FEDERAL HIGHWAY ADMINISTRATION
Long Term Pavement Performance (LTPP)
Specific Pavement Studies

CALIFORNIA SPS-8
Construction Report on Site 060800
Sycamore Street

DRAFT

Prepared for:

California Department of Transportation

August 2001

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ABSTRACT

Environmental conditions alone or interacting with pavement materials may generate major distresses in pavements. The impact of environmental conditions on long term performance of pavements has been difficult to quantify, as have the interactions between environmental stresses and load stresses. Under the Strategic Highway Research Program (SHRP), Specific Pavement Studies (SPS), experimental studies are carried out as part of the Long Term Pavement Performance (LTPP) Program across the nation. The SPS-8 experiment, "Strategic Study of Environmental Factors in the Absence of Heavy Loads," is a study designed to evaluate the effect of environmental factors on the performance of both rigid and flexible highway pavements. The California SPS-8 section combines two PCC sections of varying surface course thicknesses in a low traffic environment. The environmental conditions will be continuously monitored with the weather station installed at this site. Over time, the effect of environment on the performance of these sections will be monitored.

Two rigid sections were constructed on the northbound lane of Sycamore Street. Sycamore Street is a low traffic frontage road to US-99 at Delhi, about 18 miles (29 Km) south of Modesto, California. The automated weather station at this site collects wind speed, ambient temperature, precipitation, and solar radiation data on a continuous basis. Construction of the test sections began in May 1999 and the paving operations were completed on September 29, 1999. The test sections were opened to traffic on November 18, 1999. Details of construction are presented in this report, along with minor problems encountered during construction that may affect the pavement performance.

I. INTRODUCTION

The Strategic Highway Research Program (SHRP) SPS-8 (Specific Pavement Study) experiment was designed to more precisely determine the relative impact of environmental factors that influence the performance of flexible and rigid pavements in the absence of heavy traffic loads. Environmental conditions alone or interacting with pavement materials may generate major distresses in pavements. "D" cracking, popouts, and scaling are common environmental and material related distresses that have little or no traffic related component.

This report covers the construction of the rigid SPS-8 sections on the northbound lane of Sycamore Street, a frontage road for SR99 at Delhi, 18 miles (29 Km) south of Modesto, California. This section of the report briefly explains the organization of this report and topics covered under various sections. Section II of this report gives the project location, description, and attributes, and the key organizations and the personnel that were involved. Section III covers the construction sequence and process, detailing the construction materials, sequence, problems, and deviations that were observed during the WRCOC LTPP monitoring for the SPS-8 construction. Construction of the test sections is summarized in section IV and finally the key observations are documented in section V. Appendix A presents the photographs of construction activities, appendix B the mix design, the sampling plan is presented in appendix C, and the construction data forms are enclosed in appendix D.

SPS-8 PRODUCTS

The primary products of the SPS-8 experiment are the:

- Evaluation of existing environmental effects (damage) models.
- Determination of the effects of specific design features, thickness, and pavement type on pavement performance in the absence of heavy traffic loads.
- Development of a comprehensive database for use by state and provincial engineers and other researchers for evaluating environmental effects on pavement performance.

II. SPS-8 PROJECT DESCRIPTION

This section of the report describes in detail the geographical location, section layout, climatic zone, subgrade and structural attributes, and construction of individual sections.

LOCATION AND LAYOUT

This project is located on the northbound lane of Sycamore Street, a frontage road to US99 in Delhi, California. Delhi is about 18 miles (29Km) south of Modesto, California. The GPS co-ordinates of the beginning of the project are 37° 24.993' N latitude and 120° 45.571' W longitude. The project is located at an elevation of 36m (118'). Figure 1 presents the geographic location of the project. The project consisted of the construction of two 152.4m (500') long PCC (SPS-8) sections.

As shown in figure 2, section 060811 was 205mm of PCC over 150mm of crushed aggregate base and section 060812 was 280mm of PCC over 150mm of crushed aggregate base. The lay-out, stationing, and structural attributes of individual sections are summarized in table 1.

Table 1. Test section details for SPS-8, California.

Section	Location	Construction Stationing	Test Section Stationing	Structural Details
060811	Begin Transition	113+40	0-20.0	205 mm PCC 150 mm DGAB
	Begin Monitoring	113+60	0+00.0	
	End Monitoring	115+12.4	1+52.4	
	End Transition	115+40.0	1+80.0	
060812	Begin Transition	115+60.0	0-20.0	280 mm PCC 150 mm DGAB
	Begin Monitoring	115+80.0	0+00.0	
	End Monitoring	117+32.4	1+52.4	
	End Transition	117+60.0	1+80.0	

CLIMATE

The project is located in the LTPP "dry-no freeze" climatic zone. The estimated average precipitation at the project location is 316 mm. The average maximum and minimum temperatures during the summer and winter seasons are enumerated below:

	Summer	Winter
Average Maximum Temperature	34.7 °C	14.2 °C
Average Minimum Temperature	14.6 °C	2.8 °C

