ITEM 645.4510--25 - RELOCATE DYNAMIC MESSAGE SIGN

1. DESCRIPTION:

1.01 This work shall consist of relocating a walk-in access Dynamic Message Sign (DMS) equipment at locations specified on the plans and as directed by the Engineer. The DMS is attached currently attached to an overhead structure. This item includes the disconnection of the sign from the overhead structure and the ground mounted equipment, stored and reinstalled on a new structure. The removal of the existing structure and the new structure is not included in this item.

1.02 The DMS equipment to be relocated shall include:

- DMS enclosure display unit.
- DMS Controllers
- DMS display unit attachment hardware

2. MATERIALS:

The following materials describe the existing sign and its operational functionality. This functionality shall be adhered to when re-installing the sign. The Contractor shall be required to perform and meet the quality assurance provisions stated in sections 2.08, 2.09 and 2.10.

2.01 General Requirements

The DMS to be relocated is the following model:

The weight of the unit does not exceed

The dynamic message signs dimensions do not exceed

2.02 Functional Requirements

2. MATERIALS: (cont'd)

2.03 **Dynamic Message Sign Communications Protocol**

[redacted]

A. DMS Central Software and Field Controller software shall [redacted]

B. Ports on each device shall [redacted]

C. Subnetwork Level

1. **For Dial-Up Communication:**

Physical layer shall [redacted]

[redacted]

Data Link Layer shall [redacted]

[redacted]

The IPI shall be indicative of the following format. Implementations shall support the functionality indicated by the following formats as indicated within the PPP packet:

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

2. MATERIALS: (cont'd)

2.03 Dynamic Message Sign Communications Protocol (cont'd)

2. **For Fiber Optic/Network Communications:**

The communications link between DMS controller and Central computer [redacted] Each component shall conform t [redacted].

D. Transport Level:

1. **Dial-Up:** Communication shall be [redacted]

2. **Fiber Optic:** Communication shall [redacted].

E. **Application Level:** These protocols shall be [redacted].

F. **Information Level:** Software shall implement all mandatory objects and Full Standardized Object Ranges of all mandatory conformance groups as defined in [redacted] except as modified by this specification.

G. Software shall also implement all mandatory objects of all optional Conformance Groups listed below:

[redacted]

2. MATERIALS: (cont'd)

2.03 **Dynamic Message Sign Communications Protocol** (cont'd)

H. Software shall also implement the following objects as defined in [redacted]

[redacted]

I. The following provides the current listing of required variances:

OBJECT	MINIMUM PROJECT REQUIREMENTS
[redacted]	[redacted]

2. MATERIALS: (cont'd)

2.03 Dynamic Message Sign Communications Protocol (cont'd)

OBJECT MINIMUM PROJECT REQUIREMENTS

[redacted]

J. The field controller software shall implement the following tags ([redacted]

[redacted]

K. Software shall be supplied with full documentation, including CD-ROM containing ASCII versions of the following Management Information Base (MIB) files in Abstract Syntax Notation (ASN.1) format:

1. The relevant version of each official standard MIB Module referenced by the device functionality.

2. If the device does not support the full range of any given object within a [redacted]

3. An MIB Module in [redacted]

2. MATERIALS: (cont'd)

2.03 Dynamic Message Sign Communications Protocol (cont'd)

L. The Contractor shall provide a Profile Implementation Conformance Statement (PICS) for the Profiles as detailed [redacted] of these Standards to indicate which options of the standard were implemented as well as the ranges supported.

M. The Contractor shall reset the DMS Controller firmware for [redacted] where implemented. This firmware as two separate sets of [redacted].

2.04 **DMS Remote Controller**

A. The sign is individually addressable from a PC type computer. In addition, all signs are capabile of being addressed from a single communications link.

B. Additionally, the software is designed so as to allow an exact animated simulation of the LED display in order to permit the dynamic visualization of the message prior to actual display. Furthermore, the software shall have the capability to automatically broadcast specific messages to at least [redacted] case of emergencies.

