

SECTION 3:

ANNEX I

FIRE DEPARTMENT REQUIREMENTS AND FORMS

CITY OF CHARLOTTE, NORTH CAROLINA

FIRE DEPARTMENT 2 WAY RADIO COMMUNICATION SYSTEM

Section 1.

Public Safety Radio Coverage In Buildings

1.1 Building Radio Coverage. Except as otherwise provided no person shall maintain, own, erect, or construct, any building or structure or any part thereof, or cause the same to be done which fails to support adequate radio coverage for public safety entities, including, but not limited to, firefighters, emergency medical services and police officers. "Agency" as used in this code means the local governmental authority enacting this code.

Exceptions:

1. This section shall not apply to single family residential buildings; any building constructed of wood frame; any building twenty-five (25) feet high or less; as long as none of the aforementioned buildings make primary use of metal or concrete construction or contain below grade storage or parking areas. For purposes of this section, parking structures are included in the definition of building, and stair shafts are included in the definition of all parts of a building, but elevators may be excluded.
2. Buildings constructed prior to the implementation of this section shall not be required to comply with public safety radio coverage provisions of this section. However, should exempted structures undergo renovation, restoration, or significant modification to the original structure, exemption from the provisions of this Ordinance shall not apply.

1.2 Minimum Radio Coverage into building. A minimum voice quality of DAQ 3.4 (see TSB-88-B) (for Digital radio systems) and Circuit Merit 3 (for Analog systems) be present in all areas of the building when transmitted from the agency's radio system. For purposes of this section, 95% building coverage is considered to be all areas of the building.

1.3 Minimum Signal Strength out of building. A minimum signal strength of 20 db \pm 5 db above the noise floor shall be provided to and from the agency's radio system when transmitted or received from all areas of the building. For purposes of this section, 95% building coverage is considered to be all areas of the building.

1.4 Technical criteria maintained by the Agency. The agency shall maintain a document of technical information specific to their requirements. This document shall contain as a minimum; the frequencies required, the location and effective radiated power (ERP) of radio sites used by the in-building system, the maximum propagation delay (in microseconds) and other supporting technical information.

1.5 Amplification Systems Allowed. Buildings and structures which cannot support the required level of radio coverage shall be equipped with a radiating cable system and/or a distributed antenna system (DAS) with FCC certified Bi-Directional Amplifier (BDA)s (aka bi-directional amplifiers), or systems otherwise approved by the agency in order to achieve the required adequate radio coverage.

1.6 Battery Systems. The active components of the installed system or systems shall be capable of operating on an independent battery system for a period of at least twelve (4) hours without external power input. The battery system shall automatically charge in the presence of external power input.

1.7 Bi-Directional Amplifier (BDA) requirements. If used, Bi-Directional Amplifier (BDA)s shall meet the following requirements as well as any other requirements determined by the agency;

- a. All Bi-Directional Amplifier (BDA) components shall be contained in one NEMA4 type water proof cabinet. Permanent external filters and attachments are not permitted.
- b. The battery system shall be contained in one NEMA4 type water proof cabinet.
- c. The system shall be capable of providing automatic alarming of malfunctions of the Bi-Directional Amplifier (BDA) and battery system. Any resulting alarm shall be transmitted to the agency's designated recipient by means specified by the agency, including, but not limited to, automatic standard telephone dial-up circuit, TCP/IP network circuit, RS232 interface, etc.
- d. Products used in such systems must have FCC Certification prior to installation. Pending FCC certification is not acceptable.
- e. All Bi-Directional Amplifier (BDA)s must be compatible with both analog and digital communications simultaneously at the time of installation.

1.8 Additional frequencies and change of frequencies. The building owner will be required to modify or expand the public safety in-building system at their expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC. This is an advisory statement that the building owner may select equipment and distribution components that are capable of such changes. Prior approval of an in-building system on previous frequencies does not exempt this section.

1.9 Approval Prior to Installation. No amplification system capable of operating on frequencies licensed to the agency by the FCC shall be installed without prior coordination and approval of the agency. This is a FCC requirement.

2.0 Engineering and Design. The Bi-Directional Amplifier (BDA) system(s) shall be designed by a professionally licensed Engineering Firm with a currently certified electrical engineering professional in its employ.

2.1 Implementation. The Bi-Directional Amplifier (BDA) systems shall only be implemented by professional system integrator certified and trained by the manufacturer of the Bi-Directional Amplifier (BDA).

2.2 Documentation. As-built drawings consisting of a system block diagram, layout drawings and data settings, shall be provided electronically in AutoCAD format on CD and in paper copies (2) to the agency.

2.3 Testing and Proof of Compliance. Each owner shall submit at least one in-building coverage test:

1. Acceptance testing prior to occupancy of any newly constructed building.
2. Whenever structural changes occur including additions to buildings that would materially change the original field performance tests
3. Annually
4. When repairs or alterations are made to amplification systems, the performance test shall demonstrate that adequate radio coverage is available in all required areas of the building. At the conclusion of the testing a report shall be submitted to the agency which shall verify compliance with Section 1.2.

2.4. Acceptance Test Procedure. When an in-building radio system is required, and upon completion of installation, it will be the building owner's responsibility to have, the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 95 percent.

2.4.1 Each floor of the building shall be divided into a grid of approximately 40 equal areas. A maximum of two nonadjacent areas will be allowed to fail the test.

