

**ADDENDUM “H”
TWO-WAY COMMUNICATION SYSTEMS
REQUIREMENTS FOR PLAN SUBMITTAL, DESIGN, AND INSTALLATION**

1.0 REQUIREMENTS

1.1 The provisions contained in 2016 California Building Code Sections 403.5.3.1, 1009.6.5 & 1009.8 are to be followed. Installation and performance requirements shall comply with the currently adopted standard: NFPA 72-2016 Chapter 24: Emergency Communication Systems (ECS).

2.0 PERMITS

2.1 Two-way communications systems for stairway communication, areas of refuge and/or elevator landings require a plan submittal. They may be submitted as part of the site permit addenda schedule as a separate addendum, or combined with the fire alarm system addendum, or as a deferred submittal. This plan submittal shall be a SFFD permit only and shall not require DBI review.

The information required herein shall be provided without regard to the method of permit obtained.

2.1.1 A reference copy of the approved architectural permit plans showing the required 2-Way Communication System (location of control unit/s and call boxes).

2.1.1.1 If the building contains a horizontal exit, the architectural plans shall include call boxes on both sides of the horizontal exits in approved locations. Exception: Call boxes are not required at the discharge level (ground floor)

2.1.1.2 If elevators are provided on both sides of the horizontal exit, call boxes shall be installed at each elevator landing on every floor except on the discharge level

2.1.1.3 If only one elevator is provided on one side of the horizontal exit, call boxes shall be installed at the elevator landings on that side of the horizontal exist. An additional call box shall be required to be installed at the other side of the horizontal exit, in an approved location, on each floor, except on the discharge level.

2.1.1.4 In High-Rise buildings, the control unit must be installed in the Fire Command Center and be monitored off-site by an approved supervising station. Additional remote control stations are permitted to be installed in other approved locations in the building.

2.1.2 A signed copy of any approved “Local Equivalency” (AB-005) or “Alternate Methods” or Pre-Application meeting minutes if it is relevant to the system – check with the Architect or General Contractor if a “Local Equivalency” (AB-005) form, or pre-application meeting minutes, was submitted to and approved by the City of San Francisco.

2.1.3 Two sets of submittal plans and one materials (“cut-sheets”) packet for the proposed Two-Way communications system.

2.2 For two-way communications systems submitted with a Fire Alarm System permit, the same C-10 contractor will be responsible for the design and installation of both systems.

2.3 Fees, when submitted under the Site Permit addenda schedule, will be included in the total site permit fee. If a separate permit (deferred submittal with a “pink” application form) is submitted for the 2-way ECS, the fee will

be obtained from the 2016 SF-DBI Cost schedule included on the SF-DBI website at the following link:

<http://sfdbi.org/cost-schedule>

2.4 It is recommended that the applicant be the installing contractor. All installing contractors shall have a current California Electrical (C-10) Contractor's License and be familiar with the design and installation of these systems. When the design and plans are produced by a party other than contractor, the plans shall be stamped by a Professional Engineer.

2.5 Installation, alteration, or demolition of a system shall not commence prior to the approval of plans and the issuance of a FIRE permit.

2.6 The entire permit card and a San Francisco Fire Department approved set of plans shall be kept at the project site until final approval of the permit, after which they shall remain in the possession of the owner.

3.0 PLANS

Note: Failure to provide any of the information required in sections 3.1 through 3.8 will result in the plans being disapproved.

3.1 General Requirements for All two-way communications system projects:

3.1.1 Plans and attachments shall be clearly labeled and legible. All fonts on all plans shall be minimum 1/8" font size.

3.1.2 Plans and all revisions to the plans shall be dated. If utilizing an existing drawing or portion of a drawing, the area of work shall be highlighted and clouded with an appropriate symbol (delta). Provide a revision list with a symbol, date, description, and initials.

3.1.3 When making alterations, additions, or deletions to an existing system, all existing devices and equipment shall be shown and properly identified on the floor plan and system riser (single-line) diagram.

3.1.4 Plans shall include a title sheet, an equipment list, a sequence of operation matrix, a floor plan, a system riser diagram, and secondary power & voltage drop calculations (see paragraphs 3.2 through 3.7).

3.1.5 Attachments for all products and equipment shall include the manufacturer's specification sheets indicating the products proposed are IBC, NFPA and ADAAG Code Compliant. California State Fire Marshal (CSFM) listing sheets, as applicable, shall also be provided. See paragraph 3.8.

3.2 Title Sheet

3.2.1 The front sheet shall contain the following information:

(a) Project name and address of the project.

(b) The designer's full name (no initials, pseudonyms, acronyms, or aliases) and signature. The designer of record shall be responsible for the entire system being installed.

(c) Business name, address, and California Contractor's License number of the installing contractor. If the designer of the system is not the installing contractor, the following shall be clearly indicated/printed on the plans:

(i) **DESIGNED BY** - followed by the designer's business name, address, designer of record's full name and wet signature.

(ii) **INSTALLING CONTRACTOR** - followed by the installing contractor's business name, address and California Contractor's License number.

(d) Type of system provided.

(e) The supervising station and UL number.

(f) Occupancy group(s) of building or area as defined by the California Building Code. Number of stories, building height, and construction type. (Provide architectural plans for reference)

(g) Scope of work and why the system is being installed, i.e., required by the San Francisco Building Code or San Francisco Fire Code, required due to a variance, or a voluntary/ Non-Required system at the owner's request.

(h) A note stating that the design and installation complies with all currently adopted codes and standards.

(i) All other pertinent notes.

3.2.2 A key plan of the building and/or complex indicating the street location and the area of work within the building shall be provided.

