Washington State Department of Transportation

Materials Sampling, Field Testing and Laboratory Testing Plan

Strategic Highway Research Program

SPS-8 Experimental Project
(Rigid)

Project No. CRP 93-13

Smith Springs Road

Walla Walla County, Washington

FINAL

September 1999

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This document presents the materials and sampling plan for the experimental Strategic Highway Research Program (SHRP) SPS-8 rigid pavement sections project planned for construction on Smith Springs Road, Walla Walla County, Washington.

Background

The LTPP SPS-8 experiment entitled, "Strategic Pavement Studies of Environmental Effects In the Absence of Heavy Loads," consists of the construction of two test sections of Portland cement concrete (PCC) surface layers of varying thicknesses.

In this document, tables of materials sampling, field tests and laboratory test quantities are presented. This is followed by a detailed presentation of the materials sampling, field testing and laboratory testing plan and requirements of the Washington SPS-8 project.

Sampling and Testing Quantities

The estimated quantities for materials sampling, field testing and laboratory testing for the SPS-8 experimental project are contained in tables 1 and 2. It should be noted that the SHRP sampling and test procedures referenced in these tables and in other portions of this document must be followed in conducting this work. This includes completion and submission of all required data forms.

Table 1. Estimated quantities of laboratory materials testing, SPS-8 Washington.

	LTPP Test Designation	SHRP Protocol	No.
NATURAL SUBGRADE			
Sieve Analysis	SS01	Ship to FHWA Lab	3
Hydrometer to 0.01 mm	SS02	Ship to FHWA Lab	3
Atterberg Limits	SS03	Ship to FHWA Lab	3
Classification and Type of Subgrade	SS04	Ship to FHWA Lab	3
Moisture-Density Relations	SS05	Ship to FHWA Lab	3
Resilient Modulus	SS07	Ship to FHWA Lab	3
Natural Moisture Content	SS09	Ship to FHWA Lab	3
Unconfined Compressive Strength	SS10	P54	2
Permeability	UG09	P48	1
In-Place Density		SHRP-LTPP Method	9
PREPARED EMBANKMENT			
Sieve Analysis	SS01	Ship to FHWA Lab	3
Hydrometer to 0.01 mm	SS02	Ship to FHWA Lab	3
Atterberg Limits	SS03	Ship to FHWA Lab	3
Subgrade Classification and Type	SS04	Ship to FHWA Lab	3
Moisture-Density Relations	SS05	Ship to FHWA Lab	3
Resilient Modulus	SS07	Ship to FHWA Lab	3
Natural Moisture Content	SS09	Ship to FHWA Lab	3
Permeability	UG09	P48	1
In-Place Density		SHRP LTPP Method	9
Expansion Index	SS12	P60	20
DENSE GRADED AGGREGATE BASE			
Particle Size Analysis	UG01	Ship to FHWA Lab	3
Sieve Analysis (Washed)	UG02	Ship to FHWA Lab	3
Atterberg Limits	UG04	Ship to FHWA Lab	3
Moisture-Density Relations	UG05	Ship to FHWA Lab	3
Resilient Modulus	UG07	Ship to FHWA Lab	3
Classification	UG08	Ship to FHWA Lab	3
Permeability	UG09	P48	1
Natural Moisture Content	UG10	Ship to FHWA Lab	3
In-Place Density		SHRP-LTPP Method	9

Table 1. Estimated quantities of laboratory materials testing, SPS-8 Washington. (cont'd)

	LTPP Test Designation	SHRP Protocol	No.
PORTLAND CEMENT CONCRETE - AS DELIVERED			
Compressive Strength	PC01	P61	
14 day			3
28 day			3
1 year			3
Splitting Tensile Strength	PC02	P62	
14 day			3
28 day			3
1 year			3
Flexural Strength	PC09	P69	
14 day			3
28 day			3
1 year			3
Air Content	ASTM	C231	3
Slump	ASTM	C143	3
Temperature	ASTM	C1064	3
PORTLAND CEMENT CONCRETE - AS PLACED			
Compressive Strength	PC01	P61	
14 day			3
28 day			3
1 year			3
Splitting Tensile Strength	PC02	P62	
14 day			3
28 day			3
1 year			3
PCC Unit Weight	PC05	P65	9
Static Modulus of Elasticity	PC04	P64	
28 day			3
1 year			3
Core Examination and Thickness	PC06	P66	26
Air Content @ 28 days	PC08	P68	1
PCC Coefficient of Thermal Expansion	PC03	Ship to FHWA Lab	1

Table 2. Estimated quantities for material sampling and other field tests, SPS-8 Washington.

	Quantity	Units
PORTLAND CEMENT CONCRETE		
Coring (102mm diameter cores)	26	Cores
Bulk Sampling Mix	3	Samples
AGGREGATE BASE		
Bulk Sampling (182 kg Samples)	3	Samples
Moisture Content Samples	3	Jars
PREPARED EMBANKMENT		
Splitspoon Sampling (Expansion Tests)	20	Samples
Bulk Sampling (182 kg Samples)	3	Samples
Moisture Content Samples	3	Jars
NATURAL SUBGRADE		
Thin Walled Tube Sampling (2 tubes per hole)	12	Samples
Bulk Sampling (182 kg Samples)	3	Samples
Moisture Content Samples	3	Jars
ELEVATION SURVEYS (5 person hours per section per layer, ~60 points/section/layer)	30	Person-Hours
SHIPPING TO FHWA LAB		
Bulk Dense Graded Aggregate Sample	3	136 kg Samples
Embankment Samples (Bulk)	3	136 kg Samples
Natural Subgrade Samples (Bulk)	3	136 kg Samples
SHIPPING TO SHRP MATERIALS REFERENCE LIBRARY		
Portland Cement Bulk Sample	2	19-l pails (60 kg)
Flyash Used in the Mixture	2	19-l pails (60 kg)
Glass Containers of Liquid Additive Protected Against Breakage	2	1-l bottle

Sampling and Testing of SPS-8 Test Sections

Material sampling and testing on this project during construction includes the following measurements, tests and samples from the various construction stages:

Natural Subgrade

- Bulk sampling and thin walled tube sampling of the prepared natural subgrade surface
- Moisture content sampling of the prepared natural subgrade surface
- Moisture and density tests on the prepared natural subgrade surface
- Base line elevation surveys on the surface of the prepared natural subgrade to use as a reference in determining layer thickness

Prepared Embankment

- Bulk sampling of the prepared embankment
- Moisture content sampling of the prepared embankment
- Moisture and density tests on the prepared embankment surface
- Continuous splitspoon sampling to a depth of 6.1m
- Baseline elevation surveys on the surface of the prepared embankment to use as a reference in determining layer thickness
- Falling Weight Deflectometer (FWD) testing, performed by LTPP Regional Contractor

Dense Graded Aggregate Base

- Bulk sampling of the uncompacted dense graded aggregate base (DGAB)
- Moisture content sampling of the prepared DGAB surface
- Moisture and density tests on the prepared DGAB
- Elevation measurements on the prepared DGAB surface
- Falling Weight Deflectometer (FWD) testing, performed by LTPP Regional Contractor

Portland Cement Concrete Surface

- Bulk sampling of the Portland cement concrete (PCC) materials (cement and aggregate)
- Bulk sampling of Portland cement concrete (PCC) as delivered
- Coring of the PCC for laboratory testing
- Moulding of fresh PCC samples for lab testing
- Elevation measurements on the prepared PCC surface

The details for these samples, tests and measurements are presented in subsequent portions of this document organized by layer type.

The development of the materials sampling plan was based upon an assumed continuous construction sequencing. Significant time delays between the construction of the test sections may require changes to this sampling plan.

Referenced Documents

In addition to the appropriate AASHTO and ASTM standard methods and tests referenced in this document, the following SHRP-LTPP documents serve as reference material which contain greater details on the sampling and testing requirements and data forms.

SHRP-LTPP Interim Guide for Laboratory Material Handling and Testing (PCC, Bituminous Materials, Aggregates and Soils), Operational Guide No. SHRP-LTPP-OG-004, Strategic Highway Research Program, November, 1989, (Revised January, 1992).

Specific Pavement Studies, Materials and Testing Requirements for Experiment SPS-8, Study of Environmental Effects in the Absence of Heavy Loads, Operational Memorandum No. SHRP-LTPP-OM-030, Strategic Highway Research Program, August 1992.

SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling, Version 2.0, Operational Guide No. SHRP-LTPP-OG-006, Strategic Highway Research Program, May 1990.

Manual for FWD Testing in the Long Term Pavement Performance Study, Version 2.0, February 1993.

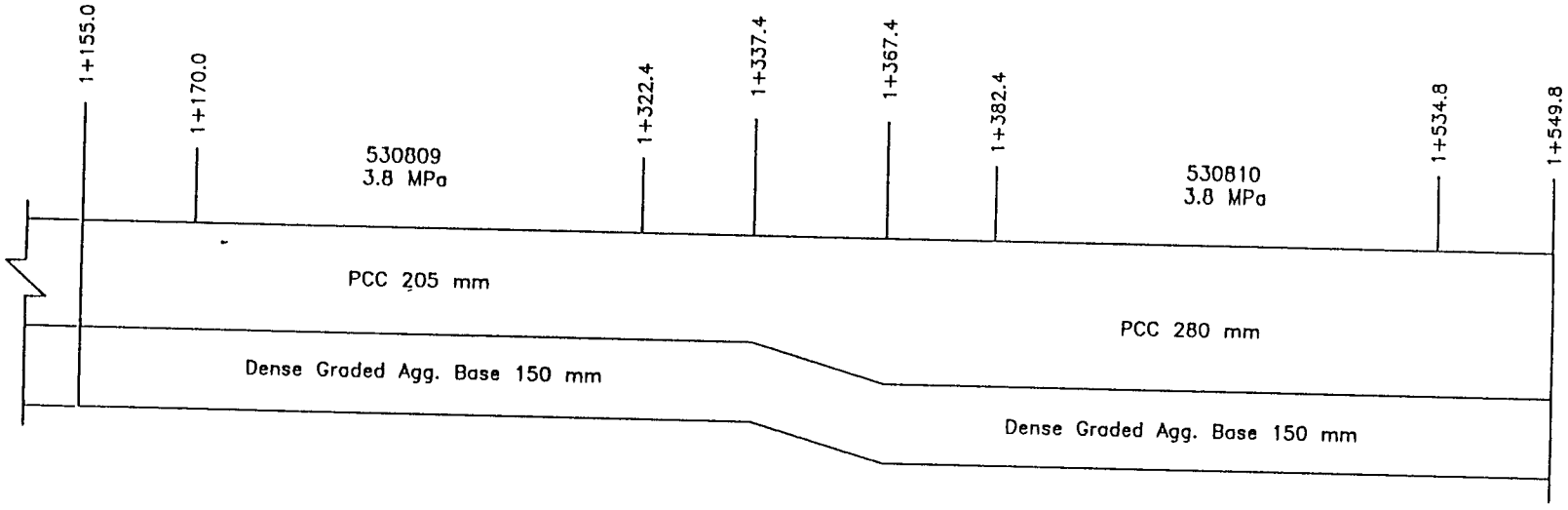
Test Section Layout

Figure 1 illustrates the order and combination of experimental test section pavement structures to be constructed. Construction stations are shown in this figure. Stylized transitions in the pavement structure are shown between the test sections. Transition details will depend upon construction sequence and practice.

The construction stationing and LTPP test section stationing for the location of the SPS-8 test sections are shown in table 3. Test section stationing refers to the method LTPP uses to reference locations within and adjacent to the ends of individual test sections. The LTPP test section stations are referenced with station 0+00 assigned to the beginning of the 152.4m monitoring portion of each test section, and station 1+52.4 at the end of the monitoring portion. In this table the six digit LTPP test section numbers are also shown. The six digit number is the official test section number for use on all data forms. The last two numbers of the six digit number correspond to the LTPP test section designation. The relevant design features of each test section are shown in this table.

