



## ANNA FIRE MARSHAL'S OFFICE – PREVENTION DIVISION EMERGENCY RESPONDER RADIO COVERAGE (ERRC) INSTALLATION

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This guide is intended as a resource and policy statement for all commercial buildings, structures, or facilities (new and existing) within the City of Anna. These guidelines shall be followed whenever an Emergency Responder Radio Coverage (ERRC) system is installed or modified. An ERRC system consists of a Distributed Antenna System (DAS) and/or Bi-Directional Amplifiers (BDA or repeaters). For the purposes of these instructions and any other guidelines or requirements of the Anna Fire Marshal's Office, ERRC systems shall conform to the 2015 International Fire Code as adopted and amended by the City of Anna, current edition of NFPA 72, and NFPA 1221. These guidelines do not replace or supersede any codes and/or ordinances adopted by the City of Anna, nor do they supersede any determinations, interpretations, and positions of the Anna Fire Marshal's Office. Questions can be directed to the Anna Fire Marshal's Office (Fire Prevention Division) by emailing [firecad@annatexas.gov](mailto:firecad@annatexas.gov) or calling (214) 831-5342.

### Where Required

- 1) All new and existing buildings located within the City of Anna and the emergency response district shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication system.
- 2) NEW CONSTRUCTION - During the final stages of construction, a pre-enhancement radio site survey shall be performed to determine the need for a BDA/ERRC system. Site surveys are required for any structure exceeding 10,000 square feet in area per story. Additionally, construction materials or structural design features that may interfere with radio communications may also warrant a survey at the discretion of the Fire Marshal.

### Building Department Permit Submittal

- 3) The following information shall be added to the architectural drawings for buildings required to meet the requirements for ERRC as listed above:
  - a. This project is required to meet the requirements in the 2015 International Fire Code, Section 510 for Emergency Responder Radio Coverage.
  - b. If the structure does not meet the signal strength requirement of -95 dB into and out of the building in 95% of all areas on each floor of the building, one of the following shall be installed:
    - A radiating cable system,
    - An internal multiple antenna system with Federal Communications Commission (FCC)-certified bi-directional amplifiers, or
    - "Other" system as approved by the Anna Fire Marshal's Office to achieve the required coverage.

### **Electrical Plans / FACP Monitoring**

- 4) The electrical plans shall include an approved secondary source of power required for the ERRC system.
- 5) The signal boosting equipment shall be designed, installed, and configured so that the Main Fire Alarm Control Panel (FACP) actively monitors the AC power status of the signal booster. Upon loss of AC power to the signal boosting equipment, a supervisory signal shall be sent to the FACP.

### **Fire Department Permit**

- 6) A Two-Way Communication permit for the installation or modification of ERRC systems and related equipment is required through the Fire Prevention Division. See our website for all submittal requirements. General maintenance performed in accordance with the International Fire Code is not considered a modification and does not require a permit.

### **Radio Design Criteria (Coverage)**

- 7) Buildings that cannot support the required level of radio coverage must be equipped with one of the following:
  - a. A radiating cable system,
  - b. A distributed antenna system with FCC certified signal boosters, or
  - c. Systems otherwise approved by the Fire Marshal's Office that achieve the required radio coverage.
- 8) Radio channels shall be filtered in accordance with FCC bandwidth limitations for those specific radio frequencies.
- 9) Simplex channels shall not be added to any system.

### **Radio Design Criteria (Signal Strength)**

- 10) The building is considered to have acceptable radio coverage when the signal strength measurements in 95% of all areas on each floor of the building meet the following signal strength requirements:
  - a. A minimum signal strength of -95 dBm must be receivable upon transmission within the building.
  - b. A minimum signal strength of -95 dBm must be received by the Agency's radio system (i.e. Dispatch Center) when transmitted from within the building.

### **Frequency Information**

Anna Fire Rescue is dispatched through the Collin County Sheriff's Office, located in McKinney, Texas.

## Collin County Interoperable Radio Network System, 700/800 MHz Frequency Allocations

774.70625	804.70625
774.23125	804.23125
773.98125	803.98125
773.73125	803.73125
772.74375	802.74375
772.25625	802.25625
771.45625	801.45625
770.19375	800.19375

*\*All questions regarding radio frequencies or radio systems should be directed to the Collin County Public Safety Dispatch and Communications Center at (972) 547-5100.*

### Standby Power

- 11) An approved secondary source of power shall be provided for radio coverage systems. The standby power supply shall be capable of operating the radio coverage system for at least 24 hours. The standby power supply shall be either a battery system, Uninterrupted Power Supply (UPS), or an emergency generator. All batteries and power supplies shall be contained within a **National Electrical Manufacturer's Association (NEMA) 4X Weatherproof enclosure**.

### Signal Booster

- 12) If installed, signal boosters shall be contained within a **NEMA 4X Weatherproof enclosure**. The signal booster and battery system shall be electronically supervised and monitored by a supervisory service connected to the fire alarm system and programmed as a supervisor signal.
- 13) Where feasible, and to prevent overheating, **all signal boosters shall be installed in a conditioned space** in which the ambient room temperature does not exceed 85-degrees Fahrenheit, i.e., a dedicated IT room.