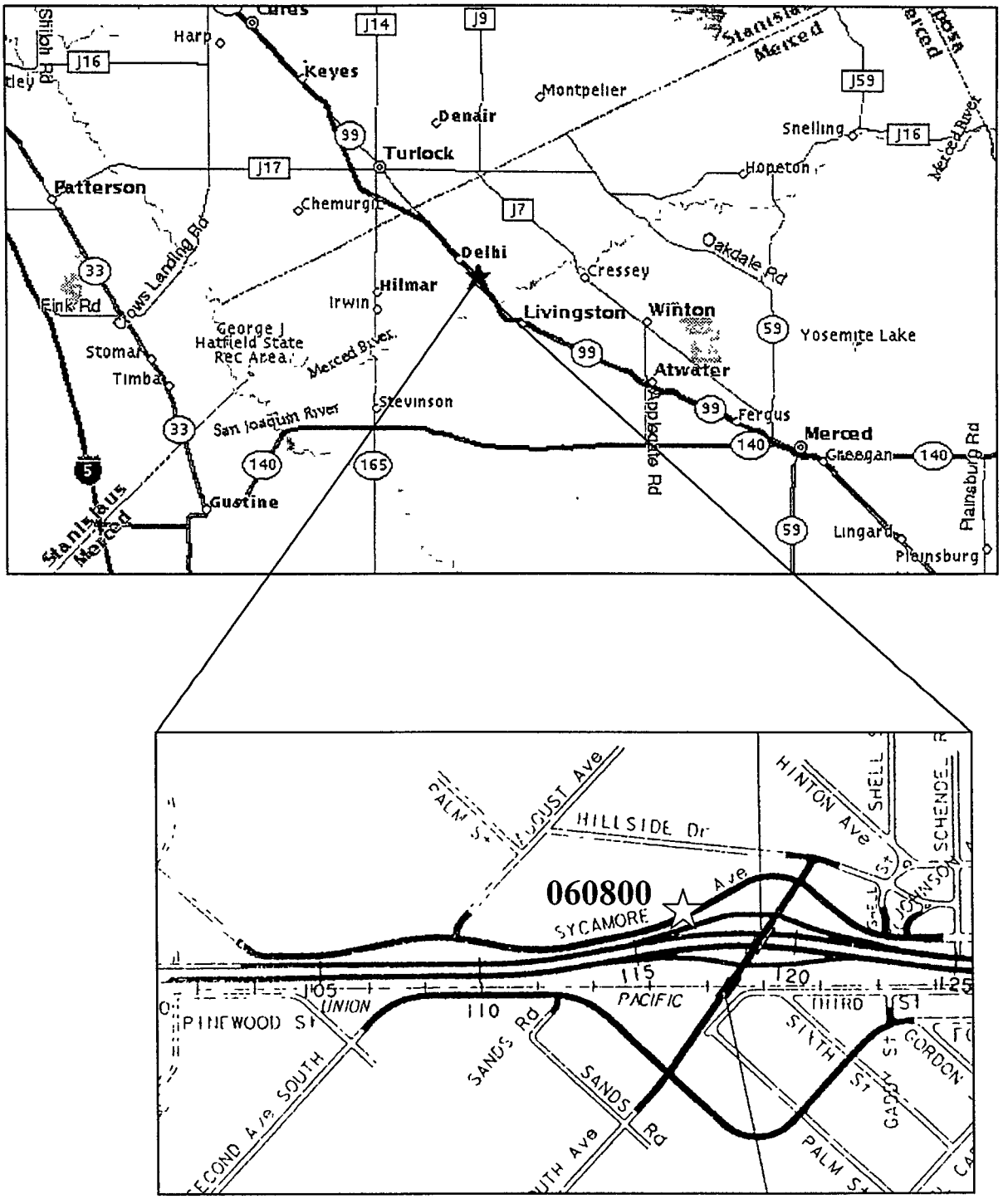


Figure 1. 060800 site location.

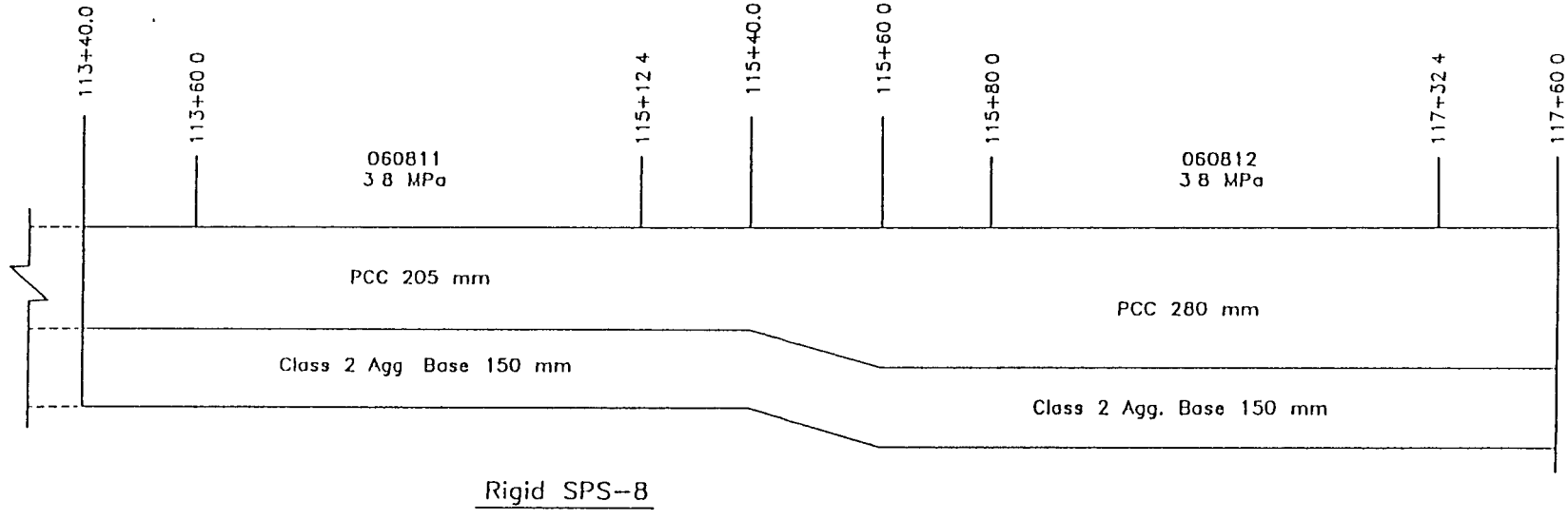


Figure 2. Layout of experimental test section, California SPS-8 project, Sycamore Ave.