The limit of each test section is defined in table 3 as the area between but including the destructive sampling areas. Each test section consists of three portions, the destructive testing areas, the monitoring testing area and the transitions. The destructive sampling areas are located immediately before and after the monitoring portion. These locations are listed in table 3, designated as the area between "begin and begin monitoring," and "end and end monitoring." The monitoring area is a 152.4m length within which no destructive testing on the surfacing is allowed. This monitoring area is designated as the area between the "begin monitoring" and "end monitoring" stations in table 3. Transition areas are those designated for the transition from differing thicknesses or differing cross sections. No sampling, testing or monitoring will be performed within the transition areas. All changes in thicknesses or properties should occur within the designated transition zones.

In general, all sampling of compacted material should occur outside of the monitoring portion but within the destructive sampling portions of the test section. The only samples and tests performed within the 152.4m monitoring portion are sampling of the subgrade material, elevation measurements, nuclear moisture-density tests and FWD measurements.



Rigid SPS-8

Figure 1. Layout of experimental test sections, Washington SPS-8 project Smith Springs Road

Table 3. Section location and project locations, Smith Springs Road, SPS-8 Washington

Site	Location	Construction Stationing	Test Section Stationing	Test Section
Transition		1+150.0 to 1+155.0		
530809	Begin	1+155.0	0-015 0	205mm PCC 150mm DGAB 3 6m Lane
	Begin Monitoring	1+170 0	0+000 0	
	End Monitoring	1+322.4	0+152.4	
	End	1+337.4	0+167.4	
Transition		1+337.4 to 1+367.4		
530810	Begin	1+367 4	0-015.0	280mm PCC 150mm DGAB 3.6m Lane
	Begin Monitoring	1+382.4	0+000.0	
	End Monitoring	1+534 8	0+152.4	
	End	1+549.8	0+167.4	

Overview of Sampling and Testing

An overview of the material sampling and testing to be performed on all test sections is shown in figures 2 and 3 for each pavement layer. In these figures, symbols are used to designate the locations for the various types of samples and tests. Bulk samples of PCC test sections should be obtained during construction.

Although all sampling is to be performed by the state, the laboratory materials testing will be performed by both the state and the FHWA-LTPP Testing Contractor Laboratory. There are additional samples which will be collected for the SHRP Materials Reference Library as well. When instructed to "ship to FHWA lab" or "MRL samples" the following guidelines should be followed:

Ship to FHWA Lab

The FHWA contracted testing laboratory is:

Braun Intertec Testing
Attention: David Clauson
PO Box 39108
Minneapolis, Minnesota 55439
(612) 941-5600

Before shipping any material, Kevin Senn, Agency Coordinator Western Region Coordination Contractor (WRCOC) (775/329-4955) and David Clauson, Braun Intertec, (612/941-5600) should be notified of the planned shipment. The cost of shipping is a state requirement.

MRL Samples

The SHRP Materials Reference Library (MRL) is located in Sparks, Nevada and is operated under contract with the FHWA by Nichols Consulting Engineers, Chtd. The MRL will supply containers and provide shipping of the MRL samples to Sparks, Nevada. Coordination for the containers and shipping should be directed to:

Nichols Consulting Engineers, Chtd.
Attention: Kevin Kawalkowski
1625 Crane Way
Sparks, Nevada 89431
(775) 358-7574 or (775) 329-4955

Natural Subgrade

The natural subgrade is defined as the natural existing material that underlies the embankment. Only clearing and grubbing normally occurs on this material. If the embankment is greater than 1.22m thick, then no samples or tests are required on the natural subgrade. However, if

this material is within 1.22m of the prepared embankment surface, then samples are required. If possible, the sampling and testing should be performed after clearing and grubbing and just prior to embankment placement. However, if the embankment has already been placed, the sampling will need to be performed by digging test pits through the embankment material. If the depth to the natural subgrade is uncertain, but potentially within 1.22 m, then test pits or auger borings should be performed to quantify this depth.

A summary of the samples, laboratory and field tests on the subgrade materials is presented in table 4. In this table, B-type samples are bulk samples of the natural subgrade materials. The T-type test locations are for nuclear moisture-density tests and the A-type sampling locations are for thin-wall tube sampling for subgrade.

Bulk Samples

Bulk samples of the subgrade material should be obtained from the locations listed in table 5. In general, bulk sampling should consist of a single excavation, 0.6m by 0.6m in area and 0.3m deep. Approximately 182 kg of material should be obtained from each sampling location. The sampling operation should be performed following the procedures contained in Section 3.5 of the SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling as appropriate. **In-place density and moisture tests should be obtained at each bulk sampling location prior to sampling operations.** Separate jar samples for gravimetric moisture tests should be collected at each bulk sample location. These sampling locations must be repaired by placing and compacting similar material.

Thin-Wall (Shelby) Tube Samples

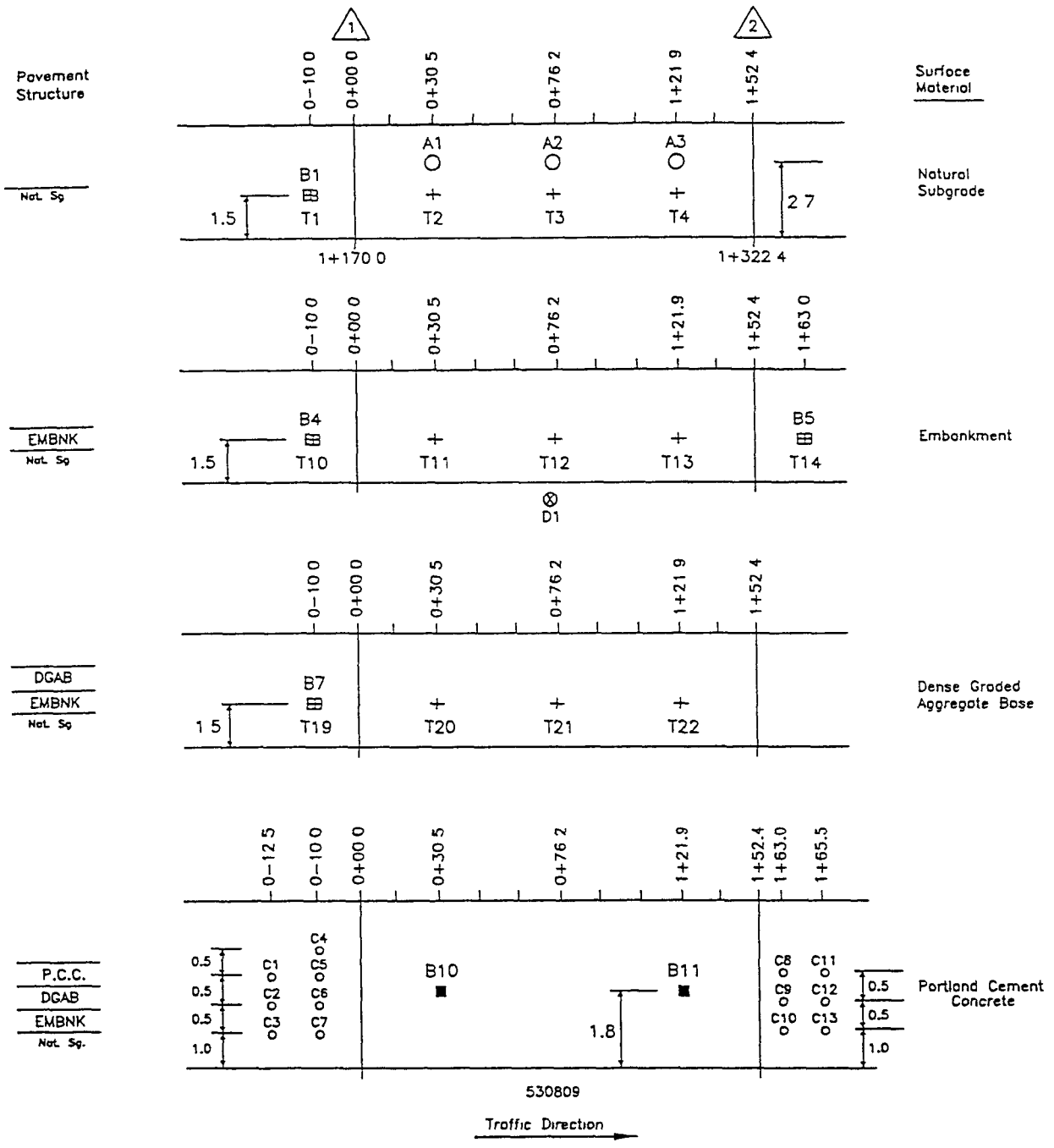
Undisturbed samples of the natural subgrade or fill material shall be obtained to a depth of 1.22 m below the top of natural subgrade using a thin-wall (Shelby) tube sampling at the locations listed in table 6. Two samples should be obtained at each location. These operations shall be performed in accordance with AASHTO T203, "Soil Investigation and Sampling by Auger Boring" and AASHTO M146, "Terms Relating to Subgrade, Soil Aggregate, and Fill Materials." Shelby tube sampling shall be performed in accordance with AASHTO T207. These sampling locations must be repaired by placing and compacting similar material. If the natural subgrade is more than 1.22 m below the top of the prepared subgrade surfacing, then the thin wall tubes will be taken within the embankment.

Density and Moisture Measurements

In-place density and moisture measurements should be performed on the natural subgrade surface at the locations specified in table 7. These test shall be performed using a recently calibrated nuclear moisture-density gauges in accordance with the procedures in **AASHTO T238-86, Method B-Direct Transmission, AASHTO T239-86 and ASTM D2950-82.** Each measurement shall be the result of the average of four readings made during each 90° rotation of the nuclear gauge through a full 360°.

