



BI-DIRECTIONAL AMPLIFIER

TWO-WAY RADIO COMMUNICATION ENHANCEMENT SYSTEMS

7TH EDITION FFPC

NFPA ,1 (FIRE CODE), 2018, SECTION 11.10
ALL BUILDINGS ARE REQUIRED TO HAVE A
MINIMUM RADIO SIGNAL STRENGTH
DETERMINED BY THE AHJ

Bryan Parks

Kenneth Castronovo

CODES

NFPA 1, 2018, CHAPTER 11.10
TWO WAY RADIO COMMUNICATION ENHANCEMENT SYSTEMS

NFPA 72, 2016, CHAPTER 24.
TWO WAY RADIO ENHANCEMENT SYSTEMS

NFPA 72, 2016, CHAPTER 14
INSPECTION, TESTING AND MAINTENANCE

NFPA 1221, 2016, SECTION 9.6
TWO WAY RADIO COMMUNICATION ENHANCEMENT SYSTEMS

BROWARD COUNTY, CHAPTER 1 (VOTED ON BY BOARD MARCH 10, 2016)



TWO-WAY RADIO COMMUNICATIONS ENHANCED SYSTEMS

APPLIES TO BOTH

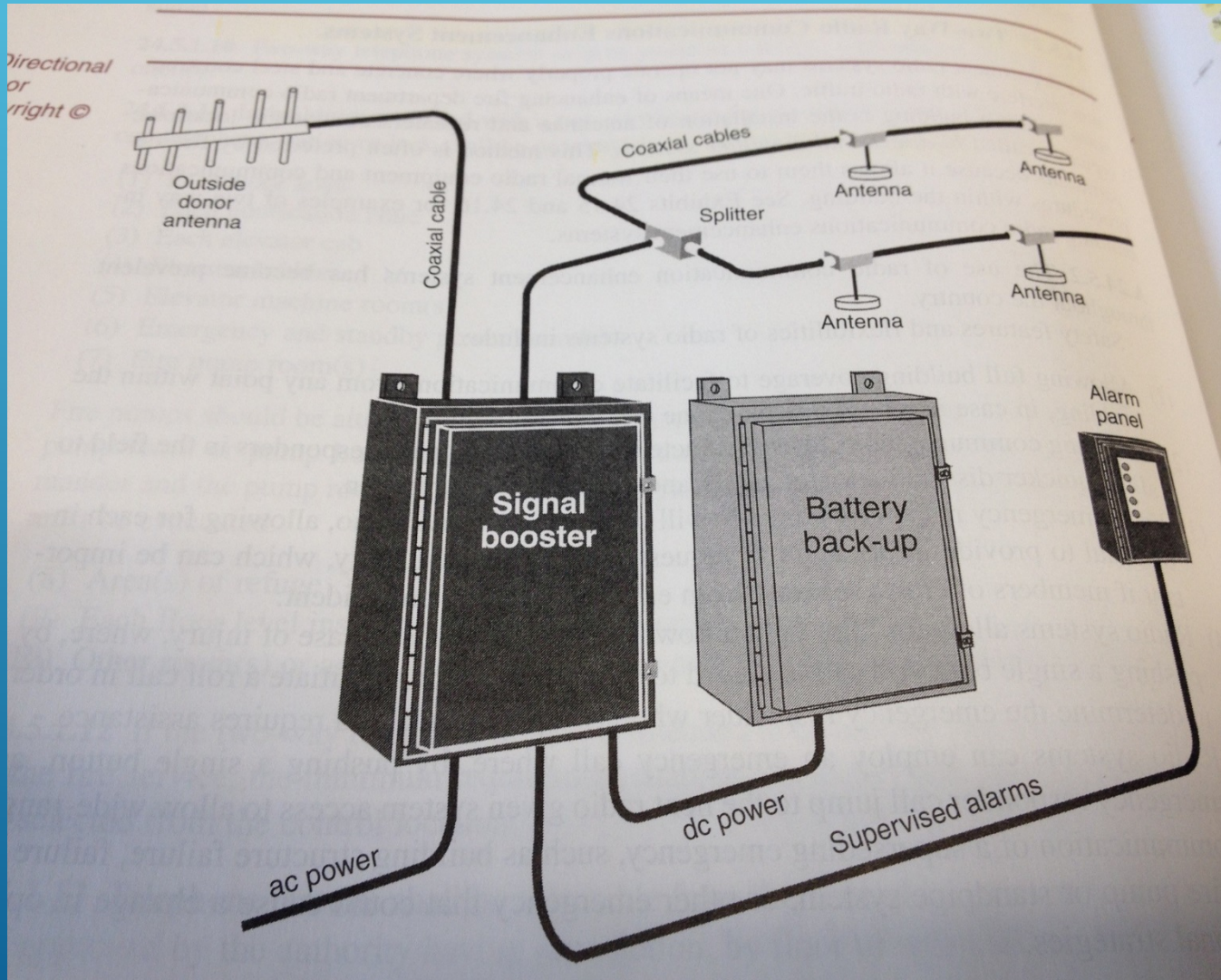
NEW AND EXISTING STRUCTURES

A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, located in the lower right quadrant of the slide.

FS 633.202

(18) The authority having jurisdiction shall determine the minimum radio signal strength for fire department communications in **all new high-rise and existing high-rise buildings**. Existing buildings are not required to comply with minimum radio strength for fire department communications and two-way radio system enhancement communications as required by the Florida Fire Prevention Code until January 1, 2022. However, by December 31, 2019, an existing building that is not in compliance with the requirements for