

National Research Council

STRATEGIC HIGHWAY RESEARCH PROGRAM



SPECIFIC PAVEMENT STUDIES
DATA COLLECTION GUIDELINES
FOR EXPERIMENT SPS-8
STUDY OF ENVIRONMENTAL EFFECTS IN THE
ABSENCE OF HEAVY LOADS

STRATEGIC HIGHWAY RESEARCH PROGRAM
818 Connecticut Avenue NW
Washington, DC 20006

September 1992

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SPECIFIC PAVEMENT STUDIES
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STUDY OF ENVIRONMENTAL EFFECTS IN THE ABSENCE OF HEAVY LOADS

INTRODUCTION

This document provides guidelines and instructions for collection of data for the Specific Pavement Studies SPS-8 experiment, Study of Environmental Effects in the Absence of Heavy Loads. Forms for recording and reporting this data are also included.

This report should be used in conjunction with the following reports:

- Operational Memorandum No. SHRP-LTPP-OM-029, "Specific Pavement Studies: Construction Guidelines for Experiment SPS-8, Study of Environmental Effects in the Absence of Heavy Loads", March 1992
- Operational Memorandum No. SHRP-LTPP-OM-030, "Specific Pavement Studies: Materials Sampling and Testing Requirements for Experiment SPS-8, Study of Environmental Effects in the Absence of Heavy Loads Experiment SPS-8", August 1992
- Operational Guide No. SHRP-LTPP-OG-001, "Data Collection Guidelines for the Long Term Pavement Performance Studies"
- Operational Guide No. SHRP-LTPP-OG-006, "SHRP-LTPP Guide for Field Materials Sampling, Testing, and Handling", May 1990
- Operational Guide No. SHRP-LTPP-OG-004, "SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing", February 1991
- Other SHRP-related guides and operational memoranda

Data elements that will be collected for this experiment are classified into the following groups:

Test Section Location Reference Table
Construction
Field Materials Sampling and Testing
Laboratory Materials Testing
Deflection
Profile
Distress
Skid Resistance
Traffic
Climatic
Maintenance
Rehabilitation

The data collection and reporting process for SPS test sites requires the completion of specific data sheets from the Data Collection Guide for Long-Term Pavement Performance Studies which were developed for the General Pavement Studies (GPS) and data sheets developed specifically for Specific Pavement Studies (SPS). The SPS project-specific data sheets address construction data and aspects of the materials sampling and testing activities.

This report addresses the data to be collected during construction. Data obtained from monitoring activities performed after construction will be reported on data forms similar to those used for the GPS test sections.

PROJECT VERSUS SECTION SPECIFIC DATA

In contrast to the General Pavement Studies test sections, each SPS site includes several test sections. Several data items including traffic, climate and some inventory data elements will be applicable to all test sections of an SPS site. Also some construction data items such as asphalt concrete or portland cement concrete mix design data will apply to more than one test section.

However, a large portion of the data elements will be specific to each test section. Data items common to all test sections will be referred to as "project level data" while data items specific to each test section will be referred to as "section specific data."

SPS TEST SECTION NUMBERING SCHEME

The structure of the SPS test section numbering scheme will differ from that used for the GPS test sections to help identify project and test section specific data. Each GPS test section is identified with a six digit code consisting of a two digit STATE CODE and a four digit SHRP SECTION ID number. Also, each SPS test section will be identified with a six digit code that will consist of a two digit STATE CODE and a four digit SHRP SECTION ID number. However, this SHRP SECTION ID number, will consist of a two digit SPS PROJECT CODE and a two digit TEST SECTION NUMBER.

The far left two digits are the STATE CODE designator. The same STATE CODE used for GPS test sections will be used for the SPS experiments. Table A.1 of the LTPP Data Collection Guide lists the STATE CODE for all states and provinces, District of Columbia, and Puerto Rico.

The middle two digits are the SPS PROJECT CODE. The first digit of this code is the multiple site designator to distinguish between multiple sites of the same SPS experiment constructed in the same state or province. A zero "0" is assigned to the first site of a specific SPS experiment constructed in a state or province. An "A", "B", "C", etc. is assigned to the second, third, fourth, etc. project of the same SPS experiment constructed in the same state or province. The second digit of this code designates the SPS experiment number, i.e., "8" for SPS-8 test sites.

The far right two digits are the TEST SECTION NUMBER. A different two digit number is assigned for each test section on a test site. The test section numbers for the SPS-8 test sections are specified in Operational Memorandum No. SHRP-LTPP-OM-029, "Specific Pavement Studies: Construction Guidelines for

Experiment SPS-8, Study of Environmental Effects in the Absence of Heavy Loads", March 1992. Test section numbers for the supplemental test sections on the SPS project should be specified by the SHRP regional office in coordination with the participating highway agency.

Thus, combination of the STATE CODE and SPS PROJECT CODE uniquely identifies each SPS test site. For "section specific data", the assigned TEST SECTION NUMBER in combination with the STATE CODE and SPS PROJECT CODE numbers will be used. However, for "project level data" "00" will be used as the TEST SECTION NUMBER to differentiate these data from the "section specific data", for which a test section number (01 through 06 for flexible test sections and 07 through 12 for rigid test sections, or higher for supplementary test sections) should be used.

FIELD MATERIALS SAMPLING AND TESTING

Field materials sampling and testing shall be performed following the guidelines outlined in Operational Memorandum No. SHRP-LTPP-OM-030, "Specific Pavement Studies: Materials Sampling and Testing Requirements for Experiment SPS-8, Study of Environmental Effects in the Absence of Heavy Loads", August 1992. This operational memorandum incorporates by reference the material included in Operational Guide No. SHRP-LTPP-OG-006, "Field Materials Sampling, Testing, and Handling" which was developed for the General Pavement Studies. This Guide will form the basis for the conduct of a substantial portion of the field materials sampling and testing activity for the SPS-8 experiment. The operational memorandum for the SPS-8 experiment includes revised field data forms and new data sheets for recording data from materials sampling and testing activities performed during construction.

REVISED FIELD DATA FORMS

As the requirements for sampling of SPS projects differ from those for GPS sections, the field materials sampling and testing data forms used in the GPS program were modified. The primary changes common to each form relate to test section number, sampling location referencing, and sampling area number.

Test Section Number. The six digit test section identification numbers on the data forms have been subdivided into three, two digit fields representing the state code, SPS project code, and test section number. The structure of this number is described under SPS Test Section Numbering Scheme of this report.

Sample Location Reference System. All material sampling and field testing data forms which reference the location of a sample or test use a station, offset and sampling area number. The sampling area number is a two digit number used to reference all of the samples taken from one area of the project. These sampling numbers are developed as part of the materials sampling plan for the test site and should run in sequential order in the direction of traffic.

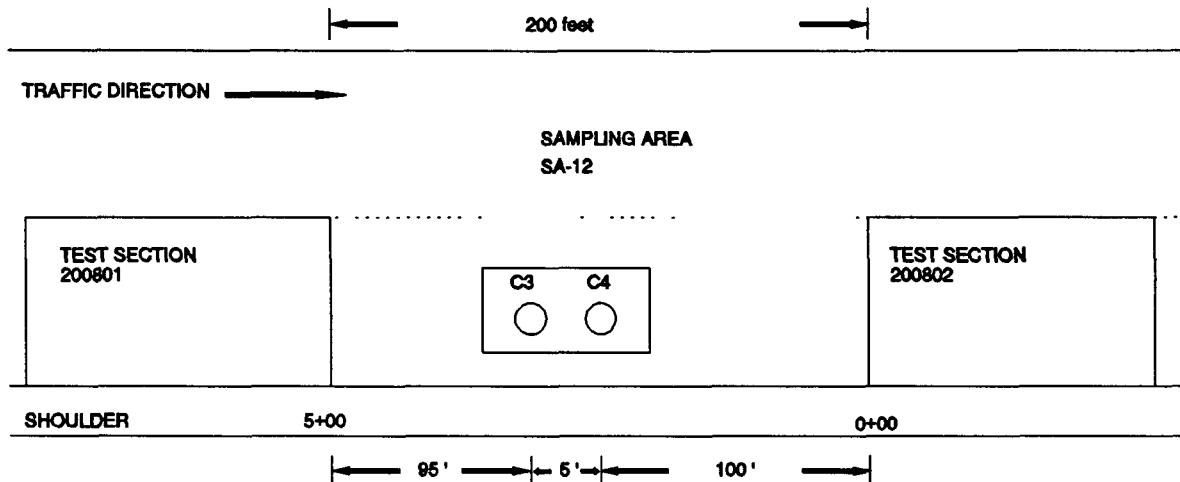
The station to be specified on these data forms is referenced from either the beginning or end of the test sections adjacent to the sampling area. For expediency in the field, the station number designated on the form is relative to the test section number designated on the data form. Thus, if the sampling area occurs after the referenced test section, the station number should be greater than 5+00. If the sampling area occurs in front of the designated test section, the station number should be negative. This station number should not be the reference project station number, as outlined in the section entitled, "Construction Data" of this report. Thus, the relative test section station number and the reference project station number will be the same only on the first test section of a project, since the beginning point of the first test section is defined as the project station 0+00. The offset distance is measured from the outside edge of the test section lane to the core location.

Figure 1 illustrates the location referencing system to be used for SPS material samples. In this example, a sampling area, designated SA-12 is situated between sections 200801 and 200802. In this sampling area, two 4-inch diameter C-Type cores, C3 and C4, are located 5 feet apart and three feet from the edge of the lane. The location of these two cores can be specified relative to either test section 200801 (alternative 1) or test section 200802 (alternative 2). In alternative 1, the station number of core C3 is 5+95 since it is 95 feet past the end of section 200801. Core C4 is located at station 6+00. In alternative 2, the station numbers of cores C3 and C4 are -1+05 and -1+00, respectively since they occur in advance of test section 200802. Thus when specifying the sampling locations on the field data form, the station number written on the form must correspond to the test section.

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING DATA SHEETS

Most of the LTPP-SPS Material Sampling and Field Testing data sheets use the same top block of information related to the test section and project.

SHEET NUMBER. Since several data sheets will be required to record the samples and test data from each sampling areas on the project, room is provided



	Alternative 1 Location referenced to test section 200801	Alternative 2 Location referenced to test section 200802
CORE C3 LOCATION		
STATE CODE	20	20
SPS PROJECT CODE	08	08
TEST SECTION NO	01	02
STATION	5+95	-1+05
OFFSET	03	03
CORE C4 LOCATION		
STATE CODE	20	20
SPS PROJECT CODE	08	08
TEST SECTION NO	01	02
STATION	6+00	-1+00
OFFSET	03	03

In this example of the location referencing system, designated sampling area SA-12 is situated between sections 200801 and 200802. In SA-12, two 4" C-type cores are specified, C3 and C4, to be 5 feet apart and three feet from the edge of the lane. The location of these two cores can be specified relative to either test section 200801 (alternative 1) or test section 200802 (alternative 2). In alternative 1, the station number of core C3 is 5+95 since it is 95 feet past the end of section 200106. Core C4 is at station 6+00. In alternative 2, the station number of core C3 is -1+05 and C4 is -1+00 since they occur in advance of test section 200802. Thus, when specifying the sampling locations on the field data form, the station number written on the form must correspond to the test section indicated on the form.

Figure 1. Illustration of Location Referencing System

on all data forms to sequentially number the data sheets. The first field is the sequential number of the data sheet and the second field is the total number of data sheets completed.

SHRP REGION. Indicate the SHRP-LTPP region in which the state or province is located, i.e. North Atlantic, North Central, Southern, or Western.

STATE. Indicate the name of the state, District of Columbia, Puerto Rico, or the Canadian Province in which the project is located. Alternatively, use the two letter abbreviation shown in Table A.1 of the LTPP Data Collection Guide.

STATE CODE. Enter the two-digit numeric code corresponding to the state or province as shown in Table A.1 of the LTPP Data Collection Guide.

SPS PROJECT CODE. The two digit SPS project code. The first digit (from the left) of this code should either be a 0 (zero), for the first SPS-8 project constructed in a state, or a letter starting with A, B, etc. for the second, third, etc. project of the same SPS experiment constructed in the same state. The second digit corresponds to the SPS experiment number.

TEST SECTION NO. The two digit number assigned to the test section (refer to Operational Memorandum No. SHRP-LTPP-OM-029).

SPS EXPERIMENT NO. The SPS experiment number for the project. This should be "8" for projects in the experiment, "Study of Environmental Effects in the Absence of Heavy Loads".

ROUTE/HIGHWAY. Record the designation for the route or highway on which the project is located.

LANE. Record a "1" if sampling occurs on the outside lane and a "2" if sampling occurs on the inside lane. Drilling and sampling shall always occur on the outside lane for the SPS experiments.

DIRECTION. Record the direction of travel at the project site. Use the following abbreviations:

- E for eastbound traffic direction
- W for westbound traffic direction
- N for northbound traffic direction
- S for southbound traffic direction

SAMPLE/TEST LOCATION. Check "Before Section" if the sampling area is located before the beginning of the test section indicated under TEST SECTION NUMBER on the form (station 0-). Check "After Section" if the sampling area is located after the end of the test section indicated on the form (station 5+). Check "Within Section" for testing locations within the test sections, such as density testing and auger probes in the shoulder.

FIELD SET NO. The field set number is a sequentially assigned number to indicate the different time periods in which material samples and field testing were conducted on the project. These time periods usually refer to different stages in the pavement life, such as prior to overlay construction, after overlay construction, end of test, etc. A field set number can apply to more than one day since sampling of the test site usually requires more than one day. As a general rule, the same field set number should be applied to all material sampling and field testing conducted in a continuous 30-day period, unless a construction event occurs between the two sampling sessions. Enter 1 for the first material sampling and field testing activity conducted on the test site. Enter 2, 3, etc. for the second, third and subsequent sampling and field testing activities conducted on the site. For SPS-8 projects, the first sampling should occur prior to any subgrade preparation activity.

The following Sampling Data Sheets must be completed for SPS-8 test sections:

- | | |
|--------------------------|--|
| SAMPLING DATA SHEET 2. | PAVEMENT CORE LOG AT C-TYPE CORE LOCATIONS |
| SAMPLING DATA SHEET 4-1. | A-TYPE BORE HOLE LOG |
| SAMPLING DATA SHEET 8-1. | IN SITU DENSITY AND MOISTURE TESTS |

SAMPLING DATA SHEET 9.	SHOULDER PROBE LOG
SAMPLING DATA SHEET 10-1.	SAMPLING UNCOMPACTED BITUMINOUS PAVING MIXTURES (flexible test sections only)
SAMPLING DATA SHEET 11-1.	SAMPLING FRESH PORTLAND CEMENT CONCRETE (rigid test sections only)
SAMPLING DATA SHEET 12.	BULK SAMPLING OF SUBGRADE AND UNBOUND GRANULAR MATERIALS
SAMPLING DATA SHEET 13.	PLATE BEARING TEST RESULTS (rigid test sections only)

Also, the following Field Operation Information Forms must be completed:

FIELD OPERATION INFORMATION FORM 1.	LABORATORY SHIPMENT SAMPLES INVENTORY
FIELD OPERATION INFORMATION FORM 2-3.	SUMMARY OF MATERIAL SAMPLES SENT TO EACH LABORATORY
FIELD OPERATIONS INFORMATION FORM 3-1.	LABORATORY SHIPMENT SAMPLES INVENTORY - MOLDED CONCRETE (rigid test sections only)

A description of items to be entered in each sampling data sheet and information form follows.

SAMPLING DATA SHEET 2. PAVEMENT CORE LOG AT C-TYPE CORE LOCATIONS

This form is similar to Form S01A used for GPS test sections and is used to log data from the 4-inch diameter pavement cores extracted from C-Type core locations. Each sheet can be used to record data for cores taken from six different core hole locations in one sampling area. A separate sheet should be used to record core data from each sampling area. Space is provided in each column to record data for up to 4 layers from one core hole. The pavement surface layer core should be recorded first, followed by other layers in the column. The first column from the left should always start with the lowest numbered core hole in the sampling area.

OPERATOR. Record the coring equipment operator's name.

EQUIPMENT USED. Indicate the generic type of the coring equipment used.

CORING DATE. Record the month, date, and year when the core was taken.

SAMPLING AREA NO. The sampling area number is a two digit number used to reference all of the samples taken from one area of the project. It has the form SA-##. This number is developed as part of the materials sampling plan for the project.

CORE BARREL SIZE. Record the rated inside diameter of the core barrel to the nearest tenth of an inch.

COOLING MEDIUM. Record the material used for cooling during the coring operation.

CORE HOLE NO. Enter the core hole sample code number following the sample coding system as specified in the materials sampling plan developed for the project.

LOCATION: STATION. This is the station number of the core, relative to the test section specified under TEST SECTION NO. on the form. This number should be greater than 5+00 for sampling locations that occur after the test section and less than 0+00 for sampling locations which occur before the test section (see discussion under Sample Location Reference System in this report).

LOCATION: OFFSET. This is the distance from the interface of the pavement lane and the outside shoulder to the core location (generally measured from the outside edge of the pavement). This distance should be indicated to the nearest tenth of a foot.

CORE RECOVERED. Circle the appropriate response to indicate if an intact and suitable core was recovered from the indicated core hole.

REPLACEMENT CORE HOLE NO. Record the sample number of the core that will replace a core which was deemed unacceptable during field sampling operations. This entry should only be used when a "No" was recorded in the "Core Recovered" data entry space of this form.

CORE SAMPLE NO. Record the core sample number for the recovered core.

DEPTH. Depth should be measured from the pavement surface to the bottom of the material interface in the core and expressed to the nearest tenth of an inch.

MATERIAL DESCRIPTION. Enter the appropriate material description based on the generic material type. These material descriptions are contained in Table C.2, Appendix C, of the SHRP-LTPP Guide for Field Materials Sampling, Handling and Testing.

MATERIAL CODE. Enter the appropriate material code number from Table C.2 in the SHRP-LTPP Guide for Field Materials Sampling, Handling and Testing corresponding to the described type of material.

SAMPLING DATA SHEET 4-1. A-TYPE BORE HOLE LOG

This form is similar to Form S02A used for GPS test sections and is designed to record logs of A-Type Shelby tube and splitspoon sampling. The following data is recorded on this form.

OPERATOR. Record the boring equipment operator's name.

EQUIPMENT USED. Indicate the generic type of the drilling equipment used.

BORING DATE. Record the month, date, and year when the operation was performed.

SAMPLING AREA NO. The sampling area number is a two digit number used to reference all the samples taken from one area of the project. It has the form SA-

##. This number is developed as part of the materials sampling plan for the project. A-Type sampling performed within the test section monitoring length will not require a sampling area number.

LOCATION: STATION. This is the station number of the bore, relative to the test section specified under TEST SECTION NO. on the form. This number should be greater than 5+00 for sampling locations that occur after the test section and less than 0+00 for sampling locations which occur before the test section (see discussion under Sample Location Reference System in this document).

LOCATION: OFFSET. This is the distance from the interface of the pavement lane and the outside shoulder to the boring location (generally measured from the outside edge of the pavement). This distance should be indicated to the nearest tenth of a foot.

BORE HOLE NO. Enter the core hole sample code number following the sample coding system specified in the material sampling plan developed for the project.

BORE HOLE SIZE. Record the borehole size (diameter) in inches to the nearest inch.

STRATA CHANGE. Record the depth of strata changes to the nearest tenth of an inch. The depth of strata changes should always be measured from the top of the pavement surface. Draw a horizontal line across the form which indicates the depth of each strata change.

Also, record the depth of sampling for each sample taken. For example, if a thin-walled tube sample was obtained at a depth from 18 inches to 36 inches, a line should be drawn at the 18 inch mark and the 36 inch mark along with the appropriate sample code number, material description, etc. See example data sheets in the SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling for further clarification.

SAMPLE NUMBER. Record the sample number for thin-walled tube samples or splitspoon sampels (if thin-walled tube samples cannot be obtained from the subgrade).

BLOWS. The next four columns (*# Blows*, *Refusal?*, *DLR (Driving Length to refusal*, *IOP (Inches of Penetration)*) shall be used only if a splitspoon sample recovery was attempted. Standard practice for recording the blow count for splitspoon samples requires the following format: A - B - C, where:

A = number of blows for first 6 inches of penetration by the splitspoon sampler. This is considered a seating drive.

B = number of blows for second 6 inches of penetration by the splitspoon sampler.

C = number of blows for third 6 inches of penetration by the splitspoon sampler.

Record the blow count from the first 6 inches of seating penetration by the splitspoon sampler in the left most column under number of blows. ("A" from above example of blow count record). Record the blow count from the second 6 inches of penetration by the splitspoon sampler in the middle column under number of blows ("B" from above example of blow count record). Record the blow count from the third 6 inches of penetration by the splitspoon sampler in the right most column under number of blows. ("C" from above example of blow count record).

Refusal of the splitspoon sampler is defined as having advanced one inch with 100 blows (or no observed advance of the sampler during the application of 10 blows) or the test is aborted at the discretion of the SHRP Representative to avoid damage to the splitspoon sampler.

If the splitspoon sampler is "refused" in the first 6 inches indicate the blow count to refusal in the left most column, place a "Y" in the *Refusal?* column and indicate in the *DLR (Driving Length to Refusal)* column, the distance,

measured to the nearest tenth of an inch, from the top of the pavement surface to refusal. Also, record the penetration depth of the splitspoon sampler in the *IOP* column (distance penetrated in "A").

If the splitspoon is refused during the second 6 inches of penetration, indicate the blow count to refusal in the middle column, place a "Y" in the *Refusal?* column and indicate in the *DLR* column the distance, measured to the nearest tenth of an inch, from the top of the pavement surface to refusal. Also, record the penetration depth of the splitspoon sampler in the *IOP* column (distance penetrated in "A" + "B").

If the total blow count ("A" + "B") reaches 100 before penetrating deeper than 12 inches, the splitspoon sampling procedure should be stopped and the blow count for the second 6 inch increment should be recorded in the middle column and the total depth of penetration recorded under the *IOP* column (the depth of penetration shall be measured from the beginning of penetration of the splitspoon sampler.)

In the case of refusal during the third 6 inch increment, the same instructions outlined previously for the left and middle columns will be followed. The penetration depth of the splitspoon sampler will be recorded in the *IOP* column (distance penetrated in "B" + "C").

If the second and third 6 inch increment blow count ("B" + "C" only) reaches 100 before prior to penetrating 18 inches, the splitspoon sampling procedure should be stopped and the blow count for the third 6 inch increment recorded in under number of blows. The total depth of penetration ("B" + "C" only) should be recorded under the *IOP* column (measured from the beginning of penetration of the splitspoon sampler minus the 6 inch seating drive).

(REF)USAL. Record a "Y" if splitspoon sampler is refused (see explanation under # *Blows* above). Record a "N" if the full 18 inch sample is recovered and the splitspoon is not refused. This column is only used if a splitspoon sampler is utilized.

Refusal is defined as occurring when the splitspoon sampler advances less than one inch in 100 blows (or no observed advance of the sampler during the application of 10 blows) or when the test is aborted at the discretion of the SHRP Representative to avoid damage to the splitspoon sampler.

DLR. Driving Length to Refusal - Record the penetration of the splitspoon sampler to refusal to the nearest tenth of an inch. This value is measured from the top of the pavement surface. This column is only used if a splitspoon sampler is utilized and refused. In the case of refusal, an entry is made in the *DLR* and *IOP* columns.

IOP. Inches of Penetration - Record the distance of penetration of the splitspoon sampler after 100 blows is reached in the first 6 inches ("A"), the first and second 6 inches of penetration ("A" and "B") or the second and third 6 inches of penetration ("B" and "C") (See explanation under # Blows above). This column is only used if a splitspoon sampler is utilized.

MATERIAL DESCRIPTION. Enter the appropriate material description for each strata based on the generic material type. These material descriptions are contained in Table C.2, Appendix C, of the SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling.

MATERIAL CODE. Enter the appropriate material code number for each strata from Table C.2 in the SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling corresponding to the described type of material.

SAMPLING DATA SHEET 8-1. IN SITU DENSITY AND MOISTURE TESTS

This sheet is similar to Form S04 used for GPS test sections and is designed to record data from the in situ density and moisture tests performed on all unbound layers and density tests performed on bound layers with a nuclear moisture and density gauge. The following data is recorded on this form.

OPERATOR. Record nuclear density gauge operator's name.

NUCLEAR DENSITY GAUGE I.D.. Record the identification number of the nuclear density gauge.

TEST DATE. Record the month, date, and year when the test was performed.

SAMPLING AREA NO. The sampling area number is a two digit number used to reference all of the samples taken from one area of the project. This number is developed as part of the materials sampling plan for the project and has the form SA-##. Test locations within the monitoring length will not require a sampling area number.

