Special Specification 6247
Installation of Traffic Management Equipment

1. DESCRIPTION

Transport, install, and test Department furnished MPEG 4 Encoder systems, Ethernet Contact Closures, Field Hardened Ethernet switches, Cellular Modems, and Contact Closure Radio link as shown on the plans, as detailed in the special specification, and as directed.

2. MATERIALS

The Department will furnish: MPEG 4 Encoder w/Power Supply, Ethernet contact closures w/Power Supply, Field Hardened Ethernet switches w/Power Supply, RS-232 Port Servers w/Power Supply, and Cellular Modems w/Power Supply.

Provide all materials not supplied by the Department necessary for the MPEG 4 Encoder installation, Ethernet contact closure installation, Field Hardened Ethernet switch installation, RS-232 Port Server installation, Cellular Modem installation, and Contact Closure Radio link installation. All materials provided by the Contractor must be new.

Unless otherwise shown on the plans, equipment for the MPEG 4 Encoder, Ethernet Contact Closures, Field Hardened Ethernet switches, RS-232 Port Servers, Cellular Modems, and Contact Closure Radios for this project will be stored by the Department for pick up at TxDOT Laredo District Office, 1817 Bob Bullock Lp, Laredo TX 78043.

Ensure that all materials and construction methods necessary to complete the installation conform to the requirements of this Item, the plans, and the pertinent requirements of the following item:

- Item 620, “Electrical Conductors”

3. POWER REQUIREMENTS

Provide equipment appurtenances as required to ensure that operations are not affected by the transient voltages, surges, and sags normally experienced on commercial power lines.

3.1. Wiring. Provide wiring that meets the requirements of the National Electric Code. Provide wires that are cut to proper length before assembly. Provide cable slacks to facilitate removal and replacement of assemblies, panels, and modules. Do not doubleback wire to take up slack. Lace wires neatly into cable with nylon lacing or plastic straps. Secure cables with non-adhesive clamps and anchors. Provide service loops at connections.

3.2. Power Service Protection. Provide equipment that contains readily accessible, manually re-settable or replaceable circuit protection devices (such as circuit breakers or fuses) for equipment and power source protection.
Provide and size circuit breakers or fuses such that no wire, component, connector, PC board or assembly must be subjected to sustained current in excess of their respective design limits upon failure of any single element or wiring.

4. MECHANICAL REQUIREMENTS

4.1. Connectors and Harnesses. Provide external connections made by means of connectors. Provide connectors that are keyed to preclude improper hookups. Color code wires and appropriately mark origin and destination of each cable.

Provide connecting harnesses of appropriate length and terminated with matching connectors for interconnection with the communications system equipment.

Provide pins and mating connectors that are plated to improve conductivity and resist corrosion. Cover connectors utilizing solder type connections by a piece of heat shrink tubing securely shrunk to ensure that it protects the connection.

4.2. Mechanical Components. Provide external screws, nuts and locking washers that are stainless steel. Provide parts made of corrosion resistant material, such as plastic, stainless steel, anodized aluminum or brass. Protect materials from fungus growth and moisture deterioration. Separate dissimilar metals by an inert dielectric material.

5. INSTALLATION OF ETHERNET CONTACT CLOSURES

Install all materials, equipment, power, and control cabling. Ensure an operating and functional system.

Prevent damage to all Transceiver components supplied by the Department. Replace any component that is damaged or lost during transportation or installation at the Contractor's expense.

Testing. Verify operation of the contact closures and demonstrate that the data communication links can be transmitted at a satisfactory rate from the field location to the central location. Demonstrate that the data packets are being received at the central site via a networked computer.

Experience Requirements. The Contractor or designated subcontractors involved in the installation and testing of the Ethernet Contact Closures, as minimum, meet the following:

Two year experience in the installation of Ethernet Contact Closures.

Must have a minimum record of having installed two Ethernet Contact Closures where they have been in continuously satisfactory operation for at least 1 year. The Contractor shall submit as proof, supporting documents, and the names, addresses and telephone numbers of the operating personnel who can be contacted regarding the system.

Provide necessary documentation of subcontractor qualifications pursuant to contract award.

6. INSTALLATION OF MPEG 4 ENCODER

Install all materials, equipment, power, video and control cabling. Ensure an operating and functional system.

Prevent damage to all Digital Video Encoder (Ethernet) system components supply by the Department. Replace any component that is damaged or lost during transportation or installation at the Contractor's expense.

Testing. Verify operation of the digital video encoder, together with operation of their wireless link and demonstrate that video images can be transmitted at a satisfactory rate from the field location to the central location. Demonstrate that the video image is being received at the central site and in a window on the monitor. The frame rated demonstrated at the field site shall be at least 6 frames per second for a traffic scene which has 30 percent of the scene being updated by moving vehicles.

Experience Requirements. The Contractor or designated subcontractors involved in the installation and testing of the Digital Video Encoder shall, as minimum, meet the following:

Two year experience in the installation of Digital Video Encoder (Ethernet) equipment.

