



**SPECIAL PROVISIONS
FOR
SPEED FEEDBACK TRAILERS**

**Warren County
IM-NHS-035-2(378)54--03-91**

**Effective Date
December 20, 2016**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150166.01 DESCRIPTION.

A. Scope of Work.

The work shall consist of installing, maintaining, and monitoring speed feedback trailers designated on the project drawings and as specified herein.

B. Definitions.

1. Speed Feedback Trailer.

Speed feedback trailers are mobile devices capable of capturing vehicle speed for oncoming traffic.

2. Display.

The Display is a device capable of connecting to the speed feedback trailer capable of broadcasting the speed of oncoming traffic captured by the speed feedback trailer. This device allows for vehicle speed feedback to the vehicle operator, allowing for speed adjustment throughout the remainder of the work zone.

150166.02 MATERIALS.

A. Power System.

1. Solar power system shall charge and maintain batteries automatically without intervention, designed for year round deployment in Iowa assuming minimal solar charging during winter months.
2. No component shall create a shadow on any portion of the solar panels.
3. Battery box shall be lockable to prevent unauthorized access.

B. Speed Display and Behavior.

1. Display shall be two digits displayed in miles per hour.
2. Character units shall be of one font and a minimum of 24 inches in height.
3. Legibility, must be able to determine numbers from 1/4 mile.
4. Visibility, must be able to determine if the sign is on from 1/2 mile.
5. Display shall have the ability to:
 - a. Continuously show the speed of an approaching vehicle and not flash regardless of speed limit or preset thresholds.
 - b. 0 to 50% of speed limit setting –Display is blank.
 - c. 50% to 130% of speed setting –Display shows vehicle speed.

C. LEDs.

1. **Requirements.**
 - a. Color range, Amber, 589.5 to 592.0 nm.
 - b. Operating temperature -20° to 212°F.
 - c. Viewing angle, minimum 30 degrees (15 degrees each side of the viewing axis).
2. Brightness shall vary for optimal viewing and power consumption based on ambient light. System will automatically adjust the brightness of the LEDs.

D. Controls.

1. System shall use an LCD display, keyboard, Rotary switches or other means to set and view operating modes, matrix displayed speed, error codes and other system information.
2. LED indicators (or similar) signify power is on, the solar charging system is active, activated alarms need for checking, battery charge is low, and power failure.

E. Operating Modes.

1. **Off.**

Except for the charging system the entire unit is off. Solar panels will continue to charge batteries in this position.
2. **Run.**

Normal operating mode.
3. **Speed Limit Settings.**

10 to 70 mph in 5 mph increments.

F. Radar.

1. K-Band, approach-only senses the largest, nearest mass moving toward it.
2. 10 to 99 mph speed range.
3. 1000 foot range.
4. Centered antenna head for maximum effectiveness regardless of which side of road the trailer is being used.

G. Regulatory Sign.

1. System shall include a regulatory speed limit sign with interchangeable speed limit numbers. Numbers shall be supplied in quantities necessary to display a speed range of 10 to 70 mph in 5 mph increments. Numbers not in use shall store in the trailer's battery box.
2. **Sign Requirements.**
 - a. Size, 30 inches by 36 inches (W x H)
 - b. Color, black characters on white background.
 - c. Mounting Height, minimum 5 feet measured from ground to bottom of sign.
 - d. Material, 0.063 inch minimum, tempered aluminum sheet with high-intensity reflective coating.

150166.03 CONSTRUCTION.

Furnish, place, operate (when specified), and maintain speed feedback trailer at locations shown on the plans. The Contractor maintains possession of speed feedback trailer upon completion of the project.

A. Testing and Configuration.

1. Physical and electronic access to speed feedback trailer shall be granted to the Engineer.
2. At least 1 week before speed feedback trailer is deployed to a project, a testing and configuration meeting with the Engineer shall be held.
3. The Engineer, in conjunction with the Contractor, will perform necessary configuration adjustments to the speed feedback trailer.

B. Direct Operation.

Speed feedback trailer will be operated directly by either the Contractor or the Engineer.

C. Maintenance.

1. Provide preventive maintenance necessary to achieve uninterrupted service.
2. Verify operational status each day as part of the daily diary and notify Engineer when a problem is detected.
3. Provide unscheduled maintenance or total replacement of sign when sign is unable to display a message adequately within 24 hours of notification. Action shall be taken to resolve the following problems if they have been visually observed or confirmed by self diagnostics by the speed feedback trailer for 3 continuous days or 7 intermittent days over a 2 week period.
 - a. An entire pixel board is showing failure.
 - b. Five or more pixel failures over entire message panel anytime while sign is deployed for use (blank or displaying a message).
 - c. Two or more pixel failures in any character when displaying the speed.
4. If service is not restored within 24 hours, Engineer will cause such work to be performed as may be necessary to provide this service. The cost for this restoration shall be borne by the Contractor.

150166.04 METHOD OF MEASUREMENT.

The Engineer will count the number of days each Speed Feedback Trailer is required to be in place along a road and capable of displaying messages to the traveling public. Days when speed feedback trailer is blank and is in good working condition, will be measured. Days when speed feedback trailer is unable to display the speed due to mechanical problems will not be measured. Days when speed feedback trailer is on the roadway and not approved by the Engineer will not be measured.

150166.05 BASIS OF PAYMENT.

Payment will be at the contract unit price per calendar day for each Speed Feedback Trailer measured. Payment is full compensation for furnishing, placing, operation (when specified), and maintenance of speed feedback trailer. Payment includes the cost of preventative and unscheduled maintenance, on-board software, hardware, and power supply.