TRAFFIC

The estimated annual average daily traffic (AADT) in two directions for these sections is 1240 vehicles. For a design period of 20 years, the total design ESALs is estimated at 480,000.

GEOMETRICS AND SUBGRADE

The SPS-8 test sections were constructed on a gentle grade (< 1.0%) and gently curving (radius of the curve = 182m, $\Delta = 69^{o}\ 29'\ 59"$) alignment. The subgrade underlying the test sections consisted of fine sand with some silt, thereby meeting the LTPP definition of "fine grain."

AGENCIES AND PERSONNEL

This project was constructed under the supervision of Caltrans, and FCI Constructors was the principal contractor. All LTPP required material sampling and baseline elevation surveys were performed by Caltrans personnel. The following personnel were involved in the project at various phases of construction.

Caltrans

Pamela Marquez was the resident engineer for this project assisted by Kurosh Boroshan, the assistant resident engineer. Rodney Soderlund was the subgrade and base materials inspector. George Crowley was the chief field technician assisted by Douglas Hammerstaad and Manpreet Singh in field sampling and testing. Bing Long, Robert Sugar, and Jay Abegglen represented the Caltrans central offices out of Sacramento.

FCI Constructors

FCI Constructors was the prime contractor for the project: Greg Le Blanc was the project manager and Rudy Bravo was the construction superintendent. Jerry Miller was the subcontractor for subgrade and base work.

Western Region Coordination Office Contractor (WRCOC)

Pete Pradere and Srikanth Holikatti from WRCOC were present for all phases of construction for the test sections.

Weather Station

In order to assure the proper climatic data would be available during analysis, an Automated Weather Station (AWS) was installed by the Western Regional Contractor. The AWS is located on-site. Nichols Consulting Engineers, Chtd. (NCE) personnel installed the AWS equipment on December 13, 2000. The installed equipment consists of a wind monitor that measures wind speed and direction, a probe to measure the temperature and humidity, a pyranometer to measure solar radiation, a rain gauge tipping bucket, a solar panel, and a datalogger. All equipment was provided by FHWA. A phone line was also installed so that the data could be downloaded and reviewed on a weekly basis.

III. CONSTRUCTION

This section of the report covers the actual construction operations, material sampling, and field testing performed during construction and any deviations that occurred during the construction process.

Sycamore Street is a two lane frontage road with no direct access to SR99. The SPS-8 sections were constructed as part of a major realignment project on SR-99. Construction work began in May 1999. Initial work consisted of vegetation clearance and grubbing. The longitudinal profile of the roadway did not warrant any embankment.

EQUIPMENT

The following equipment was used in the material processing and construction work of subgrade and aggregate base layers on the test sections.

2 CAT 623F Scrapers
2 Ingorsoll Rand Series 100 Steel Drum Vibratory Rollers
1 CAT 140H Motor Grader
1 CAT 140C Motor Grader
2 Front End Loaders
8 Belly Dump Trucks
3 Water Trucks

SUBGRADE PREPARATION

Initial work on the subgrade began in May 1999. After vegetation clearing and grubbing, the subgrade was worked with graders and scrapers to achieve proper distribution of the material and the required profile. Water trucks and steel rollers were used to attain the target compaction and moisture content. Photographs 1 and 2 in appendix A show the work on the subgrade layer.

