

ADDENDUM "G"

RADIO COVERAGE FOR EMERGENCY RESPONDERS WITHIN BUILDINGS

- A. Per the SFFC-2019 Section 510.1 and 510.1.1: All new buildings shall have approved radio coverage for emergency responders within the building. Upon completion of the building construction, a radio coverage test shall be conducted per the specific requirements of SFFC, NFPA 72, and NFPA 1221-2016 and if the test fails an Emergency Responders Radio Coverage System (ERRCS) shall be installed.
- B. All new high-rise buildings must be provided with an Emergency Responder Radio Coverage System (ERRCS). A wired phone-jack two-way communication systems shall not be permitted to be installed in new high-rise buildings in lieu of the required ERRCS.
- C. All successful Radio Coverage tests for new low-rise buildings shall be certified by a licensed FCC General Radio Operator or an approved third party testing agency. The radio coverage test certificate and test results must be documented either on the FA permit plans (if it has not been issued yet) or on a separate permit dedicated to the radio test documentation. A SFFD associated inspection shall be required to verify the results of the test. All radio tests shall include a grid test per CFC requirements with both signal strength and DAQ indications in each test grid.
- D. Existing buildings which require to have building permits for change of occupancy shall be required to have radio coverage per CFC Section 510.2 and Section 1103.2. A radio coverage test shall be required to be conducted per the requirements in item C above.
- E. All ERRCS must be designed, installed and tested in accordance with 2016 NFPA-1221 Sections 9.6, 5.5 and 5.10 and 2019 SFFC. Specific requirements are listed below.
- F. All ERRCS wires and cables (coax, fiber optic, etc.) shall comply with the required pathway survivability level based on the building's type of construction. In all building's portions/areas having 2-HR construction (such as Type IA or IB construction AND 2-HR rated vertical enclosures such as stairways or shafts in Type III and Type V buildings or portions of buildings) pathway survivability level 2 (or 3) shall be required. In all building's portions/areas having less than 2-HR construction (such as Type III or V construction) pathway survivability Level 1 shall be permitted.
- (F.1)** Per NFPA 1221-2016 Section 9.6.2, pathway survivability shall comply with Section 5.10.
- (F.2)** Where a Pathway Survivability Level 2 or 3 is required per item F of this Addendum G, it shall comply with any of the options listed in NFPA 1221-2016 Section 5.10.3 or 5.10.4 respectively.
- (F.3)** If option # 1 of Section 5.10.3 or 5.10.4 is proposed which is "2-HR fire rated circuit integrity (CI) or fire-resistive Cable" – the following items shall be provided on the ERRCS (FIRE ONLY) Permit Plans submittal to be reviewed and approved by the SFFD Plan-Review Section inspector during the ERRCS permit review process:
- F.3.1** – Scanned copy of the cable manufacturer's cut sheets showing the specific UL 2196 (or other approved equivalent) listing for the proposed cable as a 2-HR fire resistive cable.
- F.3.2** – Scanned copy of the associated UL Fire-Resistive Cable category - FHIT system 1250 (or other approved equivalent) including all specific Manufacturer's Installation Instructions for the proposed cable and its associated attachments to the building structure.
- F.3.3** – Scanned current copy of the CSFM listing sheet for the proposed cable.
- F.3.4** – Statement of compliance, from the cable manufacturer, with CEC-2019 Article 820 with specific indication for the UL listing (or other approved equivalent) of this cable as a "Plenum Rated Cable Assembly" - not required to be installed in metallic raceway.
- (F.4)** The associated ERRCS permit plans shall indicate all specific pathways (cable runs) locations utilizing the 2-HR fire-resistive coaxial cable on all associated floor plans and on the riser diagram.
- (F.5)** The installation of this cable per its specific listing shall be inspected by SFFD and DBI FIRE

and Electrical inspectors during the rough-in inspection (before the walls and ceiling are closed.)

(F.6) The ERRCS acceptance test conducted by the SFFD FIRE and Electrical inspectors, after the walls and ceiling are closed, shall verify that all portions of the installed coaxial cables are monitored for integrity via the associated ERRCS monitoring system per NFPA 1221-2016 Section 9.6.12.2 (item g – “system component malfunction”).

