LONG TERM PAVEMENT PERFORMANCE PROGRAM DIRECTIVE

For The Technical Direction Of The LTPP Program

Program Area: Monitoring **Directive Number: SM-18**

Date: March 11, 1997 **Supersedes: n/a**

Subject: Resumption of SMP Site Monitoring Activities

Whenever SMP monitoring activities are resumed on a test section upon which activities had previously been suspended and the data recording and climate instrumentation removed, the following activities shall be performed.

Site Preparation

Prepare site for the resumption of monitoring measurements as follows:

- Unseal the end of the observation piezometer pipe. Inspect and either repair or replace the piezometer access cover. Apply lubricant to the threads on the access cover as appropriate. Provide a drainage path from the inside of piezometer access cover if water accumulation inside the cover has been a problem.

- Prior to completion of any pavement repairs to the instrumentation hole, perform a condition assessment of the area around the instrumentation hole and access trench in accordance with LTPP Directive SM-14: Monitoring of Instrumentation Area.

- As needed, patch any distressed areas; reapply crack sealant around the block, over the pavement surface layer temperature sensor, and/or sides of the trench; seal the inside of the conduit if it is acting as a drain; and provide a drainage path from the inside of the cabinet if water accumulation has been a problem. Advance coordination of road repair activities with the responsible highway agency may be necessary.

- Refresh all test section markings and SMP references used to locate deflection test points and elevation surveys points using the site layout schematic prepared during site suspension activities.

- Reinstall the air temperature sensor, rain gauge, and support pole.

- Reinstall the panel board containing the Onsite CR10, power supply, terminal strip, and relay.

- Install a solar panel, as appropriate, in accordance with LTPP Directive SM-15: Installation of Solar Battery Chargers at SMP Test Sections.

- Remove material used to seal the wire and connecters in the cabinet. Inspect all wires and connectors for corrosion and damage. Repair as appropriate.

- Reconnect all sensors to the Onsite CR10 terminal strip. Reconnect the ground wire.

- Inspect the Time Domain Reflectometry (TDR) sensor cables and reapply numbered wire labels as necessary.

- On portland cement concrete pavement test sections, carefully remove the sealant placed in the joint width measurement holes. Be careful not to damage the snap rings. Inspect the snap rings for corrosion and take corrective action as necessary.

- Inspect the cabinet lock and replace if necessary.

- Perform operational checks of all equipment and sensors.

  Onsite data logger

  - reset and and run for two hours
  - manually actuate the rain gauge with a known number of tips (10 times for example)
  - monitor the functioning of MRC sensors 6 through 18 using the Graph Term program
  - after two hours, down load the data from the Onsite data logger and compare (1) air temperature measurements with those from the top five MRC sensors and (2) number of tips recorded by the rain gauge with the known number (i.e., manually actuated)
  - reset the Onsite data logger to remove the data collected during the operational check

  Mobile data

  - collect two consecutive sets of Mobile data using the Mobile Data Acquisition Unit
  - inspect the data using the MOBFIELD program
  - compare any anomalies and malfunctioning sensors against those noted in the previous site suspension report
  - attempt to correct all equipment and sensor problems to the extent possible

  Observation piezometer

  - measure the total depth of the piezometer
  - remove foreign objects inside the pipe which block access
  - compare measured depth to the depth at installation, note if there appears to be appreciable accumulation of sediments in the piezometer

- After all site preparation work is completed, take color photographs of the following locations:

    - instrumentation hole and access trench
    - reference markings used to locate test points
    - observation piezometer
    - pavement distresses which occur in the SMP monitoring zone
    - bench mark(s)

Monitoring

On the day of reinstallation of monitoring equipment or the first monitoring day after reinstallation of monitoring equipment, perform the full suite of SMP monitoring measurements including:

- FWD and associated measurements
- elevation survey
- manual distress survey with transverse profile measurements
- manual electrical resistivity measurements (two- and four-point)
- automated mobile data measurements (TDR and Resistivity)
- water table measurement

Longitudinal profile measurements should be performed within two months of the reinstallation date.

SMP Site Monitoring Resumption Status Report

Prepare a SMP Site Monitoring Resumption Status letter-report which contains the following elements:

- Narrative description of resumption activities

    - Reinstallation date of onsite data recording and climate instrumentation
    - Comments on changes in the condition of the equipment, pavement condition, etc., since SMP monitoring was suspended
    - Pavement repairs made and or needed to the instrumentation hole or trench
    - Other site preparation activities performed
    - Problems encountered

- Supplemental Information (Table 1)

    - Installed equipment table with serial numbers
    - Operational status of all instrumentation and monitoring devices (functioning properly or malfunction). Comment on all equipment or devices which are malfunctioning
    - Copies of color photographs

Submit two copies of the SMP Site Monitoring Resumption Status letter-report to the FHWA LTPP Division Office within three months after completion of the site preparation activities.

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Table 1. SMP site equipment list and operational status.

Equipment	Serial Number	Operational Status	
		OK	Malfunction (Comment)
Rain Gauge			
Air Temperature Probe			
Onsite CR10			
Observation Well			
Bench Mark 1			
Bench Mark 2			
Bench Mark 3			
Resistivity Probe			
Joint Opening Rings			
MRC Thermistor Probe			
Sensor 1			
Sensor 2			
Sensor 3			
Sensor 4			
Sensor 5			
Sensor 6			
Sensor 7			
Sensor 8			
Sensor 9			
Sensor 10			
Sensor 11			
Sensor 12			
Sensor 13			
Sensor 14			
Sensor 15			
Sensor 16			
Sensor 17			
Sensor 18			
TDR			
Probe 1			
Probe 2			
Probe 3			
Probe 4			
Probe 5			
Probe 6			
Probe 7			
Probe 8			
Probe 9			
Probe 10			