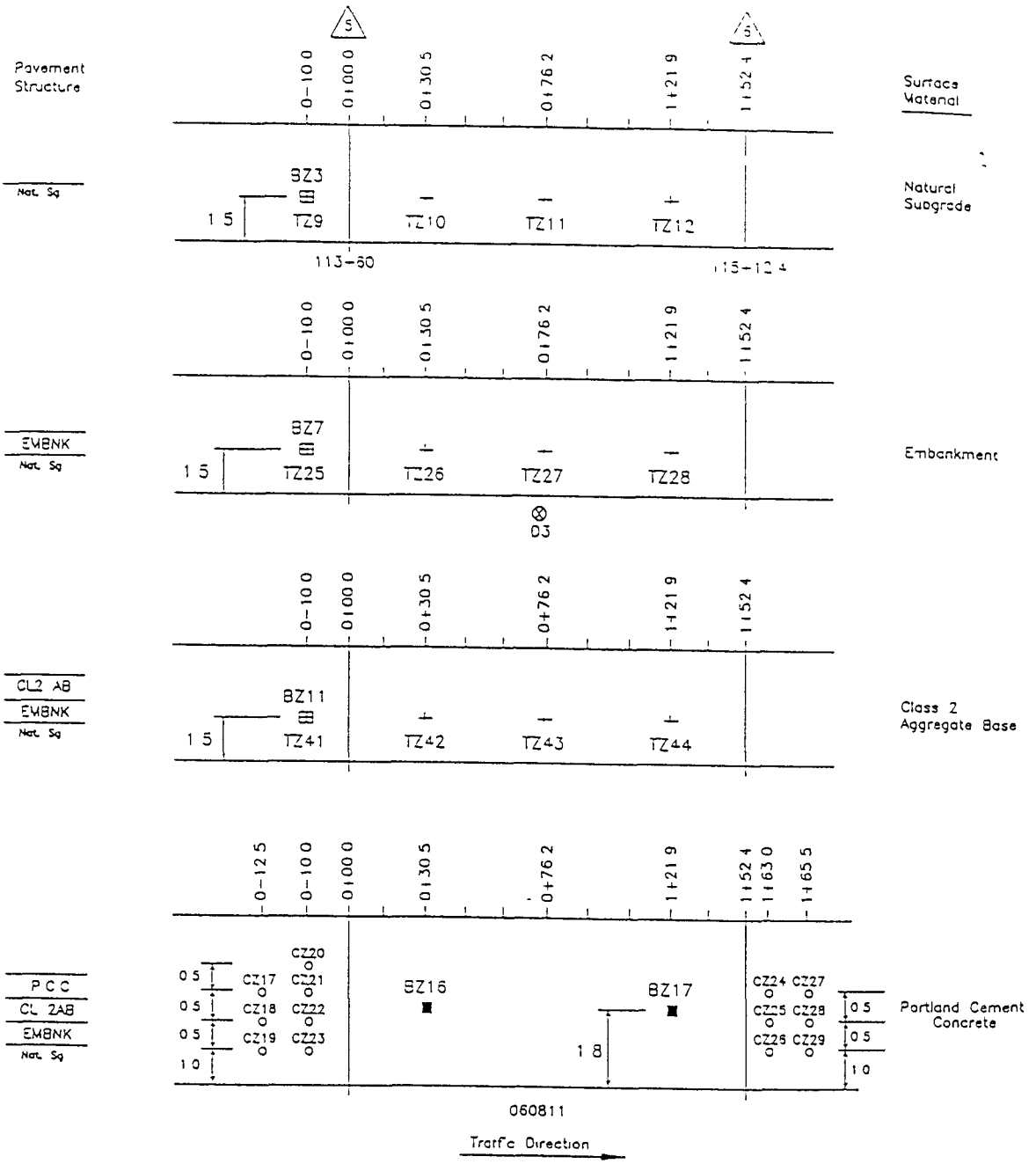
Bulk Sampling

Bulk sampling of finished subgrade was performed on July 21, 1999 by excavating test pits (photograph 3, appendix A). The bulk sampling pits were backfilled with similar subgrade material and compacted to Caltran's specifications. A summary of subgrade bulk sample locations, stationing, and sample numbers are given in table 2. Figures 3 and 4 show the subgrade bulk sampling locations. Based on the visual inspection of soil and the information provided by Caltrans, Shelby tube sampling of subgrade was deemed not to be necessary.

Table 2. Subgrade bulk sample locations, California SPS-8.

Section No.	Bulk Sample No.	Section Station	Project Station	Offset Rt. of Centerline
060811	BZ 3	0-10.0	113+50.0	2.2
060812	BZ 4	1+63.0	117+43.0	2.2

The subgrade gradations are presented below in table 3. The material has been classified as poorly graded sand with silt per SHRP/LTPP classification codes.



⊗ DJ – 6.1m Shoulder Probe
– TZ9–TZ12 – Moisture–Density tests on Natural Subgrade
□ BZ3 – Bulk sampling of Natural Subgrade
□ BZ7 – Bulk sampling of Embankment
– TZ25–TZ28 – Moisture–Density tests on Embankment
□ BZ11– Bulk sampling of Cl 2 Agg Base
– TZ41–TZ44 – Moisture–Density tests on Cl 2 Agg Base
■ BZ16–BZ17 – Bulk sampling of Portland Cement Concrete
o CZ17–CZ29 – 102mm Cores of PCC surface
Note Shoulder probe testing may be done at a later time

Figure 3. Overview of sampling, testing, and coring plan for Portland Cement Concrete section 060811, SPS-8, California.

