

LTPP Bending Plate Weigh-in-Motion System: Model Specifications for Pavement and Installation

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Long-Term Pavement Performance
Serving your need for durable pavements

WEIGH-IN-MOTION SYSTEM MODEL SPECIFICATIONS FOR SYSTEM INSTALLATION

1.00 Introduction

It is the intent of these specifications to establish the minimum requirements and conditions for the successful installation of high speed weigh-in-motion for the purpose of collecting traffic data at Long-Term Pavement Performance (LTPP) Specific Pavement Studies (SPS) sites.

2.00 Proposal Requirements and Conditions

(This section would include all special instructions and requirements in the preparation of proposal documents and bid. It would also include preferences.)

3.00 Award of Contract

4.00 Beginning of Work

4.10 Time of Completion and Liquidated Damages

5.00 General

5.10 Plans and Working Drawings

The WIM scale will be installed in a concrete pavement 500 feet long, a minimum of the depth of the frame or the depth of the pavement in thickness and the full width of the lane. The scale will be installed 75 feet from the downstream edge of the section.

Working drawings, installation details and on-site support during the weigh-in-motion system installation will be provided by the system vendor.

5.11 Labor Code Requirements

5.12 Public Safety

5.13 Subcontracting

5.14 Payments

6.0 Approved Traffic Products

6.10 Pavement Markers, Permanent Type

6.20 Pavement Markers, Temporary Type

6.30 Striping and Pavement Marking Materials

7.00 Concrete

7.10 Concrete Pavement and Pavement Preparation (Weigh-in-Motion) 4 Hour Cure

The exact limits of existing pavement removal and replacement with concrete pavement will be determined by the Engineer.

Pavement and underlying base material removal shall be replaced with concrete pavement which shall be cured for at least 4 hours prior to the time the lane is to be opened to public traffic.

The outlines of excavations in the pavement shall be cut on a neat line with a power-driven concrete saw before any material is removed. The depth of such cuts shall be no less than the total thickness of the pavement section or section to be removed. Residue resulting from cutting operations shall not be permitted to flow across shoulders or lanes occupied by public traffic. Residue shall be removed from the pavement surface before any such material flows off said surface.

The material remaining in place, after removing pavement and base to the required depth, shall be graded to a plane, watered, and compacted. The finished surface of the remaining material shall not extend above the grade established by the Engineer.

Portland cement concrete pavement for the WIM System shall conform to the provisions for concrete pavement, as per _____.

The thickness of concrete pavement for the WIM System shall be a minimum of 1.0 – foot or as shown on the plans.

Calcium chloride shall be added to the concrete mix at a rate not to exceed 2 percent of the dry weight of the cement, the exact rate shall be as recommended by the concrete supplier and subject to Engineer approval.

Chemical admixtures and mineral admixtures shall not be used to replace Portland cement.

Prior to placing concrete, a ¼-inch thick commercial quality polyethylene flexible foam expansion joint filler shall be placed across the original transverse joint faces and extend the full depth of the excavation with the top of the joint filler flush with top of pavement. The joint filler shall be secured to the existing pavement joint by any method that will hold the joint filler in place during placement of concrete.

The penetration of concrete mixes shall conform to _____. The maximum penetration shall not exceed 2 ½ inches.

Concrete shall not be placed when the atmospheric temperature is 40E F, or lower.

Concrete shall not be spread, compacted, and shaped using stationary side forms.

Wood side forms not less than 2-inch nominal thickness may be used.

Upon written request by the Contractor, the Engineer may allow use of the shoulders in lieu of stationary side forms if such shoulders are suitable. Such approval of the Engineer shall in no way relieve the contractor of meeting all other requirements.

Transverse weakened plane joints shall be constructed using the sawing method where directed by the engineer. The exact time of sawing shall be the Contractor's responsibility, but in any event, the joints shall be sawed prior to opening the pavement to traffic. The minimum depth of cuts for the sawed weakened plan joints on either side of each WIM scale frame location shall be ½ of the pavement depth.

Concrete pavement shall be cured by the curing compound method. The curing compound shall be Pigmented Curing Compound.

The Portland cement concrete pavement for the WIM system shall be ground.

7.20 Concrete Pavement and Pavement Preparation (Weigh-in-Motion) 7 Day Cure

The exact limits of existing pavement removal and replacement with concrete pavement will be determined by the Engineer.

Pavement and underlying base material removal shall be replaced with concrete pavement which shall be cured for at least 7 days prior to the time the lane is to be opened to public traffic.

The outlines of excavations in the pavement shall be cut on a neat line with a power-driven concrete saw before any material is removed. The depth of such cuts shall be no less than the total thickness of the pavement section or section to be removed. Residue resulting from cutting operations shall not be permitted to flow across shoulders or lanes occupied by public traffic. Residue shall be removed from the pavement surface before any such material flows off said surface.

The material remaining in place, after removing pavement and base to the required depth, shall be graded to a plane, watered, and compacted. The finished surface of the remaining material shall not extend above the grade established by the Engineer.

Portland cement concrete pavement for the WIM System shall conform to the provisions for concrete pavement, as per _____.

The thickness of concrete pavement for the WIM System shall be a minimum of 1.0 – foot or as shown on the plans.

Prior to placing concrete, a ¼-inch thick commercial quality polyethylene flexible foam expansion joint filler shall be placed across the original transverse joint faces and extend the full depth of the excavation with the top of the joint filler flush with top of pavement. The joint filler shall be secured to the existing pavement joint by any method that will hold the joint filler in place during placement of concrete.

