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Specifications Request Form

Created By: Joshua Verastique

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Committee Review Date:

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Effective Date:

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☒ Construction and Maintenance

☒ Right of Way

☐ Alternative Delivery

☐ Alternative Delivery Right of Way

Controlling Project ID:

XXXX-XX-XXX

District/Division:

Traffic Safety Division

Specification Book Year:

2024

Estimated Let Date:

MM/DD/YYYY

Approved Let Date:

MM/DD/YYYY

Specification Request Form Type

\* Form Type:

Statewide

☒ New

☐ Identical

Deadline Date:

MM/DD/YYYY

\* Project Type:

Construction and Maintenance

\* Funding Type:

Federal and Non-Federal

County:

Select item

Specification

☐ Replacement

☒ Required

☐ Optional

Proposed Specification Code:

6XXX

Title:

DYNAMIC LED CHEVRON SYSTEM

☐ Reference Items

Description

☐ 636

SIGNS

☐ 644

SMALL ROADSIDE SIGN ASSEMBLIES

Remove

New Item

☐ Bid Code / Specification

Description

Measurement

Comment

☐ 6XXX-XXXX

LEAD LED CHEVRON

EA Each

☐ 6XXX-XXXX

LEAD LED CHEVRON W/ MONITOR SYS

EA Each

☐ 6XXX-XXXX

LED CHEVRON

EA Each

Remove

New Item

Special Provision

☐ Special Provision

Title

Description

Replacing

Existing Special Provis

Remove

New Item

000 Provision

☐ 000 Provision

Title

Replacing

Existing 000 Provision

Remove

New Item

\* Change Summary:

New statewide LED Chevron Curve Warning System, special spec and bid codes.

Comments:

Special Spec for LED curve signs warning system in development at the moment.  
Spec Committee No. 6XXX-20243-15

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2024/Special Specification to Item FM00000038166-1.rtf

Joshua Verastique

03/20/2024

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## Special Specification 6XXX350

### Dynamic LED ~~Curve Warning~~Chevron System



#### 1. DESCRIPTION

Fabricate, furnish and erect dynamic curve warning system consisting of chevron signs with yellow light emitting diode (LED) lights outlining the chevron symbol integrated in the system, solar panels for each sign, radar detection for each approach, communication transmitters and receivers. Dynamic curve warning system function is to warn and guide motorists through a curve once activated with radar by directing the chevrons to flash sequentially.

#### 2. MATERIALS

Furnish and construct materials in accordance with the following:

- Item 636, "Signs"
- Item 644, "Small Roadside Sign Supports and Assemblies"

Provide signs that meets TMUTCD W1-8R(L) ~~or W1-2R(L)~~. Provide sign substrate that is a minimum 0.080 5052 alloy highway grade aluminum. Provide Type B<sub>FL</sub> or Type C<sub>FL</sub> reflective sheeting on all chevron signs. Provide signs with integrated LED lights. LEDs within the signs must be wired in a manner (parallel) that all LEDs continue to flash in the event of failure of an individual LED. Sign will output 550,000 millicandelas at daytime peak ensuring sign is daylight visible. Provide LEDs that have dimming capabilities and automatically adjust flash brightness to varying light conditions. Ensure that each system comes with 1 transmitter and additional receivers for each additional chevron. Ensure that communication between devices on a curve occurs wirelessly. Transmitter will be included with the Lead LED sign. Ensure the system works with either solar power or electrical service. Unless otherwise noted, system will be provided with solar panels by the manufacturer. Provide solar panels sized to allow system to work as needed 24/7 based on the 20 yr. projected traffic count of the facility. Unless otherwise noted, batteries will be provided by the manufacturer, and should be installed in a box mounted on a pole underneath the solar panel.

~~The Provide a Lead LED Chevron curve warning system must be capable of being monitored and controlling the dynamic LED curve warning system led through a web-based web-based monitoring system. Ensure the system allows for management of device settings (such as solar and battery output and wireless signal), schedules (flash durations), and impact detection notifications. (# of activations and optional alerts via text or email if system is triggered and/or down).~~

- ◆ ~~The Lead LED Chevron with Monitoring System must also include cellular modem communication to monitor and control the dynamic LED curve warning system through the web-based user interface.~~

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#### 3. CONSTRUCTION

Install sign posts in accordance to Item 644, "Small Roadside Sign Supports and Assemblies."