minimum radio strength for fire department communications must apply for an appropriate permit for the required installation with the local government agency having jurisdiction and must demonstrate that the building will become compliant by January 1, 2022. **Existing apartment buildings are not required to comply until January 1, 2025**. However, existing apartment buildings are required to apply for the appropriate permit for the required communications installation by December 31, 2022.

NFPA 72



Basic overview of Two-Way Radio Enhanced System

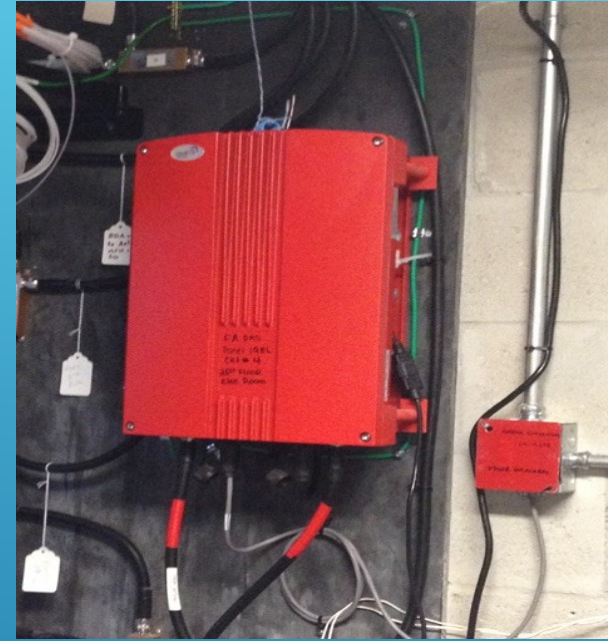
Note: The figure shows a **dedicated alarm panel** which should not be confused with the fire alarm panel.

NFPA 1221 9.6.13.2 requires that a Dedicated Panel also be installed.

BDA Booster Panel



BDA Booster Panel



NFPA 1221 9.6.11.2 NEMA 4 OR 4X ENCLOSURE(S) ARE REQUIRED

Battery Back Up plug into wall duplex receptacle

Not per code



Battery Back Up plug into wall duplex receptacle

Not per code



NFPA 1221

9.6.12 POWER SUPPLY SHALL CONFORM WITH NFPA 72

9.6.12 AT LEAST TWO INDEPENDENT AND RELIABLE POWER SUPPLIES SHALL BE PROVIDED

9.6.12.1 DEDICATED BRANCH CIRCUIT

9.6.12.3 CIRCUIT IDENTIFICATION AND ACCESSIBILITY

9.6.12.2 SECONDARY POWER SUPPLY FOR PROTECTED PREMISES FIRE ALARM SYSTEMS AND EMERGENCY COMMUNICATIONS SYSTEMS, (STORAGE BATTERY OR ALTERNATE SOURCE).