LOCATION: STATION. This is the station number of the sampling area, relative to the test section specified under TEST SECTION NO. on the form. This number should be greater than 5+00 for sampling locations that occur after the test section, and less than 0+00 for sampling locations which occur before the test section (see discussion under Sample Location Reference System in this document).

LOCATION: OFFSET. This is the distance from the edge of the pavement lane and the outside shoulder to the location the test was performed (generally measured from the edge of the pavement). This distance should be indicated to the nearest tenth of a foot.

SAMPLING LOCATION NUMBER. Enter the sampling location number shown in the material sampling plan developed for the project.

DATE OF LAST MAJOR CALIBRATION. Record the date of the last major calibration of the nuclear density gauge. All dates should be recorded as mm-dd-yy. A major calibration is defined as that calibration/verification performed as directed in Section 4 of the SHRP-LTPP Guide for Field Materials Sampling, Handling and Testing. Daily calibrations performed in the field do not constitute a major calibration.

DEPTH FROM SURFACE TO THE TOP OF THE LAYER. This information may be obtained from project plans for the surface of the layer being tested or calculated from elevation measurements. Record to the nearest tenth of an inch and measure from the top of the plan pavement surface for each test performed.

LAYER NUMBER. Write in the project specified layer number for the layer being tested.

MATERIAL TYPE. Report a "G" if the material is unbound (granular); record "T" if the material is other than unbound (treated). In practice, all entries should be a "G" since treated materials are not permitted in SPS-8.

IN SITU DENSITY. For each unbound layer, record four nuclear density gauge results. These measurements should be taken at the top of each unbound layer using the direct transmission test method if possible. Record to one decimal place in pounds per cubic foot (pcf).

AVERAGE. Calculate and record the average in situ densities for each unbound layer. Record to one decimal place.

METHOD (A,B,or C). Record the test method used to perform the in situ density test as per AASHTO T238-86, "A" - Backscatter, "B" - Direct Transmission, or "C" - Air Gap. The direct transmission method ("B") should almost always be used for unbound granular materials while backscatter ("A") may be used for asphalt concrete.

ROD DEPTH. Record the depth of the nuclear density gauge probe to the nearest tenth of an inch.

IN SITU MOISTURE CONTENT. For each unbound layer, record four in situ moisture content test results. These tests should be conducted at the top of each layer. Record as a percentage moisture content to one decimal place. The backscatter method should always be used for this measurement.

AVERAGE. Calculate and record the average of the four in situ moisture content test results for each unbound layer. Record to one decimal place.

SAMPLING DATA SHEET 9. SHOULDER PROBE LOG

This data sheet is similar to Form S05 used for the GPS test sections and is used to record the results of the shoulder auger probe to determine the depth to a rigid layer.

OPERATOR. Record the auger equipment operator's name.

EQUIPMENT USED. Indicate the generic type of the auguring equipment used.

AUGERING DATE. Record the month, date, and year when the operation was performed.

SAMPLING AREA NO. The sampling area number is a two digit number used to reference all of the samples taken from one area of the project. This number is developed as part of the materials sampling plan for the project and has the form SA-##. No sampling area number is required for probes conducted within the monitoring length.

LOCATION; STATION. This is the station number of the bore, relative to the test section specified under TEST SECTION NO. on the form. This number should be greater than 5+00 for probes located after the test section, less than 0+00 for probes located before the test section, and between 0+00 and 5+00 for probe locations within the monitoring length (see discussion under Sample Location Reference System in this document).

LOCATION; OFFSET. This is the distance from the edge of the pavement lane and the outside shoulder to the auger location (generally measured from the outside edge of the pavement). For shoulder probes, this distance will be measured toward the outside edge of the shoulder. This distance should be indicated to the nearest tenth of a foot.

AUGER PROBE NUMBER. Record the auger probe number; an S1 for the first auger and increasing numbers for subsequent auger probes.

TOP OF ROCK BASED ON. Enter "Auger Refusal" if auger is refused. If the top of rock is based on some other observation, indicate the type of observation.

DEPTH FROM SURFACE. Record the depths of strata changes to the nearest tenth of a foot.

MATERIAL DESCRIPTION. Enter the appropriate material description for each strata based on the generic material type. These material descriptions are contained in Table C.2, Appendix C, of the SHRP-LTPP Guide for Field Materials Sampling, Handling and Testing.

MATERIAL CODE. Enter the appropriate material code number for each strata from Table C.2 in the SHRP-LTPP Guide for Field Materials Sampling, Handling and Testing corresponding to described type of material.

REFUSAL WITHIN 20 FEET (Y/N). Record a "yes" or a "no" as appropriate to indicate if a rigid layer was encountered within 20 feet from the pavement surface.

DEPTH TO REFUSAL. Record the depth to refusal to the nearest tenth of a foot if the auger is refused.

SAMPLING DATA SHEET 10-1. SAMPLING UNCOMPACTED BITUMINOUS PAVING MIXTURES

This data sheet is used to record information concerning sampling of uncompact bituminous paving mixtures (only asphalt concrete material is used for SPS-8 flexible test sections) for material testing purposes. Sampling shall be performed according to AASHTO T-168, except that a 100-lb sample should be used.

If the plan-sampled material is known to be of the same batch used on specific test section, the number of this test section should be entered on the form. However, if specific test sections corresponding to the plant sampled material cannot be identified, enter "00" on the test section number to indicate "project level data."

PERSON PERFORMING SAMPLING. Record the name, title and affiliation of the person performing the sampling.

PLANT NAME. Record the common name or operator of the mix plant facility which produced the sampled material.

PLANT LOCATION. Record the location of the mix plant, including street address, town, and state.

PLANT TYPE. Indicate the general type of mix plant used to produce the mix. If a plant other than a batch or drum plant was used, indicate other and provide a description of the plant on the next line.

DESCRIPTION OF MIX PLANT. Provide a brief description of the type of mix plant noting any special features of traditional types of batch or drum plants, or a description of other mix plant types.

MANUFACTURER OF MIX PLANT. Enter the name of the mix plant manufacturer.

MODEL NUMBER. Enter the model number or model designation of the mix plant.

BATCH SIZE. Record the size of the batch the sample from which the sample was obtained.

SAMPLING LOCATION. Enter the code number shown on the data form corresponding to the location from which the sample was taken. If the sample was taken from the roadway prior to compaction, indicate the station and offset of the sample and the respective test section number.

MIX TYPE. Enter the code number corresponding to the generic type of material (virgin asphalt concrete, recycled asphalt concrete, asphalt dense graded or permeable asphalt treated). For SPS-8 flexible test sections, recycled asphalt concrete should not be used.

LAYER NUMBER. Enter the layer number for which plant-sampled material will be used (see discussion on layering structure in this report).

LAYER TYPE. Enter the code number, as shown on the form, which corresponds to the type of layer in which the material is used.

SAMPLE NUMBER. Enter the 4-digit code which signifies the generic type of material (virgin or recycled) and a sequential number for each sample of each material type obtained. The sample number shall begin with the letters BV (Bulk Virgin) for materials incorporating all virgin materials and with the letters BR (Bulk Recycled) for materials incorporating recycled materials. These letter designations are followed with a sequentially-assigned two-digit number which uniquely designates each sample of each type of material. For example BV-01 designates the first sample of virgin asphalt concrete.

APPROXIMATE SAMPLE SIZE. Enter the approximate weight of the sample obtained, to the nearest pound.

DATE SAMPLED. Enter the date when the material sample was obtained.

LOCATION SAMPLE SHIPPED TO. Record the location the sample was shipped to from the field. In many cases this should be the laboratory which will perform the testing.

DATE SHIPPED. Enter the date when the material was shipped to the location indicated on the form.

GENERAL REMARKS. Provide any general remarks concerning the obtained sample, comments concerning the quality or uniformity of the mix, or any other pertinent miscellaneous comments.

SAMPLING DATA SHEET 11-1. SAMPLING FRESH PORTLAND CEMENT CONCRETE

This data sheet is used to record information concerning sampling of fresh portland cement concrete for material testing purposes. Sampling shall be performed according to AASHTO T-141, "Sampling Fresh Concrete".

PERSON PERFORMING SAMPLING. Record the name, title and affiliation of the person performing the sampling.

SAMPLING LOCATION. Enter the code number from the sampling and testing plan corresponding to the location from which the sample was taken.

SAMPLE NUMBER. This is a 4 digit code starting with the letters FC (bulk fresh portland cement concrete) and followed with a sequentially assigned two digit number, which uniquely designates each bulk portland cement concrete sample.

PCC MIX TEMPERATURE WHEN SAMPLED. Enter the PCC mix temperature in degrees Fahrenheit at the time the sample was obtained.

AMBIENT TEMPERATURE WHEN SAMPLED. Enter the ambient temperature in degrees Fahrenheit at the time the sample was obtained.

SPECIMEN NUMBER. This is a 4 digit code starting with the letters "F" (formed beams) or "G" (formed cylinders of PCC) followed by a designator for curing interval prior to testing, "X", "Y", or "Z" for 14 day, 28 day and 365 day curing, respectively. This two letter combination is followed by a sequentially assigned two digit number, which uniquely designates each concrete beam or cylinder specimen.

TIME. Enter the time of day when the corresponding specimen was formed.

TEMPERATURE. Enter the temperature of the PCC mix when the specimen was formed.

SLUMP. Enter the slump test results of the material sampled, if tested.

AIR CONTENT. Enter the air content of the material sampled, if tested.

DATE SHIPPED. Enter the date the material was shipped to the laboratory indicated on the form.

GENERAL REMARKS. Provide any general remarks concerning the obtained sample (is it representative), comments concerning the quality or uniformity of the mix, or any other pertinent miscellaneous comments.

SAMPLING DATA SHEET 12. BULK SAMPLING OF SUBGRADE AND UNBOUND GRANULAR MATERIALS

This form is similar to Form S03 used for GPS test sections and is designed to record data from the field sampling of materials from shallow excavations made in prepared subgrade and uncompacted graded layers during construction. The following data is recorded on this form:

TECHNICIAN. Record the name of the technician who retrieved the samples and recorded the information on the data form.

EQUIPMENT USED. Indicate the generic type of the equipment used to excavate the material.

EXPLORATION DATE. Record the month, date, and year when the operation was performed.

SAMPLING AREA NO. The sampling area number is a two digit number used to reference all of the samples taken from one area of the project. It has the form SA-##. This number is developed as part of the materials sampling plan for the project.

LOCATION: STATION. This is the station number of the sampling area, relative to the test section specified under TEST SECTION NO. on the form. This

number should be greater than 5+00 for sampling locations that occur after the test section and less than 0+00 for sampling locations which occur before the test section (see discussion under Sample Location Reference System in this document).

LOCATION: OFFSET. This is the distance from the edge of the pavement lane and the outside shoulder to the outside edge of the sampling area (generally measured from the outside edge of the pavement). This distance should be indicated to the nearest tenth of a foot.

SAMPLING LOCATION NUMBER. Enter the sampling location number shown in the material sampling plan developed for the project.

EXCAVATION SIZE. Record the length and width of the excavation to the nearest half foot.

LAYER NUMBER. Enter the layer number from which the sample was obtained.

STRATA CHANGE. Record the depth of strata changes to the nearest tenth of an inch. The depth of strata changes should always be measured from the top of the pavement surface. Draw a line across the form to indicate strata changes.

MOISTURE SAMPLE NUMBER. Record sample numbers for samples taken from unbound base, subbase and subgrade for moisture content testing.

BULK SAMPLE NUMBER. Record the sample number for bulk samples taken from the unbound pavement layers and the subgrade.

MATERIAL DESCRIPTION. Enter the appropriate material description for each strata based on the generic material type. These material descriptions are contained in Table C.2, Appendix C, of the SHRP-LTPP Guide for Field Materials Sampling, Handling and Testing.

MATERIAL CODE. Enter the appropriate material code number for each strata

from Table C.2 in the SHRP-LTPP Guide for Field Materials Sampling, Handling and Testing corresponding to the described type of material.

SAMPLING DATA SHEET 13. PLATE BEARING TEST RESULTS

This form is designed to record data from the field plate bearing tests made on prepared subgrade, compacted graded layers, and compacted permeable asphalt treated layers at locations within the monitoring length of test sections during construction. The following data is recorded on this form:

TECHNICIAN. Record the name of the technician who performed the testing and recorded the information on the data form.

TEST DATE. Record the month, date, and year when the operation was performed.

LOCATION; STATION. This is the station number of the test location, relative to the test section specified under TEST SECTION NO. on the form. This number should be between 0+00 and 5+00.

LOCATION; OFFSET. This is the distance from the edge of the pavement lane (at the outside shoulder) to the test location. This distance should be indicated to the nearest tenth of a foot.

LAYER NUMBER. Enter the layer number of the material on which the test was performed. Also check the appropriate material type indicated on the form.

AVERAGE TOTAL DEFLECTION. Enter the average total movement resulting from the incremental pressure change.

UNCORRECTED MODULUS OF SOIL REACTION. Enter the ratio of the pressure increment to the average deflection, in pounds per square inch per inch.

CORRECTED MODULUS OF SOIL REACTION. Enter the modulus of soil reaction corrected for plate bending in accordance with protocol P58.

FIELD OPERATION INFORMATION FORM 1. LABORATORY SHIPMENT SAMPLES INVENTORY

This form is intended to provide a record of field activity and no information from this form will be included in the data base. This form is similar to Form S06 used for GPS test sections and provides the necessary information on where each sample was shipped for testing. Also, it provides a detailed inventory of material samples shipped to each materials testing laboratory. At least one form should be completed for each sampling area on the project. The inventory should be made in the sequence of sampling, starting from the pavement subgrade layer in each case:

1. Samples from A-Type bore holes and any additional similar bore holes.
2. Samples from shallow excavations.
3. Samples from C-Type locations. (cores of pavement surface layers after construction)

Sample location numbers, sample numbers and sampling area numbers should be obtained from the appropriate Sampling Data Sheets. "Sample size" should be used to record the number of bags of bulk samples or the number of jar samples bearing a single sample number in each case. The bulk sample from one layer can be placed in more than one bag, if necessary. However, the sample number should be the same on all of these bags with an indication of the number of bags on the labels and in the column of the "Sample size." For core samples, record only diameter of the core in the "Sample size" column in inches.

Enter core, bulk, moisture, tube or splitspoon in the "Sample type" column as appropriate. Enter AC, PCC, Base, Subbase or Subgrade in the "Sample material" column as appropriate. The "Sample condition" should indicate a brief description as to the overall quality of the sample - cores: good, poor, fractured; bulk samples: satisfactory, wet, insufficient quantity, contaminated.

Since more than one laboratory may be used to test samples in the SPS program, room is provided on this form to indicate up to three laboratories to receive samples from each sampling area. Enter the laboratory number, as noted at the bottom of the form, each sample is sent to under the LAB column.

Typically, samples will include:

- All PCC or AC cores from C-Type locations.
- Bulk samples and jar samples of granular (untreated) layers and subgrade from B-Type sampling locations.
- Thin-walled tube samples and splitspoon samples from the subgrade at A-Type sampling locations.

FIELD OPERATION INFORMATION FORM 2-3. SUMMARY OF MATERIAL SAMPLES SENT TO EACH LABORATORY

This form provides a summary of the information provided on Field Operations Information Form 1 by testing laboratory. It is similar to Form S06A used for GPS test sections. A separate form should be completed for each set of samples sent to each separate laboratory.

This form requires the samples to be aggregated into layers designated with a layer number. The layer number assigned to each layer (1 for subgrade, 2 for embankment, 3 for unbound base, 4 for surface) is shown in the left hand column. A description of the pavement layer material and sample type is provided in the next column on the right, followed by the total number of samples by sample type.

FIELD OPERATION INFORMATION FORM 3-1. LABORATORY SHIPMENT SAMPLES INVENTORY - MOLDED CONCRETE

No information from this form will be included in the data base, it is intended to provide a record of fresh PCC sampling and molded PCC test specimens.

It is used to provide a detailed inventory of material samples shipped to the materials testing laboratory. One form should be completed for all fresh PCC sampling areas within the experiment.

Sample location numbers, sample numbers and sampling area numbers should be obtained from Sampling Data Sheet 11-1.

The bottom portion of this form "MOLDED PCC SPECIMENS SENT TO LABORATORY" provides for the total number of molded cylinder and beams. This form requires the samples to be summarized according to the layer number of their source. The layer number is assigned from the subgrade to the surface. A description of the specimen type is provided in the next column on the right, followed by the total number of samples by sample type.

CONSTRUCTION DATA

Construction data for the SPS-8 experiment primarily includes items related to project and section "as-built" construction inventory, and preparation and placement of the subgrade, unbound aggregate materials, and surface layer materials. In addition, this data also includes material properties measured as part of the mix design and construction control operations.

A number of data sheets must be completed to report data obtained during construction. A set of 27 Construction Data Sheets was developed specifically for the SPS-8 projects. These Construction Data Sheets should also be completed for supplemental sections constructed at each SPS-8 project site. Table 1 lists the construction related data sheets that are to be completed for the different test sections. As indicated in Table 1, some of these sheets must be completed for the flexible test sections only and some must be completed for the rigid test sections only, and others must be completed for both pavement types.

The following Construction Data Sheets shall be completed, as appropriate, for the SPS-8 sites following the guidelines contained later in this report.

CONSTRUCTION DATA SHEET 1:	PROJECT AND SECTION IDENTIFICATION
CONSTRUCTION DATA SHEET 2:	GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION
CONSTRUCTION DATA SHEET 3:	REFERENCE PROJECT STATION TABLE
CONSTRUCTION DATA SHEET 4:	LAYER DESCRIPTIONS
CONSTRUCTION DATA SHEET 5:	PLAN-MIXED ASPHALT BOUND LAYERS - AGGREGATE PROPERTIES
CONSTRUCTION DATA SHEET 6:	PLANT-MIXED ASPHALT BOUND LAYERS - ASPHALT CEMENT PROPERTIES
CONSTRUCTION DATA SHEET 7:	PLANT-MIXED ASPHALT BOUND LAYERS - MIXTURE PROPERTIES
CONSTRUCTION DATA SHEET 8:	PLANT-MIXED ASPHALT BOUND LAYERS - MIXTURE PROPERTIES (CONTINUED)

Table 1. Guide to completion of SPS-8 Construction Data Sheets

CONSTRUCTION DATA SHEET	FLEXIBLE	RIGID
1	X	X
2	X	X
3	X	X
4	X	X
5	X	
6	X	
7	X	
8	X	
9	X	
10	X	
11	X	
12	X	X
13	X	X
14	X	X
15	X	X
16	X	X
17		X
18		X
19		X
20		X
21		X
22		X
23		X
24		*
25		*
26		*
27		*
28	*	*

X Always complete indicated data sheet for this section.
 * Complete when necessary.

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CONSTRUCTION DATA SHEET 9:	PLANT-MIXED ASPHALT BOUND LAYERS - PLACEMENT DATA
CONSTRUCTION DATA SHEET 10:	PLANT-MIXED ASPHALT BOUND LAYERS - COMPACTION DATA
CONSTRUCTION DATA SHEET 11:	PLANT-MIXED ASPHALT BOUND LAYERS - DENSITY AND PROFILE DATA
CONSTRUCTION DATA SHEET 12:	LAYER THICKNESS MEASUREMENTS
CONSTRUCTION DATA SHEET 13:	UNBOUND AGGREGATE BASE MATERIAL PLACEMENT
CONSTRUCTION DATA SHEET 14:	SUBGRADE PREPARATION
CONSTRUCTION DATA SHEET 15:	CUT-FILL SECTION LOCATIONS
CONSTRUCTION DATA SHEET 16:	SUBGRADE EXCAVATION AND BACKFILLING SKETCH
CONSTRUCTION DATA SHEET 17:	PORTLAND CEMENT CONCRETE LAYERS - JOINT DATA
CONSTRUCTION DATA SHEET 18:	PORTLAND CEMENT CONCRETE LAYERS - JOINT DATA (CONTINUED)
CONSTRUCTION DATA SHEET 19:	PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA
CONSTRUCTION DATA SHEET 20:	PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA (CONTINUED)
CONSTRUCTION DATA SHEET 21:	PORTLAND CEMENT CONCRETE LAYERS - PLACEMENT DATA
CONSTRUCTION DATA SHEET 22:	PORTLAND CEMENT CONCRETE LAYERS - PLACEMENT DATA (CONTINUED)
CONSTRUCTION DATA SHEET 23:	PORTLAND CEMENT CONCRETE SURFACE LAYER - PROFILE DATA
CONSTRUCTION DATA SHEET 24:	FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES
CONSTRUCTION DATA SHEET 25:	FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)
CONSTRUCTION DATA SHEET 26:	FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)

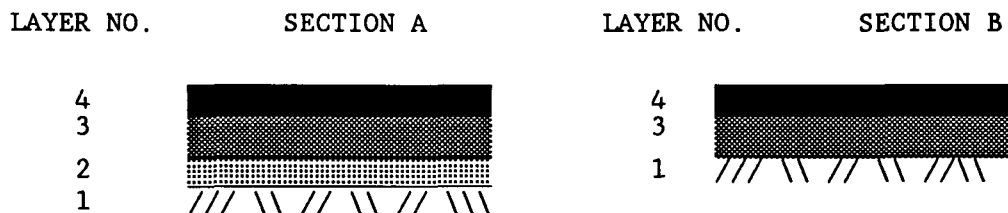
CONSTRUCTION DATA SHEET 27: FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH
PORTLAND CEMENT CONCRETE SURFACES
(CONTINUED)

CONSTRUCTION DATA SHEET 28: MISCELLANEOUS CONSTRUCTION NOTES AND
COMMENTS

A layer description table should be completed for each test section to note any differences in the layer structure and thicknesses. A project level layering structure should be developed in which a unique layer number is assigned to every layer present on the project. The layer number for each material must be kept the same across all test sections. This is needed since the detailed inventory and materials information is keyed to layer number. On test sections uniformly on cut or fill, the same layer structure should exist for all test sections, with differences between test sections due to embankment thicknesses or layer thicknesses. For test sites in which some sections are on cut and others on fill (embankment), the project layer structure should include an embankment (fill) layer. The thickness of this layer would be coded as zero on test sections which are located in cut.

The project layering concept is illustrated in Figure 2 for two hypothetical test sections (Sections A and B) located on the same project. Section A is located on a 4-foot deep fill (embankment) and Section B is located in a cut. To keep the layer number for each material the same across all test sections, the embankment layer is shown in the layer structure for Section B with a zero thickness. In this manner, all data sheets can be completed for each section on the test site in a consistent manner.

The data sheets stipulate the entry of numerous data elements. Available data should be entered and every effort should be taken to obtain data indicated by an asterisk (*). When the data element is not applicable or does not pertain to the test section, enter an "N" to indicate that the data element is not applicable. However, if the data element is applicable, but the value is unknown, enter a "U" to indicate that the value is unknown. Many items will require codes to be entered. These codes are generally listed in the data sheets.



EXAMPLE LAYER STRUCTURE CODING FOR SECTION A

LAYER NO.	LAYER DESCRIPTION	MATERIAL TYPE CLASS	THICKNESS
1	SUBGRADE (7)	52 - SANDY CLAY	N A
2	11 - EMBANKMENT	26 - SOIL-AGG MIX	48.0
3	05 - BASE LAYER	23 - CRUSHED STONE	12.0
4	03 - SURFACE	01 - AC	7.0

EXAMPLE LAYER STRUCTURE CODING FOR SECTION B

LAYER NO.	LAYER DESCRIPTION	MATERIAL TYPE CLASS	THICKNESS
1	SUBGRADE (7)	52 - SANDY CLAY	N A
2	11- EMBANKMENT	26 - SOIL - AGG MIX	0
3	05 - BASE LAYER	23 - CRUSHED STONE	12.0
4	03 - SURFACE	01 - AC	7.0

Figure 2. Example of project layering scheme for coding test section layer tables.

DATA COMMON FOR ALL SPS-8 CONSTRUCTION DATA SHEETS

A common set of project identification data appears in the upper right hand corner of each SPS-8 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.1, Appendix A of the LTPP Data Collection Guide or Appendix B of this report for codes).

SPS PROJECT CODE. Enter the two digit SPS project code. The structure of this number is described in the introductory section entitled "SPS Test Section Numbering Scheme" of this report.

TEST SECTION NUMBER. Enter the two digit SPS test section number. The structure of this number is described in the introductory section entitled "SPS Test Section Number Scheme" of this report.

CONSTRUCTION DATA SHEET 1: PROJECT 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.). The two digits identifying the year are the last two digits of the year (92 for 1992, 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 of the LTPP Data Collection Guide or Appendix B of this report).
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. TYPE OF PAVEMENT. Enter the code identifying the general type of pavement structure (such as asphalt concrete pavement with granular base). The valid pavement type codes for SPS-8 are 01 for asphalt concrete pavement with granular base and 17 for jointed plain concrete pavement on unbound base.
8. 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.
9. DATE CONSTRUCTION COMPLETION. Enter the month and year in which the test section construction was completed.
10. DATE OPENED TO TRAFFIC. Enter the month and year in which the test section was opened to traffic.
11. 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.
12. DIRECTION OF TRAVEL. Enter the number indicating the general direction of traffic flow along the entire route which includes the test section.

