Communications

Our field consultant (Altech Electronics) is strongly recommending that all future high rises have a radio wave study performed during the design phase. They state the approximate cost at about $30,000. They also show on at least 360 Huguenot that $60,000 in core drilling would have been prevented if this was done up front and conduit had been placed during the pours.

Critical language from NFPA 72.

24.2.2 This chapter establishes minimum required levels of performance, reliability, and quality of instillation for emergency communications systems but does not establish the only methods by which they are achieved.

24.3.3* Required Emergency Communications Systems. An emergency communications system shall be installed in occupancies where required by the authority having jurisdiction or by other applicable governing laws, codes, or standards.

24.3.7.2 Two-way emergency communications system shall consist of one or more of the following:

1) Two-way in-building wired emergency communications system (Not acceptable) Note: this is not the area of refuge communication system, which may still be required.

2) Two-way radio communications enhancement systems (Acceptable)

NRFD has found that a dual antenna systems are preferred. Repeater systems and hard wired phone systems are unacceptable.

NRFD uses three (3) Motorola APX4500 UHF radios, two for analog and one for digital transmissions.

Minimum System Requirements:

- ✓ Must meet NFPA 1221 & NFPA 72
- ✓ Must monitor its readiness level and report with a trouble alarm when any component is not functional.
- ✓ Shall have back up power for a minimum of 24 hours. Shall include temporary back up power if a power dip could delay communications.
- ✓ Coverage must be 100% of the building, including non-occupied spaces (i.e. pump room, boiler room, utility spaces, parking garages, etc.)
- ✓ System shall allow a minimum of 6 UHF radio channels (see list) to be preprogrammed
- ✓ System shall allow independent 2 way communications on 2 different channels at the same time.
- ✓ Each channel shall have automatic digital recording via USB Flash Drive or comparable.
- ✓ Each radio must be capable of transmitting and receiving both analog & digital communications.
- ✓ Each channel shall be able to interface with NRFD's EFAS computer.
- ✓ Provides override capability from command post.
- ✓ When possible, we would like the same system to be located in all buildings, for training and reduced confusion.
- ✓ It is desirable for the system to be able to identify which portable radio is transmitting and what floor and wing or section that radio is located.

A 2' wide x 2' deep x 3' tall space for a future radio cabinet shall be located in the roof top mechanical room / elevator room. A 110v outlet (with generator backup) shall be provided.

FIRE COMMAND CENTER

508.1 General. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a *fire command center* for fire department operations shall be provided and shall comply with Sections 508.1.1 through 508.1.6.

508.1.1 Location and access. The location and accessibility of the *fire command center* shall be *approved* by the fire chief.

508.1.2 Separation. The *fire command center* shall be separated from the remainder of the building by not less than a 1-hour *fire barrier* constructed in accordance with Section 707 of the *International Building Code* or *horizontal assembly* constructed in accordance with Section 711 of the *International Building Code*, or both.

508.1.3 Size. The *fire command center* shall be not less than 200 square feet (19 m2) in area with a minimum dimension of 10 feet (3048 mm).

508.1.4 Layout approval. A layout of the *fire command center* and all features required by this section to be contained therein shall be submitted for approval prior to installation.

508.1.5 Storage. Storage unrelated to operation of the *fire command center* shall be prohibited.

508.1.6 Required features. The *fire command center* shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.

2. The fire department communications system.

3. Fire detection and alarm system annunciator.

4. Annunciator unit visually indicating the location of the elevators and whether they are operational.

5. Status indicators and controls for air distribution systems.

6. The fire fighter's control panel required by Section 909.16 for smoke control systems installed in the building.

7. Controls for unlocking *stairway* doors simultaneously.

8. Sprinkler valve and water-flow detector display panels.

9. Emergency and standby power status indicators.

10. A telephone for fire department use with controlled access to the public telephone system.

11. Fire pump status indicators.

12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, *fire protection systems*, fire-fighter air replenishment systems, fire-fighting equipment and fire department access, and the location of *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions.

13. An *approved* Building Information Card that includes, but is not limited to, all of the following information:

13.1. General building information that includes: property name, address, the number of floors in the building above and below grade, use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor) and the estimated building population during the day, night and weekend;

13.2. Building emergency contact information that includes: a list of the building's emergency contacts including but not limited to building manager, building engineer and their respective work phone number, cell phone number and e-mail address;

13.3. Building construction information that includes: the type of building construction including but not limited to floors, walls, columns and roof assembly;

13.4. *Exit access stairway* and *exit stairway* information that includes: number of *exit access stairways* and *exit stairways* in building; each *exit access stairway* and *exit stairway* designation and floors served; location where each *exit access stairway* and *exit stairway* discharges, *interior exit stairways* that are pressurized; *exit stairways* provided with emergency lighting; each *exit stairway* that allows reentry; *exit stairways* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve; location of elevator machine rooms, control rooms and control spaces; location of sky lobby; and location of freight elevator banks;

13.5. Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator and location of natural gas service;

13.6. *Fire protection system* information that includes: location of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers and location of different types of *automatic sprinkler systems* installed including but not limited to dry, wet and pre-action;