FWD Measurements

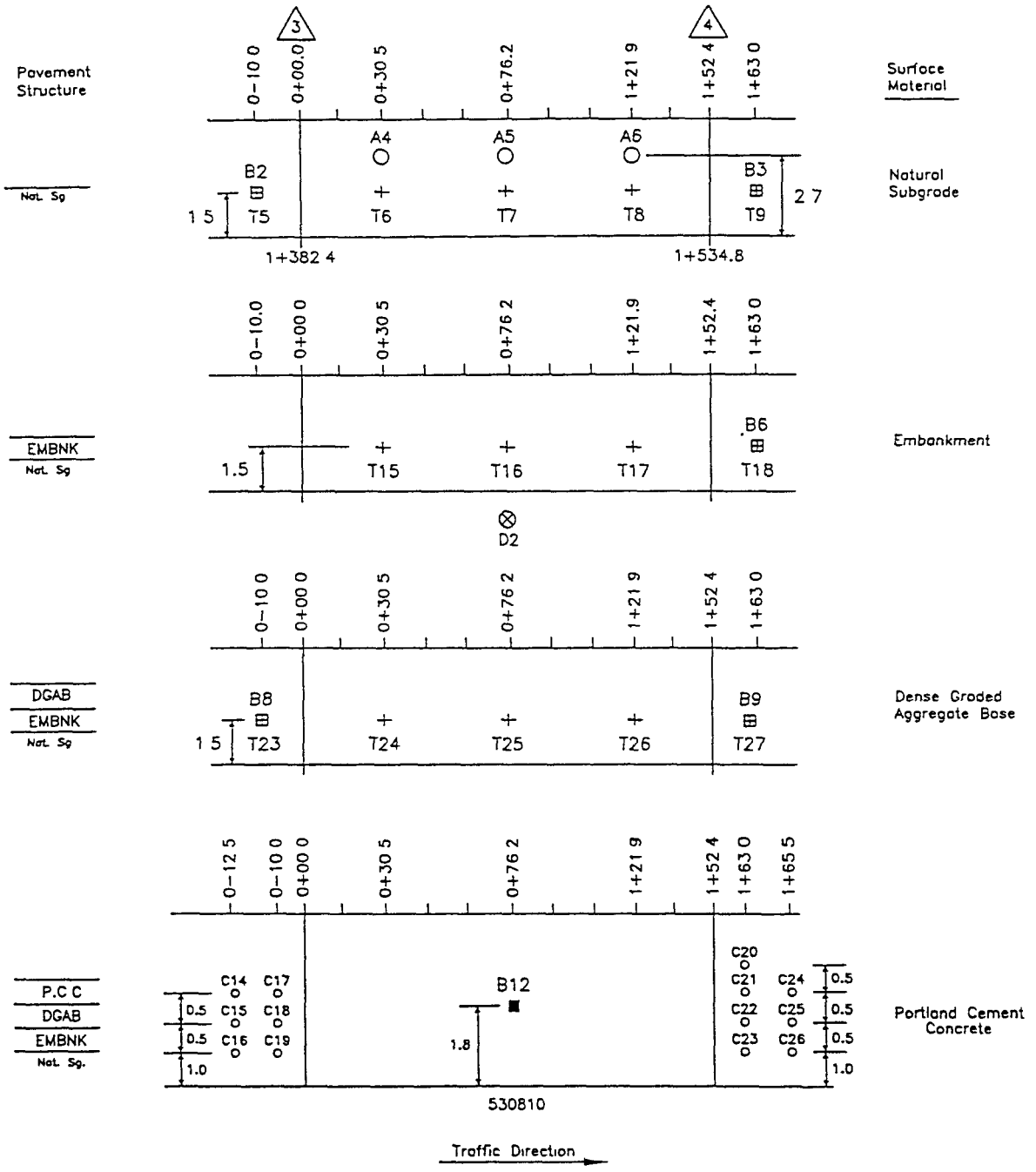
FWD measurements should be performed on each test section following the procedures and at the locations contained in LTPP SPS directive S4, "Deflection Testing of Subgrade and Base Layers for SPS-1, SPS-2, and SPS-8 Experiments." FWD testing will be performed by Nichols Consulting Engineers after coordination with WsDOT and the Walla Walla County Resident Engineer.



- □ B1 – Bulk sampling of Natural Subgrade
- \+ T1–T4 – Moisture–Density tests on Natural Subgrade
- o A1–A3 – Thinwall (Shelby) Tube sampling to 1 2m below subgrade
- ⊗ D1 – 6.1m Shoulder Probe
- □ B4–B5 – Bulk sampling of Embankment
- \+ T10–T14 – Moisture–Density tests on Embankment
- □ B7 – Bulk sampling of Dense Graded Agg Base
- \+ T19–T22 – Moisture–Density tests on DGAB
- ■ B10–B11– Bulk sampling of Portland Cement Concrete
- o C1–C13 – 102mm Cores of PCC surface

Note. Shoulder probe testing may be done at a later time

Figure 2 Overview of sampling, testing and coring plan for Portland Cement Concrete section 530809, SPS–8, Washington.



□ B2–B3 – Bulk sampling of Natural Subgrade
\+ T5–T9 – Moisture–Density tests on Natural Subgrade
o A4–A6 – Thin wall (Shelby) Tube Sampling to 1.22m below subgrade
⊗ D2 – 6.1m Shoulder Probe
□ B6 – Bulk sampling of Embankment
\+ T15–T18 – Moisture–Density tests on Embankment
□ B8–B9 – Bulk sampling of Dense Graded Agg. Base
\+ T23–T27 – Moisture–Density tests on Dense Graded Agg. Base
■ B12 – Bulk sampling of Portland Cement Concrete
o C14–C26 – 102mm Cores of PCC surface
Note. Shoulder probe testing may be done at a later time

Figure 3 Overview of sampling, testing and coring plan for Portland Cement Concrete Section 530810, SPS-8, Washington

Table 4 Field and laboratory test plan for Natural Subgrade materials, SPS-8, Washington.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Sieve Analysis	SS01	Ship to FHWA Lab[1]	3	B1-B3
Hydrometer to 0.01mm	SS02	Ship to FHWA Lab[1]	3	B1-B3
Atterberg Limits	SS03	Ship to FHWA Lab[1]	3	B1-B3
Classification & Type of Subgrade*	SS04	Ship to FHWA Lab	6	A1,A3,A5,B1-B3
Classification & Type of Subgrade*	SS04	P52	3	A2,A4,A6
Moisture-Density Relations	SS05	Ship to FHWA Lab[1]	2	B1-B3
Resilient Modulus	SS07	Ship to FHWA Lab[1]	2	B1-B3
Unit Weight	SS08	P56	2	A4,A6
Unconfined Compressive Strength	SS10	P54	2	A2,A4
Natural Moisture Content	SS09	Ship to FHWA Lab[1]	2	B1-B3
Permeability	SS11/UG09	P48	1	B2 or A2
In-Place Density		SHRP-LTPP Method	9	T1-T9

[1]Ship to FHWA lab after splitting and quartering a 45 kg sample for the state testing.

Table 5. Locations for Natural Subgrade bulk sampling, SPS-8 Washington.

Sample Location Designation	Construction Stationing	Test Section Stationing	Offset, m		Test Section	Sample Area
			Centerline, Rt	Outside Lane Edge, Lt		
B1	1+160 0	0-10.0	2 2	1.5	530809	1
B2	1+372.0	0-10.0	2.2	1.5	530810	3
B3	1+545 4	1+63 0	2.2	1.5	530810	4

Table 6. Locations for thin-wall (Shelby) tube sampling of Natural Subgrade, SPS-8 Washington.

Sample Location Designation	Construction Stationing	Test Section Stationing	Offset, m		Test Section
			Centerline, Rt.	Outside Lane Edge, Lt.	
A1	1+200.5	0+30.5	1.0	2.7	
A2	1+246 2	0+76.2	1.0	2.7	530809
A3	1+291.9	0+121.9	1.0	2 7	
A4	1+412.9	0+30.5	1.0	2 7	
A5	1+458.6	0+76.2	1.0	2.7	530810
A6	1+504.3	0+121 9	1 0	2.7	

*Visual-manual classification only on thin wall tube samples.

Table 7. Locations for in-place density and moisture tests on Natural Subgrade, SPS-8 Washington.

Sample Location Designation	Construction Stationing	Test Section Stationing	Offset, m		Test Section
			Centerline, Rt	Outside Lane Edge, Lt	
T1	1+160 0	0-10.0	2.2	1.5	530809
T2	1+200.5	0+30.5	2.2	1.5	530809
T3	1+246.2	0+76.2	2.2	1.5	530809
T4	1+316.9	1+21 9	2 2	1.5	530809
T5	1+372 4	0-10 0	2.2	1.5	530810
T6	1+412.9	0+30.5	2.2	1.5	530810
T7	1+458 6	0+76.2	2.2	1.5	530810
T8	1+504.3	1+21.9	2.2	1.5	530810
T9	1+545.4	1+63 0	2.2	1.5	530810

Prepared Embankment

The prepared embankment layer is either the material that has been processed on the roadway, i.e., remixed, moisture adjusted, relaid and recompacted, such as in a cut section or material that has been added as a fill to raise the profile grade. This material will always be sampled and tested. The prepared embankment layer measurements, testing and sampling should be performed prior to placement of the base layers. The objective is to characterize the properties of the prepared embankment fill material immediately prior to the time when the base layers are placed. It is, therefore, desired that the moisture-density tests, bulk samples and elevation measurements be performed just prior to the time when the base course is placed. This is important in instances when the prepared embankment will be left exposed to the elements for a significant period, depending on climatic events which might influence the properties of the upper layers of the embankment.

A summary of the samples, laboratory and field tests on the prepared embankment materials is presented in table 8.

Bulk Samples

Bulk samples of the prepared embankment material should be obtained from the locations listed in table 9. In general, bulk sampling should consist of a single excavation, 0.6m by 0.6m in area and 0.3m deep. Approximately 182 kg of material should be obtained from each sampling location. The sampling operation should be performed following the procedures contained in Section 3.5 of the SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling as appropriate. **In-place density and moisture tests should be obtained at each bulk sampling location prior to sampling operations.** Separate jar samples for gravimetric moisture tests should be collected at each bulk sample location. These sampling locations must be repaired by placing and compacting similar material.

Density and Moisture Measurements

Nuclear density and moisture measurements shall be performed on the prepared embankment material at the locations specified in table 11. These measurements shall be performed following the same procedures used for natural subgrade soils.

Splitspoon Sampling

Continuous splitspoon sampling shall be conducted to a depth of 6.1m using a truck mounted drill rig similar to that used for the shoulder auger boring (D type sampling locations). Locations are as shown in table 10. For a given 6.1m sample location, ten samples, each representing 0.6m of material shall be retrieved. A 152mm hollow-stem continuous flight auger with an inside diameter greater than 55mm shall be used to obtain the splitspoon samples. Samples shall be done using only a 63 kg hammer, 762mm drop and a sampler as specified in AASHTO T206, "Penetration Test and Split-barrel Sampling of Soils." Core retainers shall be used when necessary to retain soil. Care shall be exercised to provide a free

fall of the hammer (minimum friction and straight pipe) and to minimize variations in drop height. It is essential that a clearly visible reference mark be identified on the splitspoon drop hammer rod so that the drop height is consistent. Blow counts and strata depths and field classifications shall be recorded on Sampling Data Sheet 4-2.

FWD Measurements

FWD measurements should be performed on each test section following the procedure and at the locations contained in LTPP Directive S-4, "Deflection Testing of Subgrade and Base Layers for SPS-1, SPS-2, and SPS-8 Experiments." FWD testing will be performed by Nichols Consulting Engineers after coordination with WsDOT and the Walla Walla County Resident Engineer.

Table 8. Field and laboratory test plan for Prepared Embankment materials, SPS-8, Washington.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Sieve Analysis	SS01	Ship to FHWA Lab[1]	3	B4-B6
Hydrometer to 0 01mm	SS02	Ship to FHWA Lab[1]	3	B4-B6
Atterberg Limits	SS03	Ship to FHWA Lab[1]	3	B4-B6
Classification & Type of Subgrade	SS04	Ship to FHWA Lab[1]	3	B4-B6
Moisture-Density Relations	SS05	Ship to FHWA Lab[1]	3	B4-B6
Resilient Modulus	SS07	Ship to FHWA Lab[1]	3	B4-B6
Natural Moisture Content	SS09	Ship to FHWA Lab[1]	3	B4-B6
Permeability	UG09	P48	1	B5
In-Place Density		LTPP Method	9	T10-T18
Depth to Rigid Layer		LTPP Method	4	D1-D2
Expansion Index	SS12	P60	20	D1-D2

[1]Ship to FHWA lab after splitting and quartering a 45 kg sample for the state testing.

Table 9. Locations for Prepared Embankment bulk sampling, SPS-8 Washington.

Sample Location Designation	Construction Stationing	Test Section Stationing	Offset, m		Test Section	Sample Area
			Centerline, Rt	Outside Lane Edge, Lt		
B4	1+160 0	0-10 0	2.2	1.5	530809	1
B5	1+333.0	1+63.0	2.2	1.5	530809	2
B6	1+545.4	1+63.0	2.2	1.5	530810	4

Table 10. Locations for in-place density and moisture tests on Prepared Embankment, SPS-8 Washington.

