



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
16 STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0016

Janet T. Mills  
GOVERNOR

Bruce A. Van Note  
COMMISSIONER

December 8, 2022  
Subject: Replacement of  
Changeable Message Signs  
State WIN: 024239.00  
Location: **Statewide**  
**Amendment No. 1**

Dear Sir/Ms.:

Please make the following changes to the Bid Documents:

In the Bid Book:

**Remove** pages seventy-two to seventy-six titled SPECIAL PROVISION SECTION 645 CHANGEABLE MESSAGE SIGN INSTALLATION dated November 2022, totaling five pages, and **Replace** with the attached SPECIAL PROVISION SECTION 645 CHANGEABLE MESSAGE SIGN INSTALLATION dated December 5, 2022, totaling five pages.

Dear Sir/Ms.:

The following questions have been received:

**Question:** I've looking over the subject bid and wanted to be sure the model number called out as reference was correct. On the bid documents it has the following model number VF-2420-72x192-20-RGB. Daktronics does not manufacture a 72 high pixel display, but we do offer a 64 and 80 high. Please let me know if one of these are acceptable or a better fit for MDOT?

**Response:** Please see revised Special Provision section 645.

Consider these changes and information prior to submitting your bid on **December 21, 2022**.

Sincerely

*Kevin Hanlon* for

George M. A. Macdougall  
P.E. Contracts & Specifications Engineer

**SPECIAL PROVISION**

**SECTION 645**

**CHANGEABLE MESSAGE SIGN INSTALLATION**

645.01 Description This work shall consist of labor, materials and equipment to furnish and install new changeable message signs (CMS) and controllers. It includes communication to the MaineDOT Traffic Management Center (TMC), installation of service poles and electrical service equipment/connections, communication equipment and connections, grounding, metallic conduit, wires, trenching for conduit, modifications to existing riser posts, access road to Site 7, and system training/testing for Sites 1, 2, 3, 5, 6, and 7. New foundation, support structure relocation, conduit and junction boxes are included in separate pay items.

645.02 General All equipment shall be new and meet the requirements of the National Electrical Code (NEC), as well as all local and public utility codes. A one-year warranty covering material defects from the date of acceptance shall be provided on all equipment.

645.03 Materials Materials shall meet the following requirements:

Weatherhead: Service entrance caps shall be metal, and UL listed.

Metallic Conduit: Exposed conduit – including partially exposed fittings and sweeps – shall comply with Section 715.02 of the Standard Specifications.

Electrical Connections: Existing electrical connections shall remain at sites 1, 2, 3, 5, and 6. A new electrical connection, including meter base, will be installed at Site 7.

Disconnect Switch: All existing disconnect switches are to remain at sites 1, 2, 3, 5, and 6. A new disconnect switch will be installed at Site 7.

Service Poles: Wood service poles shall be Class 4, corresponding to Section 720.10 of MaineDOT's Standard Specifications. Poles shall be long enough to allow installation of power and communication lines and any additional requirements of the utilities providing service. Poles shall project at least 20 feet above ground.

Wire and Cable: Power conductors shall be rated for 600 volts. The conductors shall consist of soft-drawn or annealed copper wire, insulated with flame retardant material. The cable shall be UL approved and listed as THW. Wire shall be large enough to allow a maximum voltage drop of 5% from source of power to the load. For distances longer than 50 feet, do not use wire smaller than AWG #8. Ground wire shall be #6 solid copper wire.

Grounding: All grounding and electrical installations shall meet the requirements of NEC, as well as all applicable state, local, and applicable public utility codes. All grounding shall meet the requirements of the manufacturers of the devices installed on the project. If the manufacturers' requirements are more stringent than those of the national, state, and local codes, then the manufacturers' grounding requirements shall apply.

Transient Voltage Surge Suppression (TVSS): The Contractor shall furnish and install TVSS device(s) for all power and communications conductors leaving the equipment cabinets, including ITS equipment, including but not limited to power service, and power and communications for all devices that are external to the cabinet.

