Section 27 51 17
Public Address System

PART 1 - GENERAL

1.0 DESCRIPTION

A. The Contractor shall furnish and install all equipment including, but not limited to, outlet boxes, wiring, speakers, and all other necessary equipment to provide a complete operating system as indicated with the contract documents. Provide all necessary wall plates, specialty boxes, etc., not provided by others.

B. Valcom Class Connection™ Talback Intercom System M/N VE72TR-5, shall be considered as the base bid. The specifying authority must approve alternate systems. Alternate bidders supplying another system shall make aware their intentions and provide all information, including catalog cuts, shop and working drawings, data sheets and a demonstration of the proposed system features. This information must be presented to the relative parties as to allow sufficient time to review all material. This should be accomplished at least 10 (ten) days prior to the bid date.

C. The intent of this specification is to maximize communications between the classroom and administrative areas while enhancing school safety and reducing maintenance and operational cost.

D. Under this specification, the system shall provide a complete Communication System for the Administrative, Classroom, Cafeteria, Library, and Recreational areas.

E. The Communication System shall provide distribution of intercom, overhead paging, emergency paging, class change time tones, and emergency tones and program material and on board emergency messaging.

F. The Communication System shall feature the capability to operate a system of cameras such that visual and audible communication may be synchronized.

1.1. RESPONSIBILITIES

A. Contract documents are detailed only to the extent required to show design intent. It shall be understood and agreed upon by the Contractor that all work described herein shall be complete in every detail.

B. Furnish additional items not mentioned herein to meet requirements as specified without claim for additional payments. Items, may include hardware, rack panels, 66Blocks etc., and other devices that are required for installation.

C. Labor furnished shall be trained and experienced in telecommunication systems.

D. All equipment unless otherwise specified, shall be new, free from defects, and the best craftsmanship in its class.

E. All manufactured equipment shall be installed as recommended by the manufacturers, or as indicated in their published installation manual.

F. Furnish and install necessary equipment, backboxes, supports and enclosures.

G. Furnish and install all necessary wire.

H. Furnish shop drawings.

I. Perform initial programming of system and audio level adjustments.

J. Perform final programming of system and audio level adjustments.

K. Provide system documentation including equipment manuals and drawings.

L. Guarantee all equipment and components for their specified period from date of acceptance.

M. Provide information on system requirements to any Contractor responsible for supplying related materials for this system.

N. System must be U.L. 813 and FCC Part 15 listed for safety reasons. Systems not listed as above shall not be acceptable.

1.2. SUBMITTALS

A. See Section 01 13 00 – Administrative Requirements, for submittal procedures.

B. Submit layout drawings of the communication system and all components.

C. Submit drawings of control equipment showing all major components and positions in the rack.

D. Provide block diagrams showing components and relative connections.

E. Test Reports: Indicate satisfactory completion of each test recommended by the manufacturer.

F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

G. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

H. Submit a certificate showing a completion of installation, programming, and service training from the system manufacturer.

I. Operation Data: Include instructions for adjusting, operating, and extending the system.

J. Maintenance Data: Include repair procedures and spare parts documentation.

K. Submit data sheets on equipment provided.

1.3. QUALIFICATIONS

A. The Contractor shall be an established and local company providing solutions to the school market for a minimum of 3 (three) years with Telecom/Data/Sound Experience. The Contractor shall have service facilities within 30 miles of Project.

B. The Contractor shall maintain an adequate parts inventory to perform necessary service and upgrades.

C. Products: Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and stated.

1.4. WARRANTY

A. The Contractor shall provide a 12 (twelve)-month warranty. The warranty shall cover parts and labor. Warrantee period shall begin on the date of acceptance by the Owner or Architect/engineer.

1.5. PLEDGE OF QUALITY

A. The Contractor shall be an authorized dealer of the supplied equipment with full warranty privileges.

B. The Contractor must have attended the Manufacturers' Training Program and be an authorized Class Connection Distributor.

C. The Contractor shall inventory the necessary parts in order to maintain and service the equipment being supplied. This equipment inventory level shall be in direct proportion to total systems installed as recommended by the manufacture.

D. The Contractor shall provide complete drawings detailing all interconnections, panel wiring diagrams, and specification sheets.

