

Section 16821

PUBLIC ADDRESS SYSTEM

PART 1 - GENERAL

1.1 THE REQUIREMENT

- A. The CONTRACTOR shall provide all labor, materials and equipment for the installation of a complete extension to the existing Public Address System (PA) in Plant 2 located Huntington Beach, California as indicated on the Drawings and specified herein. As part of this contract furnish all tools, equipment, material, supplies and perform all labor required to install all control panels, equipment racks, speakers, pushbuttons, cables, conduits, connections and testing. The PA system shall be complete and operable in conjunction with the existing PA system, and shall be certified in accordance with manufacturer's instructions.
- B. The Public Address System will be controlled from the PA Panel which will be installed in Distribution Center J Building. The source signal for the PA system will be delivered by telephone connection and/or microphones located at each plant. PA system speakers shall be distributed with the facilities as shown on the Drawings.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. All work specified herein shall conform to or exceed the applicable requirements of the referenced portions of the following publications to the extent that the provisions thereof are not in conflict with other provisions of these Specifications.

1. Codes and Standards:

NEC	National Electrical Code (NFPA 70), latest adopted edition
NFPA 820	NFPA 820, Fire Protection in Wastewater Treatment and Collection Facilities, 1992 Edition
CCR, Title 8	California Code of Regulations, Title 8 (CAL-OSHA), Chapter 4, Subchapter 5, Electrical Safety Orders
CCR, Title 24	California Code of Regulations, Title 24, Part 3, California Electrical Code

1.3 CONTRACTORS SUBMITTALS

- A. Submittals shall be made in accordance with Section 16010, Electrical General Provisions. Include detailed information on the following:
 - 1. Vendor drawings, catalog cuts and other brochures depicting product characteristics, including the PA system rack layout drawing
 - 2. Plan drawings showing device locations, mounting details, and interconnection wiring. Obtain AutoCadd backgrounds from Engineer. Indicate all external requirements necessary for a complete installation. Submit drawings to Engineer/Owner for approval.
 - 3. List of recommended spare parts including ordering information.

4. Name, address, and telephone number of nearest distributor for each piece of equipment.
 5. Test documentation shall be provided in a three-ring binder(s) within three weeks after the completion of the project. The binder(s) shall be clearly marked on the outside front cover and spine with the words "Test Results", the project name, and the date of completion (month and year). Scanner tests shall be printed on 8-1/2" x 11" paper. When repairs and re-tests are performed, the problem found and corrective action taken shall be noted, and both the failed and passed test data shall be collected in the binder.
 6. CONTRACTOR shall furnish within 60 days of project acceptance as-built floor plans illustrating location of components of Public Address System. DISTRICT drawings shall be used as the source documentation for the as-built floor plans, when available. CONTRACTOR shall modify DISTRICT drawings to reflect all changes to the Public Address System.
- B. The CONTRACTOR shall update the system documentation to show additions and changes to the system. The existing documentation shall be used as a starting point; the CONTRACTOR shall integrate the changes into the existing documentation. Supplements tacked onto the back are not acceptable.

1.4 QUALITY ASSURANCE

- A. The CONTRACTOR shall hold a valid California C61 LOW VOLTAGE ALARM SYSTEMS – SOUND SYSTEMS license.
- B. The CONTRACTOR shall provide the services of a manufacturer's technician as required to test, adjust, and commission the PA system. Any fees for manufacturer's representative services must be included in the CONTRACTOR's bid.
- C. The CONTRACTOR shall provide a system warranty covering the installed Public Address System against defects in workmanship, components, and performance, and follow-on support after project completion.

1.5 WARRANTY

- A. The CONTRACTOR shall warrant the Public Address System against defects in workmanship for a period of one year from the date of system acceptance. The warranty shall cover all labor and materials necessary to correct a failed portion of the system and to demonstrate performance within the original installation specifications after repairs are accomplished. This warranty shall be provided at no additional cost to DISTRICT.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The basis of design is Electrovoice Company products; submitted products equal in performance and durability may be approved by the Engineer.