- 13-17 PROJECT STARTING POINT LOCATION. The location of the starting point of the project is to be identified by milepoint, elevation, latitude, and longitude.
13. 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.
14. 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.
- 15&16 LATITUDE AND LONGITUDE (North and West, respectively) are to be given in degrees, minutes, and seconds to the nearest 0.01 second when this type of accuracy is possible. This value may be determined at a later date.
17. 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.
18. 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.
19. 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 whole number of feet.
 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. 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.
 4. SUBSURFACE DRAINAGE TYPE. Enter the code indicating the type of subsurface drainage provided. Drainage features are not part of the SPS-8 experiment.
- SHOULDER DATA. Spaces are provided to enter data describing both the outside and inside shoulder. If there are no inside shoulders, enter "N" for those spaces pertaining to inside shoulders.
5. SHOULDER SURFACE TYPE. Enter the codes indicating the type of shoulder surfaces for the outside and inside shoulders.
 6. TOTAL WIDTH. Enter the total (paved and unpaved) widths of the outside and inside shoulders to the nearest whole number of feet.
 7. PAVED WIDTH. Enter the paved widths of the outside and inside shoulders to the nearest whole number of feet.

8. SHOULDER BASE TYPE. Enter the codes identifying the types of base material used in the shoulders (see Table A.6, Appendix A of the LTPP Data Collection Guide or Appendix B for codes).
9. SHOULDER SURFACE THICKNESS. Enter the average thicknesses of the inside and outside shoulder surfaces to the nearest 0.1 inch.
10. SHOULDER BASE THICKNESS. Enter the average base thicknesses along the shoulders to the nearest 0.1 inch.
11. DIAMETER OF LONGITUDINAL DRAINPIPES. Enter the inside diameter to the nearest 0.1 inch of the longitudinal drainpipes used for subsurface drainage. If there is no longitudinal drainage, leave blank.
12. SPACING OF LATERALS. Enter the average spacing in feet for subdrainage laterals. Leave blank if there are no subdrainage laterals.

CONSTRUCTION DATA SHEET 3: REFERENCE PROJECT STATION TABLE

A reference project station system must be established for each project. This station referencing system starts with station 0+00 assigned to the starting point of the first test section encountered on the project. The station number of the beginning and end of all test sections on the project will be referenced to this point to provide a relative distance measure of the beginning, end, and distance between test sections on the site. This continuous system is used to avoid compounding measurement error within test sections since test sections are not precisely marked to 500 feet when laid out. This information will be used to process profile data collected from continuous measurements over the test sites and to identify the locations of the materials sampling and testing operations on the test sections for the entire site. In addition, this information will indicate the ordering and distance between test sections.

Field measurements should be used to locate the start and end point of each test section with an accuracy of ± 1 foot. A manual rolling wheel distance

measurement device or a calibrated vehicle mounted DMI of the required accuracy may be used for this purpose. These measurements should be made prior to construction, e.g. during initial construction layout. This data can then be used as a check against the repositioning of the start and end of the test sections during construction.

The relative SPS project station location information is recorded on Construction Data Sheet 3. The starting point of the first test section encountered on the project in the direction of traffic is assigned station 0+00. Station numbers for the start and end of all test sections on each SPS test site should run continuous from this point with no equations and measured factor nearest one foot. This station numbering system is independent from the station numbering used on the construction plans to avoid complications due to mid-project station equations. A space is provided for the station number of the end of the first test section since it may not always occur precisely at station 5+00.

The test section ID numbers and relative station numbers of the beginning and end of each section should be entered on Sheet 3, in the order in which the test sections are encountered in the direction of traffic.

1. TEST SECTION ID NUMBER. The six digit test section ID number, consisting of the STATE CODE, SPS PROJECT CODE, and TEST SECTION NUMBER, should be entered for each SPS test section. If a GPS test section is located on the project, then the six digit GPS test section identification number, consisting of the STATE CODE and SHRP SECTION NUMBER, should be entered in the test section ID column.
2. START STATION NUMBER. The station number of the starting point of the test section relative to the starting point of the first test section on the project, to the nearest one foot.
3. END STATION NUMBER. The station number of the ending point of the test section relative to the starting point of the first test section on the project, to the nearest one foot.

4. SUBGRADE STRUCTURE TYPE. Enter the code number shown under note 1 on the form to indicate if the test section is located entirely on fill, cut, at-grade or is located on both cut and fill. If the test section is located on both cut and fill, the approximate location of the cut-fill transition within the test section should be entered using a test section relative station number (0+00 to 5+00).
5. INTERSECTIONS BETWEEN TEST SECTIONS ON THE PROJECT. If any intersections occur between any of the test sections on the project, indicate the number or name of the intersecting route, the reference project station number (referenced to the start of the first test section on the project), and check whether it is an entrance or exit ramp, or an intersection with a stop sign, traffic signal, or is unsignalized.

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. This pavement layer structure should be the same as that provided on the Laboratory Material Handling and Testing Form L05A.

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 or Appendix B of this report, for surfacing materials, base and subbase materials, subgrade soils, and thin seals and interlayers, respectively.
4. LAYER THICKNESS. Enter the average thickness of each material layer. If sufficient measurement information is available, enter the maximum, minimum, and standard deviation of the thickness measurements.

CONSTRUCTION DATA SHEET 5: PLANT MIXED ASPHALT BOUND LAYERS, AGGREGATE PROPERTIES

This sheet is to be completed during construction from available project records for each asphalt concrete layer identified on Construction Data Sheet 4, Layer Descriptions. Although various SHAs discriminate between fine and coarse aggregates on the basis of different sieve sizes, for SHRP studies all aggregate retained on the No. 8 sieve is classified as coarse aggregate and all aggregate passing the no. 8 sieve is classified as fine aggregate. "Mineral filler" is defined (per ASTM D242) as that portion passing the No. 30 sieve (at least 95 percent must pass the No. 50 sieve and at least 70 percent must also pass the No. 200 sieve).

1. LAYER NUMBER. Enter the asphalt concrete layer number for which a description is being provided (from Construction Data Sheet 4).
- 2-4. COMPOSITION OF COARSE AGGREGATE. Enter the type and percentage by weight of materials in the coarse aggregate used in the asphalt concrete mix. Space is provided for identifying a type of coarse aggregate other than those with codes. Where only one type of material is used, enter the type code and "100" in the top set of data spaces, leaving the others blank.
- 5-7. COMPOSITION OF FINE AGGREGATE. Enter the type and percentage by weight of materials in the fine aggregate (passing the No. 8 sieve and retained on

the No. 200 sieve). Space is provided for identifying another type if none of those for which codes are provided was used. Where only one type of material was used, enter its type code and "100" in the top set of data spaces, leaving the others blank.

8. TYPE OF MINERAL FILLER. Enter the type of mineral filler used. The codes appear on the data sheet, including space for entering some other type of which a code has not been provided.

9-12 BULK SPECIFIC GRAVITIES. Enter the mean bulk specific gravities (to the nearest thousandth) for coarse aggregate, fine aggregate, mineral filler, and the aggregate combination. The bulk specific gravities for the aggregate fractions are measured using the laboratory procedures indicated below:

- a. Coarse Aggregate - AASHTO T85 or ASTM C127
- b. Fine Aggregate - AASHTO T84 or ASTM C128
- c. Mineral Filler - AASHTO T100 or ASTM D854

The bulk specific gravity for the aggregate combination (usually called simply "bulk specific gravity of aggregate") is calculated as follows:

$$G_{ab} = \frac{P_1 + P_2 + P_3}{\frac{P_1}{G_1} + \frac{P_2}{G_2} + \frac{P_3}{G_3}} \quad (2.1)$$

where:

- G_{ab} - Bulk specific gravity for the total aggregate
- P_1, P_2, P_3 - Percentages by weight of coarse aggregate, fine aggregate, and mineral filler
- G_1, G_2, G_3 - Specific gravities of coarse aggregates, fine aggregates, and mineral filler

13. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATIONS. The mean calculated effective specific gravity to the nearest 0.001. This calculation requires the maximum specific gravity (no air voids) of the paving mixture, which is obtained by Test Method AASHTO T209 or ASTM D2041. The effective specific gravity of the aggregate is calculated as follows:

$$G_{se} = \frac{100 - P_b}{\frac{100}{G_{mm}} - \frac{P_b}{G_b}} \quad (2.2)$$

where:

- G_{se} - Effective specific gravity of aggregate
 P_b - Asphalt cement, percent by total weight of mixture
 G_b - Specific gravity of asphalt
 G_{mm} - Maximum specific gravity of paving mixtures (no air voids)

- 14-17 AGGREGATE DURABILITY TEST RESULTS. Enter the type of durability tests used and the results in tenths recorded in units specified for the test. Three of these sets are for coarse and one for the combination of coarse and fine aggregates. The durability test type codes appear in Table A.13, Appendix A of the LTPP Data Collection Guide or Appendix B of this report.
18. POLISH VALUE OF COARSE AGGREGATES. Enter the accelerated polish value of the coarse aggregates used in the surface layer, as determined by AASHTO T279 (ASTM D3319).

CONSTRUCTION DATA SHEET 6: PLANT MIXED ASPHALT BOUND LAYERS - ASPHALT CEMENT PROPERTIES

This data sheet is to be completed during construction from available project records for each asphalt concrete layer identified on Construction Data Sheet 4, Layer Descriptions.

1. LAYER NUMBER. Enter the asphalt concrete layer to be described on this sheet (from Construction Data Sheet 4).
 2. ASPHALT GRADE. Enter the grade of asphalt cement used (see Table A.16, Appendix A of the LTPP Data Collection Guide or Appendix B of this report). Space is provided on the data sheet for identifying another grade of asphalt cement not appearing in Table A.16.
 3. SOURCE. Enter the name of the source for the asphalt cement. A list of asphalt refiners and processors is provided in Table A.14, Appendix A of the LTPP Data Collection Guide or Appendix B of this report (as taken from the Oil and Gas Journal, March 24, 1986). Space is provided to specify other sources which may not be included in the table provided.
 4. SPECIFIC GRAVITY OF ASPHALT CEMENT. Enter the mean specific gravity of the asphalt cement (to the nearest 0.001) when it is available. If unavailable, a typical specific gravity for asphalt cements produced at the source refinery may be entered. If source is unknown, enter 1.010 as a reasonable estimate. This specific gravity is measured as specified by AASHTO T228 (or ASTM D70).
- ORIGINAL ASPHALT CEMENT PROPERTIES. The following data items should be provided when available from the supplier for the original asphalt cement, tested prior to its use in the construction.
5. VISCOSITY OF ASPHALT AT 140°F. Enter the results in poises from kinematic viscosity testing using Test Method AASHTO T202 (or ASTM D2171) on samples of the original asphalt cement prior to its use in construction of the pavement section.
 6. VISCOSITY OF ASPHALT AT 275°F. Enter the results in centistokes (to the nearest 0.01) from absolute viscosity testing using Test Method AASHTO T201 (or ASTM D2170) on samples of the original asphalt cement.

7. PENETRATION AT 77°F. Enter the penetration (in tenths of a millimeter) from testing the original asphalt cement in the mixture at 77°, using a 100 gram load and a five-second load duration with Test Method AASHTO T49 (or ASTM D5).

- 8-9. TYPE OF ASPHALT MODIFIERS. Enter the codes to identify up to two modifiers added to the asphalt cement for whatever purpose. A list of possible asphalt cement modifiers and codes for data entry are provided on Table A.15, Appendix A of the LTPP Data Collection Guide or Appendix B of this report. If a material other than those listed in Table A.15 is used, space is provided to record the pertinent information. If no modifier was used, enter "N".

- 8-9. QUANTITY OF ASPHALT MODIFIER. Enter the quantities of modifier in percent of asphalt cement weight. Some modifiers (such as lime) may be specified in terms of "percent of aggregate weight," but they must be converted to percent of asphalt cement weight for uniformity. Space is provided for up to two types of modifiers. If no modifier was used, enter "N".

10. DUCTILITY AT 77°F. Enter the ductility in centimeters as measured by Test Method AASHTO T51 at 77°F (or ASTM D113).

11. DUCTILITY AT 39.2°F. Enter the ductility in centimeters of the original asphalt cement material at 39.2°F, using the procedures of Test Method AASHTO T51 (or ASTM D113).

12. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°F. Enter the test speed in centimeters per minute for the ductility measurement taken at 39.2°F.

13. PENETRATION AT 39.2°F. Enter the penetration value using a 200 gram weight and 60 second loading duration, tested in accordance with Test Method AASHTO T49 (or ASTM D5) on samples of the original asphalt cement, prior to its use as a construction material.

14. RING AND BALL SOFTENING POINT. Enter the softening point of the asphalt cement in degrees Fahrenheit as measured with the ring-and-ball apparatus used in Test Method AASHTO T53, on samples of the original asphalt cement prior to its use as a construction material.

CONSTRUCTION DATA SHEET 7: PLANT MIXED ASPHALT BOUND LAYERS, MIXTURE PROPERTIES

This data sheet is to be completed from available project records for each asphalt concrete layer identified on Construction Data Sheet 4, Layer Descriptions.

The following data items are to be derived from tests conducted on the mixture during construction as part of the contractor/participating agency Quality Control program. Calculations for calculated values (i.e., percent air voids) should be made separately for individual samples, using data applicable to those samples.

The test samples can be compacted in the laboratory after sampling in the field, or obtained by coring, cutting, or sawing after the mixture is compacted in place. In the event that both types of samples are tested, separate data sheets should be filled out for those compacted in the laboratory and those compacted in the field. Although tests are to be conducted on core samples from the field for SHRP LTPP-SPS (and reported on other data sheets), data from project files should be entered when available.

1. LAYER NUMBER. Enter the asphalt concrete layer to be described on the sheet (from Construction Data Sheet 4).
2. TYPE OF SAMPLES. Enter the code to indicate whether the test samples were sampled in the field and compacted in the laboratory, or removed from the compacted pavement. The codes appear on the data sheet.

3. MAXIMUM SPECIFIC GRAVITY. Enter the maximum specific gravity of a mixture sampled during or soon after construction, as an average from testing of several samples according to AASHTO 209 or ASTM D2041. When possible, several samples should be tested and the average entered. The resulting maximum specific gravity and the design asphalt content for the mixture should be used to calculate the effective specific gravity of aggregate using Equation 2.3 below. Once the effective specific gravity of the aggregate is established, it may be used to calculate other maximum specific gravities for the mixture at other measured asphalt contents using Equation 2.4 below:

$$G_{se} = \frac{100 - P_b}{\frac{100}{G_{mm}} - \frac{P_b}{G_b}} \quad (2.3)$$

$$G_{mm} = \frac{100}{\frac{P_s}{G_{se}} + \frac{P_b}{G_b}} \quad (2.4)$$

where:

- G_{mm} - Maximum specific gravity of paving mixture (no air voids)
- P_s - Aggregate, percent by total weight of mixture
- P_b - Asphalt, percent by total weight of mixture
- G_{se} - Effective specific gravity of aggregate
- G_b - Specific gravity of asphalt

These calculated values of maximum specific gravity are not to be entered into the data base, but will be needed to calculate the percent air voids for measured asphalt contents for individual extractions on cores.

- 4-6. BULK SPECIFIC GRAVITY. Enter the number of tests and the minimum, maximum, mean, and standard deviation of bulk specific gravities (to the nearest thousandth) of compacted mixtures measured on cores removed from the pavement during or right after construction. While the test method specified in ASTM D1188 is preferable, the results from nuclear density tests (ASTM D2950), appropriately calibrated to measurements on cores, may also be used.

- 7-9. ASPHALT CONTENT. Enter the number of samples and the minimum, maximum, mean, and standard deviation of percents by weight of the total asphalt cement (including that absorbed by the aggregate) in the asphalt concrete mixture to the nearest 0.1 percent. Asphalt contents measured by extraction tests (AASHTO T164) on field samples are preferred, but results from nuclear test methods may also be used. If no such test results are available, enter the specified asphalt content as the mean, and leave the other spaces blank.
- 10-12 PERCENT AIR VOIDS. Enter the number of samples and the minimum, maximum, mean, and standard deviation of calculated air voids (to the nearest 0.1 percent) as a percent of the material volume. This data is frequently not available, but can be calculated using other available data from reports on mix design and density measurements on samples from the pavement. Percent air voids is calculated as follows:

$$P_a = 100 \frac{G_{mm} - G_{mb}}{G_{mm}} \quad (2.5)$$

where:

- P_a - Air voids in compacted mixture, percent of total volume
- G_{mm} - Maximum specific gravity of paving mixture (zero air voids) as determined by ASTM Method D2041
- G_{mb} - Bulk specific gravity of compacted mixture

13. VOIDS IN MINERAL AGGREGATE. Enter the mean 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.

Percent of voids in mineral aggregate (VMA) is calculated at follows:

$$VMA = 100 - \frac{G_{mb}P_s}{G_{sb}} \quad (2.6)$$

where:

- VMA - Voids in mineral aggregate (percent of bulk volume)
- G_{sb} - Bulk specific gravity of aggregate
- G_{mb} - Bulk specific gravity of compacted mixture (ASTM D2726)
- P_s - Aggregate, percent by total weight of mixture
- 100 - (percent of asphalt cement by total weight of mixture)

14. EFFECTIVE ASPHALT CONTENT. Enter the mean 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), expressed by weight of total mixture to the nearest one-tenth of one percent. The asphalt absorption may be calculated as a percent of total weight of mixture as follows:

$$P_{sb} - P_{ba}P_s = \frac{G_{se} - G_{sb}}{G_{sb}G_{se}} G_bP_s \quad (2.7)$$

where:

- P_{sb} - Absorbed asphalt, percent by weight of total mixture
- P_{ba} - Absorbed asphalt, percent by weight of aggregate
- P_s - aggregate, percent by total weight of mixture
- G_{se} - effective specific gravity of aggregate
- G_{sb} - bulk specific gravity of aggregate
- G_b - specific gravity of asphalt

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

16. NUMBER OF BLOWS. Enter the number of blows of the compaction hammer that were applied to each end of the specimen during laboratory compaction.
17. MARSHALL FLOW. Enter the mean Marshall Flow (average of measured results) as the whole number of hundredths of an inch measured by Test Method AASHTO T245 (or ASTM D1559) for the mixture during the laboratory mix design (i.e., measure 0.15 inch - enter "15").
18. HVEEM STABILITY. Enter the mean Hveem Stability or "stabilometer value" as measured with the Hveem apparatus using Test Method AASHTO T246 (or ASTM D1561).
19. 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 D1561).

CONSTRUCTION DATA SHEET 8: PLANT MIXED ASPHALT BOUND LAYERS, MIXTURE PROPERTIES (CONTINUED)

This sheet is a continuation of Construction Data Sheet 7, Plant-Mixed Asphalt Bound Layers, Mixture Properties, and should be completed for each asphalt concrete layer identified on Construction Data Sheet 4. These additional data entries are discussed below.

1. LAYER NUMBER. Enter the asphalt concrete layer to be described on the sheet (from Construction Data Sheet 4).
2. TYPE OF SAMPLES. Enter the code to indicate whether the test samples were sampled in the field and compacted in the laboratory, or removed from the compacted pavement. The codes are provided on the data sheet.
3. TYPE ASPHALT PLANT. Enter the type of plant that produced the asphalt concrete mixture. Codes are provided on the data sheet.

4. TYPE OF ANTISTRIPPING AGENT. Enter the type of antistripping agent used in the mixture. The codes are provided in Table A.21 in Appendix A of the LTPP Data Collection Guide or Appendix B of this report.

- 5-6. AMOUNT OF ANTISTRIPPING AGENT. Enter the code indicating whether the antistripping agent is liquid or solid. Also, the amount of antistripping agent used in the mixture by weight to the nearest 0.1 percent of weight of asphalt if the agent is liquid and weight of aggregate if it is solid.

CONSTRUCTION DATA SHEET 9: PLANT MIXED ASPHALT BOUND LAYERS - PLACEMENT DATA

This data sheet should be completed for all flexible pavement tests sections.

1. DATE PAVING OPERATIONS BEGAN. Enter the date on which paving operations on the test section began.

2. DATE PAVING OPERATIONS COMPLETED. Enter the date on which paving operations on the test section were completed.

3. ASPHALT CONCRETE HAUL. Enter the type of asphalt concrete mix plant, a reference mix plant name, the haul distance and approximate haul time from the plant to the construction project, and the layer numbers of the material. Space is provided for up to three different mix plants in the instance that more than one mix plant was used to produce the asphalt concrete used in the different paving courses.

4. MANUFACTURER OF ASPHALT CONCRETE PAVER. Enter the name of the manufacturer of the asphalt concrete paver.

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER. Enter the model number designation of the asphalt concrete paver used on the test section.

6. SINGLE PASS LAYDOWN WIDTH. Enter the single pass laydown width of the paver used on the test section to the nearest 0.1 foot.

7. AC BINDER COURSE LIFT. Enter the layer number of the AC binder course specified in Construction Data Sheet 4. Enter the nominal placement thickness of each lift of the binder course. This is the placement thickness prior to compaction and should be based on field observations and measurements. Provide only one entry if only one lift is placed. Leave these entries blank if an AC binder course was not placed.

8. AC SURFACE COURSE LIFT. Enter the layer number of the AC surface course lift specified in Construction Data Sheet 4. Enter the nominal placement thickness of each lift of the dense graded surface course. This is the placement thickness prior to compaction and should be based on field observations and measurements. Provide only one entry if only one lift is placed.

9. SURFACE FRICTION COURSE. If a separate surface friction course is applied to the pavement, indicate the layer number from Construction Data Sheet 4 and the nominal placement thickness. Note that surface friction courses are not desired on SPS test sections, but may be used if required by the agency.

10. TEST SECTION STATION OF TRANSVERSE JOINTS. Enter the location of transverse paving joints which occur within the limits of the test section in any of the AC layers. Use the test section relative station number (between 0+00 and 5+00). As transverse paving joints are not allowed within the test sections, this entry would generally be left blank.

11. LOCATION OF LONGITUDINAL SURFACE JOINT. Indicate if the longitudinal joint in the surface of the pavement is either located within the width of the test section lane or between lanes. In either case, enter the offset distance from the outside shoulder longitudinal surface joint (or approximate location of the edge stripe). If joints occur both within the test lane and between lanes, indicate the location of the joint within the test lane.

12. SIGNIFICANT EVENTS DURING CONSTRUCTION. Describe any significant events which occurred during construction and may influence the performance of the test section, e.g. disruptions to the paving operations due to rain, equipment break downs or unusual periods of sustained high or low temperatures. Use Construction Data Sheet 28, Miscellaneous Construction Notes and Comments, if additional space is required.

CONSTRUCTION DATA SHEET 10: COMPACTION DATA

This data sheet should be completed for all flexible pavement tests sections.

1. DATE PAVING OPERATIONS BEGAN. Enter the date on which paving operations on the test section began.

2. DATE PAVING OPERATIONS COMPLETED. Enter the date on which paving operations on the test section was completed.

3. LAYER NUMBER. Enter the layer number from Construction Data Sheet 4 which corresponds to the compaction information provided on this form. A separate sheet must be completed for each layer compacted.

4. MIXING TEMPERATURE. Enter the temperature of the mixture during mixing at the plant in °F.
5. LAYDOWN TEMPERATURES. Enter the mean, minimum, maximum, standard deviation, and number of measurements of the asphalt concrete laydown temperatures. These measurements should be performed in the field as close to the rear of the paver as practical. Measurements every 100 feet per paver pass are desired.
- 6-22 ROLLER DATA. Codes appear on the data sheet for steel-wheeled tandem, pneumatic-tired, single-drum vibratory, and double-drum vibratory types of rollers. For each type of roller, spaces are provided to describe significant characteristics for up to four different rollers of the same type. Enter the requested characteristics for each roller used to compact the referenced layer. These roller code numbers are used in the compaction data portion of the form to indicate the number of coverages of each roller.
- 23-28 COVERAGES. For the breakdown, intermediate and final compaction of each lift, indicate the numbers of coverages of each roller used. Enter the roller code number specified under roller data and the corresponding number of coverages for each lift of the material. A coverage is defined as one trip of the roller across the pavement.
29. AIR TEMPERATURE. Enter the air temperature during compaction to the nearest degree fahrenheit. Space is provided to record data for each of up to four lifts.
30. COMPACTED THICKNESS. Enter the compacted thickness to the nearest 0.1 inch. Space is provided to record data for each of up to four asphalt concrete lifts.