9.6.13.1 FIRE COMMAND CENTER (ANNUNCIATION AT FIRE COMMAND CENTER, NFPA 72, 2016 , DEFINITIONS 3.3.104)

9.6.14 COMPLETION DOCUMENTS

NFPA 72, 14.4.9, NFPA 1221 11.3.9
Annual Tests.

Where a public safety radio enhancement system is required, it shall be the building owner's responsibility to have all live components of the system, such as signal boosters, power supplies, and backup batteries tested at a **minimum of once every 12 month**. The AHJ shall be notified in advance and shall direct annual test procedures and requirements.

ANNUAL TEST

A-11.3.9 Typically, annual test require several items to be checked. Annual test should include all procedures encompass in 11.3.9. Signal boosters should be measured to ensure that the gain is the same as it was upon initial installation and acceptance. Backup batteries and power supplies should be tested under load for a period of 1 hour to verify that they will properly operate during an actual power outage. Other active components are typically checked to determine that they are operating within the manufacturer's specifications for the intended purpose.

WHY SO MUCH ATTENTION TO NFPA 1, 11.10
TWO-WAY ENHANCED RADIO SYSTEMS ARE PART
OF THE BUILDING LIFE SAFETY SYSTEM AS A
COMPONENT OF THE FIRE ALARM SYSTEM

BDA are not a stand alone system but part of the Fire Alarm and
Building Life Safety

County Administrator Letter



BERTHA W. HENRY, County Administrator
115 S. Andrews Avenue, Room 409 • Fort Lauderdale, Florida 33301 • 954-357-7362 • FAX 954-357-7360

May 8, 2015

Mr. James DiPietro
Administrative Director
Board of Rules and Appeals
1 North University Drive
Suite 3500 B
Plantation, FL 33324

Subject: Local Amendment to Building Code for Bi-Directional Amplifiers in Facilities

Dear Mr. DiPietro:

County staff has been working to identify interference issues that have been affecting Broward County's public safety radio system. There are many causes that can be attributed to interference however, most recently, County staff identified bi-directional amplifiers (BDAs) in high rise buildings in the Cities of Aventura and Hallandale Beach as a cause of significant interference.

Bi-directional amplifiers are signal boosters that are primarily used to solve coverage problems. Typically, impenetrable areas such as buildings, tunnels, parking garages, underground areas are some of the locations where BDAs may be needed. When configured correctly, a BDA is an important device because it assists our first responders with communication in these impenetrable areas in an effective manner. We encourage Cities to consider requiring BDAs in buildings to assist with public safety communication inside the building; however, per the Federal Communication Commission (FCC 11-53 and FCC 13-21) they must be configured correctly to avoid impacting the public safety radio system.

In the buildings in the Cities of Aventura and Hallandale Beach, County staff was able to locate these devices by performing "field sweeps" that scanned the area for interference. This is a time consuming process that requires a considerable amount of resources to identify the interference. Once identified, it was determined that the BDAs were not configured correctly; thus adversely affecting Broward County's public safety radio system. When the public safety radio system is affected communication to our first responders is limited and it can impact the ability to respond in a timely manner to emergency situations for our first responders, citizens, businesses and visitors. County staff is currently working with the vendor who installed the BDAs to properly configure the devices.

To ensure that BDAs are configured correctly, County staff is requesting a local amendment to the Florida Building Code be reviewed and approved to allow for County staff in the Office of Regional Communications and Technology (ORCAT) to sign-off on the configuration of any bi-directional amplifiers that are installed in buildings and facilities. Our overall goal is to minimize the impact that BDAs may have on the public safety radio system and public safety.

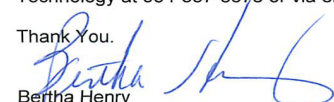
Broward County Board of County Commissioners
Mark D. Bogen • Beam Furr • Dale V.C. Holness • Martin David Kiar • Chip LaMarca • Stacy Ritter • Tim Ryan • Barbara Sharief • Lois Wexler
www.broward.org

Board of Rules and Appeals
May 8, 2015

County staff from the Office of Regional Communications and Technology is prepared to meet with the Broward County Board of Rules and Appeals (BORA) to further discuss this request at your next available meeting.