2.2 COMPONENTS

- A. The CONTRACTOR shall supply standard solid door 19" mounting rack designated the PA Panel in a free standing electronic rack cabinet. Provide a standard 120V duplex receptacle for the incoming power; provide a minimum 12 port power strip, fluorescent lighting and ground stud. Provide an exhaust fan on the side near the top and a supply fan on the opposite side near the bottom. Minimum dimensions shall be 60"H x 24"W X 20"D. HOFFMAN Catalog Number E-ER34U6060 with solid door, vents, fans, lights, power strip options, or equal.
- B. Distribution amp/router 2-in by 8-out. The distribution amp/router shall provide two electronically balanced, differential inputs on barrier strip connectors. The input channels shall include pad switches, trim controls, peak indicators, and shall be capable of accepting either microphone level or line level signals. The distribution amp/router shall provide eight electronically balanced & floating line level outputs on barrier strip connectors. Each output shall include a level control and shall be capable of driving 600 ohm loads. All level controls shall be screwdriver adjustable. Input & output isolation transformers shall be optional. The distribution amp/router shall provide sixteen logic inputs on a rear panel connector. Logic inputs shall allow each input channel to be assigned to any or all of the eight outputs, via external contact-closures. Each input channel shall include a switch to allow logic input functions to be inverted for either muting or un-muting operation. Unit shall fit the 19-inch rack and shall be marked CE, UL, or CSA. The distribution amp/router shall be BIAMP DA28R, or equal.
- C. Five-channel mixer/pre-amplifier with individual mix gain controls and transformer-balanced telephone paging input. The mixer/pre-amplifier shall have a frequency response of ± 2 dB from 60 Hz to 15kHz, THD + noise of less than 1%. Connection to external amplifier shall be in accordance with manufacturer's requirements. Unit shall fit the 19-inch rack and shall be marked CE, UL, or CSA. Electrovoice Catalog Number MA606 or equal.
- D. Power amplifier configurable to two parallel input channels with transformer isolated outputs 70.7 or 100 volt lines rated for 580 watts each. The power amplifier shall be capable of connecting multiple power amplifiers on a single audio signal source. The power amplifier shall meet the following performance specifications: rated output power from 20-20,000 Hz at less than 0.5% THD, in bridged mode at 1 kHz, the amplifier shall deliver 1,000 watts into 8 ohms; THD shall be less than 0.1% at 1 kHz at rated output power at 8 and 4 ohms. Installation shall be in accordance with manufacturer's requirements. Unit shall fit the 19-inch rack and shall be marked CE, UL, or CSA. Electrovoice catalog number CPS-2T or equal.
- E. Constant-directivity paging projector shall be supplied as called out in the drawings. These speakers shall be connected to the system for "all Zones" broadcast. Installation shall be in accordance with manufacturer's requirements. Electrovoice Catalog Number PA430T or equal.
- F. Input routing switch shall be set to parallel/mono (the input connectors of Channel A and Channel B are electrically linked for direct parallel operations). Connect multiple power amplifiers in either input Channel A or Channel B to connect all power amplifiers to a single audio signal. The audio signal is obtained by connecting the preamp output to either Channel A input or Channel B of the power amplifier. Provide matching cable to connect the unbalance audio signal to the balance input channel of the power amplifier. Refer to manufacturer's installation instructions. BIAMP Catalog number DA28R.

PART 3 - EXECUTION

3.1 GENERAL

A. Special Work Sequence And Constraints:

1. The existing treatment plant facilities must be maintained in full operation during the execution of the work. If downtime of utilities or equipment occurs due to lack of schedule, CONTRACTOR's error, or other items, which are CONTRACTOR's fault, CONTRACTOR shall work continuously (24 hours per day) until the utility or equipment is in operation. All costs for such work shall be the responsibility of the CONTRACTOR.
2. Downtime for electrical panel connections shall be kept at a minimum and shall require prior written approval of the DISTRICT, 72 hours in advance of the requested downtime. The CONTRACTOR shall submit his/her request for shutdown in writing a minimum of one week prior to the date the above approval is requested. All equipment, device, and wiring installations that occur in office areas shall be performed after 5:30 p.m. on weekdays or between 7:00 a.m. and 4:30 p.m. on the weekends. This work shall be scheduled with the DISTRICT's staff. The CONTRACTOR shall submit a written schedule detailing the connections to existing facilities.

