

**State of California Department of Transportation**

**Materials Sampling, Field Testing  
and Laboratory Testing Plan**

*Strategic Highway Research Program*

*SPS-2 Experimental Project*

**Federal Aid Project No. ACNH-P099(370)Y**

**SR 99 at and near Delhi & Various Locations**

**Merced County, California**

**FINAL**

**February 1999**

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**Materials Sampling, Field Testing, and Laboratory Testing Plan  
SPS-2 Experimental Project  
SR 99 at and near Delhi and Various Locations  
in Merced County, California**

This document presents the materials and sampling plan for the experimental Strategic Highway Research Program (SHRP) SPS-2 project planned for construction on SR 99 at and near Delhi and various locations in Merced County, California.

**Background**

The LTPP SPS-2 experiment entitled, "Strategic Pavement Study of Structural Factors for Rigid Pavements," consists of the construction of 12 test sections with portland cement concrete (PCC) surface layers on different base layers of varying thicknesses.

In the following portion of 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 for the California SPS-2 project.

**Sampling and Testing Quantities**

The estimated quantities for materials sampling, field testing, and laboratory testing for the SPS-2 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-2 California.

	<u>LTPP Test Designation</u>	<u>SHRP Protocol</u>	<u>No.</u>
<b>NATURAL SUBGRADE</b>			
Sieve Analysis . . . . .	SS01 . . . . .	Ship to FHWA Lab . . . . .	6
Hydrometer to 0.01 mm . . . . .	SS02 . . . . .	Ship to FHWA Lab . . . . .	6
Atterberg Limits . . . . .	SS03 . . . . .	Ship to FHWA Lab . . . . .	6
Classification and Type of Subgrade . . . . .	SS04 . . . . .	Ship to FHWA Lab . . . . .	6
Moisture-Density Relations . . . . .	SS05 . . . . .	Ship to FHWA Lab . . . . .	6
Resilient Modulus . . . . .	SS07 . . . . .	Ship to FHWA Lab . . . . .	6
Natural Moisture Content . . . . .	SS09 . . . . .	Ship to FHWA Lab . . . . .	6
Permeability . . . . .	UG09 . . . . .	P48 . . . . .	6
In-Place Density . . . . .		SHRP-LTPP Method . . . . .	42
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<b>PREPARED EMBANKMENT</b>			
Sieve Analysis . . . . .	SS01 . . . . .	Ship to FHWA Lab . . . . .	6
Hydrometer to 0.01 mm . . . . .	SS02 . . . . .	Ship to FHWA Lab . . . . .	6
Atterberg Limits . . . . .	SS03 . . . . .	Ship to FHWA Lab . . . . .	6
Classification and Type of Subgrade . . . . .	SS04 . . . . .	Ship to FHWA Lab . . . . .	6
Moisture-Density Relations . . . . .	SS05 . . . . .	Ship to FHWA Lab . . . . .	6
Resilient Modulus . . . . .	SS07 . . . . .	Ship to FHWA Lab . . . . .	6
Natural Moisture Content . . . . .	SS09 . . . . .	Ship to FHWA Lab . . . . .	6
Permeability . . . . .	UG09 . . . . .	P48 . . . . .	6
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<b>DENSE GRADED AGGREGATE BASE</b>			
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 . . . . .	3
Natural Moisture Content . . . . .	UG10 . . . . .	Ship to FHWA Lab . . . . .	3
In-Place Density . . . . .		SHRP-LTPP Method . . . . .	27
<b>ASPHALT TREATED PERMEABLE BASE</b>			
Asphalt Content (Extraction) . . . . .	AC04 . . . . .	P04 . . . . .	3
Gradation of Extracted Aggregate . . . . .	AG04 . . . . .	P14 . . . . .	3

Table 1. Estimated quantities of laboratory materials testing, SPS-2 California. (cont'd)

	<u>LTPP Test Designation</u>	<u>SHRP Protocol</u>	<u>No.</u>
<b>LEAN CONCRETE BASE - AS DELIVERED</b>			
Compressive Strength . . . . .	PC01 . . . . .	P61	
7 day . . . . .			6
28 day . . . . .			6
1 year . . . . .			6
Air Content . . . . .	ASTM . . . . .	C231 . . . . .	3
Slump . . . . .	ASTM . . . . .	C143 . . . . .	3
Temperature . . . . .	ASTM . . . . .	C1064 . . . . .	3
<b>LEAN CONCRETE BASE - AS PLACED</b>			
Compressive Strength . . . . .	PC01 . . . . .	P61	
14 day . . . . .			8
28 day . . . . .			8
1 year . . . . .			8
Core Examination and Thickness . . . . .	PC06 . . . . .	P66 . . . . .	24
<b>PORTLAND CEMENT CONCRETE - AS DELIVERED</b>			
Compressive Strength . . . . .	PC01 . . . . .	P61	
14 day . . . . .			6
28 day . . . . .			6
1 year . . . . .			6
Splitting Tensile Strength . . . . .	PC02 . . . . .	P62	
14 day . . . . .			6
28 day . . . . .			6
1 year . . . . .			6
Flexural Strength . . . . .	PC09 . . . . .	P69	
14 day . . . . .			6
28 day . . . . .			6
1 year . . . . .			6
Air Content . . . . .	ASTM . . . . .	C231 . . . . .	6
Slump . . . . .	ASTM . . . . .	C143 . . . . .	6
Temperature . . . . .	ASTM . . . . .	C1064 . . . . .	6

Table 1. Estimated quantities of laboratory materials testing, SPS-2 California. (cont'd)

	<u>LTPP Test Designation</u>	<u>SHRP Protocol</u>	<u>No.</u>
<b>PORTLAND CEMENT CONCRETE - AS PLACED</b>			
Compressive Strength . . . . .	PC01 . . . . .	P61	
14 day . . . . .			12
28 day . . . . .			12
1 year . . . . .			12
Splitting Tensile Strength . . . . .	PC02 . . . . .	P62	
14 day . . . . .			12
28 day . . . . .			12
1 year . . . . .			12
PCC Unit Weight . . . . .	PC05 . . . . .	P65 . . . . .	12
Static Modulus of Elasticity . . . . .	PC04 . . . . .	P64	
28 day . . . . .			12
1 year . . . . .			12
Core Examination and Thickness . . . . .	PC06 . . . . .	P66 . . . . .	99
Air Content @ 28 days . . . . .	PC08 . . . . .	P68 . . . . .	2
PCC Coefficient of Thermal Expansion . . . . .	PC03 . . . . .	Ship to FHWA . . . . .	2

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

	<u>Quantity</u>	<u>Units</u>
<b>Portland Cement Concrete</b>		
Coring (102mm diameter Cores) . . . . .	99 . . . . .	Cores
Bulk Sampling Mix (90 kgs) . . . . .	6 . . . . .	Samples
Bulk Sampling Portland Cement Concrete for MRL		
(19-2 pails) . . . . .	1 . . . . .	Samples
Bulk Sampling Aggregate (400 kg Sample) . . . . .	1 . . . . .	Sample
<b>Lean Concrete Base</b>		
Coring (102mm diameter Cores) . . . . .	24 . . . . .	Cores
Bulk Sampling Mix . . . . .	3 . . . . .	Samples
Bulk Sampling Portland Cement Concrete for MRL		
(19-1 pails) . . . . .	1 . . . . .	Samples
Bulk Sampling Aggregate (200 kg Sample) . . . . .	1 . . . . .	Sample
<b>ATPB</b>		
Bulk Sampling Mix . . . . .	3 . . . . .	Samples
Bulk Sampling Asphalt Cement MRL (57-1) . . . . .	1 . . . . .	Samples
Bulk Sampling Aggregate MRL (227 kg Sample) . . . . .	1 . . . . .	Sample
<b>Aggregate Base</b>		
Bulk Sampling (182 kg Samples) . . . . .	6 . . . . .	Samples
Moisture Content Samples . . . . .	6 . . . . .	Jars
<b>Prepared Embankment</b>		
Splitspoon Sampling . . . . .	12 . . . . .	Samples
Bulk Sampling Mix (227 kgs) . . . . .	6 . . . . .	Samples
Moisture Content . . . . .	1 . . . . .	Sample
<b>Natural Subgrade</b>		
Bulk Sampling (227 kg Sample) . . . . .	6 . . . . .	Samples
Moisture Jar Samples . . . . .	6 . . . . .	Samples
<b>Shipping to FHWA Lab</b>		
Bulk CI2AB Sample . . . . .	3 . . . . .	Samples
Bulk Embankment Sample . . . . .	6 . . . . .	Samples
Bulk Natural Subgrade Samples . . . . .	6 . . . . .	Samples

Table 2. Estimated quantities for material sampling and other field tests, SPS-2 California. (cont'd)

	<u>Quantity</u>	<u>Units</u>
Shipping to SHRP Materials Reference Library		
19 liter pails of portland cement (23 kgs) . . . . .	2 . . . . .	Pails
19 liter pails of flyash (23 kgs) . . . . .	2 . . . . .	Pails
1 liter unbreakable glass containers of liquid additive . . . . .	2 . . . . .	Glass Containers
19 liter pails of fine aggregate from plant (200 kg) . . . . .	8 . . . . .	Pails
19 liter pails of coarse aggregate from plant (200 kg) . . . . .	8 . . . . .	Pails

## Sampling and Testing of SPS-2 Test Sections

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

### *Natural Subgrade*

- Bulk and moisture sampling of the natural subgrade.
- If the natural subgrade is greater than 1.22m below the prepared subgrade or embankment surface, then no sampling is required.

### *Prepared Embankment*

- Bulk and moisture sampling of the prepared embankment surface.
- Nuclear moisture and density tests on the prepared surface.
- Auger probes through the shoulder to a depth of 6.1m below the prepared embankment surface.
- Base line elevation surveys on the surface of the prepared embankment to use as a reference in determining layer thickness.
- Falling Weight Deflectometer (FWD) measurements on the prepared embankment.

### *Class 2 Aggregate Base*

- Bulk and moisture sampling of the Class 2 Aggregate Base (CL2AB).
- Nuclear moisture and density tests on the prepared CL2AB surface.
- Elevation measurements on the prepared CL2AB surface.
- FWD measurements on the prepared CL2AB.

### *Asphalt Treated Permeable Base*

- Bulk sampling of the Asphalt Treated Permeable Base (ATPB) material.
- Elevation measurements on the prepared ATPB surface.

### *Lean Concrete Base*

- Bulk sampling and molding of cylindrical test specimens from the as-delivered Lean Concrete Base (LCB) material.
- Slump, air content and temperature measurements on the as-delivered LCB mix.
- Coring of the LCB for laboratory testing.
- Elevation measurements on the prepared LCB surface.

### *Portland Cement Concrete*

- Bulk sampling and molding of PCC specimens for laboratory testing.
- Slump, air content and temperature measurements on the as-delivered PCC mix.
- Coring of the PCC surface for laboratory testing.
- Elevation measurements on the finished PCC surface.

### *Sampling for the Materials Reference Library (MRL)*

- Bulk sampling of portland cement used in each mixture.
- Bulk sampling of fly ash used in each mixture.
- Bulk samples of liquid additives used in each mixture.
- Bulk sampling of fine aggregate used in each mixture.
- Bulk sampling of coarse aggregate used in each mixture.

The development of the materials sampling plan was based upon an assumed continuous construction sequence. Significant time delays between the construction of the test sections may require additions 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 and Amended July, 1993).

**Specific Pavement Studies, Materials and Testing Requirements for Experiment SPS-2, Strategic Study of Structural Factors for Rigid Pavements**, Operational Memorandum No. SHRP-LTPP-OM-022, Strategic Highway Research Program, Revised January, 1994.

**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.

**Specific Pavement Studies, Construction Guidelines for Experiment SPS-2, Strategic Study of Structural Factors for Rigid Pavements**, Operational Memorandum No. SHRP-LTPP-OM-018, Strategic Highway Research Program, Revised December, 1993.

Instructions and data forms for all field sampling and measurements described in this document are enclosed in appendix A. Appendix B contains the SHRP-LTPP Data Collection standard codes. The completed forms should be submitted to the LTPP representative.

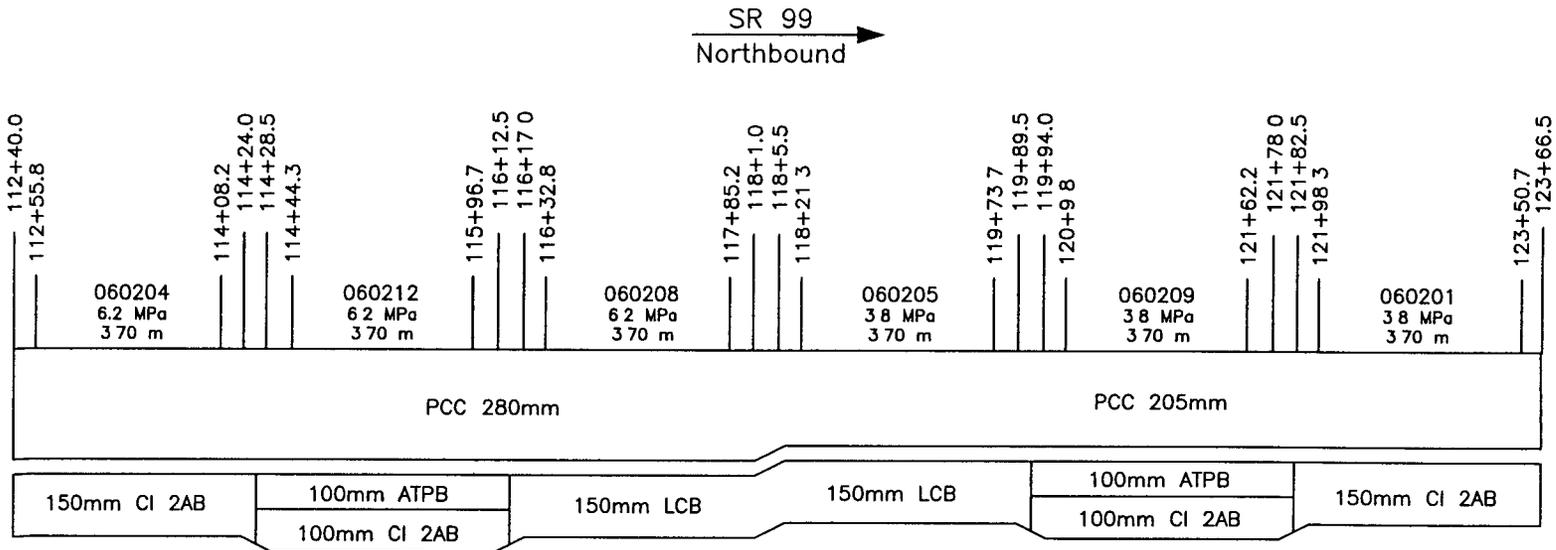
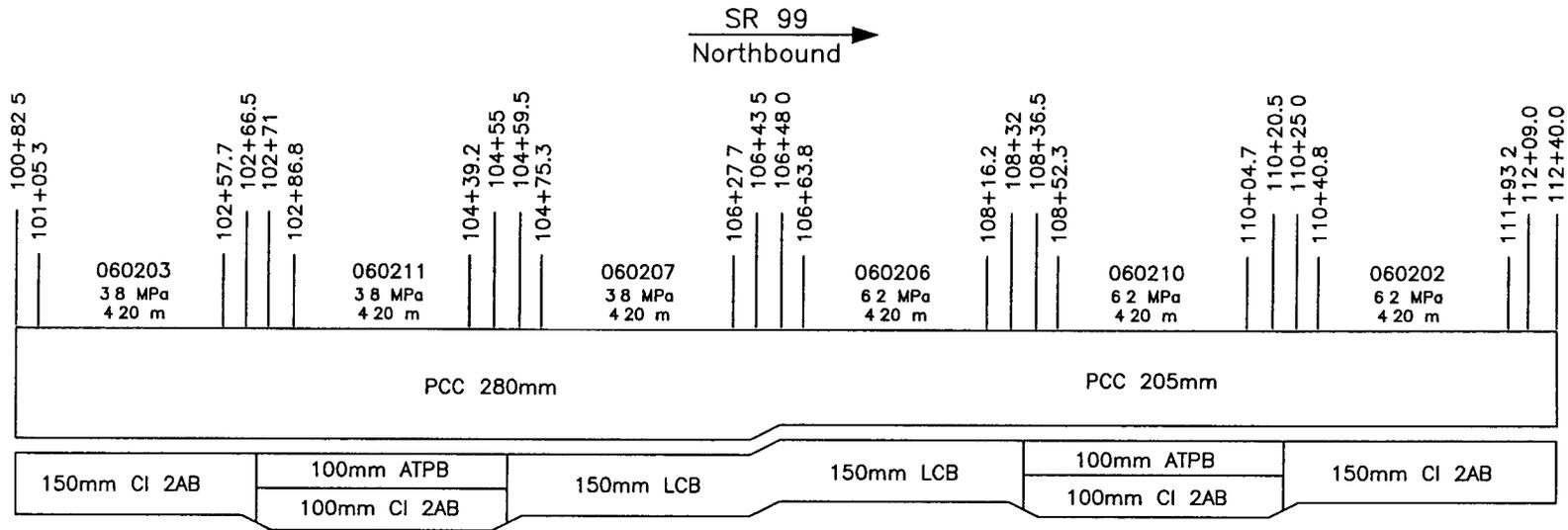
## Test Section Layout

Figure 1 illustrates the ordering and combination of the experimental SPS-2 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.

The construction stationing and LTPP test section stationing for the location of the SPS-2 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 materials, differing thicknesses or differing cross sections. No sampling, testing or monitoring will be performed within the transition areas. All changes in materials, 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.



PCC – Portland Cement Concrete Pavement  
 ATPB – Asphalt Treated Permeable Base  
 CI 2AB – Class 2 Aggregate Base  
 LCB – Lean Concrete Base

NOT TO SCALE

Figure 1. Layout of experimental test sections, California SPS-2 project, SR 99

Table 3. California SPS-2 section location and project locations, SR-99.

Site	Location	Construction Stationing	Test Section Stationing	Test Section	Concrete Strength	Comments
Transition		100+77.8 to 100+82.5	4.70 (15.4')			
060203	Begin	100+82.5	0-22.8	280mm PCC 150mm C12 AB 4.30m Lane	3.8MPa	Fill begins at Section Stn. 0+61.7 and ends at Stn. 1+52.4
	Begin Monitoring	101+05.3	0+00.0			
	End Monitoring	102+57.7	1+52.4			
	End	102+66.5	1+61.2			
Transition		102+66.5 to 102+71	4.50 (14.75')			
060211	Begin	102+71.0	0-15.8	280mm PCC 100mm ATPB 100mm C12 AB 4.30m Lane	3.8MPa	Fill begins at Section Stn. 0+00 and ends at Stn. 1+52.4
	Begin Monitoring	102+86.8	0+00.0			
	End Monitoring	104+39.2	1+52.4			
	End	104+55	1+71.2			
Transition		104+55 to 104+59.5	4.50 (14.75')			
060207	Begin	104+59.5	0-15.8	280mm PCC 150mm LCB 4.30m Lane	3.8MPa	Fill begins at Section Stn. 0+00 and ends at Stn. 1+52.4
	Begin Monitoring	104+75.3	0+00.0			
	End Monitoring	106+27.7	1+52.4			
	End	106+43.5	1+71.2			
Transition		106+43.5 to 106+48	4.50 (14.75')			
060206	Begin	106+48	0-15.8	205mm PCC 150mm LCB 4.30m Lane	6.2MPa	Fill begins at Section Stn. 0+00 and ends at Stn. 1+52.4
	Begin Monitoring	106+63.8	0+00.0			
	End Monitoring	108+16.2	1+52.4			
	End	108+32	1+71.2			
Transition		108+32 to 108+36.5	4.50 (14.75')			
060210	Begin	108+36.5	0-15.8	205mm PCC 100mm ATPB 100mm C12 AB 4.30m Lane	6.2MPa	Fill begins at Section Stn. 0+00 and ends at Stn. 1+52.4
	Begin Monitoring	108+52.3	0+00.0			
	End Monitoring	110+04.7	1+52.4			
	End	110+20.5	1+71.2			
Transition		110+20.5 to 110+25	4.50 (14.75')			
060202	Begin	110+25.0	0-15.8	205mm PCC 150mm C12 AB 4.30m Lane	6.2MPa	Fill begins at Section Stn. 0+00 and ends at Stn. 1+52.4
	Begin Monitoring	110+40.8	0+00.0			
	End Monitoring	111+93.2	1+52.4			
	End	112+09.0	1+71.8			
Transition		112+09.0 to 112+40.0	31.0 (101.7')			

Table 3. California SPS-2 section location and project locations, SR-99. (cont'd)

Site	Location	Construction Stationing	Test Section Stationing	Test Section	Concrete Strength	Comments
060204	Begin	112+40.0	0-15.8	205mm PCC 150mm C12 AB 3.70m Lane	6.2MPa	Fill begins at Section Stn. 0+00 and ends at Stn. 1+52.4
	Begin Monitoring	112+55.8	0+00.0			
	End Monitoring	114+08.2	1+52.4			
	End	114+24.0	1+71.2			
Transition		114+24 to 114+28.5	4.50 (14.75')			
060212	Begin	114+28.5	0-15.8	205mm PCC 100mm ATPB 100mm C12 AB 3.70m Lane	6.2MPa	Fill begins at Section Stn. 0+00 and ends at Stn. 1+40.7
	Begin Monitoring	114+44.3	0+00.0			
	End Monitoring	115+96.7	1+52.4			
	End	116+12.5	1+71.2			
Transition		116+12.5 to 116+17	4.50 (14.75')			
060208	Begin	116+17.0	0-15.8	205mm PCC 150mm LCB 3.70m Lane	6.2MPa	Section on cut
	Begin Monitoring	116+32.8	0+00.0			
	End Monitoring	117+85.2	1+52.4			
	End	118+01.0	1+71.2			
Transition		118+01 to 118+05.5	4.50 (14.75')			
060205	Begin	118+05.5	0-15.8	280mm PCC 150mm LCB 3.70m Lane	3.8MPa	Section on cut
	Begin Monitoring	118+21.3	0+00.0			
	End Monitoring	119+73.7	1+52.4			
	End	119+89.5	1+71.2			
Transition		119+89.5 to 119+94	4.50 (14.75')			
060209	Begin	119+94.0	0-15.8	280mm PCC 100mm ATPB 100mm C12 AB 3.70m Lane	3.8MPa	Fill begins at Section Stn. 0+67.7 and ends at Stn. 1+52.4
	Begin Monitoring	120+09.8	0+00.0			
	End Monitoring	121+62.2	1+52.4			
	End	121+78.0	1+71.2			
Transition		121+78 to 121+82.5	4.50 (14.75')			
060201	Begin	121+82.5	0-15.8	280mm PCC 150mm C12 AB 3.70m Lane	3.8MPa	Section on cut
	Begin Monitoring	121+98.3	0+00.0			
	End Monitoring	123+50.7	1+52.4			
	End	123+66.5	1+71.2			

## 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 through 6 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 materials, including CL2AB, ATPB, PCC, and LCB, are shown for the test sections from which the materials should be obtained during construction. These figures are further broken down into figures 7 through 18. Figures 7 through 18 summarize the sampling required for each individual section.

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  
6801 Washington Ave. South  
Minneapolis, Minnesota 55439  
(612) 941-5600

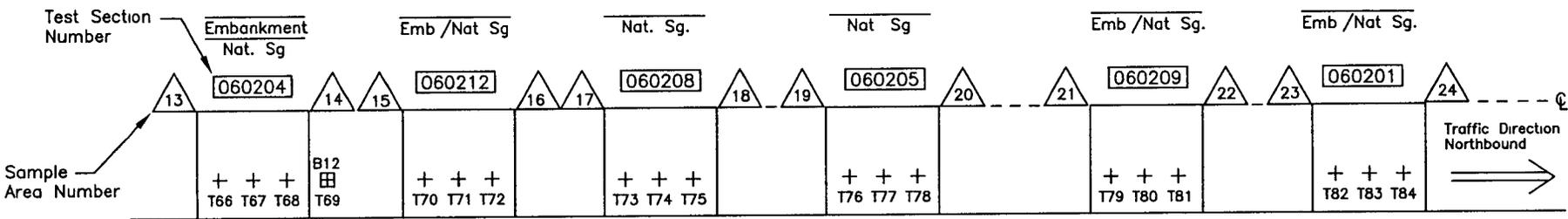
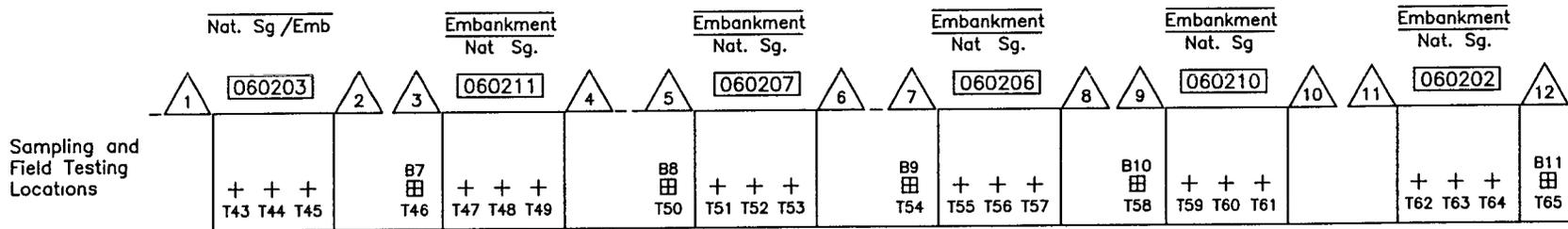
Before shipping any material, Kevin Senn, State Coordinator Western Regional Coordination Office Contractor (WRCOC) (775/329-4955) and David Clauson, Braun Intertec (612/941-5600) should be notified of the planned shipment. Cost of shipping is a state requirement.

