



## Marion County Board of County Commissioners

### Fire Rescue ▪ Headquarters

2631 SE Third St.  
Ocala, FL 34471  
Phone: 352-291-8000  
Fax: 352-291-8098



### Marion County Fire Rescue

#### In Building Public Safety Minimum Radio Signal Strength Policy

The following document is intended to assist the customer in the preparation of drawings, submittal items, and required procedures for a radio system. This checklist identifies the minimum requirement for the initial plan review with Marion County Fire Prevention. This checklist in no way details all of the requirements that may be necessary for a complete code compliant system. Please refer to the current adopted codes and standards in accordance with the National, State, and Local regulations for detail. Please complete and check off item and include this document with your permit application.

Failure to provide a complete set of documents and this checklist will result in an additional plans review fee.

**As per the Florida Fire Prevention Code NFPA 1 Chapter 11.10.1**-Two-way radio communication enhancement systems in all new and existing buildings, minimum radio signal strength for fire department communications shall be maintained at a level determined by the authority having jurisdiction.

Marion County has determined that buildings in excess of 20,000 square feet shall have a test that determines the minimum radio signal strength for the location. Additionally, this policy shall apply to any building addition which the total square footage of the new and existing building exceeds 20,000 square feet combined.

Buildings shall comply with this policy prior to receiving a final fire inspection of the building and obtaining a recommendation to the building department for the fire portion of a Certificate of Occupancy (CO) being issued.

It is highly recommended that building owners address MRSS in early stages of the building/project- planning, otherwise costs of retrofitting of enhancement-equipment could be quite costly to building owner.

#### Engineer & Contractor Qualifications

- ☐ **Engineer:** The system design shall be completed by a Florida Licensed Professional Engineer. All design documents shall be signed and sealed.
- ☐ **Contractor:** The lead installation personnel and personnel conducting the radio system test shall be qualified to perform such work and hold a current (FCC General License) and low voltage licensed as required by the scope of work being performed



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### Minimum Requirements

*All drawings submitted shall be for the radio scope of work only-Plans shall indicate the work for the radio only and all unrelated work shall be removed from the drawings.*

- ☐ All drawings, specification, reports, or documents prepared shall be signed and sealed by a Florida registered design professional.
- ☐ The plans submitted will be for a New \_\_\_\_\_ or Existing \_\_\_\_\_. (Please indicate a note on the plans)

### Initial & Final Survey Test

- ☐ A preliminary site survey test shall be completed to determine the available strength. Exception: when the occupant chooses to install a radio system in the location without a test, only the final test report will be required. The plans shall state that the owner is opting to install a radio and will not perform the preliminary test but will perform the final acceptance test.

The survey testing shall be in accordance with NFPA 72-14.4.10.3 with a grid which is overlaid onto a floor area to provide 20 grid cells per story. A minimum grid cell dimension of 20 foot and a maximum grid dimension of 80 foot will suffice to encompass the entire floor area.

### New and Existing Building Requirements

- (A) The initial construction drawings shall include a radio communication enhancement drawing or a statement on the life safety page that identifies the requirements for the radio communication enhancement system testing for critical area and non-critical areas. The final drawing will be approved and used as the minimum design requirements for obtaining a permit for the installation of the radio system.
- (B) If a radio system is required based upon the initial survey test results, the installing contractor shall use the approved communication drawings stated above that have been approved during construction permitting to design and engineer the system.
- (C) The drawings shall identify the signal test results for all areas of the building.
- (D) A permit with submitted drawings shall be required and submitted by the installing company. The installing company can provide their own permit or be associated with an established permit. Permit issuance requirements are determined by the Marion County Building Department. Please contact Marion County Building Safety at 352-438-2400 for permit questions.





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- (E) A final radio signal test report shall be provided prior to the final fire inspection. Drawings shall be provided as necessary to reflect the work permitted and approved.

### Drawings:

***The State of Florida has adopted the 2016 editions of NFPA 1221 and NFPA 72. Please ensure the submitted plans are designed to the current standard (Adopted 01/01/2021).***