3.2 INSTALLATION

- A. All equipment and devices shall be installed in accordance with requirements of the CONTRACT documents and the manufacturer's recommendations. All wiring shall be checked and tested to ensure that there are no grounds, opens, or shorts.
- B. The CONTRACTOR shall have the manufacturer of the Public Address System equipment provide the services of a qualified and authorized technical representative to supervise and instruct the CONTRACTOR in installation procedures, to inspect the entire Public Address System after installation has been completed, assist in the performance of all field tests, and certify performance.
- C. Existing wiring shall be modified and used to interconnect the new system elements. The CONTRACTOR shall install additional wire and cable required for a functional system at no additional cost to the DISTRICT.

3.3 SYSTEM TESTING

A. Preliminary Operational Testing:

1. The CONTRACTOR shall conduct an operational test of each equipment item or each equipment system. The CONTRACTOR's operational test of each piece of equipment or system shall continue for not less than 24 hours without interruption.
2. All parts shall operate satisfactorily in all respects, under continuous full load and in accordance with the specified requirements, for the full duration of the test period. If any part of a unit shows evidence of unsatisfactory or improper operation during the test period, correction or repairs shall be made and the full operational test, as specified above, shall be repeated after all parts operate satisfactorily. The CONTRACTOR shall furnish all personnel, power, and all other necessary facilities for conducting the CONTRACTOR's test operations.

B. Final Operational Testing:

1. After all equipment is installed and the entire project is ready to operate, the DISTRICT will test all equipment for a period not to exceed seven days by operating either under actual or simulated operating conditions before final acceptance is given. At the discretion of the ENGINEER, final test operation and final acceptance may be given on portions of the project prior to completion of the entire project. All defects of material or workmanship, which appear during this test period, shall be corrected by the CONTRACTOR. After such corrections are made, the final test operation may be run again before final acceptance; this requirement may be waived by the ENGINEER.
2. The DISTRICT will supply all power, operating personnel, and auxiliaries required for this final operational test.
3. If operational completion of portions of the project will be required prior to final completion of the total project, the DISTRICT shall have the right to take possession of and use any completed portions of the work. Use of any completed portions of the work shall not be construed as acceptance of those items by the DISTRICT.

3.4 ACCEPTANCE TESTING

- A. In-Progress Inspections: The ENGINEER shall make periodic inspection of the project in progress. One inspection shall be performed at the conclusion of cable pulling, prior to closing of the false ceiling, to inspect the method of cable routing and support, and the penetration firestop. A second inspection shall be performed at completion of cable termination to validate that cables were dressed and terminated in compliance with manufacturer's specification and recommendation, and that cable ends are dressed neatly and orderly.
- B. Final Inspection: The ENGINEER shall perform a final inspection of the Public Address System with the CONTRACTOR's Project Foreman. The final inspection shall be performed to validate that all cables were installed as defined in the drawing package, and that the installation meets the aesthetic expectations of DISTRICT.
- C. Test Verification: Upon receipt of the test documentation, DISTRICT reserves the right to perform spot testing of a representative sample of the Public Address System to validate test results provided in the test document. DISTRICT testing shall use the same method employed by the CONTRACTOR, and minor variations shall be allowed to account for differences in test equipment. If significant discrepancies are found the CONTRACTOR shall be notified for resolution.
- D. System Performance: During the three-week period between final inspection and delivery of the test and as-built documentation, DISTRICT will activate the Public Address System. The DISTRICT will validate operation of the Public Address System during this period.
- E. Final Acceptance: Completion of: the installation, in-progress and final inspections, receipt of the test and as-built documentation, and successful performance of the system for a two week period shall constitute acceptance of the system.

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