



# Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

July 26, 2022

SUBJECT FAI Route 270/FAP Route 310 (I-270/IL 255)  
Project HSIP-DXAF (431)  
Section 60-1, 9SG-1  
Madison County  
Contact No. 76P66  
Item No. 32, August 5, 2022 Letting  
Addendum A

## NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised Schedule of Prices.
2. Revised pages 6, 9, 11, 13, 18, 36, and 39-40 of the Special Provisions.
3. Revised sheets 2-3 of the Plans.

Prime contractors must utilize the enclosed material when preparing their bid and must include any changes to the Schedule of Prices in their bid.

Very truly yours,

A handwritten signature in black ink, appearing to read "Jack A. Elston".

Jack A. Elston, P.E.  
Bureau Chief, Design and Environment

MTS

## ROAD CLOSURE FOR OVERHEAD SIGN TRUSS INSTALLATION

The road shall be closed in one direction during the installation of the overhead sign truss under the following conditions:

- a.) The Engineer shall be notified a minimum of ten (10) working days in advance of any proposed road closure or lane restriction. This time is required to coordinate closure operations with police forces and issue the necessary press release.
- b.) Road closures for the purpose of installing the new overhead sign truss structure and or the dynamic message sign shall be scheduled between the hours of 9:00 p.m. to 5:00 a.m.
- c.) Any and all road closures and lane restrictions shall be removed and/or rescheduled if adverse weather such as rain, snow, or fog is present.
- d.) All labor, equipment, and materials required to perform the short term work shall be present prior to closing the lanes.
- e.) Road closures on any road shall be limited to a maximum of 15 minutes and shall be coordinated with the Illinois State police by the Contractor and through District 8's Bureau of Traffic's Jeff Abel, phone (618) 346-3283. Seventy-two (72) hour advance notice is required.
- f.) After the 15-minute closure, "all" lanes shall be immediately reopened to traffic for a minimum clearing period of 30 minutes or longer before resuming normal construction activities as directed by the Engineer.
- g.) Delays to the Contractor caused by complying with these requirements will be considered incidental to the item for Traffic Control and Protection (Special), and no additional compensation will be allowed.

Basis of Payment: This work will be paid for at the contract unit price per LUMP SUM for TRAFFIC CONTROL AND PROTECTION (SPECIAL).



The Contractor shall be responsible for installing the proposed ITS components in accordance with the plans, specifications, and manufacturer's recommended practices.

This work will not be paid for separately but shall be included in the contract unit price per EACH for TRUSS MOUNTED LED DYNAMIC MESSAGE SIGN.

## **TRUSS MOUNTED LED DYNAMIC MESSAGE SIGN**

### Description:

This work consists of providing a truss mounted dynamic message sign (TMDMS) at the location shown on the plans and as directed by the Engineer. Truss mounted dynamic message sign assembly includes the TMDMS enclosure, communication cables, conduits, and associated mounting hardware and software as described in these special provisions and as shown on the contract plans. It also includes operational TMDMS software that remotely provides access to the functionality and performance specified herein.

### TMDMS Manufacturer Qualifications

The TMDMS manufacturer shall submit references as specified below. Reference data shall include the current name and address of the organization and the current name and telephone number of an individual from the organization who can be contacted to verify system operation as well as date of system installation.

### Experience Requirements

The TMDMS manufacturer shall submit at least two references, preferably from other state departments of transportation, that are successfully operating a highway LED full matrix TMDMS system, supplied by this manufacturer under the current corporate name, which otherwise meets this specification, for a period of no less than two years. The LED TMDMS systems submitted shall be full-matrix with full color display and able to display at least 3 lines of 21 characters per line, 18" characters, and have walk-in access housings.

### References

The TMDMS manufacturer shall submit three references, preferably from other state departments of transportation, that are successfully operating a multi-unit, multi-lane state or interstate highway, permanently mounted, overhead dynamic message sign system supplied by this manufacturer under the current corporate name for a period of no less than five years.