### *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 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





NOT TO SCALE

- 0.6m x 0.6m bulk sampling location (B7–B12) to 0.30m below top of embankment
- + Location of nuclear moisture–density tests (T43–T84)
- △ Sample areas
- Nat. Sg. – Natural subgrade

Figure 3. Overview of material sampling and testing on Prepared Subgrade or Embankment, SPS–2 California

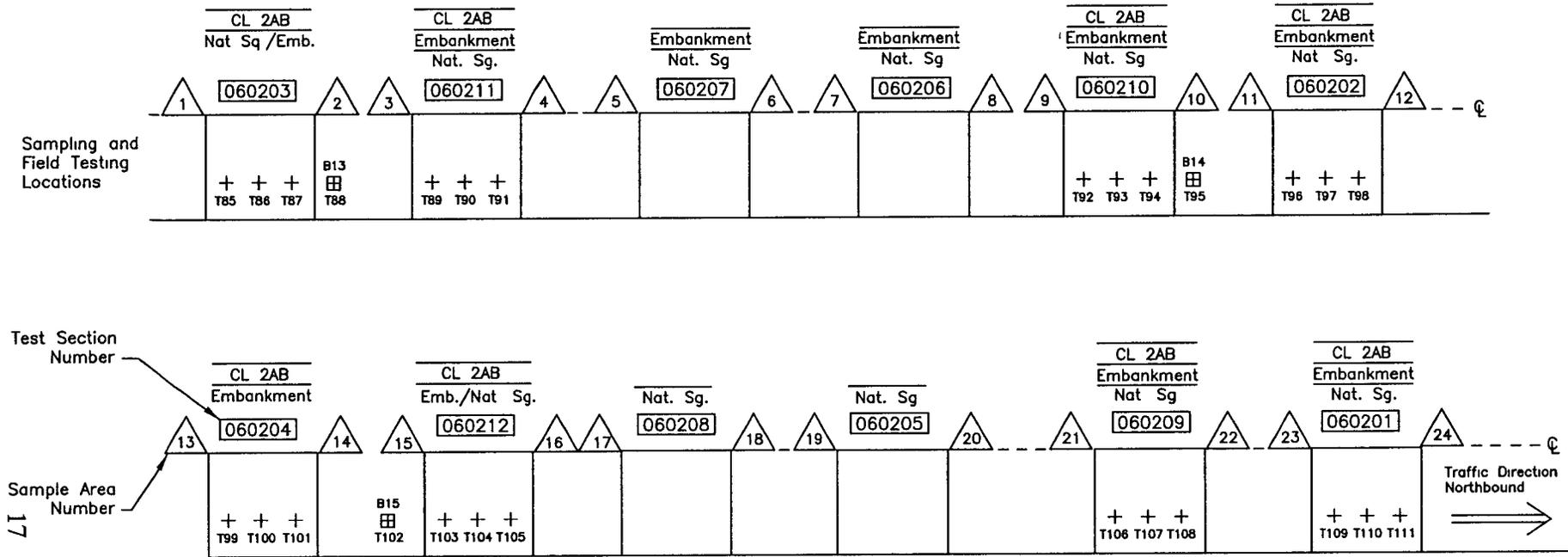
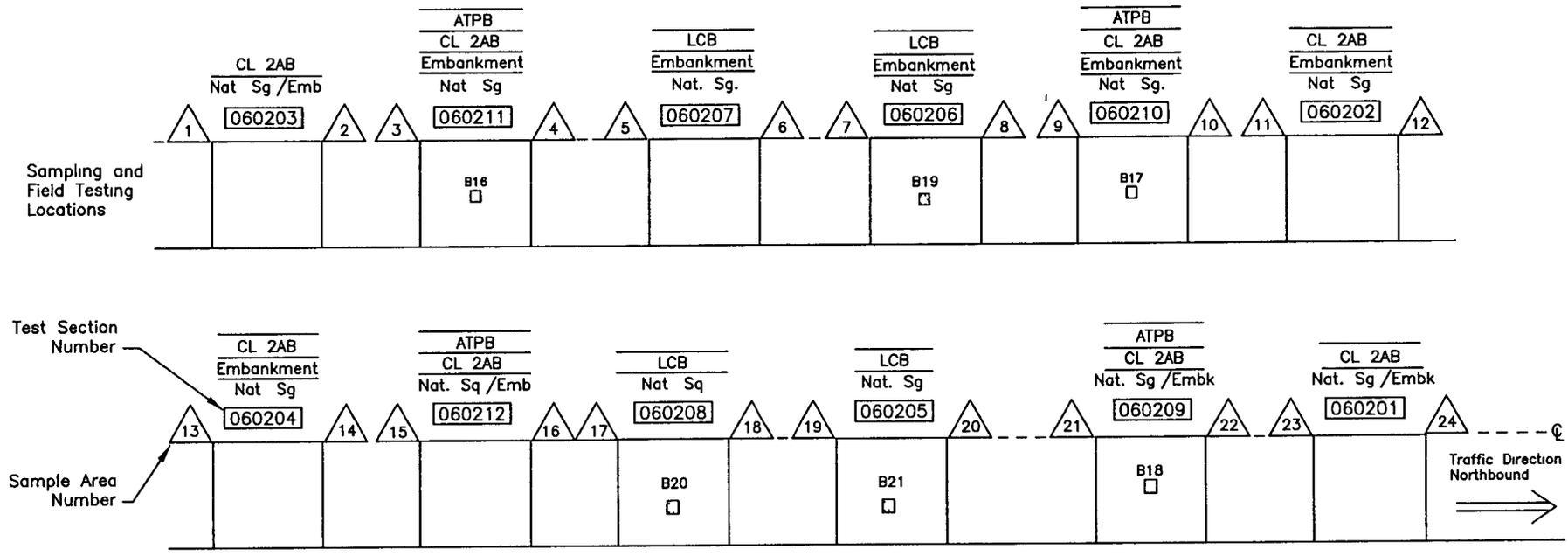


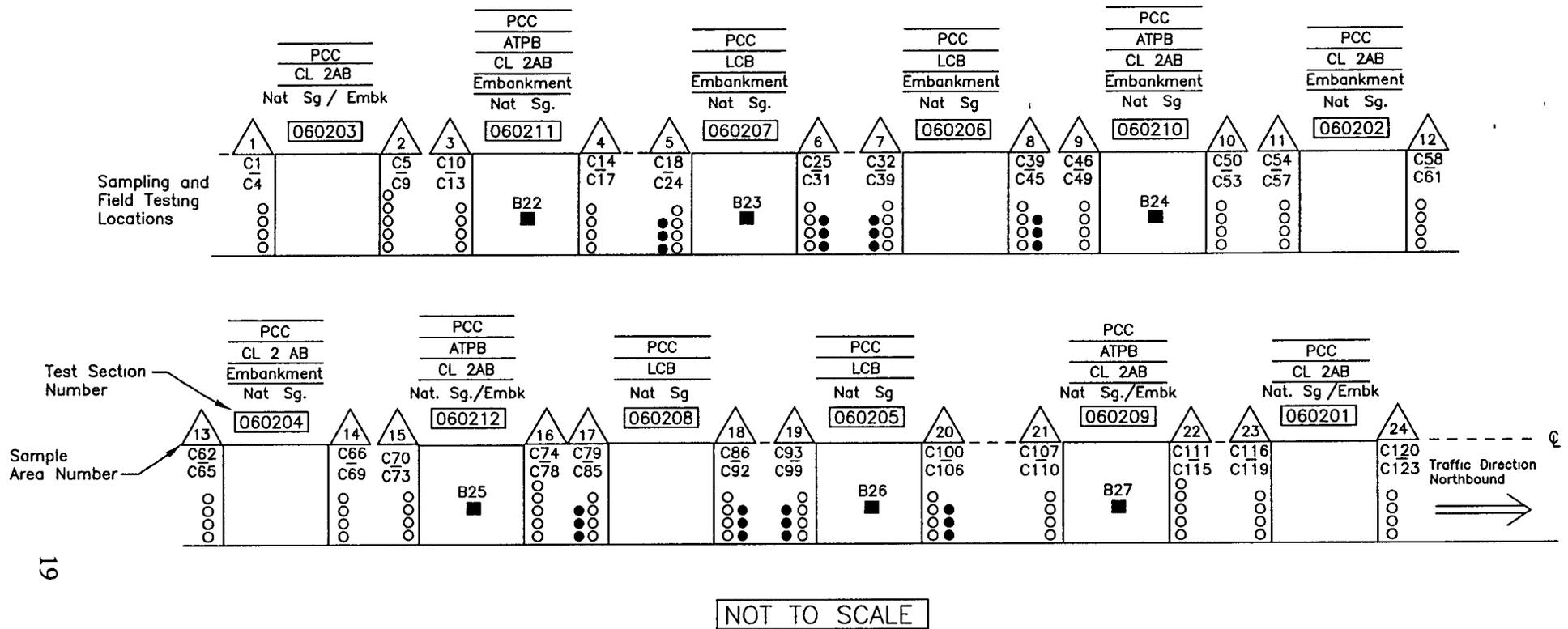
Figure 4. Overview of material sampling and testing on Class 2 Aggregate Base Course, SPS-2 California



NOT TO SCALE

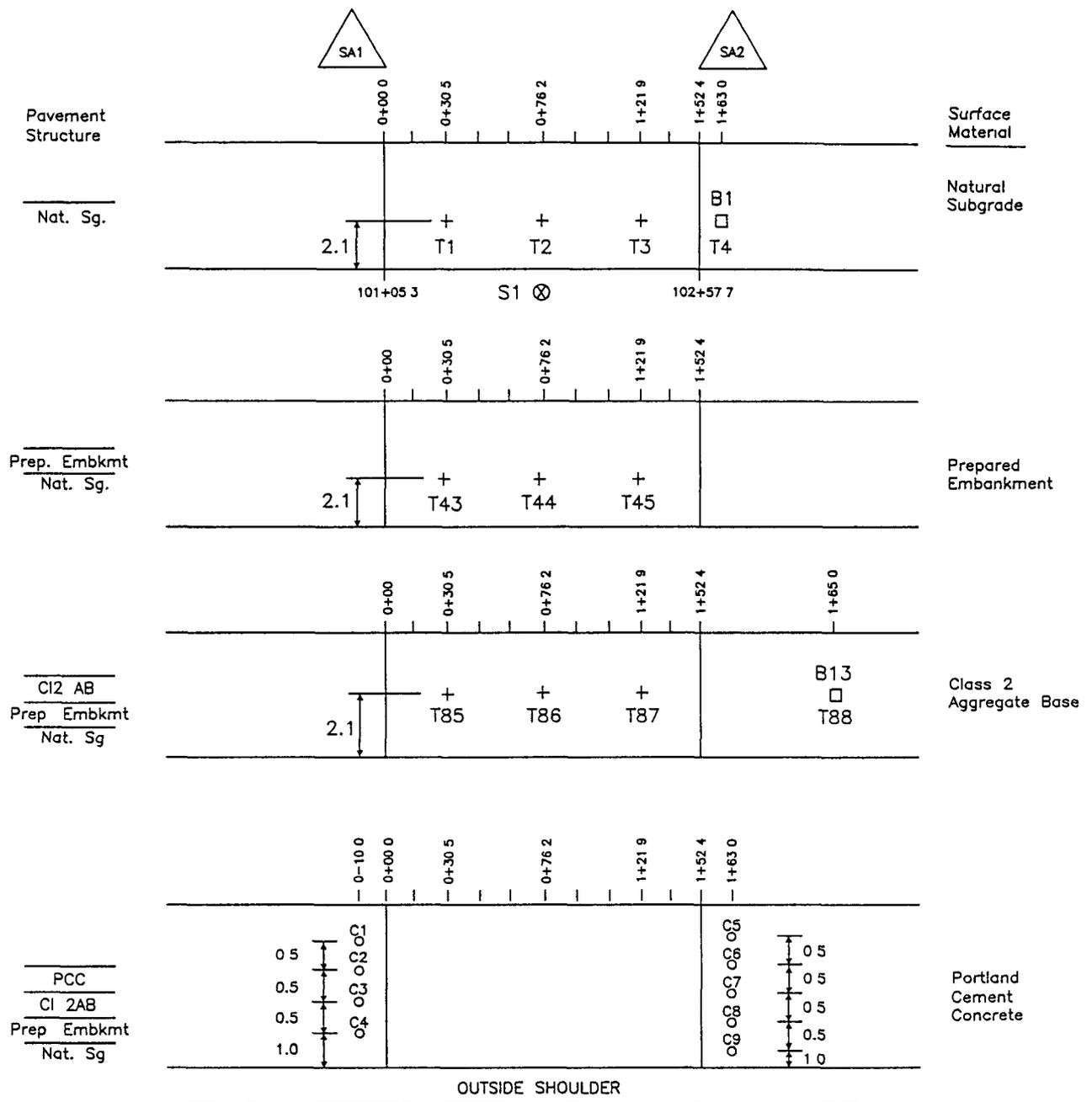
- Bulk ATPB samples (B16–B18)
- Bulk LCB samples (B19–B21)
- △ Sample areas
  - Nat. Sg. – Natural Subgrade
  - LCB – Lean Concrete Base
  - CL 2AB – Class 2 Aggregate Base
  - ATPB – Asphalt Treated Permeable Base

Figure 5. Overview of material sampling & testing on Asphalt Treated Permeable Base & Lean Concrete Base – SPS-2 California



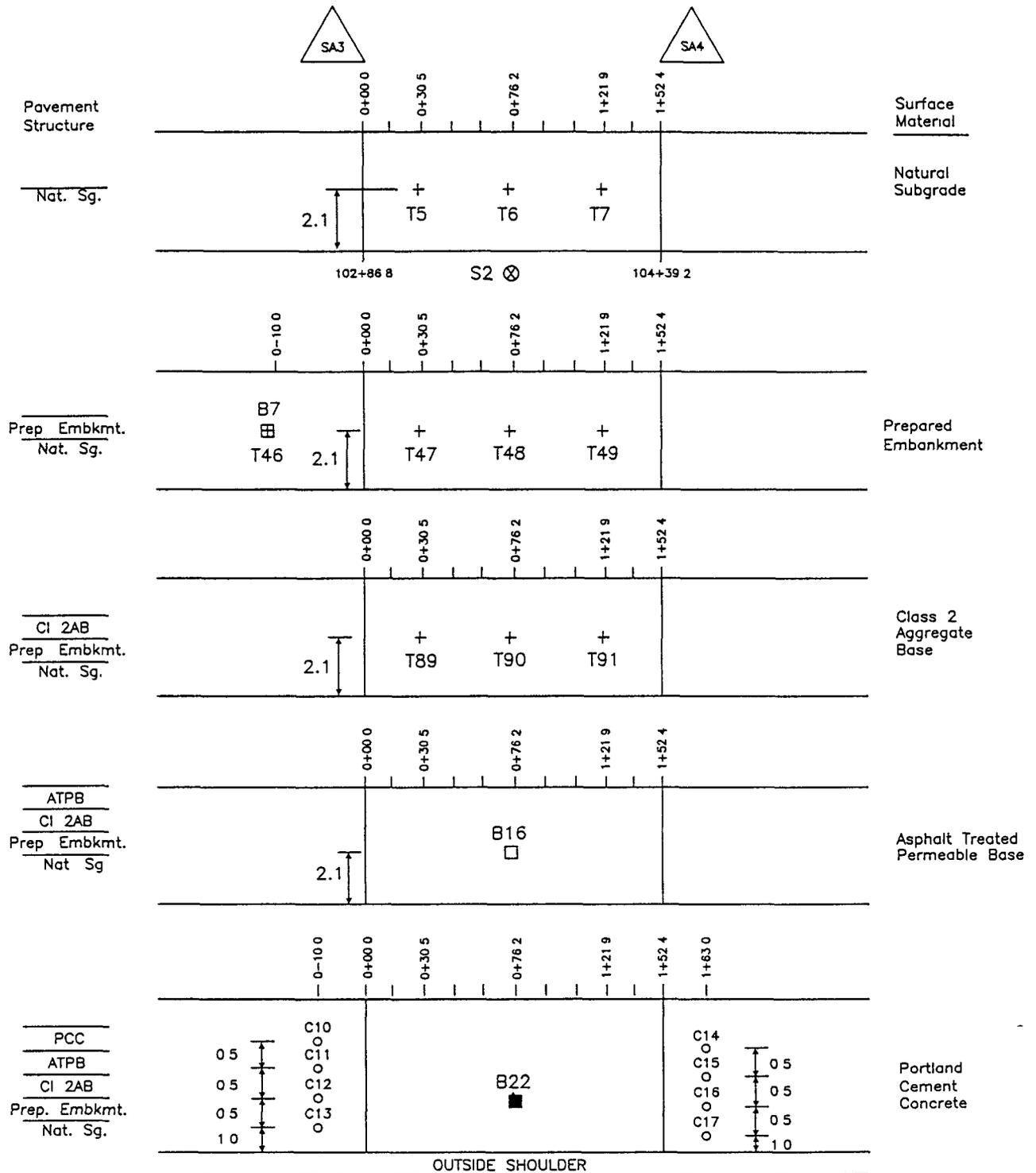
- 4" core of finished LCB layers (C18–C20, C25–C27, C32–C34, C39–C41, C79–C81, C86–C88, C93–C95, C100–C102)
- 4" core of finished PCC surface only (C1–C17, C21–C24, C28–C31, C35–C38,) (C42–C78, C82–C85, C89–C92, C96–C99, C103–C106, C107–C123)
- Bulk PCC Samples (B22–B27)
- △ Sample areas
  - Nat. Sg. – Natural Subgrade
  - LCB – Lean Concrete Base
  - CL 2AB – Class 2 Aggregate Base
  - ATPB – Asphalt Treated Permeable Base

Figure 6. Overview of sampling, testing, and coring plan for surface of test sections, SPS-2 California



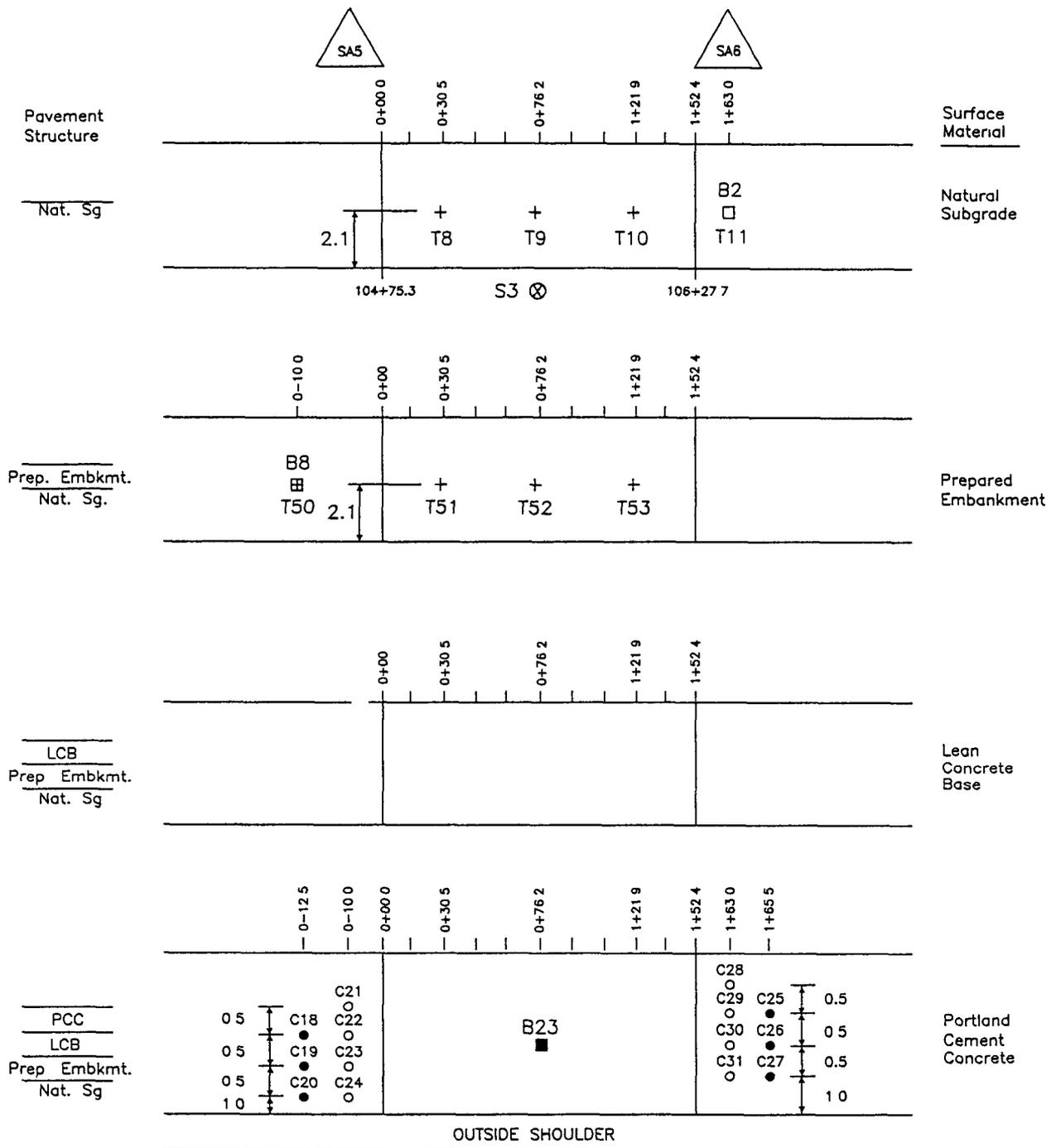
- ⊗ S1 - 6.1m Shoulder probe
  - + T1-T4 - Nuclear moisture-density tests on Natural Subgrade
  - B1 - Bulk sample of Natural Subgrade
  - + T43-T45 - Nuclear moisture-density tests on Embankment (T43-T45)
  - + T85-T88 - Nuclear moisture-density tests on CI 2AB
  - B13 - Bulk sample of CI 2AB
  - C1-C9 - Cores of PCC surface
- Note: Shoulder probe testing may be performed at a later time.

Figure 7. Sampling and test plan for test section 060203, SPS-2 California



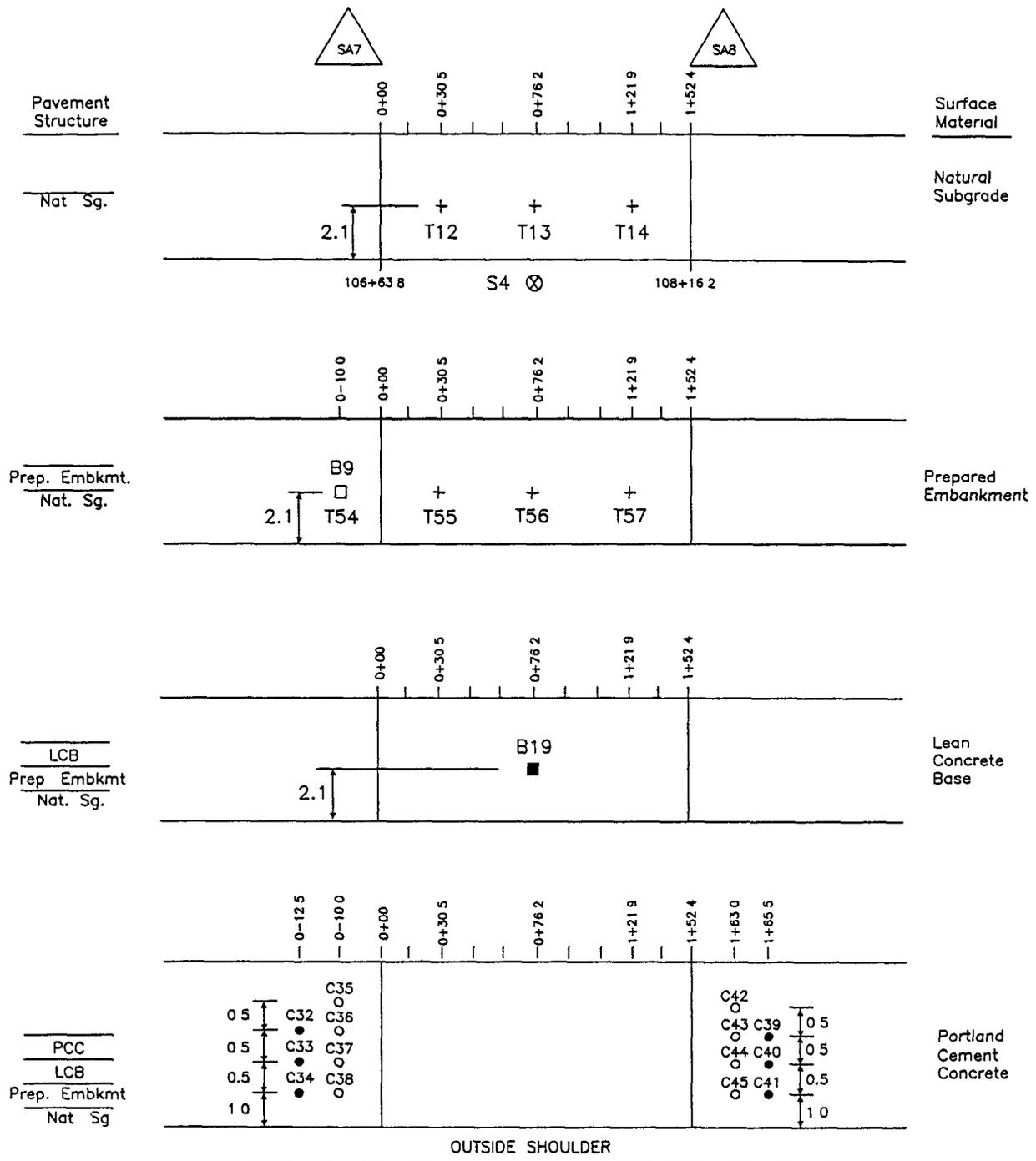
- ⊗ S2 - 6.1m Shoulder probe
  - + T5-T7 - Nuclear moisture-density tests on Natural Subgrade
  - + T46-T49 - Nuclear moisture-density tests on Embankment
  - + T89-T91 - Nuclear moisture-density tests on CI 2AB
  - B7 - Bulk sample of embankment
  - B16 - Bulk sample of ATPB
  - B22 - Bulk sample of PCC
  - C10-C17 - Cores of PCC surface
- Note: Shoulder probe testing may be performed at a later time.