We look forward to hearing from you on this request and assisting us in this important initiative. If you have any questions, please contact Rick Carpani, Director, Office of Regional Communications and Technology at 954-357-8678 or via email at rcarpani@broward.org.

Thank You.


Bertha Henry
County Administrator

BH:AJ:lr

cc: Broward County Board of County Commissioners
Joni Armstrong-Coffey, County Attorney
Rob Hernandez, Deputy County Administrator
Alphonso Jefferson, Jr., Assistant County Administrator
Rick Carpani, Director, Office of Regional Communications and Technology
Leonard Vialpando, P.E., Director, Environmental Licensing and Building Permitting Division
Broward County Consolidated Communications Committee

BROWARD BUILDING CODE, CHAPTER 1

Broward Board of Rules and Appeals
BDA Committee

Section 118 Two-Way Radio Communication Enhanced
Public Safety Signal Booster Systems



118.1 GENERAL:

118.1.1 THE TWO-WAY RADIO COMMUNICATION ENHANCEMENT PUBLIC SAFETY SIGNAL BOOSTER SYSTEM SHALL BE INSTALLED AS PER NFPA 1-11.10, NFPA 70, NFPA 1221 AND NFPA 72. ANY SUCH SYSTEM **SHALL BE ADAPTABLE FOR BOTH 700/800 OR MHZ P25** (ASSOCIATION OF PUBLIC SAFETY COMMUNICATION OFFICIALS, PROJECT 25).

118.1.2 THE AUTHORITY HAVING JURISDICTION (AHJ), IN BROWARD COUNTY, FOR THE TWO-WAY RADIO COMMUNICATION ENHANCEMENT PUBLIC SAFETY SIGNAL SYSTEMS **HAS TWO (2) PERMITTING ENTITIES AND MULTIPLE FREQUENCY LICENSES AS FOLLOWS:**

1 THE INSTALLATION AND WIRING SHALL COMPLY WITH THE LOCAL MUNICIPALITY BUILDING AND FIRE DEPARTMENTS PERMITTING PROCESS AND **SHALL BE APPROVED BY THE LOCAL AND COUNTY FCC LICENSEE PRIOR TO INSTALLATION.**

2 THE FCC LICENSEES ARE:

BROWARD COUNTY ORCAT

CITY OF CORAL SPRINGS

CITY OF FORT LAUDERDALE

CITY OF HOLLYWOOD

CITY OF PLANTATION

118.1.3 THE AHJ SHALL DETERMINE IF A NEW BUILDING OR EXISTING BUILDING SHALL REQUIRE THAT A TWO-WAY RADIO COMMUNICATION ENHANCED PUBLIC SAFETY SIGNAL BOOSTER SYSTEM BE INSTALLED TO COMPLY WITH NFPA 1-11.10.1. THE BUILDING OWNER SHALL INSTALL A PUBLIC SAFETY SIGNAL BOOSTER TO MEET THIS REQUIREMENT IF SO DIRECTED.

118.1.4 DESIGN: FOR NEW BUILDINGS, A TEMPORARY, PARTIAL OR CERTIFICATE OF OCCUPANCY SHALL NOT BE ISSUED UNTIL THE AHJ DETERMINES THAT THE BUILDING IS IN COMPLIANCE WITH NFPA 1-11.10.1. IT IS RECOMMENDED THAT THE LOCAL DEVELOPMENT REVIEW COMMITTEE (DRC) NOTIFY THE NEW BUILDING OWNER, ARCHITECT, AND ENGINEERS OF THIS REQUIREMENT IN WRITING BEFORE THE BUILDING IS DESIGNED. AT THE TIME OF BDA PERMITTING, A DESIGN PACKAGE, COMPRISING OF BLOCK LEVEL DIAGRAM, MATERIALS SUBMITTALS, COVERAGE MEASUREMENTS AND PREDICTIONS ARE REQUIRED. SUFFICIENT AND SUBSTANTIAL ENGINEERING DESIGN AND SUPPORT INFORMATION AND DATA SHALL BE SUBMITTED WITH THE APPLICATION. A SEALED SUBMITTAL FROM AN ENGINEER, WITH TRAINING AND EXPERIENCE IN ELECTRICAL ENGINEERING, SHALL ALSO BE REQUIRED.

