

SECTION 27 51 33
TWO-WAY COMMUNICATIONS SYSTEM
Construction Specification

PART 1 GENERAL**1.1 SUMMARY**

- A. Section Includes: Two-way emergency communication system for accessible means of egress, including related infrastructure and functional requirements (addressing CBC Section 1007.8 {and subparagraphs}, NFPA 72 section 24.5.3 {and subparagraphs}, and NFPA 101 items 7.2.12.2.5 and 7.2.12.2.6).
- B. Related Sections
 - 1. Comply with the Related Sections requirements of Section 270000

1.2 REFERENCES

- C. Comply with the References requirements of Section 270000.
- D. In addition or particular to the codes and standards listed in Section 270000, comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:
 - 1. California Code of Regulations (CCR), Title 24
 - a. Volume 2, "California Building Code" (CBC), Section 1007 and referenced sections

1.3 DEFINITIONS

- E. Definitions of Section 270000 apply to this section.
- F. In addition to the Definitions article of Section 270000, the following list of terms as used in this specification defined as follows:
 - 1. "Cabling": refer to 270000 for definition
 - 2. "Calling Station": System functional unit that provides two-way voice communications between the occupancy space's egress path (such as an elevator landing or area of refuge on an accessible floor) and the central control point
 - 3. "Central Control Point": shall mean either the a location approved by the fire department to monitor the System or fire command center
 - 4. "Command Station": System functional unit that that receives and controls communicates with the calling stations
 - 5. "IEEE": Institute of Electrical and Electronics Engineers
 - 6. "LED": light emitting diode
 - 7. "Telco": shall mean the telecom utility company
 - 8. "UPS": Uninterruptable Power Supply

1.4 SYSTEM DESCRIPTION

- G. Provide planning, coordination, labor, materials, apparatus, tools, equipment, and transportation required to make a complete working two-way communications system (herein "System") described in this section and shown on related T-series drawings. The System shall consist of headend equipment, command station(s), calling stations,

directions (instructional signage), rough-in, cabling, programming, labeling, and connection to the designated outside phone line(s). Refer to the drawings for locations of the command station(s) and call stations.

H. System Requirements

1. The System shall fulfill the requirements and intent of CBC section 1007 (primarily 1007.8), and all subparts and references relative to two-way communications.
2. The System, including installation, shall meet applicable ADA requirements.
3. The System headend or control station shall provide power to the calling stations; the calling stations shall not require power local to station.

I. System Operation: The System shall operate as follows and/or feature the following:

1. When a call is initiated from any calling station, the System shall establish a dedicated and uninterrupted hands-free, full duplex, two-way communications session between the calling station and a command station (effectively acting as an intercom).
2. The call station shall produce a visual annunciation to indicate that a call has been placed. Annunciation may be fulfilled as an LED integrated into call station. The LED should illuminate as blinking when a call is placed and in queue, and should illuminate as solid when a call session has been established with the command station.
3. The command station shall produce visual and audible annunciations to indicate an incoming call from a call station. Visual annunciation may be fulfilled as an LED integrated into the command station or a separate strobe. Audible annunciation may be fulfilled as a loud ring integrated into the command station or as a separate siren.
4. The command station (or associated annunciation panel) shall display requisite information – identify the call station showing the station identifier, story/floor/level, and location on the given level.
5. When the command station has an active conversation with one calling station, the System shall automatically queue additional calls from other calling stations and shall automatically put through the calls in order received when the previous call is completed.
6. When the central control point is not staffed, the System shall automatically route calls from call stations to an emergency outside line. This will allow a call placed from a call station to ultimately reach a monitored rescue team.
7. The System shall be able to initiate a call at the command station to any calling station.

J. Provide a UPS to power the System for at least 4 hours in the event of a loss of utility or normal power.

K. Provide instructional signage at calling stations (directions for using calling station).

L. Provide labeling and identification tags.

1.5 SUBMITTALS

M. Comply with Submittal procedural, quantity, and format requirements of Section 270000.

N. Substitutions: Comply with the Requests for Substitutions requirements and procedures of Section 270000.

- O. Submittal Requirements Prior to the Start of Construction:
 - 1. Product Data Submittal, consisting of production details (specifications, dimensions, connectivity requirements, etc.) and regulatory listings and certifications
 - 2. Shop Drawings Submittal, consisting of system configuration diagrams (for example, block diagram, riser diagram, and/or other diagrams), floor plans (showing station locations), installation details, and system labeling
 - a. The shop drawings shall show the dimensioned location where the control station and System equipment will be installed.
 - 3. Schedule Submittal, consisting of proposed schedule of work – this schedule may be combined with the schedule developed for division 27
- P. Submittal Requirements at Closeout:
 - 1. As-Built Drawings, consisting of floors plans (can be combined with telecommunications as-built drawings), block diagrams, and other drawings to accurately and fully describe the System – refer to section 270000 “Submittals” for more information
 - 2. Warranty statement and instructions (contact information, etc.)
 - 3. O&M Manuals, consisting of product cut sheets, as-built drawings, and warranty information– also refer to section 270000 “Submittals” for more information

1.6 QUALITY ASSURANCE

- Q. Comply with quality assurance requirements of Section 270000.

1.7 DELIVERY, STORAGE, AND HANDLING

- R. Comply with the delivery, storage and handling requirements of Section 270000.

1.8 WARRANTY

- S. Warrant the System as required in the general warranty.
- T. In addition, warrant the System for the manufacturer’s full period – 5 years minimum.

PART 2 PRODUCTS

2.1 GENERAL

- A. Equipment shall meet requirements of CBC section 1138A.4.
- B. System electrified components (such as headend equipment, control stations, and calling stations) shall be UL listed.
- C. Communications shall be full duplex.