Figure 8. Sampling and test plan for test section 060211, SPS-2 California



- ⊗ S3 - 6.1m Shoulder probe
  - + T8-T11 - Nuclear moisture-density tests on Natural Subgrade
  - ⊞ B2 - Bulk sample of Natural Subgrade
  - + T50-T53 - Nuclear moisture-density tests on Embankment
  - B8 - Bulk sample of Embankment
  - B23 - Bulk sample of PCC
  - C18-C20, C25-C27 - Cores of LCB
  - C21-C24, C28-C31 - Cores of PCC surface
- Note: Shoulder probe testing may be performed at a later time.

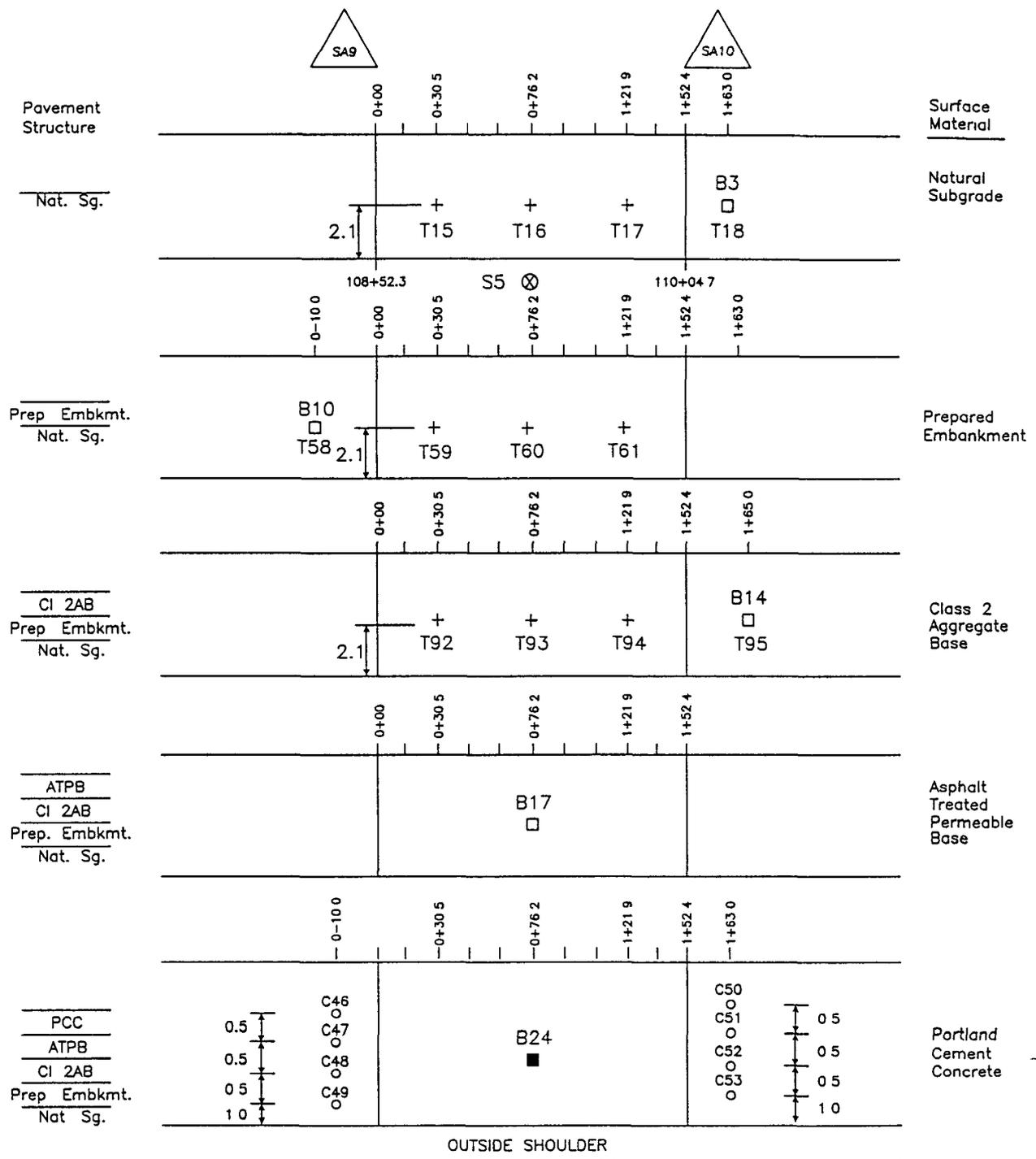
Figure 9. Sampling and test plan for test section 060207, SPS-2 California



- ⊗ S4 - 6.1m Shoulder probe
- + T12-T14 - Nuclear moisture-density tests on Natural Subgrade
- + T54-T57 - Nuclear moisture-density tests on Embankment
- B9 - Bulk sample of Embankment
- B19 - Bulk sample of LCB
- C32-C34, C39-C41 - Cores of LCB
- C35-C38, C42-C45 - Cores of PCC surface

Note: Shoulder probe testing may be performed at a later time.

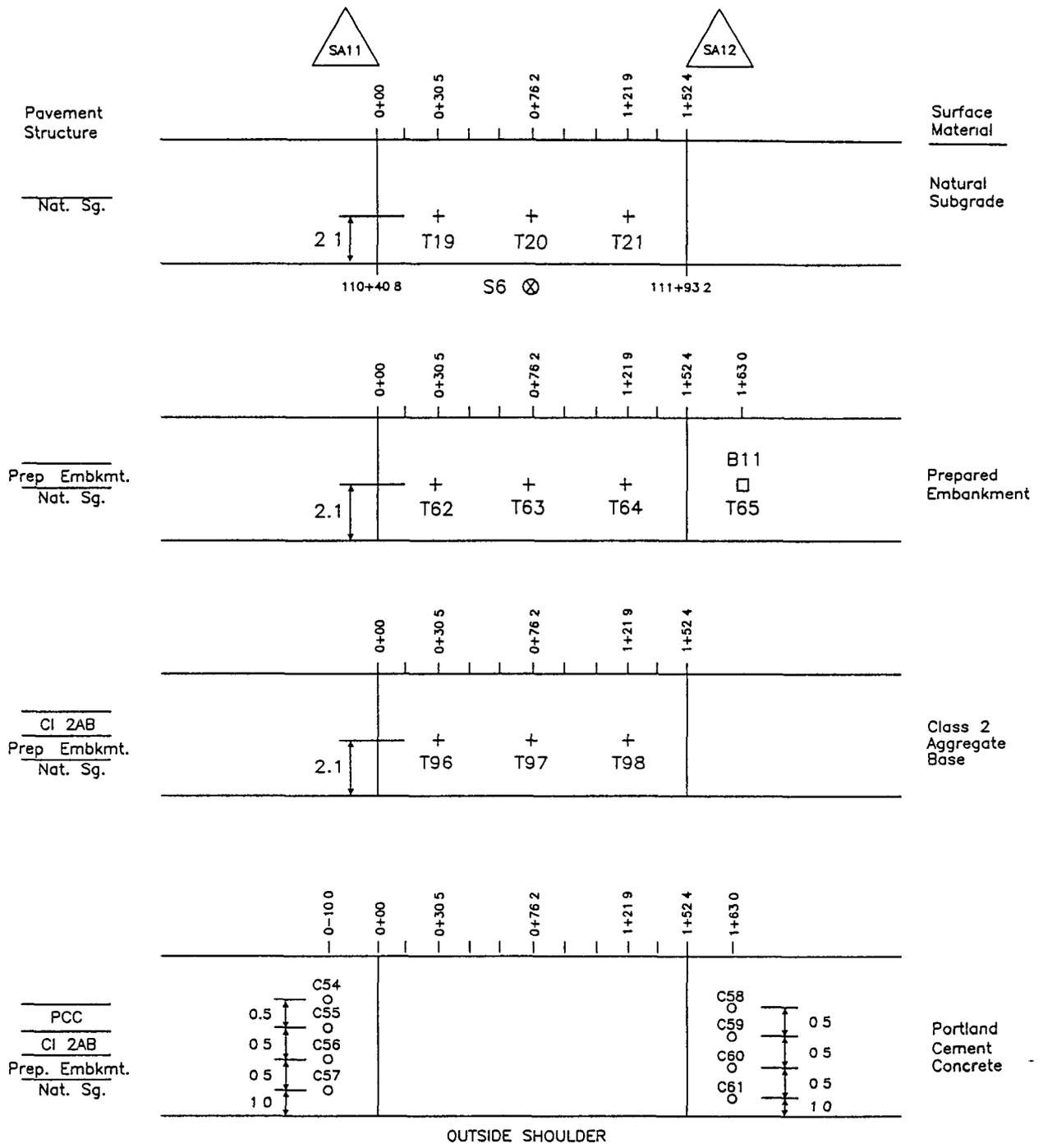
Figure 10 Sampling and test plan for test section 060206, SPS-2 California.



- ⊗ S5 - 6.1m Shoulder probe
- B3 - Bulk sample of Natural Subgrade
- + T15-T18 - Nuclear moisture-density tests on Natural Subgrade
- + T58-T61 - Nuclear moisture-density tests on Embankment
- B10 - Bulk sample of Embankment
- + T92-T95 - Nuclear moisture-density tests on CI 2AB
- B14 - Bulk sample of CI 2AB
- B17 - Bulk sample of ATPB
- B24 - Bulk sample of PCC Surface
- C46-C53 - Cores of PCC surface

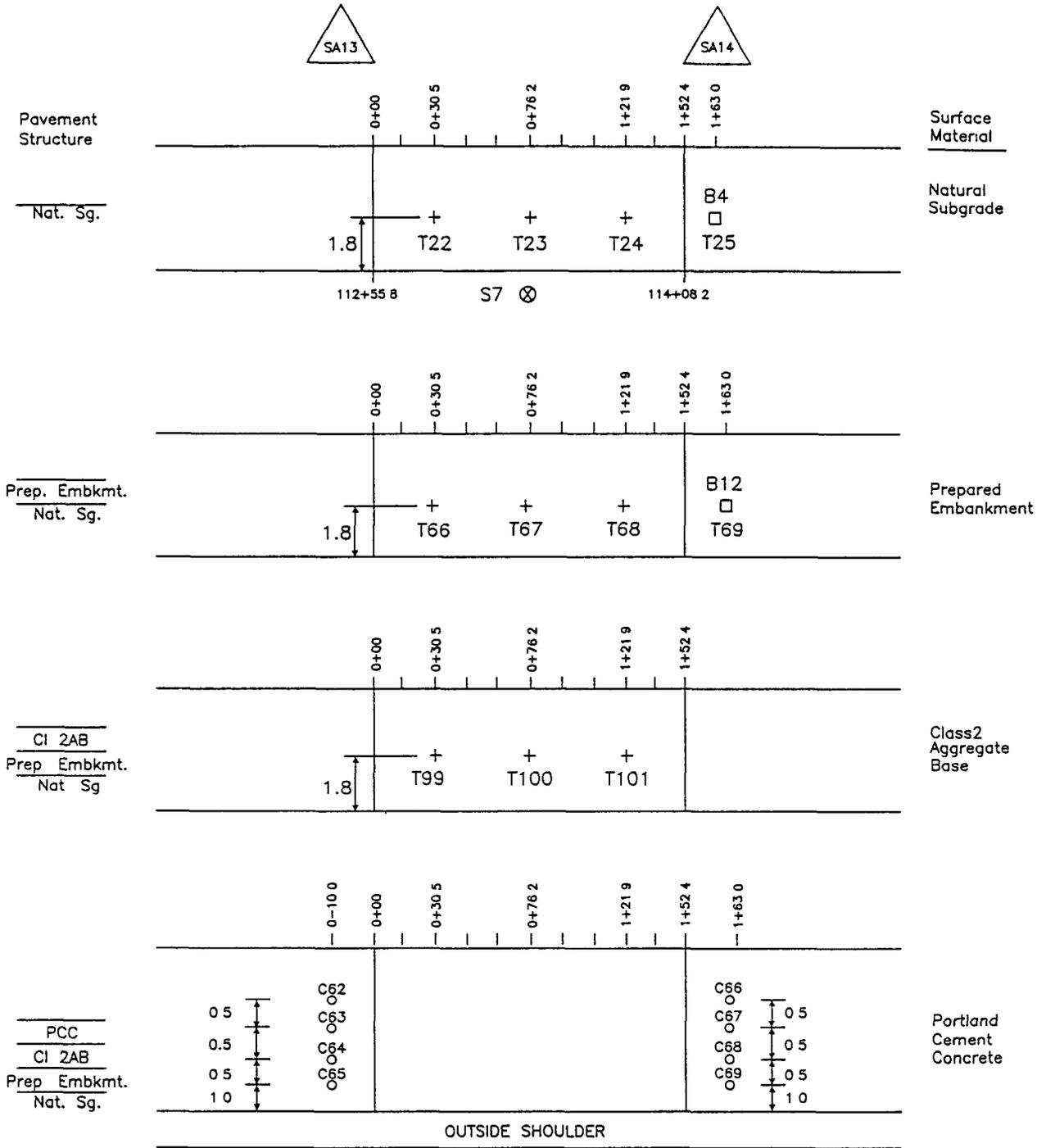
Note: Shoulder probe testing may be performed at a later time.

Figure 11. Sampling and test plan for test section 060210, SPS-2 California



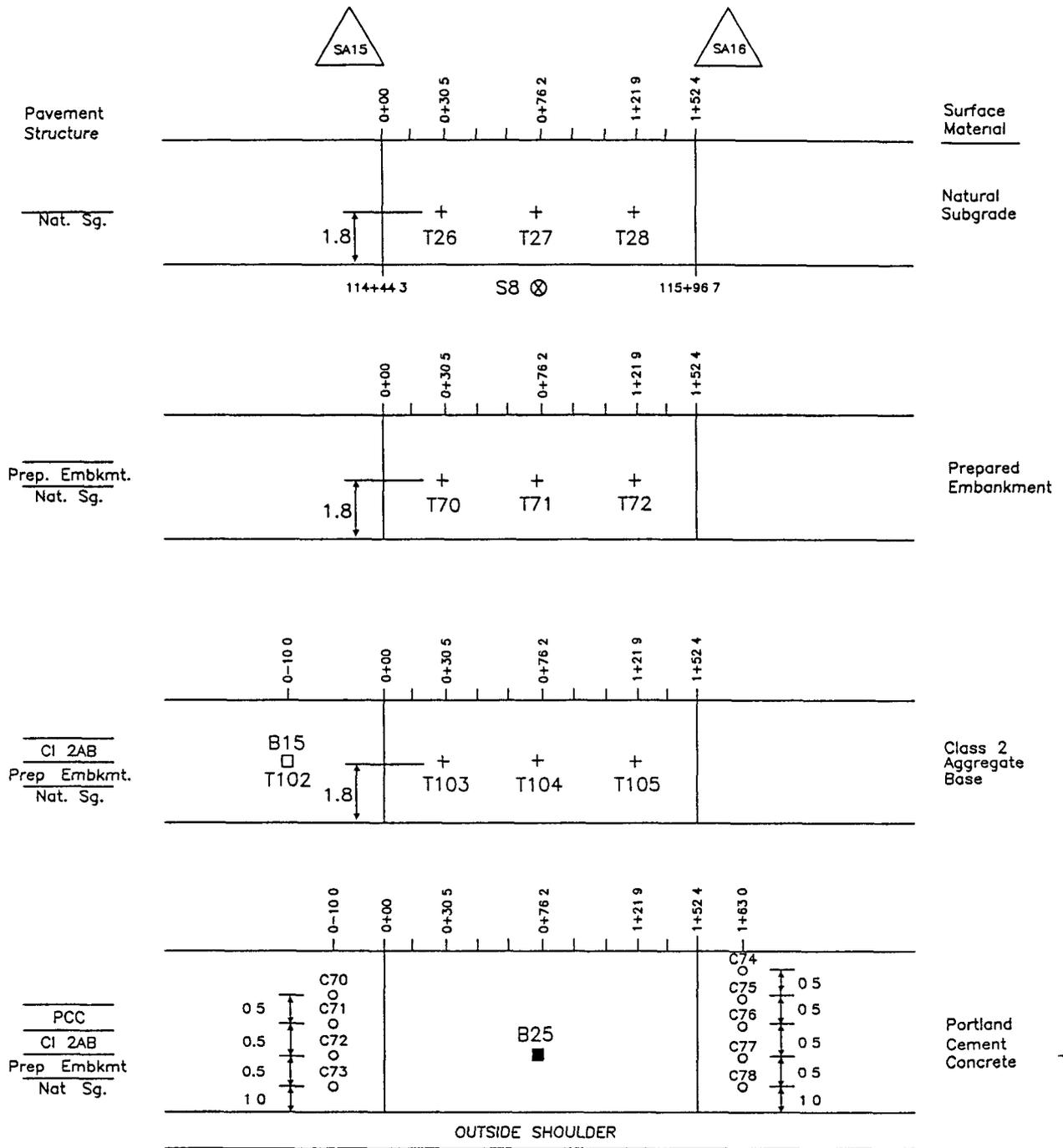
- ⊗ S6 - 6.1m Shoulder probe
  - + T19-T21 - Nuclear moisture-density tests on Natural Subgrade
  - + T62-T65 - Nuclear moisture-density tests on Embankment
  - + T96-T98 - Nuclear moisture-density tests on CI 2AB
  - B11 - Bulk sample of Embankment Material
  - C54-C61 - Cores of PCC surface
- Note. Shoulder probe testing may be performed at a later time.

Figure 12. Sampling and test plan for test section 060202, SPS-2 California



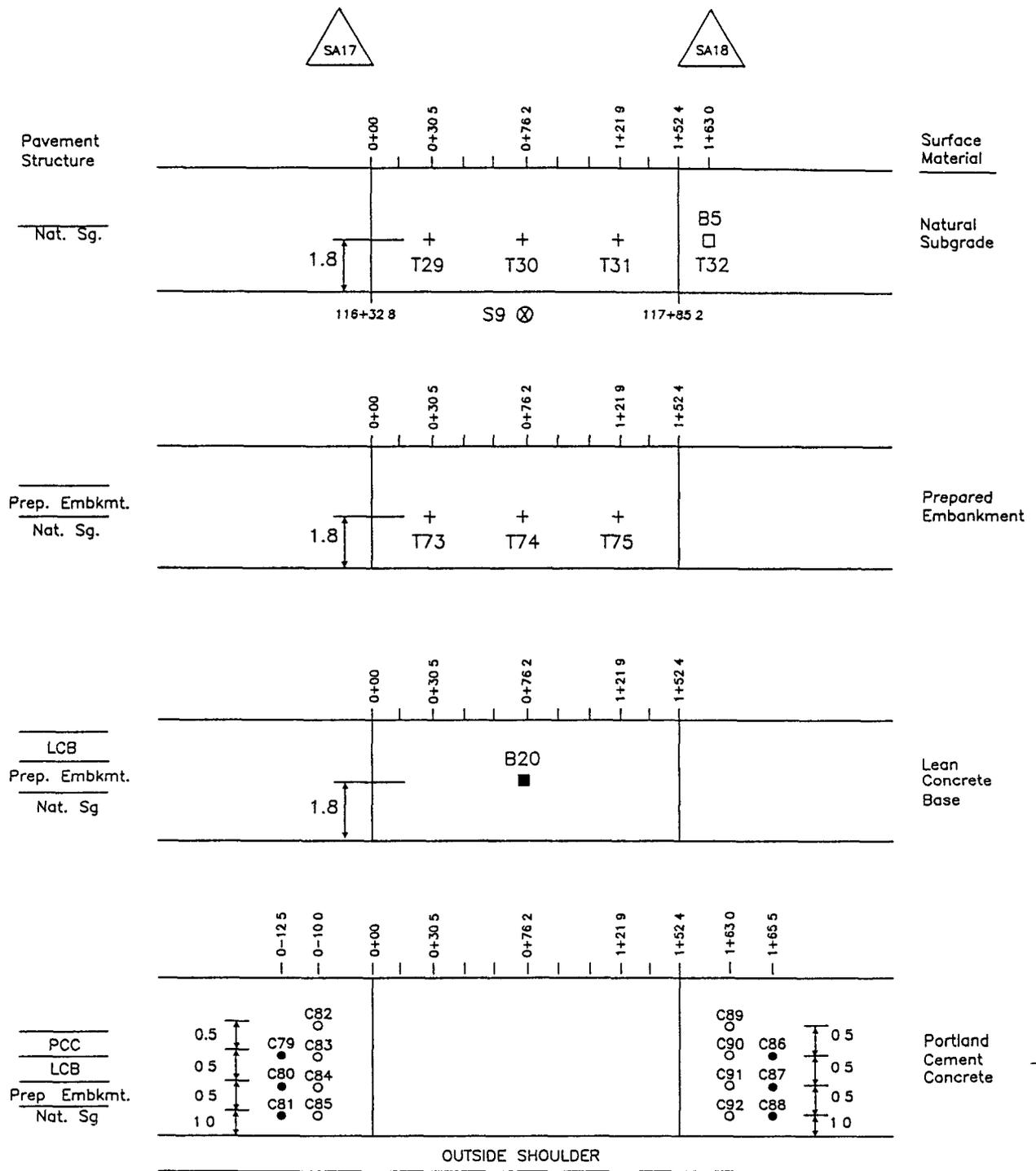
- ⊗ S7 - 6.1m Shoulder probe
  - + T22-T25 - Nuclear moisture-density tests on Natural Subgrade
  - B4 - Bulk sample of Natural Subgrade
  - + T66-T69 - Nuclear moisture-density tests on Embankment
  - B12 - Bulk sample of Embankment
  - + T99-T101 - Nuclear moisture-density tests on CI 2AB
  - C62-C69 - Cores of PCC surface
- Note: Shoulder probe testing may be performed at a later time.

