

SECTION 27 51 26

~~~ PROJECT NOTE ~~~~~

ARCHITECT OF RECORD/ENGINEER OF RECORD IS RESPONSIBLE FOR REVIEWING THIS SPECIFICATION SECTION IN DETAIL FOR COORDINATION WITH THE PROJECT SCOPE OF WORK.

ALL "PROJECT NOTE" TEXT IS TO BE REMOVED FOLLOWING REVIEW OF THE CONTENT OF EACH NOTE BY THE ARCHITECT OF RECORD/ENGINEER OF RECORD.

EDIT THE DOCUMENT FOOTER TO INCLUDE THE PROJECT NAME AND NUMBER.

EDIT THE DOCUMENT HEADER TO INDICATE THE ARCHITECT OF RECORD PROJECT ISSUE" DATE. THE "CPS CONTROL" DATE SHOULD NOT BE EDITED.

ANY MODIFICATIONS TO THE TECHNICAL STANDARDS IN THIS SECTION - INCLUDING THE REMOVAL OR ADDITION OF MANUFACTURERS - MUST BE APPROVED BY CPS.

REQUESTS FOR MODIFICATION ARE TO BE SUBMITTED TO THE DESIGN MANAGER DURING THE DESIGN PHASE FOR REVIEW AND APPROVAL.

~~~ END OF PROJECT NOTE ~~~~~

ASSISTIVE LISTENING DEVICE SYSTEMS

~~~ PROJECT NOTE ~~~~~

ASSISTIVE LISTENING SYSTEMS (ALS) ARE INTENDED TO AUGMENT STANDARD PUBLIC ADDRESS AND AUDIO SYSTEMS BY PROVIDING SIGNALS WHICH CAN BE RECEIVED DIRECTLY BY PERSONS WITH SPECIAL RECEIVERS OR THEIR OWN HEARING AIDS AND WHICH ELIMINATE OR FILTER BACKGROUND NOISE. THE APPLICATION DEPENDS ON THE CHARACTERISTICS OF THE SETTING, THE NATURE OF THE PROGRAM, AND THE INTENDED AUDIENCE.

THE TWO TYPES OF ASSISTIVE LISTENING DEVICE SYSTEMS USED BY CPS ARE:

INFRARED SYSTEM (IR) – NEW SCHOOLS AND ADDITIONS: INFRARED SYSTEMS WORK THROUGH DIRECT LINE OF SITE AND ARE SUITED FOR LARGER SPACES. THE PRIMARY ADVANTAGE IS INCREASED PRIVACY. DISADVANTAGES INCLUDE DEAD SPOTS CAUSED BY INTERIOR FLUORESCENT LIGHTING.

FM SYSTEM (RADIOWAVES): FM SYSTEMS ARE SUITED FOR LARGER SPACES WITH OVERHANGING BALCONIES. THE PRIMARY ADVANTAGES ARE ADEQUATE SIGNAL STRENGTH AT ALL SEAT LOCATIONS AND INCREASED FLEXIBILITY FOR SEPARATE EVENTS OCCURRING SIMULTANEOUSLY IN ADJOINING SPACES OR WITHIN THE SAME SPACE. DISADVANTAGES INCLUDE A LACK OF PRIVACY AND FM RADIO INTERFERENCE.

~~~ END OF PROJECT NOTE ~~~~~

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Section includes requirements for furnishing and installing a complete and operating Assistive Listening System (ALS).

1.02 DEFINITIONS

- A. Refer to Section 27 05 03 - Communications General Requirements for definitions.

1.03 REFERENCE STANDARDS

- A. City of Chicago Building Code - Municipal Code of Chicago for the Building Industry; 2017.
- B. City of Chicago Electrical Code - National Electrical Code with Chicago Amendments; 2017.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Product data: submit manufacturers data sheet including specifications, installation instructions, and general recommendations for each piece of equipment specified.
- C. Wiring diagrams, detailing wiring for power, signal, and control, differentiating clearly between manufacturer-installed wiring and field-installed wiring
- D. Dimensioned shop drawings showing transmitters, amplifiers, sensors, and other equipment installation locations, and wiring.
- E. Area of Coverage plan showing that all parts of the auditorium are covered.
- F. Maintenance data for materials and products, for inclusion in Operating and Maintenance Manual specified in Section 01 78 00 - Closeout Submittals. Provide complete manual material concurrently with system submittal. Update manual throughout project and provide as-built manual at project close-out. Include instructions for basic troubleshooting, preventive maintenance and cleaning of all equipment supplied.
- G. Product data for batteries and identify as alkaline type or rechargeable type.
- H. Maintenance recommendations for product batteries.
- I. As built drawings indicating typical locations of all devices, **[infrared sensors, emitters, transmitters]** and amplifiers. Provide additional details of any systems that are not installed in the typical manner.
- J. Submit shop drawings for fabrication and erection of specialty signs. Include plans, elevations and large-scale details of sign wording and lettering layout. Show anchorages and accessory items. Furnish location template drawings for items supported or anchored to permanent construction

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: All work shall be done by expert technicians qualified in the field with knowledge of systems and detailed requirements for fine-tuned performance. Workmanship shall comply with standard professional broadcast practice concerning grounding, shielding, cable dressing, cable termination and equipment mounting. All mounting holes shall be utilized for any equipment.
- B. Electrical component standard: provide work complying with applicable requirements of City of Chicago Electrical Code.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in factory containers. Store in clean, dry space in original containers. Protect products during construction from unintentional damage. Handle carefully to avoid damage.