### Approval Prior to Installation

- 14) No amplification system capable of operating on frequencies used by the City of Anna may be installed without prior coordination and approval of the radio system licensee. Any such system shall comply with the standards adopted by the city.

### Installation Requirements / Designer and Installer Qualifications

- 15) DEDICATED POWER - The primary power source should consist of a 120VAC 15/20A lockable dedicated power circuit.
- 16) SURGE PROTECTION - Lightning and surge protection is required for all system components.

- 17) DONOR ANTENNAS - Donor antennas shall be monitored by the FACP and indicate isolation from indoor coverage antennas to prevent system oscillation or signal noise back to the tower.
- 18) SYSTEM ISOLATION - The ERRC system shall not be combined with other systems including cellular enhancement, Wi-Fi, pager, or medical telemetry systems.
- 19) REQUIRED CREDENTIALS AND QUALIFICATIONS - The system designer and lead installation personnel must have the following minimum qualifications:
  - a. A valid **General Radio Operator License** (GROL) issued by the *Federal Communications Commission* (FCC), and
  - b. Certification of in-building system training issued by a nationally recognized organization or school such as Associated Public Safety Communications Officials International (APCO), National Association of Business and Education Radio (NABER), Personal Communications Industry Association (PCIA), the International Association for Radio, Telecommunications and Electromagnetics, Inc. (INARTE), Wireless Communication Engineering Technologies (WCET), or
  - c. A certificate issued by the manufacturer of the equipment being installed.

#### **Plan Review and Acceptance Testing**

- 20) All plan reviews require 3<sup>rd</sup> party review.
- 21) All acceptance testing shall be conducted by a 3<sup>rd</sup> party and witnessed by the Anna Fire Marshal's Office.

#### **Acceptance Test**

- 22) Upon completion of the installation, the system shall be tested after construction is complete to ensure that the two-way coverage on each floor of the building accomplishes a minimum of 90%. The test procedure shall be as follows:
  - a. Each floor of the building must be divided into a grid of approximately 20 equal test areas.
  - b. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency of jurisdiction speaking through the agency's radio communications system in both receive and transmit modes.
  - c. Failure of a maximum of 2 nonadjacent test areas shall not result in failure of the test.
  - d. If 3 of the test areas fail, the floor shall be permitted to be divided into 40 equal test areas. Failure of a maximum of 4 nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system must be altered and improved to meet the 90% coverage requirement.
  - e. A test location approximately in the center of each test area must be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location is considered a failure of that test area. Additional or alternate test locations are not permitted.
  - f. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests.
  - g. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation.
  - h. Installed systems must be registered with the FCC. Proof of registration must be provided to the Anna Fire Marshal's Office.

### Signage

- 23) A permanent sign shall be installed on the FACP access door or near the FACP identifying the location, i.e., room number of the signal boosting equipment and NEMA 4X enclosure.

### Final Report

- 24) Prior to issuance of a Certificate of Occupancy (C.O.), a final acceptance report shall be submitted to the Fire Marshal's Office containing a floor plan, signal strengths at each location tested, and other relevant information. The report shall be stamped and signed by the FCC-certified technician or Engineer with a statement specifying that the building complies with all requirements of the International Fire Code.

### Annual Testing

- 25) Testing is required both annually and when structural modifications are made that will impact the system. All components and systems shall comply with the International Fire Code.

## ERRC Plan Review Process

### Step 1: SUBMISSION

Submit your plans to the 3<sup>rd</sup> party vendor of your choice provided the requirements of Item 18 are satisfied. Installer shall pay all costs associated with 3<sup>rd</sup> party review directly to the selected vendor.

### Step 2: SUBMISSION

Submit the following items to the Anna Fire Marshal's Office for permit approval:

- A completed Anna Fire Department Fire Protection Permit Application. Form is available at [www.annatexas.gov/fire](http://www.annatexas.gov/fire)
- An electronic (PDF) document or hard copy of the reviewed plan set and all associated documents. Submitted engineered plans shall bear the stamp and signature of the 3<sup>rd</sup> party vendor and the installer's design professional.
- You may email PDF documents to [firecad@annatexas.gov](mailto:firecad@annatexas.gov) or deliver a thumb-drive in person to the fire department. Our physical address is 305 S. Powell Parkway, Anna, TX 75409. Hard copy plans are also accepted.

You will be notified when your permit has been approved. Please allow up to 5 business days for approval.

### Step 3: PERMIT FEE PAYMENT

Please call our office 214-831-5342 for instructions on payment.

### Step 4: ISSUANCE OF APPROVED PLANS AND PERMIT

After all fees are paid in full, a permit from the Anna Fire Marshal's Office will be issued. You may retrieve a copy of your approved permit from the fire department. *Work shall not commence until the permit has been issued. Working without a permit shall result in fines.*

(Updated 6/2023, RI)