### Materials

#### General

The TMDMS shall be a full matrix FULL COLOR LED display (32,000 distinct colors using red, green, and blue LEDs) in a walk-in weatherproof cabinet. The TMDMS shall provide approaching motorists with a clear readable message in all normally encountered weather and lighting



Protocol (NTCIP) Specifications applicable for TMDMS and as specified in these special provisions. The TMDMS shall communicate without error for all of the applicable NTCIP standards and be compliant with all applicable NTCIP standards for TMDMS. The TMDMS shall support all mandatory objects of all mandatory conformance groups of NTCIP for TMDMS.

The TMDMS shall enable the display of text consisting of a string of alphanumeric and other characters and graphics, including but not limited to interstate shield signs and route marker symbols. Each character shall be formed by a matrix of luminous pixels. The matrix of a standard character shall consist of 35 pixels over 5 columns and 7 rows. Each TMDMS shall be minimum 54-pixel high x 250 pixel wide (Pixel Pitch Range from 20mm to 35mm), full matrix, and capable of displaying three lines of text using a standard 5 wide x 7 high font size. All display elements and modules shall be solid state. No mechanical or electromechanical elements or shutters shall be used.

All characters, symbols, and digits shall be 18" nominal character size and shall be clearly visible and legible at a distance of 1100' within a minimum 30-degree cone of vision centered around the optical axis of the pixel.

The sign shall be capable of displaying the following:

- A static message
- A flashing message
- Alternating messages, either flashing or static

The changing from one message to another shall be instantaneous.

For message creation, the TMDMS field controller and TMDMS control software shall support the storage and use of a minimum of three (3) alphanumeric character font files comprising the ASCII character set and including 8 directional arrows. Software shall provide the ability to create and maintain message libraries containing up to 255 messages.

The sign shall be able to reproduce standard MUTCD colors per 23 CFR 655. These colors include:

- Black (no pixels on)
- White
- Blue
- Brown
- Green
- Light Blue
- Orange
- Purple
- Red
- Yellow
- Fluorescence Pink
- Fluorescence Yellow-Green

#### Software

Diagnostics:	<ul style="list-style-type: none"> <li>• Log events and alert TMC staff via email</li> <li>• Locate pixel failures instantly with an in-software visual representation test</li> <li>• View status, errors, and problem codes of all DMS subsystems</li> <li>• Verify and troubleshoot at the pixel level</li> </ul>
Security:	<ul style="list-style-type: none"> <li>• Real-time verification of "on" pixels</li> <li>• Username/password restricted access to functional areas</li> <li>• Built-in security levels for easy setup</li> <li>• Prohibited words list</li> </ul>

**In the event that the software is not capable of operating on a laptop that is connected directly to the DMS sign, the Contractor shall provide ten additional licenses of software that can be used in the field to manage the DMS and perform sign diagnostics.**

**The vendor shall furnish updated copies of all software during the warranty period at no charge to the Department.**

Software Documentation

Full documentation for all software and associated protocols shall be supplied to the Department on a CD-ROM. The Department reserves the right to provide this documentation to other parties who may be contracted to provide overall integration or maintenance of this item.

Performance Requirements

TMDMS messages shall be clearly visible and legible from in-vehicle viewing distances between 150 and 1100 feet. While using an 18" character height, the TMDMS shall be capable of simultaneously displaying up to 21 characters in each of three lines with spaces between characters and using 5 horizontal X 7 vertical (or larger) pixel matrices.

The TMDMS controller shall be capable of storing a minimum of 32 three-line full width messages. The controller shall be capable of downloading a minimum of 8 additional messages and commands from the communications interface.

The sign shall provide a RS-232 communications interface in the sign control cabinet suitable for wireless, PSTN, cellular, and fiber optic communications with the sign controller. Additionally, an RS-232 serial port and ethernet port shall be provided in the control cabinet for full sign operation by means of a laptop computer. Each serial port shall support data rates of 19.2 kbps, 14.4 kbps, 9600 bps, 4800 bps, 2400 bps, and 1200 bps.

Optical Requirements

All mandatory NTCIP sign functions shall be available, and message effects shall be visible from the ground-mounted sign control cabinet.