1.07 WARRANTY

- A. All electronic equipment shall be new and of current model. Systems shall be guaranteed for a period of two (2) years from the date of completion against defective materials, inferior workmanship or improper installation adjustment.
- B. Guarantee shall cover all parts and labor.

PART 2 PRODUCTS

2.01 SYSTEM DESIGN

- A. The system shall transmit via **["FM" frequencies] ["Infrared" frequencies]** to the receiver units.
- B. The **[transmitter (FM)] [emitter (IR) panel]** shall receive an output signal from **[the existing] [a new]** public address system.
- C. The system shall be capable of connecting to **[the existing] [a new]** public address system.
- D. Provide the minimum number of receivers to be hearing aid compatible complying with requirements of City of Chicago Building Code.

2.02 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - 1. Audio Enhancement (Riverton, Utah); www.audioenhancement.com.
 - 2. Comtek (Salt Lake City, Utah); comtek.com.
 - 3. Phonic Ear (Petaluma, California); www.phonicear.com.
 - 4. Telex (Minneapolis, Minnesota); www.telex.com.
 - 5. Williams Sound (Eden Prairie, Minnesota); www.williamssound.com.

~~~ **PROJECT NOTE** ~~~~~  
*SELECT IINFRARED SYSTEM OR FM SYSTEM FROM TWO ARTICLES BELOW.*

~~~ **END OF PROJECT NOTE** ~~~~~

2.03 COMPONENTS [INFRARED SYSTEM]

- A. The infrared wireless system shall have no channel restrictions, no interference, a three-band equalizer, two stereo inputs and one monaural input. System shall include transmitters, emitters, sensors, receivers, batteries, chargers, etc., as required for a complete operational system.
- B. Amplifier shall be sized such that the load will not exceed 90% of the rated output.
- C. Systems shall function without audible distortion, hum, buzz or rattle under normal operating conditions.
- D. Provide 2-channel integrated pendant style transmitter with performance as follows:
 - 1. IR Modulating frequencies: Above 2MH2.
 - 2. Audio Distortion: <2.0%.
 - 3. Frequency response of 100 to 15kHz2 (+/- 3dB).
 - 4. Power: 2-'AA' NIMH Rechargeable batteries.
 - 5. Internal battery charger w/battery charging port and plug in transformer.
- E. Infrared sensors shall be Ceiling-Mounted with 360 Degrees coverage. Sensors shall provide coverage for infrared signal pickup throughout entire area.

~~~ **PROJECT NOTE** ~~~~~  
*SELECT IINFRARED SYSTEM OR FM SYSTEM FROM TWO ARTICLES ABOVE AND BELOW.*

~~~ **END OF PROJECT NOTE** ~~~~~

2.04 COMPONENTS [FM SYSTEM]

- A. Transmitter: The transmitter shall be microprocessor controlled with push button configuration. It shall have an operating range of up to 1000 feet. It shall have 10 wideband and 7 non-standard wideband channels operating on a frequency of 250MH2 minimum.
- B. The transmitter front panel shall have a push button controlled LCD digital display. There shall be three pre-configured (selectable) application presents: Hearing Assist, Music and Voice. The audio level shall be adjustable by push button control. There shall be a 10 LED array showing +9 to -18 at 3dB intervals. It shall have push button control for monitoring source audio or transmitted audio. It shall have an input overload indicator. It shall have an "on" indicator and power button.

2.05 WIRE AND CABLE

- A. Provide Class 2, or better loudspeaker and sensor wiring.
- B. Cables shall be marked with commercial wire markers and shall be designated with the architectural room number or description of the area served by the circuit.