Ground Rod: Ground rods shall be copper clad steel, 8 ft x 5/8 in.

Enclosures: All existing enclosures are to remain at sites 1, 2, 3, 5, and 6. A relocated enclosure from site 4 will be installed at Site 7.

Cabinets:

All intake and exhaust vents shall meet NEMA 3R requirements with and without powering the air venting arrangements. All exhaust vents shall be furnished with a screen to prevent insects from entering the CMS cabinet.

The existing CMS cabinet light shall automatically turn on when the cabinet door is open and shut off when the door is closed. The light shall be hardwire connected to the cabinet's electrical power distribution bus.

The Contractor shall furnish a control cabinet-wiring diagram in a watertight container. Three sets of identical wiring diagrams shall be furnished for each cabinet.

645.31 CMS The CMS shall be a Daktronics model VF-2420-80x192-20-RGB or approved equal.  
Mounting: The Contractor shall furnish and install all hardware required to attach the CMS panel to the existing and relocated support structures. CMS shall be mounted using two Zee bars attached along the top and bottom of the CMS panel. The Zee bars shall be bolted to the steel H beams on each side of the web as similar to the existing configuration for the attachment of the existing CMS.

645.32 CMS Controller The CMS Controller shall be incidental to the CMS and of quality and operability of the Daktronics model VG-2420-80x192-20-RGB or approved equal.

645.33 CMS Control Cabinet A new CMS controller shall be installed in the existing relocated pole mounted cabinet at site 7 incidental to the installation of the changeable message sign.

Cabinets and enclosures shall meet the standards herein and the National Electrical Manufacturer's Association (NEMA) TS-4 standards. New controller equipment shall be installed in all control cabinet locations as shown in the contract documents. This work shall include all wiring, cabling, and power and communication connections from the CMS cabinet to the CMS panel.

The cabinet shall contain a power panel with a primary circuit breaker. The primary circuit breaker shall serve as the electrical disconnect for the cabinet and shall shut off all cabinet power when in the "off" position. Cabinet doors shall be accessible by a #2 key.

The CMS cabinet shall contain a power switch mounted within the cabinet to control power to all duplex outlets. The cabinet shall include at least two duplex outlets (total of four outlets), each rated for 15 amps.

The Contractor shall supply and install a thermostatically controlled electric fan in the cabinet to maintain the temperature within the field cabinet to that required by the equipment for outside temperatures as specified in these Special Provisions. Thermostats shall have the capability of being field adjusted from 50° F to 120° F.

All exposed, high voltage electrical terminals shall be insulated with non-conducting material such as rubber boots or silicon/rubber caulking.

The CMS cabinet shall be electrically bonded to all of its associated metallic CMS support structure grounding systems, as described elsewhere in this document or in the Contract Documents.

All air venting arrangements shall contain air filters. The air filters shall have an average rated efficiency of 30% and a resistance of 90% when tested in accordance with ASHRAE 52.1-1992 Test Standard. The filter shall be listed and rated Class 2 by the Underwriters Laboratories. Each cabinet shall be supplied with all required air filters. All fans shall be located above the air filters at the top of the cabinet.

645.34 Coaxial Cable Communications Connection A coaxial cable connection that provides information to and from the MaineDOT Traffic Management Center shall be installed.

- a. The Contractor shall install, integrate and test cable communications connection that will be provided for use with the CMS controller.
- b. The Contractor shall provide all necessary cables and connectors to connect the Cable Modem to the CMS controller and to the cabinet.

645.41 AC Power Systems The Contractor shall provide utility power systems to CMS systems as indicated in the Contract Documents.

