LONG TERM PAVEMENT PERFORMANCE PROGRAM DIRECTIVE

For The Technical Direction Of The LTPP Program

Program Area: **SPS Support** **Directive Number: S-14**

Date: **21 April 1997** **Supersedes: N/A**

Subject: **Guidelines for IMS Data Entry for SPS-9 Projects**

In order to provide basic information describing the characteristics of constructed SPS-9 projects in the Information Management System (IMS), a small subset of the construction data forms have been selected for entry. Although LTPP guidelines require that a complete suite of construction data, inventory data (for overlays), field material sampling and testing, and laboratory materials test data be collected, only the data specified in this directive shall be entered into the IMS at this time. Construction data, inventory data, field materials sampling and test data, and laboratory materials test data not specified in this directive shall not be entered into the IMS at this time. Monitoring data, including deflection, profile, distress, and traffic, shall be processed and entered into the IMS following established guidelines. The Regional Coordination Office Contractors are still responsible for management of the collection, acquisition, quality control checks, and storage of all required data. These guidelines applied to all currently defined SPS-9 projects (SPS 9A and pilot).

Note: **To handle turn of century, all year values will be entered as four digit numbers. These forms are the first ones where this change will apply.**

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Required Data Sheets

The required data sheets to be entered depend on the type of project as indicated in Table 1.

Table 1. Summary of data sheets to be entered into the IMS for SPS-9 projects.

Type Construction	Project or Section	SPS-9 Construction Data Sheets				Inventory Data Sheets		
		1	2	4	9	1	2	3
New & Reconstructed	Project	/						
	01		/	/	/			
	02		/	/	/			
	xx		/	/	/			
Overlay	Project					/	/	/
	01			X	/			
	02			X	/			
	xx			X	/			

/ Always complete indicated data sheet for this section; X Complete for overlay layer; xx -all other test sections

SPS-9 Construction Data Sheets

The SPS-9 Construction data sheets selected for input include information on project location, geometric and drainage details, layer descriptions and asphalt concrete mix properties. These data sheets include the following:

Construction Data Sheet 1: Project and Section Identification

Construction Data Sheet 2: Geometric, Shoulder and Drainage Information

Construction Data Sheet 4: Layer Descriptions

Construction Data Sheet 9: Plant-Mixed Asphalt Bound Layers -Mixture Properties -Design

These data sheets shall be complete following the instruction contained in this document.

Inventory Data Sheets Used on SPS-9 Overlay Projects

On overlay projects, the following Inventory Data Sheets used on GPS test sections are required:

Sheet 1 Project and Section Identification

Sheet 2 Geometric, Shoulder and Drainage Information

Sheet 3 Layer Descriptions

These data sheets shall be completed following the guidelines contained in **Data Collection Guidelines for Long Term Pavement Performance Studies, Operational Guide No. SHRP-LTPP-OG-001, Strategic Highway Research Program, revised October 1993.**

SPS-9 Construction Data Sheet Instructions

This section describes the input required for each of the Construction Data Sheets. A brief description of the data entry for each field is presented in order of appearance on the form. For brevity, the data elements common to all forms (header information) are presented first with the individual instructions for the data forms following.

Data Common to All SPS-9 Construction Data Sheets

A common set of project identification data appears in the upper right hand corner of each SPS-9 Construction Data Sheet. These data items are described below.

STATE CODE Enter the two digit state code which is a number used to identify the state or Canadian province in which the pavement section is located (see Table A.l, Appendix A of the LTPP Data Collection Guide).

SPS PROJECT CODE Enter the two character SPS project code; "09". The structure of this item is consistent with other SPS experiments.

TEST SECTION NUMBER Enter the two digit SPS test section number. For Construction Data Sheet 1 the project level number "00" shall be used.

Construction Data Sheet 1: Project and Section Identification

1. DATE OF DATA COLLECTION OR UPDATE Enter the month and year in which the "as-built" construction inventory data was collected. The number to identify the month is in numerical sequence of the months as they occur during the year (enter 03 for March, etc.).

2. STATE HIGHWAY AGENCY (SHA) DISTRICT NUMBER Enter the number used to identify the SHA district in which the pavement test section is located.

