

ORIGINATION FORM
Proposed Revisions to the Specifications

Date:

Specification Section:

Originator:

Articles/Subarticles:

Telephone:

email:

Why does the existing language need to be changed?

Summary of the changes:

Are these changes applicable to all Department jobs? Yes No
If not, what are the restrictions?

Will these changes result in an increase or decrease in project costs? Yes No
If yes, what is the estimated change in costs?

With who have you discussed these changes?

What other offices will be impacted by these changes?

Will this revision necessitate changes to the following: BOE PPM SDG CPAM

Design Standards List Affected Index Nos.

Other manual?

Are all references to external publications current? Yes No
If not, what references need to be updated (please include changes in the redline)?

Will this revision necessitate any of the following:

Design Bulletin

Construction Bulletin

Estimates Bulletin

Contact the State Specifications Office for assistance in completing this form.

Daniel Scheer 850-414-4130 daniel.scheer@dot.state.fl.us

Frances Thomas 850-414-4101 frances.thomas@dot.state.fl.us

Debbie Toole 850-414-4114 deborah.toole@dot.state.fl.us

Ray Haverty 850-414-4129 ray.haverty@dot.state.fl.us



Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

MEMORANDUM

DATE: December 22, 2014

TO: Specification Review Distribution List

FROM: Daniel Scheer, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: **SP7410000 Traffic Monitoring Site Vehicle Sensor – Non-Weight Applications.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

The changes are proposed by Michelle Young of the Transportation Statistics Office to consolidate, update and move special provisions 741, 743, 744, 745, 746, 747 and 748 into the Standards Specifications as part of the Consolidation of Products and Specifications effort undertaken within FDOT central office.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or online at <http://www2.dot.state.fl.us/SpecificationsEstimates/Development/IndustryReview.aspx> . Comments received after **January 19, 2015**, may not be considered. Your input is encouraged.

DS/ot
Attachment

**TRAFFIC MONITORING SITE VEHICLE SENSOR - NON-WEIGHT APPLICATIONS.
(REV 12-22-14)**

SECTION 741 is deleted.

**SECTION 741
TRAFFIC MONITORING SITE VEHICLE SENSOR
(NON-WEIGHT APPLICATIONS)**

741-1 Description:

Install traffic monitoring site (TMS) vehicle sensors of the type and at the location shown on the Plans. Use vehicle sensors currently listed on the Department's Approved Product List (APL) and compatible with the electronics unit to which they will be connected.

741-2 Type I Axle Sensor (In-Roadway):

741-2.1 General: Ensure Type I axle sensors are installed in the roadway and secured using an adhesive bonding material listed on the APL.

| Physical Characteristics, Type I Sensors | |
|--|--|
| Sensor Element Dimensions | 6 feet to 8 feet in length (as specified in Plans); 3/16 inch to 3/8 inch in diameter (varies by manufacturer) |
| Sensor Element Material | Pressure sensing piezoelectric |
| Pavement Operating Temperature | 0°F to +150°F |
| Output Signal | Minimum +200mV for passenger/pickup truck axle @ 70°F with less than 10% negative signal |

741-2.2 Installation Requirements: Install sensors in accordance with the requirements of this Section and Design Standards, Index No. 17900. Use a chalkline or string and paint to layout the position of the sensor and lead-in cable slots. Ensure the saw cuts do not deviate more than 0.5 inches from the chalkline. The saw must have a single blade or ganged blades wide enough to cut the axle sensor slot at full width in a single pass. Cutting two slots and chipping out roadway material between them is not allowed. Ensure the slots for sensor lead-in cables are 3.5 inches deep and wide enough to allow unforced placement of the cable.

Install axle sensors in the right hand wheel path midway between the leading and trailing loops as detailed in Design Standards, Index 17900. Installation in the left hand wheel path is allowed at locations where no paved shoulder exist and sensor lead-exit windows are installed at the right hand edge of the roadway surface or in a lane which is to the left of and adjacent to an open lane of traffic.

Install the axle sensor such that the cable end is closest to the pull box to which the sensor lead cable will be routed. Install the end of the sensor mid-way into the edge line stripe or lane line stripe, as appropriate. Ensure that the axle sensor being installed has lead-in cables of sufficient length to reach the cabinet without splicing. Splicing axle sensor lead-in cable is not allowed.

Installation: Cut the saw slot the length of the sensor plus an additional 3 inches to 4 inches. Ensure the depth and width of the slot are installed as recommended by the sensor manufacturer, typically 0.75 inches wide by 1 inch deep. Use the clips or jigs provided by the manufacturer to ensure the sensor will be suspended at a uniform depth in the slot. Mix and apply the bonding agent ensuring the slot is completely full with no voids beneath the sensor. Route the sensor lead to the pull box and from there to the traffic monitoring site cabinet. Mark the sensor lead at the pull box and at termination in the cabinet using a permanent marker pen or labeler. Provide lane numbering information as specified in Design Standards, Index No. 17900.

