WEIGH IN MOTION EQUIPMENT
(REV 6-19-26)

The following new Section is added:

770-1 Description.

Furnish or furnish and install a complete, operable Weigh In Motion (WIM) system as shown in the Plans and Standard Plans. The Department uses WIM to monitor the speed, number of axles, and weight of wheels, axles or vehicles.

770-2 Materials.

770-2.1 General: Meet the following requirements:

Grounding and Lightning Protection*	Section 620
Conduit*	Section 630
Video Vehicle Detection System*	995-2.3
Microwave Vehicle Detection System*	995-2.4
Loop Sealant*	995-3
Grounding and Lightning Protection	996-4
Wire for Inductive Loop*	997-4.2
Adhesive Bonding Agent*	997-12
WIM Quartz Piezoelectric Sensor*	998-2.1

*Use products listed on the Department's APL.

770-2.2 Weigh-In-Motion Component Approval: Submit forms in accordance with 603-5.

770-2.3 Notification: Notify the Engineer 10 working days prior to beginning any work around WIM equipment.

770-3 WIM Vehicle Sensor (Non-Weight) Applications.

The vehicle classification site consists of inductive loop sensors. Furnish and install WIM inductive loop sensors of the type and at the location shown in the Plans. Install all products in accordance with the Manufacturer's Instructions. Ensure loop leads reach the cabinet. Do not splice loop leads.

770-4 WIM Vehicle Sensor (Weight) Applications.

770-4.1 General: The weigh-in-motion (WIM) lane consists of WIM sensors and inductive loops sensors. Furnish and install the Weigh-In-Motion Electronic Sensors in the configuration shown on the Plans and per Manufacturer's recommendations.

770-4.2 Quartz Piezoelectric Sensor: Furnish and Install a sensor that meets the requirements of 998-2.1.

770-4.3 Installation Requirements: The installer must have a valid certification from the manufacturer for installing the Weigh-In-Motion Electronics Sensors. Use a chalk line or equivalent method to outline the perimeter of the sensor on the pavement and routes for lead-in cables. Do not allow the saw cut in the pavement to deviate more than 1.0 inch from the chalk line. Ensure that all saw cuts are free of any dust, dirt, or other debris and completely dry prior to the installation.

770-4.4 Test Requirements: Perform the manufacturer's recommended on-site pre-installation test to determine the Weigh-In-Motion electronics sensor's condition. Install only those Weigh-In-Motion electronics sensors that pass the pre-installation test. Replace any Weigh-In-Motion electronics sensors which fail the pre-installation test.

Repeat the test, following installation, at the lead-in point of connection in the WIM site cabinet. Remove and replace any Weigh-In-Motion electronics sensor which fails the test. Prior to post-installation acceptance, the Contractor shall demonstrate, in the presence of the Engineer, that the equipment supplied and installed for the system is in full compliance with the Plans and Specification herein.

The Department will operate the complete system for 30 consecutive days. In the event of any failures, the Contractor shall correct the problem(s) and restart the 30-day test. Any equipment or labor that is found to be defective during the operation test and prior to Final Acceptance shall be replaced or corrected at no expense to the Department. Final Acceptance will be made upon the successful completion of the 30-day test.

Place a copy of the final test results, including the date of installation, manufacturer's name, model number for each Weigh-In-Motion electronics sensor, laboratory calibration sheet provided by the manufacturer, and type of adhesive bonding agent used in a waterproof package in the cabinet and furnish one copy to the Engineer.

770-5 Warranty.

Transfer the warranty to the Department after testing is complete.

770-6 Method of Measurement.

The Contract unit price for each non-intrusive vehicle sensor will include the vehicle sensor, grounding cables, and all equipment, materials, testing and labor necessary for a complete and accepted installation.

Conduit and accessories will be measured and paid in accordance with Section 630.

The Contract unit price per assembly for the weigh-in-motion unit includes the electronics unit and equipment cable, all equipment, materials and labor necessary for a complete and accepted installation. No separate measurement or payment will be made for sensors that fail to meet testing requirements.

The Contract unit price for each inductive loop assembly includes loop wire, loop sealant, all equipment, materials, testing, and labor necessary for a complete and accepted installation.

770-7 Basis of Payment.

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

Payment will be made under:

770-2 – MCSAW Vehicle Detection and Identification, units

WEIGH IN MOTION MATERIALS
(REV 6-18-26)

The following new Section is added:

998-1 Description.

This Section governs the requirements for all weigh in motion (WIM) material as shown in the Plans and Standard Plans.

998-1.1 Approved Product List Submittal Requirements: All products shall be listed on the Department's Approved Product List (APL). Manufacturers seeking evaluation of their product for inclusion on the APL shall submit an application in accordance with Section 6 including documentation identified in Table 998-1 and this Section. Documentation must demonstrate that the product meets the requirements of this Section.

Table 998-1

Documentation	Requirements
Technical Data Sheet	This document will be used to verify physical and performance properties of the product.
Product Label Photo	Provide a photo of the label showing the manufacturer's name or trademark, part number, and date of manufacture or serial number.
Product Sample	When requested, submit a product sample.
Installation Manual	Instructions describing mounting or installation, cabling, and configuration requirements.
Product Photo	Display significant features of the products.

998-2 WIM Vehicle Sensors (Weight).

998-2.1 WIM Quartz Piezoelectric Sensor: Quartz piezoelectric sensors use one piece quartz crystal sensors to collect Weigh-In-Motion data. The quartz sensor shall meet the physical characteristics in Table 998-2 and be constructed of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal. All fasteners exposed to the elements shall be Type 304 or 316 passivated stainless steel.

Table 998-2 Physical Characteristics, WIM Quartz Piezoelectric Sensor	
Property	Requirements
Measuring Range wheel load (At a referenced tire contact area)	0 to 33000 pounds (8 in. by 12.6 in.)
Overload (twin wheel)	55000 pounds
Sensitivity – Nominal	17 pC/N
Sensitivity shift over sensor length	<± 2%
Threshold	<0.1 lbf
Linearity	<± 1% Full Scale Output
Hysteresis	≤ 2% Full Scale Output
Natural Frequency	> 5 kHz
Operating Temperature range	-40°F to 176°F
Temperature coefficient of sensitivity	-0.11% / °F
Operating Speed	2 MPH to 155 MPH
Insulation resistance	> 1x $10^9\Omega$
Capacitance with 130 ft. cable	7-25 nF (Cable Length =328 ft)
Environmental Requirements	NEMA TS-2, Section 2

998-3 Warranty.

Sensors shall have a 5-year warranty period. Provide warranties that are fully transferrable to the Department. Terms and conditions of warranties must be documented when submitting the APL application.

Ensure the terms and conditions define the equipment installation date as the date for such warranty to be in effect.