SECTION 27 33 00
PUBLIC ADDRESS SYSTEM

PART 1 - GENERAL

1.1 Summary

A. General: The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish a complete Public Address (PA) system in accordance with the plans and as specified herein. The contractor shall install all speakers, horns, cables and cable to be run to the main communications room. The Contractor shall make all connections and install all equipment in the communications room. The Contractor shall coordinate exact equipment mounting locations with the Owner prior to the installation of any equipment or cabling.

1.2 Quality Assurance

A. Compliance with Local Requirements: Comply with the applicable building code, local ordinances, regulations, and the requirements of the authorities having jurisdiction.

B. Comply with NFPA 70.

C. Listing and Labeling: Provide PA system components specified in this Section that are listed and labeled by Underwriters’ Laboratories, Inc. (UL).

D. PA System shall be registered under Part 68 of the Federal Communications Commission (FCC).

1.3 Submittals

A. Submit product data for each type of proposed system component specified, including dimensioned drawings showing minimum clearances and installed features and devices. Include list of materials and NRTL-listing data.

B. Submit Shop Drawings showing detailed drawings of PA system.

C. Submit wiring diagrams from manufacturer differentiating clearly between factory and field-installed wiring. Include diagrams for each component of the system with all terminals and interconnections identified. Make all diagrams specific to this Project.

D. Submit a system operation description covering this specific Project, including method of operation. Manufacturer’s standard descriptions for generic systems are unacceptable.

E. Submit product certificates signed by the manufacturer of the PA system components certifying that their products comply with specified requirements.

F. Submit the manufacturer’s warranty.

1.4 Delivery, Handling, And Storage

A. Deliver PA system components in factory fabricated containers or wrappings, which properly protect products from damage.
B. Handle PA system components carefully to prevent breakage, denting and scoring finish. Wrap finished cabinets individually, in heavy containers for protection in transit. Do not install damaged units or components; replace with new.

C. Store PA system components in original cartons in well ventilated space protected from moisture, construction traffic and debris.

1.5 Sequence of Operation

A. The PA system shall be zone based for direct connection to loop start and ground start trunks, to PBX and KEY paging ports that supplies DTMF capability and to analog T/R lines.

B. The system shall allow total amplifier power up to 250W.

C. Momentary tones shall be placed throughout the system when a contact closure is received from the master clock of the building automation system.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide the following equipment including, but not limited to, the following:
   1. Bogen PCM 2000 series (Basis of design)

2.2 HEADEND EQUIPMENT

A. All modules shall be equipped with a ribbon cable, connector and power cable for interconnection to each other. Module face plates shall be black with connector types labeled in white. Each plate shall have knockouts for cabling and wire dressing. All connectors shall be RJ-11 or RCA type.

B. Central Processor Module (CPU) shall be provided for the first 9 zones of the system. CPU shall provide satellite system identification via DIP switches. It shall include a locking program/run selector switch (with LED), satellite data link RCA jack and 12VDC power source. A connector block with screw terminals shall be provided for paging amplification connections, low and high power BGM connections, emergency/shift change signal activation, AUX contact closure and 12VDC power source. Bogen PCMCPU with Bogen PCMCPS2 power supply and Bogen RPK88 rack mount kit.

C. A zone paging module (Bogen PCMZPM) provides three zones of paging to the PCM2000 system. Up to three PCMZPM modules can be used in the basic system, providing up to nine zones of paging. Each zone module allows talkback (on/off) and background music (BGM) options for each zone. Each zone can be connected or disconnected from the background music bus; the entire module can be disconnected from the BGM bus and connected to its own local BGM source. Each module also supports either high-power (passive speakers / central amplifier) or low-power (low level signals to amplified speakers). A relay driver is available per zone, activating when the zone is active. Additional zone paging modules can be combined with additional PCMCPU modules when more than nine zones are required.

D. Telephone interface module shall have LED power indicator and provide interface selection via DIP switches and include volume control for tone and BGM source. It shall also have RJ-11 outlets for night ringer, telephone line and override functions. A connector block with screw terminal connections shall be provided for BGM source and 2 form-C relay contacts (Bogen PCMTIM).

E. A talkback module (PCMTBM) shall be provided for hands-free talkback capability and time-triggered signaling events.
F. The Zone PA system shall have the following functions:
1. Simultaneous high and low power paging.
3. Up to 32 field programmable zone groups, each consisting of 1 – 99 zones.
4. Field programmable night ringer zone group.
5. Field programmable emergency/shift change zone group. This feature shall be activated by an Owner supplied contact closure and sound a user-selected tone.
7. Background music with local music sourcing capability.
8. Field programmable Code Call Zone Group. Owner shall have choice of pattern or echo code calls and repeat functions.
9. 2 Form-C relay contactors for activating external equipment.
10. Provide uninterrupted background music to zones not being paged.
11. Non-volatile RAM for retention of programming information during power interruptions.