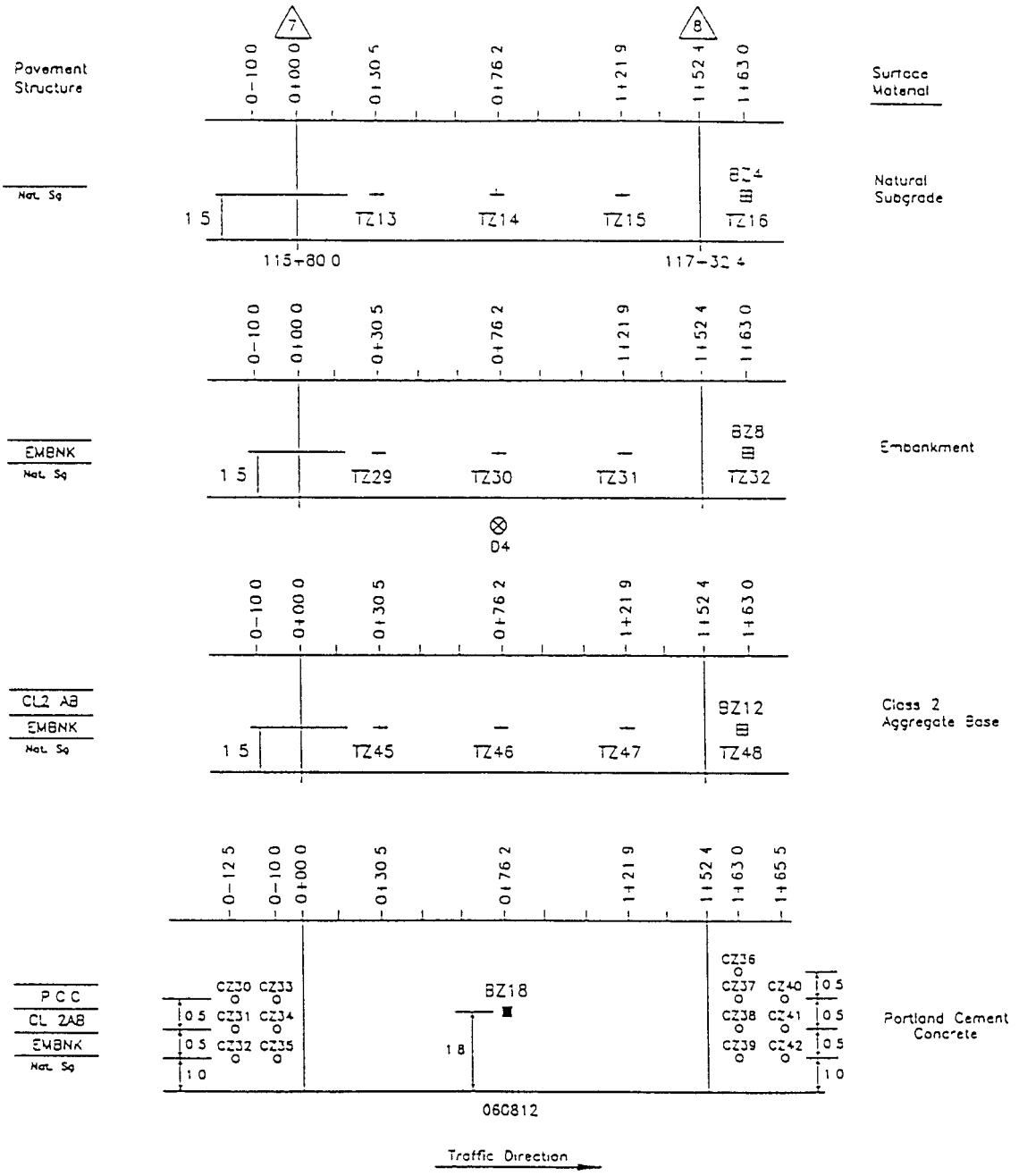


Figure 4. Overview of sampling, testing, and coring plan for Portland Cement Concrete section 060812, SPS-8, California.

Table 3. Subgrade gradations, California SPS-8.

Sieve Size (mm)	Percent Passing	
	Section 060811	Section 060812
75.00	100	100
50.00	100	100
37.50	100	100
25.00	100	100
19.00	100	100
12.50	100	100
9.50	100	100
4.75	100	100
2.00	100	100
0.425	81	86
0.180	39	43
0.075	13.5	11.9

Inspection

The finished subgrade was visually inspected for problem areas and none were observed.

Field Density and Field Moisture Testing

Field density and field moisture tests were performed on prepared subgrade layer on July 21, 1999. The density tests were carried out using nuclear gage at locations shown in figures 3 and 4 in accordance with the procedures in AASHTO T239-97 (photograph 4, appendix A). The results of the density tests are tabulated in table 4.

Table 4. Field density and moisture test results.

Section	Project Station	Section Station	C/L Reference (meters)	Avg. In-Situ Density (T/M^3)	% of Max Dry Density (T/M^3)	In-Situ Moisture Content	% Optimum Moisture Content
060811	113+40.0	0-20.0	2.1	1.84	100	2.2	20
	113+50.5	0-9.5	2.1	1.87	102	2.1	18
	113+96.2	0+36.2	2.1	1 82	99	2.3	20
	114+41.9	0+81.9	2.1	1.96	107	5.2	45
060812	115+75.2	0-10	2.1	1 85	106	2.6	19
	116+16.2	0+36.2	2.1	1.97	112	5.5	39
	116+61.9	0+81.9	2.1	1.84	105	3.3	24
	117+03.0	1+23.0	2.1	1 76	100	1 7	12

Prepared Subgrade Surface Elevations

Baseline elevation surveys on the surface of prepared subgrade were performed at locations indicated in figure 5. The purpose of the elevation surveys is to obtain a profile of prepared subgrade surface and to determine the thickness of subsequent layers.

FWD Testing

FWD testing of the subgrade was performed on July 21, 1999 for section 060811 and on July 22, 1999 for section 060812 (photograph 5, appendix A) by the WRCOC in accordance with the procedures and guidelines outlined in Specific Pavement Studies Directive Number S-4, "Deflection Testing of Subgrade and Base Layers for SPS-1, -2 and -8 Experiments". The subgrade deflection profiles of both the sections are presented in figures 6 and 7. The deflection profiles show that section 060812 has a higher variability as compared to section 060811.

Shoulder Auger Probes

Shoulder auger drilling to a depth of 6.0m was performed on April 18, 2000 to determine the existence of bedrock or any stiff underlying layer within 6m of pavement surface. Scheduling conflicts and difficulties in obtaining permits led to this work being performed after paving was completed, but there was no substantive effect from this delay as the auger probe locations were not disturbed during construction. Table 5 lists the section location and soil types encountered during the shoulder probe drilling for SPS-8 sections. No rock or stiff layer was encountered within the drilled depth in either section. The water table was encountered in section 060811 at a depth of 4.9m from the surface. There were no significant changes in the soil types in case of both sections. The shoulder auger probe locations were performed at the beginning of each test section rather than at the middle of the section as shown in the California SPS-8 material sampling and testing plan.