Figure 13. Sampling and test plan for test section 060204, SPS-2 California



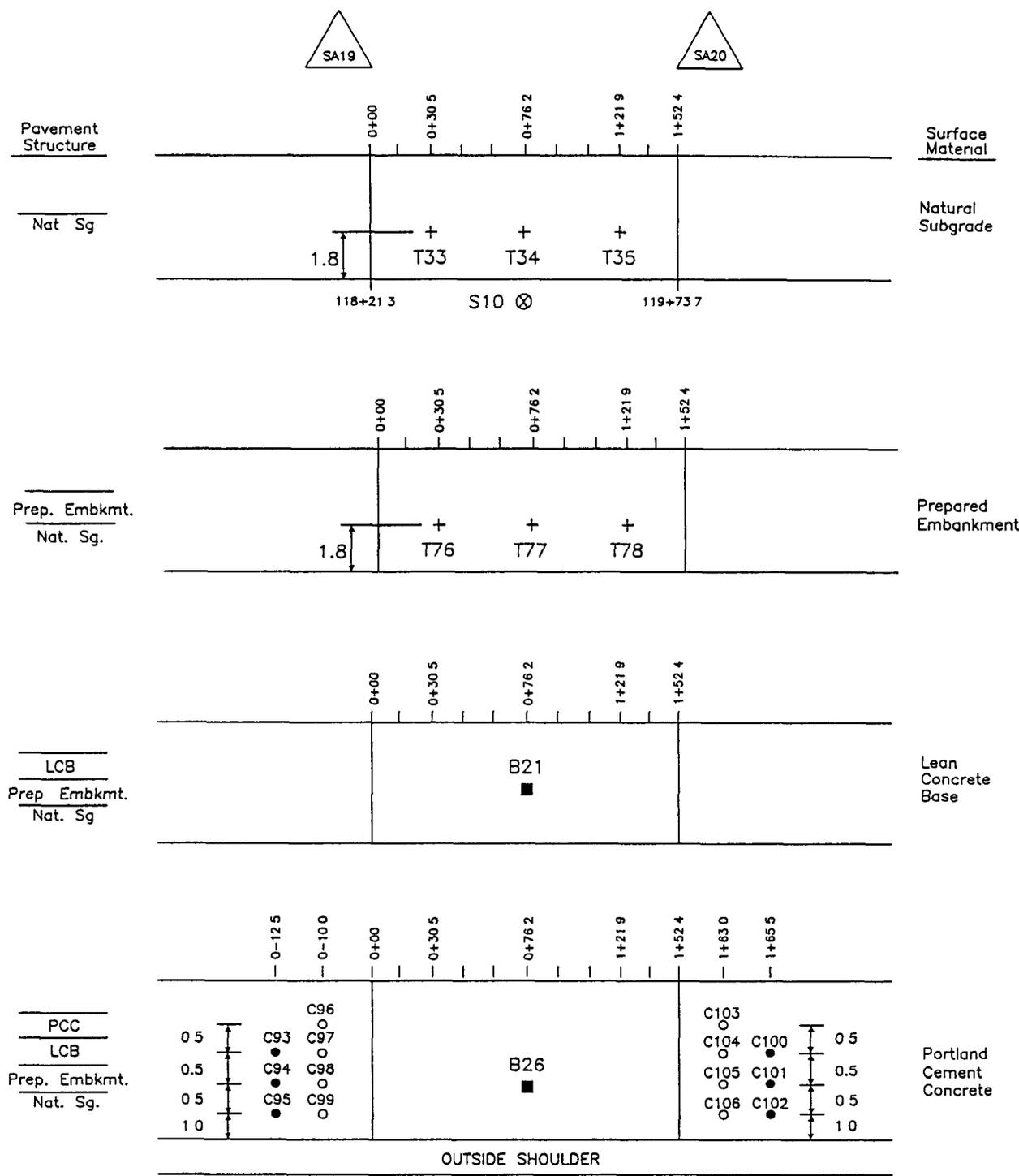
- ⊗ S8 - 6.1m Shoulder probe
  - + T26-T28 - Nuclear moisture-density tests on Natural Subgrade
  - + T70-T72 - Nuclear moisture-density tests on Embankment
  - B15 - Bulk sample of CI 2AB
  - + T102-T105 - Nuclear moisture-density tests on CI 2AB
  - B25 - Bulk sample of PCC
  - C70-C78 Cores of PCC surface
- Note: Shoulder probe testing may be performed at a later time.

Figure 14. Sampling and test plan for test section 060212, SPS-2 California



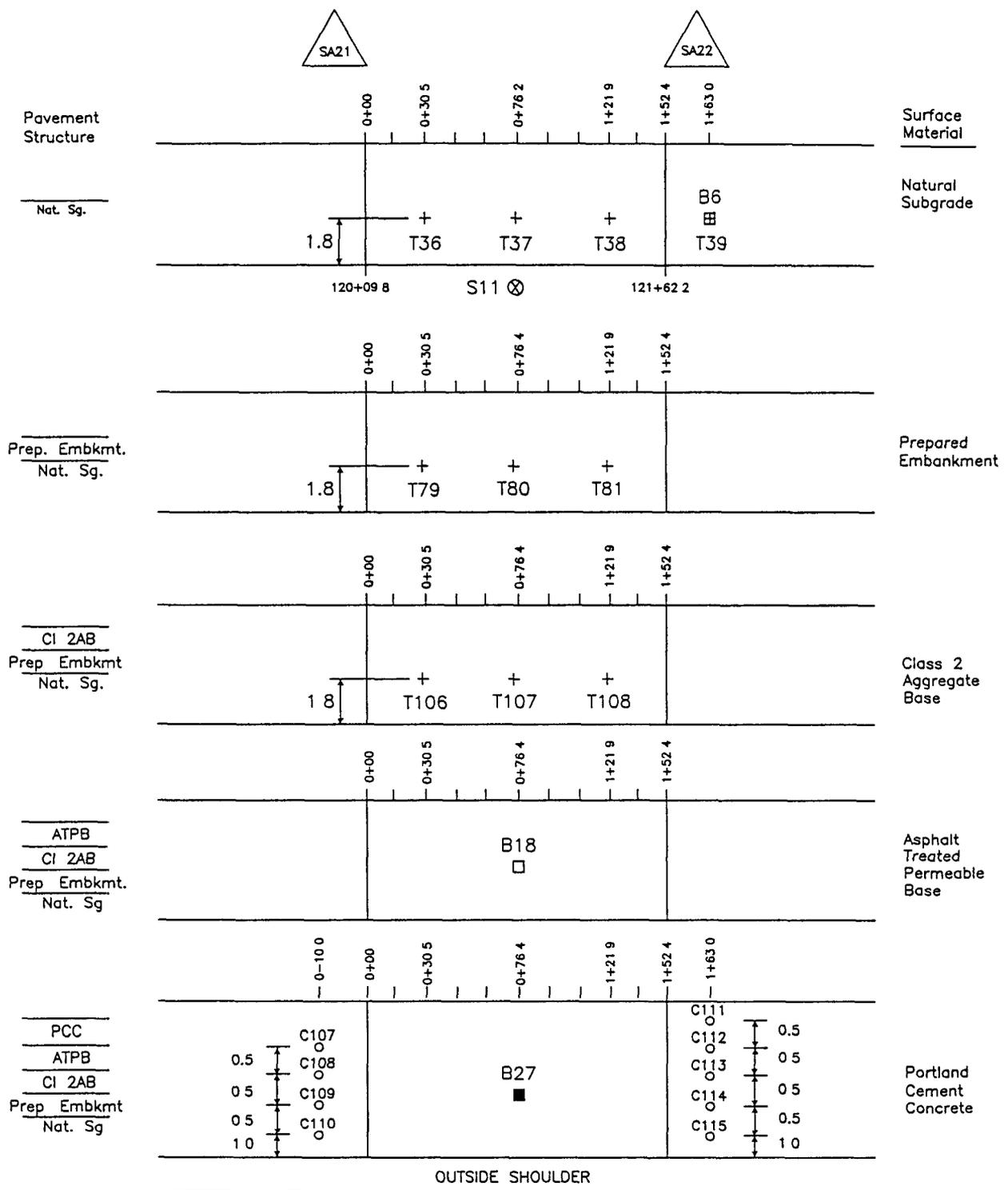
- ⊗ S9 - 6.1m Shoulder probe
  - + T29-T32 - Nuclear moisture-density tests on Natural Subgrade
  - B5 - Bulk sample of Natural Subgrade
  - + T73-T75 - Nuclear moisture-density tests on Prepared Subgrade
  - B20 - Bulk sample of LCB
  - C79-C81, C86-C88 - Cores of LCB
  - C82-C85, C89-C92 - Cores of PCC surface
- Note: Shoulder probe testing may be performed at a later time.

Figure 15. Sampling and test plan for test section 060208, SPS-2 California



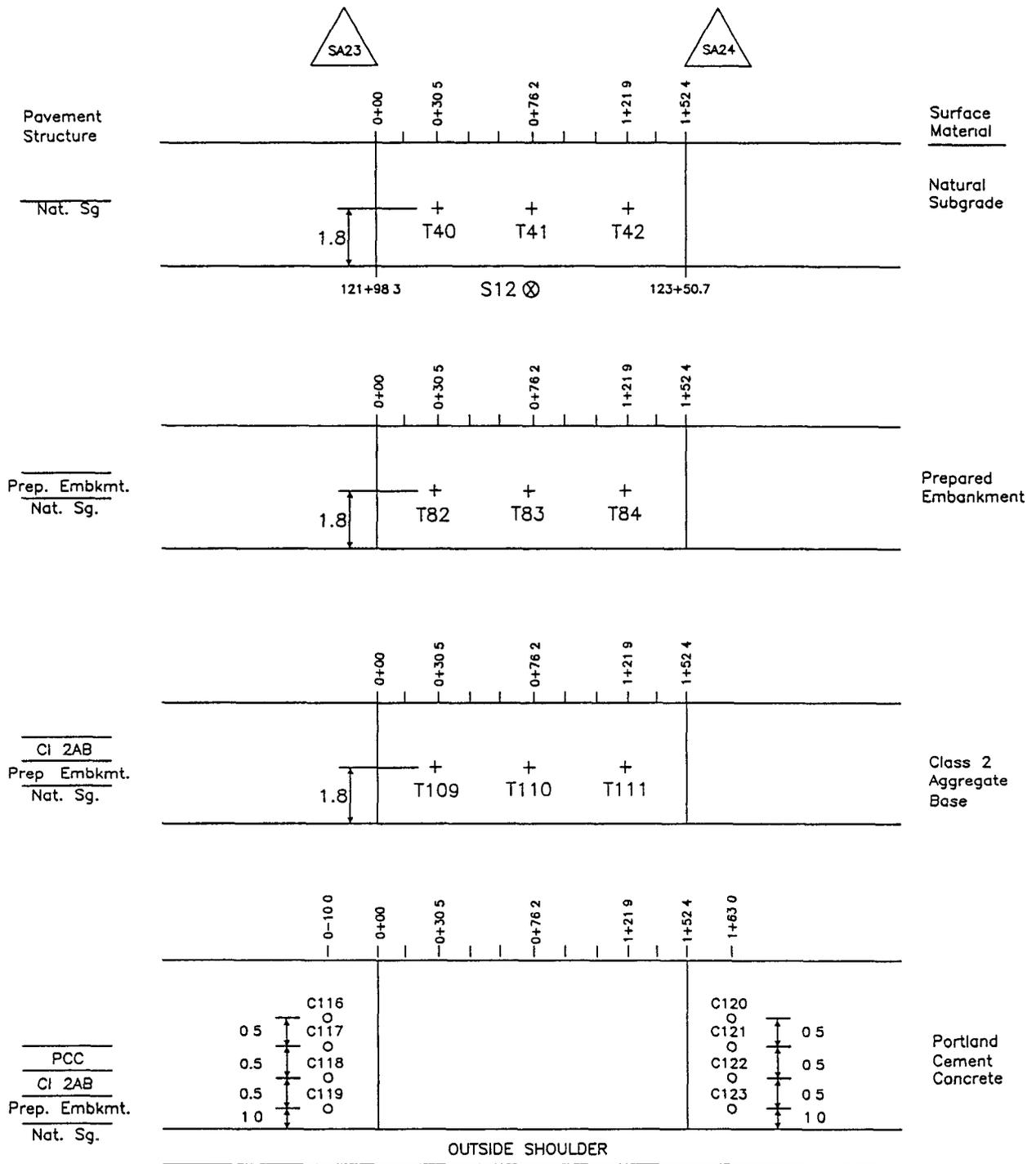
- ⊗ S10 - 6.1m Shoulder probe
  - + T33-T35 - Nuclear moisture-density tests on Natural Subgrade
  - + T76-T78 Nuclear moisture-density tests on Prepared Subgrade
  - B21 - Bulk sample of LCB
  - B26 - Bulk sample of PCC
  - C93-C95, C100-C102 - Cores of LCB
  - C96-C99, C103-C106 - Cores of PCC surface
- Note Shoulder probe testing may be performed at a later time.

Figure 16. Sampling and test plan for test section 060205, SPS-2 California



- ⊗ S11 - 6.1m Shoulder probe
  - + T36-T39 - Nuclear moisture-density tests on Natural Subgrade
  - B6 - Bulk sample of Natural Subgrade
  - + T79-T81 - Nuclear moisture-density tests on Embankment/Prepared Subgrade
  - + T106-T108 - Nuclear moisture-density tests on CI 2AB
  - B18 - Bulk sample of ATPB
  - B27 - Bulk sample of PCC
  - C107-C115 - Cores of PCC surface
- Note: Shoulder probe testing may be performed at a later time.

Figure 17. Sampling and test plan for test section 060209, SPS-2 California



⊗ S12 - 6.1m Shoulder probe  
 + T40-T42 - Nuclear moisture-density tests on Natural Subgrade  
 + T82-T84 - Nuclear moisture-density tests on Prepared Subgrade  
 + T109-T111 - Nuclear moisture-density tests on Class 2 Aggregate Base  
 o C116-C123 - Cores of PCC surface  
 Note: Shoulder probe testing may be performed at a later time.

Figure 18. Sampling and test plan for test section 060201, SPS-2 California

## Natural Subgrade

The natural subgrade is defined as the natural existing material which 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 bulk and moisture sampling should be performed immediately 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 1.22m, then several test pits or auger borings should be performed to quantify this depth.

A summary of the samples, laboratory and field tests on the natural 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 S-type locations are for the 6.1m deep auger probes through the shoulder.

### *Bulk Samples*

Bulk sampling of the natural subgrade material should be obtained from the locations listed in table 5. In general, bulk sampling should consist of a single excavation, 0.60m by 0.60m in area and 0.30m 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*

In-place density and moisture measurements should be performed on the natural subgrade surface at the locations specified in table 6. These tests shall be performed using a recently calibrated nuclear moisture-density gauge 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°.

### *Auger Probes*

Auger probes to a depth of 6.1m from the surface of the prepared embankment should be performed at the shoulder locations specified in table 7. The primary purpose of these probes is to determine if bedrock or other significantly dense layers exist within 6.1m of the pavement surface elevation. General changes in the material stratum and the depth to ground water table

can also be identified from these probes. Auguring shall be performed using a truck mounted drill rig using 0.1m or 0.15m, continuous flight, solid, helical augers. Construction sequences/stages may warrant the auger probe drilling to be performed at a later date, but before the section is opened to traffic.

#### *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." The FWD testing will be performed by Nichols Consulting Engineers in coordination with the Caltrans Resident Engineer.

Table 4. Field and laboratory test plan for **Natural Subgrade** materials, SPS-2 California.

Test Name	LTPP Test Designation	LTPP Protocol	No. of Tests	Material Source/ Test Location
Sieve Analysis	SS01	Ship to FHWA Lab	6	B1-B6
Hydrometer to 0.01mm	SS02	Ship to FHWA Lab	6	B1-B6
Atterberg Limits	SS03	Ship to FHWA Lab	6	B1-B6
Subgrade Classification & Type	SS04	Ship to FHWA Lab	6	B1-B6
Moisture-Density Relations	SS05	Ship to FHWA Lab	6	B1-B6
Resilient Modulus	SS07	Ship to FHWA Lab	6	B1-B6
Natural Moisture Content	SS09	Ship to FHWA Lab	6	B1-B6
Permeability	UG09	P48	3	B1, B3,B5
In-Place Density		LTPP Method	42	T1-T42
Depth to Rigid Layer		LTPP Method	12	S1 - S12

<sup>1</sup>Visual-Manual Classification Method Only.

Table 5. Locations of **Natural Subgrade** bulk sampling, SPS-2 California.

Sample Location Designation	Construction Stationing	Test Section Station	Offset, m		Test Section	Sample Area
			Center Line, Rt	Outside Lane Edge, Lt		
B1	102+68.3	1+63 0	2.2	2.1	060203	2
B2	106+38.3	1+63.0	2.2	2.1	060207	6
B3	110+15.3	1+63 0	2.2	2.1	060210	10
B4	114+18.8	1+63.0	1.9	1.8	060204	14
B5	117+95.8	1+63.0	1.9	1.8	060208	18
B6	121+72.8	1+63.0	1.9	1.8	060209	22

Table 6. Locations for in-place density and moisture tests on  
**Natural Subgrade, SPS-2 California.**

Sample Location Designation	Construction Stationing	Test Section Station	Offset, meters		Test Section
			Centerline, Rt	Outside Lane Edge, Lt	
T1	101+35.8	0+30.5	2.2	2.1	060203
T2	101+81.5	0+76.2	2.2	2.1	060203
T3	102+27.2	1+21.9	2.2	2.1	060203
T4	102+68.3	1+63.0	2.2	2.1	060203
T5	103+17.3	0+30.5	2.2	2.1	060211
T6	103+63.0	0+76.2	2.2	2.1	060211
T7	104+08.7	1+21.9	2.2	2.1	060211
T8	105+05.8	0+30.5	2.2	2.1	060207
T9	105+51.5	0+76.2	2.2	2.1	060207
T10	105+97.2	1+21.9	2.2	2.1	060207
T11	106+38.3	1+63	2.2	2.1	060207
T12	106+94.3	0+30.5	2.2	2.1	060206
T13	107+40.0	0+76.2	2.2	2.1	060206
T14	107+85.7	1+21.9	2.2	2.1	060206
T15	108+82.8	0+30.5	2.2	2.1	060210
T16	109+28.5	0+76.2	2.2	2.1	060210
T17	109+74.2	1+21.9	2.2	2.1	060210
T18	110+15.3	1+63.0	2.2	2.1	060210
T19	110+71.3	0+30.5	2.2	2.1	060202
T20	111+17.0	0+76.2	2.2	2.1	060202
T21	111+62.7	1+21.9	2.2	2.1	060202
T22	112+86.3	0+30.5	1.9	1.8	060204
T23	113+32.0	0+76.2	1.9	1.8	060204
T24	113+77.7	1+21.9	1.9	1.8	060204
T25	114+18.8	1+63.0	1.9	1.8	060204
T26	114+74.8	0+30.5	1.9	1.8	060212
T27	115+20.5	0+76.2	1.9	1.8	060212
T28	115+66.2	1+21.9	1.9	1.8	060212
T29	116+63.3	0+30.5	1.9	1.8	060208
T30	117+09.0	0+76.2	1.9	1.8	060208
T31	117+54.7	1+21.9	1.9	1.8	060208
T32	117+95.8	1+63.0	1.9	1.8	060208
T33	118+51.8	0+30.5	1.9	1.8	060205
T34	118+97.5	0+76.2	1.9	1.8	060205
T35	119+43.2	1+21.9	1.9	1.8	060205
T36	120+40.3	0+30.5	1.9	1.8	060209
T37	120+86.0	0+76.2	1.9	1.8	060209
T38	121+31.7	1+21.9	1.9	1.8	060209
T39	121+72.8	1+63.0	1.9	1.8	060209

Table 6. Locations for in-place density and moisture tests on  
**Natural Subgrade, SPS-2 California. (cont'd)**

Sample Location Designation	Construction Stationing	Test Section Station	Offset, meters		Test Section
			Centerline, Rt	Outside Lane Edge, Lt	
T40	122+28.8	0+30.5	1.9	1.8	060201
T41	122+74.5	0+76.2	1.9	1.8	060201
T42	123+20.2	1+21.9	1.9	1.8	060201

Table 7. Locations of 6.1m deep shoulder probes, SPS-2 California.

Sample Location Designation	Construction Stationing	Test Section Station	Offset, meters Centerline, Rt.	Test Section
S1	101+81.5	0+76.2	5.3	060203
S2	103+63.0	0+76.2	5.3	060211
S3	105+51.5	0+76.2	5.3	060207
S4	107+40.0	0+76.2	5.3	060206
S5	109+28.5	0+76.2	5.3	060210
S6	111+17.0	0+76.2	5.3	060202
S7	113+32.0	0+76.2	4.7	060204
S8	115+20.5	0+76.2	4.7	060212
S9	117+09.0	0+76.2	4.7	060208
S10	118+97.5	0+76.2	4.7	060205
S11	120+86.0	0+76.2	4.7	060209
S12	122+74.5	0+76.2	4.7	060201

## Prepared Embankment

The prepared embankment layer is either the material that has been processed on the roadway, i.e., re-mixed, moisture adjusted relaid, and re-compacted, such as in a cut section or material which has been added as a fill to raise the profile grade. This material will always be sampled and tested. The prepared embankment layer measurements, tests 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, thin-walled tube samples (if available), 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 subgrade or embankment.

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

### *Bulk Samples*

Bulk sampling 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, 0.60m by 0.60m in area and 0.30m 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 10. These measurements shall be performed following the same procedures used for natural subgrade soils.

### *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." The FWD testing will be performed by Nichols Consulting Engineers in coordination with the Caltrans Regional Engineer.

Table 8. Field and laboratory test plan for **Embankment** materials, SPS-2 California.

Test Name	LTPP Test Designation	LTPP Protocol	No. of Tests	Material Source/ Test Location
Sieve Analysis	SS01	Ship to FHWA Lab	6	B7 - B12
Hydrometer to 0.01mm	SS02	Ship to FHWA Lab	6	B7 - B12
Atterberg Limits	SS03	Ship to FHWA Lab	6	B7 - B12
Subgrade Classification & Type	SS04	Ship to FHWA Lab	6	B7 - B12
Moisture-Density Relations	SS05	Ship to FHWA Lab	6	B7 - B12
Resilient Modulus	SS07	Ship to FHWA Lab	6	B7 - B12
Natural Moisture Content	SS09	Ship to FHWA Lab	6	B7 - B12
Permeability	UG09	P48	3	B7, B9, B12
In-Place Density		LTPP Method	42	T43 - T84

Note 1 - Visual-manual classification method only.

Table 9. Locations of **Embankment** bulk sampling, SPS-2 California.

Sample Location Designation	Construction Stationing	Test Section Station	Offset, meters		Test Section	Sample Area
			Centerline, Rt	Outside Lane Edge, Lt		
B7	102+76.8	0-10.0	2.2	2.1	060211	3
B8	104+65.3	0-10.0	2.2	2.1	060204	5
B9	106+53.8	0-10.0	2.2	2.1	060206	7
B10	108+42.3	0-10.0	2.2	2.1	060210	9
B11	112+03.8	1+63.0	2.2	2.1	060202	12
B12	114+18.8	1+63.0	1.9	1.80	060204	14

Table 10. Locations for in-place density and moisture tests on **Embankment**,  
SPS-2 California.

Sample Location Designation	Construction Stationing	Test Section Station	Offset, meters		Test Section
			Centerline, Rt	Outside Lane Edge, Lt	
T43	101+35.8	0+30.5	2.2	2.1	060203
T44	101+81.5	0+76.2	2.2	2.1	060203
T49	102+27.2	1+21.9	2.2	2.1	060203
T46	102+76.8	0-10.0	2.2	2.1	060211
T47	103+17.3	0+30.5	2.2	2.1	060211
T48	103+63.0	0+76.2	2.2	2.1	060211
T49	104+08.7	1+21.9	2.2	2.1	060211
T50	104+65.3	0+10.0	2.2	2.1	060207
T51	105+05.8	0+30.5	2.2	2.1	060207
T52	105+51.5	0+76.2	2.2	2.1	060207
T53	105+97.2	1+21.9	2.2	2.1	060207
T54	106+53.8	0-10.0	2.2	2.1	060206
T55	106+94.3	0+30.5	2.2	2.1	060206
T56	107+40.0	0+76.2	2.2	2.1	060206
T57	107+85.7	1+21.9	2.2	2.1	060206
T58	108+42.3	0-10.0	2.2	2.1	060210
T59	108+82.8	0+30.5	2.2	2.1	060210
T60	109+28.5	0+76.2	2.2	2.1	060210
T61	109+74.2	1+21.9	2.2	2.1	060210
T62	110+71.3	0+30.5	2.2	2.1	060202
T63	111+17.0	0+76.2	2.2	2.1	060202
T64	111+62.7	1+21.9	2.2	2.1	060202
T65	112+03.8	1+63.0	2.2	2.1	060202
T66	112+86.3	0+30.5	1.9	1.8	060204
T67	113+32.0	0+76.2	1.9	1.8	060204
T68	113+77.7	1+21.9	1.9	1.8	060204
T69	114+18.8	1+63.0	1.9	1.8	060204
T70	114+74.8	0+30.5	1.9	1.8	060212
T71	115+20.5	0+76.2	1.9	1.8	060212
T72	115+66.2	1+21.9	1.9	1.8	060212
T73	116+63.3	0+30.5	1.9	1.8	060208
T74	117+09.0	0+76.2	1.9	1.8	060208
T75	117+54.7	1+21.9	1.9	1.8	060208
T76	118+51.8	0+30.5	1.9	1.8	060205
T77	118+97.5	0+76.2	1.9	1.8	060205
T78	119+43.2	1+21.9	1.9	1.8	060205
T79	120+40.3	0+30.5	1.9	1.8	060209
T80	120+86.0	0+76.2	1.9	1.8	060209
T81	121+31.7	1+21.9	1.9	1.8	060209

Table 10. Locations for in-place density and moisture tests on **Embankment**,  
SPS-2 California. (cont'd)

Sample Location Designation	Construction Stationing	Test Section Station	Offset, meters		Test Section
			Centerline, Rt	Outside Lane Edge, Lt	
T82	122+28.8	0+30.5	1.9	1.8	060201
T83	122+74.5	0+76.2	1.9	1.8	060201
T84	123+20.2	1+21.9	1.9	1.8	060201

## **Class 2 Aggregate Base**

The measurements, tests and samples on the Class 2 Aggregate Base (CL2AB) layer should be performed prior to placement of the next pavement layer. The objective is to characterize the properties of the prepared base at the time when the next pavement layer is placed. It is therefore desired that the moisture-density tests and elevation measurements be performed just prior to the time when the next pavement layer is placed. This is most important in instances when the aggregate base will be left exposed to the elements for a significant period, depending on climatic events which might influence the properties of the material.