Sample Location Designation	Construction Stationing	Test Section Stationing	Offset, m		Test Section
			Centerline, Rt	Outside Lane Edge, Lt	
T10	1+160.0	0-10.0	2.2	1.5	530809
T11	1+200.5	0+30.5	2.2	1.5	530809
T12	1+246.2	0+76.2	2.2	1.5	530809
T13	1+291 9	1+21.9	2.2	1.5	530809
T14	1+333.0	1+63.0	2.2	1.5	530809
T15	1+412.9	0+30.5	2 2	1.5	530810
T16	1+458.6	0+76.2	2.2	1.5	530810
T17	1+504.3	1+21.9	2.2	1.5	530810
T18	1+545 4	1+63 0	2.2	1.5	530810

Table 11. Locations of 6.1m deep splitspoon sampling, SPS-8 Washington.

Sample Location Designation	Construction Stationing	Test Section Stationing	Offset, m		Test Section
			Centerline, Rt	Outside Lane Edge, Rt	
D1	1+246 2	0+76.2	5 5	1 8	530809
D2	1+458 6	0+76 2	5 5	1 8	530810

Dense Graded Aggregate Base

The measurements, testing, and sampling on the Dense Graded Aggregate Base (DGAB) layer should be performed prior to placement of the Portland cement concrete. The objective is to characterize the properties of the prepared base at the time when the Portland cement concrete is placed. It is therefore desired that the moisture-density tests and elevation measurements be performed just prior to the time when the Portland cement concrete is placed. This is most important in instances when the aggregate base will be left exposed to the elements for a significant period of time (2-3 months) that might influence the properties of the material.

A summary of the samples to be taken from the DGAB material and tests to be conducted are presented in table 12. Only bulk material and moisture jar samples of the DGAB material are taken. Field tests include in-place density and moisture measurements.

Bulk Samples

Bulk samples of the DGAB material should be obtained at the approximate locations specified in table 13. Sampling may be performed prior to compaction to avoid interruptions to construction activities. Uncontaminated 182 kg samples shall be obtained from each location. Procedures similar to those contained in section 3.5 of the SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling should be followed. Jar moisture samples should be collected after final preparation of the DGAB surface.

Density and Moisture Measurements

Nuclear density and moisture measurements shall be performed on top of the prepared DGAB at the location specified in table 14. These measurements shall be performed following the same procedures used for subgrade soils.

FWD Measurements

FWD measurements should be performed on each test section following the procedure and at the locations contained in LTPP Directive S-4, "Deflection Testing of Subgrade and Base Layers for SPS-1, SPS-2, and SPS-8 Experiments." FWD testing will be performed by Nichols Consulting Engineers after coordination with WsDOT and the Walla Walla County Resident Engineer.

Table 12. Field and laboratory test plan for Dense Graded Aggregate Base materials, SPS-8 Washington.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Particle Size Analysis	UG01	Ship to FHWA lab[1]	3	B7-B9
Sieve Analysis (washed)	UG02	Ship to FHWA lab[1]	3	B7-B9
Atterberg Limits	UG04	Ship to FHWA lab[1]	3	B7-B9
Moisture-Density Relations	UG05	Ship to FHWA lab[1]	3	B7-B9
Resilient Modulus	UG07	Ship to FHWA lab[1]	3	B7-B9
Classification	UG08	Ship to FHWA lab[1]	3	B7-B9
Permeability	UG09	P48	1	B8
Natural Moisture Content	UG10	Ship to FHWA lab[1]	3	B7-B9
In-Place Density		SHRP-LTPP Method	9	T19-T27

[1]Ship to FHWA lab after splitting and quartering a 45 kg sample for the state testing.

Table 13. Bulk sampling of uncompacted Dense Graded Aggregate Base, SPS-8 Washington.

Sample Location Designation	Construction Stationing	Test Section Stationing	Offset, m		Test Section	Sample Area
			Centerline, Rt	Outside Lane Edge, Lt		
B7	1+160.0	0-10.0	2.2	1.5	530809	1
B8	1+372 4	0-10.0	2.2	1.5	530810	3
B9	1+545.4	1+63.0	2.2	1.5	530810	4

Table 14. Locations for in-place moisture and density measurements on compacted Dense Graded Aggregate Base, SPS-8 Washington.

Sample Location Designation	Construction Stationing	Test Section Stationing	Offset, m		Test Section
			Centerline, Rt	Outside Lane Edge, Lt	
T19	1+160.0	0-10.0	2.2	1.5	530809
T20	1+200.5	0+30.5	2.2	1.5	530809
T21	1+246.2	0+76.2	2.2	1.5	530809
T22	1+291.9	0+121.9	2.2	1.5	530809
T23	1+372.4	0-10.0	2.2	1.5	530810
T24	1+412.9	0+30.5	2.2	1.5	530810
T25	1+458.6	0+76.2	2.2	1.5	530810
T26	1+504.3	0+121.9	2.2	1.5	530810
T27	1+545 4	0+163.0	2.2	1.5	530810

Portland Cement Concrete

Sampling of the Portland cement concrete (PCC) materials shall include beams and cylinders molded from bulk samples of the as-delivered material, and cores obtained from the material as placed.

As-Delivered

Sampling of the PCC mix shall be performed in the field, during placement. A summary of the sampling and testing plan for the as-delivered PCC materials are shown in table 15. The test sections from which the designated bulk samples should be obtained are shown in figures 2 and 3. These samples shall be obtained in accordance with AASHTO T141 "Sampling Fresh Concrete", molded into the specimens specified in table 16, cured, packaged and shipped to the laboratory. All specimens shall be made and cured in the field in accordance with AASHTO T23 "Making and Curing Concrete Specimens in the Field" and AASHTO T126 "Making and Curing Concrete Specimens in the Laboratory." As shown in table 18, six - 152mm by 305mm cylindrical specimens and three - 152mm by 152mm by 508mm long beam specimens shall be molded from each bulk sample. Molded concrete samples shall be transported in accordance with Section 10, "Transportation of Specimens to Laboratory" of ASTM C31. Field tests shall be performed on the bulk samples of fresh concrete to determine mix temperature, slump, and air content (volumetric). Samples shall be obtained in accordance with ASTM C172 and tests performed in accordance with ASTM C1064 (temperature), ASTM C231 (air content), and ASTM C143 (slump).

As-Placed

A summary of the sampling and testing plan for the as-placed (PCC) materials is shown in table 16. Sampling of the as-placed PCC materials shall consist of 102mm diameter cores. The cores shall be obtained at least 2 to 4 days **prior** to the specified age for conducting the laboratory tests. This is to allow for a 40 hour lime water bath soak period immediately prior to testing the strength specimen. In table 17, tests on the cores are specified at 14 days, 28 days, and 1 year after placement. The objective of these tests are to characterize the properties of the concrete after being subjected to in-place curing conditions. These cores shall be obtained during the following time periods:

Specified Test Age	Date After Placement to Obtain Cores
14 days	10 - 12 days
28 days	21 - 24 days
1 year	350 - 360 days

The locations of the PCC cores are specified in table 18. Coring operations shall be performed in accordance with AASHTO T24 "Obtaining and Testing Drilled Cores and Sawed Beams of Concrete" using equipment specified in the SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling. Plugs shall not be inserted in cores intended for laboratory testing. All cores shall be dried prior to packaging.

Care shall be taken to insure that cores are obtained at a 90° angle to the pavement surface and that the edges are straight, intact, smooth and suitable for laboratory testing. Details on tolerances and quality control of coring operations are contained in section 4 of the SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling.

FWD Testing

FWD testing of PCC surface shall be performed in accordance with appendix B-8 and table B-8.1 of the Manual for FWD Testing in the LTPP. FWD testing will be performed by Nichols Consulting Engineers after coordination with WsDOT and the Walla Walla County Resident Engineer.

Table 15. Field and laboratory test plan for as delivered PCC materials, SPS-8 Washington.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Portland Cement Concrete - As Delivered				
Compressive Strength	PC01	P61		
14 Day			3	B10-B12[1]
28 Day			3	
1 Year			3	
Splitting Tensile Strength	PC02	P62		
14 Day			3	B10-B12
28 Day			3	
1 Year			3	
Flexural Strength	PC09	P69		
14 Day			3	B10-B12
28 Day			3	
1 Year			3	
Air Content	ASTM C231	LTPP Method	3	B10-B12
Slump	ASTM C143	LTPP Method	3	B10-B12
Temperature	ASTM C1064	LTPP Method	3	B10-B12

[1]A total of 6 cylinder specimens and 3 beam specimens are molded from each PCC bulk sample.

Table 16. Bulk samples and molded specimens from PCC mix on SPS-8 Washington.

Sample Number	Test Age After Molding	Specimen Number			Test Section
		152x305mm Cylinder Compression Test	152x305mm Cylinder Indirect Tensile	152x152x508mm Beam Flexural Strength	
B10	14 days	GX01	GX04	FX01	530809
	28 days	GY02	GY05	FY02	
	1 year	GZ03	GZ06	FZ03	
B11	14 days	GX07	GX10	FX04	530809
	28 days	GY08	GY11	FY05	
	1 year	GZ09	GZ12	FZ06	
B12	14 days	GX13	GX16	FX07	530810
	28 days	GY14	GY17	FY08	
	1 year	GZ15	GZ18	FZ09	

Table 17. Field and laboratory test plan for as-placed PCC materials, SPS-8 Washington.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Portland Cement Concrete - As Placed				
Compressive Strength	PC01	P61		
14 Day			3	C1,C10,C20
28 Day			3	C2,C11,C19
1 Year			3	C4,C13,C22
Splitting Tensile Strength	PC02	P62		
14 Day			3	C5,C14,C23
28 Day			3	C6,C15,C24
1 Year			3	C8,C17,C26
PCC Unit Weight	PC05	P65	9	All compressive strength cores
Static Modulus of Elasticity	PC04	PC64		
28 Day			3	C3,C12,C21
1 Year			3	C7,C16,C25
Air Content @ 28 Days	PC08	PC68	1	C9
PCC Thermal Coefficient		Ship to FHWA	1	C18
Core Examination	PC06	P66	26	All cores

Table 18. PCC core locations on SPS-8 Washington.

