 65° horizontal by 65° vertical ( 2kHz octave band).

c) Driver compliment includes 8" cast frame woofer with a concentrically mounted 1" exit compression driver coupled to a 65°H x 65°V HF horn.

d) Easy, weather resistant connection via a convenient recessed terminal block located on the bottom of the loudspeaker.

e) Includes a built-in, high efficiency 60 watt 70.7V transformer.

f) Efficiency rating of 100 dB (1 Watt/1Meter).

g) Maximum output of 120 dB (rated power @ 1M).

3) Acceptable Manufacturers:

1. Atlas AH66-8ST
2. Pre-Approved Equal

D. Microphones and Cabling

1) Provide listed microphones, accessories, associated cabling, and connection hardware. Prior to installation Contractor to verify equipment quantities, lengths, and locations needed in order to meet performance criteria. All sound cable (except speaker cables) shall be 100% shielded.

2) Announcement/Paging Microphone – Desktop

a) Provide one announcement/paging microphone.

b) The announcement/paging microphone shall be omni-directional pressure-operated dynamic type, offering a frequency response from 50Hz to 12kHz, substantially independent of direction to the source of sound. The output level shall be 55dB in the high impedance position, and -58 in the low impedance position.

c) Acceptable Manufacturer:

1. Shure 522
2. Telex
3. Pre-Approved Equal

3) Microphone—Hand Held

a) Provide one, dynamic, cardioid microphones. The microphones shall not weigh more than 9-1/2 ounces.

b) The frequency response shall be 40Hz to 16kHz, with output level at 1,000Hz as follows: open circuit voltage, 75dB and power level, 55dB. Front-to-back ratio shall be 25dB. Impedance of 250 Ohms shall be provided.

c) The microphone shall be equipped with a three-pin, XLR type connector and a 5/8" 27 thread quick-release stand adapter. The microphone case shall be die-cast.

d) Acceptable Manufacturer:

1. Shure SM58
2. Audio Technica
3. Pre-Approved Equal

4) Desk Stand

a) Provide one, desk stand for hand held microphone.

b) Acceptable Manufacturer:

1. Atlas DS-7E
2. Pre-Approved Equal

5) Audio Cable and XLR jacks

Provide XLR jacks, in quantities indicated, and provide audio cabling from equipment to desk/tabletop, per manufacturer’s recommendations.

E. Miscellaneous

1) Provide necessary shelving under the base contract.

2) ADA hearing assistance system

a) Provide rack mounted transmitter and antenna, to be mounted in Press Box per manufacturer’s recommendations. Supply three receivers with dual ear buds and six, 9-volt batteries.

b) Acceptable Manufacturer:

1. Telex SoundMate with antenna
2. Pre-Approved Equal

2.05 MISCELLANEOUS EQUIPMENT

As per the needs of the installation, miscellaneous equipment shall be required at the Contractor’s expense. It is the Contractor’s responsibility to identify and bid all miscellaneous equipment necessary to provide a complete and properly functioning system.

PART 3 – EXECUTION

3.01 GENERAL

A. Installation shall be performed only by experienced contractors who must be familiar with the project requirements.

B. 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. Contractor shall coordinate all work with other trades to avoid conflicts and delays in construction schedule. Contractor shall take whatever steps necessary to meet the construction schedule, including, but not limited to, expediting the delivery of materials and/or providing additional labor at no charge to the Owner.

D. Contractor shall coordinate with the Division 26 Contractor for the connection of power and ground wiring to the system and all wiring installed by the Division 26 Contractor as it relates to this equipment.

3.02 INSTALLATION

A. All equipment shall be plumb and square. The Contractor shall take such precautions as are necessary to prevent and protect against electromagnetic and electrostatic hum, to supply adequate ventilation.

B. Pre-wire panels and any other possible equipment before delivery to the job site.

C. Identify all wires and cables at every termination and connection point with the specified cable marker. The cable marker shall be Brady or equal. All cable shall be neatly tied and laced.

D. All control panels, patch bays, controls, connectors, switches, and etc. (except those on the equipment that are properly identified by the manufacturer) shall be suitably identified by engraved panels or plates or metal-photo panels or plates as approved by the PA/E.

E. Install equipment in accordance with manufacturer's instruction.

F. Splice cables only in accessible junction boxes or at terminal block units.

G. Make cable shields continuous at splices and connect speaker circuit shield to equipment ground only at amplifier.

H. Install input circuits on separate cables and raceways from output circuits.

I. Leave 12 inches excess cable at each termination of microphone, volume pad, speaker, and other system outlet.

J. Leave six feet excess cable at each termination at system cabinet.

K. Provide protection for exposed cables where subject to damage.

L. Use suitable cable fittings and connectors.

M. Conceal all exposed wiring or provide cable management for an orderly appearance.

3.03 AS-BUILT DRAWINGS

A. This Contractor shall provide equipment operation and maintenance documents (no less than five copies). Documents shall include interconnect wiring diagrams specific for this project and shall be clearly marked as such. Include instructions for adjusting, operating, and extending the system. Also, include repair procedures and spare parts documentation. Documents shall be provided in digital format based on Owner requirements.

B. Provide complete "as built" drawings indicating complete layout, wire routing, with identification and numbering of all intermediate points. A descriptive letter (M for microphone, S for Speaker, etc.) followed by two numbers shall be used to code the wiring. Numbering shall begin at top left of the diagram, going from left to right and top to bottom.

3.04 ON-SITE TRAINING

The Contractor shall provide a minimum of four hours of on-site instruction in the operation of the specific sound system equipment to personnel specified by the Owner. This instruction is necessary to ensure the Owner understands the operation of the system and to minimize service calls to readjust controls inadvertently changed by the Owner.

3.05 WARRANTY

Per Division 27 Section “Common Work Results for Communications.” However, this warranty shall be modified for this Contractor to provide loaner equipment, at no charge, if defective materials cannot be permanently replaced or repaired.

END OF SECTION