



ELEVATOR LANDING TWO WAY COMMUNICATION SYSTEMS

When Required:

Two-way communications systems for elevator landings require a separate “2-Way Elevator” permit to be submitted to the Community Risk Reduction Division. Installation, alteration, or demolition of a system shall not commence prior to the approval and issuance of a permit.

All installing contractors shall have a California Electrical (C-10) Contractor’s License and be familiar with the design and installation of these systems. The installing contractors shall also have a valid workers compensation certificate, and a City of Santa Clara business license.

Code:

All systems shall comply with the following:

1. **2022 California Fire Code** including section 1009.8
 - a. CFC 2022, 1009.8 Two-way communication: Two-way communication system shall be provided at the landing serving each elevator or bank of elevators on each accessible floor that is one or more stories above or below the level of exit discharge.
 - b. CFC 2022, 1009.8.1 System Requirements: Two-way communication systems shall provide communication between each required location and a central control point approved by the Fire Department. Where the central control point (CCP) is not constantly attended, the two-way communication system shall have a timed automatic telephone dial-out capability that provides two-way communication with an approved supervising station or 9-1-1.
2. 2022 version of NFPA 72, including sections 24.10 for general two-way requirements and 23.3.14.10 and 12.4 for pathway survivability.
3. 2022 version of the California Building Code
4. All other applicable codes and standards

Plans:

Title Sheet: Clearly state the following on the drawings:

1. Scope of work, project name, and address.
2. Occupancy group(s) of building or area as defined by the California Building Code, number of stories, building height.

3. Building construction type and its structural rating
4. Pathway Survivability Level to which you are designing the system.
5. Installing contractor's business name, address, and California Contractor's License number of the installing contractor.
6. The supervising station and UL number.
7. Applicable code sections include NFPA 72 (2022 edition), the California Fire Code (2022 edition), the California Building Code (2022 edition), and this standard.

Floor Plans:

1. Scale used and a graphical representation of the scale. The minimum scale for plans is $1/8" = 1'-0"$.
2. The architectural drawing(s) stamped and signed by the Architect of Record for the construction of the rated shaft along with UL/Gypsum Association details. The architectural drawing(s) shall also include location the UL listed firestop through penetrations assemblies to be used for all locations (floor/ceiling assemblies and wall assemblies). NOTE: The proper "T" (for floor/ceiling assemblies only) and "F" ratings are required for the UL assemblies (See Figure #2 for examples).
3. The location of all equipment.

Riser Diagram:

1. Single-line wiring diagram (riser diagram) that shows the interconnection of each device and equipment of the whole system.
2. Number of conductors in each wiring segment and the type and size of wire or conductor to be used.
3. The class for initiating, signaling line and notification device circuits to include the circuit number or identification.
4. The locations of required fire-stop penetrations.

NOTE: For high-rise buildings Class A wiring is required in accordance CFC 907.6.1.1 (2022 edition).

Battery Calculations:

1. The secondary power supply for two-way emergency communications systems shall be capable of operating the system under quiescent load for a minimum of 24 hours and then subsequently during a fire or other emergency condition for a period of 4 hours with all remote call stations activated and all master control stations annunciating the calls. (NFPA 72, 2022, section 24.10.2.1)

Material Data:

1. Manufacturer's specification sheets for all equipment and materials to be used shall be submitted, including the transponder to the supervising station. Highlight on the cut sheet which device or equipment is being used.
2. Include on the drawings the type of cable being used. If fire rated cable is being used, the cut sheets AND installation instructions shall be scanned and incorporated onto the drawing set. (Separate attachments not on the drawings will NOT be accepted.)

Sequence of Operation:

1. A written description 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.

Equipment List:

1. Provide the model number, manufacturer's name, description, quantity, CSFM listing number, 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.
2. 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.

Design and Installation:

1. LOCATION: All equipment and signage shall be located directly adjacent to the elevator cab(s). The operable part of each Call Box shall be located at 48-inches above the finished floor level. Tactile symbols or characters shall be white on a black background, and Braille shall be provided adjacent to the call box and shall be located at 48-inches above the finished floor (**See Figure #1 for example**).
2. FIRE RATING: Two-way communication systems including all cabling shall be

installed within a UL or Gypsum Association 2-hour fire rated enclosure (**See Figure #2 for examples**).