Sample Location Designation	Stationing	Test Section Station	Offset, m		Test Section	Sample Area	Coring Days After Placement
			Centerline	Outside Lane Edge, Lt			
C1	1+157.5	0-12.5	1.7	2.0	530809	1	10-13
C2	1+157 5	0-12.5	2.2	1 5	530809	1	21-24
C3	1+157.5	0-12.5	2.7	1.0	530809	1	21-24
C4	1+160.0	0-10.0	1.2	2.5	530809	1	350-360
C5	1+160.0	0-10 0	1.7	2.0	530809	1	10-13
C6	1+160.0	0-10.0	2.2	1.5	530809	1	21-24
C7	1+160.0	0-10.0	2.7	1.0	530809	1	350-360
C8	1+333.0	1+63.0	1.7	2 0	530809	2	350-360
C9	1+333.0	1+63.0	2 2	1.5	530809	2	21-24
C10	1+333.0	1+63.0	2.7	1.0	530809	2	10-13
C11	1+335.5	1+65.5	1.7	2.0	530809	2	21-24
C12	1+335.5	1+65.5	2.2	1.5	530809	2	21-24
C13	1+335.5	1+65.5	2.7	1.0	530809	2	350-360
C14	1+369.5	0-12.5	1.7	2.0	530810	3	10-13
C15	1+369.5	0-12.5	2.2	1.5	530810	3	21-24
C16	1+369.5	0-12.5	2.7	1 0	530810	3	350-360
C17	1+372.4	0-10.0	1 7	2.0	530810	3	350-360
C18	1+372.4	0-10.0	2.2	1.5	530810	3	21-24
C19	1+372.4	0-10.0	2.7	1.0	530810	3	21-24
C20	1+545.4	1+63.0	1.2	2.5	530810	4	10-13
C21	1+545.4	1+63.0	1.7	2.0	530810	4	21-24
C22	1+545.4	1+63.0	2 2	1.5	530810	4	350-360
C23	1+545.4	1+63.0	2.7	1 0	530810	4	10-13
C24	1+547.4	1+65.5	1.7	2.0	530810	4	21-24
C25	1+547.4	1+65.5	2.2	1.5	530810	4	350-360
C26	1+547.4	1+65.5	2.7	1.0	530810	4	350-360

Materials Reference Library (MRL)

During pavement construction, additional sampling of the AC and PCC layers is required. The samples obtained will be used as a record of the materials being used on the project and they will be sent to a special facility for long-term storage. The material to be obtained for this purpose shall consist of the following:

Portland Cement Concrete Samples

1 — 19 liter pail of Portland cement, approximately 23 kg (sealed in a heavy plastic bag and placed into the pail)

1 — 19 liter pail of flyash, approximately 23 kg (sealed in a heavy plastic bag and placed into the pail)

1 — 1 liter of each liquid additive (stored in glass containers suitably protected from breakage)

4 — 19 liter pails of fine aggregate (from the Plant)

4 — 19 liter pails of coarse aggregate (from the Plant)

Containers (pails/drums) for the storage of these samples will be provided by the LTPP Materials Reference Library (MRL) at no cost to the state. These containers are of special manufacture to accommodate long-term storage. It will be necessary that scheduling information be furnished to the LTPP Materials Reference Library contractor as soon as this information is available. This information should, at the minimum, contain: (1) date containers needed, (2) highway agency contact name, (3) shipping address, and (4) telephone number. The contact names and telephone numbers for the LTPP Materials Reference Library are as follows:

Contact Name	Affiliation	Phone No.
Mr. Kevin Kawalkowski	Nichols Consulting Engineers, Chtd.	775/358-7574
Dr. Sirous Alavi	Nichols Consulting Engineers, Chtd.	775/329-4955
Mr. Kevin Senn	Nichols Consulting Engineers, Chtd.	775/329-4955

The SPS-8 samples to be shipped to the MRL will be by a common carrier and the cost will be borne by the MRL contractor (Nichols Consulting Engineers Chtd.). The participating agency should contact the MRL office for exact coordination and sample shipping details. Any of the names listed above may be contacted but it is preferable that Mr. Kevin Kawalkowski be the primary contact point for the participating agencies.

A copy of Field Operations Information Form 1 should be completed and included with the shipment and another copy of the form should be mailed separately. A copy of Form 1 is provided in appendix A. This will allow a trace of the shipment if it does not arrive in a timely manner.

Elevation Measurements

Elevation measurements shall be made on the surface of each pavement layer (natural sub-grade, prepared embankment, dense graded aggregate base and PCC surface) at the locations specified in figure 4. Measurements must be made to an accuracy of 0.005m. Care must be taken to re-establish the same points on the surface of each succeeding material layer to insure accurate determination of the thickness of each layer.

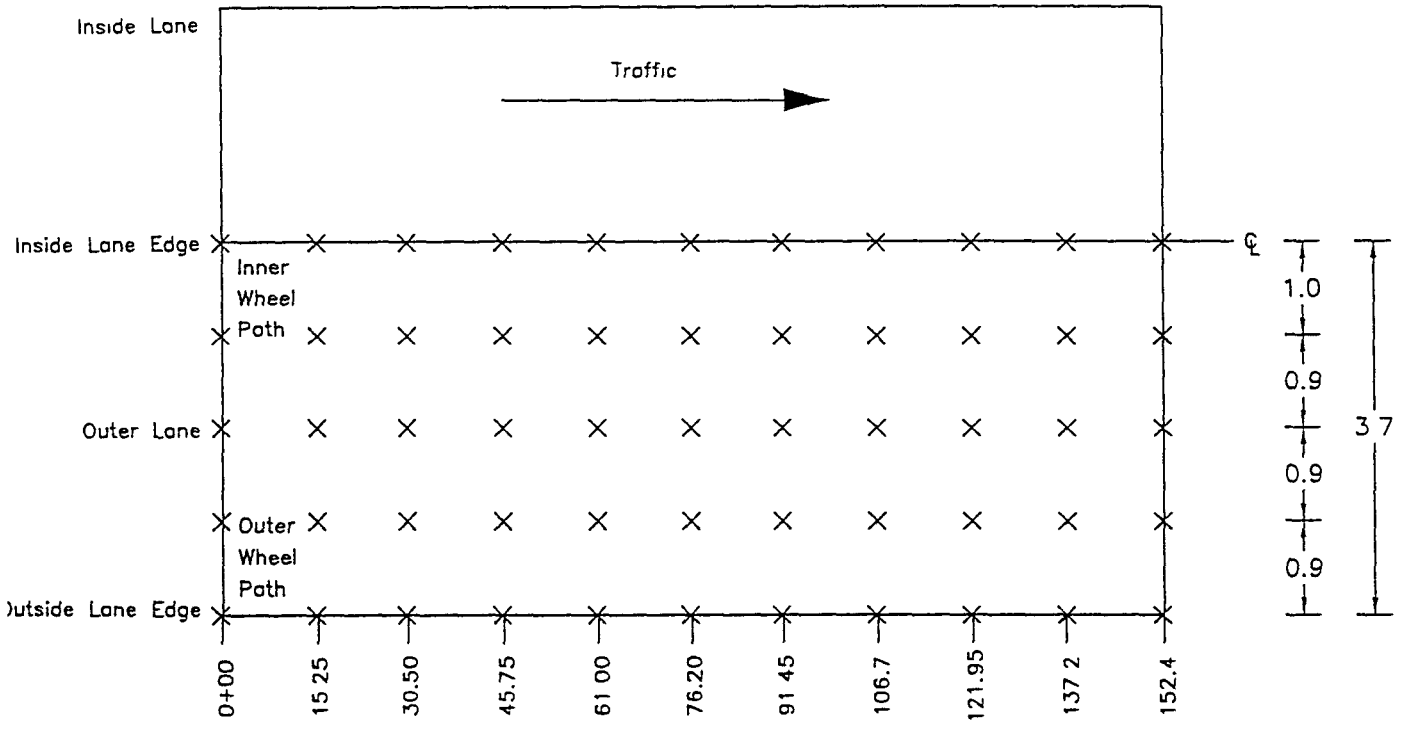


Figure 4. Test section elevation measurement locations for SPS-8 Washington.

Shipping Tracking Tables

This section contains shipping tracking tables that explain the disposition of samples retrieved from the field. Using these tracking tables (tables 19 and 20), sampling personnel can determine where each sample should be shipped and tested.

Each sample (core, bulk, moisture, etc.) shall be assigned a four digit number that must be recorded on the data forms. The sample code number will consist of two letters on the left side and up to three numbers on the right side.

The first letter on the left identifies the sample type in one of the following categories:

C - core sample
B - bulk sample
M - moisture sample
F - formed beams of Portland cement concrete surface
G - formed cylinders of Portland cement concrete surface

The second letter from the left identifies the material type or designated curing time prior to testing of the sample. This designation can be identified as one of the following categories:

P - Portland cement concrete
G - untreated, unbound granular material (base/subbase)
S - subgrade soil or fill material
X - molded specimens of PCC for tests at 14 days
Y - molded specimens of PCC for tests at 28 days after placement
Z - molded specimens of PCC for tests at 365 days after placement

The numbers on the right will designate the sample number. The numbers shall be assigned consecutively for each sample type. For example, samples taken at C-Type locations be designated CP01, CP02, CP03, etc. for the PCC material. Samples of subgrade material taken from location B1 by bulk sampling shall be designated BS01. If a bulk sample of one layer is contained in more than one bag, then the number of bags and the same bulk sample number should be recorded on each bag.

The following is a list of valid combinations of letters and numbers making up sample code numbers:

FX01 Formed Portland cement concrete beams for testing at 14 days. Assign numbers consecutively as samples are molded.

FY01 Formed Portland cement concrete beams for testing at 28 days. Assign numbers consecutively as samples are molded.

FZ01 Formed Portland cement concrete beams for testing at 365 days. Assign numbers consecutively as samples are molded.

GX01 Formed Portland cement concrete cylinders for testing at 14 days. Assign numbers consecutively as samples are obtained.

GY01 Formed Portland cement concrete cylinders for testing at 28 days. Assign numbers consecutively as samples are obtained.

GZ01 Formed Portland cement concrete cylinders for testing at 365 days. Assign numbers consecutively as samples are obtained.

CP01 Portland cement concrete cores obtained from the finished concrete surface. Assign numbers consecutively as the cores are obtained.

BG01 Bulk samples of granular base or subbase. Assign BG01-BG10 to represent embankment material and BG11-BG20 to represent aggregate base material.

BS01 Bulk samples of subgrade material from different sampling areas within the test site. Assign sample numbers consecutively (BS01, BS02, etc.) as samples are obtained.

MG01 Granular base samples obtained solely for determining natural moisture content.

MS01 Subgrade samples obtained from bulk sampling locations for moisture content determination.

JS01 Jar samples of subgrade from splitspoon sampler.

The State Laboratory (or their designee) refers to the agency responsible for the project. The FHWA-LTPP Testing Contractor Laboratory refers to Braun Intertec, Inc.

The Laboratory Test Number shall be assigned as per the following:

a. Beginning of the Section (Station 0-): samples of each layer that are retrieved from areas in the approach end of the test section (stations preceding 0+00) shall be assigned Laboratory Test Number '1'.

b. End of the Section (Stations 1+): samples of each layer that are retrieved from areas in the leave end of the test section (stations after 1+52.4) shall be assigned Laboratory Test Number '2'.

c. Middle of the Section (Stations 0+00 to 1+52.4): samples of each layer that are retrieved from areas in the middle of the test section (e.g., from the paver) shall be assigned Laboratory Test Number '3'.

Table 19. Samples to be retained by the State Laboratory (or their designee), SPS-8 Washington.

Sample Location No.	Sample No	Lab Test No.	Type of Sample
Natural Subgrade			
B1	BS01	1	182-kg bulk sample[1]
B2	BS02	1	182-kg bulk sample[1]
B3	BS03	2	182-kg bulk sample[1]
Prepared Embankment			
B4	BG4	1	182-kg bulk sample[1]
B5	BG5	2	182-kg bulk sample[1]
B6	BG6	2	182-kg bulk sample[1]
Dense Graded Aggregate Base			
B7	BG7	1	182-kg bulk sample[1]
B8	BG8	1	182-kg bulk sample[1]
B9	BG9	2	182-kg bulk sample[1]
Portland Cement Concrete			
B10	GX01	3	152x305-mm cylinder
B10	GX02	3	152x305-mm cylinder
B10	GY01	3	152x305-mm cylinder
B10	GY02	3	152x305-mm cylinder
B10	GZ01	3	152x305-mm cylinder
B10	GZ02	3	152x305-mm cylinder
B10	FX01	3	152x152x508-mm beam
B10	FX02	3	152x152x508-mm beam
B10	FX03	3	152x152x508-mm beam
B11	GX03	3	152x152x305-mm cylinder
B11	GX04	3	152x152x305-mm cylinder
B11	GY03	3	152x152x305-mm cylinder
B11	GY04	3	152x152x305-mm cylinder
B11	GZ03	3	152x152x305-mm cylinder
B11	GZ04	3	152x152x305-mm cylinder
B11	FX04	3	152x152x508-mm beam
B11	FX05	3	152x152x508-mm beam
B11	FX06	3	152x152x508-mm beam
B12	GX05	3	152x152x305-mm cylinder
B12	GX06	3	152x152x305-mm cylinder
B12	GY05	3	152x152x305-mm cylinder
B12	GY06	3	152x152x305-mm cylinder
B12	GZ05	3	152x152x305-mm cylinder
B12	GZ06	3	152x152x305-mm cylinder
B12	FX07	3	152x152x508-mm beam
B12	FX08	3	152x152x508-mm beam
B12	FX09	3	152x152x508-mm beam

Table 20. Samples to be shipped to the FHWA-LTPP Testing Contractor Laboratory, SPS-8 Washington.