- G. The signal strength shall meet the requirements of both 2019 CFC Section 510.4.1 and 2016 NFPA 1221 Section 9.6.8
- H. The ERRCS shall be monitored by the building fire alarm system if installed or by the dedicated function fire alarm system if installed (where building fire alarm system is not provided) in accordance with 2016 NFPA 1221 Section 9.6.13.
- I. In all buildings provided with a building fire alarm system or a dedicated function(s) fire alarm system, a dedicated monitoring panel (LED fire alarm annunciator) shall be provided by the fire alarm contractor in accordance with the requirements of 2016 NFPA 1221 section 9.6.13.2 and shall monitor all ERRCS conditions (a) through (g) listed in 2016 NFPA 1221 Section 9.6.13.2 (1). This dedicated monitoring panel shall be installed in the fire command center in new high-rise buildings or adjacent the FACU in low-rise buildings.
- J. If the building is not provided with a building fire alarm system or a dedicated function(s) fire alarm system, an approved dedicated monitoring panel shall be provided by the ERRCS contractor on the ERRCS permit plans. This dedicated monitoring panel shall meet the requirements of 2016 NFPA 1221 Sections 9.6.13.2 (1) and (2).
- K. Per 2016 NFPA 1221 Section 9.6.13.2 (1) (g), all ERRCS components including the donor antenna and the in-building distributed antennas and all system wiring and cables shall be monitored for integrity for trouble conditions at the building fire alarm control unit or at the dedicated function(s) fire alarm control unit, if provided, and on the required dedicated monitoring panel.
- L. The ERRCS backup power requirement shall be in accordance with 2016 NFPA 1221 Section 9.6.12.2.
- M. An approved Emergency Power-Off (EPO) means shall be provided for all ERRCS (Systems). In High Rise buildings with a Fire Command Center (FCC), the required EPO means shall be installed inside the FCC. In Low Rise buildings, not provided with an FCC, the required EPO means shall be installed adjacent to the Bi-Directional Amplifier (BDA or Signal Booster) in an approved location.
- N. In addition to the specific critical coverage areas indicated in 2016 NFPA 1221 Section 9.6.7.4, all elevator cars in the building provided with Phase II in-car firefighter emergency operation, shall be required to meet the critical areas radio coverage.
- O. The BDA and its associated UPS shall be installed in a 2-HR rated room in all low-rise or high-rise buildings, within the building, regardless the type of construction. The BDA and its associated UPS are permitted to be installed in a NEMA-4 weatherproof rated enclosure on the roof of low-rise or high-rise buildings. The BDA and its associated UPS shall not be installed inside the FCC of high-rise buildings. A smoke detector connected to the building fire alarm system (where provided) shall be installed inside each BDA and active/powerd Remote Radio Units (RRU) equipment room/space or enclosure
- P. A CCSF approved radio frequencies and BDA management form (latest version) shall be obtained (and completed) from the CCSF Department of Technology and provided on all ERRCS permit plans.

Q. The ERRCS Contractor shall provide the following signage in each building provided with an ERRCS per the following requirements:

(Q-1) This sign shall be provided at each building entrance at 60"-70" elevation on the exterior of the building above ground level in an approved location. Where a SFFD approved Lockbox is provided (See SFFD AB # 5.09 for SFFD approved Lockbox requirements), this sign shall be mounted adjacent or above the Lockbox.

(Q-2) Additional sign(s) shall be provided on the exterior side of the door leading into the room/space containing the BDA and on any other door leading into room(s)/space(s) containing active/powering Remote Radio Units (RRU) at 60"-70" elevation AFF. If the BDA/RRU is installed in a closet or in other approved enclosure, the sign shall be provided on the exterior door of that enclosure.

(Q-3) Additional sign shall be provided on the exterior door leading to the Fire Command Center (FCC) on each high-rise building provided with FCC and ERRCS.

(Q-4) The sign shall be plastic or metal, 4" X 4" in size, with white ERRCS letters and radio-tower symbol on red background. The ERRCS letters shall be 1" in height as shown on the example below.



R. The following general notes shall be provided as verbatim notes on all ERRCS permit plans:

THIS SYSTEM SHALL COMPLY WITH THE APPLICABLE ERRCS REQUIREMENTS IN SFFC, 2016 NFPA 1221, NFPA 72 AND SFFD AB # 2.01 ADDENDUM G.