- ☐ Permits and Drawings are to be submitted to the Marion County Building Safety Department for processing and review. All permit requests and plans are to be submitted to Marion County Building Safety and will be routed to the appropriate department for review. Marion County Building Safety has the ability to submit plans in an electronic format, email format, and paper submittal. Please contact their office at 352-438-2400 to obtain submittal requirements and instructions.
- ☐ Plans shall include the project name, address, city, and state on each drawing.
- ☐ The contractors name, address, city, state, and license number shall be shown on each drawing.
- ☐ Plans shall include a scope of work with appropriate notes.
- ☐ Plans shall include a scale with a graphic representation of the scale used on all plans.
- ☐ A north arrow must appear on every sheet showing a portion of the site.
- ☐ A key plan shall be required as needed in the plans.
- ☐ The plans shall include the date prepared and any subsequent revision date properly noted.
- ☐ Each sheet must show the sheet number and installation sheets are attached for all control units, components, appliances, devices, modules, and relays as listed on the legend. Drawings shall include appropriate calculations and specifications for the system to be installed.
- ☐ Plans shall state the system is capable of an upgrade, to allow for instances where the jurisdiction may find it necessary to add or change frequencies in order to maintain radio coverage as originally designed in accordance with NFPA 72.



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#### Design

- ☐ All systems shall be designed in accordance with the currently adopted Florida Fire Prevention Code 7<sup>th</sup> edition and the applicable adopted Florida versions of NFPA 1221, NFPA 72, and NEC 70.
- ☐ A preliminary site survey shall be completed to determine the available signal strength.
- ☐ The drawings shall identify all rooms and spaces by name and their use.
- ☐ Is there is a fire alarm panel connected to the system. If the location contains a fire alarm the following shall be monitored by the panel (1) Normal AC Power, (2) Signal Booster Trouble, (3) Loss of Normal AC Power, (4) Failure of Battery Charger, and (5) Low Battery Capacity.

#### Radio Coverage Throughout the Building

- ☐ **Critical Areas Radio Coverage 99%-** All critical areas such as fire command centers, fire pump rooms, exit stairs, exit passageways, elevator, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and other areas deemed critical by the authority having jurisdiction shall have a minimum of 99% floor area radio coverage in accordance with NFPA 72/1221. Please note that if the building contains an elevator, Marion County will deem this area as critical in accordance with NFPA 1221 (2016) 9.6.7.4. A letter from Marion County Fire Rescue must be obtained for submission to the Florida Elevator Division for work inside the elevator shaft.
- ☐ **Non-Critical Areas Radio Coverage 90%-** Shall have a minimum of 90% Floor Area radio coverage in accordance with NFPA 72/1221 stated on the plans.
- ☐ A minimum **inbound signal strength** of -95 DBM shown throughout the coverage area in accordance with NFPA 72/1221.
- ☐ Is the radio enhancement system equipped with an FCC complaint Class “b” signal booster (Bi-Directional Amplifier/Distributed Antenna System) or other system approved by the AHJ.
- ☐ Are all components installed in a proper enclosure (such as repeaters, transmitters, receivers, signal booster components, and battery system components). For Example NEMA 4- or 4X-Type enclosures per NFPA 72/1221.





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- ☐ Are the radio enhancement system and all active controls located in a place that meets all environmental requirements with regards to heating, ventilation, cooling, and humidity requirements of the manufacturer specifications.
- ☐ Are the radio system active controls and enhancement system located in an area free from hazards
- ☐ If a signal booster is installed, is it FCC certificated and compatible with both analog and digital per NFPA 72/1221.
- ☐ Has the project met the requirements of pathway survivability? Specifically, does it meet the requirements of 1221/72 for Level 1, Level 2, or Level 3 protection? Indicate on the plans the level of pathway survivability that is being used for the location.
- ☐ All equipment shall be UL Listed in accordance with its intended use.
- ☐ Plans provide for lightning protection in accordance with NFPA 780.

### Monitoring Signals

- ☐ Does the integrity of the circuit monitoring the signal booster(s) and power supply comply with NFPA 72/1221.
- ☐ Signal booster and power supplies shall include the following monitoring signals:
- ☐ **Fire Alarm System Monitoring:** Shall include automatically supervisory and trouble signals booster(s) and power supplies that are annunciated by the fire alarm system and comply with the following:
  - 1) The integrity of the circuit monitoring the boosters and power supplies shall comply with NFPA 72/1221.
  - 2) System and signal booster supervisory signal shall include antenna malfunction, signal booster failure, and low battery capacity indication when 70 percent of the 12-hour capacity has been depleted.
  - 3) Power supply shall signals shall include the loss of normal AC power and failure of battery charger.



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- ☐ If a donor antenna exists, is there isolation between the donor antenna and all inside antennas at a minimum of 15 DB above the signal booster gain under all operating conditions per NFPA 72/1221
  - ☐ Are there no permanent external filters and attachments per NFPA 72/1221.
  - ☐ Are all exterior antennas directional, high gain, vertical polarized, and specified for the operating frequencies.
  - ☐ Are all antennas protected from lightning strikes per NFPA 72.
  - ☐ Is there a grid system overlaying all floors in order to identify areas of deficiencies while testing.
- Is the primary source supplied from a dedicated twenty (20) ampere branch circuit.