Exception: Level 1 (as defined by NFPA 72) shall be permitted where the building is less than 2-hour fire-rated construction.

Building Construction Fire Resistance Rating	Pathway Survivability Required	Code Section (NFPA 72, 2022)
No rating	Level 1	24.3.14.4.5 > 23.3.14.4.6
1 hour	Level 4	24.3.14.4.4
2 hour	Level 2 or Level 3	24.3.14.8 > 24.3.14.4.3

12.4 Pathway Survivability

- 12.4.1 Pathway Survivability Level 0. (*No protection*)
 - 12.4.2 Pathway Survivability Level 1. (*Sprinklered + Conduit*)
 - 12.4.3 Pathway Survivability Level 2. (*Non-sprinklered + 2 hour rating*)
 - 12.4.4 Pathway Survivability Level 3. (*Sprinklered + 2 hour rating*)
 - 12.4.5 Pathway Survivability Level 4. (*Sprinklered + 1 hour rating*)
3. **CALLING OUT:** Two-way communication systems shall provide communication between each required location and the base station unit location approved by the fire department. The base station unit shall be located next to the FACP. The base station shall send signals without delay (no waiting for the base station to ring) to an approved central station monitoring company providing 24-hour service (proprietary or remote service)
 4. **AUDIBLE AND VISUAL SIGNALS:** The two-way communication system shall include both audible and visible signals. A button in the elevator landings shall activate both a light in the area of refuge and/or elevator landings indicating that rescue has been requested and a light at the base station unit indicating that rescue is being requested. A button at the base station unit shall activate both a light at the base station unit and a light in the area of refuge and/or elevator landings indicating that the request has been received (**See Figure #1 for example**).
 5. **IDENTIFICATION:** Each Call Box shall indicate its location to the FCC/Base Station and the central monitoring service.
 6. **POSTED DIRECTIONS and LOCATION SIGNAGE:** Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification, including braille) of the location (specific story, floor location and building address or other building identifier) shall be posted adjacent to the two-way communication system (**See Figure #1 for example**, CFC 2022, 1009.8.2 and NFPA 72, 2022 section 24.10.13.1).

7. FIRE ALARM MONITORING: All 2-way troubles shall be monitored by the fire alarm control panel. At minimum the fire alarm control panel shall identify each signal as a 'General 2-way trouble'.
8. 2-WAY BASE STATION MONITORING: The 2-way base station shall monitor the following points for troubles:
 - AC (normal) power loss
 - Battery failure or disconnect
 - Phone line trouble or disconnect
 - All pathways between the remote call stations and the master control station shall be monitored for integrity (NFPA 72, 2022 section 24.10.5). The specific location of each active remote call station shall be identified on the master control station display on a floor and area basis in accordance with 24.10.11. (NFPA 72, 2022 section 24.10.10)
9. COVER: If the 2-way call button is within 36" of the elevator call button, then an ADA compliant cover shall be placed over the 2-way call button to prevent false activation.