1.6. IN-SERVICE TRAINING

A. The Contractor shall furnish in-service training with the system. The sessions shall facilitate the training of personnel in operating classroom equipment, administrative equipment, program distribution, and user programming functions. System specific customized user manuals shall be provided at the time of training. Provide a minimum of one day of training.

1.7. WIRING

A. Wiring shall be in accordance with the Manufacturer's specifications. Wiring shall meet all local and state codes. All wiring shall be ground and short tested.

1.8. COMMUNICATION SYSTEM

The Communication System shall provide at least the following functions and features:

A. Direct dialed, hands-free, two-way communication from all administrative telephones to any location equipped with a talkback speaker.

B. Automatic gain control on intercom speech to assure constant talkback speech level.

C. Microprocessor based system capable of handling up to 720 points (seven hundred twenty). A point is defined as a call-in switch or a speaker output.

D. System shall be modular in design and capable of expanding in increments of 48 points allowing for budget flexibility and expandability.

E. System shall interface with any telephone system, thus allowing the school(s) to upgrade or replace their telephone system without suffering a requirement to replace, or lose any feature of, their internal communications (intercom) system. Any system that limits system features based upon any selected telephone system, and/or is proprietary to one or only a few telephone systems shall not be acceptable.

F. Automatically sound a tone or play a pre-page WAV file over any loudspeaker connected for two-way communication to alert the classroom teacher that this two-way call has been established. This is intended to prevent unauthorized monitoring. The privacy tone must repeat every 15 (fifteen) seconds.

G. Distribution of emergency announcement(s) from any authorized telephone to all areas furnished with a loudspeaker. Emergency announcements shall have the highest system priority.

H. Distribution of general announcements from any administrative telephone, staff telephone, or classroom telephone. The system shall be capable of providing all-call, group calls, multiple group call, or dial-on-the-fly page groups.

I. Classroom speakers shall be software assignable to any or all of 72 (seventy-two) audio paging/distribution groups.

J. Provide the ability to define and archive unlimited time tone schedules with up to 255 events per schedule. Each scheduled event shall be capable of controlling any one of 6 (six) internal tones; user selected custom audio/voice phrases, audio from any of 3 auxiliary sources or up to 40 relays for building control. Each scheduled audio event shall be distributable to up to 72 audio groups. The system shall feature the ability to automatically initiate up to 8 schedules per day, based upon the day of the week or calendar dates up to one year in advance. Up to 8 daily schedules shall operate simultaneously. Music distribution, control relay activation, paging & class change grouping and time schedule administration, modification and creation functions must be available through administration PC software. Systems that do not allow the school to manage their own audio groups and schedules with PC software

or do not offer calendar based scheduling up to one year in advance or require separate page and time groups shall not be acceptable.

K. Provide 1, 2, 3 or 4 digits numbering plan, thus allowing the classroom speaker and the classroom telephone to be the same architectural number.

L. Provide facilities for up to 7 (seven) call-in priority levels. Each classroom call button shall be assignable to any one or two of these priority levels. The call button priority levels shall have the capacity to change state on a time of day basis. The priority levels shall be as follows:

1) Normal
2) Security
3) Normal/Emergency
4) Urgent/Emergency
5) Overhead Ring
6) Emergency Only
7) Ignore

M. Call button priority levels shall determine call queue placement. Emergency calls will be answered first; urgent calls second and normal calls last.

N. System shall be capable of placing intercoms call on hold in order to perform other administrative functions.

O. Any classroom/area loudspeaker must have the flexibility to be programmed as a testing room. A testing room shall be excluded from receiving general announcements, class change tones, group announcements and program material. The testing room must receive emergency tones and announcements. A dial code must be provided that will access these testing rooms at the same time, allowing for an announcement to the testing rooms for applications such as standardized testing. The testing rooms may be reactivated to normal operation at any time by the administration staff as needed. Testing rooms shall automatically be reset to normal operation before start of class the next day.

P. Programmable features shall be stored in non-volatile memory and shall not be lost due to power failures.

Q. Classroom initiated intercom calls must be able to be assigned to ring at specific administrative ports. These administrative ports shall have the flexibility to be forwarded to other administrative ports should a call go unanswered or should the assigned administrative port be busy.

R. Facilities to annunciate incoming intercom calls at multiple administrative phones simultaneously. Calls may be answered from any of the administrative telephones by simply lifting handset, dialing the room number or pressing a button on the telephone. Once answered, the call will automatically be cancelled for other administrative phones.

