



Emergency Responder Radio Coverage System

During emergencies, firefighters and other emergency response personnel use portable radios to communicate while inside of the building or structure. Buildings and structures interfere with the emergency responder's ability to effectively communicate due to construction types and materials. These features can absorb or block the radio frequency energy used to carry the signals inside or outside of the building, which poses a significant safety hazard to the emergency response personnel and building occupants.

As a safety solution, the International Fire Code (IFC) sets forth requirements for certain new and existing buildings to be equipped with an emergency responder radio coverage system. ***Compliance with all applicable provisions of the International Fire Code (IFC), 2018 edition, is required.***

Emergency Responder Radio Coverage (IFC 2018 510.1)

New buildings shall have *approved* radio coverage for emergency responders within the building based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

- 1. Where approved by the building official and the fire code official, a wired communication system in accordance with Section 907.2.12.2 shall be permitted to be installed or maintained instead of an approved radio coverage system.*
 - 2. Where it is determined by the fire code official that the radio coverage system is not needed.*
 - 3. In facilities where emergency responder radio coverage is required and such systems, components or the normal operations of that facility, the fire code official shall have the authority to accept an automatically activated emergency responder radio coverage system.*
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Emergency Responder Radio Coverage In Existing Buildings (IFC 2018 510.2)

Existing buildings shall be provided with *approved* radio coverage for emergency responders as required in Chapter 11. **(IFC 2018 1103.2): Existing buildings other than Group R-3, that do not have approved radio coverage for emergency responders in the building based on existing coverage levels of the public safety communication systems, shall be equipped with such coverage according to one of the following:**

- 1. Where an existing wired communication system cannot be repaired or is being replaced, or where not approved in accordance with Section 510.1, Exception 1.**
- 2. Within the time frame established by the adopting authority.**

Exception: Where it is determined by the fire code official that the radio coverage system is not needed.

Construction Permit is Required (IFC 510.3)

A construction permit for the installation of or modification to emergency responder radio coverage systems and related equipment is required. Maintenance performed in accordance with this code is not considered a modification and does not require a permit

Minimum Signal Strength In/Out of the Building (IFC 2018 510.4.1.1 & 510.4.1.2)

The minimum inbound/outbound signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The inbound signal level shall be sufficient to provide not less than a Delivered Audio Quality (DAQ) of 3.0 or an equivalent Signal-to-Interference-Plus-Noise Ratio (SINR) applicable to the technology for either analog or digital signals.

Radio Signal Strength (IFC 2018 510.4.1)

The building shall be considered to have acceptable emergency responder communication enhancement system coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 and 510.4.1.3.

System Design and Installation (IFC 2018 510.4.2)

The emergency responder radio coverage system shall be designed and installed in accordance with Sections 510.4.2.8 through 510.4.2.8 and NFPA 1221.

Amplification Systems Allowed (IFC 2018 510.4.2.1)

Buildings and structures that cannot support the required level of radio coverage shall be equipped with systems and components to enhance the public safety radio signals and achieve the required level of radio coverage specified in sections 510.4.1 through 510.4.1.3. Public safety communications enhancement systems utilizing radio-frequency-emitting devices and cabling shall be approved by the *fire code official*. Prior to installation, all RF-emitting devices shall have the certification of the radio licensing authority and be suitable for public safety use.

Standby Power (IFC 2018 510.4.2.3)

Emergency responder radio coverage systems shall be provided with dedicated standby batteries or provided with 2-hour standby batteries connected to the facility generator power system in accordance with Section 1203. The standby power supply shall be capable of operating the emergency responder radio coverage system at 100-percent system capacity for a duration of not less than 12 hours.

Signal Booster Requirements (IFC 2018 510.4.2.4)

If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4-type water proof cabinet.
 2. Battery systems used for the emergency power source shall be contained in a NEMA 3R or higher-rated cabinet.
 3. Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.
 4. Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions.
 5. Bi-Directional Amplifiers (BDAs) used in emergency responder radio coverage systems shall have oscillation prevention circuitry.
 6. The installation of amplification systems or system that operate on or provide the means to cause interference on any emergency responder radio coverage networks shall be coordinated and approved by the *fire code official*.
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Additional Frequencies And Change of Frequencies (IFC 2018 510.4.2.6)

The building owner shall modify or expand the frequency range at his or her expense in the even frequency changes are required by the FCC or additional frequencies are made available by the FCC. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this requirement. (www.fcc.gov)

Installation Requirements (IFC 2018 510.5)

The installation of the public safety radio coverage system shall be in accordance with NFPA 1221 and Sections 510.5.1 through 510.5.2.