Each pixel shall be a maximum of 1-3/8" in diameter. The LEDs in each pixel shall be clustered to maximize long range visibility. The average light intensity of the LEDs in each pixel shall be 3 candelas minimum. All pixels in the sign shall have equal color and on-axis intensity. All pixels shall have a minimum on-axis intensity of 40 candelas @ 20 mA forward current with an overbright capability of 60 cd.

All pixels in all signs in this project, including the spare parts, shall have equal color and on-axis intensity. The pixel strings shall be powered from a regulated DC power source, and the LED current shall be maintained at the LED manufacturer's specified nominal operating current to maximize life of the pixel. The failure of an LED in one string within a pixel shall not affect the operation of any other string or pixel. Pixel power drawn from the DC supplies shall not exceed 1.5 W per pixel, including the driving circuitry.

The LEDs shall be individually mounted directly to a printed circuit board and shall be easily replaceable and individually removable using conventional electronics repair methods.

The LEDs shall be protected from the outside environmental conditions including, but not limited to, moisture, snow, ice, wind, dust, dirt, and UV rays.

TMDMS pixels shall be constructed with discrete high quality LEDs. Discrete LEDs shall conform to the following specifications:

- LED's shall be non-tinted, non-diffused, high-intensity, solid-state lamps that utilize AlInGAP OR InGaN semiconductor technology.
- LED lenses shall be fabricated from UV light resistant epoxy.
- The LED lens diameter shall be 0.2 inches (5 mm).
- Red LEDs shall be AlInGAP with a peak wavelength of 626 nm.
- Green LEDs shall be InGaN with a peak wavelength of 525 nm.
- Blue LEDs shall be InGaN with a peak wavelength of 475 nm.
- LEDs shall be obtained from a one-bin luminous intensity sort.
- LEDs shall have a minimum half-power viewing angle of 15°.
- LED package style shall be through-hole flush-mount. LEDs with standoffs and surface mount LEDs will not be accepted.
- All LEDs used in all TMDMS provided for this contract shall be from the same manufacturer and have the same part number.

The sign shall have a minimum intensity of 12,400 cd/m<sup>2</sup>.

Basis of Payment: This work will be paid for at the contract unit price per EACH for REMOVE EXISTING ITS EQUIPMENT.

## CAT 5 ETHERNET CABLE

This work shall be in accordance with Sections 873, 1076, and 1088 of the Standard Specifications, except as modified herein.

This work shall consist of furnishing and installing an outdoor rated CAT5E cable in conduits, handholes, and poles.

The cable shall be rated for outdoor use and conform to the following specifications:

- Outdoor CMX rated jacket (climate/oil resistant jacket)
- UV resistant outer jacket material (PVC-UV, UV Stabilized)
- Outer jacket ripcord
- Designed For outdoor above- ground or conduit duct applications
- Cat5E rated to 350MHz (great for 10/100 or even 1000mbps gigabit Ethernet)
- Meets TIA/EIA 568b.2 standard
- Shielded twist pair
- 4 pairs, 8 conductors
- 24AWG, solid core copper
- UL 444 ANSI TIA/EIA-568.2 ISO/IEC 11801
- RoHS compliant
- Water blocking gel

Basis of Payment: This work will be paid for at the contract unit price per FOOT for CAT 5 ETHERNET CABLE.

## CLOSED CIRCUIT TELEVISION SYSTEM

Description. This work shall consist of furnishing and installing an integrated closed-circuit television (CCTV) dome camera assembly, camera bracket, and all other items required for installation and operation. This assembly shall contain all components identified in the materials section and shall be configured as indicated on the plan sheets.

### Materials.

The CCTV camera shall be an outdoor rated dome camera with 1920x1080 HD resolution, 31x optical zoom, laser focus, speed dry, and full VAPIX API support for software integration.

The Contractor shall provide all materials required to install the proposed camera on the proposed sign structure camera mast as shown on the plan sheets.



WARRANTY: Axis 3-year warranty and AXIS extended warranty option

#### Environmental Enclosure/Housing

The environmental enclosure shall be designed to physically protect the integrated camera from the outdoor environment and moisture via a sealed enclosure. If the option exists in the standard product line of the manufacturer, the assembly shall be supplied with an integral sun shield. The enclosure shall be fully water and weather resistant with a NEMA 4 rating or better.

