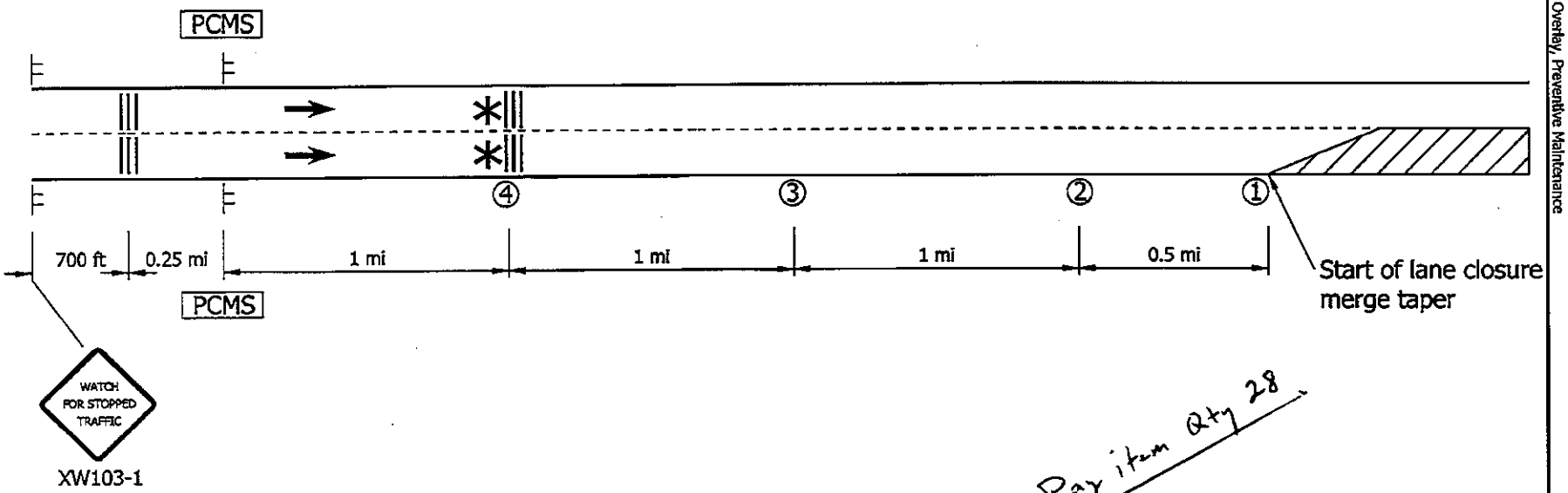
AUTOMATED WORK ZONE INFORMATION SYSTEM PLAN

Type 1



Pay item Qty 28

1 setup

①* Non-Intrusive Traffic Speed Detector (*number varies)

PCMS Portable Changeable Message Sign

* Downstream rumble strips to be installed 0.5 mi in advance of the anticipated queue length

