**item 632 Interconnect, misc.: spread spectrum radio**

This work consists of the furnishing, installation, integration and testing of 4.9 GHz Ethernet Spread Spectrum Radios as shown on the Plans. Spread Spectrum Radios shall be Intuicom Axiom AC, Cisco Aironet 1562PS AP w/ Public Safety 4.9GHz radio, or Encom Energy 4.9 GHz radio.

The Radios shall enable high-speed outdoor communications links that will be used to complete ‘last mile’ applications of network installation where fiber optic cable is not feasible. The Radios shall provide seamless connectivity between the Ethernet switches and the communications backbone network with no disruption or degradation of data and video quality.

The Contractor will furnish, install, integrate and test all equipment and required components, including wireless radios, power supplies, power injectors, connectors, and surge protection necessary to provide fully functional wireless links in all respects, without additional expense to the City.

All equipment including clamps, gusseted tubes to extend the height of the radio, brackets, or other miscellaneous items required for the testing of devices and subsystems contained within this project must be supplied by the Contractor as an appurtenance to the electronic equipment included within the project and at no additional cost to the City. See mounting details in the Plans.

The wireless radios shall be mounted a minimum 3ft from signal heads and signs.

The Ethernet Spread Spectrum Radios shall meet the following requirements:

* Operates in the 4.9 GHz Licensed Public Safety Frequency Band and must support communication using the following two 10MHz channels: (A) – comprised of Ch 9(4962.5MHz) and Ch 10(4967.5MHz); (B) – comprised of Ch 10(4967.5MHz) and Ch 11(4972.5MHz) (two 10 MHz channels with center frequencies of 4965MHz and 4970MHz)
* Integrated Antenna Design
* 13 Mbps data rate (minimum) @ 10MHz QPSK
* Dynamic Frequency Selection (4.940-4.990 GHz)
* Secure Data Encryption
* Built-in diagnostics tools: Antenna alignment, bandwidth test, frequency usage
* Transmit Power: => 20dBm at QPSK modulation
* Rx Sensitivity- Max: >-30dBm
* Threshold (BER=10-6) QPSK: -85dBm
* Latency: <10ms
* Dimensions: Panel face shall be less than 18”x18”
* Power consumption: <40W
* Power over Ethernet
* Minimum 128 bit AES encryption
* Environmentally Hardened Outdoor Units
* NEMA 4/IP 66
* Operating Temperature: (-40°C to +85°C)
* Storage Temperature: (-40°C to +80°C)
* 0 to 95% non-condensing
* FCC Part 90
* 120 VAC input power source

Set up the radio for operation in accordance with the manufacturer’s recommendations. Configure the radios as masters, slaves, or repeaters as appropriate. Configure them to use the frequencies found to minimize interference. Align antennas to receive the maximum signal transfer. Implement strong encryption and any other security features offered or as requested by the Engineer. Test to ensure that the radios function as intended.

Provide surge protection in controller cabinets to comply with the radio manufacturer’s recommendations for these protectors.

The Contractor shall coordinate with the City Engineer thirty (30) days in advance of installation to ensure that the 4.9 GHz license has been filed and approved with the FCC.

Radio shall be configured to hide MAC address and SSID.

The work as described will be measured as one unit for each of the installations specified, and shall include all materials, equipment and incidentals, complete in place. Terminations, connections and other miscellaneous items and materials shall be incidental to this work and no separate payment will be made.

Communication shall be completed and accepted prior to final payment of this item. 7/1/24