3. COUNTY OR PARISH Enter the number used to identify the county or parish where the pavement section is located. County codes may be found in Federal Information Processing Standards Publications 6, "Counties of the States of the United States."

4. FUNCTIONAL CLASS Enter the number used to identify the functional classification of the highway for which the pavement section is a sample (see Appendix A, Table A.2).

5 ROUTE SIGNING Enter the code to identify the letter designation that precedes the number of the highway where the SHA project is located.

6. ROUTE NUMBER Enter the number assigned to the highway where the SHA project is located (e.g., I-280).

7. NUMBER OF THROUGH LANES Enter the number indicating the total number of through lanes (exclusive of ramps and access roads) in the direction of travel.

8. DATE CONSTRUCTION COMPLETION Enter the month and year in which the test section construction was completed.

9. DATE OPENED TO TRAFFIC Enter the month and year in which the test section was opened to traffic.

10. CONSTRUCTION COSTS PER LANE MILE Enter the total average construction cost in thousands of dollars per lane mile for the test section, exclusive of non-pavement costs such as bridges, culverts, lighting, and guard rails.

11. DIRECTION OF TRAVEL Enter the number indicating the general direction of traffic flow along the entire route which includes the test section.

12-16. PROJECT STARTING POINT LOCATION The location of the starting point of the project is to be identified by milepoint, elevation, latitude, and longitude.

12. MILEPOINTS are to be determined by adjusting the value posted on the nearest milepost to the starting point. For example, if the direction of travel (preceding data element) is in the same direction as increasing mileposts for a given roadway, and the starting point was 0.29 miles from the preceding milepost (Mile 114), the milepoint for the starting point of the test section would be 114.29. Milepoints are to be given to the nearest 0.01 mile.

13. ELEVATIONS are to be entered to the nearest foot. Survey measurements are not required - the intent is to obtain a reasonable estimate. In many cases, the elevations can be taken off the construction plans.

14-15. LATITUDE AND LONGITUDE (North and West, respectively) are to be given in degrees, minutes, and seconds to the nearest one-tenth of a second. Unless otherwise approved, these values shall be determined from Global Positioning System (GPS) measurements taken at the start of the project.

16. ADDITIONAL LOCATION INFORMATION (SIGNIFICANT LANDMARKS) Enter additional information regarding the location of the section starting point location. This type of information will be useful for field crews locating the project during monitoring activities.

17. HPMS SAMPLE NUMBER Enter the twelve-digit "Section/Grouped Data Identification" assigned to any section of highway in the Highway Performance

Monitoring System (HPMS). It provides a unique identification for a test section and may be obtained from those SHA personnel servicing the HPMS.

18. HPMS SECTION SUBDIVISION Enter the single digit code used to identify a further subdivision of an original HPMS section, generally included as a thirteenth digit to the HPMS sample number.

Construction Data Sheet 2: Geometric, Shoulder and Drainage Information

1. LANE WIDTH Enter the width of the lane to be monitored, to the nearest foot.

2. MONITORING SITE LANE NUMBER Enter the number that identifies which lane is to be monitored. Lanes are identified as indicated on the data sheet. Although a highway agency may wish to monitor more than one lane, each lane should be considered as a separate "test section," with its own data (although much data may actually be common such as environmental, materials, and thickness design data). For the LTPP Studies, only the outside lane will be studied, so the code “1” should be entered.

3. TYPE OF PAVEMENT Enter the code identifying the general type of pavement structure after construction (such as asphalt concrete pavement with granular base). The valid pavement type codes for SPS-9 are 01, 02, 07, and 11-25 (see Table A.4, Appendix A of the LTPP Data Collection Guide).

4. SUBSURFACE DRAINAGE LOCATION Enter the code indicating whether the subsurface drainage is continuous along the section or was provided at intermittent locations or was not provided.

5. SUBSURFACE DRAINAGE TYPE Enter the code indicating the type of subsurface drainage provided. A space is provided for describing another type of subsurface drainage if different from those for which codes are provided.

SHOULDER DATA Spaces are provided to enter data describing both the outside and inside shoulder. If there are no inside shoulders, please leave spaces pertaining to inside shoulders blank.

6. SURFACE TYPE Enter the codes indicating the type of shoulder surfaces for the outside and inside shoulders. The inside and outside shoulder surfaces should be asphalt concrete for newly constructed SPS-9 sites.