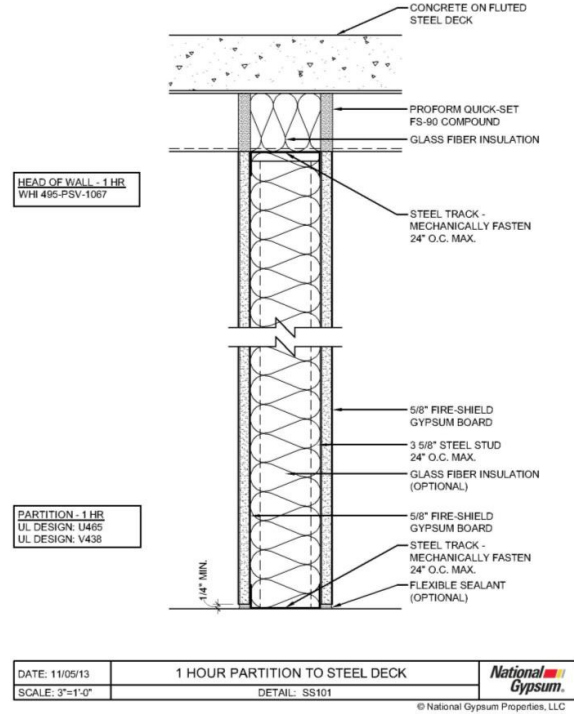
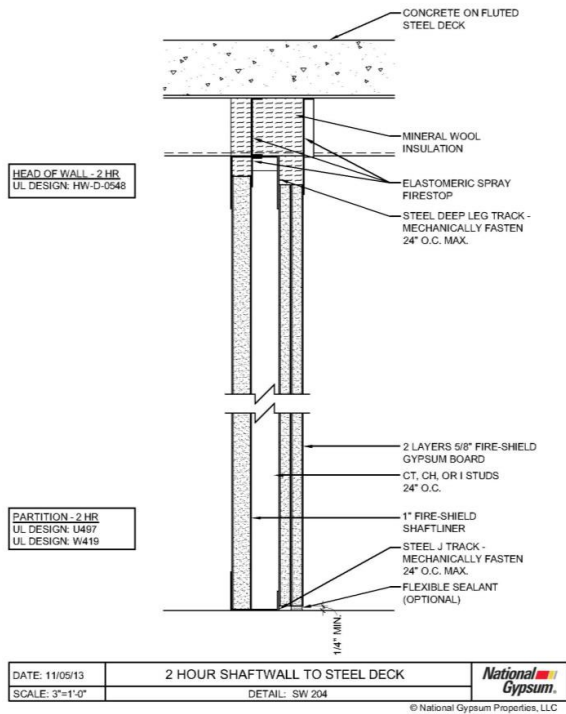


Inspections:

1. Field inspections shall be scheduled only after a permit has been issued.
2. Inspections shall be scheduled by the installing contractor only.
3. The installing contractor shall conduct a complete pre-test of the system.
4. At the time of inspection, the contractor shall provide a printed full size set of approved and stamped plans.
5. NFPA 72 requires 24 hours of standby and 4 hours of talk time on battery power. Because a 4 hour talk time test may not be realistic, a battery calculation SHALL be provided to show the equivalent power draw in standby time (i.e. 48 hours of standby time may be the equivalent to 4 hours of talk time in a specific system). Please be prepared to switch the system to battery power PRIOR to your fire inspection.
6. Trouble testing shall be done at each call station. A call station shall be disconnected in the field, and the base station shall identify the SPECIFIC call station in trouble with floor and / or address identification number.
7. There shall be a minimum of two technicians. Two-way radios shall be provided.

Figure #2: Fire Rated Construction Details (Typical):

The construction details below are for illustration purposes only. Many other listed systems available for use depending on construction needs of the project. The details proposed to be utilized shall be clearly noted on the construction documents.



System No. C-AJ-2166

F Rating - 2 Hr
T Ratings - 0 and 1 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft
W Rating - Class 1 (See Item 3B)

Section A-A

- Floor or Wall Assembly** - Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete floor or wall. Floor may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow-core **Precast Concrete Units**. Wall may also be constructed of any UL Classified **Concrete Blocks**. Max diam of opening is 3 in. (76 mm). See **Concrete Blocks (CAZT)** and **Precast Concrete Units (CFTV)** categories in the Fire Resistance Directory for names of manufacturers.
- Through Penetrants** - One nonmetallic pipe, conduit or tubing to be centered within the firestop system. A non annular space of 5/16 in. (8 mm) is required within the firestop system. The pipe, conduit or tubing to be rigidly supported on both sides of floor or wall. The following types and sizes of pipes, conduits or tubing may be used:
 - Polyvinyl Chloride (PVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste, or vent) piping systems.
 - Rigid Nonmetallic Conduit (RNC)** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code, (NFPA No. 70.)
 - Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
 - Acrylonitrile Butadiene Styrene (ABS) Pipe** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

