Travis County ESD No. 12
11200 Gregg Lane
Manor, Texas 78653
(512) 272-4502
FirePrevention@tcesd12.com

# EMERGENCY RESPONDER RADIO COVERAGE SYSTEMS

**Emergency Responder Radio Coverage Systems shall conform, at minimum, to 2016 NFPA 72, 2016 NFPA 1221, 2015 International Fire Code and FCC 47 CFR Part 90.219.**

According to the Safer Building Coalition, the 3 pillars of in-building public safety communications are: 1) mobile 911 calls must get out with location accuracy, 2) mobile mass notifications must get in, and 3) first responder communications must work.

When a building within the jurisdiction of Travis County ESD No. 12 is required to have emergency responder radio coverage and it does not meet the minimum required coverage, steps shall be taken to ensure sufficient radio coverage is provided for emergency responders. Dedicated equipment to provide adequate in-building emergency responder communication shall be provided if radio communication coverage standards fail to be met.

**Any new commercial building or a commercial building under renovation shall meet the minimum following standards unless otherwise approved by Travis County ESD No. 12.**

## APPLICABILITY

Building construction, building size, construction features, and other elements can absorb or block radio communications. All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the Greater Austin/Travis Regional Radio System (GATRRS) at the exterior of the building.

General areas, shall be provided with 95 percent floor area radio coverage.

Critical areas, such as fire command center(s), fire pump room(s), sprinkler riser room, exit stairs, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and other areas deemed critical shall be provided with 99 percent floor area radio coverage.

**To determine if an emergency responder radio coverage system is needed, a specialized FCC GROL certified technician will be required to perform an RF survey.**

An RF survey is strongly recommended if a newly constructed building meets any one of the following conditions:

1. The new building is of Type I, II or III construction.
2. There are more than 3-stories above grade plane.
3. The total building area is 50,000 square feet or greater.
4. The building has a total basement area of 10,000 square feet or greater.
5. The building is 20,000 square feet or greater and is equipped with a solar photovoltaic system.

This guideline shall not apply to the following:

1. Existing buildings or structures for which a building permit has been issued.

2. Elevators.
3. Structures that are three stories or less without subterranean storage or parking and do not exceed 50,000 square feet on any single story.
4. Wood-constructed residential structures four stories or less without subterranean storage or parking which are not built integral to an above ground multi-story parking structure.
5. In construction that is three stories or less and does not exceed 50,000 square feet on any single story but DOES include subterranean storage or parking, then this requirement shall apply only to the subterranean areas.

NOTE: The owner of any building or structure to which this guideline applies shall be responsible for all costs associated with the installation, maintenance, testing and compliance with the most current Greater Austin/Travis Regional Radio System coverage requirements. Existing buildings undergoing extensive remodel and/or expansion shall coordinate with the local AHJ to determine if the installation of an in-building emergency responder radio system survey and potential radio coverage system is needed.

## DEFINITIONS

*Emergency Responder Radio Coverage System (ERRCS)*: An in-building public safety radio amplification system composed of FCC-certified bidirectional 800 MHz amplifier(s), associated distribution system, and subcomponents.

*FCC GROL Certified Technician*: An individual who is qualified with a General Radiotelephone Operator License (GROL/PG), or equivalent, to review design plans and perform tests in affected structures to measure compliance with the specifications set forth in this article.

*Greater Austin/Travis Regional Radio System (GATRRS)*: The radio system used by local law enforcement, fire, and public works departments within Austin/Travis County for emergency and non-emergency radio communication on the 800 MHz radio band.

*Backbone*: A communications cable in an in-building radio enhancement system that carries wideband signals important to the entire building, from the donor antenna, through the amplifiers, and to distribution antenna lines. Damage to a backbone cable will disable the radio enhancement system through much or all of the building, and as a result it should be identified and protected. The backbone cable can be fiber-optic, copper, or coaxial cable, but it does not radiate RF energy along its path.

*Distribution*: A communications cable that carries RF energy in both directions along its length to distribution antennas in one or more places in the building. It is typically a coax cable or radiating cable, and it is outside of the heat and fire protection provided by firewalls or other means.

## TECHNICAL REQUIREMENTS

The system designer and lead installation personnel shall, at minimum, possess:

1) A valid FCC-issued general radio operator license (GROL), and
2) Certification of in-building system training issued by a nationally recognized organization, school, or the manufacturer of the equipment being installed.

The pathway survivability of the ERRCS shall be determined by the risk analysis.