7. TOTAL WIDTH Enter the total (paved and unpaved) widths of the outside and inside shoulders to the nearest foot.

8. PAVED WIDTH Enter the paved widths of the outside and inside shoulders to the nearest foot.

9. SHOULDER BASE TYPE Enter the codes identifying the types of base material used in the shoulders (see Table A.6, Appendix A for codes).

10. SHOULDER SURFACE THICKNESS Enter the average thicknesses of the inside and outside shoulder surfaces to the nearest tenth of an inch.

11. SHOULDER BASE THICKNESS Enter the average base thicknesses along the shoulders to the nearest tenth of an inch.

12. DIAMETER OF LONGITUDINAL DRAINPIPES Enter the inside diameter to the nearest tenth of an inch of the longitudinal drainpipes used for subsurface drainage. If there is no longitudinal drainage, leave blank.

13. SPACING OF LATERALS Enter the average spacing in feet for subdrainage laterals. Leave blank if there are no subdrainage laterals.

Construction Data Sheet 4: Layer Descriptions

This data sheet should be completed for each test section to describe the newly constructed pavement layers. The layer numbers shown on this form provide a key reference to the other detailed information sheets concerning the properties of the layer. In order to provide future analysts with information on the test section pavement structure and to avoid confusion with layer numbers, the complete layer structure of the test section must be described. For new and reconstruction projects this pavement layer structure should be the same as that provided on the Laboratory Material Handling and Testing Form L05. For rehabilitation projects this

information combined with inventory layer information should be the same as that provided on the Laboratory Material Handling and Testing Form L05.

1. LAYER NUMBER Enter the printed layer number on the form which is used to reference the pavement layers on other data sheets. The first layer is assigned to subgrade and all other layers assigned increasing numbers. The surface will be the highest numbered layer.

2. LAYER DESCRIPTION Enter the layer description code, as shown in note 2 on the form. This code, which describes the general type of layer, should be entered corresponding to its order within the layer structure.

3. MATERIAL TYPE CLASSIFICATION Enter the code that identifies the type of material in each layer. These codes are listed in Tables A.5, A.6, A.7, and A.9, of Appendix A of the LTPP Data Collection Guide, for surfacing materials, base and subbase materials, subgrade soils, and thin seals and interlayers, respectively.

4. LAYER THICKNESS Enter the average thickness of each layer. In addition, if sufficient measurement information is available, enter the minimum, maximum, and standard deviation of the thickness measurements to the nearest tenth of an inch.

5. DEPTH BELOW SURFACE TO "RIGID" LAYER Enter the depth below the surface where rigid layer is encountered, to the nearest one-tenth of a foot.

Construction Data Sheet 9: Plant-Mixed Asphalt Bound Layers, Mixture Properties - Design

This data sheet is to be filled out from available project records for the asphalt concrete surface layer identified on Sheet 4 (refers to the uppermost asphalt concrete structural layer, not a friction course). The following data items are to be obtained from laboratory mixture design records and/or the test section asphalt concrete job mix formula (JMF). Information may also be derived from tests conducted on the mixture during construction as part of the contractor/ participating agency Quality Control program; however, the intent is to record design values.

1. LAYER NUMBER Enter the asphalt concrete layer to be described on the sheet (from Sheet 4). (the uppermost asphalt concrete structural layer)

2. TYPE OF MIX DESIGN Enter the code to indicate whether the mixture was designed using Marshall, Hveem, SUPERPAVE or some other design technique. The codes appear on the data sheet. If some other design technique was used, please describe it in the space provided.

3. MAXIMUM SPECIFIC GRAVITY Enter the maximum specific gravity of a mixture from the mix design information/JMF determined according to AASHTO 209 or ASTM D204l.

4. BULK SPECIFIC GRAVITY Enter the design target value for the bulk specific gravity (to the nearest thousandth) of compacted mixtures as tested using the method specified in ASTM D1188.

5. ASPHALT CONTENT Enter the design asphalt content as percent by weight of the total asphalt cement (including that absorbed by the aggregate) in the asphalt concrete mixture to the nearest one-tenth of one percent.

