

**TOWN OF ADDISON
SPECIAL SPECIFICATION**

A9007

Wireless Ethernet Radio Equipment for Traffic Signal System

1. **Description.** Install Wireless Ethernet Radio (WER) equipment for traffic signal system.
2. **Materials.** Supply complete manufacturer specifications for radios, reflectors, cables, connectors, power supply, mounting hardware, and lightning surge protector, including the exact gain of the radio.
3. **Access Point and Subscriber Unit Radios.** Install access point and subscriber unit radios on top of the water tower and in the field with the following operating minimum characteristics:

FREQUENCY	5725-5850 MHz
RANGE	124 Miles line of sight
REPEAT CAPABILITIES	Store and Forward Repeater Capabilities
ANTENNA BEAM WIDTH	3 dB Antenna Beam Width 60 degrees, Azimuth and Elevation
TYPICAL AGGREGATE USEFUL THROUGHPUT	14 Mbps to 1 Mi
EQUIVALENT ISOTROPIC RADIATING POWER (EIRP)	1W (63W with reflector)
ENVIRONMENT	Temperature -40°F to 131°F
FCC APPROVAL	No License Requirements Type acceptance under FCC Part 15.247
DATA CHARACTERISTICS	Half or Full Duplex Operation Interface 10/100 Base T Ethernet
ACCESS METHOD	Time Division Duplex / Time Division Multiple Access (TDD/TDMA)
GAIN	7 dBi
WIND RATING	118 miles/hour
REGULATED POWER SUPPLY	Voltage 24 VDC Amperage 0.3 Amp Power 7.2 W

Install the access point and subscriber unit radios as shown on the plans or as directed.

Supply radios with diagnostic software capable of testing the link between the access point radio and the subscriber unit. Provide software capable of detecting channels which are not adequate for the transmission of data and allow for the exclusion of these frequencies in the selection of frequencies to be scanned.

Mount the radio on a traffic signal pole, mast arm with extension, or a separate steel pole as directed by the plans. Ground the radio to the metal support. Do not use a wood pole or support.

If adequate signal strength cannot be attained, provide a reflector to enhance signal strength. The reflector is considered subsidiary to “Wireless Ethernet Radio”.

4. **Backhaul Radio.** Install point-to-point backhaul radios with the following minimum characteristics:

FREQUENCY	5.725-5.850 GHz
RANGE	124 Miles line of sight
SIGNALING RATE	60 Mbps
CHANNEL WIDTH	12 MHz
TYPICAL AGGREGATE USEFUL THROUGHPUT	3.0 to 43 Mbps
EQUIVALENT ISOTROPIC RADIATING POWER (EIRP)	Adjustable to 12.0 W
ENVIRONMENT	Temperature -40°F to 140°F
FCC APPROVAL	No License Requirements Type acceptance under FCC Part 15.247
DATA CHARACTERISTICS	Auto MDI/MDIX switching 10/100 Base T Ethernet
ACCESS METHOD	Time Division Duplex (TDD) Time Division Multiple Access (TDMA)
ANTENNA GAIN	28 dBi
NETWORK MANAGEMENT	Web Server and SNMP
WIND RATING	150 miles/hour
REGULATED POWER SUPPLY	Voltage 36-60 VDC Amperage 0.34 Amp Power 55 W max

Mount the antenna on a separate steel pole as directed by the plans. Ground the radio to the metal support. Do not use a wood pole or support.

5. **Cluster Management Module.** Install cluster management module with the following minimum characteristics:

Furnish cluster management modules for locations with two (2) or more radio devices. Install module in accordance with manufacturer's recommendations and as shown on the plans or as directed. Any one radio shall not exceed 328 cable feet from the cluster management module. Cluster management module shall meet CE IP44 according to EN60529.2000

6. **Cable.** Install Category 5E cable that includes power over Ethernet. Cable shall be rated for outdoor application.
7. **Experience Requirements.** The Contractor or designated subcontractors involved in the installation and testing of the signal system, as a minimum, must meet the following requirements:

- Two years experience in the installation of the above specified radio equipment for the purpose of traffic signal communications.
- Two installed traffic signal communication systems where units have been in continuously satisfactory operation for at least 1 year. Submit as proof, photographs or other supporting documents, and the names, addresses and telephone numbers of the operating personnel who can be contacted regarding the system.

Provide all necessary documentation of subcontractor qualifications pursuant to contract award.

8. **Additional Equipment.** Any additional materials not specifically mentioned, but required to successfully operate the traffic signal system shall be considered subsidiary to this Item. Materials may include, but are not limited to, additional Ethernet equipment, couplers, connectors, mounting hardware, pole extensions, computers, and solar equipment.
9. **Testing, Training, and Warranty.** Provide a factory certified representative for installation and testing of the equipment. Conduct a test site survey prior to the installation of the equipment.

Provide up to 2 days of training to personnel of the Town in the operation, setup and maintenance of the wireless broadband radio system. Provide instruction and materials for a maximum of 5 persons and at a location selected by the Town. Provide instruction personnel certified by the manufacturer. The User's Guide is not an adequate substitute for practical classroom training and formal certification.

Provide equipment with no less than 95% of the manufacturer's standard warranty remaining when equipment invoices are submitted for payment. Any equipment with less than 95% of its warranty remaining will not be accepted.

Provide updates of the wireless broadband radio software free of charge during the warranty period, including the update to NTCIP compliancy.

10. **Measurement.** This Item will be measured by each WER radio, cluster management module, and by the linear foot of cable installed.
11. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Wireless Ethernet Radio (Subscriber Unit)", "Wireless Ethernet Radio (Access Point)", "Cluster Management Module", and "CAT 5E Ethernet Cable". The price is full compensation for assembling, installing the radios, antennas, and the cable; for mounting attachments; for testing, labor, tools, equipment and incidentals.