

# Special Specification 6425

## Cellular Router



### 1. DESCRIPTION

Transport, install, and test Department-furnished Cellular Router – Cisco IR1101 (with Antenna) or equivalent Cellular Router with power supply and power cable assembly.

### 2. MATERIALS

Provide all materials not supplied by the Department necessary for the Cellular Router installation. All materials provided by the Contractor must be new. Provide a minimum of 30 days' notice to the Department for pick-up of Department-furnished materials. Unless otherwise shown on the plans, Cellular Router will be stored by the Department for pick up at location identified by the Engineer.

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."

### 3. CONSTRUCTION

- 3.1. **Installation.** Install Cellular Router in equipment cabinets in accordance with this Item and details and dimensions as shown on the plans or as directed. Maintain safe construction practices. Equipment will be installed in a neat and workmanlike manner.

Adjustments or additions of attachment hardware, support brackets, and appurtenances may be necessary for compatibility, as shown on the plans or as directed. All adjustments or additional materials will not be paid for directly but will be subsidiary to this Item.

Prevent damage to all components. Do not use any materials furnished by the Department on any work which is not required by and which does not constitute a 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 will remain the property of the Department and must 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.

Equipment to be installed at each Signalized Intersection shown on the plans may include, but not be limited to, the following:

- Cellular Router (provided by the Department);
- cabling and connectors from power source to Cellular Router connection point as specified by the manufacturer (provided by the Contractor);
- cabling and connectors from telecommunications source to Cellular Router connection point as specified by the Cellular Router manufacturer when required (provided by the Contractor); and
- Category 6 Ethernet communication cables in accordance with Item 6004 "Networking Intelligent Transportation System (ITS) Communication Cable (provided by the Contractor). Provide Ethernet communication cables following the color scheme and assignment information as follows:

- blue – Traffic Signal Controller;
- green – Malfunction Monitor Unit (MMU);
- red – Battery Backup Unit (BBU), if present;
- yellow – APS (Accessible Pedestrian System), if present; and
- black – Detection (i.e. radar, video, etc), if present.

The cellular router has a total of 4 ethernet ports. The Contractor must coordinate with the District which equipment should be connected to the router, up to the maximum of 4.

Make all arrangements for connection to the power supply and telecommunications source including any required permits. Supply and install any required materials not provided by the utility companies (power or communications service provider).

3.2. **Working Drawings.** Before fabrication, submit for approval 5 prints of the working drawings for attachment of each Cellular Router. Show the details of any additional brackets, connections, and methods of attachment.

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

After all Cellular Routers have been installed within a township or corridor, the Department will conduct approved continuity, stand alone, and Cellular Routers tests on the installed field equipment with central, remote, and laptop equipment (test as they go). A final acceptance test will be conducted to demonstrate all control, monitor, and communication requirements for 90 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 hrs. 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.

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#### 4. MEASUREMENT

This Item will be measured as each Cellular Router system installed and tested.

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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 "Installation of Cellular Router." This price is full compensation for transportation and installation of Cellular Router; furnishing and installing any new mounting hardware; storing the Cellular Router when required; testing the Cellular Router; replacement or repair of damaged components; disposal of unsalvageable material and for all manipulations, labor, tools, working drawings, equipment, and incidentals.