31. CURING PERIOD. Enter the length of the curing period, to the nearest 0.1 day, before a new lift is placed or the layer is opened to traffic. Space is provided to record data for each of up to four asphalt concrete lifts.

CONSTRUCTION DATA SHEET 11: PLANT-MIXED ASPHALT BOUND LAYERS - DENSITY AND PROFILE DATA

The purpose of this form is to record the results of nuclear density tests or surface profile measurements performed on the flexible test sections, if used for construction control or acceptance by the participating agency. For nuclear density tests, it is desired that the test section be treated as the sampling unit if a random sampling technique is used. Reported Profilograph readings should be based on measurements on the test section and prorated to units of inches per mile. Measurements over 528 feet (0.1 of a mile) centered around the test section may also be used.

1. NUCLEAR DENSITY MEASUREMENTS. Space is provided for entry of the results of nuclear density tests on the binder course, surface course, and surface friction course pavement layers. Enter information only for the layers on the test section that were tested. For each layer tested, enter the measurement method (backscatter, direct transmission, air gap), rod depth (for direct transmission measurements), number of measurements, average, maximum, minimum and standard deviation of the density measurements (pounds per cubic foot), and corresponding the layer number from Construction Data Sheet 4, Layer Descriptions.
2. MANUFACTURER OF NUCLEAR DENSITY GAUGE. Indicate the name of the manufacturer of the nuclear density gauge used for the reported measurements.

3. NUCLEAR DENSITY GAUGE MODEL NUMBER. Enter the manufacturer's model designation of the gauge used.
4. NUCLEAR DENSITY GAUGE IDENTIFICATION NUMBER. Enter the identification number of the nuclear density gauge used.
5. NUCLEAR GAUGE COUNT RATE FOR STANDARDIZATION. Enter the gauge count rate used for standardization.
6. PROFILOGRAPH MEASUREMENTS. Report the results of any Profilograph measurements performed on the asphalt concrete surface layer. For each measurement performed, report the type of Profilograph (Rainhart or California), Profile index, interpretation method (manual, mechanical, or computer), height of blanking band, and cutoff height. Note that mechanical interpretation method refers to readings from mechanical counters located on some devices. Enter mechanical counter reading only if the profilograms are not interpreted either by manual or computer methods.
7. SURFACE PROFILE USED AS BASIS OF INCENTIVE PAYMENT. Indicate if the surface profile is or is not used as a contractual basis for incentive payments to the construction contractor.

CONSTRUCTION DATA SHEET 12: LAYER THICKNESS MEASUREMENTS

This form is used to record the results of the layer thickness measurements within the test section from before and after elevation measurements for the flexible and rigid pavement test sections. Results of these measurements should be provided for 5 offset points at every station along the project which was measured. The station number should be entered as the test section relative station number. Offset distance should be entered in inches and measured from

the outside shoulder lane edge joint or edge stripe. Space is provided to enter elevation for up to five types of layers within the test section. If individual layer thicknesses are not measured, enter the layer thicknesses in the column corresponding to the layer whose after placement surface elevation was measured. For example, if surface elevation was only measured for the surface course, then the layer thickness should be entered under the surface course column. Enter the layer number of any layer for which layer thickness is shown. Use more than one sheet as required.

CONSTRUCTION DATA SHEET 13: UNBOUND AGGREGATE BASE MATERIAL PLACEMENT

This data sheet should be completed for all flexible and rigid pavement tests sections.

1. LAYER NUMBER. Enter the unbound aggregate base course layer number to be described on this sheet (from Construction Data Sheet 4).
2. UNBOUND BASE MATERIAL PLACEMENT BEGAN. Enter the date on which the unbound base material placement on the test section began.
3. UNBOUND BASE MATERIAL PLACEMENT COMPLETED. Enter the date on which the unbound base material placement on the test section was completed.

PRIMARY COMPACTION EQUIPMENT

4. CODE TYPE. Enter the code for primary compaction equipment used to compact the unbound aggregate base course material. The codes for the various types of equipment are given on the data sheet.
5. GROSS WEIGHT. Enter the gross weight (in tons) of the primary compaction equipment used to compact the unbound aggregate base course material.

6. LIFT THICKNESSES. Enter the nominal placement thickness of each lift of the dense graded base course material. The lift thickness is the thickness prior to compaction and should be based on field observations or measurements.
7. SIGNIFICANT EVENTS DURING CONSTRUCTION. Describe any significant events which occurred during construction and may influence the performance of the test section, e.g., disruptions due to equipment break down or the weather. Use Construction Data Sheet 28, Miscellaneous Construction Notes and Comments, if additional space is required.

CONSTRUCTION DATA SHEET 14: SUBGRADE PREPARATION

This data sheet should be completed for all flexible and rigid pavement tests sections.

1. SUBGRADE PREPARATION BEGAN. Enter the date on which subgrade preparation on the test section began.
2. SUBGRADE PREPARATION COMPLETED. Enter the date on which subgrade preparation on the test section was completed.

PRIMARY COMPACTION EQUIPMENT

3. CODE TYPE. Enter the code for the primary compaction equipment used in subgrade preparation. The codes are provided on the data sheet.
4. GROSS WEIGHT. Enter the gross weight (in tons) of the primary compaction equipment used to compact the subgrade.

- 5-6. TYPE AND PERCENT STABILIZING AGENT. Enter the type code and average percent based on dry weight of the subgrade soil for each type of stabilizing agent used. If only one stabilizing agent is used, leave the spaces for "Stabilizing Agent 2" blank. Stabilizing agents can be added to the subgrade to provide a stable working platform as part of the construction process but shall not be used as an additive to increase the strength of the subgrade in the pavement structure.
7. TYPICAL LIFT THICKNESS. Enter the nominal placement thickness of the subgrade fill material. The lift thickness is the thickness prior to compaction and should be based on field observations or measurements.
8. SIGNIFICANT EVENTS DURING SUBGRADE PREPARATION. Describe any significant events which occurred during construction and may influence the performance of the test section, e.g., disruptions due to equipment break downs or the weather. Use Construction Data Sheet 28, Miscellaneous Construction Notes and Comments, if additional space is required for comments.

CONSTRUCTION DATA SHEET 15: CUT-FILL SECTION LOCATIONS

This data sheet provides information regarding the locations of the cut and fill sections throughout the entire project length and should be completed for all flexible and rigid pavement test sections.

1. CUT-FILL. Enter the code shown under note 1 on the form to indicate if the subgrade structure is cut or fill.
2. START STATION NUMBER. Enter the station number of the starting point of the indicated subgrade structure relative to the starting point of the first test section on the project, to the nearest foot.

3. END STATION NUMBER. Enter the station number of the ending point of the indicated subgrade structure relative to the starting point of the first test section on the project, to the nearest foot.
4. TEST SECTION NO.. Enter the six digit test section ID number, consisting of the STATE CODE, SPS PROJECT CODE, and TEST SECTION NUMBER, in which the indicated subgrade structure is located. This number will be repeated for each subgrade structure occurring within the test section.

CONSTRUCTION DATA SHEET 16: SUBGRADE EXCAVATION AND BACKFILLING SKETCH

This form is used to sketch the approximate locations where excavation and backfilling of the subgrade was performed in the flexible and rigid pavement test sections. It should also be used to indicate the average depth of excavation and backfilling performed at each location, and to describe the type of backfill material.

CONSTRUCTION DATA SHEET 17: PORTLAND CEMENT CONCRETE LAYERS - JOINT DATA

This data sheet is used for reporting information on joints constructed in the portland cement concrete surface layer identified on Construction Data Sheet 4, Layer Descriptions, of the rigid pavement test sections. Dowels are required for the SPS-8 rigid test sections. However, where dowels or other mechanical load transfer devices are not provided at joints, enter "N" in the spaces for describing these devices.

1. LAYER NUMBER. Enter the portland cement concrete layer for which a description is being provided (from Construction Data Sheet 4).
- 2-3. AVERAGE CONTRACTION JOINT SPACING. Enter the average spacing in feet (to the nearest 0.1 foot) between consecutive contraction joints (length of

the concrete slab) of the pavement under survey. A space is provided to write in a description of any random joint spacing.

4. SKEWNESS OF JOINTS. Enter the average deviation of the contraction joint across the slab from a right angle with the edge, measured in feet per lane. If joints are not skewed, enter "N". Perpendicular joints are required for the SPS-8 rigid test sections and, therefore, "N" should generally be entered.
5. TRANSVERSE CONTRACTION JOINT LOAD TRANSFER SYSTEM. Indicate the mechanism by which a portion of the moving load is transferred across the transverse contraction joint to the adjacent slab. Codes are provided on the data sheet as well as a space to write in a description of another load transfer system if different from those for which codes are provided.
6. DOWEL DIAMETER. Enter the outer diameter of the round dowel bar used as the load transfer device across a contraction joint of the pavement under survey. This number is to be entered to the nearest 0.01 inch.
7. DOWEL SPACING. Enter the average center-to-center distance in inches between mechanical load transfer devices (round or I-beam, star lugs, etc.) across the contraction joint of the portland cement concrete surface layer being described.
8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE. Enter the distance of the center of the nearest dowel or mechanical load transfer device from the outside lane-shoulder edge to the nearest 0.1 inch.
9. DOWEL LENGTH. Enter the mean length in inches of the round or I-beam dowel bars across contraction joints in the PCC layer being described.

10. DOWEL COATING. Indicate the type of material covering the dowel bar surfaces when installed in the concrete slab. A space is provided to write in a description if some dowel coating was used other than those for which codes are provided.
11. METHOD USED TO INSTALL MECHANICAL LOAD TRANSFER DEVICES. Indicate the method used to install the dowels. Space is provided for describing another method if the method used differs from those for which codes are provided.
12. DOWEL ALIGNMENT CHECKED BEFORE PLACEMENT. Indicate whether the alignment of the dowel bars was checked prior to placement of the portland cement concrete.
13. DOWEL ALIGNMENT CHECKED AFTER PLACEMENT. Indicate whether the alignment of the dowel bars was checked after placement of the portland cement concrete. A space is provided to describe the method used to check the dowel bar alignment.

**CONSTRUCTION DATA SHEET 18: PORTLAND CEMENT CONCRETE LAYERS - JOINT DATA
(CONTINUED)**

This sheet is a continuation of Construction Data Sheet 17, Portland Cement Concrete Layers-Joint Data, and should be completed for each concrete surface layer identified on Construction Data Sheet 4, Layer Descriptions, of the rigid pavement test sections. These additional data items are described below.

1. LAYER NUMBER. Indicate the portland cement concrete layer for which a description is being provided (from Construction Data Sheet 4).

2. METHOD USED TO FORM TRANSVERSE JOINTS. Indicate whether the contraction joints were constructed by sawing the hardened slab at the proper time, by placing an insert in the slab surface while the concrete is plastic, or by any other construction method used to form the joint. Space is provided for describing another method if none of those for which codes were provided was used.
3. TYPE OF LONGITUDINAL JOINT. Indicate how the longitudinal joint between the lanes was formed. Space is provided for describing another way of forming the joints if none of those for which codes are provided was used.
4. TYPE OF SHOULDER-TRAFFIC LANE JOINT. Indicate how the joint between the concrete shoulder and the traffic lane was formed. Space is provided for describing another way of forming the joints if none of those for which codes are provided was used.
5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS. Enter the average depth of sawcut to the nearest 0.01 inch. This value should be obtained from actual field measurements.
6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT. Enter the time interval between the time of concrete placement and the time of joint sawcutting to the nearest hour.
7. TRANSVERSE JOINT SEALANT TYPE (AS-BUILT). Indicate the type of joint sealant actually used in the transverse joints. Space is provided for describing another type of sealant if none of those for which codes were provided was used.

- 8-9. TRANSVERSE JOINT SEALANT RESERVOIR (AS-BUILT). Enter the mean as-constructed Width and Depth of the transverse joint sealant reservoir to the nearest 0.01 inch.
- 10-11. LONGITUDINAL JOINT SEALANT RESERVOIR. Enter the average width and depth of the as-built longitudinal joint sealant reservoir to the nearest 0.01 inch.
12. BETWEEN LANE TIE BAR DIAMETER. Enter the nominal diameter of the tie bars used across longitudinal joints between lanes entered to the nearest 0.01 inch.
13. BETWEEN LANE TIE BAR LENGTH. Enter the mean length of the tie bars used across the longitudinal joint between the lanes to the nearest inch.
14. BETWEEN LANE TIE BAR SPACING. Enter the mean center-to-center spacing between consecutive tie bars across the longitudinal joint between the lanes to the nearest 0.1 inch.
- 15-16. SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT). Enter the average width and depth of the as-built joint sealant reservoir between the shoulder and traffic lane.

CONSTRUCTION DATA SHEET 19: PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA

This data should be completed during construction from available project records for the portland cement concrete surface layer identified on Construction Data Sheet 4, Layer Descriptions, for the rigid pavement test sections.

1. LAYER NUMBER. Enter the portland cement concrete surface layer number for which a description is being provided (from Construction Data Sheet 4).

- 2-5. MIX DESIGN. Enter the oven dry weights in pounds of coarse aggregate, fine aggregate, cement, and the weight of water provided by the mix design for a cubic yard of concrete.

6. TYPE CEMENT USED. Enter the type of cement used. These cement type codes appear in Table A.11 of the LTPP Data Collection Guide and Appendix B of this report.

7. ALKALI CONTENT OF CEMENT. Enter the alkali content of the cement to the nearest 0.1 percent.

- 8-10. ADMIXTURES. Enter the types and amounts (in percent by weight of cement to the nearest thousandth) of admixtures used in the concrete. The codes for concrete admixtures appear in Table A.12 of the LTPP Data Collection Guide and Appendix B of this report. A space has been provided for identifying an admixture for which a code was not provided.

- 11-14. AGGREGATE DURABILITY TEST RESULTS. Enter the type of durability tests performed and the test results in tenths in the units specified for the test. Three of these sets are for coarse aggregates and one is for the combination of coarse and fine aggregates. The durability test type codes and the units for reporting appear in Table A.13 of the LTPP Data Collection Guide and Appendix B of this report.

CONSTRUCTION DATA SHEET 20: PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA
(CONTINUED)

This data sheet is a continuation of Construction Data Sheet 19, Portland Cement Concrete Layers-Mixture Data, and should be completed from project records for each portland cement concrete layer identified on Construction Data Sheet 4, Layer Descriptions, for the rigid pavement test sections.

1. LAYER NUMBER. Indicate the portland cement concrete layer for which a description is being provided (from Construction Data Sheet 4).

- 2-4. COMPOSITION OF COARSE AGGREGATE. Indicate the types and percentages by weight of up to three separate materials in the coarse aggregate (that portion of an aggregate retained on the No. 4 sieve) used in the concrete mix. Space is provided for description of another type if none of the types for which codes are provided were used. Where only one type of material was used, enter its type code and 100 in the top set of data spaces, leaving the other blank.

5. GEOLOGIC CLASSIFICATION OF COARSE AGGREGATE. Indicate the geologic classification of the natural stone used as coarse aggregate in the concrete. These codes appear in Table A.9 of the LTPP Data Collection Guide (Appendix B of this report) and provide identification as to which of the three major classes of rock the coarse aggregate belongs to and the type of rock within those classes. If a "blend" was used, enter the code for the geological classification for the material representing the majority of the coarse aggregate. If a "crushed slag," "manufactured lightweight," or "recycled concrete" was used as course aggregate, enter "N".

- 6-8. COMPOSITION OF FINE AGGREGATE. Indicate the types and percentages by weight of materials in the fine aggregate (passing the No. 4 sieve and retained on the No. 200 sieve). Space is provided for identifying another type if none of those for which codes are provided was used. Where only one type of material was used, enter its type code and 100 in the top set of data spaces, leaving the others blank.
9. INSOLUBLE RESIDUE. Enter the percentage of insoluble residue (non-carbonate material) as determined using ASTM D3042.
10. GRADATION OF COARSE AGGREGATE. Enter the percent of coarse aggregate passing various standard sieve sizes to the nearest one percent. It is not expected that values will be available for all sieve sizes shown. The objective is to provide sufficient sieve sizes to accommodate testing and specification practices for most agencies.
11. GRADATION OF FINE AGGREGATES. Enter the percent of fine aggregate passing various standard sieve sizes to the nearest one percent. It is not expected that values will be available for all sieve sizes shown. The objective is to provide sufficient sieve sizes to accommodate testing and specification practices for most agencies.
- 12-13. BULK SPECIFIC GRAVITIES. Enter the mean bulk specific gravities (to the nearest thousandth) for coarse aggregate and fine aggregate. The bulk specific gravities are measured using AASHTO T85 (or ASTM C127) and AASHTO T84 (or ASTM C128) procedures for the coarse and fine aggregate fractions, respectively.

CONSTRUCTION DATA SHEET 21: PORTLAND CEMENT CONCRETE LAYERS - PLACEMENT DATA

The data sheet is used for reporting information on the placement operations for portland cement concrete surface courses, and should be completed for all rigid pavement test sections.

1. DATE PAVING OPERATIONS BEGAN. Enter the date on which paving operations on the test section began.
2. DATE PAVING OPERATIONS COMPLETED. Enter the date on which paving operations on the test section were completed.
3. LAYER NUMBER. Indicate the layer number from Construction Data Sheet 4, Layer Descriptions, for which the information is being provided.
4. CONCRETE MIX PLANT AND HAUL. Enter a reference mix plant name, the haul distance, and approximate haul time from the plant to the construction project. Space is provided for up to three different mix plants in the instance that more than one mix plant is utilized.
5. PAVER TYPE. Indicate whether a slip-form or side-form paver was used to place the concrete. The codes appear on the data sheet along with a space to describe a different type not listed.
6. PAVER MANUFACTURER AND MODEL NUMBER. Indicate the name of the manufacturer and the model number of the paver equipment.
7. SPREADER TYPE. Indicate the generic type of spreader used in paving operations.

8. SPREADER MANUFACTURER AND MODEL NUMBER. Indicate the name of the manufacturer and the model number of the spreader equipment.
9. WIDTH PAVED IN ONE PASS. Indicate the width of the finished concrete from a single pass of the paving train which includes the monitoring lane, to the nearest tenth of a foot.
10. DOWEL PLACEMENT METHOD. Indicate type of dowel placement, dowel bar inserter (DBI) or dowel baskets.
11. NUMBER OF VIBRATORS. Enter the number of spud vibrators integral with the paver used in consolidating the concrete.
12. VIBRATOR SPACING. Indicate the average spacing between the spud vibrators, to the nearest inch.
13. DEPTH OF VIBRATORS BELOW SURFACE. Indicate the depth below the concrete surface where vibrators are functioning, to the nearest 0.5 inch.
14. ADDITIONAL VIBRATION APPLIED. Indicate the use of vibration in addition to spud vibrators. Pan vibrators attached to the paver and vibration imparted by the dowel bar inserter should be indicated.

**CONSTRUCTION DATA SHEET 22: PORTLAND CEMENT CONCRETE LAYERS - PLACEMENT DATA
(CONTINUED)**

This data sheet is a continuation of Construction Data Sheet 21, Portland Cement Concrete Layers - Placement Data, and should be completed for the rigid pavement test sections.

1. CONSOLIDATION OF MATERIALS. Indicate the method used to consolidate the concrete. The codes appear on the data sheet along with a space to describe a different type not listed.
2. FINISHING. Indicate the method used to finish the concrete. The codes appear on the data sheet along with a space to describe a different type not listed.
3. CURING. Indicate the method used to cure the concrete. The codes appear on the data sheet along with a space to describe a different type not listed.
4. TEXTURING. Indicate the method used to provide a surface texture on the concrete. The codes appear on the data sheet along with a space to describe a different type not listed.

**CONSTRUCTION DATA SHEET 23: PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE
DATA**

This data sheet is used to provide information on the smoothness and related operations performed during construction of the portland cement concrete surface layer identified on Construction Data Sheet 4, Layer Descriptions, and should be completed for the rigid pavement test sections.

1. PROFILOGRAPH TYPE. Indicate the type of profilograph used on the concrete surface. The codes appear on the data sheet.
2. PROFILOGRAPH INDEX. Enter the profilograph index in inches per mile.

3. INTERPRETATION METHOD. Indicate the method used in interpreting the profilograph data. The codes appear on the data sheet.
4. HEIGHT OF BLANKING BAND. Enter the height of the blanking band in inches to the nearest 0.01 inch.
5. CUTOFF HEIGHT. Enter the cutoff height in inches to the nearest 0.01 inch.
6. SURFACE PROFILE USED AS BASIS OF INCENTIVE PAYMENT. Indicate whether the surface profile results were used as a basis of incentive payment.
7. WAS SURFACE PROFILE CORRECTED BY DIAMOND GRINDING. Indicate whether the surface profile was corrected by diamond grinding.
8. DATE DIAMOND GRINDING OPERATIONS BEGAN. Enter the date on which diamond grinding operations began.
9. DATE DIAMOND GRINDING OPERATIONS COMPLETED. Enter the date on which diamond grinding operations were completed.
10. REASON FOR GRINDING. Indicate the reason for performing diamond grinding. The codes appear on the data sheet along with a space to describe a different type not listed.
11. AVERAGE DEPTH OF CUT. Enter the average depth of cut made during diamond grinding operations to the nearest 0.01 inch.
12. CUTTING HEAD WIDTH. Enter the cutting head width of the diamond grinder to the nearest 0.01 inch.

13. AVERAGE GROOVE WIDTH. Enter the average groove width in the concrete surface to the nearest 0.1 inch.
14. AVERAGE SPACING BETWEEN BLADES. Enter the average blade spacing of the diamond grinder to the nearest 0.1 inch.

CONSTRUCTION DATA SHEET 24: FULL DEPTH REPAIR FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES

This data sheet is used for reporting details of full depth repair, including either full depth patches or complete slab replacement, for pavements with PCC surfaces. This sheet should be completed, as appropriate, for the rigid pavement test sections.

1. DATE PATCHING OPERATIONS BEGAN. Enter the date on which patching operations on the test section began.
2. DATE PATCHING OPERATIONS COMPLETE. Enter the date on which patching operations on the test section were completed.
3. PRIMARY DISTRESS OCCURRENCE PATCHED OR REPLACED WITH NEW SLAB. Enter the code for the primary reason for patching or slab replacement. If patching or slab replacement was required for more than one reason, enter the cause resulting in the greatest repair area. Codes appear in Table A.22 of the LTPP Data Collection Guide and Appendix B of this report. A space is provided for describing a reason for which no code is provided.
4. SECONDARY DISTRESS OCCURRENCE PATCHED OR REPLACED WITH NEW SLAB. Enter the code for the second reason for patching or slab replacement.

5. PATCHES. Enter the number and area in square feet of patches placed. Quantities shall be recorded separately for patches of slab replacement only and for patches of both the slab and base replacement.
6. PATCH MATERIAL USED. Enter the code for the type of surface material used to patch the pavement. If a material other than those specified is used, it should be described in the space provided.
7. SLABS REPLACED. Enter the number and area in square feet of slabs replaced. Quantities shall be recorded separately for slab replacement of concrete only and slab replacement of concrete and base layers.
8. METHOD FOR PATCH BOUNDARY DETERMINATION. Enter the code for the means of determining the extent of the area to be patched, or whether slabs should be replaced. Space is provided to describe other methods for which a code was not provided.
9. CUTTING INSTRUMENT. Enter the code for the instrument used to cut the boundaries of the area to be patched.

**CONSTRUCTION DATA SHEET 25: FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH
PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)**

This data sheet is a continuation of Construction Data Sheet 24, Full Depth Repair Data for Portland Cement Concrete Pavements, and should be completed, as appropriate, for the rigid pavement test sections.

1. SECURING LOAD TRANSFER DEVICES. Enter the code for the material used to grout or epoxy load transfer devices into drilled or preformed holes. Space is provided to enter material other than those specified on the data sheet.

2. REINFORCING STEEL PLACED IN PATCH. Indicate whether the patched area contains reinforcing steel or not.
3. REBAR NUMBER. Enter the rebar number designations of the longitudinal and transverse bars or wire mesh (tied or untied to old reinforcement) for temperature steel, dowel bars, and tie bars in the full-depth repair. If either longitudinal or transverse bars were not used, the appropriate spaces may be left blank for these and the next three items.
4. BAR LENGTHS. Enter the lengths of longitudinal and transverse bars or wire mesh, to the nearest 0.1 inch.
5. BAR SPACINGS. Enter the approximate center-to-center spacings of adjacent longitudinal and transverse bars or wire mesh, to the nearest 0.1 inch.
6. DOWEL COATINGS. Indicate the type of coatings used on longitudinal and transverse dowel bars. If dowel bars were not used, leave this space blank.
7. NUMBER OF SAW CUTS. Enter the number of saw cuts required per patch, if any.
8. DEPTH OF TYPICAL BOUNDARY SAW CUT. Enter the average depth, to the nearest 0.1 inch, of boundary saw cut.
9. CONCRETE BREAKUP. Enter the code to specify the means of breaking up the existing concrete to be removed.
10. REMOVAL OF CONCRETE. Indicate the method of material removal from the area patched.