A summary of the samples to be taken from the CL2AB material and tests to be conducted is presented in table 11. Sampling includes bulk and moisture samples of the CL2AB material. Field tests include in-place density and moisture measurements and FWD tests.

### *Bulk Samples*

Bulk samples of the CL2AB material should be obtained at the approximate locations specified in table 12. Sampling may be performed prior to compaction to avoid interruptions to construction activities. Uncontaminated 182 kg samples shall be obtained from each location. A moisture jar sample of the prepared base immediately prior to placement of the next layer should be collected at each bulk sampling location. The procedures similar to those contained in section 3.5 of the SHRP-LTPP Guide for Field Materials Sampling, Testing and Handling should be followed. The bulk sampling locations must be repaired by placing and compacting similar material.

### *Density and Moisture Measurements*

Nuclear density and moisture measurements shall be performed on top of the prepared CL2AB at the location specified in table 13. 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 procedures and at the locations contained in LTPP SPS Directive S4, "Deflection Testing of Subgrade and Base Layers." The FWD testing will be performed by Nichols Consulting Engineers in coordination with the Caltrans Regional Engineer.

Table 11. Field and laboratory test plan for Class 2 Aggregate Base materials, SPS-2 California.

Test Name	LTPP Test Designation	LTPP Protocol	No. of Tests	Material Source/ Test Location
Particle Size Analysis	UG01	Ship to FHWA Lab	3	B13 - B15
Sieve Analysis (washed)	UG02	Ship to FHWA Lab	3	B13 - B15
Atterberg Limits	UG04	Ship to FHWA Lab	3	B13 - B15
Moisture-Density Relations	UG05	Ship to FHWA Lab	3	B13 - B15
Resilient Modulus	UG07	Ship to FHWA Lab	3	B13 - B15
Classification	UG08	Ship to FHWA Lab	3	B13 - B15
Permeability	UG09	P48	3	B13 - B15
Natural Moisture Content	UG10	Ship to FHWA Lab	3	B13 - B15
In-Place Density		LTPP Method	27	T85 - T111

Table 12. Bulk sampling of uncompacted Class 2 Aggregate Base, SPS-2 California.

Sample Location Designation	Construction Stationing	Test Section Station	Offset, meters		Test Section	Sample Area
			Centerline, Rt	Outside Lane Edge, Lt		
B13	102+70.3	1+65.0	2.2	2.1	060203	2
B14	110+17.3	1+65.0	2.2	2.1	060210	10
B15	114+34.3	0-10.0	1.9	1.8	060212	15

Table 13. Locations for in-place density and moisture tests on  
**Class 2 Aggregate Base, SPS-2 California.**

Sample Location Designation	Construction Stationing	Test Section Station	Offset, meters		Test Section
			Centerline, Rt	Outside Lane Edge, Lt	
T85	101+35.8	0+30.5	2.2	2.1	060203
T86	101+81.5	0+76.2	2.2	2.1	060203
T87	102+27.2	1+21.9	2.2	2.1	060203
T88	102+70.3	1+65.0	2.2	2.1	060203
T89	103+17.3	0+30.5	2.2	2.1	060211
T90	103+63.0	0+76.2	2.2	2.1	060211
T91	104+08.7	1+21.9	2.2	2.1	060211
T92	108+82.8	0+30.5	2.2	2.1	060210
T93	109+28.5	0+76.2	2.2	2.1	060210
T94	109+74.2	1+21.9	2.2	2.1	060210
T95	110+17.3	1+65.0	2.2	2.1	060210
T96	110+71.3	0+30.5	2.2	2.1	060202
T97	111+17.0	0+76.2	2.2	2.1	060202
T98	111+62.7	1+21.9	2.2	2.1	060202
T99	112+86.3	0+30.5	1.9	1.8	060204
T100	113+32.0	0+76.2	1.9	1.8	060204
T101	113+77.7	1+21.9	1.9	1.8	060204
T102	114+34.3	0-10.0	1.9	1.8	060212
T103	114+74.8	0+30.5	1.9	1.8	060212
T104	115+20.5	0+76.2	1.9	1.8	060212
T105	115+66.2	1+21.9	1.9	1.8	060212
T106	120+40.3	0+30.5	1.9	1.8	060209
T107	120+86.0	0+76.2	1.9	1.8	060209
T108	121+31.7	1+21.9	1.9	1.8	060209
T109	122+28.8	0+30.5	1.9	1.8	060201
T110	122+74.5	0+76.2	1.9	1.8	060201
T111	123+20.2	1+21.9	1.9	1.8	060201

## **Asphalt Treated Permeable Base**

The field and laboratory test plan for the Permeable Asphalt Treated Base (ATPB) materials is presented in table 14. Only bulk samples of the uncompacted mix should be obtained.

### *Bulk Samples*

Bulk sampling of the uncompacted mix should be performed at the test site from the paver immediately prior to placement. Care should be taken to obtain the designated samples of the materials to be placed in the test sections shown in figure 5. These samples should be obtained in accordance with **AASHTO T168** and shipped to the laboratory in suitable containers. If concerns about the uniformity of the ATPB mix arise during construction, additional samples should be obtained. Each sample shall consist of 46 kg of material.

**Table 14. Field sampling and laboratory test plan for Asphalt Treated Permeable Base, SPS-2 California.**

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Asphalt Content (Extraction)	AC04	P04	3	B16 - B18
Extracted Aggregate				
Aggregate Gradation	AG04	P14	3	B16 - B18

## Lean Concrete Base

Sampling of the Lean Concrete Base (LCB) materials shall include cylinders molded from bulk samples of the as-delivered material, and cores obtained from the material as placed. In general, the applicable portion of the specifications for sampling, molding, curing and transportation of PCC materials shall apply to LCB materials. A summary of the field and laboratory test plan is given in table 15.

### *As-Delivered*

Sampling of the concrete used in the LCB shall be performed in the field, during or just before placement. The test sections from which the designated bulk samples should be obtained are shown in figure 5. 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 in time for the specified tests to be performed. Tests on the molded specimens are specified at 7 day, 28 day, and 1 year after placement. As shown in table 16, six - 152mm by 305mm cylindrical specimens shall be molded from each bulk sample.

Field tests shall be performed on each bulk sample of fresh LCB material 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*

Sampling of the as-placed LCB 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. 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 material 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

If the PCC surface layer is placed over the LCB prior to the coring date, coring of the LCB must be performed through the PCC surface layer. Prior to placement of the PCC layer, the cores of the LCB can be obtained directly from the surface of the LCB and the core holes repaired with a portland cement concrete patching material. The locations of the LCB cores are shown in table 21. After cores for the strength tests are taken they must be soaked in a lime water bath for a period of 40 hours immediately prior to testing. 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.

Care shall be taken to insure that cores are obtained at a 90° angle to the 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.

Table 15. Field and laboratory test plan for as-delivered Lean Concrete Base material, SPS-2 California.

Test Name	LTPP Test Designation	LTPP Protocol	No. of Tests	Material Source/ Test Location
Lean Concrete Base - As Delivered				
Compressive Strength	PC01	P61		
7 Day			6	B19 - B21 (Note 1)
28 Day			6	
1 Year			6	
Air Content	ASTM C231	LTPP Method	3	B19 - B21
Slump	ASTM C143	LTPP Method	3	B19 - B21
Temperature	AASTM C1064	LTPP Method	3	B19 - B21

Note 1. A total of 6 cylinder specimens are molded from each bulk sample, two specimens for each cure age.

Table 16. Bulk samples and molded specimens from Lean Concrete Base, SPS-2 California.

Material Source/ Test Location	Sample No.	Test Age After Placement	Specimen No. 152X305 Cylinder Compression Test	Test Section
B19	BL1	7 days	LX01, LX02	060206
		28 days	LY01, LY02	
		1 year	LZ01, LZ02	
B20	BL2	7 days	LX03, LX04	060208
		28 days	LY03, LY04	
		1 year	LZ03, LZ04	
B21	BL3	7 days	LX05, LX06	060205
		28 days	LY05, LY06	
		1 year	LZ05, LZ06	

Table 17. Field and laboratory test plan for as-placed LCB material, SPS-2 California.

Test Name (Age)	LTPP Test Designation	LTPP Protocol	# of Tests	Material Source/Test Location
Lean Concrete Base - As Placed				
Compressive Strength	PC01	P61		
14 Day			8	C18,C25,C32,C39,C79,C86,C93,C100
28 Day			8	C19,C26,C33,C40,C80,C87,C94,C101
1 Year			8	C20,C27,C34,C41,C81,C88,C95,C102
Core Examination & Thickness	PC06	P66	24	All LCB Cores

## 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 18. The test sections from which the designated bulk samples should be obtained are shown in figure 6. These samples shall be obtained in accordance with **AASHTO T141 "Sampling Fresh Concrete"**, molded into the specimens specified in table 19, 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 19, 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 20. 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 20, 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 21. 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 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." The FWD testing will be performed by Nichols Consulting Engineers in coordination with the Caltrans Regional Engineer.

Table 18. Field and laboratory test plan for as-delivered PCC material, SPS-2 California.

Test Name	LTPP Test Designation	LTPP Protocol	# of Tests	Material Source /Test Location	
Compressive Strength	PC01	P61		3.8 MPa PCC mix	6.3 MPa PCC mix
14 Day			6	B25-B27 <sup>Note 1</sup>	B22-B24 <sup>Note 1</sup>
28 Day			6		
1 Year			6		
Splitting Tensile Strength	PC02	P62		3.8 MPa PCC mix	6.2 Mpa PCC mix
14 Day			6	B25-B27	B22-B24
28 Day			6		
1 Year			6		
Flexural Strength	PC09	P69		3 8 MPa PCC Mix	6 2 MPa PCC mix
14 Day			6	B25-B27	B22-B24
28 Day			6		
1 Year			6		
Air Content	ASTM C231	LTPP Method	6	B22-B27	
Slump	ASTM C143	LTPP Method	6	B22-B27	
Temperature	ASTM C1064	LTPP Method	6	B22-B27	

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

Table 19. Bulk samples and molded specimens from PCC mix, SPS-2 California.

Material Source/Test Location	Sample No.	Test Age After Placement	Specimen No.			Test Section
			152mm x 305mm Cylinder Compression	152mm x 305mm Cylinder Indirect Tensile	152mm x 508mm Beam Flexural Strength	
B22	BP01	14 days	GX01	GX02	FX01	060211
		28 days	GY01	GY02	FY01	
		1 year	GZ01	GZ02	FZ01	
B23	BP02	14 days	GX03	GX04	FX02	060207
		28 days	GY03	GY04	FY02	
		1 year	GZ03	GZ04	FZ02	
B24	BP03	14 days	GX05	GX06	FX03	060210
		28 days	GY05	GY06	FY03	
		1 year	GZ05	GZ06	FZ03	
B25	BP04	14 days	GX07	GX08	FX04	060212
		28 days	GY07	GY08	FY04	
		1 year	GZ07	GZ08	FZ04	
B26	BP05	14 days	GX09	GX10	FX05	060205
		28 days	GY09	GY10	FY05	
		1 year	GZ09	GZ10	FZ05	
B27	BP06	14 days	GX11	GX12	FX06	060209
		28 days	GY11	GY12	FY06	
		1 year	GZ11	GZ12	FZ06	

Table 20. Field and laboratory test plan for as-placed PCC material, SPS-2 California.

Test Name (Age)	LTPP Test Designation	LTPP Protocol	# of Tests	Material Source/ Test Location
Portland Cement Concrete - As Placed (Cores)				
Compressive Strength	PC01	P61		
14 Day			12	C1,C10,C21,C35,C46,C54,C62,C70,C82,C96,C107,C116
28 Day			12	C2,C11,C22,C36,C47,C55,C63,C71,C83,C97,C108,C117
1 Year			12	C3,C12,C23,C37,C48,C56,C64,C72,C84,C98,C109,C118
Splitting Tensile Strength	PC02	P62		
14 Day			12	C5,C14,C28,C42,C50,C58,C66,C74,C89,C103,C111,C120
28 Day			12	C6,C15,C29,C43,C51,C59,C67,C75,C90,C104,C112,C121
1 Year			12	C7,C16,C30,C44,C52,C60,C68,C76,C91,C105,C113,C122
PCC Unit Weight	PC05	P65	12	C4,C13,C24,C38,C49,C57,C65,C73,C85,C99,C110,C119
Static Modulus of Elasticity	PC04	P64		
28 Day			12	C4,C13,C24,C38,C49,C57,C65,C73,C85,C99,C110,C119
1 Year			12	C8,C17,C31,C45,C53,C61,C69,C77,C92,C106,C114,C123
Core Examination and Thickness	PC06	P66	98	C1-C17,C21-C24,C28-C31,C35-C38,C42-C78,C82-C85,C89-C92,C96-C99,C103-C123
Air Content @ 28 Days	PC08	P68	2	C2,C55
PCC Thermal Coefficient		Ship to FHWA	2	C9,C78

Table 21. Portland Cement Concrete and Lean Concrete Base core locations, SPS-2 California.

Material Type	Sample Location Designation	Construction Stationing	Test Section Station	Offset, m		Test Section	Sample Area	Coring, Days After Placement
				Centerline, Rt	Outside Lane Edge, Lt			
PCC	C1	100+95.3	0-10.0	1.8	2.5	060203	1	10 - 13
PCC	C2	100+95.3	0-10.0	2.3	2.0	060203	1	21 - 24
PCC	C3	100+95.3	0-10.0	2.8	2.5	060203	1	350 - 360
PCC	C4	100+95.3	0-10.0	3.3	1.0	060203	1	21 - 24
PCC	C5	102+68.3	1+63.0	1.3	3.0	060203	2	10 - 13
PCC	C6	102+68.3	1+63.0	1.8	2.5	060203	2	21 - 24
PCC	C7	102+68.3	1+63.0	2.3	2.0	060203	2	350 - 360
PCC	C8	102+68.3	1+63.0	2.8	1.5	060203	2	350 - 360
PCC	C9	102+68.3	1+63.0	3.3	1.0	060203	2	21 - 24
PCC	C10	102+76.8	0-10.0	1.8	2.5	060204	3	10 - 13
PCC	C11	102+76.8	0-10.0	2.3	2.0	060204	3	21 - 24
PCC	C12	102+76.8	0-10.0	2.8	1.5	060204	3	350 - 360
PCC	C13	102+76.8	0-10.0	3.3	1.0	060204	3	21 - 24
PCC	C14	104+49.8	1+63.0	1.8	2.5	060204	4	10 - 13
PCC	C15	104+49.8	1+63.0	2.3	2.0	060204	4	21 - 24
PCC	C16	104+49.8	1+63.0	2.8	1.5	060204	4	350 - 360
PCC	C17	104+49.8	1+63.0	3.3	1.0	060204	4	350 - 360
LCB	C18	104+62.8	0-12.5	2.3	2.0	060207	5	10 - 13
LCB	C19	104+62.8	0-12.5	2.8	1.5	060207	5	21 - 24
LCB	C20	104+62.8	0-12.5	3.3	1.0	060207	5	350 - 360
PCC	C21	104+65.3	0-10.0	1.8	2.5	060207	5	10 - 13
PCC	C22	104+65.3	0-10.0	2.3	2.0	060207	5	21 - 24
PCC	C23	104+65.3	0-10.0	2.8	1.5	060207	5	350 - 360
PCC	C24	104+65.3	0-10.0	3.3	1.0	060207	5	21 - 24

Table 21. Portland Cement Concrete and Lean Concrete Base core locations, SPS-2 California. (cont'd)

Material Type	Sample Location Designation	Construction Stationing	Test Section Station	Offset, m		Test Section	Sample Area	Coring, Days After Placement
				Centerline, Rt	Outside Lane Edge, Lt			
LCB	C25	106+40.8	1+65.5	2.3	2.0	060207	6	10 - 13
LCB	C26	106+40.8	1+65.5	2.8	1.5	060207	6	21 - 24
LCB	C27	106+40.8	1+65.5	3.3	1.0	060207	6	350 - 360
PCC	C28	106+38.3	1+63.0	1.8	2.5	060207	6	10 - 13
PCC	C29	106+38.3	1+63.0	2.3	2.0	060207	6	21 - 24
PCC	C30	106+38.3	1+63.0	2.8	1.5	060207	6	350 - 360
PCC	C31	106+38.3	1+63.0	3.3	1.0	060207	6	350 - 360
LCB	C32	106+51.3	0-12.5	2.3	2.0	060206	7	10 - 13
LCB	C33	106+51.3	0-12.5	2.8	1.5	060206	7	21 - 24
LCB	C34	106+51.3	0-12.5	3.3	1.0	060206	7	350 - 360
PCC	C35	106+53.8	0-10.0	1.8	2.5	060206	7	10 - 13
PCC	C36	106+53.8	0-10.0	2.3	2.0	060206	7	21 - 24
PCC	C37	106+53.8	0-10.0	2.8	1.5	060206	7	350 - 360
PCC	C38	106+53.8	0-10.0	3.3	1.0	060206	7	21 - 24
LCB	C39	108+29.3	1+65.5	2.3	2.0	060206	8	10 - 13
LCB	C40	108+29.3	1+65.5	2.8	1.5	060206	8	21 - 24
LCB	C41	108+29.3	1+65.5	3.3	1.0	060206	8	350 - 360
PCC	C42	108+26.8	1+63.0	1.8	2.5	060206	8	10 - 13
PCC	C43	108+26.8	1+63.0	2.3	2.0	060206	8	21 - 24
PCC	C44	108+26.8	1+63.0	2.8	1.5	060206	8	350 - 360
PCC	C45	108+26.8	1+63.0	3.3	1.0	060206	8	350 - 360
PCC	C46	108+42.3	0-10.0	1.8	2.5	060210	9	10 - 13
PCC	C47	108+42.3	0-10.0	2.3	2.0	060210	9	21 - 24
PCC	C48	108+42.3	0-10.0	2.8	1.5	060210	9	350 - 360

Table 21. Portland Cement Concrete and Lean Concrete Base core locations, SPS-2 California. (cont'd)

Material Type	Sample Location Designation	Construction Stationing	Test Section Station	Offset, m		Test Section	Sample Area	Coring, Days After Placement
				Centerline, Rt	Outside Lane Edge, Lt			
PCC	C49	108+42.3	0-10.0	3.3	1.0	060210	9	21 - 24
PCC	C50	110+15.3	1+63.0	1.8	2.5	060210	10	10 - 13
PCC	C51	110+15.3	1+63.0	2.3	2.0	060210	10	21 - 24
PCC	C52	110+15.3	1+63.0	2.8	1.5	060210	10	350 - 360
PCC	C53	110+15.3	1+63.0	3.3	1.0	060210	10	350 - 360
PCC	C54	110+30.8	0-10.0	1.8	2.5	060202	11	10 - 13
PCC	C55	110+30.8	0-10.0	2.3	2.0	060202	11	21 - 24
PCC	C56	110+30.8	0-10.0	2.8	1.5	060202	11	350 - 360
PCC	C57	110+30.8	0-10.0	3.3	1.0	060202	11	21 - 24
PCC	C58	112+03.8	1+63.0	1.8	1.5	060202	12	10 - 13
PCC	C59	112+03.8	1+63.0	2.3	2.0	060202	12	21 - 24
PCC	C60	112+03.8	1+63.0	2.8	1.5	060202	12	350 - 360
PCC	C61	112+03.8	1+63.0	3.3	1.0	060202	12	350 - 360
PCC	C62	112+45.8	0-10.0	1.2	2.5	060204	13	10 - 13
PCC	C63	112+45.8	0-10.0	1.7	2.0	060204	13	21 - 24
PCC	C64	112+45.8	0-10.0	2.2	1.5	060204	13	350 - 360
PCC	C65	112+45.8	0-10.0	2.7	1.0	060204	13	21 - 24
PCC	C66	114+18.8	1+63.0	1.2	2.5	060204	14	10 - 13
PCC	C67	114+18.8	1+63.0	1.7	2.0	060204	14	21 - 24
PCC	C68	114+18.8	1+63.0	2.2	1.5	060204	14	350 - 360
PCC	C69	114+18.8	1+63.0	2.7	1.0	060204	14	350 - 360
PCC	C70	114+34.3	0-10.0	1.2	2.5	060212	15	10 - 13
PCC	C71	114+34.3	0-10.0	1.7	2.0	060212	15	21 - 24
PCC	C72	114+34.3	0-10.0	2.2	1.5	060212	15	350 - 360

Table 21. Portland Cement Concrete and Lean Concrete Base core locations, SPS-2 California. (cont'd)

Material Type	Sample Location Designation	Construction Stationing	Test Section Station	Offset, m		Test Section	Sample Area	Coring, Days After Placement
				Centerline, Rt	Outside Lane Edge, Lt			
PCC	C73	114+34.3	0-10.0	2.7	1.0	060212	15	21 - 24
PCC	C74	116+07.3	1+63.0	0.7	3.0	060212	16	10 - 13
PCC	C75	116+07.3	1+63.0	1.2	2.5	060212	16	21 - 24
PCC	C76	116+07.3	1+63.0	1.7	2.0	060212	16	350 - 360
PCC	C77	116+07.3	1+63.0	2.2	1.5	060212	16	350 - 360
PCC	C78	116+07.3	1+63.0	2.7	1.0	060212	16	21 - 24
LCB	C79	116+20.3	0-12.5	1.7	2.0	060208	17	10 - 13
LCB	C80	116+20.3	0-12.5	2.2	1.5	060208	17	21 - 24
LCB	C81	116+20.3	0-12.5	2.7	1.0	060208	17	350 - 360
PCC	C82	116+22.8	0-10.0	1.2	2.5	060208	17	10 - 13
PCC	C83	116+22.8	0-10.0	1.7	2.0	060208	17	21 - 24
PCC	C84	116+22.8	0-10.0	2.2	1.5	060208	17	350 - 360
PCC	C85	116+22.8	0-10.0	2.7	1.0	060208	17	21 - 24
LCB	C86	117+98.3	1+65.5	1.7	2.0	060208	18	10 - 13
LCB	C87	117+98.3	1+65.5	2.2	1.5	060208	18	21 - 24
LCB	C88	117+98.3	1+65.5	2.7	1.0	060208	18	350 - 360
PCC	C89	117+95.8	1+63.0	1.2	2.5	060208	18	10 - 13
PCC	C90	117+95.8	1+63.0	1.7	2.0	060208	18	21 - 24
PCC	C91	117+95.8	1+63.0	2.2	1.5	060208	18	350 - 360
PCC	C92	117+95.8	1+63.0	2.7	1.0	060208	18	350 - 360
LCB	C93	118+08.8	0-12.5	1.7	2.0	060205	19	10 - 13
LCB	C94	118+08.8	0-12.5	2.2	1.5	060205	19	21 - 24
LCB	C95	118+08.8	0-12.5	2.7	1.0	060205	19	350 - 360
PCC	C96	118+11.3	0-10.0	1.2	2.5	060205	19	10 - 13

Table 21. Portland Cement Concrete and Lean Concrete Base core locations, SPS-2 California. (cont'd)

Material Type	Sample Location Designation	Construction Stationing	Test Section Station	Offset, m		Test Section	Sample Area	Coring, Days After Placement
				Centerline, Rt	Outside Lane Edge, Lt			
PCC	C97	118+11.3	0-10 0	1.7	2.0	060205	19	21 - 24
PCC	C98	118+11.3	0-10.0	2.2	1.5	060205	19	350 - 360
PCC	C99	118+11.3	0-10 0	2.7	1.0	060205	19	21 - 24
LCB	C100	119+86.8	1+65.5	1.5	2.0	060205	20	10 - 13
LCB	C101	119+86.8	1+65.5	2.2	1.5	060205	20	21 - 24
LCB	C102	119+86 8	1+65.5	2.7	1.0	060205	20	350 - 360
PCC	C103	119+84.3	1+63.0	1.2	2.5	060205	20	10 - 13
PCC	C104	119+84 3	1+63.0	1.7	2.0	060205	20	21 - 24
PCC	C105	119+84.3	1+63.0	2.2	1.5	060205	20	350 - 360
PCC	C106	119+84.3	1+63.0	2.7	1.0	060205	20	350 - 360
PCC	C107	119+99.8	0-10.0	1.2	2.5	060209	21	10 - 13
PCC	C108	119+99.8	0-10.0	1.7	2.0	060209	21	21 - 24
PCC	C109	119+99.8	0-10.0	2.2	1.5	060209	21	350 - 360
PCC	C110	119+99.8	0-10.0	2.7	1.0	060209	21	21 - 24
PCC	C111	121+72.8	1+63.0	0.7	3.0	060209	22	10 - 13
PCC	C112	121+72.8	1+63.0	1.0	2.5	060209	22	21 - 24
PCC	C113	121+72.8	1+63.0	1.5	2.0	060209	22	350 - 360
PCC	C114	121+72 8	1+63.0	2.2	1.5	060209	22	350 - 360
PCC	C115	121+72.8	1+63.0	2.7	1.0	060209	22	21 - 24
PCC	C116	121+88.3	0-10.0	1.2	2.5	060201	23	10 - 13
PCC	C117	121+88 3	0-10.0	1.7	2.0	060201	23	21 - 24
PCC	C118	121+88 3	0-10.0	2.2	1.5	060201	23	350 - 360
PCC	C119	121+88.3	0-10.0	2.7	1.0	060201	23	21 - 24
PCC	C120	123+61.3	1+63.0	1.2	2.5	060201	24	10 - 13

Table 21. Portland Cement Concrete and Lean Concrete Base core locations, SPS-2 California. (cont'd)

Material Type	Sample Location Designation	Construction Stationing	Test Section Station	Offset, m		Test Section	Sample Area	Coring, Days After Placement
				Centerline, Rt	Outside Lane Edge, Lt			
PCC	C121	123+61.3	1+63.0	1.7	2.0	060201	24	21 - 24
PCC	C122	123+61.3	1+63.0	2.2	1.5	060201	24	350 - 360
PCC	C123	123+61.3	1+63.0	2.7	1.0	060201	24	350 - 360

## Materials Reference Library (MRL)

During pavement construction, additional sampling of the 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:

- 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)

If different types of any of these materials are used for the 3.8 MPa and 6.2 MPa concrete, then a separate sample shall be taken of each material.

