

# Special Specification 6096

## Wrong Way Driver Sign(s) and Radar Equipment



### 1. DESCRIPTION

Transport, install and test Department furnished LED Wrong Way Signs, LED Blank Out Signs, Wrong Way Driver Radar Detectors, Contact Closure Radios, Serial Radios, Wireless Modems, and Solar Power Kits.

### 2. MATERIALS

Provide all materials not supplied by the Department necessary for the installation of the LED Wrong Way Signs, LED Blank Out Signs, Wrong Way Driver Radar Detectors, Contact Closure Radios, Serial Radios, Wireless Modems, and Solar Power Kits. All materials provided by the Contractor must be new. Include a task in the project schedule for delivery of Department furnished materials and provide a minimum of 30 days' notice to the Department for pick up of Department furnished materials. Unless otherwise shown on the plans, Wrong Way Drivers Signs and Radar Equipment will be stored by the Department for pick up at location(s) shown on the plans.

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 Items:

- Item 618, "Conduit"
- Item 620, "Electrical Conductors"
- Item 644, "Small Roadside Sign Supports and Assemblies"
- Item 656, "Foundations for Traffic Control Devices"

### 3. CONSTRUCTION

- 3.1. **Installation.** Before installation of any equipment, perform a site survey of the proposed locations to determine the optimal positioning of the signs and radar units to achieve proper operation based on the manufacturer's recommendations. Test wireless links to assure they provide optimal communication between transmitters and receivers. Adjust locations as approved by the Engineer if necessary.

Install equipment in accordance with this Item and the lines, grades, details and dimensions as shown on the plans or as directed. Maintain safe construction practices. Ensure the mechanical execution of work complies with NEC, Article 110.12. Equipment must be installed in a neat and workmanlike manner.

Provide all mounting hardware and cabling necessary to install and make operational all equipment. Provide only new and corrosion resistant materials. Consider all mounting hardware and cables as subsidiary to this item with no direct payment.

Adjustments and/or addition of sign attachment hardware, support brackets and appurtenances, such as conduit, etc., may be necessary for compatibility with specified positioning recommended by the manufacturer, as shown on the plans, or as directed. All adjustments and/or additional materials will not be paid for directly but will be subsidiary to this Item.

Prevent damage to all equipment provided by the department. Replace any portion of the equipment that is damaged or lost during transportation or installation. Do not use any materials furnished by the Department on any other work which is not part of the contract. Materials not used which were furnished by the Department must be returned undamaged to the location from which the materials were obtained upon completion of the work. Any unused or removed material deemed salvageable by the Engineer shall remain

the property of the Department and shall be delivered to a designated site. Accept ownership of unsalvageable materials and dispose of in accordance with federal, state, and local regulations.

Stockpile all materials designated for reuse or to be retained by the Department within the project limits or at a designated location as directed.

- 3.2. **Experience Requirements.** The Contractor or subcontractor must meet the following experience requirements prior to installation of equipment:

Two years continuous existence by the Contractor of the subcontractor offering services in the installation of vehicle radar detectors and of wireless radios operating at 902–928 MHz, with frequency hopping and spread spectrum modulation. The devices must have been made operational with and able to be monitored by a central traffic management control center.

Two completed projects for each of the following items: A minimum of 2 vehicle radar detectors and 2 wireless radios (as described above) where the Contractor or subcontractor's personnel installed and tested this equipment and made it operational and monitored by a central traffic management control center. The detectors and radios must have been installed outdoors and permanently mounted. The completed system installations must have been in continuous satisfactory operation for a minimum of 1 year.

- 3.3. **Testing.** Testing of the installed equipment locations is for the purpose of relieving the Contractor of maintenance of the equipment. The Contractor will be relieved of the responsibility for maintenance of the equipment in accordance with Item 7, "Legal Relations and Responsibilities", after all testing is successfully completed.

After all equipment locations have been installed, the Department and the contractor will conduct approved continuity, stand alone, and system tests on the installed field equipment with central, remote, and laptop equipment. A final acceptance test will be conducted to demonstrate all control, monitor, and communication requirements for 60 days. The Engineer will furnish a Letter acknowledging the final acceptance testing commencement date stating the first day of the final acceptance test.