Sample Location Number	Sample Number	Lab Test Number	Type of Sample
Natural Subgrade			
B1	BS01	1	136-kg bulk sample[1]
B2	BS02	1	136-kg bulk sample[1]
B3	BS03	2	136-kg bulk sample[1]
B1	MS01	1	Moisture content jar sample
B2	MS02	1	Moisture content jar sample
B3	MS03	2	Moisture content jar sample
Prepared Embankment			
B4	BG04	1	136-kg bulk sample[1]
B5	BG05	2	136-kg bulk sample[1]
B6	BG06	2	136-kg bulk sample[1]
B4	MG04	1	Moisture content jar sample
B5	MG05	2	Moisture content jar sample
B6	MG06	2	Moisture content jar sample
Dense Graded Aggregate Base			
B7	BG7	1	136-kg bulk sample[1]
B8	BG8	1	136-kg bulk sample[1]
B9	BG9	2	136-kg bulk sample[1]
B7	MG7	1	Moisture content jar sample
B8	MG8	1	Moisture content jar sample
B9	MG9	2	Moisture content jar sample

Laboratory Tracking of Samples

This section contains Laboratory Sample Tracking Tables that explain the sample handling and tracking throughout the laboratory testing process. Tables 21 through 24 detail the sample handling and testing for the state agency laboratory and tables 25 and 26 detail the sample handling and testing for the FHWA-LTPP Laboratory Materials Testing Contractor.

These tables provide the laboratories with the following information and directions:

- tracking of samples as they are taken from the field and tested in the laboratory,
- laboratory test sequences for each pavement material type,
- dedicated sample(s) for each test,
- designation of extra samples for future use,
- instructions for sample storage, and
- special instructions and other remarks.

The following is a description of the column headings used for the tracking table:

- *Layer Number* - is assigned beginning with layer number 1. Layer number 1 is always assigned for the subgrade and the last layer number is always the pavement surface layer.
- *Layer Description Code* - is used to describe the material layer. Valid codes for this project are:

  Original Surface Layer 03
  Base Coarse 05
  Subgrade 07
  Embankment (Fill) 11

- *Layer Type* - is used to classify the type of layer. Valid codes for this project are:

  PC. . . . . for Portland cement concrete layer
  GB. . . . . for unbound (granular) base layer
  GS. . . . . for unbound (granular) subbase layer (embankment)
  SS. . . . . for subgrade layer

- *Test Section Number* - is the number of the test section for which the sample pertains.
- *Sample Location Number* - is the location the sample was taken and should be shown on sample tags and labels.
- *Sample Number* - is the number identifying each individual sample and should shown on sample tags and labels.

- *Lab Test Number* - shall be assigned as per the following:
  a. Beginning of the Section (Station 0-): samples of each layer that are retrieved from areas in the approach end of the test section (stations preceding 0+00) shall be assigned Laboratory Test Number '1'.
  b. End of the Section (Stations 1+52.4): samples of each layer that are retrieved from areas in the leave end of the test section (stations after 1+52.4) shall be assigned Laboratory Test Number '2'.
  c. Middle of the Section (Stations 0+00 to 1+52.4): samples of each layer that are retrieved from areas in the middle of the test section (from the paver) shall be assigned Laboratory Test Number '3'.
- *Required Laboratory Tests Per Layer* - order in which testing shall proceed.
- *Extra Sample* - is the sample to be saved as a backup for other tests? A "yes" in this column implies that this is a dedicated extra sample saved for future use. A "no" indicates that a sample can be discarded after use.
- *Sample Storage* - the following codes are used to specify the sample storage conditions for samples:
  a. environmentally protected and controlled storeroom at 5-21°C
  b. environmentally protected and controlled storeroom at 5-38°C
- *Sample Disposal?* - indicates whether or not a sample can be disposed of after testing. Generally all samples, or portions of samples that are not tested are saved until further notice.

Tables 21 through 26 should be completed (layer number), checked and modified as necessary to reflect the actual samples received and then submitted to Nichols Consulting Engineers for approval before any testing commences by the state testing lab and the FHWA-LTPP testing lab, respectively.

Table 21. Tracking table of **Natural Subgrade** testing in the **State Laboratory**, SPS-8 Washington.

Layer No.[1]	Layer Description Code	Layer Type	Test Section No.	Sample Location No.	Sample No.	Lab Test No.	Steps Involved in Laboratory Handling and Testing Sequence						
							Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
							First	Second	Third	Fourth			
	07	SS	530809	B1	BS01	1	No Testing - Samples Stored				Yes	(b)	No
	07	SS	530810	B2	BS02	1	SS11/P57 - If TS03 or TS04 unavailable				Yes	(b)	No
	07	SS	530810	B3	BS03	2	No Testing - Samples Stored				Yes	(b)	No
	07	SS	530809	A2	TS03	3	SS04/P52	SS11/P57			No	(c)	Yes
	07	SS	530809	A2	TS04	3					Yes	(c)	No
	07	SS	530810	A4	TS07	3	SS04/P52	SS08/P56	SS10/P54		No	(c)	Yes
	07	SS	530810	A4	TS08	3					Yes	(c)	No
	07	SS	530810	A6	TS11	3	SS04/P52	SS08/P56	SS10/P54		No	(c)	Yes
	07	SS	530810	A6	TS12	3					Yes	(c)	No

[1]Layer number to be completed by testing lab after reviewing field sampling logs.
[2]Retain one portion of sample after splitting. Ship second portion to FHWA.

Table 22. Tracking table of **Prepared Embankment** testing in the **State Laboratory**, SPS-8 Washington.

Layer No.[1]	Layer Description Code	Layer Type	Test Section No.	Sample Location No.	Sample No.	Lab Test No.	Steps Involved in Laboratory Handling and Testing Sequence						
							Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
							First	Second	Third	Fourth			
	06	GS	530809	B4	BG05	1	No testing - samples stored				Yes	(b)	No
	06	GS	530809	B5	BG06	2	UG09/P48				No	(b)	No
	06	GS	530810	B6	BG07	2	No testing - samples stored				Yes	(b)	No
	06	GS	530809	D1	JS01	3	SS12/P60				No	(b)	Yes
	06	GS	530809	D1	JS02	3	SS12/P60				No	(b)	Yes
	06	GS	530809	D1	JS03	3	SS12/P60				No	(b)	Yes
	06	GS	530809	D1	JS04	3	SS12/P60				No	(b)	Yes
	06	GS	530809	D1	JS05	3	SS12/P60				No	(b)	Yes
	06	GS	530809	D1	JS06	3	SS12/P60				No	(b)	Yes
	06	GS	530809	D1	JS07	3	SS12/P60				No	(b)	Yes
	06	GS	530809	D1	JS08	3	SS12/P60				No	(b)	Yes
	06	GS	530809	D1	JS09	3	SS12/P60				No	(b)	Yes
	06	GS	530809	D1	JS10	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS11	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS12	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS13	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS14	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS15	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS16	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS17	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS18	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS19	3	SS12/P60				No	(b)	Yes
	06	GS	530810	D2	JS20	3	SS12/P60				No	(b)	Yes

[1]Layer number to be completed by testing lab after reviewing field sampling logs.
[2]Retain one portion of sample after splitting. Ship second portion to FHWA.

Table 23. Tracking table of **Dense Graded Aggregate Base** testing in the **State Laboratory**, SPS-8 Washington.

Layer No.[1]	Layer Description Code	Layer Type	Test Section No.	Sample Location No.	Sample No.	Lab Test No.	Steps Involved in Laboratory Handling and Testing Sequence						
							Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
							First	Second	Third	Fourth			
.	05	GB	530809	B7	BG09	1	UG09/P48			.	No	(b)	Yes
	05	GB	530810	B8	BG10	1	UG09/P48				No	(b)	Yes
	05	GB	530810	B9	BG11	2	UG09/P48				No	(b)	Yes

[1]Layer number to be completed by testing lab after reviewing field sampling logs.
[2]Retain one portion of sample after splitting. Ship second portion to FHWA.

Table 24. Tracking table of **Portland Cement** testing in the **State Laboratory**, SPS-8 Washington.

Layer No [1]	Layer Description Code	Layer Type	Test Section No	Sample Location No.	Sample No	Lab Test No	Steps Involved in Laboratory Handling and Testing Sequence					
							Required Laboratory Tests Per Layer			Extra Sample	Sample Storage	Sample Disposed ?
							First	Second	Third			
	3	PCC	530809	B10	GX01	3	PC01/P61 (14 day)			No	(a)	Yes
	3	PCC	530809	B10	GY02	3	PC01/P61 (28 day)			No	(a)	Yes
	3	PCC	530809	B10	GZ03	3	PC01/P61 (1 year)			No	(a)	Yes
	3	PCC	530809	B10	GX04	3	PC02/P62 (14 day)			No	(a)	Yes
	3	PCC	530809	B10	GY05	3	PC02/P62 (28 day)			No	(a)	Yes
	3	PCC	530809	B10	GZ06	3	PC02/P62 (1 year)			No	(a)	Yes
	3	PCC	530809	B10	FX01	3	PC09/P69 (14 day)			No	(a)	Yes
	3	PCC	530809	B10	FY02	3	PC09/P69 (28 day)			No	(a)	Yes
	3	PCC	530809	B10	FZ03	3	PC09/P69 (1 year)			No	(a)	Yes
	3	PCC	530809	B11	GX07	3	PC01/P61 (14 day)			No	(a)	Yes
	3	PCC	530809	B11	GY08	3	PC01/P61 (28 day)			No	(a)	Yes
	3	PCC	530809	B11	GZ09	3	PC01/P61 (1 year)			No	(a)	Yes
	3	PCC	530809	B11	GX10	3	PC02/P62 (14 day)			No	(a)	Yes
	3	PCC	530809	B11	GY11	3	PC02/P62 (28 day)			No	(a)	Yes
	3	PCC	530809	B11	GZ12	3	PC02/P62 (1 year)			No	(a)	Yes
	3	PCC	530809	B11	FX04	3	PC09/P69 (14 day)			No	(a)	Yes
	3	PCC	530809	B11	FY05	3	PC09/P69 (28 day)			No	(a)	Yes
	3	PCC	530809	B11	FZ06	3	PC09/P69 (1 year)			No	(a)	Yes
	3	PCC	530810	B12	GX13	3	PC01/P61 (14 day)			No	(a)	Yes
	3	PCC	530810	B12	GY14	3	PC01/P61 (28 day)			No	(a)	Yes
	3	PCC	530810	B12	GZ15	3	PC01/P61 (1 year)			No	(a)	Yes
	3	PCC	530810	B12	GX16	3	PC02/P62 (14 day)			No	(a)	Yes
	3	PCC	530810	B12	GY17	3	PC02/P62 (28 day)			No	(a)	Yes
	3	PCC	530810	B12	GZ18	3	PC02/P62 (1 year)			No	(a)	Yes
	3	PCC	530810	B12	FX07	3	PC09/P69 (14 day)			No	(a)	Yes
	3	PCC	530810	B12	FY08	3	PC09/P69 (28 day)			No	(a)	Yes
	3	PCC	530810	B12	FZ09	3	PC09/P69 (1 year)			No	(a)	Yes