2.05 **Sign and Face Enclosure**

A. A lifting mechanism shall be provided for transporting and installing the DMS and shall be a permanent, integral part of the DMS housing structural frame

B. Signs shall be attached to their overhead support structures with [redacted] overhead sign support structure shall be as required to conform to the latest editions of AASHTO's Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, NYSDOT Design Specifications for Overhead Sign Structures Carrying Variable Message Signs, October 1998 and all other structural requirements specified for this contract. The beam attachment shall also be certified by a Professional Engineer.

2.06 **Electrical Protection, Documentation, Warranty**

A. In order to protect all different parts of the variable message sign assembly from electric and electromagnetic surges, all necessary equipment have been supplied as part of the variable message sign assembly. A [redacted]

[redacted]

B. The sign assembly, cabinet and structure shall be electrically bonded to assure proper grounding of all components.

2. MATERIALS: (cont'd)

WARRANTY: All of the mechanical and electronic equipment specified to make the system operational and functional shall be warranted for a period of two (2) years. The warranties shall be issued to the New York State Thruway Authority by the respective manufacturer and/or system fabricator. The warranties shall cover the repair or replacement of the component or device.

Replacements shall be new units. The Authority will be responsible for removing and re-installing the component or device after the Contractors initial warranty period. The warranties shall be effective from the date of final acceptance.

The Contractor shall comply with Subsection 104-08 of the Standard Specifications for the initial warranty period.

Nothing contained in these Special Specifications shall relieve the Contractor of the implied warranty that the equipment, system, and service provided are both first quality, fit, and merchantable for the uses intended as indicated herein.

2.07 **DMS Controls:** All controls shall be contained in the sign housing.

A. A modem and all auxiliary equipment necessary for manual programming of the LED sign shall be included and will be enclosed in the cabinet at each site. [redacted] There shall be no substitution for the modem or antenna.

B. Signs that communicate by [redacted]

C. Sign controls shall [redacted]

D. Cabinet has a [redacted]

E. Surge protection – a surge protection [redacted]

2.08 **Quality Assurance Provisions**

A. Two (2) types of tests shall be required for each unit of equipment re-installed: Stand-Alone Tests, and System Acceptance Tests. Each of these tests is described in the following sections.

B. The Contractor shall be responsible for developing detailed test procedures for each type of equipment and for conducting the specified tests to verify satisfactory operation of the equipment. The test procedures shall be submitted to the Engineer for approval prior to the tests. Only approved test procedures shall be used during the tests. A minimum of ten (10) working days shall be allowed for the Engineer's review and approval of the test procedures.

2. MATERIALS: (cont'd)

C. The Engineer shall be notified in writing a minimum of ten (10) work days in advance of the time when these tests are to be conducted.

D. The results of each test shall be compared with the requirements specified herein. Failure to conform to the requirements of any test shall be counted as a defect, and equipment shall be subject to rejection by the Engineer.

E. Rejected equipment may be offered again for retest provided all non-compliant items have been corrected and retested by the Contractor and evidence thereof submitted to the Engineer.

F. Final inspection and acceptance of equipment shall be made after installation at the locations specified on the Plans unless otherwise specified herein.

2.09 **Stand-Alone Test**

A. The Contractor shall conduct an approved stand-alone test of each piece of equipment for the approval of the Engineer before shipment from the factory and after installation of each field site shown on the Plans. This test shall not be performed unless a representative of the DMS manufacturer is present. The tests shall, as a minimum, exercise all stand-alone (non-network) functional operations of the equipment with all the equipment assembled at the Factory and all of the equipment installed in the field as per the plans as directed by the Engineer. Approved data forms shall be completed and turned over to the Engineer as the basis for review and rejection or acceptance. As a minimum, the following tests shall be performed:

2. MATERIALS: (cont'd)

B. If the equipment fails the stand-alone test, it shall be corrected or another substituted in its place and the test successfully repeated.