S. System functionality must include the capability to manually distribute up to 5 (five) alert emergency tones via pushbuttons, contact closure, or dial up tones from any

administrative telephone. These tones shall be customizable with respect to cadence, type and duration. Dial up tones must only be accessible by authorized users.

T. The system must provide a minimum of 4 (four) ports to be connected to the telephone system from the intercom system. These 4 (four) intercom lines shall provide built-in Enhanced Caller Line Identification which will visually announce the name of the teacher or location, the architectural classroom number, and the status of the call-in level; thus allowing interfacing to any telephone system. Systems that require integration to a specific telephone system or systems in order to offer any system feature shall not be acceptable.

U. The system shall have the ability to control all system relays. Relays shall be controlled through the administrative software, DTMF controlled, automatically cycle at a programmed time of day, follow time schedule events, follow audio group events, follow security calls, and follow emergency and ADA calls. All relays must be software programmable with the flexibility to change as required. A minimum of eight (8) relays shall be provided.

V. The system shall provide at least three simultaneously operating, non-restrictive program distribution channels. The audio program material shall be controlled and distributed with administration PC software allowing simple and easy changes. Systems that require manual operated switch-banks or cumbersome DTMF telephone codes for distribution shall not be acceptable.

W. The Communication System shall feature voice call progress. When 2 or more system users attempt to announce into the same area, the unsuccessful user shall be notified via a voice message. When a user's announcement attempt is overridden by a higher priority announcement, the overridden user shall be notified via a voice message.

X. The system shall have the ability to store up to 60 minutes of WAV files directly onto the CPU and shall not be lost due to power outage.

1)The WAV files shall be activated via the Administration Software, Telephone and/or Telephone system, and/or pushbuttons.

2)The WAV files shall be programmable as to what level of priority they can be broadcast. They shall be programmable as to override any class change tones, normal all call, music, and intercom in the event of an emergency.

3)The WAV files shall also have the ability to be broadcast into any one or all of the 72 audio groups as well to any zone within the system.

4)The WAV files shall be have the ability to be broadcast via a schedule for any day of the week or time of the day. They shall also have the ability to be broadcast for any duration of time and repeat number of plays with the ability to select how long the duration is between each repeated broadcast.

5)The WAV files shall be able to be broadcast via a pushbutton. When this pushbutton is activated it shall be programmable to select which WAV file is

broadcast, the priority level, where it is broadcast, and how many times it shall play.

6)The WAV files shall also have the ability to be a part of the class change tones within the system. These files shall be able to replace any tone within the class change schedules as to offer the flexibility of customizable tones and or phrases in this class change mode.

7)The WAV files shall be programmable as to replace the hands-free alert tone, repeated alert tone, or the all call alert tones.

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PART 2 - PRODUCTS

2.0 INTERCOM CONTROL UNIT

A. Shall be capable of expanding to 720 (seven hundred twenty) points. A point is defined as a call-in switch or speaker output.

B. Provide pre-alert tone to classroom for intercom calls and general announcements.

C. Ability to program and control the built-in master clock with unlimited events and unlimited time schedules with multiple audio groups.

D. Ability to control wireless or wired clocks (various correction methods).

E. Ability to produce user defined tone signals for time tones or emergency tones.

F. Ability to select the tone on an all-call basis from any, or selected, administrative telephones.

G. Provide an RS-232 and Ethernet port, which will give ability to monitor operations and functions of the systems.

H. Provide off-site programming and diagnostics of the system. It shall also be capable of determining basic circuit faults.

I. The system shall be capable of simultaneous conversations between administrative ports.

J. The system shall have a Windows® based PC administration programming tool which allows the administrative personnel to easily manage Audio Sources, Class Change schedules, paging groups, time updates, holiday schedules and day/night mode operation from their desktop PC across a standard Ethernet LAN. It shall also have the ability to activate on board WAV files on a schedule and/or immediately in the event of an emergency at the highest priority override level. Systems that require propriety consoles, special LCD displays or solely utilize DTMF for changes to perform these functions shall not be acceptable.

K. System shall provide calendar based scheduling up to one year in advance.

L. The system shall be programmable via Ethernet or direct COM port cable connection.

M. System shall be capable of utilizing 45 (forty-five) ohm or 25-volt speakers for classroom type speakers. Systems that require re-tapping existing classroom 25-volt speakers shall not be acceptable.