741-2.3 Test Requirements: Perform the manufacturer's recommended on-site pre-installation test to determine the sensor's condition using an Inductive/Capacitance/Resistance meter. Install only those sensors that pass the pre-installation test. After installation, repeat the tests at the termination point in the cabinet. Use an oscilloscope to view and record typical waveforms and signal intensity measurements for the axles of passenger cars and large trucks. Remove and replace any sensor that fails the test at no additional charge to the Department.

741-3 Type II, Wireless Vehicle Sensors (Off-Roadway).

741-3.1 General: Install Type II wireless vehicle sensors on a pole or structure adjacent to the roadway as shown in the Plans.

| Physical Characteristics of Type II Sensors | |
|---|---|
| Detection Zone | A minimum of 8 distinguishable lanes within a minimum 200 feet of detection zone |
| Enclosure | Weatherproof aluminum, stainless steel or polycarbonate housing |
| Dimensions | Typically up to 15" X 12" X 6" |
| Weight | Typically less than 10 lbs |
| Operating Temperature (Ambient) | 0°F to 140°F |
| Operating Frequency | Wireless transmission in FCC approved band or unlicensed RF range |
| Communications | RS-232/RS-485 ports, supports minimum 19,200 baud rate |
| Data Interface | Compatible with the Department's field storage devices (counters) and downloads data via contact closure board using a hardwired connection |

741-3.2 Installation Requirements: Install the sensor on a pole oriented at the roadway such that it is perpendicular to the target lanes of traffic with room to perform horizontal and vertical aiming adjustments. Order the Type II sensor with sufficient cable length to reach the cabinet without splicing. Fasten the cable to the pole so wind does not move it, or route the cable within the pole cavity to the cabinet termination point. Provide slack in the cable at the connections to the sensor and in the cabinet to ensure the cable is stress-free. Include the appropriate mounting hardware, contact closure signal that corresponds to vehicle presence and the manufacturer's recommended surge suppression as a part of the installation.

————— Using the manufacturer’s instructions and software, set up the lane detection zones and verify that the sensor’s orientation is perpendicular to the roadway. Configure the Type II sensor for vehicle volume unless otherwise specified in the Plans.

————— **741-3.3 Test Requirements:** Conduct a visual test to determine that all detection zones are being counted accurately. Connect a laptop computer to the electronics unit and observe traffic in every lane, verifying that each vehicle is displayed on screen. A minimum of twenty vehicles should be observed for each lane of traffic with all vehicles counted. If any vehicles are not counted, reconfigure the Type II sensor and repeat the visual observation test until all lanes count correctly. If the sensor fails to provide accurate counts after three test attempts, it must be replaced with a new unit at no expense to the Department.

741-4 Guaranty Provisions:

————— **741-4.1 Contractor's Responsibility:** Secure all guaranties that are customarily issued by the equipment manufacturers for the specific equipment included in the Contract. Ensure that the form in which such guaranties are delivered includes the provision that they are subject to transfer to the Department, and is accompanied by proper validation of such fact. Transfer guaranties at final acceptance of the work (or equipment) by the Department.

————— **741-4.2 Terms:** Ensure that the manufacturers of the equipment stipulate the terms of guaranties when submitting a request to the Department for certification and for equipment submittal for construction projects. Include terms for a specified service performance with provisions for repair parts and labor, or for replacement. Ensure the provisions define the equipment “installation date” as the date for such guaranty to be in effect. For construction projects, the “installation date” is the first day of equipment “burn in”. For warehouse purchases, the “installation date” is the date of visual inspection approval, not to exceed ten days after delivery date.

————— **741-4.3 Conditions:** When guaranty is available, ensure that a written and signed guaranty accompanies the manufacturer’s billing invoice. The Engineer will sign and retain the original and provide a copy to the manufacturer. If the Contractor does not comply with the terms of the guaranty, the Department may suspend the certification. Comply with additional terms and conditions as stated in purchasing agreements.

741-5 Method of Measurement

————— **741-5.1 General:** Measurement for payment will be in accordance with the following tasks:

————— **741-5.2 Furnish and Install:** The Contract unit price each for vehicle sensor, furnished and installed, includes the vehicle sensor, lead-in cables, bonding agent, all equipment, materials, and labor necessary for a complete and accepted installation.

————— **741-5.3 Furnish:** The Contract unit price each for vehicle sensor, furnished, includes the vehicle sensor and materials as specified in the Contract Documents, plus all shipping and handling costs involved in the delivery as specified in the Contract Documents.

————— **741-5.4 Install:** The Contract unit price each for vehicle sensor, installed, includes all lead-in cables, bonding agent, miscellaneous materials, labor, and equipment necessary for a complete and accepted installation. The Engineer will supply the vehicle sensor.

741-6 Basis of Payment.

————— Price and payment will be full compensation for all work specified in this Section.

————— Payment will be made under:

SP7410000

All Jobs

~~Item No. 741-1 Traffic Monitoring Site Vehicle Sensor Non Weight
Applications each.~~