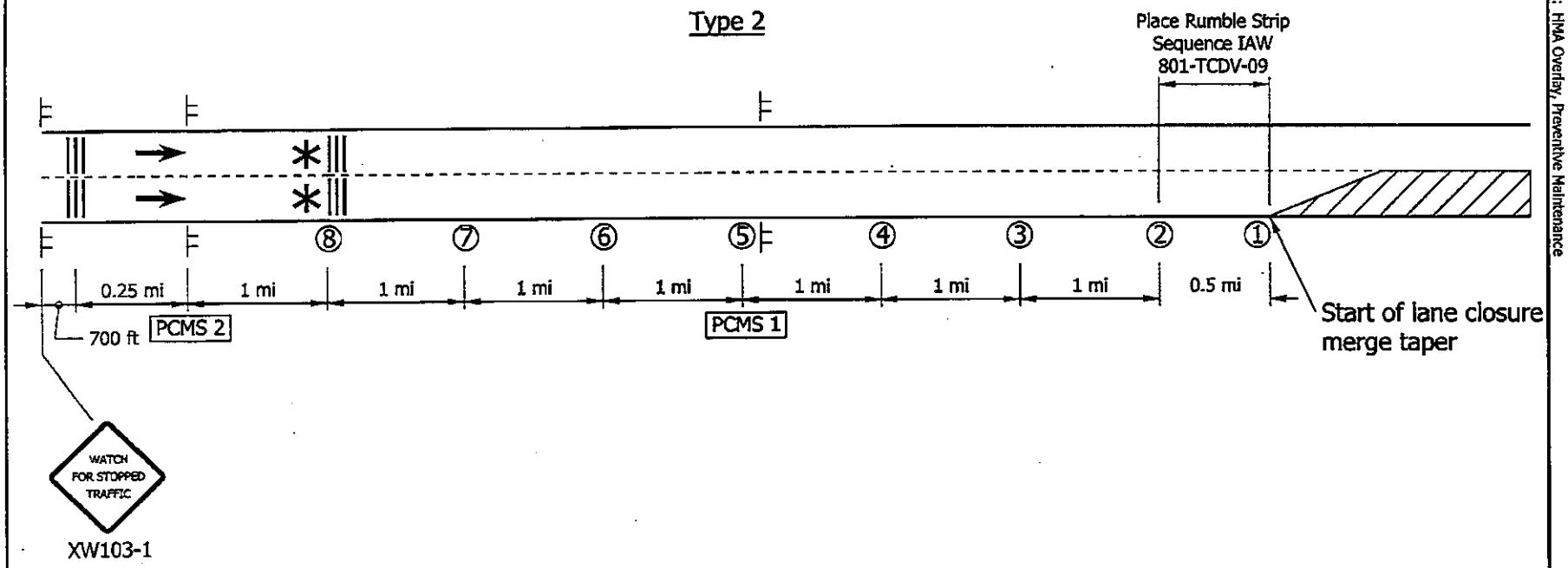
→ Traffic Flow Arrow

NOTE:
1. Location of the detectors and the PCMS can be field adjusted based on site conditions and start of lane closure (ramp locations and other signage).
2. The Contractor shall verify the location of the detectors and PCMS with the Engineer.
3. Max Queue Design is less than or equal to 3.5 miles.

AWZIS TYPE 1 DETAILS

PCMS Message	Last 5-Minute Average Speed V (mph)			
	④	③	②	①
ROAD WORK AHEAD	V > 55 or V = 0.0	V > 55 or V = 0.0	V > 55 or V = 0.0	V > 55 or V = 0.0
SLOW TRAFFIC 3 MILES	V > 55 or V = 0.0	V > 55 or V = 0.0	V > 55 or V = 0.0	40 ≤ V < 55
SLOW TRAFFIC 2 MILES	V > 55 or V = 0.0	V > 55 or V = 0.0	40 ≤ V < 55	V > 40 or V = 0.0
SLOW TRAFFIC 1 MILE	V > 55 or V = 0.0	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0
SLOW TRAFFIC AHEAD	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0	0.0 ≤ V < 40
STOPPED TRAFFIC 3 MILES	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	Any Value
STOPPED TRAFFIC 2 MILES	V > 40 or V = 0.0	V > 40 or V = 0.0	Any Value	Any Value
STOPPED TRAFFIC 1 MILE	V > 40 or V = 0.0	0.0 ≤ V < 40	Any Value	Any Value
STOPPED TRAFFIC AHEAD	0.0 ≤ V < 40	Any Value	Any Value	Any Value

AUTOMATED WORK ZONE INFORMATION SYSTEM PLAN



①* Non-Intrusive Traffic Speed Detector (*number varies)

PCMS Portable Changeable Message Sign

* Downstream rumble strips to be installed 0.5 mi in advance of the anticipated queue length

→ Traffic Flow Arrow

NOTE:

1. Location of the detectors and the PCMS can be field adjusted based on site conditions and start of lane closure (ramp locations and other signage).
2. The Contractor shall verify the location of the detectors and PCMS with the Engineer.
3. Max Queue Design is less than or equal to 7.5 miles.