N. System speakers shall be capable of utilizing standard CAT 3 (three), CAT 5 (five), or 6 (six) telephone/data wiring for installation. The speakers and call buttons shall be capable of utilizing spare pairs in the telephone wire connected to the classroom, allowing for lower installation cost. Systems that waste infrastructure by requiring separate heavy gauge infrastructure wire shall not be acceptable.

O. Provide 8 (eight) unrestricted simultaneous audio paths for communication between administrative phones, program material, time tone distribution, and paging. Systems that do not allow simultaneous pages to different paging groups will not be accepted.

P. Provide 6 (six) software programmable pushbutton inputs that can be used to activate tones, emergency tones, time tones, schedules, set system time, force a holiday schedule, door entry, etc.

Q. Provide 8 (eight) software programmable output contact closures which can be activated manually to turn on cameras, unlock doors, emergency lockdown, etc., or automatically via Master Time Control Center.

R. Provide voice-synthesized call-in, which allows the administrative telephones to hear the incoming intercom call's room number over the handset.

S. Provide call confirmation tone at speaker when an intercom call is placed. This verifies that the call has been placed in queue. If the call is upgraded to an emergency, a second confirmation tone shall be activated.

T. Automatically announce the architectural room number over any one, group, or all speakers if an emergency call-in from a classroom goes unanswered for a programmable period of time. Systems that do not announce emergency call-ins shall not be acceptable.

U. Provide Emergency Override On Board Voice Messaging via the following methods:
   Any authorized PC on the schools LAN/WAN
   Any authorized telephone
   Any pushbutton

2.1. SPEAKERS/CALL SWITCHES

2x2 Talkback Lay in Speaker – Valcom M/N VECTLA-2 or approved equal
   Cone Diameter: 8"
   Voice coil impedance: 45 Ohms
   Power Handling: 12 Watts
   Frequency response: 80Hz to 15Khz

Steel Housing with a white baked on acrylic enamel finish

Wall Talkback Speaker – Valcom V-WTGY or approved equal
Cone Diameter: 8”
Voice coil impedance: 45 Ohms
Power Handling: 12 Watts
Frequency response: 80Hz to 15Khz
Gray Metal enamel finish with Black cloth grill

2x2 Paging Speaker – Valcom – VE9022A-2 or approved equal
Cone Diameter: 8”
Input Impedance: 600 ohms
Power Requirements: 50mA @ 24 VDC
Frequency response: 80Hz to 15Khz
Steel Housing with a white baked on acrylic enamel finish

Wall Paging Speaker – Valcom – V-1052C or approved equal
Cone Diameter: 8”
Input Impedance: 600 ohms
Power Requirements: 50mA @ 24 VDC
Frequency response: 80Hz to 15Khz
Gray Metal enamel finish with Black cloth grill

Paging Loudspeaker (Weather Resistant) – Valcom V-1036CGY or approved equal
Cone Diameter: 8”
Input Impedance: 600 ohms
Power Requirements: 300mA @ 24 VDC
Frequency response: 275Hz to 15Khz
High impact grey ABS Plastic

2.2. WIRING

A. All wiring shall be listed for the intended purpose. The intercom shall use CAT 3 (three) UTP U.L. listed cable. All two way speakers shall be homerun.

B. All interior wiring shall be in accordance with new construction guidelines suggested by the Manufacturer; including the speaker.

2.3. INSTALLATION

A. Complete system shall be installed in accordance with Manufacturer’s recommendations.

B. All wiring shall be installed in raceways or plenum rated cable where routed in plenum ceiling areas.

2.4. PROTECTION

A. The contractor shall provide all necessary protection on the AC power feed and on all station lines leaving/entering the building.

B. The contractor shall note in his system drawings, the type of protection devices and all relative information.

3.0 INSTALLATION

A. Install in accordance with manufacturer's instructions

B. Leave 18 inches excess cable at each termination at speaker and other system outlets

C. Leave 3 feet excess cable at each termination at system cabinet

D. Support cables above accessible ceilings to keep them from resting on ceiling tiles. Use J hooks to support cables from structure for ceiling suspension system.

E. Ground and bond equipment and circuits in accordance with manufacturer's recommendations and instructions.

End of Section