The T Rating of the firestop system is dependent upon the type of penetrant used. If a PVC pipe, RNC or CPVC pipe is used, the T Rating is 1 Hr. If an ABS pipe is used, the T Rating is 0 Hr.
- Firestop System** - The firestop system shall consist of the following:
 - Fill, Void or Cavity Material - Wrap Strip** - Nom 1/8 in. (3.2 mm) or 1/4 in. (6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. One layer of wrap strip installed around outer circumference of the through penetrant with ends butted and held in place with masking tape. The wrap strip shall be recessed a nom 3/4 in. (19 mm) from the bottom surface of the concrete floor. In walls having a nom thickness of 3-1/4 in. (83 mm) or less, the wrap strip shall be centered within the wall. In walls having a nom thickness equal to or greater than 3-1/4 in. (83 mm), the wrap strip shall be installed on both surfaces of the wall such that the exposed edges of the wrap strip are recessed a max 1/4 in. (6 mm) from each side of the wall. When floor is constructed of hollow-core precast concrete unit, wrap strip shall be installed on both surfaces of floor such that the exposed edges of the wrap strip are recessed a max 1/4 in. (6 mm) from each side of the floor.
 - SPECIFIED TECHNOLOGIES INC.** - Specseal RED or RED2 Wrap Strip
 - Fill, Void or Cavity Material - Sealant** - Min 1/2 in. (13 mm) thickness of fill material applied within the annulus. Flush with top surface of floor or with both surfaces of wall assembly. In floors, bottom edge of fill material shall be recessed a nom 1/4 in. (6 mm) below the top edge of wrap strip. When floor is constructed of hollow-core precast concrete unit, sealant to be installed symmetrically on both sides of floor. Flush with floor surfaces.
 - SPECIFIED TECHNOLOGIES INC.** - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, Pensil 300 Sealant or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300SL Sealant or SpecSeal Series SIL300SL Sealant for floors only.

W Ratings apply when Pensil 300, SpecSeal Series SIL300, Pensil 300SL or SpecSeal Series SIL300SL Sealants are used.

*Bearing the UL Listing Mark
*Bearing the UL Classification Marking
*Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada) respectively.

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System No. C-AJ-2298

F Rating - 2 Hr
T Ratings - 2 Hr

Section A-A

- Floor or Wall Assembly** - Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete floor. Floor may also be constructed of any min 6 in. thick hollow-core **Precast Concrete Units**. Wall may also be constructed of any UL Classified **Concrete Blocks**. For nom 2-1/2 in. diam and smaller pipes and conduits, diam of opening shall be max 1/4 in. larger than nom pipe diam. For pipes and conduits greater than nom 2-1/2 in. diam of opening shall be max 1/2 in. larger than nom pipe diam. See **Concrete Blocks (CAZT)** or **Precast Concrete Units (CFTV)** categories in the Fire Resistance Directory for names of manufacturers.
- Through Penetrants** - One nonmetallic pipe or conduit to be centered within opening with a max 1/8 in. annular space for nom 2-1/2 in. diam and smaller pipes and conduits and a max 1/4 in. annular space for pipes and conduits greater than 2-1/2 in. diam. Pipe or conduit to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes and conduits may be used:
 - Polyvinyl Chloride (PVC) Pipe** - Nom 4 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
 - Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 4 in. diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
 - Acrylonitrile Butadiene Styrene (ABS) Pipe** - Nom 4 in. diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
 - Rigid Nonmetallic Conduit** - Nom 4 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
- Firestop System** - The firestop system consists of the following:
 - Fill, Void or Cavity Material - Sealant** - Min 1/4 in. thickness applied within annulus, flush with top surface of floor or both surfaces of wall.
 - SPECIFIED TECHNOLOGIES INC.** - SpecSeal LCI Sealant
 - Firestop Device** - Galv steel collar lined with an intumescent material sized to fit the specific diam of the through penetrant. Device shall be installed around through penetrant in accordance with the accompanying installation instructions. Device incorporates anchor tabs for attachment to bottom surface of floor or both surfaces of wall assembly by means of 1/4 in. diam by min 1-1/4 in. long steel concrete screws in conjunction with min 1 in. diam steel fender washers.
 - SPECIFIED TECHNOLOGIES INC.** - SpecSeal LCC Collar or SpecSeal SSC Collar

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