Table 5. Soil profiles and soil types for SPS-8, California.

Test No	Section	Project Station	Section Station	Offset	Type of Equipment Used	Depth of Layer (m)	Material Description
D3	060811	113+60	0+00	1 8m right of lane edge	CME 75	0 to 1 2	Light brown damp fine sand
						1 2 to 1.5	Light brown damp fine sand
						1.5 to 3 00	Light brown to tan damp fine sand
						3 0 to 4.5	Brown wet fine clayey sand
						4 5 to 4.9	Brown wet fine clayey sand, water table at 4.9m
						4 9 to 6 0	Brown wet fine sand w/small amounts of clay
D4	060812	115+80	0+00	1.8m right of lane edge	CME 75	0 to 1.5	Brown damp fine sand
						1 5 to 3.0	Brown damp fine sand
						3 0 to 6.0	Brown damp clayey fine sand

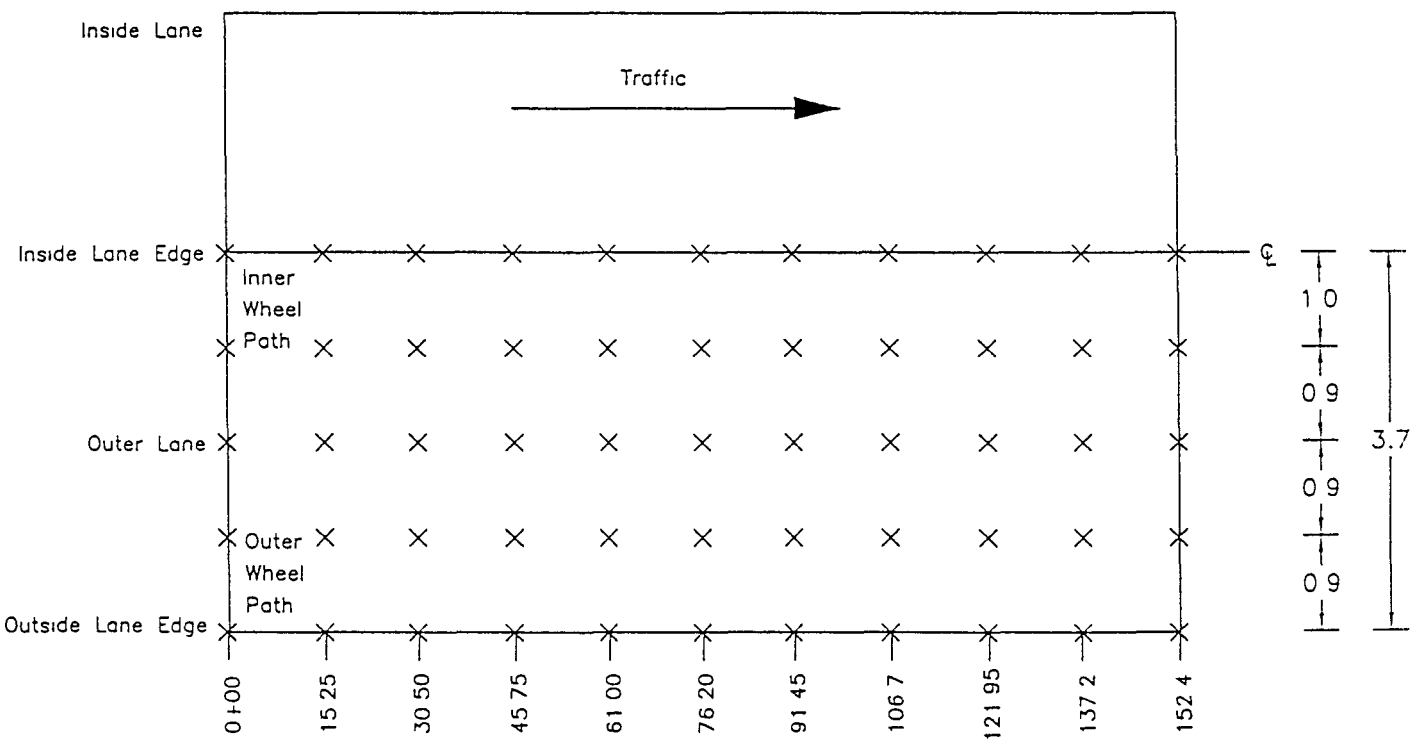


Figure 5. Test section elevation measurement location for SPS-8 California.