AWZIS TYPE 2 DETAILS

PCMS 2 Message	PCMS 1 Message	Last 5-Minute Average Speed V (mph)							
		⑧	⑦	⑥	⑤	④	③	②	①
SLOW TRAFFIC 3 MILES	LANE CLOSED 3 MILES	V > 55 or V = 0.0	V > 55 or V = 0.0	V > 55 or V = 0.0	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0
SLOW TRAFFIC 2 MILES	LANE CLOSED 3 MILES	V > 55 or V = 0.0	V > 55 or V = 0.0	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0
SLOW TRAFFIC 1 MILE	LANE CLOSED 3 MILES	V > 55 or V = 0.0	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0
SLOW TRAFFIC AHEAD	LANE CLOSED 3 MILES	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0
STOPPED TRAFFIC 3 MILES	LANE CLOSED 3 MILES	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	0.0 ≤ V < 40	Any Value	Any Value	Any Value	Any Value
STOPPED TRAFFIC 2 MILES	LANE CLOSED 3 MILES	V > 40 or V = 0.0	V > 40 or V = 0.0	0.0 ≤ V < 40	Any Value	Any Value	Any Value	Any Value	Any Value
STOPPED TRAFFIC 1 MILE	LANE CLOSED 3 MILES	V > 40 or V = 0.0	0.0 ≤ V < 40	Any Value	Any Value	Any Value	Any Value	Any Value	Any Value
STOPPED TRAFFIC AHEAD	LANE CLOSED 3 MILES	0.0 ≤ V < 40	Any Value	Any Value	Any Value	Any Value	Any Value	Any Value	Any Value
SLOW TRAFFIC 3 MILES	LANE CLOSED 3 MILES	V > 55 or V = 0.0	V > 55 or V = 0.0	V > 55 or V = 0.0	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0
SLOW TRAFFIC 2 MILES	LANE CLOSED 3 MILES	V > 55 or V = 0.0	V > 55 or V = 0.0	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0
SLOW TRAFFIC 1 MILE	LANE CLOSED 3 MILES	V > 55 or V = 0.0	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0
SLOW TRAFFIC AHEAD	LANE CLOSED 3 MILES	40 ≤ V < 55	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0
STOPPED TRAFFIC 3 MILES	LANE CLOSED 3 MILES	V > 40 or V = 0.0	V > 40 or V = 0.0	V > 40 or V = 0.0	0.0 ≤ V < 40	Any Value	Any Value	Any Value	Any Value
STOPPED TRAFFIC 2 MILES	LANE CLOSED 3 MILES	V > 40 or V = 0.0	V > 40 or V = 0.0	0.0 ≤ V < 40	Any Value	Any Value	Any Value	Any Value	Any Value
STOPPED TRAFFIC 1 MILE	LANE CLOSED 3 MILES	V > 40 or V = 0.0	0.0 ≤ V < 40	Any Value	Any Value	Any Value	Any Value	Any Value	Any Value
STOPPED TRAFFIC AHEAD	LANE CLOSED 3 MILES	0.0 ≤ V < 40	Any Value	Any Value	Any Value	Any Value	Any Value	Any Value	Any Value

j. When possible given all other constraints, for patches equal to or over 16 feet, new D-1 Contraction Joints shall be located at existing adjacent D-1 joint locations or adjacent mid-panel cracks.

k. Each proposed concrete panel shall only be longitudinally tied to one adjacent PCCP panel. If a panel is adjacent to more than one existing PCCP panel, the patch shall be tied only to the longest contiguous panel.

Opening to traffic shall be in accordance with 506.11 except that patches longer than 15 feet will be controlled as follows:

a. Construction vehicles, equipment, or traffic may be allowed on the PCCP containing HES concrete, when a flexural strength of 425 psi is achieved. The flexural strength shall be determined by averaging two beams cast from each of the job control samples cast for that purpose.

b. Concrete meeting the mix criteria requirement of 502.04(a) shall be in accordance with 502.18 except that the modulus of rupture value shall be 425 psi or greater for all cases.

Any construction vehicle or equipment that may damage the PCCP shall not be used on the PCCP unless adequate protection is provided. Approved joint cutting saws may be operated on the PCCP as determined by the Contractor.

AUTOMATED WORK ZONE INFORMATION SYSTEM (AWZIS)

Description

This item shall consist of furnishing, installing, relocating, operating, servicing, and removing various components of a temporary automated, quickly deployable, portable, real time work zone information system, AWZIS, in accordance with 105.03 and as specified herein. The Contractor shall also provide the maintenance of the complete system for the duration of the project or as directed by the Engineer.