2.06 RECEIVERS

- A. The receiver shall be encased in, polycarbonate impact-resistant plastic with a hinged door for battery installation. The receiver shall be a body-pack type and include a detachable belt-clip for hands-free operation. The receiver shall have a 3.5 mm mono phone jack and accommodate low-impedance mono earphones, headphones and neckloops telecoil couplers. The receiver shall have combination volume control and power on/off rotator dial, and a green LED power "on" indicator. The LED power "on" indicator shall illuminate red to indicate low battery power. There shall be a screwdriver adjustable tuning pot accessible through the batter door. There shall be a side selection switch located through the batter door for choosing Alkaline or NiMH battery operation. There shall be drop-in charger contracts on the bottom of the receiver unit. The receiver shall be filed adjustable by internal turning cold. The receiver shall operate 100 hours when using 1.5 V AA Alkaline batteries, and 50 hours when using 1.5 V NiMH rechargeable AA Batteries. The receiver shall provide a maximum output of 35mW at 16 Ohms with an earbud-type earphone. The system's signal-to-noise ratio shall be 65 dB at 10µV. The receiver shall have a sensitivity of 2µV at 12 dB Sinad.

*~~~ PROJECT NOTE ~~~~~
FOR DEVICES LISTED BELOW SHOW QUANTITY, SIGN WORDING AND LOCATION ON THE PLANS*

~~~ END OF PROJECT NOTE ~~~~~

- B. The receiver shall have a selection of optional listening devices, including earbuds, headphones and inductive loops.

*~~~ PROJECT NOTE ~~~~~
FOR ITEM 2.06.C BELOW SHOW QUANTITY, SIGN WORDING AND LOCATION ON THE PLANS*

~~~ END OF PROJECT NOTE ~~~~~

- C. Per Chicago Building Code provide a number of assistive listening receivers to be hearing aid compatible and provide and install interior signage informing general public of their availability. Location per plans.

PART 3 EXECUTION

3.01 WIRING

- A. Provide interconnection to **[existing] [new]** sound system and proper wiring.
- B. Provide power and wiring for all devices. Wiring shall be installed in raceways. Raceways installed in public areas shall be wiremold surface raceway.
- C. Reference Section 26 27 26 - Wiring Devices for additional wiring requirements.

3.02 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Verify field measurements are as shown on drawings as instructed by manufacturer.
- C. Provide the specified system in a complete and operating condition with all necessary materials and labor to fulfill the requirements and the intent of the specifications.
- D. Verify that required utilities are available, in proper locations, and ready for use.
- E. Verify and coordinate mounting height and exact locations of all mounting brackets with architectural details and elevations prior to installation.
- F. Notify Architect/Engineer of Record of conditions that would adversely affect installation or subsequent use.
- G. Proceed only after unsatisfactory conditions have been corrected. Commencement of work in this section will be an indication of the acceptance of substrate conditions and the Contractor will be held responsible for the satisfactory execution and results of the finished work.

3.03 INSTALLATION OF AUDIO ENHANCEMENT SYSTEMS

- A. Install each system shown as indicated, in an accordance with equipment manufactures instructions, and with recognized industry practice, to ensure that system equipment comprise with requirements. Comply with requirements of NEC and applicable portions of NECA's "Standard of Installation" practices.
- B. Provide each individual system with a receiver / amplifier, teacher microphone, external sensors as required, speakers as required (minimum 4) and all cable necessary. Before rough in test each application for sensors and speakers required. Install sensors as required for complete coverage in all parts of the space. Coordinate the number of speakers required with the reflected ceiling needs. Provide a back-box for each speaker and verify all support requirements.
- C. Coordinate with other electrical work, including cable/wire, raceways, electrical boxes and fittings, as appropriate to interface installation with other systems work.
- D. Equipment Check-Out: Provide equipment checkout by a factory trained and authorized technician before energizing circuits. Make final connections under technician's direction.
- E. Locate **[transmitters] / [emitters]** in room for proper coverage. Quantity of **[transmitters] / [emitters]** shall be provided for proper coverage.

3.04 SYSTEM INTERCONNECTION

- A. Provide system electronic components in **[existing] [new]** sound system for system interconnection.

3.05 CLEANING

- A. The Contractor shall remove all paint spatters, spots, dirt, debris and foreign substances from the equipment.
- B. Clean equipment and devices internally and externally using methods and materials recommended by the manufacturer.
- C. Replace stained or improperly painted wall plates or devices.
- D. Remove labels that are not permanent.

3.06 CLOSEOUT ACTIVITIES

- A. Provide Board Training of the basic principles of the ALS as well as the operation of the receivers, coupling devices, how to turn the system on and off, how to handle malfunctioning devices, other accessories and options as applies such as battery handling and or charging devices, collection and storage of the receivers for a given event including collateral handling options to loan of a receiver and disposing / replacing earbud tips.
- B. Provide sign-off's evidencing completion of Board Training Sessions. Specifically list on the Training Form each of the components discussed above for staff to sign off.
- C. Provide three (3) copies of a separate bound training manual.
- D. Demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed retesting.
- E. Employ manufacturer's field representative to demonstrate system operation to Board's personnel.
- F. Conduct walking tour of project and describe function, operation, and maintenance of each component as well as proof testing each component.
- G. Use submitted operation and maintenance manual as reference during demonstration and training.

END OF SECTION 27 51 26