The camera dome shall be constructed of distortion free acrylic or approved equivalent material that must not degrade from environmental conditions. The environmental housing shall include a camera-mounting bracket. In addition, the environmental housing shall include a heater, blower, and power surge protector. An integral fitting compatible with a standard 1-1/2 in (38.1 mm) NPT pipe, suitable for outdoor pendant mounting shall also be provided.

The enclosure shall be equipped with a heater controlled by a thermostat. The heater shall turn on when the temperature within the enclosure falls below 40° F (4.4°C). The heater shall turn off when the temperature exceeds 60°F (15.6°C). The heater will minimize internal fogging of the dome faceplate when the assembly is operated in cold weather.

In addition, a fan shall be provided as part of the enclosure. The fan will provide airflow to ensure effective heating and to minimize condensation.

The enclosure shall be equipped with a hermetically sealed, weatherproof connector, located near the top for external interface with power, video, and control feeds.

#### CCTV Camera System Mounting Supports

The Contractor shall furnish and install a Pole Mount Bracket with integral IDC wire termination inside the bracket for camera installation on CCTV camera poles and light poles and stainless steel banding as required.

Mounting supports shall be configured as shown on the camera support detail plans and as approved by the Engineer. Mount shall be of aluminum construction with enamel or polyester powder coat finish. Braces, supports, and hardware shall be stainless steel. Wind load rating shall be designed for sustained gusts up to 90 mph (145 km/hr) with a 30% gust factor. Load rating shall be designed to support up to 75 lb (334 N). For roof or structural post/light pole mounting, mount shall have the ability to swivel inward for servicing. The mounting flange shall use standard 1-1/2 inch (38.1 mm) NPT pipe thread.

#### Connecting Cables

The Contractor shall furnish and install outdoor rated, shielded CAT5E cable at the locations shown on the plan sheets. The cable shall be terminated using the terminal block inside the camera bracket, the IDC connector and pre-formed IP66 rated RJ-45 connector on the camera end, and a shielded RJ-45 connector in the cabinet. The Contractor shall test the cable prior and after termination.

Cable will not be paid for separately but shall be included in the cost of this pay item.

REVISED 7-26-2022



Construction Requirements.

General

The Contractor shall prepare a shop drawing detailing the complete CCTV dome camera assembly and the installation of all components to be supplied for approval of the Engineer. Particular emphasis shall be given to the cabling and the interconnection of all of the components.

The Contractor shall install the CCTV dome camera assembly at the locations indicated in the plans. The CCTV dome camera assembly shall be mounted on a pole, wall, or other structure.

Testing

The Contractor shall test each installed CCTV dome camera assembly. The test shall be conducted from the field cabinet using the standard communication protocol and a laptop computer. The Contractor shall verify that the camera can be fully exercised and moved through the entire limits of Pan, Tilt, Zoom, Focus and Iris adjustments using both the manual control and presets. The Contractor shall maintain a log of all testing and the results. A representative of the Contractor and a representative of the Engineer shall sign the log as witnessing the results. Records of all tests shall be submitted to the Engineer prior to accepting the installation.

Method of Measurement. The closed-circuit television dome camera bid item will be measured for payment by the actual number of CCTV dome camera assemblies furnished, installed, tested, and accepted.

Basis of Payment. This work will be paid for at the contract unit price per EACH for CLOSED CIRCUIT TELEVISION DOME CAMERA, HD.



**FIBER OPTIC ETHERNET DROP AND REPEAT SWITCH**

The Contractor shall furnish a fiber optic drop and repeat switch complete with the accessories specified below and install it inside the proposed traffic signal cabinet.

The fiber optic drop and repeat switch shall meet or exceed the following minimum specifications:

**Approved Models: Antaira (Aaxeon) Technologies Model LNX-0702C-SFP-T (7-Port (5-port 10/100T + 2 10/100/1000T SFP ports industrial Ethernet switch, wide operating temperature) or approved equal.**