CONSTRUCTION DATA SHEET 26: FULL DEPTH REPAIR DATA FOR PORTLAND CEMENT
CONCRETE PAVEMENTS (CONTINUED)

This data sheet is a continuation of Construction Data Sheets 24 and 25, Full Depth Repair Data for Portland Cement Concrete Pavements, and should be completed, as appropriate, for the rigid pavement test sections.

1. METHOD OF REINFORCING STEEL PLACEMENT. Indicate the means of placing the reinforcing steel. If reinforcing steel is not included, this space should be left blank.
2. MIXTURE DESIGN FOR PCC PATCH MATERIAL. Enter the pounds per cubic yard of coarse aggregate, fine aggregate, cement, and water (in gallons per cubic yard) in patch mixture. Coarse aggregate is the portion retained on the No. 4 sieve.
3. CEMENT TYPE USED. Enter the appropriate code to identify the type of cement used in the patch mix. Types of cement and associated codes are provided in Table A.11 of the LTPP Data Collection Guide and Appendix B of this report. Enter "61 for epoxy cement and "62" for polymer cement. If a cement not otherwise identified was used, enter "63."
4. AIR CONTENT. Enter the mean air content and range of the measured values (in percent by volume) in the portland cement mix, to the nearest 0.1 percent.
5. ADMIXTURES. Indicate the admixtures added to the PCC mix. Spaces are provided to list up to two types of admixtures. A list of admixtures is provided in Table A.12 of the LTPP Data Collection Guide and Appendix B of this report.

6. SLUMP. Enter the mean slump and the range (minimum and maximum measured values) for portland cement concrete patch material, to the nearest 0.1 inch.

7. FLEXURAL STRENGTH (MODULUS OF RUPTURE). Enter the mean flexural strength of the portland cement concrete mix used in the patch in pounds per square inch, based on third point loading (ASTM C78), and the number of days the beam was cured before testing. If third-point beam tests were not performed and another strength test (such as compressive or splitting tensile tests) was performed, space is provided to identify the type of strength testing performed on the concrete mixture, the type of loading, age at testing, and measured strength. Refer to the test by AASHTO, ASTM, or other agency's designation.

8. AMBIENT CONDITIONS AT TIME OF PATCHING. Enter the low and high air temperature observed during patching activities in degrees Fahrenheit, and a code to indicate whether the surface was dry or wet at the time of patching.

9. MAXIMUM SIZE OF COARSE AGGREGATE. Enter the maximum size of the coarse aggregate in the patch material to the nearest 0.1 inch.

10. CONSOLIDATION OF MATERIALS. Indicate the means of consolidating the patch materials into the area patched.

11. FINISHING. Indicate the means of finishing the surface of the patched area or new slab. Where a method other than one of those specified was used, it should be indicated in the space provided.

CONSTRUCTION DATA SHEET 27: FULL DEPTH REPAIR DATA FOR PORTLAND CEMENT
CONCRETE PAVEMENTS (CONTINUED)

This data sheet is a continuation of Construction Data Sheets 24, 25, and 26, Full Depth Repair Data for Portland Cement Concrete Pavements, and should be completed, as appropriate, for the rigid pavement test sections.

1. JOINT FORMING METHOD. Indicate the method of forming contraction joints in the shoulder, transverse direction, and longitudinal direction. Space is provided to specify a method other than those listed.
2. WAS BOND BREAKER USED BETWEEN ADJACENT LANES. Indicate whether a bond breaker was used to prevent bonding of the new patch to the adjacent lane.
3. CURING METHOD. Indicate one or two methods used in curing the patch materials. A space is provided to specify a method other than one of those listed. If only one method was used, leave "Method 2" blank.
4. APPROXIMATE TIME BETWEEN PATCHING AND OPENING TO TRAFFIC. Enter the approximate time, in hours, for which the patch materials were allowed to cure prior to allowing traffic on the surface.
5. TYPE OF TRANSVERSE JOINTS IN PATCHES OR SLABS. Indicate the type of joints (expansion joints, contraction joints, or a mixture of the two) adjacent to or in patches or new slabs. Leave code for patches blank if either no patches were constructed or no joints were included. Leave code for slabs blank if no full slabs were replaced.
6. WERE OLD JOINTS MATCHED. Indicate whether joints in the patch were matched with the existing joints in the pavement.

CONSTRUCTION DATA SHEET 28: MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS

This construction data sheet is used for reporting miscellaneous notes and comments, additional descriptions of entries on other forms, or construction-related data that are not covered on other data forms. Comments on this form should address construction operations which may influence the performance of the test sections. For example, comments concerning quality control aspects pertaining to the materials, mixes, and operations may be addressed on this sheet. This sheet should be completed, as appropriate, for the flexible and rigid pavement test sections.

Also, this sheet may be used to provide additional comments on items included in other data sheets. In these cases, the items and sheets numbers pertaining to these comments should be indicated on this form.

In addition, this form can be used to report other types of quality control measurements performed on the test sections which are not covered in the construction data sheets. For example, if profile or ride quality acceptance procedures are not based on Profilograph measurements, this information could be provided on this form. In this case, specify the type, manufacture, model number of measurement equipment used, and a reference to the standard test procedure employed (such as ASTM, AASHTO, or Agency's test method). If similar types of data or information are reported for several SPS test sites on this sheet, then consideration will be given to the development of standard forms for reporting this information to simplify its entry in the data base.

LABORATORY MATERIAL TESTING DATA

Laboratory material tests should be performed in accordance with the SHRP standard protocols contained in the most recent version of Operational Guide No. SHRP-LTPP-OG-004, "SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing." The Guide contains data forms for reporting test information and results. Procedures and forms for those test methods that are not included in the GPS materials testing program but required for the SPS-8 experiment are listed in the Operational Memorandum No. SHRP-LTPP-OM-030, "Specific Pavement Studies: Materials Sampling and Testing Requirements for Experiment SPS-8, Study of Environmental Effects in the Absence of Heavy Loads", August 1992.

TRAFFIC DATA

Traffic data should be collected and reported using weigh-in-motion equipment. The WIM must be permanently installed and located such that the traffic stream over the project site is properly monitored. Monitoring information must be reported using the same formats and procedures as required for GPS test sections.

In general, traffic data should be recorded as "project level data" and coded with a "00" as the test section number. In instances where an intersection exists within the test site and thus resulting in different traffic levels on the test sections, measurements of the traffic level on the different groups of sections on each side of the intersection should be referenced to the lead test section of the group. The locations of intersections or ramps that exist within the test site should be recorded on Construction Data Sheet 3, Reference Project Station Table.

CLIMATIC DATA

Information on climatic conditions at each SPS-8 test site is needed. In general, the following data elements will be required.

Maximum Daily Temperature, (TMAX);
Minimum Daily Temperature, (TMIN);
Mean Daily Temperature, (MNTP);
Daily Precipitation, (PRCP);
Daily Snowfall, (SNOW);
Daily Occurrences of Weather, (DYSW);
Daily Average Wind Speed, (AWND);
Peak Gust Wind Speed and Direction, (PKGS);
Percent of Possible Sunshine, (PSUN);
Average Sky Coverage Sunrise to Sunset, (SCSS);
Average Sky Coverage Midnight to Midnight, (SCMM);
Daily Minimum Relative Humidity, (MNRH); and
Daily Maximum Relative Humidity, (MXRH)

The procedures used for collection and storage of climate and environmental data for GPS test sections should be followed for SPS-8 projects. Since this data will apply to all test sections on the project, it should be recorded as "project level data" with a "00" entered as the test section number.

DISTRESS, DEFLECTION, PROFILE AND SKID DATA

Guidelines on the timing of deflection, profile, distress, and friction measurements are shown in Table 2. In general, the same procedures and reporting formats used for GPS should be followed for the measurements on SPS test sections. Deflection measurements should be obtained in accordance with the FWD

Table 2. Guidelines on initial monitoring measurements on SPS-8 test sites.

MEASUREMENT	AFTER CONSTRUCTION
DEFLECTION MEASUREMENTS	1 - 3 Months
PROFILE MEASUREMENTS	< 2 Months
DISTRESS SURVEY	< 6 Months
FRICTION MEASUREMENTS	3 - 12 Months

Test Plan developed for this experiment. This monitoring data should be obtained and reported for each test section.

MAINTENANCE AND REHABILITATION DATA

All maintenance and rehabilitation activities performed on the SPS test sections after completion of construction should be recorded on a test section basis using the data sheets contained in the LTPP Data Collection Guide.

APPENDIX A

SAMPLING DATA SHEETS, FIELD OPERATIONS INFORMATION FORMS
AND SPS-8 CONSTRUCTION DATA SHEETS

(Exclusively for SPS Experiments)

PAVEMENT CORE LOG AT C-TYPE CORE LOCATIONS

SAMPLING DATA SHEET 2

IRP REGION _____ STATE _____ STATE CODE _____
 SPS EXPERIMENT NO _____ SPS PROJECT CODE _____
 ROUTE/HIGHWAY _____ Lane _____ Direction _____ TEST SECTION NO. _____
 SAMPLE/TEST LOCATION: Before Section After Section FIELD SET NO. _____
 OPERATOR _____ EQUIPMENT USED _____ CORING DATE ____-____-____
 SAMPLING AREA NO SA- _____ CORE BARREL Size _____ Cooling Medium _____

Note: Record information for all cores extracted from each core hole in one column in the table below. Use a separate sheet for each sampling area. "Depth" should be measured from the pavement surface to the bottom of the core and recorded to the nearest tenth of an inch.

CORE HOLE NUMBER						
LOCATION: (a) STATION						
(b) OFFSET (Feet, O/S)						
Core Recovered?	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO
Replacement Core Hole No.						
Core Size (inch Diam.)	4/6	4/6	4/6	4/6	4/6	4/6
Core Sample No.						
Depth (Inches)						
Material Description						
Material Code						
Core Size (inch Diam.)	4/6	4/6	4/6	4/6	4/6	4/6
Core Sample No.						
Depth (Inches)						
Material Description						
Material Code						
Core Size (inch Diam.)	4/6	4/6	4/6	4/6	4/6	4/6
Core Sample No.						
Depth (Inches)						
Material Description						
Material Code						
Core Size (inch Diam.)	4/6	4/6	4/6	4/6	4/6	4/6
Core Sample No.						
Depth (Inches)						
Material Description						
Material Code						
Remarks						

GENERAL REMARKS: _____

CERTIFIED _____ VERIFIED AND APPROVED _____ DATE _____

 eld Crew Chief
 filiation: _____

 SHRP Representative
 Affiliation: _____

_____-_____-19_____
 Month- Day- Year

A-TYPE BORE HOLE LOG

SAMPLING DATA SHEET 4-1

_____ RP REGION _____ STATE _____ STATE CODE _____
 SPS EXPERIMENT NO _____ SPS PROJECT CODE _____
 ROUTE/HIGHWAY _____ Lane _____ Direction _____ TEST SECTION NO. _____
 SAMPLE/TEST LOCATION: Before Section After Section FIELD SET NO. 1
 Within Section
 OPERATOR _____ EQUIPMENT USED _____ BORING DATE ____ - ____ - ____
 SAMPLING AREA NO: SA- _____ LOCATION: STATION _____ OFFSET _____ feet from 0/s
 BORE HOLE NUMBER: _____ BORE HOLE SIZE: _____ (inch Diam.)

Scale (Inches)	Strata Change (Inches)	Sample Number (1)	#Blows(2)			Ref? Y/N (3)	DLR (Inches) (4)	IOP (5)	Material Description	Material Code
			6"	6"	6"					
<u>10.0</u>										
<u>20.0</u>										
<u>30.0</u>										
<u>40.0</u>										
<u>50.0</u>										

- Record sample numbers for splitspoon/thin-walled tube samples taken from the subgrade.
- For splitspoon samples, record the number of blows for the first, second and third 6 inches of penetration.
- Refused** - If the splitspoon is refused, place a Y in the **REFUSAL** column and complete **Driving Length To Refusal** column. Refusal is defined as less than 1 inch of penetration with 100 blows.
- Driving Length To Refusal** - Record penetration to refusal of splitspoon from the top of the pavement surface.
- Inches Of Penetration** - Record from start of splitspoon sampling procedure if 100 blows is reached before one foot of penetration. If penetration exceeds 12 inches before 100 blows is reached, enter middle 6 inches plus depth of penetration into the last 6 inches when 100 blows was reached (not including seating drive); record to nearest tenth of an inch.

GENERAL REMARKS: _____
 CERTIFIED _____ VERIFIED AND APPROVED _____ DATE _____ - ____ - 19____
 Field Crew Chief _____ SHRP Representative _____
 Affiliation: _____ Affiliation: _____
 Month- Day- Year

IN SITU DENSITY AND MOISTURE TESTS

SAMPLING DATA SHEET 8-1

RP REGION _____ STATE _____ STATE CODE _____
 SPS EXPERIMENT NO _____ SPS PROJECT CODE _____
 ROUTE/HIGHWAY _____ Lane _____ Direction _____ TEST SECTION NO. _____
 SAMPLE/TEST LOCATION: Before Section After Section FIELD SET NO. _____
 Within Section
 OPERATOR _____ NUCLEAR DENSITY GAUGE I.D. _____ TEST DATE - - -
 SAMPLING AREA NO: SA- _____ LOCATION: STATION _____ OFFSET _____ feet from °/s
 LOCATION NO: _____ DATE OF LAST MAJOR CALIBRATION - - -
 Note: Use additional sheets if necessary

DEPTH FROM SURFACE TO THE TOP OF THE LAYER, INCHES (From Plans)						
LAYER NUMBER						
MATERIAL TYPE: (Unbound=G Other=T)						
IN SITU DENSITY, pcf (AASHTO T238-86)	1					
	2					
	3					
	4					
AVERAGE						
Method (A,B, or C)						
Rod Depth, inches						
IN SITU MOISTURE CONTENT, % (AASHTO T239-86)	1					
	2					
	3					
	4					
AVERAGE						

GENERAL REMARKS: _____

CERTIFIED _____ VERIFIED AND APPROVED _____ DATE _____
 Field Crew Chief _____ SHRP Representative _____ Month- Day- Year
 Affiliation: _____ Affiliation: _____

SHOULDER PROBE LOG

SAMPLING DATA SHEET 9

IP REGION _____ STATE _____

STATE CODE _____

EXPERIMENT NO _____

SPS PROJECT CODE _____

ROUTE/HIGHWAY _____ Lane _____ Direction _____

TEST SECTION NO. _____

SAMPLE/TEST LOCATION: Before Section After Section
 Within Section

FIELD SET NO. _____

OPERATOR _____ EQUIPMENT USED _____ AUGERING DATE ____-____-____

AUGER PROBE NUMBER _____ LOCATION STATION: _____ OFFSET: _____ feet from 0/s

TOP OF ROCK BASED ON: _____

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

REFUSAL WITHIN 20 FEET (Y/N): _____ DEPTH TO REFUSAL: _____ (FEET)

GENERAL REMARKS: _____

_____ VERIFIED AND APPROVED _____ DATE _____
 Field Crew Chief SHRP Representative _____
 Affiliation: _____ Affiliation: _____ Month- Day- Year

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING
SAMPLING UNCOMPACTED BITUMINOUS PAVING MIXTURES
SAMPLING DATA SHEET 10-1

SHEET NUMBER _____ OF _____

SHRP REGION _____ STATE _____
SPS EXPERIMENT NUMBER _____
ROUTE/HIGHWAY _____ Lane _____ Direction _____

STATE CODE _____
SPS PROJECT CODE _____
TEST SECTION NO. _____
FIELD SET NO. 1

PERSON PERFORMING SAMPLING

NAME _____ EMPLOYER _____
TITLE _____

MIX PLANT

PLANT NAME _____
PLANT LOCATION _____
PLANT TYPE Batch..... 1 Drum..... 2 Other (Specify)..... 3 []
DESCRIPTION OF MIX PLANT _____
MANUFACTURER OF ASPHALT PLANT _____
MODEL NUMBER _____
BATCH SIZE _____

SAMPLING LOCATION []

Conveyor Belt..... 1 Stockpile..... 2 Haul Truck..... 3 Funnel Device..... 4
Roadway Prior to Compaction 5 Station __ + __ __ Offset ____ (feet from O/S)
Other..... 6 (specify) _____

MIX TYPE "Virgin" Asphalt Concrete (BV).. 1 Recycled Asphalt Concrete (BR).. 2 []
Asphalt Treated Dense Graded (BT).. 3 Permeable Asphalt Treated (BT).. 4 []

LAYER NUMBER []

LAYER TYPE BINDER COURSE ...3 SURFACE COURSE... 4 []
SURFACE FRICTION LAYER ... 5 BASE COURSE ... 6

SAMPLE NUMBER (MIX TYPE letter codes and sequential numbering) [_ _ _ _]

APPROXIMATE SAMPLE SIZE (lbs) _____

DATE SAMPLED (Month - Day - Year) [_ _ - _ _ - _ _]

LOCATION SAMPLE SHIPPED TO _____

DATE SHIPPED (Month-Day-Year) [_ _ - _ _ - _ _]

GENERAL REMARKS: _____

CERTIFIED _____ VERIFIED AND APPROVED _____ DATE _____
eld Crew Chief SHRP Representative -19
Affiliation: _____ Affiliation: _____ Month- Day- Year

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING
 SAMPLING FRESH PORTLAND CEMENT CONCRETE MIXTURES
 SAMPLING DATA SHEET 11-1

SHEET NUMBER _____ OF _____

SHRP REGION _____ STATE _____
 SPS EXPERIMENT NUMBER _____
 ROUTE/HIGHWAY _____ Lane _____ Direction _____

STATE CODE _____
 SPS PROJECT CODE _____
 TEST SECTION NO. _____
 FIELD SET NO. _____

PERSON PERFORMING SAMPLING
 NAME _____ EMPLOYER _____
 TITLE _____

SAMPLING LOCATION _____ [____]
 Batch Plant 1 Hauling Truck before Paving 2
 Hauling Truck during Paving 3 Paver 4
 Other 5 (specify) _____

SAMPLE NUMBER (FC-- for PCC, BL-- for LCB) [____]

TIME SAMPLED (Military Time) [____]

DATE SAMPLED (Month - Day - Year) [____ - ____ - ____]

PCC MIX TEMPERATURE WHEN SAMPLED (°F) [____]

AMBIENT TEMPERATURE WHEN SAMPLED (°F) [____]

AIR CONTENT (PERCENT) [____.____]

UMP (INCHES) [____.____]

SPECIMENS FORMED FROM SAMPLE SPECIMEN NUMBER

CYLINDERS [G ____] [G ____]
 [G ____] [G ____]
 [G ____] [G ____]
 [L ____] [L ____]
 [L ____] [L ____]
 [L ____] [L ____]

BEAMS [F ____] [F ____]

LABORATORY ID CODE [____]

DATE SHIPPED [____ - ____ - ____]

NOTES : X denotes 14 day cure Y denotes 28 day cure Z denotes 365 day cure

GENERAL REMARKS: _____

CERTIFIED _____ VERIFIED AND APPROVED _____ DATE _____-____-19____
 Field Crew Chief SHRP Representative Month- Day- Year
 Affiliation: _____ Affiliation: _____

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING

SHEET NUMBER _____ OF _____

BULK SAMPLING OF SUBGRADE AND UNBOUND GRANULAR MATERIALS

SAMPLING DATA SHEET 12

IRP REGION _____ STATE _____
 SPS EXPERIMENT NO _____
 ROUTE/HIGHWAY _____ Lane _____ Direction _____
 SAMPLE/TEST LOCATION: Before Section After Section

STATE CODE _____
 SPS PROJECT CODE _____
 TEST SECTION NO. _____
 FIELD SET NO. 1

TECHNICIAN _____ EQUIPMENT _____ EXPLORATION DATE ____-____-____

SAMPLING AREA NO: SA-_____ LOCATION: STATION _____ OFFSET _____ feet from 0/s

SAMPLING LOCATION NUMBER _____

PIT SIZE: (a) Length _____ feet (b) Width _____ feet

LAYER NUMBER: _____ (SUBGRADE _____ GRADED AGGREGATE BASE _____)

Scale (Inches)	Strata Change (Inches)	Moisture Sample No.	Bulk Sample No.	Material Description	Material Code
4					
12					
16					

GENERAL REMARKS: _____

CERTIFIED

 Field Crew Chief
 Affiliation: _____

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

DATE
 ____-____-19____
 Month- Day- Year

PLATE BEARING TEST RESULTS

SAMPLING DATA SHEET 13

SHRP REGION _____ STATE _____
SPS EXPERIMENT NO _____
ROUTE/HIGHWAY _____ Lane _____ Direction _____
SAMPLE/TEST LOCATION: Within Section

STATE CODE _____
SPS PROJECT CODE _____
TEST SECTION NO. _____
FIELD SET NO. 1

TECHNICIAN _____

TEST DATE ____ - ____ - ____

LOCATION: STATION _____ OFFSET _____ feet from 0/s

SAMPLING LOCATION NUMBER _____

LAYER NUMBER: _____

(SUBGRADE _____ GRADED AGGREGATE BASE _____ PERMEABLE ASPHALT TREATED BASE _____)

1. AVERAGE TOTAL DEFLECTION (INCHES) _____

2. UNCORRECTED MODULUS OF SOIL REACTION (PSI/INCH) _____

CORRECTED MODULUS OF SOIL REACTION (PSI/INCH) [_____]

NOTE: DATA SHEETS FOR THIS TEST PROTOCOL MUST BE COMPLETED AND ATTACHED TO THIS FORM.

GENERAL REMARKS: _____

CERTIFIED

Field Crew Chief
Affiliation: _____

VERIFIED AND APPROVED

SHRP Representative
Affiliation: _____

DATE
____ - ____ - 19____
Month- Day- Year

LABORATORY SHIPMENT SAMPLES INVENTORY

FIELD OPERATIONS INFORMATION FORM 1

SHRP REGION _____ STATE _____
 SPS EXPERIMENT NO _____
 ROUTE/HIGHWAY _____ Lane _____ Direction _____
 SAMPLE/TEST LOCATION: Before Section After Section
 Within Section

STATE CODE _____
 SPS PROJECT CODE _____
 TEST SECTION NO. _____
 FIELD SET NO. _____

FIELD WORK COMPLETED ON ____-____-____

Note: Use additional sheets if necessary. Include summary information (Field Operations Information Form 2-3) and "as actual" sampling location plan sheets with this material samples inventory. Enter the sampling area number in the left hand column. If sampling is "Within Section" enter the test section number preceded by the letter "S" such that S2 is section 2.

SA #	SAMPLE LOCATION	SAMPLE NUMBER	SAMPLE SIZE	SAMPLE TYPE	SAMPLE MATERIAL	SAMPLE CONDITION	LAB*

Enter number of laboratory, as specified below, each sample was sent to:

Lab No. (1) _____
 Lab No. (2) _____
 Lab No. (3) _____

GENERAL REMARKS: _____

RTIFIED

VERIFIED AND APPROVED

DATE

Field Crew Chief
 Affiliation: _____

SHRP Representative
 Affiliation: _____

_____-_____-19____
 Month- Day- Year

SUMMARY OF MATERIAL SAMPLES SENT TO EACH LABORATORY

FIELD OPERATIONS INFORMATION FORM 2-3

SHRP REGION _____ STATE _____ STATE CODE _____
 SPS EXPERIMENT NO _____ SPS PROJECT CODE _____
 ROUTE/HIGHWAY _____ Lane _____ Direction _____ TEST SECTION NO. _____
 FIELD SET NO. _____

LABORATORY _____ WORK COMPLETED ON ____-____-____

NOTE: This is a summary of material samples sent to each laboratory based on the information from Field Operations Information Form 1. Complete one form for each laboratory that material samples were sent.

LAYER NO. (From Subgrade)	MATERIAL/SAMPLE TYPE	TOTAL NUMBER OF SAMPLES
4	PCC CORES:	4" Diameter _____
4	PCC Molded Cylinders	_____
4	PCC Molded Beams	_____
4	AC CORES:	4" Diameter _____
4	AC BULK SAMPLES: 100 Pound Samples	_____
3	UNBOUND BASE SAMPLES: (a) BAGS (BULK) _____ (b) JARS (MOISTURE) _____	
2	EMBANKMENT (FILL) SAMPLES: (a) BAGS (BULK) _____ (b) JARS (MOISTURE) _____	
1	SUBGRADE SAMPLES: (a) BAGS (BULK) _____ (b) JARS (MOISTURE) _____	
	(c) THIN-WALLED TUBES _____ (d) SPLITSPOON _____ JARS	

GENERAL REMARKS: _____

CERTIFIED _____ VERIFIED AND APPROVED _____ DATE _____
 Field Crew Chief _____ SHRP Representative _____
 filiation: _____ Affiliation: _____
 _____ - ____ -19 ____
 Month- Day- Year

LABORATORY SHIPMENT SAMPLES INVENTORY - MOLDED CONCRETE

FIELD OPERATIONS INFORMATION FORM 3-1

IRP REGION _____ STATE _____
 SPS EXPERIMENT NO _____
 ROUTE/HIGHWAY _____ Lane _____ Direction _____

STATE CODE _____
 SPS PROJECT CODE _____
 TEST SECTION NO. _____
 FIELD SET NO. _____

FIELD WORK COMPLETED ON ____ - ____ - ____

Note: Use one form for all fresh PCC samples collected for all sampling areas. Use additional sheets if necessary. Include "as actual" sampling location plan sheets with this material samples inventory.