118.1.5 TO THE EXTENT AUTHORIZED BY LAW, DISTRIBUTED ANTENNA SYSTEMS INTEGRATORS WITH PUBLIC SAFETY AND/OR COMMUNICATION INSTALLATION EXPERIENCE, AS A SUB-CONTRACTOR IN ASSOCIATION WITH QUALIFIED ELECTRICAL CONTRACTORS, TWO WAY RADIO ENHANCEMENT INSTALLERS AND FIRE ALARM CONTRACTORS, MAY INSTALL OR REPAIR TWO – WAY RADIO COMMUNICATION ENHANCEMENT SYSTEMS. THE CONTRACTOR OF RECORD WITHOUT RADIO FREQUENCY EXPERIENCE (RF) SHALL SUB-CONTRACT THE INSTALLATION OR REPAIR OF NON-FIRE ALARM FUNCTION TO A QUALIFIED COMPANY, HAVING KNOWLEDGE OF RADIO FREQUENCY INSTALLATIONS, WITH TRAINING AND EXPERIENCE.

118.2 PERMIT DOCUMENTATION:

118.2.1 THE FOLLOWING DOCUMENTATION SHALL BE REQUIRED FOR PERMITTING A “TWO-WAY RADIO COMMUNICATION ENHANCEMENT SYSTEM”:

1. CITY AND COUNTY FCC LICENSEE SHALL APPROVE PROPOSED INSTALLATION OF TWO-WAY RADIO COMMUNICATING ENHANCED SYSTEMS PRIOR TO INSTALLATION IN WRITING OR BY STAMPING DOCUMENTS SUBMITTED FOR REVIEW.
2. CITY AND COUNTY WRITTEN APPROVAL OR STAMPED DOCUMENTS SHALL BE PROVIDED TO THE LOCAL FIRE PREVENTION BUREAU OFFICE AT THE TIME OF PLAN SUBMITTAL AND PRIOR TO PLAN REVIEW.
3. PLANS SHALL COMPLY WITH FBC 107, NFPA 1, 1.7, NFPA 70, 1221 AND NFPA 72. PLANS TO BE SIGNED AND SEALED BY AN ENGINEER
4. SEALED FLOOR PLANS SHOWING RADIO COVERAGE FOR CRITICAL AND GENERAL AREAS (RF MODELING).
5. SCHEDULE OF SIGNAL STRENGTH AS PER NFPA 72 OR AS AGREED TO BY THE FIRE CODE OFFICIAL IN CONSULTATION WITH THE FCC LICENSEE IN WRITING.
6. SCHEDULE OF THE SYSTEM RADIO FREQUENCIES OR BAND OF FREQUENCIES.
7. NOTATION THAT THE SYSTEM IS UPGRADABLE FOR FREQUENCY BAND COVERAGE CHANGES INCLUDING AT A MINIMUM BOTH 700/800 MHZ
8. PLANS SHALL SHOW THAT THE BDA ENCLOSURE SHALL BE PAINTED RED. A SIGN AFFIXED NEXT TO OR STENCILING ON THE ENCLOSURE SHALL BE PROVIDED IN HIGH CONTRASTING LETTERS OVER A RED BACKGROUND, WEATHERPROOF PLAQUE AND SHALL INCLUDE THE FOLLOWING INFORMATION:
 - A) FIRE DEPARTMENT SIGNAL BOOSTER
 - B) PERMIT NUMBER: _____
 - C) SERVICED BY: VENDOR NAME AND TELEPHONE

118.3 SYSTEM NOTIFICATIONS:

118.3.1 THE AHJ'S FOR THE FCC LICENSEE AND BROWARD COUNTY OFFICE OF REGIONAL COMMUNICATIONS AND TECHNOLOGY (ORCAT) SHALL BE NOTIFIED IN WRITING OF THE FOLLOWING EVENTS BY THE PERMIT HOLDER, THE SYSTEM VENDOR, AND/OR THE BUILDING OWNER. THE AHJ FOR THE FCC LICENSEE SHALL APPROVE THE DATE AND TIME AND MAY REQUEST THAT THE AHJ SHALL BE PRESENT DURING THE FOLLOWING EVENTS:

- 1 INITIAL SYSTEM TESTING, WITH DATE AND TIME START AND FINISH.
- 2 PERIODIC SYSTEM TESTING, WITH DATE AND TIME START AND FINISH.
- 3 SYSTEM PLACED IN OPERATION WITH DATE AND TIME.