The penetration of concrete mixes shall conform to _____. The maximum penetration shall not exceed 2 ½ inches.

Concrete shall not be placed when the atmospheric temperature is 40E F, or lower.

Concrete shall not be spread, compacted, and shaped using stationary side forms.

Wood side forms not less than 2-inch nominal thickness may be used.

Upon written request by the Contractor, the Engineer may allow use of the shoulders in lieu of stationary side forms if such shoulders are suitable. Such approval of the Engineer shall in no way relieve the contractor of meeting all other requirements.

Transverse weakened plane joints shall be constructed using the sawing method where directed by the engineer. The exact time of sawing shall be the Contractor's responsibility, but in any event, the joints shall be sawed prior to opening the pavement to traffic. The minimum depth of cuts for the sawed weakened plan joints on either side of each WIM scale frame location shall be ½ of the pavement depth.

Concrete pavement shall be cured by the curing compound method. The curing compound shall be Pigmented Curing Compound.

7.30 Grinding

The Portland cement concrete pavement for the WIM system shall be ground.

The surface ground will be straight-edged at locations to be determined by the Engineer with a straightedge 12 feet long. When the straightedge is laid on finished pavement in a

direction parallel with centerline or normal to centerline, the surface shall not vary more than 0.01-foot from the lower edge.

Fog seal coat shall be applied to all ground asphalt concrete pavement.

7.31 Grinding Procedure

Spot bump grinding should not be allowed.

All grinding should be done in the direction of travel, starting on the left lane line (This would normally be the high side of super elevation). The grinder should make a continuous cut.

Where uneven pavement joints exists, provision shall be made for adequate warning traffic control devices in conformance with agency requirements.

Ground surfaces shall not be smooth or polished. Provide a surface texture consisting of parallel grooves between 2.3 mm (0.09 inch) and 3.3 mm (0.13 inch) wide with a "land area" between grooves of 1.52 mm (0.060 inch) to 2.79 mm (0.110 inch) and the difference between the peaks of the ridges and the bottom of the grooves of approximately 16 mm (1/16-inch).

After the grinder has completed a cut over the WIM concrete pad, the profile should be checked, using a 12-foot straight edge. If there are areas still outside of specifications, the WIM pad should have a total regrind.

7.32 Equipment Requirements

The grinding equipment shall have a cutting mandrel with carbide or diamond tipped cutting teeth and shall be designed specifically for grinding pavement surfaces to close tolerances. The equipment shall accurately establish slope elevations and profile grade controls.

Whenever possible a control strip shall be ground. The strip should have a uniformly textural surface and cross section.

Residue and excess water resulting from grinding shall be removed from the roadway by vacuuming or any other method approved by the Engineer. The residue shall be removed prior to opening the lane to traffic. Residue and water from grinding operations shall not be allowed to flow across lanes occupied by traffic, onto roadway shoulder or areas containing vegetation, or to flow to gutters, or other drainage facilities. Dried residue resulting from grooving operations shall be removed from pavement surfaces with a pick up or power broom prior to allowing traffic over the opened work area.

8.00 Construction Details

8.10 Water Pollution Control

8.20 Construction Area Signs

8.30 Maintaining Traffic

8.40 Closure Requirements and Conditions

8.41 Closure Schedule

8.42 Contingency Plan

8.50 Traffic Control for Lane Closure

9.00 High Speed Weigh-In-Motion Electrical System

9.10 Description

The Weigh-In-Motion Equipment shall be furnished by others.

The Weigh-In-Motion System (hereafter WIM system) shall include equipment and software for collecting, processing, storing, transmitting and manipulating information related to the counting, classifying and speed monitoring of all vehicles and the weighing of trucks and buses.

9.11 Conduit

Conduit to be installed underground shall be grounded IMC.

9.12 Trenching Installation of Conduit

The installation of all conduits between WIM scales and the outside edge of shoulder shall be done by trenching. No boring will be allowed.

9.13 Pull Boxes (Junction Boxes)

9.14 Traffic Pull Boxes

9.15 Conductors and wiring

9.16 Telephone Cable

9.17 Service and Service Cabinet

9.18 High Speed WIM Controller Cabinet

The controller cabinet will be provided by the WIM vendor as part of the WIM system. The contractor will provided the concrete cabinet foundation, cabinet mounting fasteners and conduits. The contractor will install the controller cabinet on the foundation.

9.19 Detectors

Loop detector sensors shall be furnished and installed by the WIM vendor.

Loop wire shall be furnished by the WIM vendor.

Loop detector lead-in cable shall be furnished by the WIM vendor.

Slot cutting for inductive detector loops shall not be performed until after the concrete pavement has been ground, straight-edged and brought into tolerance.

Slots in Portland cement concrete shall be filled with elastomeric sealant.

9.20 Concrete Removal (WIM Scale Frame)

Neither saw cutting nor the removal of concrete for WIM scales shall be performed until after the concrete pavement has been ground, straight-edged and brought into tolerance.

9.21 On-site Equipment

The WIM system shall be provided by others and installed by the contractor according to contract plans, WIM vendor shop drawings and WIM vendor requirements..

10.00 Payment

The contract price paid per cubic yard for concrete pavement (weigh-in-motion) shall include full-compensation for furnishing all labor, materials, tools equipment and incidentals, and for doing all the work involved in constructing concrete pavement complete in place. This includes sawing, grinding new WIM PCC pavement and the existing AC pavement, applying fog seal, removing and disposing of existing pavement and base material, as shown on the plans and as directed by the Engineer.