Materials

Materials shall be in accordance with 801.02 and as follows:

All materials used shall meet the manufacturer's specifications and recommendations. The Contractor shall maintain an adequate inventory of parts to support maintenance and repair of the AWZIS.

The Contractor shall maintain this system and shall be locally available to service and maintain system components, move portable devices as necessary and respond to emergency situations. The Contractor has oversight responsibility for directing placement of devices in the project area. The Contractor is to be accessible seven days a week and twenty-four hours a day while the system is deployed.

The Contractor shall provide contact information for the system coordinator and others responsible for maintenance of the system prior to installation of the system. The Contractor shall furnish an on-site System Coordinator for monitoring the WZIS throughout all periods of deployment.

Furnish a system capable of providing advance traffic information to motorists when there is a slowing of traffic due to congestion resulting from lane reductions or other conditions. The condition-responsive notification to the motorist occurs with the use of Portable Changeable Message Signs (PCMS) in accordance with 801.15, activated through real-time traffic data collected downstream of the PCMS location. This equipment must be a packaged system that operates as a stand-alone AWZIS meeting this specification. Conditions might exist that require multiple deployments of this system at a given time

The Department reserves the right to terminate this item at any time if it determines this AWZIS is not performing in accordance with this specification or the Contractor has not met the responsibilities identified in this specification.

Provide an AWZIS that consists of the following field equipment: portable vehicle detection devices and PCMS's. Provide a system capable of withstanding inclement weather conditions while continuing to provide adequate battery power. The system must calculate and notify drivers via PCMS's of the traffic delay conditions ahead. All message dialogs shall be approved by the Engineer prior to use. The number and location of detection, and message trailers are defined in the plans and as directed by the Engineer. The decision to deploy or relocate field equipment is made by the Engineer and instrumented through the System Coordinator. The decision for equipment removal is made by the Engineer after work is complete.

The detector shall be capable of collecting traffic speed data. The processed data is used to remotely control PCMS's to display user definable, Engineer approved and locally stored messages. The message trigger state thresholds are user configurable.

The PCMS will be in accordance with 801.15, with the additional capability of supporting communications via modem/radio/CDMA/GPRS for remote message management.

Construction Requirements

All communication costs including cellular telephone service, FCC licensing, wireless data networks, satellite and internet subscription charges, and battery charging and maintenance. Additional to these requirements, the Contractor shall assume all responsibility for any and all damaged equipment due to crashes, vandalism, and adverse weather that may occur during the contract period.

The AWZIS shall operate continuously when deployed on the project. The system is in a constant "data collection" mode. The Contractor shall provide technical support for the AWZIS for all periods of operation.

In the event that communication with any field equipment is lost; provide a means and staff to manually program a PCMS message. If communication is lost for more than 10 consecutive minutes, the system shall revert to a fail-safe ROAD/WORK/AHEAD message displayed on the PCMS(s) until communications is restored.

System Operator local control functions and remote management operations must be password protected.

The AWZIS shall be capable of acquiring traffic information and selecting messages automatically without operator intervention after system initialization. The lag time between changes in threshold ranges and the posting of the appropriate PCMS message(s) shall be no greater than 60 seconds. The system operation and accuracy must not be appreciably degraded by inclement weather or degraded visibility conditions including precipitation, fog, darkness, excessive dust, and road debris.

The system shall be capable of storing ad-hoc messages created by the System Coordinator and logging this action when overriding any default or automatic advisory message.

The AWZIS communication system shall incorporate an error detection/correction mechanism to insure the integrity of all traffic conditions data and motorist information messages. Any required configuration of the AWZIS communication system shall be performed automatically during system initialization.

Pre-deployment system acceptance is based on the successful performance demonstration of AWZIS for a 5 day continuous period in accordance to this specification and as set forth in the plans. Ensure compliance to all FCC and Department specifications.

Equipment Maintenance

Maintain system components in good working condition at all times. Repair or replace damaged or malfunctioning components, at no cost to the Department, as soon as possible and within 12 hours of notification by the Engineer. Periodically clean PCMS.