C. If a unit has been modified as a result of a stand-alone test failure, a report shall be prepared and delivered to the Engineer prior to retesting of the equipment. The report shall describe the nature of the failure and the corrective action taken. If a failure pattern, as defined by the Engineer, develops, then he may direct that design and construction modifications be made to all equipment without additional cost to the Authority or extension of the contract period.

D . In addition to the Stand Alone Test defined in A. above, once installed the sign controller must pass a test of the [redacted]. The test will be performed by Thruway personnel or their designee using [redacted] the test it is expected that the Contractor, manufacturer, and Authority's Construction inspection firm will be present. The date, location, and time of the test will be designated by the Authority.

NOTE: The sign controller must pass this test in order to be accepted. If the manufacturer can prove that the Authority has tested the exact DMS Controller, Software, Firmware, and system software using the above method, then this item may be waived at the sole discretion of the Authority.

2.10 **Final Acceptance Test**

A. Following satisfactory completion of the stand-alone field test, a final acceptance test shall be conducted.

B. The final acceptance test shall, as a minimum, exercise all functional operations of the equipment as an integrated system. The test shall demonstrate all remotely controlled features and all local controlled features specified herein. The test shall continue for a period of 90 days.

The 90-day test will be run from the Thruway Statewide Operation Center, TSOC. Each sign must successfully connect [redacted] of the time during the test period. During this time the following tests, at a minimum, must occur:

[redacted]

C. In the event of a failure of any supplied equipment, the test shall be suspended until the problems have been corrected, and then the test shall be resumed from the beginning.

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3. CONSTRUCTION DETAILS:

3.01 The existing sign shall be carefully removed from the existing structure and transported to the designated storage site until the sign is to be re-installed. At the storage site the Contractor shall unload the sign and place it upright and secured on adequate dunnage at least 2 foot above ground level. The sign shall be covered. The dunnage shall be provided by the contractor.

3.03 During the storage period the Contractor shall be responsible for the integrity of the stored sign. This will include the re-securing of the sign or recovering the sign.

3.02 The Contractor shall develop and deliver shop drawings which illustrate, in detail, how to mount and connect the dynamic message sign enclosure to the appropriate truss shown on the plans. All shop drawings shall be approved by a licensed N.Y.S. Professional Engineer. The sign enclosure shall be attached so that the sign face will be tilted down at an angle of 5 □degrees to dynamic message sign enclosure shall include any support mechanism necessary for the installation of the dynamic message sign enclosures which would not have been included in the support structure.

3.03 The sign shall not be mounted over the road or on the roadside unless all power and communication lines have been brought to the site and are ready for connection to the sign.

4. METHOD OF MEASUREMENT:

4.01 Work under this item will be measured for payment by each of the dynamic message sign assemblies removed from its existing structure, stored, re-installed and made operational.

5. BASIS OF PAYMENT:

5.01 This work shall be paid for at the contract unit price for each dynamic message sign assembly removed, stored , installed and accepted. Payment is to be made as follows: Fifty percent (50%) of the bid price of each item will be paid upon completion of the removal and placement at the storage site ; percent (40%) will be paid upon re-installation; and ten percent (10%), less any liquidated damages, will be paid upon satisfactory completion of the acceptance test, as described in Sections 2.09 through 2.11 of this specification. This price shall include the dynamic message signs in their entirety including all auxiliary equipment, ground and underdeck mounted cabinets and attachments, software, installation of mounting to the support structure and all electronics and appurtenances relative to the signs.

5. 02 Maintaining the integrity of the stored sign shall be included in the price bid.

5.03 The cost for removal of the existing structure and the new structure shall be paid under separate items.

5. 04 Liquidated damages shall be assessed at the rate of $100.00 per day for failure to complete any of the Milestones on schedule. The Engineer may adjust milestone dates to compensate for delays in the availability of the site.

Milestone No.	Description	COMPLETION DATE
1	Completion of Final Acceptance Test	November 16, 2012