2.2 MANUFACTURERS

- A. Talk-A-Phone
- B. Aiphone
- C. Alpha Communications
- D. Cornell Communications

- E. Jeron Electronic Systems

2.3 DEVICES

- A. Command Station
- B. Calling station
- C. Central Equipment
- D. Indicator Panel
- E. Call Station Signage
 - 1. Call station signage shall comply with CBC 1007.8.2.
 - 2. Call station signage shall display the following information.
 - a. Location identification with the specific story, floor location, building address (or other building identifier), and any other information to uniquely identify the exact location – example: “Level 4 West Stair”
 - b. Directions for use of the two-way communications system
 - c. Instructions for summoning assistance via the two-way communications system

2.4 CABLE, TERMINATION APPARATUS, AND CABLE LABELS

- A. Refer to manufacturer requirements for product and code specific cable, termination and labeling.

PART 3 EXECUTION

3.1 GENERAL

- A. Comply with the Execution requirements of Section 270000.

3.2 EXAMINATION AND PREPARATION

- A. Call Stations: Prior to installation:
 - 1. Confirm the installation dimensions of call stations and associated signage within each space (as the station may impact surrounding finishes).
 - 2. Verify that the rough-in is installed properly using the proper products.
 - 3. Verify locations are ready for the installation and that surfaces are suitable to accept the calling stations.
- B. Central Control Point: Prior to installation, verify the room is ready for the installation and that surfaces are suitable to accept the control stations and equipment.

3.3 INSTALLATION

- A. Call Stations
 - 1. Height: Installation height of calling stations shall comply with CBC figures 11B-5C “Forward Reach” and 11B-5D “Side Reach”
 - 2. Fasteners: Install calling stations using tamper-proof screws; quantity and type as required by the manufacturer’s installation instructions.
 - 3. Permanently install signage displaying information required by CBC.

- B. Command Stations
 - 1. Install headend equipment into rack at the designated location, and make final connections. Dress wiring and cords within cable management apparatus.
- C. Command Station Indicator Panel
 - 1. Install indicator panel onto the wall at the designated location. Label the command station's indicator panel with each calling station's requisite information.
- D. System Programming
 - 1. Program each calling station per the manufacturer's instructions to call directly to the command station.
 - 2. Program each command station/headend equipment with each call station's requisite information. Program each command station/headend equipment with the automatic roll-over number (number provided by the District).
- E. Cabling: Refer to section 271513 for cabling installation and labeling requirements – placement, termination, patching/crossconnecting, identifier, and labeling.
- F. Cabling Testing: Refer to section 270811 for cabling testing requirements.

3.4 PROTECTION

- A. After installation, protect in place call stations, signage, headend equipment, command stations, and related equipment/accessories to mitigate damage from other construction activities.
- B. Repair damaged call stations, signage, and related System equipment/accessories to a like-new condition. Replace products damaged beyond repair, at no cost to the District.

3.5 PRE-FUNCTIONAL TESTING

- A. Test cabling per the requirements of 270811.
- B. Test the emergency outside line. Ensure the line is active and successfully reaches a monitoring rescue team.

3.6 FUNCTIONAL TESTING

- A. Prior to acceptance testing, perform the functional testing and submit a functional testing report.
- B. Test 1: Calling Station Operation
 - 1. At each calling station, press the call button.
 - 2. While the call station is in the process of establishing a connection with the command station (e.g., dialing), confirm the call station illuminates the dialing-in-process light. Record the light operation.
 - 3. Confirm each station establishes a two-way communications link with the command station. Record each station's operation (establishing a two-way connection with the command station).
 - 4. While the call is established between the call station and the command station, confirm the call station illuminates the call-established light. Record the light operation.
- C. Test 2: Command Station Operation

1. At the command station, call each calling station to confirm the command station has the ability to dial each calling stations. Record the command station operation.
- D. Test 3: Cueing Multiple Calls
1. At 2 calling stations, press the call button at one station and then the call button at the other call station.
 2. Confirm the first call station establishes a connection with the command station and the other call station gets put in cue. Record the System operation.
 3. At the command station, disconnect the first call station. Confirm the second call station (the one that was in cue) establishes a connection with the command station. Record the System operation.
- E. Test 4: Automatic Dial Out to Emergency Line
1. At a calling station, press the call button. At the command station, do not pick up the call – let the System roll the call over to the emergency outside line (to the monitoring rescue team). Record the System operation.
- 3.7 FINAL INSPECTION AND ACCEPTANCE TESTING
- A. Comply with system acceptance and certification requirements of section 270000.
- B. Punch the Work of this Section compliant to the requirements of section 270000.
- C. Demonstrate System's operation witnessed by the District, IOR, architect, engineer, general contractor, and System installer. The District will accept the System only after testing demonstrates 100% functionality of calling stations, command station(s), calling scenarios, and as accepted by the IOR. Demonstrate the following System operation:
1. Calling station operation (operation, 2-way communications with command station, visual indicators)
 2. Command station operation (operation, receiving calls from calling station, station identification per call, cueing multiple concurrent calls)
 3. Automatic roll over to outside line / monitored rescue team
- D. Remove and replace with new, at no cost to the District, stations and/or other components failing to meet the requirements of this section until the System proves fully functional.
- 3.8 TRAINING
- A. Provide 3 one-hour sessions with the District to train the system users. Training should cover (at least): system configuration (general arrangement of system and components), cabling (cable type, routes, crossconnections), stations (detailed descriptions, features), system programming, emergency outside line (connection location, number, description of the monitoring rescue team), and other pertinent aspects.

END OF SECTION