Method of Measurement

Automated Work Zone Information System including detectors, data communications system and all supporting field equipment will be measured by each detector for the WZIS installed, maintained and removed.

3. I-65 shall maintain a minimum of two (2) lanes open to traffic, in each direction at all times except as shown below, when one (1) lane of traffic in each direction shall remain open:

14 hr shifts
- Sunday, 8pm - Monday, 10am
- Monday, 8pm - Tuesday, 10am
- Tuesday, 8pm - Wednesday, 10am

10 hr shift
- Wednesday, 8pm - Thursday, 6am
- Thursday, 8pm - Friday, 6am
- Friday, 8pm - Saturday, 6am

14 hr
- Saturday, 8pm - Sunday, 10am

No lane closures will be allowed on holiday weekends on the last business day prior to the holiday until the first business day following a holiday weekend. Normal business days are Monday through Friday. The Project Engineer/Supervisor may impose additional lane closure restrictions for special events and/or weather conditions.

Lane closure signs shall not be erected any earlier than an hour before the starting hours listed above. These signs shall be taken down within one hour after the closure is removed. In addition, all lane closures shall be removed during adverse weather conditions as determined by the Project Engineer/Supervisor. (No barricade or other traffic control device may be positioned in a lane outside the hours listed above)

The Contractor shall furnish all materials necessary for the completion of this work in accordance with the specifications.

5 mile MAX

4. The maximum length of work zone for this contract is five (5) miles. The Contractor may not maintain a continuous lane closure longer than five (5) miles at any point in time of the contract.

5. Liquidated Damages: If any lane closure occurs other than what is specified under Maintaining Traffic and Lane Closures During Construction, $2,500.00 will be assessed as liquidated damages, not as a penalty, but as damages sustained for each hour or fraction of an hour that lane closures occur other than the times indicated.

6. The worksite speed limit shall be 55 MPH. Work shall be limited to the following sections:

a. Segment #1: RP 207+20 to RP 217+21
b. Segment #2: RP 217+21 to RP 224+49
c. Segment #3: RP 223+40 to RP 233+00

7. The ramps shall remain open, and where feasible, have adequate acceleration/ deceleration distances. This may require the ramp configuration to be shifted to allow work to be performed on the section of roadway that traffic is utilizing for the original ramp configuration.

Stage Construction Sequence of Operations

Stage 1: Close inside lane (lane #1) and shift outside lane (lane #2) onto the outside shoulder. Conduct patching and rehabilitation of inside lane (lane #2) and median shoulder

Stage 2: Close outside lane (lane #2) and shift inside lane (lane #1) onto the median shoulder. Conduct patching rehabilitation of outside lane(s) (lane #2), outside shoulder, and ramp lane(s).

SIGN COVERS

Description

This work shall consist of all labor, materials and equipment required to cover signs in accordance with this special provision.

Materials

Material shall be in accordance with the applicable requirements of section 801 of the Standard Specifications.

Construction

For permanent signs, other than overhead signs and signs larger than 60 square feet, cover the entire front of the sign panel. Mount the sign coverings using Department-approved methods to avoid damaging the sign sheeting. Do not apply fastening devices or covers directly to the reflective sheeting. Use spacers that provide two (2) inches of air space between the cover and the sign face to protect the sheeting from damage.

Spacers

Submit shop drawings of the sign covers to the Engineer, and obtain the Engineer's approval, before covering signs on the project.

Shop Drawing

Do not use burlap or similar material to cover Department owned signs. The Contractor may use soft covers on other temporary signs.

Do not use sign plaque overlays that alter part of the legend or symbol.

The cost of covering signs shall be included in the lump sum cost of the Maintaining Traffic pay item.

COORDINATION OF MAINTENANCE OF TRAFFIC

MAINTENANCE OF TRAFFIC for each project in Contract RS-37695 and R-28973 shall be coordinated in accordance with 105.07. The cost shall be included in the pay item "Maintaining Traffic".

GROOVING FOR DURABLE PAVEMENT MARKING

GROOVING FOR DURABLE PAVEMENT MARKING shall be omitted on project Des 1401310 UBWC pavement.