### Power Supply & Booster

- ☐ Is there at least two independent and reliable supplies provided for all repeater, transmitter, receiver, and signal booster components (primary and secondary) per NFPA 72/1221.
- ☐ All control panels must be connected to a dedicated circuit breaker marked Radio Enhancement Control Circuit per NFPA 72/1221.
- ☐ Are all backup batteries the same size as those required on the approved plan and marked with the date of installation per NFPA 72.
- ☐ The secondary power source shall consist of one of the following:
  - 1) A storage battery dedicated to the system with at least 12 hours of 100 percent system operation capacity
  - 2) An automatic starting engine driven generator serving the dedicated branch circuit or the system with at least 12 hours of 100 percent system operation capacity and storage batteries dedicated to the system with at least two hours of 100 percent system operation capacity.
- ☐ I have included this check sheet as part of my submittal package for a radio system installation permit.



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### Final Test Procedure and Requirements

- ☐ A second test shall be completed at the final that identifies the building has met the minimum requirements of the building signal strength for both critical and non-critical areas.
- ☐ A completed test report shall be submitted prior to the final inspection to Marion County Fire Rescue Fire Prevention for review.
- ☐ The certificate of radio coverage shall be posted next to the system devices and a signed and executed copy provided to the AHJ.
- ☐ Final approval shall be subject to field inspection and any corrections made in compliance with the code.
- ☐ **Verification of Radio Registration**-The installing contractor shall be responsible to register the system at the FCC website prior to calling for the final. The contractor shall provide proof of registration.
- ☐ Comments from Applicant:

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Marion County Public Safety Communications operates a Motorola 800 MHZ P25 phase one trunked radio system. The system contains 8 tower sites providing countywide coverage utilizing a simulcast configuration. The system contains 12 trunked channels which transmit between 850.000-860.000 MHZ and receiving between 805-815 MHZ.

The Motorola radio system uses a digital control channel that typically will assign to channel 1. The system may periodically rotate the control channel between the different channels.

When a radio signal test is conducted, the active control channel will need to be the test frequency used to determine the signal levels. The control channel continuously transmits data 24/7.

#### **Technical Criteria 9.6**

In accordance with NFPA 1221, the technical criteria documentation shall be provided by the Marion County Public Safety Communications Radio System Manager. Installers shall contact the radio manager to obtain frequencies, radio sites, delay, components, and other technical items.

Alphonso Gordon  
Marion County Radio Systems Manager  
Marion County Public Safety Communications  
2710 East Silver Springs Boulevard  
Ocala, Florida 34470  
(352) 671-8455  
[Alphonso.Gordon@marioncountyfl.org](mailto:Alphonso.Gordon@marioncountyfl.org)





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**Certificate of Radio Coverage Compliance Notice**

**Project Name:** \_\_\_\_\_

**Project Address:** \_\_\_\_\_

**Installation Contractor:** \_\_\_\_\_

**Test Date:** \_\_\_\_\_ **Test Time:** \_\_\_\_\_

(Testing for compliance and certification shall be after construction and interior finishing work is complete)

I am the responsible person in charge and I certify the occupancy identified above was tested for Marion County P25 Trunked system frequencies for public safety RF coverage levels and meets the minimum requirements set forth by NFPA 72 and NFPA 1221 as per adopted at time of installation.

I further certify that the building was tested in accordance with the provisions set forth in NFPA 72 and NFPA 1221 and to the best of my knowledge, information and belief, the radio coverage levels for this occupancy meet or exceed those required by NFPA 72 & NFPA 1221 as per adopted at the time of installation and permitting.

**Design Professional Certification:**

I hereby certify these engineering documents were prepared or approved by me, and I am duly licensed professional engineer under the laws of the State of Florida.

**Name:** \_\_\_\_\_ **Company:** \_\_\_\_\_

**Engineer License Number:** \_\_\_\_\_ **Expiration Date:** \_\_\_\_\_



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### FCC GROL License Professional:

I hereby certify that all initial and final testing documents were prepared or approved by me, and I am duly licensed by the federal communications commission in the United States and meet all rules and regulations of the State of Florida

Name: \_\_\_\_\_

Company: \_\_\_\_\_

FCC GROL License Number: \_\_\_\_\_

Expiration Date: \_\_\_\_\_

Signature FCC License Holder: \_\_\_\_\_

Date: \_\_\_\_\_

### Owner/General Contractor/Authorized Owner Signature:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_