A Fairfax County, VA., publication

EMERGENCY RESPONDER COMMUNICATION ENHANCEMENT SYSTEM SUBMITTAL AND PERMIT REQUIREMENTS GUIDELINES

Version 2, September 2025

Public Safety Headquarters

Office of the Fire Marshal
Engineering Plans Review Branch
12099 Government Center Parkway, 3rd floor
Fairfax, VA 22035
Tel: 703-246-4806, TTY 711
Fax: 703-246-6043
Email: fire.engplansreview@fairfaxcounty.gov

TABLE OF CONTENTS

APPLICABLE CODES AND STANDARDS

- VCC – Virginia Construction Code, Part 1 (2021)
- IFC – International Fire Code (2021)
- NFPA 72 – National Fire Alarm and Signaling Code (2019)
- NFPA 1225 – Standard for Emergency Services Communications (2022)

INTRODUCTION

The 2021 Virginia Construction Code (VCC), Section 918, In-Building Emergency Communications Coverage discusses requirements and exceptions for the installation of dedicated infrastructure to accommodate and perpetuate continuous in-building emergency wireless communication equipment for emergency responders. Fairfax County uses wireless communications equipment; therefore, it is the responsibility of the developer, owner, or their agent to review the requirements in VCC Section 918 to determine if a system is required. If a system is required or voluntarily installed, the developer, owner, or their agent shall follow these step-by-step guidelines concerning the required documentation, permits, multiagency review process, and inspection and testing protocols.

The following terms describe In-Building Emergency Communications Coverage systems, which provide in-building two-way radio coverage for first responders:

- Emergency Responder Communication Enhancement System (ERCES)
- Emergency Responder Radio Communications Systems (ERRCS)
- Bi-directional Amplifier Systems (BDA)
- Distributed Antenna Systems (DAS)
- Signal Booster

This document will use ERCES as the term to describe these systems.

During emergencies, firefighters and other emergency response personnel use portable radios to communicate while inside of buildings or structures. Fairfax County (FFX) and our regional partners recognize that modern building design and construction techniques, especially those required to satisfy Leadership in Energy and Environmental Design certification, make reliable two-way radio coverage difficult or impossible for first responders operating inside of those buildings. Two-way radio ERCES help ensure the safety of building occupants and first responders by extending the coverage of a public safety communications system through a network of indoor antennas strategically located to provide reliable public safety radio system coverage throughout the interior of a building.

In some buildings and structures, such as those with smaller footprints or those located near one of the FFX's 12 radio transmission sites, it may be possible to achieve reliable public safety radio communications coverage throughout the building or structure without the use of ERCES. However, it is highly encouraged and recommended that all commercial, multi-unit residential, government, and educational occupancies install reliable ERCES that meet the requirements of the National Fire Protection Association's (NFPA) 72 – National Fire Alarm and Signaling Code and NFPA 1225 – Standard for Emergency Services Communications Systems. For example, installing ERCES in lieu of fire department communications systems (firefighter phones) in high-rise buildings offers considerable cost savings over the life of a building. Instead of installing a building-wide communications system the fire department will never use, other first responders do not know how to use, is frequently abused, and costly to inspect and maintain, ERCES systems costs less to install, maintain, and provide a communication systems all first responders can and will use.

The County strongly recommends that building owners and developers engage the services of a firm qualified in the engineering and design of two-way radio communications enhancement systems to assist with this determination. The design, installation, maintenance, and repair of ERCES requires hiring qualified personnel to ensure the system meets the coverage reliability requirements of NFPA 72 and NFPA 1225. In addition, systems cannot cause unintended harmful interference to the County's radio system or other users of the RF spectrum licensed by the Federal Communications Commission (FCC).

The FCC requires that the licensee of the public safety radio system operate the ERCES or as authorized by the licensee, for another party to operate the ERCES. Additionally, the licensee must provide the information required by Fairfax County Department of Information Technology (DIT) so that the ERCES location and contact information can be entered into a nationwide registry maintained by the FCC to ensure the appropriate parties contact information is available should the ERCES cause interference to radio systems operated by other licensees.

The following steps should be completed consecutively for any voluntary ERCES installation or any infrastructure installation as prescribed by VCC 918.1. The process will involve coordination from FFX's DIT Emergency Communications Branch – Radio Services Center; Land Development Services (LDS) – Building Division; and the Office of the Fire Marshal (OFM). DIT is responsible for the technical requirements, frequency licensing, and the initial coverage testing. LDS and OFM will coordinate the plan review and necessary permits.