Containers (pails/buckets) 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 Siros Alavi	Nichols Consulting Engineers, Chtd.	775/329-4955
Mr Kevin Senn	Nichols Consulting Engineers, Chtd.	775/329-4955

The SPS-2 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. 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 subgrade, prepared embankment, base layers and surface layers. Measurements should be made at 5 points located transversely across the outside lane (outside lane edge, wheel path, center of the lane, inside wheel path and centerline). For test sections with 3.70m lane widths, these 5 transverse points should be at offsets from the center line of 0, 0.9m, 1.8m, 2.7m and 3.7m. For test sections with 4.3m lane widths, the 5 transverse points should be made at centerline offsets of 0, 0.9m, 1.8m, 2.7m, and 4.3m. These measurements should be made at 15.2m intervals starting at test section station 0+00 and extending to test section station 1+52.4 (11 locations per test section). Test section station locations are specified in figure 19. 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.

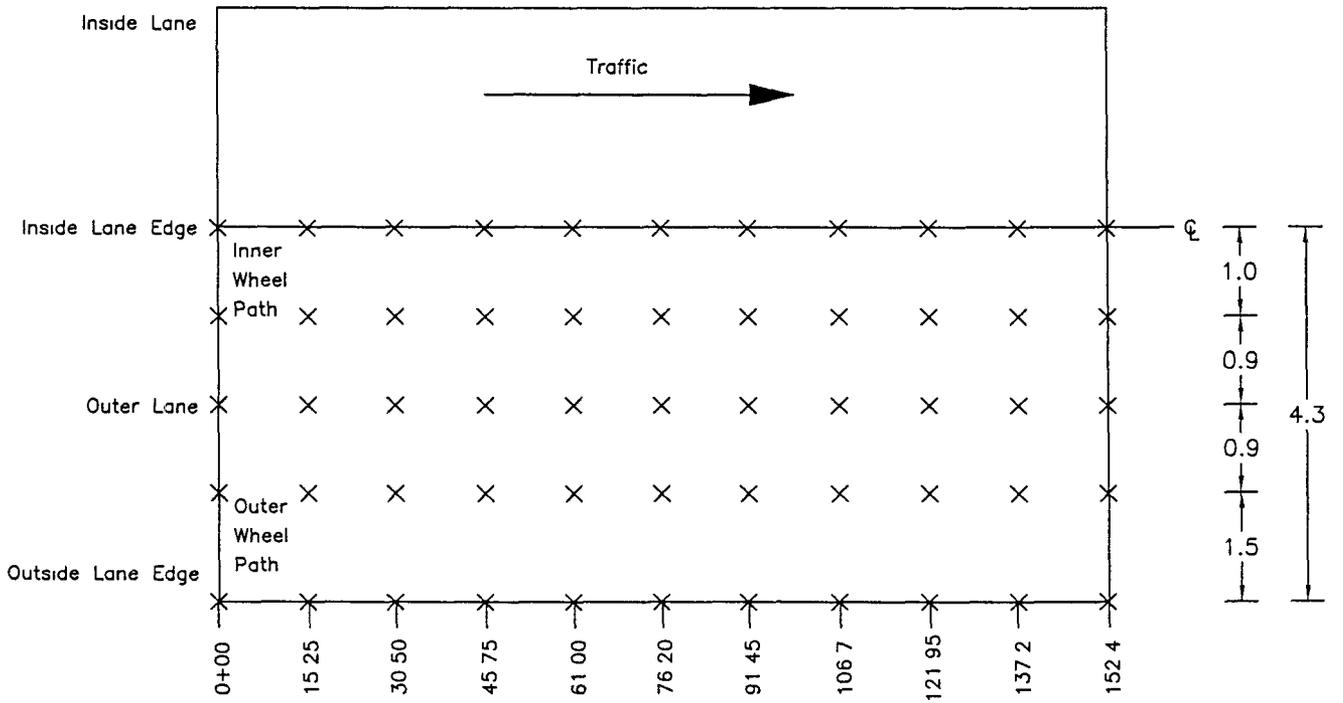
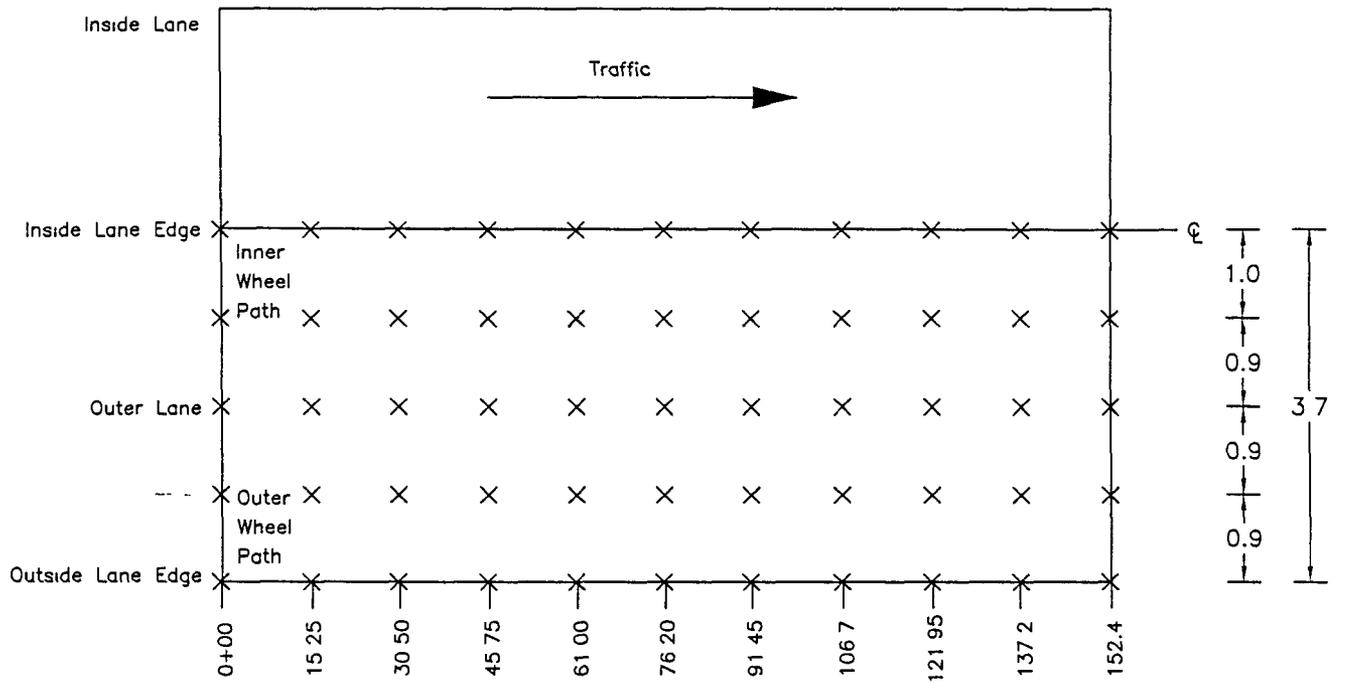


Figure 19. Test section elevation measurement location for SPS-2 California

## Shipping Tracking Tables

This section contains shipping tracking tables which contains instructions for disposition of samples retrieved from the field. Using these tracking tables (tables 22 and 23), sampling personnel can determine where each sample is supposed to be shipped and tested.

Each sample (core, bulk, moisture) 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
- L - Formed cylinders of lean concrete base

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
- L - lean concrete
- T - treated, bound, or stabilized material (base/subbase)
- G - untreated, unbound granular material (base/subbase)
- S - subgrade soil or fill material
- X - molded specimens of PCC and LCB for tests at 14 days (PCC) and 7 days (LCB) after placement
- Y - molded specimens of PCC and LCB for tests at 28 days after placement
- Z - molded specimens of PCC and LCB 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 CL01, CL02, CL03, etc. for the LCB material. Samples of subgrade material taken from location A1 by Shelby tube shall be designated TS01 and TS02. 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.
- LX01 Formed lean concrete base concrete cylinders for testing at 7 days. Assign numbers consecutively as samples are molded.
- LY01 Formed lean concrete base concrete cylinders for testing at 28 days. Assign numbers consecutively as samples are molded.
- LZ01 Formed lean concrete base concrete cylinders for testing at 365 days. Assign numbers consecutively as samples are molded.
- CP01 Portland cement concrete cores obtained from the finished concrete surface. Assign numbers consecutively as the cores are obtained.
- CL01 Lean concrete base cores obtained from the finished LCB layer. 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.
- BT01 Bulk samples of uncompacted asphalt treated aggregate. Assign numbers consecutively as samples are obtained, BT01 through BT19 for asphalt treated permeable base.
- 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.
- TS04 Shelby tube samples from subgrade (two Shelby tubes from A-Type locations, as appropriate).
- JS01 Jar samples of subgrade from splitspoon sampler (two splitspoons from each A-Type location).

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 22. Samples to be shipped to the State Laboratory  
(or their designee), SPS-2 California.

Sample Location No	Sample No.	Lab Test No.	Type of Sample
<b>Portland Cement Concrete</b>			
B22	GX01	3	152x305mm cylinder
	GX02	3	152x305mm cylinder
	GY01	3	152x305mm cylinder
	GY02	3	152x305mm cylinder
	GZ01	3	152x305mm cylinder
	GZ02	3	152x305mm cylinder
	FX01	3	152x152x508mm beam
	FY01	3	152x152x508mm beam
	FZ01	3	152x152x508mm beam
B23	GX03	3	152x305mm cylinder
	GX04	3	152x305mm cylinder
	GY03	3	152x305mm cylinder
	GY04	3	152x305mm cylinder
	GZ03	3	152x305mm cylinder
	GZ04	3	152x305mm cylinder
	FX02	3	152x152x508mm beam
	FY02	3	152x152x508mm beam
	FZ02	3	152x152x508mm beam
B24	GX05	3	152x305mm cylinder
	GX06	3	152x305mm cylinder
	GY05	3	152x305mm cylinder
	GY06	3	152x305mm cylinder
	GZ05	3	152x305mm cylinder
	GZ06	3	152x305mm cylinder
	FX03	3	152x152x508mm beam
	FY03	3	152x152x508mm beam
	FZ03	3	152x152x508mm beam
B25	GX07	3	152x305mm cylinder
	GX08	3	152x305mm cylinder
	GY07	3	152x305mm cylinder
	GY08	3	152x305mm cylinder
	GZ07	3	152x305mm cylinder
	GZ08	3	152x305mm cylinder
	FX04	3	152x152x508mm beam
	FY04	3	152x152x508mm beam
	FZ04	3	152x152x508mm beam

Table 22. Samples to be shipped to the State Laboratory  
(or their designee), SPS-2 California. (cont'd)

Sample Location No	Sample No.	Lab Test No.	Type of Sample
B26	GX09	3	152x305mm cylinder
	GX10	3	152x305mm cylinder
	GY09	3	152x305mm cylinder
	GY10	3	152x305mm cylinder
	GZ09	3	152x305mm cylinder
	GZ10	3	152x305mm cylinder
	FX05	3	152x152x508mm beam
	FY05	3	152x152x508mm beam
	FZ05	3	152x152x508mm beam
B27	GX11	3	152x305mm cylinder
	GX12	3	152x305mm cylinder
	GY11	3	152x305mm cylinder
	GY12	3	152x305mm cylinder
	GZ11	3	152x305mm cylinder
	GZ12	3	152x305mm cylinder
	FX06	3	152x152x508mm beam
	FY06	3	152x152x508mm beam
FZ06	3	152x152x508mm beam	
C1	CP01	1	102mm core
C2	CP02	1	102mm core
C3	CP03	1	102mm core
C4	CP04	1	102mm core
C5	CP05	2	102mm core
C6	CP06	2	102mm core
C7	CP07	2	102mm core
C8	CP08	2	102mm core
C9	CP09	1	102mm core
C10	CP10	1	102mm core
C11	CP11	1	102mm core
C12	CP12	1	102mm core
C13	CP13	1	102mm core
C14	CP14	2	102mm core
C15	CP15	2	102mm core
C16	CP16	2	102mm core
C17	CP17	2	102mm core
C21	CP21	1	102mm core
C22	CP22	1	102mm core
C23	CP23	1	102mm core
C24	CP24	1	102mm core
C28	CP28	2	102mm core
C29	CP29	2	102mm core

Table 22. Samples to be shipped to the State Laboratory  
(or their designee), SPS-2 California. (cont'd)

Sample Location No.	Sample No.	Lab Test No	Type of Sample
C30	CP30	2	102mm core
C31	CP31	2	102mm core
C35	CP35	1	102mm core
C36	CP36	1	102mm core
C37	CP37	1	102mm core
C38	CP38	1	102mm core
C42	CP42	2	102mm core
C43	CP43	2	102mm core
C44	CP44	2	102mm core
C45	CP45	2	102mm core
C46	CP46	1	102mm core
C47	CP47	1	102mm core
C48	CP48	1	102mm core
C49	CP49	1	102mm core
C50	CP50	2	102mm core
C51	CP51	2	102mm core
C52	CP52	2	102mm core
C53	CP53	2	102mm core
C54	CP54	1	102mm core
C55	CP55	1	102mm core
C56	CP56	1	102mm core
C57	CP57	1	102mm core
C58	CP58	2	102mm core
C59	CP59	2	102mm core
C60	CP60	2	102mm core
C61	CP61	2	102mm core
C62	CP62	1	102mm core
C63	CP63	1	102mm core
C64	CP64	1	102mm core
C65	CP65	1	102mm core
C66	CP66	2	102mm core
C67	CP67	2	102mm core
C68	CP68	2	102mm core
C69	CP69	2	102mm core
C70	CP70	1	102mm core
C71	CP71	1	102mm core
C72	CP72	1	102mm core
C73	CP73	1	102mm core
C74	CP74	2	102mm core
C75	CP75	2	102mm core
C76	CP76	2	102mm core

Table 22. Samples to be shipped to the State Laboratory  
(or their designee), SPS-2 California. (cont'd)

Sample Location No.	Sample No.	Lab Test No.	Type of Sample
C77	CP77	2	102mm core
C78	CP78	1	102mm core
C82	CP82	1	102mm core
C83	CP83	1	102mm core
C84	CP84	1	102mm core
C85	CP85	1	102mm core
C89	CP89	2	102mm core
C90	CP90	2	102mm core
C91	CP91	2	102mm core
C92	CP92	2	102mm core
C96	CP96	1	102mm core
C97	CP97	1	102mm core
C98	CP98	1	102mm core
C99	CP99	1	102mm core
C103	CP103	2	102mm core
C104	CP104	2	102mm core
C105	CP105	2	102mm core
C106	CP106	2	102mm core
C107	CP107	1	102mm core
C108	CP108	1	102mm core
C109	CP109	1	102mm core
C110	CP110	1	102mm core
C111	CP111	2	102mm core
C112	CP112	2	102mm core
C113	CP113	2	102mm core
C114	CP114	2	102mm core
C115	CP115	1	102mm core
C116	CP116	1	102mm core
C117	CP117	1	102mm core
C118	CP118	1	102mm core
C119	CP119	1	102mm core
C120	CP120	2	102mm core
C121	CP121	2	102mm core
C122	CP122	2	102mm core
C123	CP123	2	102mm core
<b>Lean Concrete Base</b>			
B19	LX01	3	152x305mm cylinder
	LX02	3	152x305mm cylinder
	LY01	3	152x305mm cylinder
	LY02	3	152x305mm cylinder
	LZ01	3	152x305mm cylinder

Table 22. Samples to be shipped to the State Laboratory  
(or their designee), SPS-2 California. (cont'd)

Sample Location No.	Sample No.	Lab Test No.	Type of Sample
	LZ02	3	152x305mm cylinder
B20	LX03	3	152x305mm cylinder
	LX04	3	152x305mm cylinder
	LY03	3	152x305mm cylinder
	LY04	3	152x305mm cylinder
	LZ03	3	152x305mm cylinder
	LZ04	3	152x305mm cylinder
	B21	LX05	3
LX06		3	152x305mm cylinder
LY05		3	152x305mm cylinder
LY06		3	152x305mm cylinder
LZ05		3	152x305mm cylinder
LZ06		3	152x305mm cylinder
C18	CL18	1	102mm core
C19	CL19	1	102mm core
C20	CL20	1	102mm core
C25	CL25	2	102mm core
C26	CL26	2	102mm core
C27	CL27	2	102mm core
C32	CL32	1	102mm core
C33	CL33	1	102mm core
C34	CL34	1	102mm core
C39	CL39	2	102mm core
C40	CL40	2	102mm core
C41	CL41	2	102mm core
C79	CL79	1	102mm core
C80	CL80	1	102mm core
C81	CL81	1	102mm core
C86	CL86	2	102mm core
C87	CL87	2	102mm core
C88	CL88	2	102mm core
C93	CL93	1	102mm core
C94	CL94	1	102mm core
C95	CL95	1	102mm core
C100	CL100	2	102mm core
C101	CL101	2	102mm core
C102	CL102	2	102mm core
<b>Asphalt Treated Permeable Base</b>			
B16	BT01	3	45kg bulk sample
B17	BT02	3	45kg bulk sample
B18	BT18	3	45kg bulk sample

Table 22. Samples to be shipped to the State Laboratory  
(or their designee), SPS-2 California. (cont'd)

Sample Location No.	Sample No.	Lab Test No.	Type of Sample
<b>Class 2 Aggregate Base</b>			
B13	BG11	2	45kg bulk sample
B14	BG12	2	45kg bulk sample
B15	BG13	1	45kg bulk sample
<b>Natural Subgrade</b>			
B1	BS01	2	45kg bulk sample
B2	BS02	2	45kg bulk sample
B3	BS03	2	45kg bulk sample
B4	BS04	2	45kg bulk sample
B5	BS05	2	45kg bulk sample
B6	BS06	2	45kg bulk sample
<b>Prepared Embankment Material</b>			
B7	BG01	1	45kg bulk sample
B8	BG02	1	45kg bulk sample
B9	BG03	1	45kg bulk sample
B10	BG04	1	45kg bulk sample
B11	BG05	2	45kg bulk sample
B12	BG06	2	45kg bulk sample

Table 23. Samples to be shipped to the FHWA-LTPP Testing Contractor Laboratory, SPS-2 California.

Sample Location No.	Sample No.	Lab Test No.	Type of Sample
<b>Portland Cement Concrete</b>			
<i>No testing to be performed by FHWA-LTPP Contractor</i>			
<b>Lean Concrete Base</b>			
<i>No testing to be performed by FHWA-LTPP Contractor</i>			
<b>Permeable Asphalt Treated Base</b>			
<i>No testing to be performed by FHWA-LTPP Contractor</i>			
<b>Unbound Granular Base</b>			
B13	BG11	2	136kg bulk sample
B14	BG12	2	136kg bulk sample
B15	BG13	1	136 kg bulk sample
B13	MG11	2	Moisture Content Jar Sample
B14	MG12	2	Moisture Content Jar Sample
B15	MG13	1	Moisture Content Jar Sample
<b>Natural Subgrade</b>			
B1	BS01	2	136kg bulk sample
B2	BS02	2	136kg bulk sample
B3	BS03	2	136kg bulk sample
B4	BS04	2	136 kg bulk sample
B5	BS05	2	136kg bulk sample
B6	BS06	2	136 kg bulk sample
B1	MS01	2	Moisture Content Jar Sample
B2	MS02	2	Moisture Content Jar Sample
B3	MS03	2	Moisture Content Jar Sample
B4	MS04	2	Moisture Content Jar Sample
B5	MS05	2	Moisture Content Jar Sample
B6	MS06	2	Moisture Content Jar Sample
<b>Prepared Subgrade or Embankment</b>			
B7	BG01	1	136kg bulk sample
B8	BG02	1	136kg bulk sample
B9	BG03	1	136kg bulk sample
B10	BG04	1	136kg bulk sample
B11	BG05	2	136kg bulk sample
B12	BG06	2	136kg bulk sample
B7	MG01	1	Moisture Content Jar Sample
B8	MG02	1	Moisture Content Jar Sample
B9	MG03	1	Moisture Content Jar Sample
B10	MG04	1	Moisture Content Jar Sample
B11	MG05	2	Moisture Content Jar Sample
B12	MG06	2	Moisture Content Jar Sample

## Laboratory Tracking of Samples

This section contains Laboratory Sample Tracking Tables which contain instructions for sample handling and tracking throughout the laboratory testing process. Tables 24 through 28 detail the sample handling and testing for the state agency laboratory and tables 29 and 30 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
AC Layer Below Surface (Binder Coarse) . . . . .	04
Base Course . . . . .	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,
TB. . . . .	for bound (treated) base 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 (station 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
  - (c) Moist room at  $23 \pm 1.7^\circ\text{C}$ . Specimens shall have free water maintained on the entire surface at all times. The moist room shall meet the requirements of AASHTO Specification M201. Specimens shall not be exposed to dripping or running water.
- *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 24 through 30 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 24. Tracking table of **Subgrade/Embankment** testing in the **State Laboratory**  
(or their designee), SPS-2 California.

Layer No. <sup>1</sup>	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			
<b>Subgrade</b>													
	07	SS	060203	B1	BS01	2	UG09/P48				No	(b)	Yes
	07	SS	060207	B2	BS02	2	No Testing - Samples Stored				Yes	(b)	No
	07	SS	060210	B3	BS03	2	No Testing - Samples Stored				Yes	(b)	No
	07	SS	060204	B4	BS04	2	UG09/P48				No	(b)	Yes
	07	SS	060208	B5	BS05	2	No Testing - Samples Stored				Yes	(b)	No
	07	SS	060209	B6	BS06	2	UG09/P48				No	(b)	Yes
<b>Embankment</b>													
	06	GS	060211	B7	BG01	1	UG09/P48				No	(b)	Yes
	06	GS	060207	B8	BG02	1	No Testing - Samples Stored				Yes	(b)	No
	06	GS	060206	B9	BG03	1	UG09/P48				No	(b)	Yes
	06	GS	060210	B10	BG04	1	No Testing - Samples Stored				Yes	(b)	No
	06	GS	060202	B11	BG05	2	UG09/P48				No	(b)	Yes
	06	GS	060204	B12	BG06	2	No Testing - Samples Stored				Yes	(b)	No

<sup>1</sup>Layer Number to be completed by testing lab after reviewing field sampling logs.

Table 25. Tracking table of **Class 2 Aggregate Base** testing in the **State Laboratory**  
(or their designee), SPS-2 California.

Layer No. <sup>1</sup>	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	060203	B13	BG07	2	UG09/P48				No	(b)	Yes
	05	GB	060210	B14	BG08	2	UG09/P48				No	(b)	Yes
	05	GB	060212	B15	BG13	1	UG09/P48				No	(b)	Yes

<sup>1</sup>Layer Number to be completed by testing lab after reviewing field sampling logs.

Table 26. Tracking table of ATPB testing in the State Laboratory (or their designee), SPS-2 California.

Layer No. <sup>1</sup>	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	TB	060211	B16	BT01	3	AC04/P04	AG04/P14			No	(a)	Yes
	05	TB	060210	B17	BT02	3	AC04/P04	AG04/P14			No	(a)	Yes
	05	TB	060209	B18	BT03	3	AC04/P04	AG04/P14			No	(a)	Yes

<sup>1</sup>Layer Number to be completed by testing lab after reviewing field sampling logs.