3.3 Equipment List

3.3.1 Provide the model number, manufacturer's name, description, quantity, CSFM listing number (if applicable), and symbols to be used (legend) for each device, equipment, and conductors proposed to be installed (*Note: The Fire Department reserves the right to disallow any listed product due to past performance*).

3.3.2 The symbols used on the plans shall match the legend. Strike out any "typical" symbols that do not pertain.

3.4 Sequence of Operation – a written description in a matrix format shall be provided to define the events that occur when initiating the Two-way communication system. The description shall include details relating to annunciation, remote signaling, and activation of control functions, as applicable. Also provide programming description.

3.5 Floor Plan

3.5.1 Scale used and a graphical representation of the scale. The minimum scale for plans is 1/8" = 1'-0". Metric scale shall not be accepted.

3.5.3 The location of all system components.

3.6 Riser Diagram – provide the following:

3.6.1 Single-line wiring diagram (riser diagram) that shows the interconnection of each device and equipment of the whole system.

3.6.2 Number of conductors in each wiring segment and the type and size of wire or conductor to be used.

3.6.3 The class for initiating, signaling line and notification device circuits. Including circuit number or identification.

3.6.3.4 Survivability Riser diagram showing the specific protection of the system wiring.

3.7 Calculations

3.7.1 The means of two-way communications normally connected to the building power supply shall automatically transfer to a source of emergency power within (10) seconds after the normal supply fails. The power source shall be capable of providing for the operation of the system (including annunciators) and the means of two-way conversation for (4) hours.

3.7.2 Secondary power calculation - provide calculations to verify that standby batteries or other approved secondary power source has 24 hours of battery backup plus (4) hours of talk time at full system capacity. If an emergency

generator is provided as a backup power source, stamped calculations by a CA silenced Electrical Engineer showing sufficient power and fuel capacity of the generator to support all emergency loads combined for 24 Hours standby + 4 Hours of talk time (when all call stations are calculated in talk mode). In that case the required standby batteries capacity shall be permitted to be reduced to 4-Hours of standby plus 2-Hours of Talk time.

3.7.3 Voltage drop calculation - calculations shall be provided to verify that the voltage drop in the Two-way communication system circuits do not exceed **10 percent of the starting voltage power per circuit (use 85% of nominal voltage as the starting voltage per circuit)**. Provide voltage drop calculations for each circuit.

3.8 Attachments (Materials-Submittal)

3.8.1 Manufacturer's specification sheets for all equipment and materials to be used shall be submitted, including the transponder to the supervising station. The device or equipment is being used, the listing information, and the application per listing.

3.8.2 Submit copies of the CSFM listing number sheets for all devices and equipment requiring listing.

4.0 DESIGN AND INSTALLATION

4.1 Two-way communication systems shall be designed and installed in accordance with NFPA 72-2016 Chapter 24-ECS. (All 2-Way Communication Systems, Including Elevator-Landings and Stairway Communication systems shall comply with the currently adopted requirements for Areas of Refuge 2-Way communication system listed in NFPA 72-2016 Chapter 24-ECS).

4.2 Two-way communication systems shall have a pathway survivability of Level 2 or 3 per NFPA 72-2016, section 24.3.13.7 which is further explained in Section 12.4 for the required elements. *Exception: Level 1 survivability shall be permitted only in building's area(s) having less than 2-hour fire-rated construction. (Must provide approved architectural plans for reference)*

4.3 Refer to the California Building Code -2016 edition, Sections 403.5.3.1, 1009.6.5 & 1009.8 to determine when a two-way communication system is required.

4.4 Two-way communication systems shall provide communication between each required location and the fire command center (FCC) in high-rise buildings, or a central control point (CCP) location as approved by the fire department for low rise buildings. Where the central control point is not constantly attended (24/7/365), a two-way communication system shall have an automatic voice dial-out capability to a central monitoring location providing 24 hour service. An approved central, proprietary or remote service, which will provide effective means of conversation for immediately summoning assistance at all times in case of emergency, shall monitor the Two-way communication system.

4.5 The two-way communication system shall include both audible and visible signals. A button complying with the California Building Code -2016 edition Section 1138A or 11-B-205 and 11B-308 in the area of refuge and/or elevator landings/ or stairway shall activate both a light in the area of refuge and/or elevator landings/ or stairway indicating that rescue has been requested and a light at the central control point indicating that rescue is being requested. A button at the central control point shall activate both a light at the central control point

and a light in the area of refuge and/or elevator landings /or the stairway communication system call box indicating that the request has been received.

- 4.6 Each two-way communication system initiating device (Call Box) shall indicate its location to the CCP and the central monitoring service via a pre-recorded message or Caller ID feature or other approved means.
- 4.7 Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location shall be posted adjacent to the two-way communication system. Per CBC-2016 Section 1009.8.2
- 4.8 Comply with CBC-2016 Section 1009.9 for the required signage.
- 4.9 Supervising Station Service shall provide all the services and comply with all the requirements delineated in Section 26.3 of NFPA 72, 2016 edition.
- 4.10 Monitoring the Integrity of all system components and wiring shall comply with NFPA 72, 2016 edition. All system components shall be monitored for integrity and shall be supervised by the building Fire Alarm system. The building Fire Alarm system shall supervise the two-way communication system via two addressable monitor-modules. One address shall be indicated as a “general two-way communication system trouble” (open, short, communication trouble, etc.). The other address shall be indicated as “Power two-way communication system Trouble” (Loss of AC power, Battery charger trouble, power supply trouble, low-battery trouble, etc.).
- Monitoring the integrity of the two-way communication system by an off-site supervising station, via the building Fire Alarm system, shall not be required if the central control unit is located in a constantly attended location within low-rise buildings.
- 4.11 Protective covers for call boxes – All call boxes may be provided with approved clear protective covers to prevent unwanted activation of the two-way communication system.