G. VoIP tie in module to enable access from IP phone system to paging system. Coordinate with Owner’s phone system vendor.

H. The single channel central amplifier shall be rack mountable, and capable of supporting 25V or 70V loads. Total Harmonic Distortion of less than 0.5% and Frequency Response of +0/-2dB from 65 to 20,000 Hz at full rated output. The amplifier shall be loaded to a max of 80% of capacity. Bogen GS150D (125 watts) or Bogen GS250D (250 watts). Provide with Bogen GSDRPK rack mount kit.

2.3 ADDITIONAL EQUIPMENT

A. Rack
1. Provide equipment in data racks as specified in Section 27 11 16 “Communications Cabinets, Racks, Frames and Enclosures”.

B. Recessed Ceiling Speakers
1. Provide a complete speaker/transformer/baffle/backbox/tile bridge assembly, designed for drop-tile ceiling installations.
2. 8” O.D. speaker with 10 oz magnet and a 5W, 25/70V transformer with five tap settings between 0.31W and 5W (C10X/BU/WS w/ TBLU).
3. Round, steel stud-mount baffle, with white powder coat finish (BR8WS)
4. Rust-resistant steel, load bearing support bridge (SSB-3)
5. Round, steel, 275 CID backbox (ERD8U)
6. Quam Solution 1 (two complete speaker assemblies of the above components) or approved equal by Rauland or Atlas.

C. Drop in Ceiling Tile Speakers
1. UL listed, shallow depth lightweight speaker assembly, 1’ x 2’ ceiling tile loudspeaker system consisting of 8” O.D. dual cone loudspeaker with 5 oz. magnet and 5W-25/70V transformer.
2. Quam 8C5PAX/TBLU or approved equal by Rauland or Atlas.

D. Paging Horns
1. Compression type, double re-entrant horn loudspeaker with an integrated 15W, 25/70V rotary select transformer and an adjustable mounting base.
2. Five tap settings between 1W and 15W.
3. Indoor or outdoor environment.
4. 110-degree coverage angle.
5. Quam QH16T or approved equal by Rauland or Atlas.

E. Wall Mount Volume Control
1. Single gang, 20 watt, ten-step continuous rotary audio level attenuator with an “off” position.
2. Stainless steel faceplate with embossed positions and central knob with indicator mark.
3. Quam QC10 or approved equal by Rauland or Atlas.
F. Cabling
   1. Speaker cabling shall be plenum rated, 2-conductors twisted pair, 18-gauge stranded copper.
   2. West Penn 25224B or approved equal by General or Belden.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL
   A. Install system according to standards referenced in Part 1 of this Section.

3.2 EQUIPMENT INSTALLATION
   A. Install ceiling/wall mounted speakers and other equipment per manufacturer’s recommendation.
   B. Flush wall mount volume controller as required.

3.3 WIRING INSTALLATION
   A. Wiring Method: Install paging system wiring in metal conduit where concealed and inaccessible, such as within walls and enclosed ceilings. Wiring above accessible ceilings may be routed in J-hooks. Where low voltage cable tray is available, speaker cables can be routed within.
   B. Final termination in the main communications room will be by the Contractor.
   C. Speaker circuits shall be designed not to exceed a 5 percent voltage drop.

3.4 IDENTIFICATION
   A. Identify system components, wiring, cabling, and terminals according to Division 26 Section “Identification for Electrical Systems.”

3.5 GROUNDING
   A. Ground equipment according to system manufacturer’s instructions to eliminate shock hazard and to minimize, to the greatest extent possible, ground loops, common mode returns, noise pickup, cross talk, and other impairments.
   B. Ground equipment, conductor and cable shields. For audio circuits, minimize, to the greatest extent possible, ground loops, common mode returns, noise pickup, cross talk, and other impairments.

3.6 FIELD QUALITY CONTROL
   A. Minimum System Tests: The minimum required tests are as follows:
      1. Verify the absence of unwanted voltages between circuit conductors and ground.
      2. Test all conductors for short circuits using an insulation-testing device.
      3. Test the system for all specified functions according to the approved operation and maintenance manual. Systematically initiate specified functional performance items at each station. Observe all voice audio for routing, clarity, quality, freedom from noise and distortion, and proper volume level.
B. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log. Submit log upon the satisfactory completion of tests. A copy of the test reports shall be included in the Owner's O&M Manual.

C. Tag all equipment, stations, and other components at which tests have been satisfactorily completed.

END OF SECTION 27 33 00