118.4.2 PRIOR TO THE INITIAL TESTING:

1. THE VENDOR SHALL PROVIDE THE SYSTEM'S SETTINGS PRIOR TO THE INITIAL SYSTEM TESTING AS ACCEPTED BY THE AHJ, FCC LICENSEE AND ORCAT. THE AHJ MAY ASK FOR ADDITIONAL INFORMATION PRIOR TO TESTING.

2. THE SYSTEM SHALL REMAIN "OFF THE AIR" UNTIL THE INITIAL TESTING WITH AHJ, FCC LICENSEE, ORCAT, AND THE FIRE CODE OFFICIAL ARE READY TO BEGIN AND PROVIDE THEIR APPROVAL.

118.5 ANNUAL TEST

118.5.1 IN ADDITION TO THE ANNUAL FIRE ALARM TEST, AN ANNUAL TEST AND REPORT, IN COMPLIANCE WITH NFPA 1221, CHAPTER 11, SHALL BE COMPLETED BY A QUALIFIED COMPANY HAVING THE KNOWLEDGE OF RF INSTALLATION WITH TRAINING AND EXPERIENCE OF TWO – WAY RADIO COMMUNICATION ENHANCED RADIO SYSTEMS TO INSURE THAT THE ORIGINAL INSTALLED SYSTEM IS STILL IN COMPLIANCE.

118.5.2 ANNUAL TEST REPORT:

THE ANNUAL TEST REPORT SHALL BE MAINTAINED WITH THE FIRE ALARM LOG BOOK AND COPIES SHALL BE SUBMITTED TO THE LOCAL AHJ AND TO CITY AND ORCAT FOR REVIEW. ALL PROBLEMS FOUND, WITH ANY CORRECTIVE ACTION(S), SHALL BE NOTED IN THE TEST REPORT, ALONG WITH THE NAME AND LICENSE NUMBER OF THE FIRE ALARM CONTRACTOR AND SUB-CONTRACTOR INSPECTION COMPANY.

118.6. SYSTEM MONITORING AND MAINTENANCE:

ANY PUBLIC SAFETY SIGNAL BOOSTER SYSTEM INSTALLED IN A PREMISE SHALL BE TIED INTO A FIRE ALARM SYSTEM FOR MONITORING.

IN CASE OF FAILURE, THE BUILDING OWNER SHALL BE NOTIFIED WITHIN TWO (2) HOURS AND HE/SHE SHALL CAUSE TO OCCUR AN INSPECTION OF THE SYSTEM. IF A TROUBLE CONDITION IS FOUND THE SYSTEM SHALL BE REPAIRED WITHIN 2 HOURS OF NOTIFICATION. IF SUCH REPAIR PROVES TO BE LONGER IN TIME OR IMPOSSIBLE TO PERFORM, A NOTIFICATION TO THE FIRE MARSHAL SHALL BE MADE INDICATING THE FAILURE OF THE SYSTEM, SO THAT IN CASE OF EMERGENCY THE SYSTEM SHALL NOT BE RELIED UPON BY THE FIRST RESPONDERS.
ANY SYSTEM INSTALLED SHALL HAVE A SERVICE LEVEL AGREEMENT WITH A RESPONSIBLE COMPANY THAT PROVIDES FOR NO MORE THAN 48 HOURS RESPONSE TIME. ONCE THE SYSTEM IS REPAIRED THE SERVICE COMPANY SHALL NOTIFY BOTH THE BUILDING OWNER AND THE FIRE MARSHAL.

ORCAT

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QUESTIONS