[1]Layer number to be completed by testing lab after reviewing field sampling logs

Table 24. Tracking table of **Portland Cement** testing in the **State Laboratory**, SPS-8 Washington. (cont'd)

Layer No [1]	Layer Description Code	Layer .Type	Test Section No	Sample Location No.	Sample No	Lab Test No	Steps Involved in Laboratory Handling and Testing Sequence					
							Required Laboratory Tests Per Layer			Extra Sample	Sample Storage	Sample Disposed ?
							First	Second	Third			
	03	PC	530809	C1	CP17	1	PC06/P66	PC05/P65	PC01/P61 (14 days)	No	(b)	Yes
	03	PC	530809	C2	CP18	1	PC06/P66	PC05/P65	PC01/P61 (28 days)	No	(b)	Yes
	03	PC	530809	C3	CP19	1	PC06/P66	PC04/P64 (28 day)		No	(b)	Yes
	03	PC	530809	C4	CP20	1	PC06/P66	PC05/P65	PC01/P61 (1 year)	No	(b)	Yes
	03	PC	530809	C5	CP21	1	PC06/P66	PC02/P62 (14 day)		No	(b)	Yes
	03	PC	530809	C6	CP22	1	PC06/P66	PC02/P62 (28 day)		No	(b)	Yes
	03	PC	530809	C7	CP23	1	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	530809	C8	CP24	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	530809	C9	CP25	2	PC06/P66	PC08/P68 (28 day)		No	(b)	Yes
	03	PC	530809	C10	CP26	2	PC06/P66	PC05/P65	PC01/P61 (14 days)	No	(b)	Yes
	03	PC	530809	C11	CP27	2	PC06/P66	PC05/P65	PC01/P61 (28 days)	No	(b)	Yes
	03	PC	530809	C12	CP28	2	PC06/P66	PC04/P64 (28 day)		No	(b)	Yes
	03	PC	530809	C13	CP29	2	PC06/P66	PC05/P65	PC01/P61 (1 year)	No	(b)	Yes
	03	PC	530810	C14	CP30	1	PC06/P66	PC02/P62 (14 day)		No	(b)	Yes
	03	PC	530810	C15	CP31	1	PC06/P66	PC02/P62 (28 day)		No	(b)	Yes
	03	PC	530810	C16	CP32	1	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	530810	C17	CP33	1	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	530810	C18	CP34	1	PC06/P66	Note 2		No	(b)	Yes
	03	PC	530810	C19	CP35	1	PC06/P66	PC05/P65	PC01/P61 (28 days)	No	(b)	Yes

[1]Layer number to be completed by testing lab after reviewing field sampling logs

Note 2 Ship cores to FHWA c/o Ms Marcia Simon, TFHRC, HNR 20, 630 Georgetown Pike, McLean, VA 22101-2296 for PCC thermal coefficient tests

Table 24. Tracking table of **Portland Cement** testing in the **State Laboratory**, SPS-8 Washington (cont'd)

Layer No [1]	Layer Description Code	Layer Type	Test Section No	Sample Location No	Sample No.	Lab Test No	Steps Involved in Laboratory Handling and Testing Sequence					
							Required Laboratory Tests Per Layer			Extra Sample	Sample Storage	Sample Disposed ?
							First	Second	Third			
	03	PC	530810	C20	CP36	2	PC06/P66	PC05/P65	PC01/P61 (14 days)	No	(b)	Yes
	03	PC	530810	C21	CP37	2	PC06/P66	PC04/P64(28 day)		No	(b)	Yes
	03	PC	530810	C22	CP38	2	PC06/P66	PC05/P65	PC01/P61 (1 year)	No	(b)	Yes
	03	PC	530810	C23	CP39	2	PC06/P66	PC02/P62 (14 day)		No	(b)	Yes
	03	PC	530810	C24	CP40	2	PC06/P66	PC02/P62 (28 day)		No	(b)	Yes
	03	PC	530810	C25	CP41	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	530810	C26	CP42	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes

[1]Layer number to be completed by testing lab after reviewing field sampling logs

Note 2 Ship cores to FHWA c/o Ms Marcia Simon, TFHRC, HNR 20, 630 Georgetown Pike, McLean, VA 22101-2296 for PCC thermal coefficient tests

Table 25. Tracking table of Natural Subgrade testing in the FHWA-LTPP Testing Contractor Laboratory, SPS-8 Washington.

Layer No.[1]	Layer Description Code	Layer Type	Test Section No.	Sample Location No.	Sample No.	Lab Test No.	Steps Involved in Laboratory Handling and Testing Sequence								
							Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed?
							First	Second	Third	Fourth	Fifth	Sixth			
	07	SS	530809	B1	BS01	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46[2]	No	(b)	Yes
	07	SS	530810	B2	BS02	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46[2]	No	(b)	Yes
	07	SS	530810	B3	BS03	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46[2]	No	(b)	Yes
	07	SS	530809	B1	MS01	1	SS09/P49						No	(b)	Yes
	07	SS	530810	B2	MS02	1	SS09/P49						No	(b)	Yes
	07	SS	530810	B3	MS03	2	SS09/P49						No	(b)	Yes
	07	SS	530809	A1	TS01	3	SS04/P52	SS07/P46					No	(c)	Yes
	07	SS	530809	A1	TS02	3							Yes	(c)	No
	07	SS	530809	A3	TS05	3	SS04/P52	SS07/P46					No	(c)	Yes
	07	SS	530809	A3	TS06	3							Yes	(c)	No
	07	SS	530810	A5	TS09	3	SS04/P52	SS07/P46					No	(c)	Yes
	07	SS	530810	A5	TS10	3							Yes	(c)	No

[1] Layer number to be completed by testing lab after reviewing field sampling logs.
[2] SS07/P46 only performed if tube samples are unavailable.

Table 26. Tracking table of Prepared Embankment testing in the FHWA-LTPP Testing Contractor Laboratory, SPS-8 Washington.

Layer No.[1]	Layer Description Code	Layer Type	Test Section No.	Sample Location No.	Sample No.	Lab Test No.	Steps Involved in Laboratory Handling and Testing Sequence								
							Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed?
							First	Second	Third	Fourth	Fifth	Sixth			
	05	GB	530809	B4	BGZ05	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
	05	GB	530809	B5	BGZ06	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
	05	GB	530810	B6	BGZ07	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
	05	GB	530809	B4	MGZ05	1	SS09/P49						No	(b)	Yes
	05	GB	530809	B5	MGZ06	1	SS09/P49						No	(b)	Yes
	05	GB	530810	B6	MGZ07	1	SS09/P49						No	(b)	Yes

[1] Layer number to be completed by testing lab after reviewing field sampling logs.

Table 27. Tracking table of Dense Graded Aggregate Base testing in the FHWA-LTPP Testing Contractor Laboratory, SPS-8 Washington.

Layer No [1]	Layer Description Code	Layer Type	Test Section No	Sample Location No	Sample No.	Lab Test No	Steps Involved in Laboratory Handling and Testing Sequence								
							Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed?
							First	Second	Third	Fourth	Fifth	Sixth			
	05	GB	530809	BZ09	BG09	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
	05	GB	530810	BZ10	BG10	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
	05	GB	530810	BZ11	BG11	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
	05	GB	530809	BZ09	MG09	1	UG10/P49						No	(b)	Yes
	05	GB	530810	BZ10	MG10	1	UG10/P49						No	(b)	Yes
	05	GB	530810	BZ11	MG11	2	UG10/P49						No	(b)	Yes

[1] Layer number to be completed by testing lab after reviewing field sampling logs.

Data Forms

Data forms and instructions for all field sampling and measurements described in this document are contained in "Specific Pavement Studies, Materials Sampling and Testing Requirements for Experiment SPS-8, Study of Environmental Effects in the Absence of Heavy Loads". Copies of blank data forms are included in appendix A, and SHRP-LTPP Data Collection standard codes are provided in appendix B. These data forms must be completed at the time of the work. Completed forms shall be submitted to the designated LTPP representative.

APPENDIX A

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

(Exclusively for SPS Experiments)

PP-SPS MATERIAL SAMPLING AND FIELD TESTING

AVEMENT CORE LOG AT C-TYPE CORE LOCATIONS

SAMPLING DATA SHEET 2

SHEET NUMBER _____ OF _____

RP REGION _____ STATE _____ STATE CODE __ __

S EXPERIMENT NO _____ SPS PROJECT CODE __ __

UTE/HIGHWAY_____ Lane_____ Direction_____ TEST SECTION NO. __ __

MPLE/TEST LOCATION: ☐ Before Section ☐ After Section FIELD SET NO. __

ERATOR_____ EQUIPMENT USED_____ CORING DATE ___-___-___

MPLING AREA NO SA-_____ CORE BARREL Size _____ Cooling Medium_____

ote: Record information for all cores extracted from each core hole in one column in the able below. Use a separate sheet for each sampling area. "Depth" should be measured from ne 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

___-___-19___

Month- Day- Year

_____

eld Crew Chief

ffiliation: _____

_____

SHRP Representative

Affiliation: _____

_PP-SPS MATERIAL SAMPLING AND FIELD TESTING SHEET NUMBER _____ OF _____

—A-TYPE BORE HOLE LOG

SAMPLING DATA SHEET 4-1

RP REGION _____ STATE _____ *STATE CODE* __ __

S EXPERIMENT NO _____ *SPS PROJECT CODE* __ __

OUTE/HIGHWAY_____ Lane_____ Direction_____ *TEST SECTION NO.* __ __

MPLE/TEST LOCATION: ☐ Before Section ☐ After Section *FIELD SET NO.* 1

☐ Within Section

PERATOR_____ EQUIPMENT USED_____ *BORING DATE*___-___-___

AMPLING AREA NO: SA-_____ *LOCATION: STATION*_____ *OFFSET*_____ *feet from °/s*

*ORE HOLE NUMBER:*_____ *BORE HOLE SIZE:* _____ (inch Diam.)

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

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.