STEP 1 – DEPARTMENT OF INFORMATION TECHNOLOGY DESIGN, REVIEW, AND DOCUMENTATION REQUIREMENTS

Once it is determined the project needs an ERCES installation in full or limited capacity (limited capacity equipment includes donner antenna, cable, and in-building communications interface box) applicant shall access the following link that provides FFX's DIT Emergency Communications Branch – Radio Services Center technical requirements for ERCES, design, installation, licensing, and testing:

PROCESS AND TECHNICAL REQUIREMENTS FOR EMERGENCY RESPONDER COMMUNICATIONS ENHANCEMENT SYSTEMS

The applicant will be required to submit plans, technical specifications, and a Retransmission Authorization form to DIT for review and approval. Some of the information submitted to DIT is also required to be submitted as part of the LDS and OFM permitting process.

Applicant may contact DIT to discuss the requirements for the proposed design by phone or email at the following:

- Phone: 703-591-1083
- Email: DITDistributedAntennaSystems@fairfaxcounty.gov

STEP 2 – LAND DEVELOPMENT SERVICES (LDS) BUILDING PERMIT REQUIREMENTS

Upon approval by DIT, the applicant shall apply for a building permit with LDS. LDS requires a building permit for:

- New construction
- If there are any penetrations through fire-rated assemblies in existing buildings.

Where applicable, plans, calculations, manufacturer's product data sheets, and any other pertinent information or documentation shall be provided for review with the permit application.

The following link provides additional technical information:

Permit Library | Land Development Services (fairfaxcounty.gov)

Building plans and permit requirements include:

- The building plan should clearly identify the extent of system installation
- The preliminary riser design approved by DIT's Radio Services Center should be shown on the plan and all applicable through-penetration firestop systems should be listed on the plan for review and approval
- All pertinent information and documentation that is necessary to complete the review

Applicant can reach LDS by phone or email at the following:

- Phone: 703-222-0801 Option 2

- Email: LDSbuildingpermits@fairfaxcounty.gov

STEP 3 – LAND DEVELOPMENT SERVICES (LDS) ELECTRICAL / LOW VOLTAGE VOICE / DATA PERMIT REQUIREMENTS

Submit application for an Electrical / Low Voltage Voice/Data permit with LDS.

- For new construction, a building permit is required prior to issuance of an Electrical / Low Voltage Voice/Data permit
- For existing buildings, if the Electrical / Low Voltage Voice/Data scope of work penetrates through a fire-rated assembly, a building permit is required
- If penetrations are discovered at the time of inspection without the benefit of approved building plans or permit, the contractor will be required to apply for a building permit before any inspection of Electrical / Low Voltage Voice/Data work

The following link provides additional technical information:

Permit Library | Land Development Services (fairfaxcounty.gov)

Applicant can reach LDS by phone or email at the following:

- Phone: 703-222-0801 Option 2

- Email: LDSbuildingpermits@fairfaxcounty.gov

STEP 4 – OFFICE OF THE FIRE MARSHAL (OFM) FIRE ALARM SYSTEM PERMITTING REQUIREMENTS

Full ERCES systems require a fire alarm system permit. The fire alarm system plan submittal for review by the OFM should demonstrate the connection between the ERCES system and the building's fire alarm system and ERCES signals monitored by the fire alarm system. If the building does not have a

fire alarm system, the ERCES system shall be monitored by a supervising station monitoring service. There is no requirement for a fire alarm system permit for partial ERCES system installations.

Contact OFM Revenue and Records Branch at 703-246-4803 for application requirements. The following link provides additional technical information:

Fire Marshal Installation Permit Requirements | Fire and Rescue (fairfaxcounty.gov)

STEP 5 – OFFICE OF THE FIRE MARSHAL EMERGENCY COMMUNICATIONS PERMITTING REQUIREMENTS

An In-Building Emergency Communications Coverage (FCOMM) permit is required for all system installations. The following information and documents shall be submitted with the permit application:

- A properly signed Maintenance Agreement for Emergency Responder Radio Communications Systems
- DIT Design Approval
- Approved building plans (Only the pages showing communication system related items)
- Approved building permit number
- Electrical / Low Voltage Voice/Data permit number
- If installing ERCES in lieu of firefighter phones, approved Code Modification number (See *Code Modification Path for High-Rise Projects* below)

Contact OFM Revenue and Records Branch at 703-246-4803 for application requirements. The following link provides additional technical information:

Fire Marshal Installation Permit Requirements | Fire and Rescue (fairfaxcounty.gov)

CODE MODIFICATION PROCESS FOR HIGH-RISE PROJECTS

If installing an ERCES system in a high-rise building in lieu of firefighter phones, a code modification application is required. The following provides information and the process to apply for a code modification. There is additional information on the Code Modification process on the PLUS Portal.