Must have a minimum record of having installed two Digital Video Encoder (Ethernet) systems where they have been in continuously satisfactory operation for at least 1 year. The Contractor shall 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 necessary documentation of subcontractor qualifications pursuant to contract award.

7. INSTALLATION OF FIELD HARDENED ETHERNET SWITCHES

Install all materials, equipment, power, video and control cabling. Ensure an operating and functional system.

Prevent damage to all Field Hardened Ethernet Switch system components supplied by the Department. Replace any component that is damaged or lost during transportation or installation at the Contractor's expense.

Testing. Verify operation of the Hardened Ethernet Switch, together with operation of its links and demonstrate that data can be transmitted at a satisfactory rate from the field location to the central location. Demonstrate that the Field Hardened Ethernet Switch data packets are being received at the central site via a networked computer.

Experience Requirements. The Contractor or designated subcontractors involved in the installation and testing of the Field Hardened Ethernet Switches shall, as minimum, meet the following:

Two year experience in the installation of Field Hardened Ethernet Switches.

Must have a minimum record of having installed two Hardened Ethernet Switches where they have been in continuously satisfactory operation for at least 1 year. The Contractor shall 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 necessary documentation of subcontractor qualifications pursuant to contract award.

8. INSTALLATION OF RS-232 PORT SERVERS

Install all materials, equipment, power, and control cabling. Ensure an operating and functional system.

Prevent damage to all RS-232 Port Server components supplied by the Department. Replace any component that is damaged or lost during transportation or installation at the Contractor's expense.

Testing. Verify operation of the RS-232 port servers, together with operation of their wireless link, demonstrate that the data communication links can be transmitted at a satisfactory rate from the field location to the central location. Demonstrate that the RS-232 data packets are being received at the central site via a networked computer.

Experience Requirements. The Contractor or designated subcontractors involved in the installation and testing of the RS-232 port servers, as minimum, meet the following:

Two year experience in the installation of RS-232 Port Servers.

Must have a minimum record of having installed two RS-232 port server systems where they have been in continuously satisfactory operation for at least 1 year.

The Contractor shall submit as proof, supporting documents, and the names, addresses and telephone numbers of the operating personnel who can be contacted regarding the system.

Provide necessary documentation of subcontractor qualifications pursuant to contract award.

9. INSTALLATION OF CELLULAR MODEMS

Install all materials, equipment, power, video and control cabling. Ensure an operating and functional system.

Prevent damage to all Cellular Modem components supplied by the Department. Replace any component that is damaged or lost during transportation or installation at the Contractor's expense.

Testing. Verify operation of the Cellular Modems, together with operation of its links, demonstrate that data can be transmitted at a satisfactory rate from the field location to the central location. Demonstrate that the Cellular Modems data packets are being received at the central site via a networked computer.

Experience Requirements. The Contractor or designated subcontractors involved in the installation and testing of the Cellular Modems shall, as a minimum, meet the following:

Two year experience in the installation of Cellular Modems.

Must have a minimum record of having installed two Cellular Modems where they have been in continuously satisfactory operation for at least 1 year. The Contractor shall 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 necessary documentation of subcontractor qualifications pursuant to contract award.

10. INSTALLATION OF CONTACT CLOSURE RADIO LINK

Installation consists of both radios, both antennas, all cables, mounting brackets and hardware; installed, positioned for optimal communication, configured, tested, and made operational between the RVSD (Radar Vehicle Sensing Device) and DMS in accordance with this specification and as shown on the plans.

Prevent damage to all Contact Closure Radio components supplied by the Department. Replace any component that is damaged or lost during transportation or installation at the Contractor's expense.

Testing. Verify operation of the Contact Closure Radio Link, demonstrate that data can be transmitted at a satisfactory rate as per manufacture's recommendations.

Experience Requirements. The Contractor or designated subcontractors involved in the installation and testing of the Contact Closure Radio link shall, as a minimum, meet the following:

Two year experience in the installation of Contact Closure Radios.

Must have a minimum record of having installed two Contact Closure radios where they have been in continuously satisfactory operation for at least 1 year. The Contractor shall 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 necessary documentation of subcontractor qualifications pursuant to contract award.

11. MEASUREMENT

This Item will be measured as each MPEG 4 Encoder, Ethernet Contact Closures, Field Hardened Ethernet Switches, RS-232 Port Servers, Cellular Modems, and Contact Closure Radio link made fully operational, and tested.

12. PAYMENT

The work performed and material furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Installation of MPEG 4 Encoder” or ”Installation of Ethernet Contact Closures” or “Installation of Field Hardened Ethernet Switch” or “Installation of RS-232 Port Servers” or “Installation of Cellular Modems” or “ Installation of Contact Closure Radio Link”. This price is full compensation for transportation and installation of all equipment described under this Item; furnishing and installing all cables, connectors, and mounting assemblies; all documentation and testing; all labor, manipulations, materials, tools, equipment, and incidentals..