SAMPLE LOCATION	SPECIMEN NUMBERS OF MOLDED SPECIMENS

LABORATORY ID CODE [_____]

MOLDED PCC SPECIMENS SENT TO LABORATORY

LAYER NO. (From Subgrade)	SPECIMEN TYPE	TOTAL NUMBER OF SAMPLES
4	PCC Molded Cylinders	_____
4	PCC Molded Beams	_____

GENERAL REMARKS: _____

CERTIFIED _____ VERIFIED AND APPROVED _____ DATE _____
 eld Crew Chief SHRP Representative -_____-19
 affiliation: _____ Affiliation: _____ Month- Day- Year

SPS-8 CONSTRUCTION DATA SHEET 1 PROJECT 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. TYPE OF PAVEMENT (01 for Granular Base, 02 for Treated Base) [__ __.]
- 8. NUMBER OF THROUGH LANES (ONE DIRECTION) [__.]
- *9. DATE OF CONSTRUCTION COMPLETION (Month/Year) [__ __/__ __]
- *10. DATE OPENED TO TRAFFIC (Month/Year) [__ __/__ __]
- 11. CONSTRUCTION COSTS PER LANE MILE (In \$1000) [__ __ __ __.]
- 12. DIRECTION OF TRAVEL [__.]
 East Bound... 1 West Bound... 2 North Bound... 3
 South Bound... 4
- PROJECT STARTING POINT LOCATION
- *13. MILEPOINT [__ __ __. __ __]
- *14. ELEVATION [__ __ __ __]
- *15. LATITUDE [__ __ ° __ __ ' __ __ . __ __"]
- *16. LONGITUDE [__ __ ° __ __ ' __ __ . __ __"]
- 17. ADDITIONAL LOCATION INFORMATION (SIGNIFICANT LANDMARKS): [_____]

- 18. HPMS SAMPLE NUMBER (HPMS ITEM 28) [__ __ __ __ __ __ __ __]
- 19. HPMS SECTION SUBDIVISION (HPMS ITEM 29) [__.]

SPS-8 CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [_ _] * SPS PROJECT CODE [_ _] * TEST SECTION NO. [_ _]
--	--

- *1. LANE WIDTH (FEET) [_ _ .]
2. MONITORING SITE LANE NUMBER [_ .]
(LANE 1 IS OUTSIDE LANE, NEXT TO SHOULDER
LANE 2 IS NEXT TO LANE 1, ETC.)
- *3. SUBSURFACE DRAINAGE LOCATION [_ .]
Continuous Along Test Section... 1 Intermittent... 2 None... 3
- *4. 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 | <u>INSIDE
SHOULDER</u> | <u>OUTSIDE
SHOULDER</u> |
|---|----------------------------|-----------------------------|
| *5. SURFACE TYPE [_ .] [_ .] | [_ .] | [_ .] |
| Turf... 1 Granular... 2 Asphalt Concrete... 3
Concrete... 4 Surface Treatment... 5
Other (Specify)... 6 _____ | | |
| *6. TOTAL WIDTH (FEET) | [_ _ .] | [_ _ .] |
| *7. PAVED WIDTH (FEET) | [_ _ .] | [_ _ .] |
| 8. SHOULDER BASE TYPE (CODES-TABLE A.6) | [_ _ .] | [_ _ .] |
| 9. SURFACE THICKNESS (INCHES) | [_ _ . _] | [_ _ . _] |
| 10. SHOULDER BASE THICKNESS (INCHES) | [_ _ . _] | [_ _ . _] |
| 11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) | | [_ . _] |
| 12. SPACING OF LATERALS (FEET) | | [_ _ _ .] |

PREPARER _____

EMPLOYER _____

DATE _____

SPS-8 CONSTRUCTION DATA SHEET 3 REFERENCE PROJECT STATION TABLE	* STATE CODE [] * SPS PROJECT CODE [] * TEST SECTION NO. []
---	---

ORDER	*1 TEST SECTION ID NO	REFERENCE PROJECT STATION NUMBER		*4 CUT-FILL ¹	
		*2 START	*3 END	TYPE	STATION
1	-----	0 + 0 0	----- +	---	+---
2	-----	----- +	----- +	---	+---
3	-----	----- +	----- +	---	+---
4	-----	----- +	----- +	---	+---
5	-----	----- +	----- +	---	+---
6	-----	----- +	----- +	---	+---
7	-----	----- +	----- +	---	+---
8	-----	----- +	----- +	---	+---
9	-----	----- +	----- +	---	+---
10	-----	----- +	----- +	---	+---
11	-----	----- +	----- +	---	+---
12	-----	----- +	----- +	---	+---
13	-----	----- +	----- +	---	+---
14	-----	----- +	----- +	---	+---
15	-----	----- +	----- +	---	+---
16	-----	----- +	----- +	---	+---
17	-----	----- +	----- +	---	+---
18	-----	----- +	----- +	---	+---
19	-----	----- +	----- +	---	+---
20	-----	----- +	----- +	---	+---

*5 INTERSECTIONS BETWEEN TEST SECTION ON THE PROJECT RAMP | ---INTERSECTION--- |

ROUTE	PROJECT STATION NO.	EXIT	ENT	STOP SIGNAL	UNSIG
-----	----- +	---	---	---	---
-----	----- +	---	---	---	---
-----	----- +	---	---	---	---

Note 1. Indicate the type of subgrade section the test section is located on:
 Cut.... 1 Fill..... 2 At-Grade..... 3 Cut and Fill..... 4
 If cut-fill transition is located in a test section, enter test section station of the cut-fill transition location.

SPS-8 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 THICKNESSES (Inches)			
			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 (FEET) [.]
 (Rock, Stone, Dense Shale)

NOTES:

- Layer 1 is the subgrade soil, the highest numbered layer is the pavement surface.
- 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.....07 Embankment (Fill).....11
 HMAC Layer (Subsurface).04 Interlayer.....08
- 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.
- Enter the average thickness of each layer and the minimum, maximum and standard deviation of the thickness measurements, if known.

SPS-8 CONSTRUCTION DATA SHEET 5 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* STATE CODE [] [] * SPS PROJECT CODE [] [] * TEST SECTION NO. [] []
--	--

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

COMPOSITION OF COARSE AGGREGATE TYPE PERCENT

*2. Crushed Stone... 1 Gravel... 2 Crushed Gravel... 3 [] [] [] []

*3. Crushed Slag... 4 Manufactured Lightweight... 5 [] [] [] []

*4. Other (Specify)... 6 _____ [] [] [] []

COMPOSITION OF FINE AGGREGATE TYPE PERCENT

*5. Natural Sand... 1 [] [] [] []

*6. Crushed or Manufactured Sand (From Crushed Gravel or [] [] [] []

Stone... 2 Recycled Concrete... 3 [] [] [] []

Other (Specify)... 4 _____ [] [] [] []

*8. TYPE OF MINERAL FILLER []

Stone Dust... 1 Hydrated Lime... 2 Portland Cement... 3

Fly Ash... 4

Other (Specify)... 5 _____

BULK SPECIFIC GRAVITIES:

*9. Coarse Aggregate (AASHTO T85 or ASTM C127) [] [] [] []

*10. Fine Aggregate (AASHTO T84 or ASTM C128) [] [] [] []

*11. Mineral Filler (AASHTO T100 or ASTM D854) [] [] [] []

*12. Aggregate Combination (Calculated) [] [] [] []

13. Effective Specific Gravity of Aggregate Combination [] [] [] []
(Calculated)

AGGREGATE DURABILITY TEST RESULTS
(SEE DURABILITY TEST TYPE CODES, TABLE A.13)

	<u>TYPE OF TEST</u>	<u>RESULTS</u>
--	---------------------	----------------

14. Coarse	[] []	[] [] [] []
------------	---------	-----------------

15. Coarse	[] []	[] [] [] []
------------	---------	-----------------

16. Coarse	[] []	[] [] [] []
------------	---------	-----------------

17. Coarse and Fine - Combined	[] []	[] [] [] []
--------------------------------	---------	-----------------

18. POLISH VALUE OF COARSE AGGREGATES _____
SURFACE LAYER ONLY (AASHTO T279, ASTM D3319)

SPS-8 CONSTRUCTION DATA SHEET 6 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE [_ _] * SPS PROJECT CODE [_ _] * TEST SECTION NO. [_ _]
---	--

- *1. LAYER NUMBER (FROM SHEET 4) [_]
- *2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [_ _]
 (IF OTHER, SPECIFY) _____
- *3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [_ _]
 (IF OTHER, SPECIFY) _____

4. SPECIFIC GRAVITY OF ASPHALT CEMENT [_ . _ _]
 (AASHTO T228)

GENERAL ASPHALT CEMENT PROPERTIES (If available from supplier)

- 5. VISCOSITY OF ASPHALT AT 140°F (POISES)
 (AASHTO T202) [_ _ _ _ .]
- 6. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES)
 (AASHTO T202) [_ _ _ . _]
- 7. PENETRATION AT 77°F (AASHTO T49) (TENTHS OF A MM)
 (100 g., 5 sec.) [_ _ _ .]

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

- | | <u>TYPE</u> | <u>QUANTITY (%)</u> |
|--|-------------|---------------------|
| 8. MODIFIER #1 | [_ _] | [_ _ .] |
| 9. MODIFIER #2
(IF OTHER, SPECIFY) _____ | [_ _] | [_ _ .] |
| 10. DUCTILITY AT 77°F (CM)
(AASHTO T51) | | [_ _ _ .] |
| 11. DUCTILITY AT 39.2°F (CM)
(AASHTO T51) | | [_ _ _ .] |
| 12. TEST RATE FOR DUCTILITY MEASUREMENT
AT 39.2°F (CM/MIN) | | [_ _ _ .] |
| 13. PENETRATION AT 39.2°F (AASHTO T49) (TENTHS OF A MM)
(200 g., 60 sec.) | | [_ _ _ .] |
| 14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) | | [_ _ _ .] |

NOTE: If emulsified or cutback asphalt was used, enter "N" in the spaces for "Original Asphalt Cement Properties".

SPS-8 CONSTRUCTION DATA SHEET 7 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [___] * SPS PROJECT CODE [___] * TEST SECTION NO. [___]
--	--

- *1. LAYER NUMBER (FROM SHEET 4) [___]
- *2. TYPE OF SAMPLES [___]
 - SAMPLES COMPACTED IN LABORATORY 1
 - SAMPLES TAKEN FROM TEST SECTION 2
- *3. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) [___ . ___ ___]
 (AASHTO T209 OR ASTM D2041)

 BULK SPECIFIC GRAVITY (ASTM D1188)
- *4. MEAN [___ . ___ ___] NUMBER OF TESTS [___ .]
- 5. MINIMUM [___ . ___ ___] MAXIMUM [___ . ___ ___]
- 6. STD. DEV. [___ . ___ ___]
- ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX)
 (AASHTO T164 OR ASTM D2172)
- *7. MEAN [___ . ___ ___] NUMBER OF SAMPLES [___ .]
- 8. MINIMUM [___ . ___ ___] MAXIMUM [___ . ___ ___]
- 9. STD. DEV [___ . ___ ___]
- PERCENT AIR VOIDS
- *10. MEAN [___ . ___ ___] NUMBER OF SAMPLES [___ .]
- 11. MINIMUM [___ . ___ ___] MAXIMUM [___ . ___ ___]
- 12. STD. DEV. [___ . ___ ___]
- *13. VOIDS IN MINERAL AGGREGATE (PERCENT) [___ . ___]
- *14. EFFECTIVE ASPHALT CONTENT (PERCENT) [___ . ___]
- *15. MARSHALL STABILITY (LBS) (AASHTO T245 OR ASTM D1559) [___ . ___]
- *16. NUMBER OF BLOWS [___]
- *17. MARSHALL FLOW (HUNDREDTHS OF AN INCH) [___ . ___]
 (AASHTO T245 OR ASTM D1559)
- *18. HVEEM STABILITY (AASHTO T246 OR ASTM D1561) [___ . ___]
- *19. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) [___ . ___]
 (AASHTO T246 OR ASTM 1561)

PREPARER _____ EMPLOYER _____ DATE _____

SPS-8 CONSTRUCTION DATA SHEET 8 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES (CONTINUED)	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
--	---

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

- *2. TYPE OF SAMPLES [__]
 - SAMPLES COMPACTED IN LABORATORY... 1
 - SAMPLES TAKEN FROM TEST SECTION... 2

- *3. TYPE ASPHALT PLANT [__]
 - BATCH PLANT... 1 DRUM MIX PLANT... 2
 - OTHER (SPECIFY)... 3 _____

- *4. TYPE OF ANTISTRIPPING AGENT USED [__ __]
 - (SEE TYPE CODES, TABLE A.21)
 - OTHER (SPECIFY) _____

- *5. AMOUNT OF ANTISTRIPPING AGENT USED LIQUID OR SOLID CODE [__]

- *6. (If liquid, enter code 1, and amount as percent [__ __. __]
 of asphalt cement weight. If solid, enter code
 2 and amount as percent of aggregate weight.)

SPS-8 CONSTRUCTION DATA SHEET 9 PLANT-MIXED ASPHALT BOUND LAYERS PLACEMENT DATA	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
--	---

- *1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [__ __ - __ __ - __ __]
- *2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [__ __ - __ __ - __ __]
- *3. ASPHALT CONCRETE PLANT AND HAUL

Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[__] _____	[__ __ __]	[__ __]	[__] [__] [__]
Plant 2	[__] _____	[__ __ __]	[__ __]	[__] [__] [__]
Plant 3	[__] _____	[__ __ __]	[__ __]	[__] [__] [__]

Plant Type: Batch..... 1 Drum Mix.... 2 Other... 3 Specify _____
- 4. MANUFACTURER OF ASPHALT CONCRETE PAVER _____
- 5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER _____
- 6. SINGLE PASS LAYDOWN WIDTH (Feet) [__ __.]
- 7. AC BINDER COURSE LIFT

Layer Number	[__ __]
Nominal First Lift Placement Thickness (Inches)	[__ . __]
Nominal Second Lift Placement Thickness (Inches)	[__ . __]
- 8. AC SURFACE COURSE LIFT

Layer Number	[__ __]
Nominal First Lift Placement Thickness (Inches)	[__ . __]
Nominal Second Lift Placement Thickness (Inches)	[__ . __]
- 9. SURFACE FRICTION COURSE (If Placed)

Layer Number	[__ __]
Nominal Placement Thickness (Inches)	[__ . __]
- 10. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)

Binder Course	[__ + __ __]
Surface Course	[__ + __ __]
Surface Friction Course	[__ + __ __]
- 11. LOCATION OF LONGITUDINAL SURFACE JOINT [__]

Between lanes.. 1 Within lane.. 2

(specify offset from O/S feet) [__ __.]
- 12. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.) _____

SPS-8 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS COMPACTION DATA	* STATE CODE [_ _] * SPS PROJECT CODE [_ _] * TEST SECTION NO. [_ _]
--	--

- *1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [_ _ - _ _ - _ _]
- *2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [_ _ - _ _ - _ _]
- *3. LAYER NUMBER [_]
- *4. MIXING TEMPERATURE (°F) [_ _ .]
- 5. LAYDOWN TEMPERATURES (°F)

Mean.....	— — .	Number of Tests	— — .
Minimum.....	— — .	Maximum.....	— — .
Standard Deviation...	— — .		

ROLLER DATA

Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A Steel-Whl Tandem	— — .				
7	B Steel-Whl Tandem	— — .				
8	C Steel-Whl Tandem	— — .				
9	D Steel-Whl Tandem	— — .				
10	E Pneumatic-Tired	— — .				
11	F Pneumatic-Tired	— — .				
12	G Pneumatic-Tired	— — .				
13	H Pneumatic-Tired	— — .				
14	I Single-Drum Vibr.	— — .				
15	J Single-Drum Vibr.	— — .				
16	K Single-Drum Vibr.	— — .				
17	L Single-Drum Vibr.	— — .				
18	M Double-Drum Vibr.	— — .				
19	N Double-Drum Vibr.	— — .				
20	O Double-Drum Vibr.	— — .				
21	P Double-Drum Vibr.	— — .				
22	Q Other					

COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
BREAKDOWN				
23 Roller Code (A-Q)	—	—	—	—
24 Coverages	— — .	— — .	— — .	— — .
INTERMEDIATE				
25 Roller Code (A-Q)	—	—	—	—
26 Coverages	— — .	— — .	— — .	— — .
FINAL				
27 Roller Code (A-Q)	—	—	—	—
28 Coverages	— — .	— — .	— — .	— — .
29 Air Temperature (°F)	— — — .	— — — .	— — — .	— — — .
30 Compacted Thickness (In)	— . —	— . —	— . —	— . —
31 Curing Period (Days)	— — .	— — .	— — .	— — .

SPS-8 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS DENSITY AND PROFILE DATA	* STATE CODE [_ _] * SPS PROJECT CODE [_ _] * TEST SECTION NO. [_ _]
---	---

1. NUCLEAR DENSITY MEASUREMENTS

LAYER TYPE	Binder Course	Surface Course	Surface Friction Layer
Measurement Method (A, B, C) ¹	—	—	—
Number of Measurement	— —	— —	— —
Average (pcf)	— — — . —	— — — . —	— — — . —
Maximum (pcf)	— — — . —	— — — . —	— — — . —
Minimum (pcf)	— — — . —	— — — . —	— — — . —
Standard Deviation (pcf)	— — — . —	— — — . —	— — — . —
Layer Number	— —	— —	— —

¹ Measurement Method Backscatter... A Direct Transmission... B Air Gap... C

2. MANUFACTURER OF NUCLEAR DENSITY GAUGE _____

3. NUCLEAR DENSITY GAUGE MODEL NUMBER _____

4. NUCLEAR DENSITY GAUGE IDENTIFICATION NUMBER _____

5. NUCLEAR GAUGE COUNT RATE FOR STANDARDIZATION _____

6. PROFILOGRAPH MEASUREMENTS

Profilograph Type California... 1 Rainhart... 2 _____
 Profile Index (Inches/Mile) _____
 Interpretation Method Manual.. 1 Mechanical.. 2 Computer.. 3 _____
 Height of Blanking Band (Inches) _____
 Cutoff Height (Inches) _____

7. SURFACE PROFILE USED AS BASIS OF INCENTIVE PAYMENT? (YES, NO) _____

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [] * SPS PROJECT CODE [] * TEST SECTION NO. []
---	---

SHEET _____ OF _____

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches)			
		DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
+					
+					
+					
+					
+					
+					
+					
+					
+					
LAYER NUMBER					

SPS-8 CONSTRUCTION DATA SHEET 13 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
--	--

- *1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [__ __-__ __-__ __]
- *2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [__ __-__ __-__ __]
- *3. LAYER NUMBER (From Sheet 4) [__]

PRIMARY COMPACTION EQUIPMENT

- *4. CODE TYPE [__]
- COMPACTION TYPE CODES
 Pneumatic - Tired... 1 Steel Wheel Tandem... 2 Single Drum Vibr.... 3
 Double Drum Vibr.... 4
 Other (Specify)... 5 _____

- *5. GROSS WEIGHT (TONS) [__ __. __]

- *6. LIFT THICKNESSES
- Nominal First Lift Placement Thickness (inches) [__ __]
 Nominal Second Lift Placement Thickness (inches) [__ __]
 Nominal Third Lift Placement Thickness (inches) [__ __]
 Nominal Fourth Lift Placement Thickness (inches) [__ __]

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

- 7. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) _____

SPS-8 CONSTRUCTION DATA SHEET 14 SUBGRADE PREPARATION	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
---	--

- *1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [__ __ - __ __ - __ __]
- *2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [__ __ - __ __ - __ __]

PRIMARY COMPACTION EQUIPMENT

- *3. CODE TYPE [__]

COMPACTION EQUIPMENT TYPE CODES

Sheepsfoot... 1 Pneumatic Tired... 2 Steel Wheel Tandem... 3
 Single Drum Vibr.... 4 Double Drum Vibr.... 5
 Other (Specify)... 6 _____

- *4. GROSS WEIGHT (TONS) [__ __. __]

- | | <u>TYPE</u> | <u>PERCENT</u> |
|-------------------------|-------------|----------------|
| *5. STABILIZING AGENT 1 | [__] | [__ __. __] |
| *6. STABILIZING AGENT 2 | [__] | [__ __. __] |

STABILIZING AGENT TYPE CODES

Portland Cement... 1 Lime... 2 Fly Ash, Class C... 3
 Fly Ash, Class N... 4
 Other (Specify)... 5 _____

- *7. TYPICAL LIFT THICKNESS (INCHES) [__ __]
 (For Fill Sections Only)

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

- 8. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) _____

SPS-8 CONSTRUCTION DATA SHEET 15 CUT-FILL SECTION LOCATIONS	* STATE CODE [_ _] * SPS PROJECT CODE [_ _] * TEST SECTION NO. [_ _]
---	---

ORDER	*1 CUT-FILL ¹	REFERENCE PROJECT STATION NUMBER		*4 TEST SECTION NO
		*2 START	*3 END	
1	_____	0 + 0 0	+ _____	_____
2	_____	+ _____	+ _____	_____
3	_____	+ _____	+ _____	_____
4	_____	+ _____	+ _____	_____
5	_____	+ _____	+ _____	_____
6	_____	+ _____	+ _____	_____
7	_____	+ _____	+ _____	_____
8	_____	+ _____	+ _____	_____
9	_____	+ _____	+ _____	_____
10	_____	+ _____	+ _____	_____
11	_____	+ _____	+ _____	_____
12	_____	+ _____	+ _____	_____
13	_____	+ _____	+ _____	_____
14	_____	+ _____	+ _____	_____
15	_____	+ _____	+ _____	_____
16	_____	+ _____	+ _____	_____
17	_____	+ _____	+ _____	_____
18	_____	+ _____	+ _____	_____
19	_____	+ _____	+ _____	_____
20	_____	+ _____	+ _____	_____
21	_____	+ _____	+ _____	_____
22	_____	+ _____	+ _____	_____
23	_____	+ _____	+ _____	_____
24	_____	+ _____	+ _____	_____
25	_____	+ _____	+ _____	_____

- NOTES:
1. Indicate the type of subgrade section with one of the following:
 Cut... 1 Fill... 2
 2. A given Test Section No. will be repeated if both cut and fill sections exist within the test section.