SECONDARY POWER SUPPLY TO BE PROVIDED BY INTEGRAL BATTERIES. THE SYSTEM SHALL PROVIDE AT LEAST 12 HOURS OF 100 PERCENT SYSTEM OPERATION CAPACITY, PER 2016 NFPA 1221 SECTION 9.6.12.2

THE EMERGENCY RESPONDER RADIO COVERAGE SYSTEM SHALL BE MONITORED BY A DEDICATED FIRE ALARM LED MONITORING PANEL THAT SHALL BE CONNECTED TO THE BUILDING FIRE ALARM CONTROL UNIT. THIS ANNUNCIATOR SHALL BE PROVIDED ON A SEPARATE FIRE ALARM SYSTEM PERMIT*. THE EMERGENCY RESPONDER RADIO COVERAGE SYSTEM SHALL BE MONITORED FOR THE FOLLOWING CONDITIONS:

- (a) Normal ac power ON – Green LED
- (b) Loss of normal ac power – Yellow LED
- (c) Battery charger failure – Yellow LED
- (d) Low battery capacity (to 70 percent depletion) – Yellow LED
- (e) Donor antenna malfunction – Yellow LED
- (f) Active RF emitting device malfunction – Yellow LED
- (g) System component malfunction, including the in-building distributed antennas and all ERRCS wires and cables – Yellow LED

***If a building fire alarm system or a dedicated function(s) fire alarm system is not provided in the building, an approved dedicated monitoring panel shall be provided by the ERRCS contractor on the ERRCS permit plans and be connected directly to the ERRCS.**

THE OWNER OF THE FACILITY SHALL BE RESPONSIBLE FOR MAINTAINING REQUIRED UTILITIES SO AS TO PROVIDE FOR THE CONTINUOUS OPERATION OF THE PROTECTION SYSTEM. THIS SHALL INCLUDE DEDICATED PRIMARY POWER SUPPLY BY MEANS OF DEDICATED BRANCH CIRCUIT.

THE DEVICES AND CONDUIT LOCATIONS SHOWN ON THESE DRAWINGS ARE APPROXIMATE. LOCATIONS MAY NEED TO BE ADJUSTED SLIGHTLY DURING INSTALLATION TO ACCOMMODATE BUILDING CONSTRUCTION FEATURES.

**THIS SYSTEM WAS DESIGNED BY AND SHALL BE INSTALLED BY:
FCC GENERAL RADIO/TELEPHONE OPERATORS LICENSE # _____
(Contact Info for FCC Contractor)_____**

THE ERRCS CONTRACTOR SHALL CONTACT THE SF CITY RADIO SERVICE DIVISION AT THE START OF THE ERRCS WORK PRIOR TO THE DONOR ANTENNA POSITIONING AND ERRCS INSTALLATION.

CONTACT INFORMATION:

Department of Technology,
City and County of San Francisco
Radio Engineer Manager
Office - (415) 558-3828
radio@sfgov.org

THE ERRCS CONTRACTOR SHALL PROVIDE A COPY OF THE APPROVED ERRCS PERMIT PLANS TO THE SF CITY RADIO SERVICE DIVISION FOR THEIR RECORDS via radio@sfgov.org email.

THE ERRCS CONTRACTOR SHALL PROVIDE AN FCC TEST CERTIFICATE AND A RADIO TEST REPORT TO THE FIRE DISTRICT INSPECTOR AT TIME OF SYSTEM INSPECTION via radio@sfgov.org email.

THE ERRCS CONTRACTOR SHALL COORDINATE THE ERRCS TESTING WITH THE RADIO SERVICE DIVISION AND THE SFFD FIRE INSPECTOR AT: 415-558-3300.

THE TWO-WAY EMERGENCY COMMUNICATIONS RADIO SIGNAL (STRENGTH AND DAQ) IS REQUIRED IN ALL ELEVATOR CARS IN THE BUILDING PROVIDED WITH PHASE II IN-CAR FIREFIGHTER'S EMERGENCY OPERATION IT MUST PASS THE SAME TESTS AS OTHER CRITICAL AREAS LISTED IN 2016 NFPA 1221 SECTION 9.6.7.4