13.7. Hazardous material information that includes: location and quantity of hazardous material.

14. Work table.

15. Generator supervision devices, manual start and

16. Public address system, where specifically required by other sections of this code.

17. Elevator fire recall switch in accordance with ASME A17.1.

18. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

19. Foam System monitoring / controls, if applicable.

<u>Additional items needed in fire command center:</u>

A) Remote cameras: Critical areas include the:
   - Lobby (if not clearly visible from the FCC.)
   - Elevator Lobby (if not clearly visible from the FCC.)
   - Mechanical Spaces (i.e. Boiler Room, Compacter room, etc.)
   - Fire Pump Room
   - Any other areas that already have cameras

B) Two thumb drives with the technical documents listed above. One will be left in the FCC.

Other Communication Issues

1) **Microwave** – NRFD and NRPD have a microwave-based radio system that connects different radios throughout the city. In the event that a new building is placed in the path of our microwave transmissions. The building will need to provide a microwave pass through. This generally consists of two small microwave dishes placed on opposite sides of the building and cabling to connect them plus generator power.

2) **Radio Shadow** – As new buildings are placed in the city a radio shadow or dead area may occur. Thus, blocking emergency communications in an area adjacent to the building. In this event, The building will need to provide an additional radio receiver and/or transmitter with antennas and power, thus restoring emergency communication to the area effected.

   NRFD will work with the buildings as early as possible to determine if these are issues and what corrective actions might be needed.

FREQUENCE REQUIREMENTS

After lengthy discussions. The Fire Chief has requested that we standardize all the communication frequencies as we move forward. He also would like to limit them as listed below:

CH.	Name	Transmit	Receive	PL
2	**New Rochelle Fireground #1 WC FG #5**	453.9625	453.9625	100
3	**NRFD Fireground #2**	465.6375	465.6375	186.2
4	**NRFD Command**	465.6125	465.6125	173.8
12	**Westchester FG 6 (New Rochelle Back-up)**	458.9625	458.9625	100
15	**UTAC 41D**	453.4625	453.4625	CTCSS 156.7
16	**UTAC 42D**	453.7125	453.7125	CTCSS 156.7

We have also tried to standardize on the Motorola APX4500 radio.

We require a cable system with internal antennas. To run off a UHF radio in the fire command room. The system requires clear communications on all fire departments UHF radio channels in all sections of the building.

Amplification has not been needed, but that does not mean that a future project will not require it to meet the communications goals. All channels are simplex, and we do not use repeated channels.

The system must be able to handle 3 simultaneous channels, 2 analogy channels (listed in the above chart) and digital radio signals being handled on a separated radio head attached to a separate cable/antenna system. The digital radio is to be programed as a digital radio modem and will be connected to a fire department laptop via a Motorola programing cable with a USB adapter. The New Rochelle Fire Department runs Systems Definitions Electronic Firefighter Accountability System (E.F.A.S.) also known as APAA. This program uses the digital radio & modem and transmits using a Motorola seven (7) digit identifier. All radios used for voice transmissions need this ID (which NRFD will provide).

Communication equipment commissioning includes technical tests/reports from the vendor and spot checks from the NRFD.

Additional issues found during recent commissioning's:

- Microphone gain to high / room feed back
- Microphone not properly grounded
- Radio 7 digit Identifier not programmed
- Channel Announcement
- Firmware not up to date
- Radio Screens shall be program color coded
    - Red – Modem
    - Green – Primary Radio
    - Yellow – Secondary Radio

If you would like to meet to discuss this in more detail, we can schedule a meeting

Updated 05/05/22

NRFD Communications Review, Instillation and Testing Process

We strongly encourage that the applicant, designers, installers, etc. contact the Fire Marshalls office as early as possible in the building process. We have found that this dramatically reduces costly errors.

Fill out and submit a permit application and associated filling fee. The form can be found on the city website. Include your design plans and associated documentation.

All paperwork is submitted to New Rochelle Fire Headquarters

The Fire Marshall's office will perform a Plan Review

The Fire Marshall may perform preliminary Instillation inspections.

Once the instillation is complete and ready to tested, please contact the Fire Marshall's office.

Acceptance Test Plan
Each floor of the building shall be divided into a grid of approximately twenty (20) equal areas. A maximum of one (1) area will be allowed to fail the test per floor. A spot located approximately in the center of a grid area will be selected for the test. Once the spot has been selected, prospecting for a better spot within the grid area will not be permitted. This procedure will be completed for Fire department radio frequencies. An acceptable test will have minimum signal strength of -95 dBm (DAQ4) shall be available on over 95% of the floor area required to be covered when transmitted from the fire department also minimum signal strength of -100 dBm (DAQ4) shall be received at the fire department system from over 95% of the floor area required to be covered. The field strength test instrument will incorporate a similar antenna used by Fire department handheld radios.

This testing shall be witnessed by the Fire Marshall.

In addition, the Fire Marshall may conduct a test using NRFD personnel to determine radio coverage throughout the building. This testing shall be performed by members walking the building with NRFD portable radios while communicating with the fire command room.