2.4.2 In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be divided into 40 equal areas. A maximum of four nonadjacent areas will be allowed to fail the test. After the 40-area test, if the system continues to fail, it will be the building owner's responsibility to have the system altered to meet the 95 percent coverage requirement.

2.4.3 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 system.

2.4.4 A test location approximately in the center of each grid area will be selected for the test, then the radio will be enabled to verify two-way communications to and from the outside of the building through the agency's radio communications system. Once the test location has been selected, prospecting for a better spot within the grid area will be permitted within 3' in any direction of the original selected test location.

2.4.5 Isolation Testing. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject Bi-Directional Amplifier (BDA) due to coupling (lack of sufficient isolation) between the input and output antenna systems. This test will be conducted at time of installation and subsequent annual inspections.

2.5 System Settings. The gain and power values of all Bi-Directional Amplifier (BDA)s shall be measured. The test measurement results shall be recorded on as-built drawings and kept on file with the building owner so that the measurements can be verified each year during the annual tests. In the event that the measurement results become lost, the building owner will be required to rerun the acceptance test to reestablish the gain values.

2.6 Annual Tests. When an in-building radio system is required, it shall be the building owner's responsibility to have all active components of the system, such as Bi-Directional Amplifier (BDA)s, power supplies and backup batteries tested to a minimum of once every twelve (12) months. Bi-Directional Amplifier (BDA)s shall be tested to ensure that the gain and power are the same as it was upon initial installation and acceptance. Backup batteries and power supplies shall be tested under load of a period of one hour to verify that they will properly operate during an actual power outage. If within the one hour test period, and in the opinion of the agency's representative, the battery exhibits symptoms of failure, the test shall be extended for additional one hour periods until the integrity of the battery can be determined. All other active components shall be checked to determine that they are operating within the manufacturers specifications for the intended purpose.

2.7 Field Testing. Police and Fire Personnel shall at any time have the right to enter onto the property to conduct its own field-testing to be certain that the required level of radio coverage is present.

2.8 Minimum qualifications of personnel. The minimum qualifications of the system engineer and integration organization shall include

- a. A Valid Professional Engineering Certification
- b. Certification of in-building system training issued by the manufacturer of the equipment being installed.

2.9 Other code compliance. The in-building system installation and components shall comply with all applicable local codes, including but not limited to, Federal Communications Rules (47 CFR 90.219), NEC, NFPA, IBC, IFC, TIA/EIA etc.

Version 9-18-07



Charlotte Fire Department Building Details

Pre-Incident / Prevention Building Survey

Building Name: _____ Building Phone: _____

Address: _____

General Information

Property/Land Use: _____ Fire Demand: _____ High Rise: _____

Occupancy Use: _____ Grid Number: _____ Still Alarm: _____

Inspection

Inspection District: _____ Permitted Occupancy: _____ Frequency: _____

Last Inspection Date: _____ Total # of Inspections: _____

Inspector: _____ # of Active Permits: _____

CO Inspector: _____ Occupancy Load: _____

Fire Educator: _____ Last Building Survey: _____

Fire Alarm

Type: _____ Test Date: _____ Monitoring Agency: _____

Annunciator Location: _____

Control Panel Location: _____

Other Extinguishing System Title: _____ Location: _____ Test Date: _____

Sprinkler System

Type: _____ Test Date: _____ Standpipes: _____ Standpipes Test Date: _____

Standpipe FDC Location: _____

FD Connection Location: _____

Post Indicator Location: _____

Riser #1 Location: _____

Riser #2 Location: _____

Riser #3 Location: _____

Backflow Preventer: _____ Test Date: _____

Fire Pumps: _____ # Pumps: _____ Test Date: _____

Utilities

Electrical Panel Location: _____

Gas Meter Location: _____

Water Shut Off Location: _____

Emergency Generator: _____



Charlotte Fire Department Building Details

Pre-Incident / Prevention Building Survey

Knox Box

Knox Box Location: _____

Knox Box Serial #: _____

Haz Mat

Health: ___ Fire: ___ Reaction: ___ Other: ___ # Haz Mats: ___

Fire Protection Considerations

Fire Load: _____ Defensive Ops Only: _____ Fire Flow Required Available: _____

Common Attic: _____ Building Length: _____ Fire Flow Required: _____

Roof Operations: _____ Building Width: _____

Exposures: _____

Risk Assessment

<u>Vertical Open:</u>	<u>Stairway:</u>	<u>Basement:</u>	<u>Floor:</u>	<u>Roof:</u>
Elevator: _____	Open: _____	Exterior Entrance: _____	Unsafe: _____	Unsafe: _____
Dumbwaiter: _____	Enclosed: _____	Interior Entrance: _____	Crowded: _____	Wood Truss: _____
Laundry/Trash: _____	NA: _____	NA: _____	Open Pit: _____	Truss: _____
NA _____		# Floors Below: _____	High Pile: _____	Concrete: _____
			NA: _____	Bar Joist: _____
<u>Roof Attachments:</u>	<u>Walls:</u>	<u>Tanks:</u>	# Floors: _____	Steel Truss Deck: _____
Cooler: _____	Unsafe: _____	Above Ground: _____		Other: _____
Tank: _____	Cracked: _____	Underground: _____	<u>Exits:</u>	
A/C: _____			#Exit Doors: _____	
Sign: _____	<u>See Remarks:</u> _____	<u>High Risk:</u> _____		

Remarks: _____

Other

MST Notes: _____

Critical Facility: _____ Vital Facility: _____

Property Contacts

First Name:	Last Name:	Primary Phone #:	Calling Sequence:
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_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____