Approval Prior to Installation (IFC 2018 510.5.1)

Amplification systems capable of operating on frequencies licensed to any public safety agency by the FCC or other radio licensing authority shall not be installed without prior coordination and approval of the *fire code official*.

Minimum Qualifications of Personnel (IFC 2018 510.5.2)

The minimum qualifications of the system designer and lead installation personnel shall include both of the following:

1. A valid FCC-issued general radio operators license
2. Certification of in-building system training issued by an approved organization or approved school, or a certificate issued by the manufacturer of the equipment being installed.

These qualifications shall not be required where demonstration of adequate skills and experience satisfactory to the fire code official is provided.

Acceptance Test Procedure (IFC 2018 510.5.3)

Where an emergency responder. Radio coverage system 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 95%. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications.
3. Failure of more than one test area shall result in failure of the test.
4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40 area test, the system shall be altered to meet the 95-percent coverage requirement.
5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.
6. 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. In the event that the measurement results become lost, the building *owner* shall be required to rerun the acceptance test to reestablish the gain values.
7. 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 and at subsequent annual inspections.
8. Systems incorporating Class B signal-booster devices or Class B broadband fiber remote devices shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

Reference the video hyperlink below:

https://www.youtube.com/watch?time_continue=100&v=osGhVGWbZeU&feature=emb_logo

FCC Compliance (IFC 2018 510.5.4)

The emergency responder radio coverage system installation and components shall comply with all applicable federal regulations including, but not limited too, FCC 47 CFR Part 90.219.

Maintenance (IFC 2018 510.6)

The emergency responder radio coverage system shall be maintained operational at all times in accordance with Sections 510.6.1 through 510.6.4.

Testing and Proof of Compliance (IFC 2018 510.6.1)

The owner of the building or owner's authorized agent shall have the emergency responder radio coverage system shall be inspected and tested annually or where 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 tests as described in section 510.5.3.
2. Signal boosters shall be tested to verify that the gain is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.
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 manufacturers specifications.
5. At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.3, shall be submitted to the *fire code official*.

Field Testing (IFC 2018 510.6.4)

Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of radio coverage.

Any questions regarding Emergency Responder Radio Coverage please contact Taylor Bryant or Nelson Bauer at (251) 981-6166.

REFERENCE COPY

This is not an official FCC license. It is a record of public information contained in the FCC's licensing database on the date that this reference copy was generated. In cases where FCC rules require the presentation, posting, or display of an FCC license, this document may not be used in place of an official FCC license.



**Federal Communications Commission
Public Safety and Homeland Security Bureau**

RADIO STATION AUTHORIZATION

LICENSEE: BALDWIN COUNTY COMMISSION

ATTN: MICHAEL JOB, ASST. DIR CIS DEPT
BALDWIN COUNTY COMMISSION
22251 PALMER STREET
ROBERTSDALE, AL 36567

Call Sign WQKW889	File Number
Radio Service SY - Trunked Public Safety 700 MHz	
Regulatory Status PMRS	
Frequency Coordination Number	

FCC Registration Number (FRN): 0001747526

Grant Date 10-13-2009	Effective Date [REDACTED]	Expiration Date [REDACTED]	Print Date
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STATION TECHNICAL SPECIFICATIONS

Fixed Location Address or Mobile Area of Operation

- Loc. 1** Address: 23972 PERDIDO BEACH BLVD
City: ORANGE BEACH County: BALDWIN State: AL
Lat (NAD83): 30-15-40.8 N Long (NAD83): 087-36-55.0 W ASR No.: Ground Elev: 5.5
- Loc. 2** Area of operation
Land Mobile Control Station meeting the 6.1 Meter Rule: BALDWIN county, AL
- Loc. 3** Area of operation
Countywide: BALDWIN, AL
- Loc. 4** Address: 29900 WAYSIDE DR
City: SPANISH FORT County: BALDWIN State: AL
Lat (NAD83): 30-39-34.0 N Long (NAD83): 087-53-33.0 W ASR No.: 1036419 Ground Elev: 50.9
- Loc. 5** Address: 555 S. SECTION STREET
City: FAIRHOPE County: BALDWIN State: AL
Lat (NAD83): 30-30-27.9 N Long (NAD83): 087-54-02.6 W ASR No.: 1232676 Ground Elev: 24.7

Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp (meters)	Ant. AAT (meters)	Construct Deadline Date
1	1	000769.09375000	FB2	1		8K10F1E 9K80D7W	16.000	120.200	121.9	123.8	10-13-2010

Conditions:

Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

Licensee Name: BALDWIN COUNTY COMMISSION

Call Sign: WQKW889

File Number:

Print Date:

Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp meters	Ant. AAT meters	Construct Deadline Date
1	1	000769.34375000	FB2	1		8K10F1E 9K80D7W	16.000	120.200	121.9	123.8	10-13-2010
1	1	000769.84375000	FB2	1		8K10F1E 9K80D7W	16.000	120.200	121.9	123.8	10-13-2010
1	1	000770.11875000	FB2	1		8K10F1E 9K80D7W	16.000	120.200	121.9	123.8	10-13-2010
1	1	000770.51875000	FB2	1		8K10F1E 9K80D7W	16.000	120.200	121.9	123.8	10-13-2010
1	1	000771.01875000	FB2	1		8K10F1E 9K80D7W	16.000	120.200	121.9	123.8	08-28-2013
2	1	000800.11875000	FX1	15		8K10F1E 9K80D7W	16.000	88.200			
2	1	000799.09375000	FX1	15		8K10F1E 9K80D7W	16.000	88.200			
2	1	000799.34375000	FX1	15		8K10F1E 9K80D7W	16.000	88.200			
2	1	000799.84375000	FX1	15		8K10F1E 9K80D7W	16.000	88.200			
2	1	000800.51875000	FX1	15		8K10F1E 9K80D7W	16.000	88.200			
2	1	000801.01875000	FX1	15		8K10F1E 9K80D7W	16.000	88.200			
3	1	000799.09375000	MO	150		8K10F1E 9K80D7W	25.000	23.200			10-13-2010
3	1	000799.34375000	MO	150		8K10F1E 9K80D7W	25.000	23.200			10-13-2010
3	1	000799.84375000	MO	150		8K10F1E 9K80D7W	25.000	23.200			10-13-2010
3	1	000800.11875000	MO	150		8K10F1E 9K80D7W	25.000	23.200			10-13-2010

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Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp meters	Ant. AAT meters	Construct Deadline Date
3	1	000800.51875000	MO	150		8K10F1E 9K80D7W	25.000	23.200			10-13-2010
3	1	000801.01875000	MO	150		8K10F1E 9K80D7W	25.000	23.200			08-28-2013
3	1	000803.19375000	MO	100		8K10F1E 9K80D7W	25.000	23.200			04-08-2016
3	1	000801.69375000	MO	100		8K10F1E 9K80D7W	25.000	23.200			04-08-2016
3	1	000801.14375000	MO	100		8K10F1E 9K80D7W	25.000	23.200			04-08-2016
3	1	000800.75625000	MO	100		8K10F1E 9K80D7W	25.000	23.200			04-08-2016
3	1	000803.99375000	MO	100		8K10F1E 9K80D7W	25.000	23.200			04-08-2016
4	1	000773.19375000	FB2	1		8K10F1E 9K80D7W	50.000	213.800	121.2	149.6	04-08-2016
4	1	000771.69375000	FB2	1		8K10F1E 9K80D7W	50.000	213.800	121.2	149.6	04-08-2016
4	1	000771.14375000	FB2	1		8K10F1E 9K80D7W	50.000	213.800	121.2	149.6	04-08-2016
4	1	000770.75625000	FB2	1		8K10F1E 9K80D7W	50.000	213.800	121.2	149.6	04-08-2016
5	1	000773.99375000	FB2	1		8K10F1E 9K80D7W	50.000	181.700	54.9	65.9	04-08-2016

Control Points

Control Pt. No. 1

Address: 22251 PALMER STREET

City: ROBERTSDALE County: BALDWIN State: AL Telephone Number: (251)580-2575

Associated Call Signs

Licensee Name: BALDWIN COUNTY COMMISSION

Call Sign: WQKW889

File Number:

Print Date:

<NA>

Waivers/Conditions:

Operation in the 769 - 775 MHz and 799 - 805 MHz frequency band must be operated only in accordance with Rule 90.545 and must protect existing TV and DTV broadcast stations transmitting on TV channels 62, 63, 64, 65, 67, 68, or 69.