September 1992

SPS-8 CONSTRUCTION DATA SHEET 16 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [_ _] * SPS PROJECT CODE [_ _] * TEST SECTION NO. [_ _]
---	--

PREPARER _____

EMPLOYER _____

DATE _____

SPS-8 CONSTRUCTION DATA SHEET 17 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
---	---

- * 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [__]
 - * 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [__ __ .__]
 - 3. (RANDOM JOINT SPACING, IF ANY:
 _____)
 - * 4. SKEWNESS OF JOINTS (ft/lane) [__.__]
 - * 5. TRANSVERSE CONTRACTION JOINT LOAD TRANSFER SYSTEM [__]
 - Round Dowels..... 1
 - Aggregate Interlock..... 2
 - Other (Specify) _____ 3
 - * 6. ROUND DOWEL DIAMETER (Inches) [__.__]
 - * 7. DOWEL SPACING (Inches) [__ __.]
 - 8. DISTANCE OF NEAREST DOWEL
 FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [__ __.]
 - 9. DOWEL LENGTH (Inches) [__ __.]
 - 10. DOWEL COATING [__]
 - Paint and/or Grease..... 1
 - Plastic..... 2
 - Monel..... 3
 - Stainless Steel..... 4
 - Epoxy..... 5
 - Other (Specify) _____ 6
 - 11. METHOD USED TO INSTALL MECHANICAL LOAD TRANSFER DEVICES [__]
 - Preplaced on Baskets..... 1
 - Mechanically Installed..... 2
 - Other (Specify) _____ 3
 - 12. DOWEL ALIGNMENT CHECKED BEFORE PLACEMENT (Y/N) [__]
 - 13. DOWEL ALIGNMENT CHECKED AFTER PLACEMENT (Y/N) [__]
- If Yes, describe method used _____
 (e.g. Pachometer, Ground Penetrating Radar)

SPS-8 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA (CONTINUED)	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
--	---

- * 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [__]
- * 2. METHOD USED TO FORM TRANSVERSE JOINTS [__]
 - Sawed..... 1 Metal Insert..... 3
 - Plastic Insert..... 2
 - Other (Specify) _____ 4
- * 3. TYPE OF LONGITUDINAL JOINT (BETWEEN LANES) [__]
 - Butt..... 1 Insert Weakened Plane..... 3
 - Sawed Weakened Plane..... 2
 - Other (Specify) _____ 4
- * 4. TYPE OF SHOULDER-TRAFFIC LANE JOINT [__]
 - Butt..... 1 Insert Weakened Plane..... 3
 - Sawed Weakened Plane..... 2
 - Other (Specify) _____ 4
- * 5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)..... [__. __]
- * 6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)..... [__ __.]
- 7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [__]
 - Preformed (Open Web)..... 1 Rubberized Asphalt..... 3
 - Asphalt..... 2 Low-Modulus Silicone..... 4
 - Other (Specify) _____ 5

TRANSVERSE JOINT SEALANT RESERVOIR (AS BUILT)

- 8. WIDTH, (Inches)..... [__. __]
- 9. DEPTH, (Inches)..... [__. __]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

- 10. WIDTH, (Inches)..... [__. __]
- 11. DEPTH, (Inches)..... [__. __]
- 12. BETWEEN LANE TIE BAR DIAMETER (Inches) [__. __]
- 13. BETWEEN LANE TIE BAR LENGTH (Inches) [__ __.]
- 14. BETWEEN LANE TIE BAR SPACING (Inches) [__ __.]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

- 15. WIDTH, (Inches)..... [__. __]
- 16. DEPTH, (Inches)..... [__. __]

SPS-8 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [___] * SPS PROJECT CODE [___] * TEST SECTION NO. [___]
---	--

- *1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [___]
 MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)
- *2. Coarse Aggregate (Pounds) [_____]
- *3. Fine Aggregate (Pounds) [_____]
- *4. Cement (Pounds) [_____]
- *5. Water (Pounds) [_____]
- *6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [___]
 (If Other, Specify _____)
- *7. ALKALI CONTENT OF CEMENT (PERCENT WEIGHT OF CEMENT) [___ . ___]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

	<u>TYPE CODE</u>	<u>AMOUNT</u>
*8. ADMIXTURE #1	[___]	[___ . ___]
*9. ADMIXTURE #2	[___]	[___ . ___]
*10. ADMIXTURE #3	[___]	[___ . ___]

(See Cement Admixture Codes, Table A.12)
 (If Other, Specify _____)

AGGREGATE DURABILITY TEST RESULTS
 (SEE DURABILITY TEST TYPE CODES, TABLE A.13)

	<u>TYPE OF AGGREGATE</u>	<u>TYPE OF TEST</u>	<u>RESULTS</u>
11.	Coarse	[___]	[_____ . ___]
12.	Coarse	[___]	[_____ . ___]
13.	Coarse	[___]	[_____ . ___]
14.	Coarse and Fine	[___]	[_____ . ___]

PREPARER _____ EMPLOYER _____ DATE _____

SPS-8 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
--	---

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

COMPOSITION OF COARSE AGGREGATE TYPE PERCENT

* 2. [__] [__ __ __.]

* 3. [__] [__ __ __.]

* 4. [__] [__ __ __.]

Crushed Stone.... 1 Manufactured gravel..... 2 Crushed Gravel..... 3
 Crushed Slag..... 4 Lightweight..... 5 Recycled Concrete... 6
 Other (Specify)_____ 7

* 5. GEOLOGIC CLASSIFICATION OF COARSE AGGREGATE [__ __.]
 (SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE TYPE PERCENT

* 6. [__] [__ __ __.]

* 7. [__] [__ __ __.]

* 8. [__] [__ __ __.]

Natural Sand... 1
 Crushed, Manufactured Sand (From Crushed Gravel or Stone)...2
 Recycled Concrete... 3 Other (Specify)_____ 4

9. INSOLUBLE RESIDUE, PERCENT (ASTM D3042) [__ __ __.]

10. GRADATION OF COARSE AGGREGATE 11. GRADATION OF FINE AGGREGATE

<u>Sieve Size</u>	<u>% Passing</u>	<u>Sieve Size</u>	<u>% Passing</u>
2".....	___ ___	No. 8.....	___ ___
1 1/2"....	___ ___	No. 10....	___ ___
1".....	___ ___	No. 16....	___ ___
7/8".....	___ ___	No. 30....	___ ___
3/4".....	___ ___	No. 40....	___ ___
5/8".....	___ ___	No. 50....	___ ___
1/2".....	___ ___	No. 80....	___ ___
3/8".....	___ ___	No. 100...	___ ___
No. 4.....	___ ___	No. 200...	___ ___

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [__. __ __]

13. Fine Aggregate (AASHTO T84 or ASTM C128) [__. __ __]

SPS-8 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [] * SPS PROJECT CODE [] * TEST SECTION NO. []
--	--

- *1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) []-[]-[]
- *2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) []-[]-[]
- *3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) []
- *4. CONCRETE MIX PLANT AND HAUL

	<u>Name</u>	<u>Haul Distance (Mi)</u>	<u>Time (Min)</u>
Plant 1	_____	[]-[]-[]	[]-[]-[]
Plant 2	_____	[]-[]-[]	[]-[]-[]
Plant 3	_____	[]-[]-[]	[]-[]-[]

- *5. PAVER TYPE []
Slip Form Paver.... 1 Side Form... 2
Other (Specify) _____ 3

6. PAVER MANUFACTURER AND MODEL NUMBER _____

7. SPREADER TYPE (if applicable) _____

8. SPREADER MANUFACTURER AND MODEL NUMBER _____

9. WIDTH PAVED IN ONE PASS (Feet) []-[]-[]

- 10. DOWEL PLACEMENT METHOD []
Dowel Bar Inserter (DBI)..... 1 Dowel Basket..... 2

11. NUMBER OF VIBRATORS []-[]

12. VIBRATOR SPACING (Inches) []-[]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) []-[]-[]

14. ADDITIONAL VIBRATION APPLIED _____

SPS-8 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
--	---

1. CONSOLIDATION OF MATERIALS [__]
 Internal Vibrators... 1 Vibrating Screeds... 2 Troweling... 3
 Rolling... 4 Tamping... 5
 Other (Specify)... 6 _____
2. FINISHING [__]
 Screeding... 1 Hand-Troweling... 2 Machine-Troweling... 3
 Other (Specify)... 4 _____
3. CURING [__]
 Membrane Curing Compound..... 1 Burlap-Polyethylene Blanket... 5
 Burlap Curing Blankets..... 2 Cotton Mat Curing..... 6
 Waterproof Paper Blankets..... 3 Hay..... 7
 White Polyethylene Sheeting... 4
 Other (Specify)_____ 8
4. TEXTURING [__]
 Tine..... 1 Grooved Float..... 4
 Broom..... 2 Astro Turf..... 5
 Burlap Drag..... 3 None..... 6
 Other (Specify)_____ 7

SPS-8 CONSTRUCTION DATA
 SHEET 23
 PORTLAND CEMENT CONCRETE SURFACE LAYER
 PROFILE DATA

* STATE CODE [_ _]
 * SPS PROJECT CODE [_ _]
 * TEST SECTION NO. [_ _]

1. DATE PROFILE MEASURED (Month-Day-Year) [_ _ - _ _ - _ _]
2. PROFILOGRAPH TYPE California... 1 Rainhart... 2 [_]
3. PROFILE INDEX (Inches/Mile) [_ _]
4. INTERPRETATION METHOD Manual.. 1 Mechanical.. 2 Computer.. 3 [_]
5. HEIGHT OF BLANKING BAND (Inches) [_ . _ _]
6. CUTOFF HEIGHT (Inches) [_ . _ _]
7. SURFACE PROFILE USED AS BASIS OF INCENTIVE PAYMENT? (YES, NO) [_]
8. WAS SURFACE PROFILE CORRECTED BY DIAMOND GRINDING? (YES, NO) [_]
- IF YES COMPLETE THE FOLLOWING:
9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [_ _ - _ _ - _ _]
10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [_ _ - _ _ - _ _]
- *11. REASON FOR GRINDING [_]
 Elimination of Faulting... 1 Elimination of Slab Warping... 2
 Improve Skid Resistance... 3
 Restoration of Transverse Drainage Slope... 4
 Correction of Construction Deficiencies... 5
 Other (Specify)... 6 _____
12. AVERAGE DEPTH OF CUT (Inches) [_ . _ _]
13. CUTTING HEAD WIDTH (Inches) [_ _ _ . _ _]
14. AVERAGE GROOVE WIDTH (Inches) [_ . _]
15. AVERAGE SPACING BETWEEN BLADES (Inches) [_ . _]

SPS-8 CONSTRUCTION DATA SHEET 24 FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
---	--

1. DATE PATCHING OPERATIONS BEGAN (Month-Day-Year) [__ __-__ __-__ __]
2. DATE PATCHING OPERATIONS COMPLETED (Month-Day-Year) [__ __-__ __-__ __]
3. PRIMARY DISTRESS OCCURRENCE PATCHED OR REPLACED WITH NEW SLAB [__ __]
 (See Table A.22 for Type Codes)
 Other (Specify) _____
4. SECONDARY DISTRESS OCCURRENCE PATCHED OR REPLACED WITH NEW SLAB [__ __]
 (See Table A.22 for Type Codes)
 Other (Specify) _____
5. PATCHES

	NUMBER	SQ. FEET
SLAB ONLY	[__ __]	[__ __ __ __.]
SLAB AND BASE	[__ __]	[__ __ __ __.]

6. PATCH MATERIAL USED [__]
 Portland Cement Concrete... 1 Polymer Concrete... 2 Epoxy Mortar... 3
 Other (Specify)... 4 _____
7. SLABS REPLACED

	NUMBER	SQ. FEET
SLAB ONLY	[__ __]	[__ __ __ __.]
SLAB AND BASE	[__ __]	[__ __ __ __.]

8. METHOD FOR PATCH BOUNDARY DETERMINATION [__]
 Visual... 1 Coring... 2 Deflection... 3
 State Standard or Specification... 4
 Other (Specify)... 5 _____
9. CUTTING INSTRUMENT [__]
 Diamond Blade Saw... 1 Carbide Blade Saw... 2 Wheel Saw... 3
 Air Hammer... 4
 Other (Specify)... 5 _____

SPS-8 CONSTRUCTION DATA SHEET 25 FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
---	---

1. SECURING LOAD TRANSFER DEVICES [__]
 None... 1 Grout Filler... 2 Epoxy filler... 3
 Other... 4 _____

2. REINFORCING STEEL PLACED IN PATCH [__]
 No... 1 Yes... 2

	<u>Temperature Steel</u>		<u>Dowel Bars</u>	<u>Tie Bars</u>
	<u>Transverse</u>	<u>Longitudinal</u>		
3. REBAR NUMBER DESIGNATION	[__ __]	[__ __]	[__ __]	[__ __]
4. BAR LENGTHS, Inches	[__ __ .__]	[__ __ .__]	[__ __ .__]	[__ __ .__]
5. BAR SPACING, Inches	[__ __ .__]	[__ __ .__]	[__ __ .__]	[__ __ .__]

6. DOWEL COATINGS [__]
 None... 1 Paint and/or Grease... 2 Plastic... 3
 Monel... 4 Stainless Steel... 5 Epoxy... 6
 Other (Specify)... 7 _____

7. NUMBER OF SAW CUTS PER PATCH (If Sawed) [__ __]

8. DEPTH OF TYPICAL BOUNDARY SAW CUT, Inches [__ __ .__]

9. CONCRETE BREAKUP [__]
 None... 1 Pneumatic Air Hammer... 2 Gravity Drop Hammer... 3
 Sawing... 4
 Other (Specify)... 5 _____

10. REMOVAL OF CONCRETE [__]
 Concrete Breakup and Cleanout... 1 Lift Out Intact Slab Section... 2
 Other (Specify)... 3 _____

SPS-8 CONSTRUCTION DATA SHEET 26 FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
---	---

1. METHOD OF REINFORCING STEEL PLACEMENT [__]
 Chairs... 1 Between Layers of Concrete... 2

2. MIXTURE DESIGN FOR PCC PATCH MATERIAL (lb./Cubic Yard)

Coarse Aggregate	[__ __ __ .]
Fine Aggregate	[__ __ __ .]
Cement	[__ __ __ .]
Water (Gallons/Cubic Yard)	[__ __ __ .]

3. CEMENT TYPE USED [__]
 (See Type Codes, Table A.11)

4. AIR CONTENT (Percent by Volume)

Mean	[__ __ .]
Range	[__ __ .] to [__ __ .]

5. ADMIXTURES [__]
 (See Cement Additive Codes, Table A.12) [__]

6. SLUMP (Inches)

Mean	[__ __ .]
Range	[__ __ .] to [__ __ .]

7. FLEXURAL STRENGTH (MODULUS OF RUPTURE) (psi) [__ __ __ .]
 (Based on 3rd Point Loading) Curing Time, Days [__]
 If Unavailable, and Other Strength Test Conducted,
 Enter Alternate Test [_____]

Type of Loading [_____]	
Age, Days [__ __];	Strength, psi [__ __ __ .]

8. AMBIENT CONDITIONS AT TIME OF PATCHING

Air Temperature °F	LOW [__ __ __ .]	HIGH [__ __ __ .]	
Surface Moisture - Dry = 1, Wet = 2			[__]

9. MAXIMUM SIZE OF COARSE AGGREGATE (Inches) [__ .]

10. CONSOLIDATION OF MATERIALS [__]
 Internal Vibrators... 1 Vibrating Screeds... 2 Troweling... 3
 Rolling... 4 Tamping... 5
 Other (Specify)... 6 _____

12. FINISHING [__]
 Screeding... 1 Hand-Troweling... 2 Machine-Troweling... 3
 Other (Specify)... 4 _____

SPS-8 CONSTRUCTION DATA SHEET 27 FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES (CONTINUED)	* STATE CODE [_ _] * SPS PROJECT CODE [_ _] * TEST SECTION NO. [_ _]
---	--

1. JOINT FORMING METHOD SHOULDER TRANSVERSE LONGITUDINAL
- [_] [_] [_]
- None... 1 Polyethylene Strip Insert... 2 Styrofoam Insert... 3
 Fiberboard Insert... 4 Sawing... 5 Forms... 6
 Other (Specify)... 7 _____
2. WAS BOND BREAKER USED BETWEEN ADJACENT LANES? [_]
- Yes... 1 No... 2
3. CURING METHOD METHOD 1 [_ _]
- METHOD 2 [_ _]
- None... 1 Membrane Curing Compound... 2
 Burlap Curing Blankets... 3 Waterproof Paper Blankets... 4
 White Polyethylene Sheeting... 5 Burlap-Polyethylene Blankets... 6
 Insulating Layers... 7 Cotton Mat Curing... 8 Hay... 9
 Other (Specify)... 10 _____
4. APPROXIMATE TYPICAL TIME BETWEEN PATCHING AND OPENING TO TRAFFIC, HOURS [_ _ .]
5. TYPE OF TRANSVERSE JOINTS IN PATCHES _____ OR SLABS _____
- None... 1 All Expansion Joints... 2 All Contraction Joints... 3
 Mixture of Expansion and Contraction Joints... 4
6. WERE OLD JOINTS MATCHED? [_]
- Yes... 1 No... 2

SPS-8 CONSTRUCTION DATA SHEET 28 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [_ _] * SPS PROJECT CODE [_ _] * TEST SECTION NO. [_ _]
--	--

Provide any miscellaneous comments and notes concerning construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indication of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

APPENDIX B

SHRP-LTPP DATA COLLECTION STANDARD CODES

(Reproduced from Appendix A of the SHRP-LTPP Data Collection Guide)

Revised August 30, 1989

APPENDIX A. STANDARD CODES

This appendix provides standard codes to simplify entry of data during collection and the subsequent storage and processing of this data. These codes are tabulated as follows:

Table A.1	Standard Codes for States, District of Columbia, Puerto Rico, American Protectorates, and Canadian Provinces
Table A.2	Functional Class Codes
Table A.3	Experiment Type Definitions for LTPP
Table A.4	Pavement Type Codes
Table A.5	Pavement Surface Material Type Classification Codes
Table A.6	Base and Subbase Material Type Classification Codes
Table A.7	Subgrade Soil Description Codes
Table A.8	Material Type Codes for Thin Seals and Interlayers
Table A.9	Geologic Classification Codes
Table A.10	Soil Type Codes, AASHTO Soil Classification
Table A.11	Portland Cement Type Codes
Table A.12	Portland Cement Concrete Admixture Codes
Table A.13	Aggregate Durability Test Type Codes
Table A.14	Asphalt Refiners and Processors in the United States
Table A.15	Asphalt Cement Modifier Codes
Table A.16	Grades of Asphalt, Emulsified Asphalt, and Cutback Asphalt Codes
Table A.17	Maintenance and Rehabilitation Work Type Codes
Table A.18	Maintenance Location Codes
Table A.19	Maintenance Materials Type Codes
Table A.20	Recycling Agent Type Codes
Table A.21	Anti-Stripping Agent Type Codes
Table A.22	Distress Types

Revised June 13, 1988

Table A.1. Table of Standard Codes for States, District of Columbia,
Puerto Rico, American Protectorates and Canadian Provinces.

<u>State</u>	<u>Code</u>	<u>State</u>	<u>Code</u>
Alabama	01	New York	36
Alaska	02	North Carolina	37
Arizona	04	North Dakota	38
Arkansas	05	Ohio	39
California	06	Oklahoma	40
Colorado	08	Oregon	41
Connecticut	09	Pennsylvania	42
Delaware	10	Rhode Island	44
District of Columbia	11	South Carolina	45
Florida	12	South Dakota	46
Georgia	13	Tennessee	47
Hawaii	15	Texas	48
Idaho	16	Utah	49
Illinois	17	Vermont	50
Indiana	18	Virginia	51
Iowa	19	Washington	53
Kansas	20	West Virginia	54
Kentucky	21	Wisconsin	55
Louisiana	22	Wyoming	56
Maine	23	American Samoa	60
Maryland	24	Guam	66
Massachusetts	25	Puerto Rico	72
Michigan	26	Virgin Islands	78
Minnesota	27	Alberta	81
Mississippi	28	British Columbia	82
Missouri	29	Manitoba	83
Montana	30	New Brunswick	84
Nebraska	31	Newfoundland	85
Nevada	32	Nova Scotia	86
New Hampshire	33	Ontario	87
New Jersey	34	Prince Edward Island	88
New Mexico	35	Quebec	89
		Saskatchewan	90

Note: The U.S. codes are consistent with the Federal
Information Processing Standards (FIPS) and HPMS

Table A.2. Functional class codes.

<u>Functional Class</u>	<u>Code</u>
Rural:	
Principal Arterial - Interstate.....	01
Principal Arterial - Other.....	02
Minor Arterial.....	06
Major Collector.....	07
Minor Collector.....	08
Local Collector.....	09
Urban:	
Principal Arterial - Interstate.....	11
Principal Arterial - Other Freeways or Expressways.....	12
Other Principal Arterial.....	14
Minor Arterial.....	16
Collector.....	17
Local.....	19

Note: These codes are consistent with the HPMS system.

Table A.3. Detailed Descriptions of Pavements for Each LTPP
General Pavement Studies Experiment.

(01) ASPHALT CONCRETE PAVEMENT WITH GRANULAR BASE

Acceptable pavements for this study include a dense-graded hot mix asphalt concrete (HMAC) surface layer (1), with or without other HMAC layers (28), placed over untreated granular base (22 or 23). One or more subbase layers (22, 23, 24, 25, 26, 42, or 43) may also be present, but are not required. Two or more consecutive lifts of the same mixture design are to be treated as one layer. "Full depth" asphalt concrete pavements are also included in this study. They include an HMAC surface layer (1) and usually one or more HMAC layers (28) beneath the surface, with a minimum total HMAC thickness of 8 inches placed directly upon treated or untreated subgrade. For "full depth" asphalt concrete pavements, a base layer (Layer Description 5) of zero thickness and material code 21 should be indicated. If a treated subgrade (42 or 43) is present, it should be shown as a subbase (Layer Description 6). Seal coats or porous friction courses are allowed on the surface, but not in combination, i.e., a porous friction course placed over a seal coat is not acceptable. Seal coats are also permissible on top of granular base layers. At least one layer of dense graded HMAC is required, regardless of the existence of seal coats or porous friction courses.

(02) ASPHALT CONCRETE PAVEMENT WITH BOUND BASE

Acceptable pavements for this study include a dense-graded HMAC surface layer (1) with or without other HMAC layers (28), placed over a bound base layer (27-39, 42-44, 46). To properly account for a variety of bound base types in the sampling design, two classifications of binder types, bituminous and non-bituminous, are defined as the factor levels. Bituminous binders include asphalt cements, cutbacks, emulsions, and road tars. Non-bituminous binders include all hydraulic cements (those which harden by a chemical reaction with water and are capable of hardening under water), lime, fly ashes and natural pozzolans, or combinations thereof. Stabilized bases with lower quality materials such as sand asphalt or soil cement are also allowed. Stabilization practices of primary concern for this study are those in which the structural characteristics of the material are improved due to the cementing action of the stabilizing agent. Thus, the description of the study actually refers to treatments improving the structural properties of the base materials. Two or more consecutive lifts of the same mixture design are to be treated as one layer. One or more subbase layers (22, 23, 24, 25, 26, 42, or 43) may be present but are not required. Seal coats or porous friction courses are permitted on the surface but not in combination, i.e., a porous friction course placed over a seal coat is not acceptable. Project selection is often to those constructed on both fine and coarse subgrades (51-65).

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Table A.3. Detailed Descriptions of Pavements for Each LTPP
General Pavement Studies Experiment (Continued).

(07) AC OVERLAY OF JOINTED CONCRETE PAVEMENT

Acceptable pavements for this study include a dense-graded HMAC surface layer (1) with or without other HMAC layers (28) placed on either a JPCP (4), JRCP (5), or CRCP (6). The slab may rest on any combination of base and/or subbase layers indicated in Table A.6 (except 45). The previously existing concrete slab may also have been placed directly on lime or cement treated fine or coarse-grained subgrade (27, 42, and 43), or on untreated coarse-grained subgrade (57-65). Slabs placed directly on untreated fine-grained subgrade (51-56) are not acceptable. Seal coats or porous friction courses are permissible, but not in combination. Fabric interlayers (75 or 76) and SAMIs (77) are acceptable when placed between the original surface (concrete) and the overlay. Overlaid pavements with aggregate interlayers (79) and open-graded asphalt concrete (80) will not be considered in this study. The total thickness of HMAC used in the overlay must be at least 1.5 inches. Pavements which have been overlaid more than once since they were originally constructed are not acceptable. Pavements in both bad and good condition as measured by levels of specific distress types present prior to the overlay are needed.

(09) UNBONDED JCP OVERLAYS OF CONCRETE PAVEMENT

Acceptable projects for this study include unbonded JPCP (4), JRCP (5), or CRCP (6) overlay with a thickness of 5 inches or more placed over an existing JPCP (4), JRCP (5), or CRCP (6) pavement. The overlaid concrete pavement may rest on any of the base and subbase types listed in Table A.6 or directly upon subgrade.

Table A.4 Pavement Type Codes

<u>Type of Pavement</u>	<u>Code</u>
<u>Asphalt Concrete (AC) Surfaced Pavements:</u>	
AC With Granular Base.....	01
AC With Bituminous Treated Base.....	02
AC With Non-Bituminous Treated Base.....	07
AC Overlay on AC Pavement.....	03
AC Overlay on JPCP Pavement.....	28
AC Overlay on JRCP Pavement.....	29
AC Overlay on CRCP Pavement.....	30
Other.....	10
<u>Portland Cement Concrete Surfaced Pavements:</u>	
JPCP - Placed Directly On Untreated Subgrade.....	11
JRCP - Placed Directly On Untreated Subgrade.....	12
CRCP - Placed Directly On Untreated Subgrade.....	13
JPCP - Placed Directly On Treated Subgrade.....	14
JRCP - Placed Directly On Treated Subgrade.....	15
CRCP - Placed Directly On Treated Subgrade.....	16
JPCP - Over Unbound Base.....	17
JRCP - Over Unbound Base.....	18
CRCP - Over Unbound Base.....	19
JPCP Over Bituminous Treated Base.....	20
JRCP Over Bituminous Treated Base.....	21
CRCP Over Bituminous Treated Base.....	22
JPCP Over Non-Bituminous Treated Base.....	23
JRCP Over Non-Bituminous Treated Base.....	24
CRCP Over Non-Bituminous Treated Base.....	25
JPCP Overlay on JPCP Pavement.....	31
JPCP Overlay on JRCP Pavement.....	33
JPCP Overlay on CRCP Pavement.....	35
JRCP Overlay on JPCP Pavement.....	32
JRCP Overlay on JRCP Pavement.....	34
JRCP Overlay on CRCP Pavement.....	36
CRCP Overlay on JPCP Pavement.....	38
CRCP Overlay on JRCP Pavement.....	39
CRCP Overlay on CRCP Pavement.....	37
JPCP Overlay on AC Pavement.....	04
JRCP Overlay on AC Pavement.....	05
CRCP Overlay on AC Pavement.....	06
Prestressed Concrete Pavement.....	40
Other.....	49

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Table A.4 Pavement Type Codes
(Continued)

*Composite Pavements (Wearing Surface Included in Initial Construction):

JPCP With Asphalt Concrete Wearing Surface.....	51
JRCP With Asphalt Concrete Wearing Surface.....	52
CRCP With Asphalt Concrete Wearing Surface.....	53
Other.....	59

Definitions:

- JPCP - Jointed Plain Concrete Pavement
- JRCP - Jointed Reinforced Concrete Pavement
- CRCP - Continuously Reinforced Concrete Pavement

* "Composite Pavements" are pavements originally constructed with an asphalt concrete wearing surface over a portland cement concrete slab (1986 "AASHTO Guide for Design of Pavement Structures").