ENERAL REMARKS:_____

ERTIFIED VERIFIED AND APPROVED DATE

_____ _____ ____-____-19___

ield Crew Chief SHRP Representative Month- Day- Year

ffiliation:_____ Affiliation:_____

MATERIAL SAMPLING AND FIELD TESTING SHEET NUMBER _____ OF _____

ITU DENSITY AND MOISTURE TESTS

SAMPLING DATA SHEET 8-1

ON _____ STATE _____ STATE CODE __ __

IMENT NO _____ SPS PROJECT CODE __ __

EWAY_____ Lane_____ Direction_____ TEST SECTION NO. __ __

ST LOCATION: ☐ Before Section ☐ After Section FIELD SET NO. __

☐ Within Section

_____ NUCLEAR DENSITY GAUGE I.D._____ TEST DATE___-___-____

AREA NO: SA-_____ LOCATION: STATION_____ OFFSET_____feet from °/s

NO:_____ DATE OF LAST MAJOR CALIBRATION___-___-___

e additional sheets if necessary

FROM SURFACE TO P OF THE LAYER, S (From Plans)						
ER NUMBER						
RIAL TYPE: nd=G Other=T)						
1						
IN SITU 2 NSITY, pcf						
3						
SHTO T238-86) 4						
RAGE						
hod (A,B,or C)						
Depth, inches						
1						
IN SITU 2 MOISTURE						
CONTENT, % 3						
ASHTO T239-86) 4						
AVERAGE						

REMARKS: _____

ED VERIFIED AND APPROVED DATE

_____ _____ ____-____-19___

rew Chief SHRP Representative Month- Day- Year

tion:_____ Affiliation:_____

'P-SPS MATERIAL SAMPLING AND FIELD TESTING

SHOULDER PROBE LOG

SAMPLING DATA SHEET 9

SHEET NUMBER _____ OF _____

RP REGION _____ STATE _____ STATE CODE

S EXPERIMENT NO _____ SPS PROJECT CODE — —

UTE/HIGHWAY _____ Lane _____ Direction _____ TEST SECTION NO. — —

AMPLE/TEST LOCATION: ☐ Before Section ☐ After Section FIELD SET NO. — —

☐ Within Section —

'ERATOR _____ EQUIPMENT USED _____ AUGERING DATE ___-___-___

UGER PROBE NUMBER _____ LOCATION STATION: _____ OFFSET: _____ feet from °/s

'OP 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: _____

CERTIFIED

_____

Field Crew Chief

Affiliation: _____

VERIFIED AND APPROVED

_____

SHRP Representative

Affiliation: _____

DATE

___-___-19___

Month- Day- Year

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING

SHEET NUMBER _____ OF _____

MPLING UNCOMPACTED BITUMINOUS PAVING MIXTURES

SAMPLING DATA SHEET 10-1

P REGION _____ STATE _____

EXPERIMENT NUMBER _____

OUTE/HIGHWAY_____ Lane_____ Direction_____

STATE CODE __ __

SPS PROJECT CODE __ __

TEST SECTION NO. __ __

FIELD SET NO. 1

RSON PERFORMING SAMPLING

NAME _____ EMPLOYER _____

TITLE _____

IX PLANT

LANT 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 _____

Field Crew Chief

Affiliation: _____

VERIFIED AND APPROVED _____

SHRP Representative

Affiliation: _____

DATE ____-____-19___

Month- Day- Year

TPP-SPS MATERIAL SAMPLING AND FIELD TESTING

SHEET NUMBER _____ OF _____

PLING FRESH PORTLAND CEMENT CONCRETE MIXTURES

SAMPLING DATA SHEET 11-1

RP REGION _____ STATE _____

S EXPERIMENT NUMBER _____

UTE/HIGHWAY_____ Lane_____ Direction_____

STATE CODE __ __

SPS PROJECT CODE __ __

TEST SECTION NO. __ __

FIELD SET NO. __

RSON PERFORMING SAMPLING

AME _____ EMPLOYER _____

ITLE _____

MPLING LOCATION [__]

Batch Plant ..... 1 Hauling Truck before Paving 2

Hauling Truck during Paving ..... 3 Paver 4

Other ..... 5 (specify) _____

AMPLE NUMBER (FC-- for PCC, BL-- for LCB) [__ __ __ __]

IME SAMPLED (Military Time) [__ __ __ __]

ATE SAMPLED (Month - Day - Year) [__ __ - __ __ - __ __]

CC MIX TEMPERATURE WHEN SAMPLED (°F) [__ __ __]

MBIENT TEMPERATURE WHEN SAMPLED (°F) [__ __ __]

AIR CONTENT (PERCENT) [__.__]

LUMP (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 _____

eld Crew Chief

Affiliation: _____

VERIFIED AND APPROVED _____

SHRP Representative

Affiliation: _____

DATE

_____-_____-19___

Month- Day- Year

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING SHEET NUMBER _____ OF _____

LK SAMPLING OF SUBGRADE AND UNBOUND GRANULAR MATERIALS

SAMPLING DATA SHEET 12

RP REGION _____ STATE _____ STATE CODE __ __

'S EXPERIMENT NO _____ SPS PROJECT CODE __ __

)UTE/HIGHWAY_____ Lane_____ Direction_____ TEST SECTION NO. __ __

AMPLE/TEST LOCATION: ☐ Before Section ☐ After Section FIELD SET NO. 1

ECHNICIAN_____ EQUIPMENT _____ EXPLORATION DATE___-___-___

AMPLING AREA NO: SA-_____ LOCATION: STATION_____ OFFSET_____feet from °/s

AMPLING LOCATION NUMBER_____

IT SIZE: (a) Length_____feet (b) Width_____feet

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

Scale (Inches)	Strata Change (Inches)	Moisture Sample No.	Bulk Sample No.	Material Description	Material Code
4					
8					
12					
16					

GENERAL REMARKS:_____

_____

CERTIFIED

_____

Field Crew Chief

Affiliation:_____

VERIFIED AND APPROVED

_____

SERP Representative

Affiliation:_____

DATE

_____-_____-19___

Month- Day- Year

SHEET NUMBER ______ OF ______

ATERIAL SAMPLING AND FIELD TESTING

TORY SHIPMENT SAMPLES INVENTORY

OPERATIONS INFORMATION FORM 1

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

ON ____________ STATE ____________

IMENT NO ______ Lane______ Direction__________

WAY__________

ST LOCATION: ☐ Before Section ☐ After Section ☐ Within Section

FIELD WORK COMPLETED ON ____-____-____

e additional sheets if necessary. Include summary information (Field Operations ion Form 2-3) and "as actual" sampling location plan sheets with this material nventory. Enter the sampling area number in the left hand column. If sampling is ection" enter the test section number preceded by the letter "S" such that S2 is 2.

AMPLE LOCATION	SAMPLE NUMBER	SAMPLE SIZE	SAMPLE TYPE	SAMPLE MATERIAL	SAMPLE CONDITION	LAB*

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

No.(1) ______________________________

No.(2) ______________________________

No.(3) ______________________________

REMARKS: ______________________________

IED

____

Crew Chief

ation: ______________

VERIFIED AND APPROVED

____

SHRP Representative

Affiliation: ______________

DATE

____-____-19____

Month- Day- Year

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING

SUMMARY OF MATERIAL SAMPLES SENT TO EACH LABORATORY

FIELD OPERATIONS INFORMATION FORM 2-3

SHEET NUMBER _____ OF _____

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

_____

Field Crew Chief

Affiliation: _____

VERIFIED AND APPROVED

_____

SHRP Representative

Affiliation: _____

DATE

____-____-19___

Month- Day- Year

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING SHEET NUMBER _____ OF _____

LABORATORY SHIPMENT SAMPLES INVENTORY - MOLDED CONCRETE

FIELD OPERATIONS INFORMATION FORM 3-1

SHRP REGION _____ STATE _____ *STATE CODE* __ __

SPS EXPERIMENT NO _____ *SPS PROJECT CODE* __ __

ROUTE/HIGHWAY_____ Lane_____ Direction_____ *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 _____

Field Crew Chief

Affiliation: _____

VERIFIED AND APPROVED _____

SHRP Representative

Affiliation: _____

DATE ____-____-19___

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	INSIDE SHOULDER	OUTSIDE SHOULDER
*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)		[__ __ __.]

SPS-6 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] TYPE
		*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	_ _ _ _ _ _	_ _ _ _ + _ _	_ _ _ _ + _ _	_

*5 INTERSECTIONS BETWEEN TEST SECTION ON THE PROJECT

ROUTE	PROJECT STATION NO.	RAMPS EXIT	RAMPS ENT	INTERSECTION STOP	INTERSECTION SIGNAL	INTERSECTION UNSIG
_____	_ _ _ _ + _ _	___	___	___	___	___
_____	_ _ _ _ + _ _	___	___	___	___	___
_____	_ _ _ _ + _ _	___	___	___	___	___

Note 1. Indicate the type of subgrade construction the test section is located on: Cut... 1 Fill... 2 At-Grade... 3 Cut, Fill, and At-Grade Combo... 4

If a section contains any combination of cut, fill and at-grade portions (code 4 above), enter the specific details of the cut, fill and at-grade locations on SPS-8 Construction Data Sheet 15.

PREPARED EMPLOYER _____ DATE _____

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:

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

2. Layer description codes:

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

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

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

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

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
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)

	TYPE	QUANTITY (%)
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)

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..... __ __ __.
Minimum..... __ __ __.
Standard Deviation... __ __.__
Number of Tests ..... __ __.
Maximum..... __ __ __.

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)	__ __.__	__ __.__	__ __.__	__ __.__

DATE

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		__ __	__ __	__ __	__ __

DATE

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) [__ __.__]

		TYPE	PERCENT
*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)... 6 _____

*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 TYPE	TEST SECTION STATION NUMBER	
		*2 START	*3 END
1	_____	0 + 0 0	__ __ __ __ + __ __
2	_____	__ __ __ __ + __ __	__ __ __ __ + __ __
3	_____	__ __ __ __ + __ __	__ __ __ __ + __ __
4	_____	__ __ __ __ + __ __	__ __ __ __ + __ __
5	_____	__ __ __ __ + __ __	__ __ __ __ + __ __
6	_____	__ __ __ __ + __ __	__ __ __ __ + __ __
7	_____	__ __ __ __ + __ __	__ __ __ __ + __ __
8	_____	__ __ __ __ + __ __	__ __ __ __ + __ __
9	_____	__ __ __ __ + __ __	__ __ __ __ + __ __
10	_____	__ __ __ __ + __ __	__ __ __ __ + __ __

NOTES:

1. Indicate the type of subgrade construction with one of the following:

   Cut... 1 Fill... 2 At-Grade... 3

2. Use one line for each cut, fill or at-grade zone present within the section boundaries.

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

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 BY WEIGHT OF CEMENT) [__ __.__]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

	TYPE CODE	AMOUNT
*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)

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
11.	Coarse	[__ __]	[__ __ __.__]
12.	Coarse	[__ __]	[__ __ __.__]
13.	Coarse	[__ __]	[__ __ __.__]
14.	Coarse and Fine	[__ __]	[__ __ __.__]

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

Sieve Size	% Passing
2".....	__ __ __
1 1/2"....	__ __ __
1".....	__ __ __
7/8".....	__ __ __
3/4".....	__ __ __
5/8".....	__ __ __
1/2".....	__ __ __
3/8".....	__ __ __
No. 4.....	__ __ __

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	__ __ __
No. 10....	__ __ __
No. 16....	__ __ __
No. 30....	__ __ __
No. 40....	__ __ __
No. 50....	__ __ __
No. 80....	__ __ __
No. 100...	__ __ __
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

	Name	Haul Distance (Mi)	Time (Min)
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

	Temperature Steel Transverse	Temperature Steel Longitudinal	Dowel Bars	Tie Bars
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:

Revised June 13, 1988

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

State	Code	State	Code
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.

Functional Class	Code
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 tudy are those in which the strucutral 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).

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.

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Table A.4 Pavement Type Codes

Type of Pavement	Code
Asphalt Concrete (AC) Surfaced Pavements:	
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
Portland Cement Concrete Surfaced Pavements:	
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").

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Table A.5 Pavement Surface Material Type Classification Codes

Material Type	Code
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.

	Code
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

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Table A.7. Subgrade soil description codes.

Soil Description	Code
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

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

	Code
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

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Table A.9. Geologic classification codes.

	Code
Igneous:	
Granite	01
Syenite	02
Diorite	03
Gabbro	04
Peridotite	05
Felsite	06
Basalt	07
Diabase	08
Sedimentary:	
Limestone	09
Dolomite	10
Shale	11
Sandstone	12
Chert	13
Conglomerate	14
Breccia	15
Metamorphic:	
Gneiss	16
Schist	17
Amphibolite	18
Slate	19
Quartzite	20
Marble	21
Serpentine	22

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

	Code
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

	Code
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

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Table A.12 Portland Cement Concrete Admixture Codes

	Code
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.

Description	AASHTO	ASTM	Code
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.*

	Code
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).

	Code
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.

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Table A.15 Asphalt Cement Modifier Codes

	Code
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

	Code
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

	Code
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)

	Code
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.

	Code
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

	Code
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

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Table A.20. Recycling agent type codes.

	Code
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.

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

	Code
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

	Code
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