- 3.1. **Vehicle speed sensor activation.** Mount a low power draw digital signal processing based radar on the lead LED chevron in the curve warning system. Ensure curve warning system is capable of detecting a compact vehicle within 300 ft. of the chevron. Ensure the radar activates the LED system and wirelessly signals the LED chevrons in the curve to sequentially turn on. House the radar and transmitter in a control box mounted on the Lead LED chevron. LED chevrons in the system can flash in unison or sequentially depending on how the system is configured and flash duration is predetermined. The radar must provide real time vehicle detection (within 112 milliseconds of vehicle arrival).

Install each chevron sign as shown on plans and in accordance with D&OM (3).

#### 4. WARRANTY

Materials and batteries must have a 5 year warranty from accepted installation date. The accepted installation date is defined as the date the Department determines the sign has passed installed testing requirements. The warranty must cover all defects in material, parts and cover shipping costs, except when installation has been damaged by outside forces.

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#### 5. ~~THE SYSTEM AS A WHOLE WILL HAVE A MINIMUM 2 YR. WARRANTY FROM THE TIME OF INSTALLATION AND ACCEPTANCE OF THE SYSTEM. BATTERIES MUST HAVE A 5 YR. LIFESPAN WHILE OPERATING 24/7. LED WILL OPERATE AT LEAST 100,000 HOURS. MANUFACTURER WILL SHIP REPLACEMENT PARTS AT NO COST AS REQUIRED DURING 2 YR. WARRANTY PERIOD, EXCEPT WHEN INSTALLATION HAS BEEN DAMAGED BY OUTSIDE FORCES.~~

#### 6.5. MEASUREMENT

This Item will be measured by each LED chevron, ~~or lead LED chevron~~ or lead LED chevron with monitoring system. Each lead LED ~~chevron and lead LED chevron with monitoring system chevron~~ must have a transmitter that will communicate with other chevron signs in the curve. Each LED chevron will have a receiver and will be paid for separately as each "LED Chevron." ~~The Lead LED chevron and lead LED chevron with monitoring system will have the vehicle speed sensor and.~~ The Lead LED chevron will be paid for separately as each "Lead LED chevron," or "Lead LED Chevron with Monitoring System."

"Lead LED Chevron with Monitoring System" Lead LED chevron will include cost of the web-based device monitoring system, and control software and paid cellular service for a period of 5 years to monitor and control the dynamic LED curve warning system. The system must allow for management of device settings (such as solar, battery output and wireless signal), schedules (flash durations) and impact detection notifications. The web-based monitoring system must be capable of sending alerts through the user interface as well as e-mail and Short Message Service (SMS) alerts for all configured users for a period of 5 years. Software provides automated data analysis and reporting. Software also allows for data upload, incident detection, trend analysis, historic reviews, and interactive map with all similar devices.

#### 7.6. 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 bids for "LED Chevron," ~~and "Lead LED Chevron,"~~ and "Lead LED Chevron with Monitoring System."

This price is full compensation for furnishing and installing complete LED chevrons/lead LED chevrons/lead LED chevrons with monitoring service, including sign connections and all hardware; attaching chevrons to the supports; washing and cleaning the chevrons; and equipment, materials, labor, tools, and incidentals. The price also includes testing of the LED curve warning system and making adjustments as needed. Price is full compensation for installing solar panels to ensure optimal recharging of batteries, solar powered batteries, solar powered batteries, interconnecting chevrons/lead chevrons so transmitter and receivers communicate with each other, to the satisfaction of the Engineer.

Additionally, the price bid for "Lead LED Chevron with Monitoring System" is full compensation for access to the web-based user interface, cellular modem, and 5 years of paid internet service for remote device monitoring.

A minimum of one day (8 hr.) of on-site training is included to train employees on setup of system, software installation, software control, and set up of alert notifications.

6~~XXX~~350

Installation of sign post and foundations will be paid for under Item 644, "Small Roadside Sign Supports and Assemblies."