6. AIR VOIDS Enter the design air voids as a percent of the material volume, to the nearest one-tenth of one percent.

7. VOIDS IN MINERAL AGGREGATE Enter the design void space between the aggregate particles of a compacted asphalt concrete mixture, which includes air voids and the effective asphalt content, to the nearest one-tenth of one percent.

8. EFFECTIVE ASPHALT CONTENT Enter the design effective asphalt content (total asphalt content of the paving mixture minus the mean portion of asphalt that is lost by absorption into the aggregate particles) as a percentage of the total mixture weight, to the nearest one-tenth of one percent.

9. MARSHALL STABILITY Enter the mean Marshall Stability (Test Method AASHTO T245 or ASTM D1559) in pounds for the mixture during laboratory mix design.

10. NUMBER OF BLOWS Enter the number of blows of the compaction hammer that were applied to each end of the specimen during laboratory compaction for Marshall mix design.

11. MARSHALL FLOW Enter the mean Marshall Flow (average of measured results) as the whole number of 0.01 inches measured by Test Method AASHTO T245 (or ASTM D1559) for the mixture during the laboratory mix design.

12. HVEEM STABILITY Enter the mean Hveem Stability or "stabilometer value" as measured with the Hveem apparatus using Test Method AASHTO T246 (or ASTM DI561).

13. HVEEM COHESIOMETER VALUE Enter the cohesiometer value, in grams per 25 mm width (or diameter) of specimen, obtained by Test Method AASHTO T246 (or ASTM DI561).

14. SUPERPAVE GYRATORY COMPACTION, N_{design} Enter the number of revolutions of the SUPERPAVE gyratory compactor to achieve 4% air voids.

15. ASPHALT GRADE Enter the code for the asphalt grade used in asphalt mixtures, if available. (See asphalt code sheet Table A.16 in Appendix A of the LTPP Data Collection Guide)

16. SUPERPAVE ASPHALT BINDER GRADE Enter the performance grade for asphalt binder used.

SPS-9 CONSTRUCTION DATA SHEET 1 PROJECT AND SECTION IDENTIFICATION	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]

*1. DATE OF DATA COLLECTION OR UPDATE (Month/Year) [__ __ / __ __ __ __]

*2. STATE HIGHWAY AGENCY (SHA} DISTRICT NUMBER [__ __]

*3. COUNTY OR PARISH [__ __ __]

4. FUNCTIONAL CLASS (SEE TABLE A.2, APPENDIX A) [__ __]

*5. ROUTE SIGNING (NUMERIC CODE) [__]
Interstate ..... 1 U. S. ..... 2 State ..... 3 Other 4

*6. ROUTE NUMBER [__ __ __ __ __]

7. NUMBER OF THROUGH LANES (ONE DIRECTION) [__ .]

*8. DATE OF CONSTRUCTION COMPLETION (Month/Year) [__ __ / __ __ __ __]

*9. DATE OPENED TO TRAFFIC (Month/Year) [__ __ / __ __ __ __]

10. CONSTRUCTION COSTS PER LANE MILE (In $1000) [__ __ __ __ __ .]

11. DIRECTION OF TRAVEL [__]
East Bound ..... 1 West Bound ..... 2 North Bound ..... 3 South Bound 4

PROJECT STARTING POINT LOCATION

*12. MILEPOINT [__ __ __ . __ __]

*13. ELEVATION (ft) [__ __ __ __ __ .]

*14. LATITUDE [__ __ E __ __ ’ __ __ __ __ ”]

*15. LONGITUDE [__ __ __ E __ __ ’ __ __ __ __ ”]

16. ADDITIONAL LOCATION INFORMATION (SIGNIFICANT LANDMARKS): [_____
_____
_____

17. HPMS SAMPLE NUMBER (HPMS ITEM 28) [__ __ __ __ __ __ __ __ __ __ __ __]

18. HPMS SECTION SUBDIVISION (HPMS ITEM 29) [__]

PREPARER _____ EMPLOYER _____ DATE _____

SPS-9 CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]

*1. LANE WIDTH (ft) [__ __ .]

*2. MONITORING SITE LANE NUMBER [__]
(LANE 1 IS OUTSIDE LANE, NEXT TO SHOULDER LANE 2 IS NEXT TO LANE 1, ETC.)