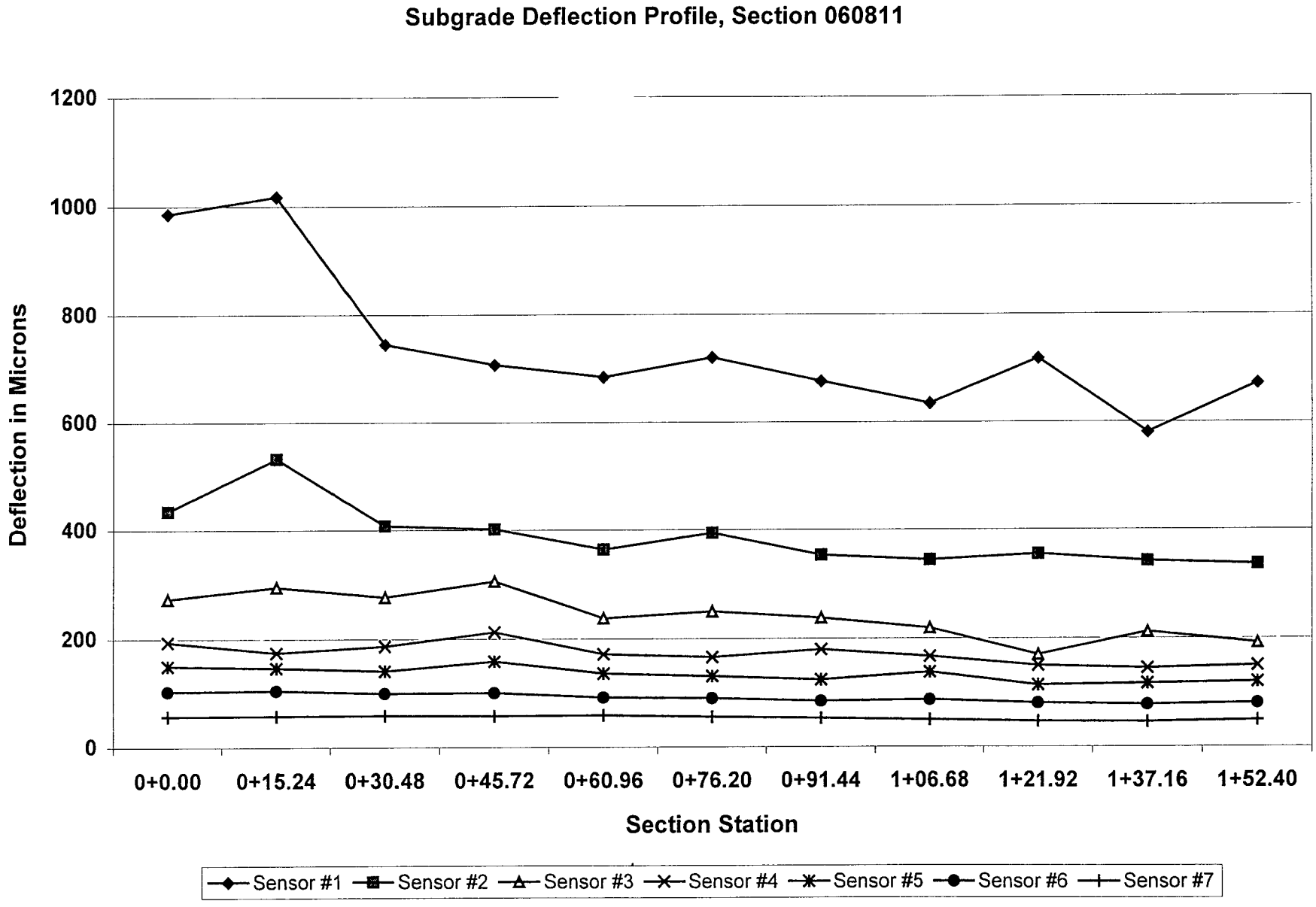


Figure 6. Subgrade deflection profile, section 060811.