The completion of the final acceptance test occurs when system downtime due to mechanical, electrical, or other malfunctions to equipment furnished or installed does not exceed 72 hr. and any individual points of failure identified during the test period have operated free of defects. Assume responsibility only for test failures directly related to the work in accordance with this Item. Upon completion of successful final acceptance testing, document the acceptance date and project identification information and provide 2 copies to the Engineer.

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## 4. MEASUREMENT

Install LED Wrong Way Sign will be measured as each LED Wrong Way Sign installed and made operational in accordance with this specification and as shown on the plans.

Install LED Wrong Way Sign with Basic Solar Power Kit will be measured as each LED Wrong Way Sign with Basic Solar Power Kit installed and made operational in accordance with this specification and as shown on the plans.

Install LED Wrong Way Sign with Radar Solar Power Kit will be measured as each LED Wrong Way Sign with Radar Solar Power Kit installed and made operational in accordance with this specification and as shown on the plans.

Install Wrong Way Driver Radar Detector will be measured as each Wrong Way Driver Radar Detector installed, positioned properly, configured, tested, and made operational with the TransGuide system in accordance with this specification and as shown on the plans.

Install Wireless Modem Transmitter Kit will be measured as each Wireless Modem Transmitter Kit installed, positioned properly, configured for optimal communication, tested, and made operational with the TransGuide system in accordance with this specification and as shown on the plans.

Install Wireless Modem Receiver Kit will be measured as each Wireless Modem Receiver Kit installed, positioned properly, configured for optimal communication, tested, and made operational with the TransGuide system in accordance with this specification and as shown on the plans.

Install LED Blank Out Sign will be measured as each LED Blank Out Sign installed and made operational in accordance with this specification and as shown on the plans.

Install Solar Power Kit for LED Blank Out and Wrong Way Signs on OSB will be measured as each Solar Power Kit for LED Blank Out and Wrong Way Signs on OSB installed and made operational in accordance with this specification and as shown on the plans.

Install HD Radar Vehicle Sensing Device (RVSD) Vehicle Alert Module will be measured as each HD Radar Vehicle Sensing Device (RVSD) Vehicle Alert Module installed, configured, tested, and made operational with the TransGuide system in accordance with this specification and as shown on the plans.

Install Solar Power Kit for HD Radar Vehicle Sensing Device (RVSD) will be measured as each Solar Power Kit for HD Radar Vehicle Sensing Device (RVSD) installed and made operational in accordance with this specification and as shown on the plans.

Install Contact Closure Radio Link will be measured as each Contact Closure Radio Link which consists of both radios, both antennas, all cables, mounting brackets and hardware; installed, positioned for optimal communication, configured, tested, and made operational with the main lane LED Blank Out signs and LED Wrong Way signs in accordance with this specification and as shown on the plans.

Install Serial Radio Link will be measured as each Serial Radio Link which consists of both radios, both antennas, all cables, mounting brackets and hardware; installed, positioned for optimal communication, configured, tested, and made operational with the TransGuide system in accordance with this specification and as shown on the plans.

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## 5. 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 "Install LED Wrong Way Sign", "Install LED Wrong Way Sign with Basic Solar Power Kit", "Install LED Wrong Way Sign with Radar Solar Power Kit", "Install Wrong Way Driver Radar Detector", "Install Wireless Modem Transmitter Kit", "Install Wireless Modem Receiver Kit", "Install LED Blank Out Sign", "Install Solar Power Kit for LED Blank Out and Wrong Way Signs on OSB", "Install HD Radar Vehicle Sensing Device (RVSD) Vehicle Alert Module", "Install Solar Power Kit for HD Radar Vehicle Sensing Device (RVSD)", "Install Contact Closure Radio Link", and "Install Serial Radio Link". This price is full compensation for transportation and installation of material furnished by the State; for furnishing and installing any required mounting hardware, connectors, conduit, cables, junction boxes and equipment cabinets; storing the equipment when required; testing the equipment; replacement/repair of damaged components; disposal of unsalvageable material, and for all manipulations, labor, tools, working drawings, equipment and incidentals.