

SECTION 27 51 31 – EMERGENCY RESPONDER RADIO SIGNAL SURVEY

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide a site survey for bi-directional emergency responder radio signals to determine radio coverage throughout the building. The installation of an amplification system shall not be included as part of this project.
- B. The site survey shall comply with the requirements the locally adopted versions of:
 - 1. NFPA 72.
 - 2. NFPA 1221.
 - 3. IBC (International building Code).
 - 4. IFC (International Fire Code).
- C. The site survey shall meet with the approval of the Fire Department, the Building Department and all other agencies and authorities having jurisdiction (AHJ).
- D. The work in this section shall include the responsibility for all filings with the AHJ. Where filings require engineer's review, documents shall be submitted for his review. This responsibility shall include furnishing of required quantities of floor plans, descriptive notes and/or specifications, wiring diagrams, shop drawings and amendment forms.
- E. Early completion of the site survey will be required as to permit the installation of a bi-direction emergency responder radio amplification system prior to acquiring a Certificate of Occupancy.
- F. Any specialty permits (general work permits covered elsewhere in these specifications) necessary for the installation of the work shall be obtained prior to the commencement of the work. All permit costs and inspection fees shall be included as the part of the required work.

1.2 DESIGN REQUIREMENTS

- A. It is critical that the site survey be tested, and documentation be provided as early as practical, but after the building is fully enclosed, to allow a system be designed and installed, if needed, prior to building occupancy. Refer to Part 3 for additional information on site survey test requirements.
- B. The site survey shall be performed by a qualified and approved vendor. Contact the AHJ to ensure the Vendor is acceptable to the AHJ to perform the test.
- C. The site survey shall be conducted, documented, and signed by a person in possession of an FCC General Radio Telephone Operators License. Personnel qualifications must be acceptable to the AHJ.
- D. An overall pass/fail indication shall be provided for areas, and shall meeting the following:
 - 1. Critical areas, as identified in part 3, must have 100% coverage.
 - 2. General building areas shall have 95% radio coverage, or as specified by the AHJ.
 - 3. The following signal strengths are required to pass the tests:
 - a. Downlink - Minimum signal strength of -95 dBm throughout the coverage area.

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- b. Uplink - Minimum signal strength of -95 dBm received at the AHJ Radio System.

1.3 SUBMITTALS

A. Qualification Requirements:

- 1. Provide a copy of a valid FCC issued general radio operators license of a full-time employee
- 2. Provide a certification of in-building system training issued by a nationally recognized organization, school or a certificate issued by the manufacturer of the equipment being submitted.

B. Additional Submittal Requirements:

- 1. Once the survey is complete, provide drawings, at original scale, and other documents showing all survey points and test points, including their tested values.

C. When preparing submittals and any required final programming, use a room number schedule generated by the architect and/or the owner, which indicates the actual room numbers that will be used when the building is occupied. If the schedule is not available, revise the initial submittal, when a schedule is available, to reflect the proper room numbers.

1.4 QUALIFICATIONS

- A. Vendor: The vendor must have a minimum of five years' experience in the testing, design and installation of systems equal in size and type required by this project.

1.5 REGULATORY REQUIREMENTS

- A. National Electrical Code Compliance: Comply with applicable local code requirements of the authority having jurisdiction, and that portion of the NEC which pertains to installation and construction of specified products.
- B. FCC Compliance: Comply with U.S. Federal Communication Class B standard for allowable radiation from equipment and wiring.
- C. National Fire Protection Association Compliance: Comply with applicable NFPA sections, including, but not limited to 72 and 1221.
- D. International Fire Code Compliance: Comply with applicable IFC sections, including, but not limited to 510.

PART 2 - PRODUCTS

Not Applicable.

PART 3 - EXECUTION

3.1 GENERAL

- A. Prior to any testing, a meeting shall be held between the Contractor, Vendor, Owner's Representative, Fire Department, and Authority Having Jurisdiction to confirm the requirements of the tests. This meeting shall be held early in the construction process to ensure all system tests and installation, should a system be required, can be accomplished within the timeline of the project, and not delay acquiring the Building Occupancy Permit.
- B. Examine areas and conditions under which the site survey is to be performed. Do not proceed with site survey until the building is complete enough to the satisfaction of the testing agency.

3.2 SITE SURVEY AND TEST PROCEDURES

- A. Tests must be performed before design.
- B. The coverage testing shall be done in accordance with NFPA 72, National Fire Alarm and Signaling Code, NFPA 1221 and as required by the local AHJ. The following shall be considered a minimum:
 - 1. Each floor of the building shall be divided into a grid of at least 20 equal test areas. Additional test areas shall be provided so that no test area exceeds 3,000 square feet.
 - 2. The test shall be conducted using a calibrated portable radio capable of communicating on the same band as is used by the emergency response agency. Coordinate requirements with the fire department and local AHJ.
 - 3. Failure of not more than two (2) nonadjacent test areas shall not result in failure of the test.
 - 4. In the event that three of the test areas fail the test, the floor shall be divided into at least 40 equal test areas, or a maximum of 1,500 square feet. Failure of not more than four (4) non-adjacent test areas shall not result in failure of the test. If the system fails this 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 failure of that test area. Additional test locations shall not be permitted.
 - 6. Provide additional tests as required by applicable local codes and standards.
- C. All tests shall be conducted, documented, and signed by a person in possession of a current FCC General Radio Operator License.
- D. All test records must be submitted as early as possible, within two (2) weeks of the tests being performed, to allow the Owner to design and install an amplification system prior to occupancy if necessary.

END OF SECTION 27 51 31