- a. The Contractor shall make the necessary arrangements with the utility company to ensure having needed utility service available at the time of equipment testing and turn-on. Any utility energization, connection, or disconnection delays will not be a valid reason for a time extension. The Contractor shall be responsible for all utility charges, including connection and monthly service charges, until System Acceptance.
- b. The Contractor shall adhere to all applicable NEC, IEEE 1100-1992, UL 1459, and UL 1950 standards and practices.
- c. The metered service shall include a 100-amp main disconnect.
- d. The Contractor shall provide a rigid conduit riser on the exterior of the sign structure with a weatherhead at the top of the riser. The meter and disconnect equipment shall be banded to the

sign structure support with a conduit below the disconnect switch entering the sign structure support.

645.42 Training The Contractor shall provide up to 6 hours training on all components of the CMS system. The Training shall meet the following requirements:

- a. The Contractor shall provide training on the configuration, operation, and maintenance of the items provided under this contract as described herein. The training shall be on the new items provided under this contract, including the CMS, CMS controller, and CMS control cabinet.
- b. The Contractor shall develop and supply all necessary manuals, displays, class notes, and visual aids, and other instructional materials furnished by equipment manufacturers. Instructional materials shall include all data sheets and manuals from manufacturers for all contract items supplied.
- c. All training shall include hands-on use of all field equipment and central equipment.

645.5 Testing The Contractor shall test all components of the system, as follows:

- a. The Contractor shall propose a test plan for the CMS system and submit the test plan(s) and procedures as detailed herein. Each test plan shall contain the following elements:
  - i. Proposed date, time, and location of the testing
  - ii. Names and credentials of the Contractor personnel who will be conducting the testing
  - iii. Descriptive overview of the proposed test procedure, to include the integration of both the MaineDOT TMC Compass software as well as manufacturers controller software
  - iv. List of test equipment required to perform the testing
  - v. Test cases and test logging forms which detail every step of the test procedure
- b. Test logging forms shall be in tabular format, with separate columns for each of the following:
  - i. Test case description detailing the test step to be performed.
  - ii. Expected result
  - iii. Actual result
  - iv. Pass/fail
  - v. Comments
- c. At the time of testing, the Contractor shall supply separate test logging forms for each test plan and for each device location. The test logging forms shall show the device location, date, and the start and end times of the test.
- d. At the end of each test logging form, there shall be a space for signature and date locations for each of the following:
  - i. Contractor personnel conducting the test
  - ii. Engineer representative witness
  - iii. MaineDOT Resident
- e. Signatures on the test logging form will signify only that the test was performed and witnessed, not that it passed or failed.

- f. The detailed Test Plans shall be submitted to the Resident no later than thirty (30) days prior to the beginning of each test phase.
- g. The Contractor shall have approved test plans before submitting a request to schedule the start of any test activities. The Contractor shall notify the Resident at least seven (7) days prior to the beginning of any equipment or systems testing.
- h. Testing shall provide verification and documentation that all requirements as detailed in this Section and the Plans are met. The Contractor shall develop the test plans to ensure that all contract requirements have been met and tested successfully and verified.
- i. If any deviations or change to an approved test plans arises, the plan shall be resubmitted for review and approval by the Resident at least fourteen (14) calendar days prior to any planned test activity stage. No tests shall be conducted until the Resident has approved the test plan.
- j. A summary of all tests shall be produced at the completion of each testing phase of the project to ensure that all requirements defined by the system are satisfied.

645.6 Method of Measurement Changeable Message Sign (CMS) Systems will be measured for payment as each for each fully operational system furnished, installed, and accepted and includes all labor, equipment, and materials to provide a full operational and maintainable system with communications to MaineDOT’s TMC and training for MaineDOT staff as noted above.

645.7 Basis of Payment The accepted quantity of CMS Systems will be paid for at the Contract each price. This price shall be full compensation for furnishing, installing, configuring, and testing all equipment necessary for a fully functioning system as well as training associated with the CMS board and controller. The price also includes all costs associated with setting- up and paying for a coaxial cable modem account, technical support, and training.

Payment will be made under:

| <u>Pay Item</u>                    | <u>Pay Unit</u> |
|------------------------------------|-----------------|
| 645.1551      Dynamic Message Sign | Each            |