Table 27. Tracking table of LCB testing in the State Laboratory (or their designee), SPS-2 California.

Layer No. <sup>1</sup>	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			
	05	TB	060206	B19	LY01	3	PC01/P61 (28 days)			No	(d)	Yes
	05	TB	060206	B19	LY02	3	PC01/P61 (28 days)			No	(d)	Yes
	05	TB	060206	B19	LZ01	3	PC01/P61 (1 year)			No	(d)	Yes
	05	TB	060206	B19	LZ02	3	PC01/P61 (1 year)			No	(d)	Yes
	05	TB	060208	B20	LX03	3	PC01/P61 (7 days)			No	(d)	Yes
	05	TB	060208	B20	LX04	3	PC01/P61 (7 days)			No	(d)	Yes
	05	TB	060208	B20	LY03	3	PC01/P61 (28 days)			No	(d)	Yes
	05	TB	060208	B20	LY04	3	PC01/P61 (28 days)			No	(d)	Yes
	05	TB	060208	B20	LZ03	3	PC01/P61 (1 year)			No	(d)	Yes
	05	TB	060208	B20	LZ04	3	PC01/P61 (1 year)			No	(d)	Yes
	05	TB	060205	B21	LX05	3	PC01/P61 (7 days)			No	(d)	Yes
	05	TB	060205	B21	LX06	3	PC01/P61 (7 days)			No	(d)	Yes
	05	TB	060205	B21	LY05	3	PC01/P61 (28 days)			No	(d)	Yes
	05	TB	060205	B21	LY06	3	PC01/P61 (28 days)			No	(d)	Yes
	05	TB	060205	B21	LZ05	3	PC01/P61 (1 year)			No	(d)	Yes
	05	TB	060205	B21	LZ06	3	PC01/P61 (1 year)			No	(d)	Yes

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<sup>1</sup>Layer Number to be completed by testing lab after reviewing field sampling logs.

Table 28. Tracking table of PCC testing in the State Laboratory (or their designee), SPS-2 California.

Layer No. <sup>1</sup>	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	060203	C1	CP01	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060203	C2	CP02	1	PC06/P66	PC08/P68 (28 days)	PC01/P61 (28 days)	No	(b)	Yes
	03	PC	060203	C3	CP03	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060203	C4	CP04	1	PC06/P66	PC05/P65	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060203	C5	CP05	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060203	C6	CP06	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060203	C7	CP07	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060203	C8	CP08	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060203	C9	CP09	2	PC06/P66	Note 2		No	(b)	Yes
	03	PC	060211	C10	CP10	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060211	C11	CP11	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060211	C12	CP12	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060211	C13	CP13	1	PC06/P66	PC05/P65 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060211	C14	CP14	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060211	C15	CP15	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060211	C16	CP16	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060211	C17	CP17	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060207	C21	CP21	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060207	C22	CP22	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060207	C23	CP23	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060207	C24	CP24	1	PC06/P66	PC05/P65 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060207	C28	CP28	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060207	C29	CP29	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060207	C30	CP30	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060207	C31	CP31	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes

<sup>1</sup>Layer number to be completed by testing lab after reviewing field sampling logs.

<sup>2</sup>Ship core to FHWA, c/o s. Marcia Simon, TFHRC, HNR-20, 6300 Georgetown Pike, McLean, VA 22101-2296 for PCC thermal coefficient test.

Table 28. Tracking table of PCC testing in the State Laboratory (or their designee), SPS-2 California. (cont'd)

Layer No. <sup>1</sup>	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	060206	C35	CP35	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060206	C36	CP36	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060206	C37	CP37	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060206	C38	CP38	1	PC06/P66	PC05/P65 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060206	C42	CP42	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060206	C43	CP43	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060206	C44	CP44	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060206	C45	CP45	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060210	C46	CP46	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060210	C47	CP47	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060210	C48	CP48	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060210	C49	CP49	1	PC06/P66	PC05/P64 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060210	C50	CP50	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060210	C51	CP51	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060210	C52	CP52	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060210	C53	CP53	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060202	C54	CP54	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060202	C55	CP55	1	PC06/P66	PC08/P68 (28 days)	PC01/P61 (28 days)	No	(b)	Yes
	03	PC	060202	C56	CP56	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060202	C57	CP57	1	PC06/P66	PC05/P64 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060202	C58	CP58	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060202	C59	CP59	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060202	C60	CP60	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060202	C61	CP61	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060204	C62	CP62	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes

<sup>1</sup>Layer number to be completed by testing lab after reviewing field sampling logs

<sup>2</sup>Ship core to FHWA, c/o s. Marcia Simon, TFHRC, HNR-20, 6300 Georgetown Pike, McLean, VA 22101-2296 for PCC thermal coefficient test.

Table 28. Tracking table of PCC testing in the State Laboratory (or their designee), SPS-2 California. (cont'd)

Layer No. <sup>1</sup>	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	060204	C63	CP63	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060204	C64	CP64	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060204	C65	CP65	1	PC06/P66	PC05/P65 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060204	C66	CP66	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060204	C67	CP67	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060204	C68	CP68	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060204	C69	CP69	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060212	C70	CP70	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060212	C71	CP71	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060212	C72	CP72	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060212	C73	CP73	1	PC06/P66	PC05/P65 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060212	C74	CP74	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060212	C75	CP75	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060212	C76	CP76	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060212	C77	CP77	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060212	C78	CP78	2	PC06/P66	Note 2		No	(b)	Yes
	03	PC	060208	C82	CP82	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060208	C83	CP83	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060208	C84	CP84	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060208	C85	CP85	1	PC06/P66	PC05/P65 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060208	C89	CP89	2	PC06/P66	PC02/P62 (14 days)		Yes	(b)	No
	03	PC	060208	C90	CP89	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060208	C91	CP91	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060208	C92	CP92	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060205	C96	CP96	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes

<sup>1</sup>Layer number to be completed by testing lab after reviewing field sampling logs.

<sup>2</sup>Ship core to FHWA, c/o s. Marcia Simon, TFHRC, HNR-20, 6300 Georgetown Pike, McLean, VA 22101-2296 for PCC thermal coefficient test.

Table 28. Tracking table of PCC testing in the State Laboratory (or their designee), SPS-2 California. (cont'd)

Layer No. <sup>1</sup>	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	060205	C97	CP97	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060205	C98	CP98	1	PC06/P66	PC01/P61 1 year)		No	(b)	Yes
	03	PC	060205	C99	CP99	1	PC06/P66	PC05/P65 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060205	C103	CP103	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060205	C104	CP104	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060205	C105	CP105	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060205	C106	CP106	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060209	C107	CP107	1	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060209	C108	CP108	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060209	C109	CP109	1	PC06/P66	PC01/P61 1 year)		No	(b)	Yes
	03	PC	060209	C110	CP110	1	PC06/P66	PC05/P65 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060209	C111	CP111	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060209	C112	CP112	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060209	C113	CP113	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060209	C114	CP114	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060209	C115	CP115	2	PC06/P66	PC01/P61 (14 days)	Note2	Yes	(b)	No
	03	PC	060201	C116	CP116	1	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060201	C117	CP117	1	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060201	C118	CP118	1	PC06/P66			No	(b)	Yes
	03	PC	060201	C119	CP119	2	PC06/P66	PC05/P65 (28 days)	PC04/P64 (28 days)	No	(b)	Yes
	03	PC	060201	C120	CP120	2	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060201	C121	CP121	2	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060201	C122	CP122	2	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060201	C123	CP123	2	PC06/P66	PC04/P64 (1 year)		No	(b)	Yes
	03	PC	060211	B22	GX01	3	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes

<sup>1</sup>Layer number to be completed by testing lab after reviewing field sampling logs.

<sup>2</sup>Ship core to FHWA, c/o s. Marcia Simon, TFHRC, HNR-20, 6300 Georgetown Pike, McLean, VA 22101-2296 for PCC thermal coefficient test.

Table 28. Tracking table of PCC testing in the State Laboratory (or their designee), SPS-2 California. (cont'd)

Layer No. <sup>1</sup>	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	Thrd			
	03	PC	060211	B22	GX02	3	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060211	B22	GY01	3	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060211	B22	GY02	3	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060211	B22	GZ01	3	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060211	B22	GZ02	3	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060211	B22	FX01	3	PC06/P66	PC09/P69 (14 days)		No	(b)	Yes
	03	PC	060211	B22	FY01	3	PC06/P66	PC09/P69 (28 days)		No	(b)	Yes
	03	PC	060211	B22	FZ01	3	PC06/P66	PC09/P69 (1 year)		No	(b)	Yes
	03	PC	060207	B23	GX03	3	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060207	B23	GX04	3	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060207	B23	GY03	3	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060207	B23	GY04	3	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060207	B23	GZ03	3	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060207	B23	GZ04	3	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060207	B23	FX02	3	PC06/P66	PC09/P69 (14 days)		No	(b)	Yes
	03	PC	060207	B23	FY02	3	PC06/P66	PC09/P69 (28 days)		No	(b)	Yes
	03	PC	060207	B23	FZ02	3	PC06/P66	PC09/P69 (1 year)		No	(b)	Yes
	03	PC	060210	B24	GX05	3	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060210	B24	GX06	3	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060210	B24	GY05	3	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060210	B24	GY06	3	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060210	B24	GZ05	3	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060210	B24	GZ06	3	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060210	B24	FX03	3	PC06/P66	PC09/P69 (14 days)		No	(b)	Yes
	03	PC	060210	B24	FY03	3	PC06/P66	PC09/P69 (28 days)		No	(b)	Yes

<sup>1</sup>Layer number to be completed by testing lab after reviewing field sampling logs.

<sup>2</sup>Ship core to FHWA, c/o s. Marcia Simon, TFHRC, HNR-20, 6300 Georgetown Pike, McLean, VA 22101-2296 for PCC thermal coefficient test.

Table 28. Tracking table of PCC testing in the State Laboratory (or their designee), SPS-2 California. (cont'd)

Layer No. <sup>1</sup>	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	060210	B24	FZ03	3	PC06/P66	PC09/P69 (1 year)		No	(b)	Yes
	03	PC	060212	B25	GX07	3	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060212	B25	GX08	3	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060212	B25	GY07	3	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060212	B25	GY08	3	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060212	B25	GZ07	3	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060212	B25	GY08	3	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060212	B25	FX04	3	PC06/P66	PC09/P69 (14 days)		No	(b)	Yes
	03	PC	060212	B25	FY04	3	PC06/P66	PC09/P69 (28 days)		No	(b)	Yes
	03	PC	060212	B25	FZ04	3	PC06/P66	PC09/P69 (1 year)		No	(b)	Yes
	03	PC	060205	B26	GX09	3	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060205	B26	GX10	3	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060205	B26	GY09	3	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060205	B26	GY10	3	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060205	B26	GZ09	3	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060205	B26	GZ10	3	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes
	03	PC	060205	B26	FX05	3	PC06/P66	PC09/P69 (14 days)		No	(b)	Yes
	03	PC	060205	B26	FY05	3	PC06/P66	PC09/P69 (28 days)		No	(b)	Yes
	03	PC	060205	B26	FZ05	3	PC06/P66	PC09/P69 (1 year)		No	(b)	Yes
	03	PC	060209	B27	GX11	3	PC06/P66	PC01/P61 (14 days)		No	(b)	Yes
	03	PC	060209	B27	GX12	3	PC06/P66	PC02/P62 (14 days)		No	(b)	Yes
	03	PC	060209	B27	GY11	3	PC06/P66	PC01/P61 (28 days)		No	(b)	Yes
	03	PC	060209	B27	GY12	3	PC06/P66	PC02/P62 (28 days)		No	(b)	Yes
	03	PC	060209	B27	GZ11	3	PC06/P66	PC01/P61 (1 year)		No	(b)	Yes
	03	PC	060209	B27	GZ12	3	PC06/P66	PC02/P62 (1 year)		No	(b)	Yes

<sup>1</sup>Layer number to be completed by testing lab after reviewing field sampling logs.

<sup>2</sup>Ship core to FHWA, c/o s Marcia Simon, TFHRC, HNR-20, 6300 Georgetown Pike, McLean, VA 22101-2296 for PCC thermal coefficient test.

Table 28. Tracking table of PCC testing in the State Laboratory (or their designee), SPS-2 California. (cont'd)

Layer No. <sup>1</sup>	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	060209	B27	FX06	3	PC06/P66	PC09/P69 (14 days)		No	(b)	Yes
	03	PC	060209	B27	FY06	3	PC06/P66	PC09/P69 (28 days)		No	(b)	Yes
	03	PC	060209	B27	FZ06	3	PC06/P66	PC09/P69 (1 year)		No	(b)	Yes

<sup>1</sup>Layer number to be completed by testing lab after reviewing field sampling logs.

<sup>2</sup>Ship core to FHWA, c/o s Marcia Simon, TFHRC, HNR-20, 6300 Georgetown Pike, McLean, VA 22101-2296 for PCC thermal coefficient test.

Table 29. Tracking table of Subgrade/Embankment testing in the FHWA-LTPP Testing Contractor Laboratory, SPS-2 California.

Layer No <sup>1</sup>	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 <sup>9</sup>
							First	Second	Third	Fourth	Fifth	Sixth			
<b>Natural Subgrade</b>															
	07	SS	060203	B1	BS01	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
	07	SS	060207	B2	BS02	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
	07	SS	060210	B3	BS03	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
	07	SS	060204	B4	BS04	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
	07	SS	060208	B5	BS05	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
	07	SS	060209	B6	BS06	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(b)	Yes
	07	SS	060203	B1	MS01	2	SS09/P49						No	(b)	Yes
	07	SS	060207	B2	MS02	2	SS09/P49						No	(b)	Yes
	07	SS	060210	B3	MS03	2	SS09/P49						No	(b)	Yes
	07	SS	060204	B4	MS04	2	SS09/P49						No	(b)	Yes
	07	SS	060208	B5	MS05	2	SS09/P49						No	(c)	Yes
	07	SS	060209	B6	MS06	2	SS09/P49						No	(c)	Yes
<b>Prepared Embankment</b>															
	06	GS	06021	B7	BG01	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(c)	Yes
	06	GS	060207	B8	BG02	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(c)	Yes
	06	GS	060206	B9	BG03	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(c)	Yes
	06	GS	060210	B10	BG04	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(c)	Yes
	06	GS	060202	B11	BG05	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(c)	Yes
	06	GS	060204	B12	BG06	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46	No	(c)	Yes
	06	GS	060211	B7	MG01	1	SS09/P49						No	(c)	Yes
	06	GS	060207	B8	MG02	1	SS09/P49						No	(c)	Yes
	06	GS	060206	B9	MG03	1	SS09/P49						No	(c)	Yes
	06	GS	060210	B10	MG04	1	SS09/P49						No	(c)	Yes
	06	GS	060202	B11	MG05	2	SS09/P49						No	(c)	Yes
	06	GS	060204	B12	MG06	2	SS09/P49						No	(c)	Yes

Table 30. Tracking table of CL 2AB testing in the FHWA-LTPP Testing Contractor Laboratory, SPS-2 California.

Layer No <sup>1</sup>	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	060203	B13	BG11	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
	05	GB	060210	B14	BG12	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
	05	GB	060212	B15	BG13	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
	05	GB	060203	B13	MG11	2	UG10/P49						No	(b)	Yes
	05	GB	060210	B14	MG12	2	UG10/P49						No	(b)	Yes
	05	GB	060212	B15	MG13	1	UG10/P49						No	(b)	Yes

## **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-2, Strategic Study of Structural Factors for Rigid Pavements**". 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.

SPS-2 Data Collection Guidelines, February 1992

APPENDIX A

SAMPLING DATA SHEETS, FIELD OPERATIONS INFORMATION FORMS  
AND SPS-2 CONSTRUCTION DATA SHEETS

(Exclusively for SPS Experiments)

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING  
 PAVEMENT CORE LOG AT G-TYPE CORE LOCATIONS  
 SAMPLING DATA SHEET 2

SHEET NUMBER \_\_\_\_\_ OF \_\_\_\_\_

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

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

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

GENERAL REMARKS: \_\_\_\_\_

CERTIFIED

VERIFIED AND APPROVED

DATE

Field Crew Chief  
 Affiliation: \_\_\_\_\_

SHRP Representative  
 Affiliation: \_\_\_\_\_

\_\_\_\_\_-\_\_\_\_\_-19\_\_\_\_\_  
 Month- Day- Year

A-TYPE BORE HOLE LOG

SAMPLING DATA SHEET 4-1

SHRP REGION \_\_\_\_\_ STATE \_\_\_\_\_ STATE CODE \_\_\_\_\_  
 SPS EXPERIMENT NO \_\_\_\_\_ SPS PROJECT CODE \_\_\_\_\_  
 ROUTE/HIGHWAY \_\_\_\_\_ Lane \_\_\_\_\_ Direction \_\_\_\_\_ TEST SECTION NO. \_\_\_\_\_  
 SAMPLE/TEST LOCATION:  Before Section  After Section FIELD SET NO. 1  
 Within Section

OPERATOR \_\_\_\_\_ EQUIPMENT USED \_\_\_\_\_ BORING DATE \_\_\_\_-\_\_\_\_-\_\_\_\_

SAMPLING AREA NO: SA- \_\_\_\_\_ LOCATION: STATION \_\_\_\_\_ OFFSET \_\_\_\_\_ feet from °/s

BORE HOLE NUMBER: \_\_\_\_\_ BORE HOLE SIZE: \_\_\_\_\_ (Inch Diam.)

Scale (Inches)	Strata Change (Inches)	Sample Number (1)	#Blows(2)			Ref? Y/N (3)	DLR (Inches) (4)	IOP (5)	Material Description	Material Code
			6"	6"	6"					
<u>10.0</u>										
<u>20.0</u>										
<u>30.0</u>										
<u>0.0</u>										
<u>50.0</u>										

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

GENERAL REMARKS: \_\_\_\_\_

CERTIFIED \_\_\_\_\_ VERIFIED AND APPROVED \_\_\_\_\_ DATE \_\_\_\_-\_\_\_\_-19\_\_\_\_  
 Field Crew Chief \_\_\_\_\_ SHRP Representative \_\_\_\_\_  
 Affiliation: \_\_\_\_\_ Affiliation: \_\_\_\_\_

IN SITU DENSITY AND MOISTURE TESTS

SAMPLING DATA SHEET 8-1

JHRP REGION \_\_\_\_\_ STATE \_\_\_\_\_  
 SPS EXPERIMENT NO \_\_\_\_\_  
 ROUTE/HIGHWAY \_\_\_\_\_ Lane \_\_\_\_\_ Direction \_\_\_\_\_  
 SAMPLE/TEST LOCATION:  Before Section  After Section  
 Within Section

STATE CODE \_\_\_\_\_  
 SPS PROJECT CODE \_\_\_\_\_  
 TEST SECTION NO. \_\_\_\_\_  
 FIELD SET NO. \_\_\_\_\_

OPERATOR \_\_\_\_\_ NUCLEAR DENSITY GAUGE I.D. \_\_\_\_\_ TEST DATE \_\_\_\_-\_\_\_\_-\_\_\_\_  
 SAMPLING AREA NO: SA- \_\_\_\_\_ LOCATION: STATION \_\_\_\_\_ OFFSET \_\_\_\_\_ feet from °/s  
 LOCATION NO: \_\_\_\_\_ DATE OF LAST MAJOR CALIBRATION \_\_\_\_-\_\_\_\_-\_\_\_\_

note: Use additional sheets if necessary

DEPTH FROM SURFACE TO THE TOP OF THE LAYER, INCHES (See Sheet 5)						
LAYER NUMBER						
MATERIAL TYPE: (Unbound-G Other-T)						
IN SITU DENSITY, pcf (AASHTO T238-86)	1					
	2					
	3					
	4					
AVERAGE						
Method (A,B,or C)						
Rod Depth, inches						
IN SITU MOISTURE CONTENT, % (AASHTO T239-86)	1					
	2					
	3					
	4					
AVERAGE						

GENERAL REMARKS: \_\_\_\_\_

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

SHOULDER PROBE LOG

SAMPLING DATA SHEET 9

SRP REGION \_\_\_\_\_ STATE \_\_\_\_\_  
 SPS EXPERIMENT NO \_\_\_\_\_  
 ROUTE/HIGHWAY \_\_\_\_\_ Lane \_\_\_\_\_ Direction \_\_\_\_\_  
 SAMPLE/TEST LOCATION:  Before Section  After Section  
 Within Section

STATE CODE \_\_\_\_\_  
 SPS PROJECT CODE \_\_\_\_\_  
 TEST SECTION NO. \_\_\_\_\_  
 FIELD SET NO. \_\_\_\_\_

OPERATOR \_\_\_\_\_ EQUIPMENT USED \_\_\_\_\_ AUGERING DATE \_\_\_\_-\_\_\_\_-\_\_\_\_  
 AUGER PROBE NUMBER \_\_\_\_\_ LOCATION STATION: \_\_\_\_\_ OFFSET: \_\_\_\_\_ feet from °/s  
 TOP OF ROCK BASED ON: \_\_\_\_\_

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

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

GENERAL REMARKS: \_\_\_\_\_  
 CERTIFIED \_\_\_\_\_ VERIFIED AND APPROVED \_\_\_\_\_ DATE \_\_\_\_-\_\_\_\_-\_\_\_\_  
 Field Crew Chief \_\_\_\_\_ SHRP Representative \_\_\_\_\_ Month- Day- Year  
 Affiliation: \_\_\_\_\_ Affiliation: \_\_\_\_\_

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

SHEET NUMBER \_\_\_\_\_ OF \_\_\_\_\_

JHRP REGION \_\_\_\_\_ STATE \_\_\_\_\_  
SPS EXPERIMENT NUMBER \_\_\_\_\_  
ROUTE/HIGHWAY \_\_\_\_\_ Lane \_\_\_\_\_ Direction \_\_\_\_\_

STATE CODE \_\_\_\_\_  
SPS PROJECT CODE \_\_\_\_\_  
TEST SECTION NO. \_\_\_\_\_  
FIELD SET NO. 1

PERSON PERFORMING SAMPLING

NAME \_\_\_\_\_ EMPLOYER \_\_\_\_\_  
TITLE \_\_\_\_\_

MIX PLANT

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

SAMPLING LOCATION

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

MIX TYPE "Virgin" Asphalt Concrete ..... 1 Recycled Asphalt Concrete..... 2   
Asphalt Treated Dense Graded ..... 3 Permeable Asphalt Treated..... 4

LAYER NUMBER

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

SAMPLE TYPE DESIGNATION

SAMPLE NUMBER

APPROXIMATE SAMPLE SIZE (lbs) \_\_\_\_\_  
DATE SAMPLED (Month - Day - Year) [\_\_ - \_\_ - \_\_]  
LOCATION SAMPLE SHIPPED TO \_\_\_\_\_  
DATE SHIPPED (Month-Day-Year) [\_\_ - \_\_ - \_\_]

GENERAL REMARKS: \_\_\_\_\_

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

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING  
 SAMPLING ~~FRESH~~ PORTLAND CEMENT CONCRETE  
 OR LEAN CONCRETE BASE MIXTURES  
 SAMPLING DATA SHEET 11

SHEET NUMBER \_\_\_\_\_ OF \_\_\_\_\_

LTPP REGION \_\_\_\_\_ STATE \_\_\_\_\_ STATE CODE \_\_\_\_\_  
 SPS EXPERIMENT NUMBER \_\_\_\_\_ SPS PROJECT CODE \_\_\_\_\_  
 ROUTE/HIGHWAY \_\_\_\_\_ Lane \_\_\_\_\_ Direction \_\_\_\_\_ TEST SECTION NO. \_\_\_\_\_  
 FIELD SET NO. \_\_\_\_\_

PERSON PERFORMING SAMPLING \_\_\_\_\_  
 NAME \_\_\_\_\_ EMPLOYER \_\_\_\_\_  
 TITLE \_\_\_\_\_

LOCATION NUMBER (B#### for bulk sample) [ \_\_\_\_\_ ]

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

PCC MIX TEMPERATURE WHEN SAMPLED (°F) [ \_\_\_\_\_ ]

AMBIENT TEMPERATURE WHEN SAMPLED (°F) [ \_\_\_\_\_ ]

TIME SAMPLED (Military Time) [ \_\_\_\_\_ ]

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

SPECIMENS FORMED FROM SAMPLE SPECIMEN NUMBER

CYLINDERS

1.	[ _____ ]
2.	[ _____ ]
3.	[ _____ ]
4.	[ _____ ]
5.	[ _____ ]
6.	[ _____ ]

BEAMS

1.	[ _____ ]
2.	[ _____ ]
3.	[ _____ ]

AIR CONTENT (PERCENT) [ \_\_\_\_\_ ]

SLUMP (INCHES) [ \_\_\_\_\_ ]

LABORATORY ID CODE [ \_\_\_\_\_ ]

DATE SHIPPED [ \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ ]

NOTES : X as the second digit of the cylinder/beam sample number denotes 7 day cure for  
 LCB and 14 day cure for PCC, similarly  
 Y denotes a 28 day cure  
 Z denotes a 365 day cure