Table A.5 Pavement Surface Material Type Classification Codes

<u>Material Type</u>	<u>Code</u>
Hot Mixed, Hot Laid Asphalt Concrete, Dense Graded.....	01
Hot Mixed, Hot Laid Asphalt Concrete, Open Graded (Porous Friction Course)	02
Sand Asphalt.....	03
Portland Cement Concrete (JPCP).....	04
Portland Cement Concrete (JRCP).....	05
Portland Cement Concrete (CRCP).....	06
Portland Cement Concrete (Prestressed).....	07
Portland Cement Concrete (Fiber Reinforced).....	08
Plant Mix (Emulsified Asphalt) Material, Cold Laid.....	09
Plant Mix (Cutback Asphalt) Material, Cold Laid.....	10
Single Surface Treatment.....	11
Double Surface Treatment.....	12
Recycled Asphalt Concrete	
Hot, Central Plant Mix.....	13
Cold Laid Central Plant Mix.....	14
Cold Laid Mixed-In-Place.....	15
Heater Scarification/Recompaction.....	16
Recycled Portland Cement Concrete	
JPCP.....	17
JRCP.....	18
CRCP.....	19
Other.....	20

Table A.6. Base and subbase material type classification codes.

	<u>Code</u>
No Base (Pavement Placed Directly on Subgrade).....	21
Gravel (Uncrushed).....	22
Crushed Stone, Gravel or Slag.....	23
Sand.....	24
Soil-Aggregate Mixture (Predominantly Fine-Grained Soil).	25
Soil-Aggregate Mixture (Predominantly Coarse-Grained Soil).....	26
Soil Cement.....	27
Asphalt Bound Base or subbase Materials	
Dense Graded, Hot Laid, Central Plant Mix.....	28
Dense Graded, Cold Laid, Central Plant Mix.....	29
Dense Graded, Cold Laid, Mixed In-Place.....	30
Open Graded, Hot Laid, Central Plant Mix.....	31
Open Graded, Cold Laid, Central Plant Mix.....	32
Open Graded, Cold Laid, Mixed In-Place.....	33
Recycled Asphalt Concrete, Plant Mix, Hot Laid.....	34
Recycled Asphalt Concrete, Plant Mix, Cold Laid.....	35
Recycled Asphalt Concrete, Mixed In-Place.....	36
Sand Asphalt.....	46
Cement-Aggregate Mixture.....	37
Lean Concrete (<3 sacks cement/cy).....	38
Recycled Portland Cement Concrete.....	39
Sand-Shell Mixture.....	40
Limerock, Caliche (Soft Carbonate Rock).....	41
Lime-Treated Subgrade Soil.....	42
Cement-Treated Subgrade Soil.....	43
Pozzolanic-Aggregate Mixture.....	44
Cracked and Seated PCC Layer.....	45
Other.....	49

Table A.7. Subgrade soil description codes.

<u>Soil Description</u>	<u>Code</u>
Fine-Grained Subgrade Soils:	
Clay (Liquid Limit >50).....	51
Sandy Clay.....	52
Silty Clay.....	53
Silt.....	54
Sandy Silt.....	55
Clayey Silt.....	56
Coarse-Grained Subgrade Soils:	
Sand.....	57
Poorly Graded Sand.....	58
Silty Sand.....	59
Clayey Sand.....	60
Gravel.....	61
Poorly Graded Gravel.....	62
Clayey Gravel.....	63
Shale.....	64
Rock.....	65

Table A.8. Material type codes for thin seals and interlayers.

	<u>Code</u>
Chip Seal Coat.....	71
Slurry Seal Coat.....	72
Fog Seal Coat.....	73
Woven Geotextile.....	74
Nonwoven Geotextile.....	75
Stress Absorbing Membrane Interlayer.....	77
Dense Graded Asphalt Concrete Interlayer.....	78
Aggregate Interlayer.....	79
Open Graded Asphalt Concrete Interlayer.....	80
Chip Seal With Modified Binder (Does Not Include Crumb Rubber).....	81
Sand Seal.....	82
Asphalt-Rubber Seal Coat (Stress Absorbing Membrane).....	83
Sand Asphalt.....	84
Other.....	85

Table A.9. Geologic classification codes.

<u>Igneous:</u>	<u>Code</u>
Granite.....	.01
Syenite.....	.02
Diorite.....	.03
Gabbro.....	.04
Peridotite.....	.05
Felsite.....	.06
Basalt.....	.07
Diabase.....	.08
<u>Sedimentary:</u>	
Limestone.....	.09
Dolomite.....	.10
Shale.....	.11
Sandstone.....	.12
Chert.....	.13
Conglomerate.....	.14
Breccia.....	.15
<u>Metamorphic:</u>	
Gneiss.....	.16
Schist.....	.17
Amphibolite.....	.18
Slate.....	.19
Quartzite.....	.20
Marble.....	.21
Serpentine22

Table A.10. Soil and soil-aggregate mixture type codes, AASHTO classification.

	<u>Code</u>
A-1-a.....	.01
A-1-b.....	.02
A-3.....	.03
A-2-4.....	.04
A-2-5.....	.05
A-2-6.....	.06
A-2-7.....	.07
A-4.....	.08
A-5.....	.09
A-6.....	.10
A-7-5.....	.11
A-7-6.....	.12

Table A.11 Portland Cement Type Codes

	<u>Code</u>
Type I	41
Type II	42
Type III	43
Type IV	44
Type V	45
Type IS	46
Type ISA	47
Type IA	48
Type IIA	49
Type IIIA	50
Type IP	51
Type IPA	52
Type N	53
Type NA	54
Other	55

Table A.12 Portland Cement Concrete Admixture Codes

	<u>Code</u>
Water-Reducing (AASHTO M194, Type A)	01
Retarding (AASHTO M194, Type B)	02
Accelerating (AASHTO M194, Type C)	03
Water-Reducing and Retarding (AASHTO M194, Type D)	04
Water-Reducing and Accelerating (AASHTO M194, Type E)	05
Water-Reducing, High Range (AASHTO M194, Type F)	06
Water-Reducing, High Range and Retarding (AASHTO M194, Type G) ...	07
Air-Entraining Admixture (AASHTO M154)	08
Natural Pozzolans (AASHTO M295, Class N)	09
Fly Ash, Class F (AASHTO M295)	10
Fly Ash, Class C (AASHTO M295)	11
Other (Chemical)	12
Other (Mineral)	13

Table A.13. Aggregate durability test type codes.

<u>Description</u>	<u>AASHTO</u>	<u>ASTM</u>	<u>Code</u>
Resistance to Abrasion of Small Size Coarse Aggregate by Use of Los Angeles Machine (Percent Weight Loss)	T96	C131	01
Soundness of Aggregate by Freezing and Thawing (Percent Weight Loss)	T103	--	02
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate (Percent Weight Loss)	T104	C88	03
Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine (Percent Weight Loss)	--	C535	04
Potential Volume Change of Cement-Aggregate Combinations (Percent Expansion)	--	C342	05
Evaluation of Frost Resistance of Coarse Aggregates in Air-Entrained Concrete by Critical Dilution Procedures (Number of Weeks of Frost Immunity)		C682	06
Potential Alkali Reactivity of Cement Aggregate Combinations (Average Percent Expansion)	--	C227	07
Potential Reactivity of Aggregates (Reduction in Alkalinity-mmol/L)	--	C289	08
Test for Clay Lumps and Friable Particles in Aggregates (Percent by Weight)	T112	C142	09
Test for Potential Alkali Reactivity of Carbonate Rocks for Concrete Aggregates (Percent Change in Speciment Length)	--	C586.....	11

Table A.14. Codes for Asphalt Refiners and Processors in the United States.*

	<u>Code</u>
Belcher Refining Co.--Mobile Bay, Alabama	78
Hunt Refining Company--Tuscaloosa, Alabama	01
Chevron USA, Inc.--Kenai, Alaska	02
Mapco Alaska Petroleum--North Pole, Alaska	03
Intermountain Refining Cl.--Fredonia, Arizona.....	04
Berry Petroleum Company--Stevens, Arkansas	05
Cross Oil and Refining Company--Smackover, Arkansas	06
Lion Oil Company--El Dorado, Arkansas	07
McMillan Ring, Free Oil Cl.--Norphlet, Arkansas	08
Chevron USA, Inc.--Richmond, California	09
Conoco, Inc.--Santa Maria, California	10
Edgington Oil Co., Inc.--Long Beach, California	11
Golden Bear Division, Witco Chemical Corp.--Oildale, California	12
Golden West Refining, Co.--Santa Fe Springs, California	13
Huntway Refining Co.--Benicia, California	14
Huntway Refining Co.--Wilmington, California	15
Lunday-Thagard Co.--South Gate, California	79
Newhall Refining Co., Inc.--Newhall, California	16
Oxnard Refining--Oxnard, California	17
Paramount Petroleum Corp.--Paramount, California	80
Powerline Oil Co.--Santa Fe Springs, California	81
San Joaquin Refining Cl.--Bakersfield, California	18
Shell Oil Co.--Martinez, California	19
Superior Processing Co.--Santa Fe Springs, California	20
Colorado Refining Co.--Commerce City, Colorado	82
Conoco, Inc.--Commerce City, Colorado	21
Amoco Oil Co.--Savannah, Georgia	22
Young Refining Corp.--Douglasville, Georgia	23
Chevron USA--Barber's Point, Hawaii	24
Clark Oil and Refining Corp.--Blue Island, Illinois	25
Shell Oil Co.--Wood River, Illinois	26
Unacol Corp.--Lemont, Illinois	27
Amoco Oil Co.--Whiting, Indiana	28
Laketon Refining Corp.--Laketon, Indiana	83
Young Refining Corp.--Laketon, Indiana	29
Derby Refining Co.--El Dorado, Kansas	84
Farmland Industries, Inc.--Phillipsburg, Kansas	30
Total Petroleum, Inc.--Arkansas City, Kansas	31
Ashland Petroleum Co.--Catlettsburg, Kentucky	32
Atlas Processing Co.--Shreveport, Louisiana	33
Calumet Refining Co.--Princeton, Louisiana	34
Exxon Co.--Baton Rouge, Louisiana	35
Marathon Petroleum Co.--Garyville, Louisiana	36
Marathon Petroleum Co.--Detroit, Michigan	37
Ashland Petroleum Co.--St. Paul, Minnesota	38
Koch Refining Co.--Rosemount, Minnesota	39
Chevron USA, Inc.--Pascagoula, Mississippi	40
Ergon Refining Inc.--Vicksburg, Mississippi	41
Southland Oil Co.--Lumberton, Mississippi	42
Southland Oil Co.--Sanderson, Mississippi	43

Table A.14. Codes for Asphalt Refiners and Processors in the United States
(Continued).*

	<u>Code</u>
Cenex--Laurel, Montana	44
Conoco, Inc.--Billings, Montana	45
Exxon Co.--Billings, Montana	46
Chevron USA, Inc.--Perth Amboy, New Jersey	47
Exxon Co., Linden, New Jersey	48
Giant Industries, Inc.--Gallup, New Mexico	85
Navahoe Refining Co.--Artesia, New Mexico	49
Cibro Petroleum Products Co.--Albany, New York	86
Ashland Petroleum Co.--Canton, Ohio	50
Standard Oil Co.--Toledo, Ohio	51
Sohio Oil Co (BP America)--Toledo, Ohio	87
Kerr-McGee Refining Co.--Wynnewood, Oklahoma	52
Sinclair Oil Corp.--Tulsa, Oklahoma	53
Sun Co. Inc.--Tulsa, Oklahoma	54
Total Petroleum Inc.--Ardmore, Oklahoma	55
Chevron USA, Inc.--Portland, Oregon	56
Atlantic Refining & Marketing Corp.--Philadelphia, PA	57
United Refining Co.--Warren, Pennsylvania	58
Mapco Petroleum Inc.--Memphis, Tennessee	59
Charter International Oil Co.--Houston, Texas	60
Chevron USA, Inc.--El Paso, Texas	61
Coastal Refining & Marketing, Inc.--Corpus Christi, Texas	88
Coastal States Petroleum Co.--Corpus Christi, Texas	62
Diamond Shamrock Corp.--Sunray, Texas	63
Exxon Co. USA--Baytown, Texas	64
Fina Oil and Chemical Co.--Big Spring, Texas	65
Fina Oil and Chemical Co.--Port Arthur, Texas	89
Hill Petroleum Co.--Houston, Texas	90
Shell Oil Co.--Deer Park, Texas	66
Star Enterprise--Port Arthur & Port Neches, Texas	91
Texaco Refining & Marketing Inc.--Port Arthur & Port Neches, Texas	67
Trifinery--Corpus Christi, Texas	92
Unocal Corp.--Nederland, Texas	68
Valero Refining Co.--Corpus Christi, Texas	69
Phillips 66 Co.--Woods Cross, Utah	70
Chevron USA Inc.--Seattle, Washington	71
Sound Refining, Inc.--Tacoma, Washington	72
US Oil and Refining Co.--Tacoma, Washington	73
Murphy Oil USA, Inc.--Superior, Wisconsin	74
Big West Oil Co.--Cheyenne, Wyoming	75
Little America Refining Co.--Casper, Wyoming	93
Sinclair Oil Corp.--Sinclair, Wyoming	76
Other	77

* Taken from Oil and Gas Journal, March 20, 1989, pp. 72-89.

Table A.15 Asphalt Cement Modifier Codes

	<u>Code</u>
Stone Dust.....	01
Lime.....	02
Portland Cement.....	03
Carbon Black.....	04
Sulfur.....	05
Lignin.....	06
Natural Latex.....	07
Synthetic Latex.....	08
Block Copolymer.....	09
Reclaimed Rubber.....	10
Polyethylene.....	11
Polypropylene.....	12
Ethylene-Vinyl Acetate.....	13
Polyvinyl Chloride.....	14
Asbestos.....	15
Rock Wool.....	16
Polyester.....	17
Manganese.....	18
Other Mineral Salts.....	19
Lead Compounds.....	20
Carbon.....	21
Calcium Salts.....	22
Recycling Agents.....	23
Rejuvenating Oils.....	24
Amines.....	25
Fly Ash.....	26
Other.....	27

Table A.16 Grades of Asphalt, Emulsified Asphalt, and
Cutback Asphalt Codes

	<u>Code</u>
Asphalt Cements	
AC-2.5	01
AC-5	02
AC-10	03
AC-20	04
AC-30	05
AC-40	06
AR-1000 (AR-10 by AASHTO Designation)	07
AR-2000 (AR-20 by AASHTO Designation)	08
AR-4000 (AR-40 by AASHTO Designation)	09
AR-8000 (AR-80 by AASHTO Designation)	10
AR-16000 (AR-160 by AASHTO Designation)	11
200-300 pen	12
120-150 pen	13
85-100 pen	14
60-70 pen	15
40-50 pen	16
Other Asphalt Cement Grade	17
Emulsified Asphalts	
RS-1	18
RS-2	19
MS-1	20
MS-2	21
MS-2h	22
HFMS-1	23
HFMS-2	24
HFMS-2h	25
HFMS-2s	26
SS-1	27
SS-1h	28
CRS-1	29
CRS-2	30
CMS-2	31
CMS-2h	32
CSS-1	33
CSS-1h	34
Other Emulsified Asphalt Grade	35
Cutback Asphalts (RC, MC, SC)	
30 (MC only)	36
70	37
250	38
800	39
3000	40
Other Cutback Asphalt Grade	99

Taken from MS-5, "A Brief Introduction to Asphalt," and Specification Series No. 2 (SS-2), "Specifications for Paving and Industrial Asphalts," both publications by the Asphalt Institute.

Table A.17 Maintenance and Rehabilitation Work Type Codes

	<u>Code</u>
Crack Sealing (linear ft.)	01
Transverse Joint Sealing (linear ft.)	02
Lane-Shoulder, Longitudinal Joint Sealing (linear ft.)	03
Full Depth Joint Repair Patching of PCC (sq. yards)	04
Full Depth Patching of PCC Pavement Other than at Joint (sq. yards)	05
Partial Depth Patching of PCC Pavement Other than at Joint (sq. yards)	06
PCC Slab Replacement (sq. yards)	07
PCC Shoulder Restoration (sq. yards)	08
PCC Shoulder Replacement (sq. yards)	09
AC Shoulder Restoration (sq. yards)	10
AC Shoulder Replacement (sq. yards)	11
Grinding/Milling Surface (sq. yards)	12
Grooving Surface (sq. yards)	13
Pressure Grout Subsealing (no. of holes)	14
Slab Jacking Depressions (no. of depressions)	15
Asphalt Subsealing (no. of holes)	16
Spreading of Sand or Aggregate (sq. yards)	17
Reconstruction (Removal and Replacement) (sq. yards)	18
Asphalt Concrete Overlay (sq. yards)	19
Portland Cement Concrete Overlay (sq. yards)	20
Mechanical Premix Patch (using motor grader and roller) (sq. yards)	21
Manual Premix Spot Patch (hand spreading and compacting with roller) (sq. yards)	22
Machine Premix Patch (placing premix with paver, compacting with roller) (sq. yards)	23
Full Depth Patch of AC Pavement (removing damaged material, repairing supporting material, and repairing) (sq. yards) ...	24
Patch Pot Holes - Hand Spread, Compacted with Truck (no. of holes)	25
Skin Patching (hand tools/hot pot to apply liquid asphalt and aggregate) (sq. yards)	26
Strip Patching (using spreader and distributor to apply hot liquid asphalt and aggregate) (sq. yards)	27
Surface Treatment, single layer (sq. yards)	28
Surface Treatment, double layer (sq. yards)	29
Surface Treatment, three or more layers (sq. yards)	30
Aggregate Seal Coat (sq. yards)	31
Sand Seal Coat (sq. yards)	32
Slurry Seal Coat (sq. yards)	33
Fog Seal Coat (sq. yards)	34
Prime Coat (sq. yards)	35
Tack Coat (sq. yards)	36
Dust Layering (sq. yards)	37
Longitudinal Subdrains (linear feet)	38
Transverse Subdrainage (linear feet)	39

Table A.17 Maintenance and Rehabilitation Work Type Codes
(continued)

	<u>Code</u>
Drainage Blankets (sq. yards)	40
Well System	41
Drainage Blankets with Longitudinal Drains	42
Hot-Mix Recycled Asphalt Concrete (sq. yards)	43
Cold-Mix Recycled Asphalt Concrete (sq. yards)	44
Heater Scarification, Surface Recycled Asphalt Concrete (sq. yards)	45
Crack and Seat PCC Pavement as Base for New AC Surface (sq. yards)	46
Crack and Seat PCC Pavement as Base for New PCC Surface (sq. yards)	47
Recycled Portland Cement Concrete (sq. yards)	48
Pressure Relief Joints in PCC Pavements (linear feet)	49
Joint Load Transfer Restoration in PCC Pavements (linear feet) ...	50
Mill Off Existing Pavement and Overlay with AC (sq. yards)	51
Mill Off Existing Pavement and Overlay with PCC (sq. yards)	52
Other	53
Partial Depth Patching of PCC Pavement at Joints (sq. yards)	54

Table A.18. Maintenance location codes.

	<u>Code</u>
Outside Lane (Number 1)	01
Inside Lane (Number 2)	02
Inside Lane (Number 3)	03
All Lanes	09
Shoulder	04
All Lanes Plus Shoulder	10
Curb and Gutter	05
Side Ditch	06
Culvert	07
Other	08

Note: SHRP LTPP only studies outside lanes.

Table A.19 Maintenance Materials Type Codes

	<u>Code</u>
Preformed Joint Fillers	01
Hot-Poured Joint and Crack Sealer	02
Cold-Poured Joint and Crack Sealer	03
Open Graded Asphalt Concrete	04
Hot Mix Asphalt Concrete Laid Hot	05
Hot Mix Asphalt Concrete Laid Cold	06
Sand Asphalt	07
Portland Cement Concrete (overlay or replacement)	
Joint Plain (JPCP)	08
Joint Reinforced (JRCP)	09
Continuously Reinforced (CRCP)	10
Portland Cement Concrete (Patches)	11
Hot Liquid Asphalt and Aggregate (Seal Coat)	12
Hot Liquid Asphalt and Mineral Aggregate	13
Hot Liquid Asphalt and Sand	14
Emulsified Asphalt and Aggregate (Seal Coat)	15
Emulsified Asphalt and Mineral Aggregate	16
Emulsified Asphalt and Sand	17
Hot Liquid Asphalt	18
Emulsified Asphalt	19
Sand Cement (Using Portland Cement)	20
Lime Treated or Stabilized Materials	21
Cement Treated or Stabilized Materials	22
Cement Grout	23
Aggregate (Gravel, Crushed Stone or Slag)	24
Sand	25
Mineral Dust	26
Mineral Filler	27
Other	28

Table A.20. Recycling agent type codes.

	<u>Code</u>
RA 1.....	42
RA 5.....	43
RA 25.....	44
RA 75.....	45
RA 250.....	46
RA 500.....	47
Other.....	48

Note: The recycling agent groups shown in this table are defined in ASTM D4552.

Table A.21. Anti-stripping agent type codes.

	<u>Code</u>
Permatac	01
Permatac Plus	02
Betascan Roads	03
Pavebond	04
Pavebond Special	05
Pavebond Plus	06
BA 2000	07
BA 2001	08
Unichem "A"	09
Unichem "B"	10
Unichem "C"	11
AquaShield AS4115	12
AquaShield AS4112	13
AquaShield AS4113	14
Portland Cement	15
Hydrated Lime:	
Mixed Dry With Asphalt Cement	16
Mixed Dry with Dry Aggregate	17
Mixed Dry with Wet Aggregate	18
Slurried Lime Mixed with Aggregate	19
Hot Lime Slurry (Quick Lime Slaked and Slurried at Job Site)	20
Nostrip Chemicals A-500	21
No Strip Chemical Works ACRA RP-A	22
No Strip Chemical Works ACRA Super Conc.	23
No Strip Chemical Works ACRA 200	24
No Strip Chemical Works ACRA 300	25
No Strip Chemical Works ACRA 400	26
No Strip Chemical Works ACRA 500	27
No Strip Chemical Works ACRA 512	28
No Strip Chemical Works ACRA 600	29
Darakote	30
De Hydro H86C	31
Emery 17065	32
Emery 17319	33
Emery 17319 - 6880	34
Emery 17320	35
Emery 17321	36
Emery 17322	37
Emery 17339	38
Emery 1765-6860	39
Emery 6886B	40
Husky Anti-Strip	41
Indulin AS-Special	42

Table A.22 Distress Types

	<u>Code</u>
Asphalt Concrete Pavement	
Alligator Cracking	01
Block Cracking	02
Edge Cracking	03
Longitudinal Cracking	04
Reflection Cracking	05
Transverse Cracking	06
Patch Deterioration	07
Potholes	08
Rutting	09
Shoving	10
Bleeding	11
Polished Aggregate	12
Raveling and Weathering	13
Lane Shoulder Dropoff	14
Water Bleeding	15
Pumping	16
Other	17
Portland Cement Concrete Pavement	
Corner Breaks	20
Durability Cracking	21
Longitudinal Cracking	22
Transverse Cracking	23
Joint Seal Damage	24
Spalling	25
Map Cracking/Scaling	26
Polished Aggregate	27
Popouts	28
Punchouts	29
Blowouts	30
Faulting	31
Lane/Shoulder Dropoff	32
Lane/Shoulder Separation	33
Patch Deterioration	34
Water Bleeding/Pumping	35
Slab Settlement	36
Slab Upheavel	37
Other	38