In accordance with the administrative requirements of the VCC, Part 1, firefighter phones are still required in high-rise buildings. However, because FFX utilizes public safety wireless communications, the requirements in VCC 918.1 remain in force unless nullified by an approved exception. The OFM recognizes the benefits of an ERCES; therefore, OFM is working in conjunction with the LDS – Building Official, DIT – Radio Services Center, and the County Attorney's Office to facilitate ERCES installations in lieu of firefighter phones in FFX. This option needs to be submitted and reviewed through the code modification process to ensure that the ERCES will remain functional and in good standing for the life of the building.

Please consider the benefits to first responders related to the installation of ERCES versus hardwired firefighter communications phones that are required in high-rise buildings if an ERCES is not installed. Be aware that public safety agencies carry and use radios for all communications, and it is highly unlikely that the hardwired firefighter phones will be used by any public safety agency. In addition, over the life of the building, the cost savings of installing and maintaining ERCES verse installing and maintaining hardwired firefighter phones can be significant.

If an applicant wishes to pursue installation of an ERCES system, the following proposed language provide examples to be used in a code modification request for complete ERCES installation. Code modification requests are processed through the PLUS system.

"In lieu of firefighter phones, an ERCES is proposed to be installed. The basis of this request is that the International Fire Code (IFC) 2021 edition, Section 510 Emergency Responder Radio Coverage states new and existing buildings shall be equipped with an ERCES. However, as of now, the Virginia Construction Code, Part 1 imposes limitations on requirements for ERCES; therefore, in lieu of installing hardwired firefighter phones, we are asking to install an ERCES and reference the IFC, 2021 edition, Section 510 as referenced by the International Building Code, 2021 edition, Section 918 and accept these responsibilities.

A radio enhancement system will be provided in accordance with VCC, Section 918, In-Building Emergency Communication Coverage, which references the IFC. The ERCES system will be monitored by the fire alarm system, routinely inspected, and maintained according to NFPA and Joint Commission standards.

- *The In-Building Emergency Communication Coverage system is maintained in perpetuity.*
- *The In-Building Emergency Communication Coverage system shall remain functional and compatible with the Fairfax County Radio System in perpetuity.*
- *The In-Building Emergency Communication Coverage system shall be installed and maintained in accordance with all requirements established by FFX's DIT – Radio Services.*
- *An Annual Testing/Maintenance/Retransmission Agreement will be in place.*
- *We will retain the services of a qualified firm to conduct annual services to coordinate the annual services of the system*
- *Annual testing of the communications system will take place according to NFPA 72 and NFPA 1225*
- *We will resubmit annual retransmission agreement/authorizations to DIT*
- *All FCC regulations are to be complied with pertaining to the use of retransmitted frequencies*
- *Failure to abide by the Retransmission Agreement requirements can lead to the termination of the agreement with the Department of Information Technology, Emergency Communications Branch – Radio Services Center and the Board of Supervisors of Fairfax County, Virginia.*
- *Builder /Owner agrees to a future Maintenance Agreement with the County*

STEP 6 - INSPECTION REQUIREMENTS

System inspection and acceptance testing will be performed by DIT, LDS, and OFM. The first inspection and acceptance testing will be by DIT Radio Services to ensure components, cabling, and associated equipment installation meets all VCC, IFC, NFPA, and FCC specifications. Once approved, the fire alarm, building, and emergency communications coverage inspections can proceed. The building and electrical / low voltage permit inspection will be performed by LDS trades inspectors. The fire alarm and In-building emergency communications coverage inspections will be performed by OFM acceptance testing inspectors.

The following steps provide information concerning who to contact for the different inspection types.

1. To schedule the radio coverage system inspection and test, contact DIT – Radio Services Center:

- Phone: 703-591-1083

- Email: DITDistributedAntennaSystems@fairfaxcounty.gov

2. To schedule building and electrical / low voltage inspections contact Building and Trade Inspections (residential and commercial):

- Phone: 703-631-5101 Option 2
- Email: LDSBuildingInspections@fairfaxcounty.gov
- Scheduling Building and Low Voltage Inspections

3. Complete the Acceptance Test Request Form to schedule the fire alarm system / in-building emergency communications coverage inspections.

For questions concerning inspections, contact OFM – Fire Protection Systems Branch:

- Phone: 703-246-4821
- Email: Fire.AcceptanceTesting@fairfaxcounty.gov. (For complete ERCES installations only)
- Webpage: Acceptance Testing of Fire Protection Systems & Special Locks | Fire and Rescue (fairfaxcounty.gov)
- Note: Fire alarm and In-Building Emergency Communications Coverage inspections shall be coordinated with DIT, Fire Department Communications, and OFM.