All new buildings which require an ERRCS system shall be constructed with a backbone having a minimum two-hour fire resistive rating installed between the first floor or the bottom subterranean floor, to the roof or other approved 2-hour fire-resistive rated enclosure.

Installed backbone cables can be fiber-optic, copper, or coaxial cable. Backbone cables shall be protected by a 2-hour fire-resistive rated enclosure.

All connections between the backbone and distribution antenna cables shall be made within the 2-hour-rated enclosure, and passage of the feeder cable in and out of the 2-hour rated enclosure shall be firestopped to 2-hour ratings.

The backbone cables shall be connected to the antenna distribution, radiating, or copper cables using coupler devices of a value determined by the overall design.

All backbone and distribution cable are required to be plenum-rated. Cable other than backbone or distribution cable is allowed to comingle with the backbone and distribution cable in the conduit provided it is listed, shielded cable that will not interfere with the backbone or distribution cable.

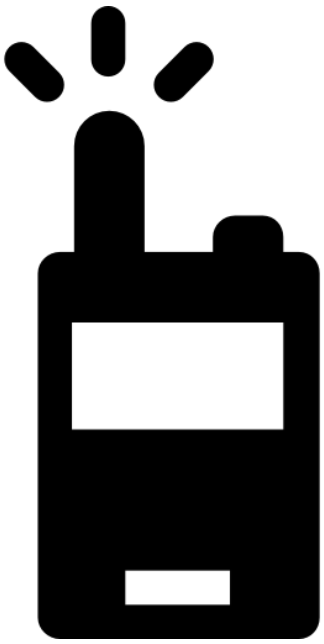
A minimum signal strength of -95dBm shall be provided into the building. A minimum signal strength of -95 dBm shall be received by the radio system when transmitting from within the building.

At each floor and the roof, an opening shall be made to allow easy access to the conduit from the ceiling. Access in either the form of a drop ceiling or access panel shall be made along hallways and through firewalls. All floors of the subterranean parking garages shall have a similar conduit installation and access.

A dedicated annunciator in the fire control room shall be installed to annunciate the status of all RF emitting devices. If a building does not have a fire control room, the communications control equipment shall be located inside the building near the fire alarm control panel or other approved location.

Buildings equipped with an emergency responder radio coverage system (ERRCS) shall be identified by an approved sign located above or near the building Knox Box location stating “Emergency Radio System Installed.”

6”x8” Metal backed sign
½” lettering
2’x4” Graphic
Red background with Blue
Reflective Letters and Graphic



EMERGENCY RADIO SYSTEM INSTALLED

The occurrence of any fault in the ERRCS system where the system function is decreased shall cause a supervisory signal at an off-site monitoring service company.

ERRCS systems shall be provided with standby power, capable of operating the emergency responder radio coverage system for a duration of not less than 24 hours.

All signal booster components and battery systems used for the emergency power source shall be contained in a NEMA 4-type waterproof cabinet.

Systems that are out of service for more than 8 hours require notification to the TCESD No. 12 Fire Marshal.

No obstruction of the public safety system shall be allowed without an approved mitigating plan. The mitigating plan shall be approved by all parties affected by potential change.

It is strongly recommended that newly constructed buildings install means to either install an ERRCS or upgrade the existing ERRCS system should a change to coverage occur due to future construction.

Where an ERRCS is required, and upon completion of installation, the building ***owner*** shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 90 percent. The acceptance test shall follow the requirements set forth in Section 510.5.3 of the 2015 International Fire Code.

## MONITORING AND MAINTENANCE

The Emergency Responder Radio Coverage System (ERRCS) shall include automatic supervisory and trouble signals for malfunctions of the signal booster(s) and power supply(ies) that are annunciated by the fire alarm system. Each component shall include the following as applicable:

1. System and signal booster supervisory signals shall include the following:
    a. Antenna malfunction
    b. Signal booster failure
2. Power supply/Battery backup signals shall include the following for each signal booster:
    a. Loss of normal ac power
    b. Failure of battery charger
    c. Low-battery capacity indication

The Emergency Responder Radio Coverage System (ERRCS) shall be inspected and tested annually or when structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test.
2. Signal boosters shall be tested to verify that the output power is the same as it was upon initial installation and acceptance.
3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.
4. Other active components shall be checked to verify operation within the manufacturer's specifications.
5. At the conclusion of the testing, a report, which shall verify compliance will be submitted to the Fire Marshal.

The information provided in this document delineates the minimum requirements for ERRCS. It is the responsibility of the designer and installing contractor to include any pertinent information not mentioned above. For any questions, please contact TCESD No. 12 at FirePrevention@tcesd12.com or (512) 272-4502.