GENERAL REMARKS: \_\_\_\_\_

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

LTPP-SPS MATERIAL SAMPLING AND FIELD TESTING  
 BULK SAMPLING OF SUBGRADE AND UNBOUND GRANULAR MATERIALS  
 SAMPLING DATA SHEET 12

SHEET NUMBER \_\_\_\_\_ OF \_\_\_\_\_

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

STATE CODE \_\_\_\_\_  
 SPS PROJECT CODE \_\_\_\_\_  
 TEST SECTION NO. \_\_\_\_\_  
 FIELD SET NO. 1

TECHNICIAN \_\_\_\_\_ EQUIPMENT \_\_\_\_\_ EXPLORATION DATE \_\_\_\_-\_\_\_\_-\_\_\_\_

SAMPLING AREA NO: SA- \_\_\_\_\_ LOCATION: STATION \_\_\_\_\_ OFFSET \_\_\_\_\_ feet from °/s

SAMPLING LOCATION NUMBER \_\_\_\_\_

PIT SIZE: (a) Length \_\_\_\_\_ feet (b) Width \_\_\_\_\_ feet

LAYER NUMBER: \_\_\_\_\_ (SUBGRADE \_\_\_\_\_ GRADED AGGREGATE BASE \_\_\_\_\_)

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

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  
PLATE BEARING TEST RESULTS  
SAMPLING DATA SHEET 13

SHEET NUMBER \_\_\_\_\_ OF \_\_\_\_\_

SHRP REGION \_\_\_\_\_ STATE \_\_\_\_\_  
SPS EXPERIMENT NO 2  
ROUTE/HIGHWAY \_\_\_\_\_ Lane \_\_\_\_\_ Direction \_\_\_\_\_  
SAMPLE/TEST LOCATION:  Within Section

STATE CODE \_\_\_\_\_  
SPS PROJECT CODE \_\_\_\_\_  
TEST SECTION NO. \_\_\_\_\_  
FIELD SET NO. 1

TECHNICIAN \_\_\_\_\_

TEST DATE \_\_\_\_ - \_\_\_\_ - \_\_\_\_

LOCATION: STATION \_\_\_\_\_ OFFSET \_\_\_\_\_ feet from °/s

SAMPLING LOCATION NUMBER \_\_\_\_\_

LAYER NUMBER: \_\_\_\_\_ (SUBGRADE \_\_\_\_\_ GRADED AGGREGATE BASE \_\_\_\_\_  
PERMEABLE ASPHALT TREATED BASE \_\_\_\_\_)

- 1. AVERAGE TOTAL DEFLECTION (INCHES) \_\_\_\_\_
- 2. UNCORRECTED MODULUS OF SOIL REACTION (PSI/INCH) \_\_\_\_\_
- CORRECTED MODULUS OF SOIL REACTION (PSI/INCH) [ \_\_\_\_\_ ]

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

GENERAL REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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



LTTP-SPS MATERIAL SAMPLING AND FIELD TESTING  
 SUMMARY OF MATERIAL SAMPLES SENT TO EACH LABORATORY  
 FIELD OPERATIONS INFORMATION FORM 2-2

SHEET NUMBER \_\_\_\_\_ OF \_\_\_\_\_

SHRP REGION \_\_\_\_\_ STATE \_\_\_\_\_ STATE CODE \_\_\_\_\_  
 SPS EXPERIMENT NO 2 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
6	PCC CORES:	4" Diameter _____
6	PCC Molded Cylinders	_____
6	PCC Molded Beams	_____
5	LCB CORES:	4" Diameter _____
5	LCB Molded Cylinders:	_____
4	AC Treated BULK SAMPLES: 100 Pound Samples -PATB	_____
4	PATB CORES:	4" Diameter _____
3	UNBOUND BASE SAMPLES: (a) BAGS (BULK) _____ (b) JARS (MOISTURE) _____	
2	EMBANKMENT (FILL) SAMPLES: (a) BAGS (BULK) _____ (b) JARS (MOISTURE) _____	
1	SUBGRADE SAMPLES: (a) BAGS (BULK) _____ (b) JARS (MOISTURE) _____	
	(c) THIN-WALLED TUBES _____ (d) SPLITSPOON _____ JARS	

GENERAL REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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



SPS-2 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 B) [ \_ \_ . ]
  - \*5. ROUTE SIGNING (NUMERIC CODE) [ \_ . ]  
 Interstate... 1 U.S.... 2 State... 3  
 Other... 4
  - \*6. ROUTE NUMBER [ \_ \_ \_ \_ \_ . ]
  - 7. TYPE OF PAVEMENT (See Codes Below) [ \_ \_ . ]
  - 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) [ \_ . ]

VALID PAVEMENT TYPE CODES FOR SPS-2, SPS-2A, and SPS-2B

JPCP on unbound base	17
JRCP on unbound base	18
JPCP on Bituminous base	20
JRCP on Bituminous base	21
JPCP on Lean Concrete Base	23
JRCP on Lean Concrete Base	24

SPS-2 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.)
  

SHOULDER DATA	<u>INSIDE</u> <u>SHOULDER</u>	<u>OUTSIDE</u> <u>SHOULDER</u>
* 3. SHOULDER SURFACE TYPE Turf... 1    Granular.... 2    Asphalt Concrete... 3 Concrete... 4    Surface Treatment... 5 Other (Specify)... 6 _____	[ ][. ]	[ ][. ]
* 4. TOTAL SHOULDER WIDTH (Feet)	[ ][. ]	[ ][. ]
* 5. PAVED SHOULDER WIDTH (Feet)	[ ][. ]	[ ][. ]
6. SHOULDER BASE TYPE (CODES-TABLE A.6)	[ ][. ]	[ ][. ]
7. SHOULDER SURFACE THICKNESS (Inches)	[ ][. ][ ]	[ ][. ][ ]
8. SHOULDER BASE THICKNESS (Inches)	[ ][. ][ ]	[ ][. ][ ]
* 9. 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 _____		[ ][. ]
*10. SUBSURFACE DRAINAGE LOCATION Continuous Along Test Section... 1    Intermittent... 2		[ ][. ]
11. DIAMETER OF LONGITUDINAL DRAINPIPES (Inches)		[ ][. ][ ]
12. SPACING OF LATERALS (Feet)		[ ][. ][. ]

SPS-2 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 <sup>1</sup>	
		*2 START	*3 END	TYPE	STATION
1	-----	0 + 0 0	----- + -----	---	+ -----
2	-----	----- + -----	----- + -----	---	+ -----
3	-----	----- + -----	----- + -----	---	+ -----
4	-----	----- + -----	----- + -----	---	+ -----
5	-----	----- + -----	----- + -----	---	+ -----
6	-----	----- + -----	----- + -----	---	+ -----
7	-----	----- + -----	----- + -----	---	+ -----
8	-----	----- + -----	----- + -----	---	+ -----
9	-----	----- + -----	----- + -----	---	+ -----
10	-----	----- + -----	----- + -----	---	+ -----
11	-----	----- + -----	----- + -----	---	+ -----
12	-----	----- + -----	----- + -----	---	+ -----
13	-----	----- + -----	----- + -----	---	+ -----
14	-----	----- + -----	----- + -----	---	+ -----
15	-----	----- + -----	----- + -----	---	+ -----
16	-----	----- + -----	----- + -----	---	+ -----
17	-----	----- + -----	----- + -----	---	+ -----
18	-----	----- + -----	----- + -----	---	+ -----
19	-----	----- + -----	----- + -----	---	+ -----
20	-----	----- + -----	----- + -----	---	+ -----

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

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

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

If cut-fill transition is located in a test section, enter test section station of the cut-fill transition location.



SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [    ] * SPS PROJECT CODE [    ] * TEST SECTION NO. [    ]
--------------------------------------------------------------------	-------------------------------------------------------------------------------

LAYER THICKNESS MEASUREMENTS (Inches) SHEET \_\_\_\_\_ OF \_\_\_\_\_

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS (INCHES)			
		DENSE GRADED AGGREGATE BASE	PERMEABLE ASPHALT TREATED BASE	LEAN CONCRETE BASE	PCC SURFACE
__+__	____	____.____	____.____	____.____	____.____
__+__	____	____.____	____.____	____.____	____.____
__+__	____	____.____	____.____	____.____	____.____
__+__	____	____.____	____.____	____.____	____.____
__+__	____	____.____	____.____	____.____	____.____
__+__	____	____.____	____.____	____.____	____.____
__+__	____	____.____	____.____	____.____	____.____
__+__	____	____.____	____.____	____.____	____.____
LAYER NUMBER <sup>1</sup>		____	____	____	____

<sup>1</sup> from Construction Data Sheet 4

SPS-2 CONSTRUCTION DATA SHEET 6 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)... 5 \_\_\_\_\_

- \*7. TYPICAL LIFT THICKNESS (Inches) [    .    ]  
 (For Fill Sections Only)

NOTE: Density Data is recorded on Sampling Data Sheet 8-1

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SPS-2 CONSTRUCTION DATA SHEET 7 CUT-FILL SECTION LOCATIONS	* STATE CODE [    ] * SPS PROJECT CODE [    ] * TEST SECTION NO. [    ]
------------------------------------------------------------------	-------------------------------------------------------------------------------

ORDER	*1 CUT-FILL <sup>1</sup>	REFERENCE PROJECT STATION NUMBER		*4 TEST SECTION NUMBER <sup>2</sup>
		*2 START	*3 END	
1	_____	0 + 0 0	_____ + _____	_____
2	_____	_____ + _____	_____ + _____	_____
3	_____	_____ + _____	_____ + _____	_____
4	_____	_____ + _____	_____ + _____	_____
5	_____	_____ + _____	_____ + _____	_____
6	_____	_____ + _____	_____ + _____	_____
7	_____	_____ + _____	_____ + _____	_____
8	_____	_____ + _____	_____ + _____	_____
9	_____	_____ + _____	_____ + _____	_____
10	_____	_____ + _____	_____ + _____	_____
11	_____	_____ + _____	_____ + _____	_____
12	_____	_____ + _____	_____ + _____	_____
13	_____	_____ + _____	_____ + _____	_____
14	_____	_____ + _____	_____ + _____	_____
15	_____	_____ + _____	_____ + _____	_____
16	_____	_____ + _____	_____ + _____	_____
17	_____	_____ + _____	_____ + _____	_____
18	_____	_____ + _____	_____ + _____	_____
19	_____	_____ + _____	_____ + _____	_____
20	_____	_____ + _____	_____ + _____	_____
21	_____	_____ + _____	_____ + _____	_____
22	_____	_____ + _____	_____ + _____	_____
23	_____	_____ + _____	_____ + _____	_____
24	_____	_____ + _____	_____ + _____	_____
25	_____	_____ + _____	_____ + _____	_____

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

February 1992

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [ _ _ ] * SPS PROJECT CODE [ _ _ ] * TEST SECTION NO. [ _ _ ]
----------------------------------------------------------------------------------	----------------------------------------------------------------------------------

PREPARER \_\_\_\_\_

EMPLOYER \_\_\_\_\_

DATE \_\_\_\_\_

SPS-2 CONSTRUCTION DATA SHEET 9 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) [ ] [ ] . [ ]

NOTE: Density Data is recorded on Sampling Data Sheet 8-1

7. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SPS-2 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* 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            Manufactured Lightweight..... 5  
 Other (Specify) \_\_\_\_\_ 6

COMPOSITION OF FINE AGGREGATE TYPE            PERCENT

\* 5. [ \_ ]            [ \_ \_ \_ . ]

\* 6. [ \_ ]            [ \_ \_ \_ . ]

\* 7. [ \_ ]            [ \_ \_ \_ . ]  
 Natural Sand... 1  
 Crushed or Manufactured Sand (From Crushed Gravel or Stone)...2  
 Recycled Concrete... 3    Other (Specify) \_\_\_\_\_ 4

\* 8. TYPE OF MINERAL FILLER [ \_ ]

Stone Dust... 1            Hydrated Lime... 2            Portland Cement... 3  
 Fly Ash... 4            Other (Specify)... 5 \_\_\_\_\_

BULK SPECIFIC GRAVITIES:

\* 9. COARSE AGGREGATE (AASHTO T85 or ASTM C127) [ \_ . \_ \_ \_ ]

\*10. FINE AGGREGATE (AASHTO T84 or ASTM C128) [ \_ . \_ \_ \_ ]

\*11. MINERAL FILLER (AASHTO T100 or ASTM D854) [ \_ . \_ \_ \_ ]

\*12. AGGREGATE COMBINATION (CALCULATED) [ \_ . \_ \_ \_ ]

13. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED) [ \_ . \_ \_ \_ ]

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

<u>TYPE OF AGGREGATE</u>	<u>TYPE OF TEST</u>	<u>RESULTS</u>
14. Coarse	[ _ _ ]	[ _ _ _ . ]
15. Coarse	[ _ _ ]	[ _ _ _ . ]
16. Coarse	[ _ _ ]	[ _ _ _ . ]
17. Coarse and Fine - Combined	[ _ _ ]	[ _ _ _ . ]

18. POLISH VALUE OF COARSE AGGREGATES [ \_ \_ ]  
 SURFACE LAYER ONLY (AASHTO T279, ASTM D3319)

SPS-2 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE            [__ __] * SPS PROJECT CODE    [__ __] * TEST SECTION NO.    [__ __]
------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------

- \*1. LAYER NUMBER (FROM CONSTRUCTION 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)
- ORIGINAL ASPHALT CEMENT PROPERTIES    (If available from supplier)
- 5. VISCOSITY OF ASPHALT AT 140°F (Poises) [\_\_\_\_\_.]  
 (AASHTO T202)
- 6. VISCOSITY OF ASPHALT AT 275°F (Centistokes) [\_\_\_\_\_.]  
 (AASHTO T202)
- 7. PENETRATION AT 77°F (AASHTO T49) (Tenths of a mm) [\_\_\_\_\_.]  
 (100 g., 5 sec.)
- ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

	<u>TYPE</u>	<u>QUANTITY (%)</u>
8. MODIFIER #1	[__ __]	[____.]
9. MODIFIER #2 (IF OTHER, SPECIFY) _____	[__ __]	[____.]

- 10. DUCTILITY AT 77°F (cm) [\_\_\_\_\_.]  
 (AASHTO T51)
- 11. DUCTILITY AT 39.2°F (cm) [\_\_\_\_\_.]  
 (AASHTO T51)
- 12. TEST RATE FOR DUCTILITY MEASUREMENT [\_\_\_\_\_.]  
 AT 39.2°F (cm/Min)
- 13. PENETRATION AT 39.2°F (AASHTO T49) (Tenths of a mm) [\_\_\_\_\_.]  
 (200 g., 60 sec.)
- 14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [\_\_\_\_\_.]

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

SRS-2 CONSTRUCTION DATA SHEET 12 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE            [__ __] * SPS PROJECT CODE    [__ __] * TEST SECTION NO.    [__ __]
-----------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------

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

\*2. TYPE OF SAMPLES [\_\_]  
 COMPACTED IN LABORATORY... 1    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/25mm of Width) [\_\_ \_\_ \_\_.]  
 (AASHTO T246 OR ASTM 1561)

\*20. TYPE OF ANTISTRIPPING AGENT USED [\_\_]  
 (SEE TYPE CODES, TABLE A.21)    OTHER (SPECIFY) \_\_\_\_\_

\*21. ANTISTRIPPING AGENT USED:    LIQUID... 1    SOLID... 2 [\_\_]

\*22. AMOUNT OF ANTISTRIPPING AGENT USED (Percent) [\_\_ \_\_.]

(LIQUID: enter percent of asphalt cement weight    SOLID: enter percent of aggregate weight.)

SPS-2 CONSTRUCTION DATA SHEET 12 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
-----------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------

- \*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [\_\_]
- \*2. TYPE OF SAMPLES [\_\_]  
 COMPACTED IN LABORATORY... 1 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/25mm of Width) [\_\_ \_\_ \_\_ \_\_ .]  
 (AASHTO T246 OR ASTM 1561)
- \*20. TYPE OF ANTISTRIPPING AGENT USED [\_\_ \_\_]  
 (SEE TYPE CODES, TABLE A.21) OTHER (SPECIFY) \_\_\_\_\_
- \*21. ANTISTRIPPING AGENT USED: LIQUID... 1 SOLID... 2 [\_\_]
- \*22. AMOUNT OF ANTISTRIPPING AGENT USED (Percent) [\_\_ \_\_ . \_\_]  
  
 (LIQUID: enter percent of asphalt cement weight SOLID: enter percent of aggregate weight.)





SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE            [ _ _ ] * SPS PROJECT CODE    [ _ _ ] * TEST SECTION NO.    [ _ _ ]
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- \* 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-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [ ] [ ] * SPS PROJECT CODE [ ] [ ] * TEST SECTION NO. [ ] [ ]
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- \* 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-2 CONSTRUCTION DATA SHEET 17 PORTLAND CEMENT CONCRETE LAYERS REINFORCING STEEL DATA	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
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- \* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [\_\_]
- \* 2. TYPE OF REINFORCING [\_\_]
  - Deformed Bars..... 1
  - Welded Wire Fabric..... 2
  - Other (Specify)\_\_\_\_\_ 3
- \* 3. TRANSVERSE BAR DIAMETER (Inches) [\_\_. \_\_]
- \* 4. TRANSVERSE BAR SPACING (Inches) [\_\_ \_\_. \_\_]
- \* 5. LONGITUDINAL BAR DIAMETER (Inches) [\_\_. \_\_]
- \* 6. DESIGN PERCENTAGE OF LONGITUDINAL STEEL (%) [\_\_. \_\_]
- \* 7. DEPTH TO REINFORCEMENT FROM SLAB SURFACE (Inches) [\_\_. \_\_]
- 8. LONGITUDINAL BAR SPACING (Inches) [\_\_ \_\_. \_\_]
- 9. YIELD STRENGTH OF REINFORCING (ksi) [\_\_ \_\_. \_\_]
- 10. METHOD USED TO PLACE REINFORCEMENT [\_\_]
  - Preset on Chairs..... 1
  - Mechanically..... 2
  - Between Layers of Concrete..... 3
  - Other (Specify)\_\_\_\_\_ 4

SPS-2 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT, CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [ _ _ ] * SPS PROJECT CODE [ _ _ ] * TEST SECTION NO. [ _ _ ]
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- \*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)

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

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

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

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

SPS-2 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [__ __] * SPS PROJECT CODE [__ __] * TEST SECTION NO. [__ __]
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- \*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)

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

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

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

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

SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE            [__ __] * SPS PROJECT CODE    [__ __] * TEST SECTION NO.    [__ __]
----------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------

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

COMPOSITION OF COARSE AGGREGATE TYPE      PERCENT

\* 2. [\_\_]      [\_\_ \_\_ .]

\* 3. [\_\_]      [\_\_ \_\_ .]

\* 4. [\_\_]      [\_\_ \_\_ .]

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

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

COMPOSITION OF FINE AGGREGATE TYPE      PERCENT

\* 6. [\_\_]      [\_\_ \_\_ .]

\* 7. [\_\_]      [\_\_ \_\_ .]

\* 8. [\_\_]      [\_\_ \_\_ .]

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

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

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

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

BULK SPECIFIC GRAVITIES:

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

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



SPS-2 CONSTRUCTION DATA SHEET 21 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-2 CONSTRUCTION DATA SHEET 23 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 \_\_\_\_\_

PREPARER \_\_\_\_\_

EMPLOYER \_\_\_\_\_

DATE \_\_\_\_\_

<p style="text-align: center;">SPS-2 CONSTRUCTION DATA SHEET 24</p> <p>FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES, CONTINUED</p>	<p>* STATE CODE [ _ _ ]</p> <p>* SPS PROJECT CODE [ _ _ ]</p> <p>* TEST SECTION NO. [ _ _ ]</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------

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

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

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

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

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

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

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

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

SPS-2 CONSTRUCTION DATA SHEET 25 FULL DEPTH REPAIR DATA FOR PAVEMENTS WITH PORTLAND CEMENT CONCRETE SURFACES, CONTINUED	* STATE CODE            [__ __] * SPS PROJECT CODE    [__ __] * TEST SECTION NO.    [__ __]
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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 \_\_\_\_\_





APPENDIX B

SHRP-LTPP DATA COLLECTION STANDARD CODES

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

Revised August 30, 1989

APPENDIX A. STANDARD CODES

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

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

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

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

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

Table A.2. Functional class codes.

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

Note: These codes are consistent with the HPMS system.

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

(01) ASPHALT CONCRETE PAVEMENT WITH GRANULAR BASE

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

(02) ASPHALT CONCRETE PAVEMENT WITH BOUND BASE

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

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

(03) JOINTED PLAIN CONCRETE PAVEMENT - JPCP

Acceptable jointed, unreinforced portland cement concrete slab (4) placed over untreated granular base (22 or 23), HMAC (28 or 31), or stabilized base (29, 30, 37, or 38). One or more subbase layers (22, 23, 24, 25, 26, 42, or 43) may also be present, but are not required. The joints may have either no load transfer devices or smooth dowel bars. A seal coat is also permissible above a granular base layer. Jointed slabs with load transfer devices other than dowel bars and pavements placed directly upon a treated or untreated subgrade are also not acceptable.

(04) JOINTED REINFORCED CONCRETE PAVEMENT - JRCP

Acceptable projects include jointed reinforced portland cement concrete pavements (5) with doweled joints spaced between 20 and 65 feet. The slab may rest directly upon a layer of any material listed in Table A.6 (except 25 and 45) or upon unstabilized coarse-grained subgrade (57-65). A base layer and one or more subbase layers may exist, but are not required. These layers may consist of any of the material types indicated in Table A.6. A seal coat is also permissible above a granular base layer. JRCP placed directly upon a fine-grained soil/aggregate layer (25) or a fine-grained subgrade (51-56) will not be considered for this study. JRCP's without load transfer devices or using devices other than smooth dowel bars at the joints are not acceptable.

(05) CONTINUOUSLY REINFORCED CONCRETE PAVEMENT - CRCP

Acceptable projects include continuously reinforced portland cement concrete pavements (6) placed directly upon a layer of any material listed in Table A.6 (except 25 or 45), or upon unstabilized coarse-grained subgrade (57-65). CRCP's placed directly upon a fine-grained soil/aggregate layer (25) or a fine-grained subgrade (51-56) are not acceptable for this study.

(06) AC OVERLAY OF AC PAVEMENT

Acceptable pavements for this study include a dense-graded HMAC surface layer (1) with or without other HMAC layers (28) placed over a previously existing asphalt concrete pavement meeting the requirements of GPS-1 or GPS-2. Seal coats or porous friction courses are allowed, but not in combination. Fabric interlayers (75 and 76) and Stress Absorbing Membrane Interlayers (SAMIs) (77) are permitted between the original surface and the overlay. The total 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.

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

(07) AC OVERLAY OF JOINTED CONCRETE PAVEMENT

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

(09) UNBONDED JCP OVERLAYS OF CONCRETE PAVEMENT

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

Table A.4 Pavement Type Codes

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

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Table A.4 Pavement Type Codes  
(Continued)

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

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

Definitions:

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

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

Table A.5 Pavement Surface Material Type Classification Codes

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

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

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

Table A.7. Subgrade soil description codes.

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

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

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

Table A.9. Geologic classification codes.

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

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

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

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Table A.11 Portland Cement Type Codes

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

Table A.12 Portland Cement Concrete Admixture Codes

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

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Table A.13. Aggregate durability test type codes.

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

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

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

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

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

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

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Table A.15 Asphalt Cement Modifier Codes

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

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

	<u>Code</u>
<b>Asphalt Cements</b>	
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
<b>Emulsified Asphalts</b>	
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
<b>Cutback Asphalts (RC, MC, SC)</b>	
30 (MC only) .....	36
70 .....	37
250 .....	38
800 .....	39
3000 .....	40
Other Cutback Asphalt Grade .....	99

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

Table A.17 Maintenance and Rehabilitation Work Type Codes

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

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

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

Table A.18. Maintenance location codes.

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

Note: SHRP LTPP only studies outside lanes.

Table A.19 Maintenance Materials Type Codes

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

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Table A.20. Recycling agent type codes.

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

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

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

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

Table A.21. Anti-stripping agent type codes (continued).

	<u>Code</u>
Indulin AS-1 .....	43
Jetco AD-8 .....	44
Kling .....	45
Kling Beta ZP-251 .....	46
Kling Beta L-75 .....	47
Kling Beta LV .....	48
Kling Beta 1000 .....	49
Kling Beta 200 .....	50
Nacco Anti Strip .....	51
No Strip .....	52
No Strip Concentrate .....	53
Redi-Coat 80-S .....	54
Redi-Coat 82-S .....	55
Silicone .....	56
Super AD-50 .....	57
Tap Co 206 .....	58
Techni H1B7175 .....	59
Techni H1B7173 .....	60
Techni H1B7176 .....	61
Techni H1B7177 .....	62
Tretolite DH-8 .....	63
Tretolite H-86 .....	64
Tretolite H-86C .....	65
Tyfo A-45 .....	66
Tyfo A-65 .....	67
Tyfo A-40 .....	68
Edoco 7003 .....	69
Other.....	70

Table A.22 Distress Types

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