3. TYPE OF PAVEMENT (See Table A.4 of the SHRP Data Collection Guide) [__ __]

4. SUBSURFACE DRAINAGE LOCATION [__]
Continuous Along Test Section ..... 1 Intermittent ..... 2 None 3

5. SUBSURFACE DRAINAGE TYPE [__]
No Subsurface Drainage ..... 1 Longitudinal Drains 2
Transverse Drains ..... 3 Drainage Blanket ..... 4 Well System 5
Drainage Blanket with Longitudinal Drains 6
Other (Specify) ..... 7 _____

SHOULDER DATA		INSIDE SHOULDER	OUTSIDE SHOULDER
6.	SURFACE TYPE Turf ..... 1 Granular ..... 2 Asphalt Concrete ..... 3 Concrete ..... 4 Surface Treatment ..... 5 Other (Specify) ..... 6 _____	[__]	[__]
7.	TOTAL WIDTH (ft)	[__ __ .]	[__ __ .]
8.	PAVED WIDTH (ft)	[__ __ .]	[__ __ .]
9.	SHOULDER BASE TYPE (CODES-TABLE A.6)	[__ __]	[__ __]
10.	SURFACE THICKNESS (in)	[__ __ . __]	[__ __ . __]
11.	SHOULDER BASE THICKNESS (in)	[__ __ . __]	[__ __ . __]
12.	DIAMETER OF LONGITUDINAL DRAINPIPES (in)		[__ __ . __]
13.	SPACING OF LATERALS (ft)		[__ __ __ .]

PREPARER _____ EMPLOYER _____ DATE _____

SPS-9 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESS			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE (7)	[__ __]	#	#	# #	# #
2	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
3	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
4	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
5	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
6	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
7	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
8	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
9	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
10	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
11	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
12	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
13	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
14	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]
15	[__ __]	[__ __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]	[__ __ __ . __]

5 DEPTH BELOW SURFACE TO "RIGID" LAYER (ft) [__ __ . __]
(Rock, Stone, Dense Shale)

NOTES:

1. Layer 1 is the subgrade soil, the highest numbered layer is the pavement surface.

2. Layer description codes:

Overlay 01	Base Layer 05	Porous Friction Course 09
Seal/Tack Coat 02	Subbase Layer 06	Surface Treatment 10
Original Surface 03	Subgrade Layer 07	Embankment (Fill) 11
HMAC Layers 04	Interlayer 08	

3. The material type classification codes are presented in Tables A.5, A.6, A.7 and A.8 of the Data Collection Guide for Long Term Pavement Performance Studies, dated January 17, 1990.

4. Enter the average thickness of each layer and the minimum, maximum and standard deviation of the thickness measurements, if known.

PREPARER _____ EMPLOYER _____ DATE _____

SPS-9 CONSTRUCTION DATA SHEET 9 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES - DESIGN	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]

*1 LAYER NUMBER (FROM SHEET 4) [__]

*2. TYPE OF MIX DESIGN [__]
Marshall ..... 1 HVEEM ..... 2 SUPERPAVE 3
Other (Specify) ..... 4 _____

3. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) [__ . __ __ __]
(AASHTO T209 OR ASTM D2041)

4. BULK SPECIFIC GRAVITY (ASTM D1188) [__ . __ __ __]

5. ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX) [__ . __ __ __]
(AASHTO T164 OR ASTM D2172)

6. AIR VOIDS (PERCENT) [__ __ . __]

7. VOIDS IN MINERAL AGGREGATE (PERCENT) [__ __ . __]

8. EFFECTIVE ASPHALT CONTENT (PERCENT) [__ __ . __]

9. MARSHALL STABILITY (lb) (AASHTO T245 OR ASTM D1559) [__ __ __ __ .]

10. NUMBER OF BLOWS [__ __ .]

11. MARSHALL FLOW (0.01 in) [__ __ .]
(AASHTO T245 OR ASTM D1559)

12. HVEEM STABILITY (AASHTO T246 OR ASTM D1561) [__ __ __ .]

13. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) [__ __ __ __ .]
(AASHTO T246 OR ASTM 1561)

14. SUPERPAVE GYRATORY COMPACTION N_{design} [__ __ __ .]

15. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [__ __]

16. SUPERPAVE ASPHALT BINDER GRADE [P G __ __ - __ __]

PREPARER _____ EMPLOYER _____ DATE _____