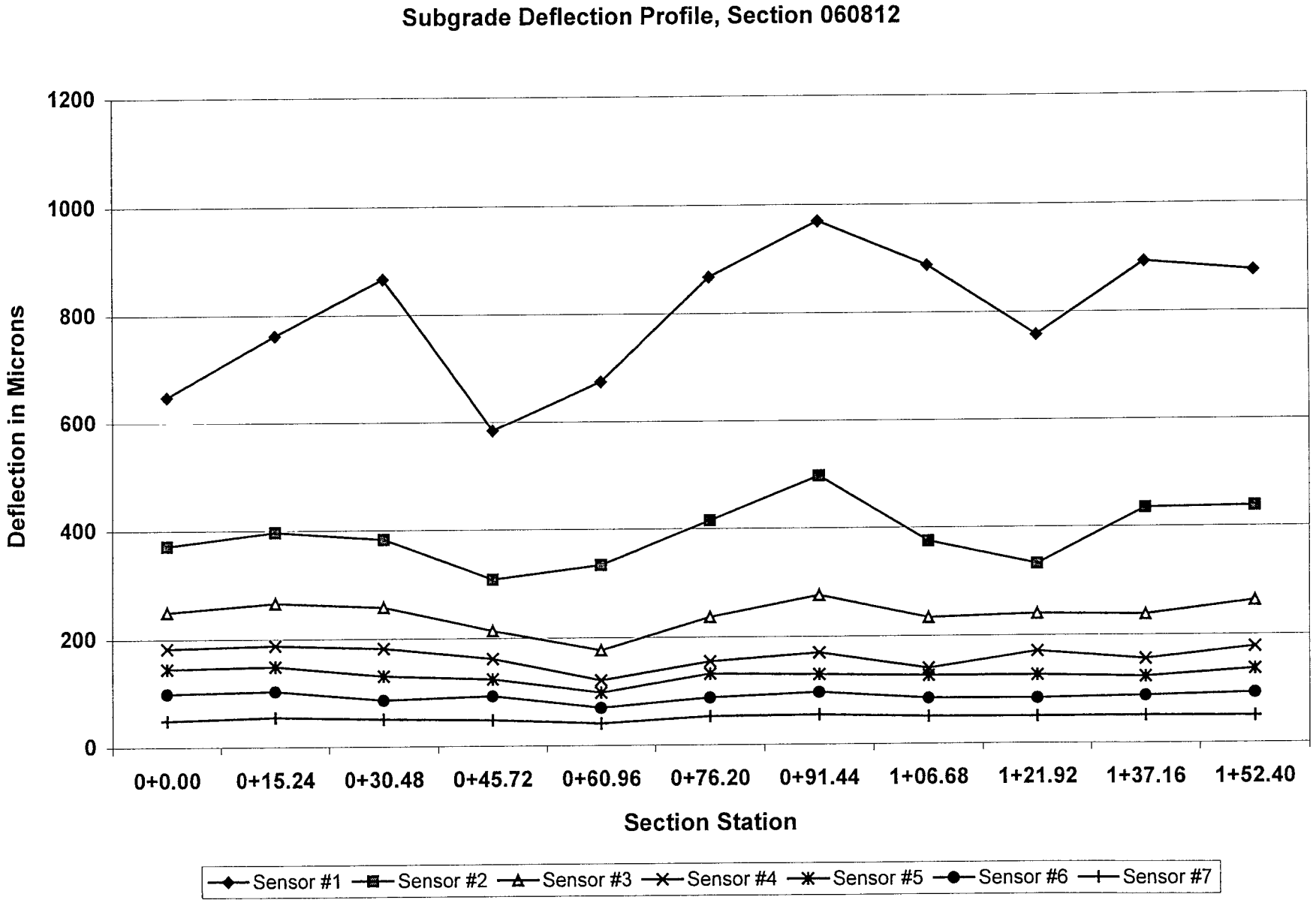


Figure 7. Subgrade deflection profile, section 060812

DENSE GRADED AGGREGATE BASE (DGAB)

Placement of the DGAB layer for the two SPS-8 sections began on July 23, 1999 and was completed on July 27, 1999. The DGAB material was brought in by belly dump trucks. It was then windrowed and worked by the graders and blades to achieve the required grade and profile (photograph 6, appendix A). Steel wheel and pneumatic rollers were employed to achieve target compaction. Water trucks were utilized to maintain the required moisture content. The design DGAB layer thickness for both sections was 150 mm (shown earlier in figure 2).

Inspection

The finished DGAB layer was visually inspected for problems and none were observed. In the transition between the PCC sections (project stations 115+00.0 to 115+20.0) the DGAB layer thickness was maintained constant instead of having a gradual transition to accommodate the change in surface layer thickness.

Bulk Sampling

Bulk sampling of DGAB material was performed on July 28, 1999 by excavating a test pit in the finished layer that would provide the required quantity of material. After the bulk sampling, the pits were backfilled with similar material and compacted to the target density. Bulk sample numbers, locations, sections, and stationing information is presented in figures 4 and 5, respectively and tabulated in table 6. Gradations of DGAB are presented in table 7.

Table 6. Dense graded aggregate base bulk sample locations, California SPS-8.

Section No.	Bulk Sample No.	Section Station	Project Station	C/L Reference
060811	BZ 11	0-10.0	113+50.0	2.2m Rt.
060812	BZ 12	1+63.0	117+43.0	2.2m Rt.

Table 7. Dense graded aggregate base gradations, California SPS-8.

Sieve Size (mm)	Percent Passing	
	Section 060811	Section 060812
75.0	100	100
50.0	100	100
37.5	100	100
25.0	85	88
19.0	74	78
12.5	57	58
9.50	46	47
4.75	37	38
2.00	27	28
0.425	14	18
0.180	10	13
0.075	6.3	8.2

Field Density and Field Moisture Tests

Field density and field moisture content tests were performed on the finished DGAB layer on July 28, 1999 in accordance with AASHTO T 238-97 and T239-97, respectively, at locations indicated in figures 3 and 4. The test results are tabulated in table 8.

Table 8. Dense graded aggregate base field density and moisture test results.

Section	Project Station	Section Station	C/L Reference (meters)	Avg. In-Situ Density (T/M^3)	% of Max Dry Density (T/M^3)	In-Situ Moisture Content	% Optimum Moisture Content
060812	113+40.0	0-50	2.1	2.36	106	3.4	57
	113+50.5	0-9.5	2.1	2.38	108	3.3	55
	113+96.2	0+36 2	2.1	2.38	108	3.7	62
	114+41.9	0+81.9	2.1	2.35	105	3.4	57
060812	115+70 5	0-9.5	2.1	2.34	104	3.0	50
	116+16.2	0+36.2	2.1	2.34	104	3.1	52
	116+61.9	0+81.9	2.1	2.30	103	3.3	55
	117+03.0	1+23.0	2.1	2.31	103	3.1	52

Finished DGAB Surface Elevations

Elevation surveys on the surface of the prepared DGAB surface were performed at the locations indicated in figure 5. The purpose of the elevation surveys is to obtain a profile of prepared DGAB surface and to determine the thickness of DGAB layers. The DGAB profiles of test sections are presented in figure 10. The in-place thicknesses of DGAB layers are summarized in table 9. As can be seen in table 9, the DGAB for both layers was constructed slightly thicker than called for in the experiment design.

Table 9. Dense graded aggregate base thickness.

Section	Minimum Thickness (mm)	Maximum Thickness (mm)	Average Thickness (mm)	Design Thickness (mm)	Standard Deviation (mm)
060811	130	178	158	150	11
060812	134	189	160	150	12

FWD Testing

FWD testing of the DGAB layer for sections 060811 and 060812 was performed on July 28, 1999, by the WRCOC. The testing was performed in accordance with the procedures and guidelines outlined in Specific Pavement Studies Directive Number S-4, "Deflection Testing of Subgrade and Base Layers for SPS-1, -2 and -8 Experiments." The results of the FWD testing are presented in figures 8 and 9. Unlike the subgrade deflection profiles, the DGAB deflection profiles have very little deviation from station to station.

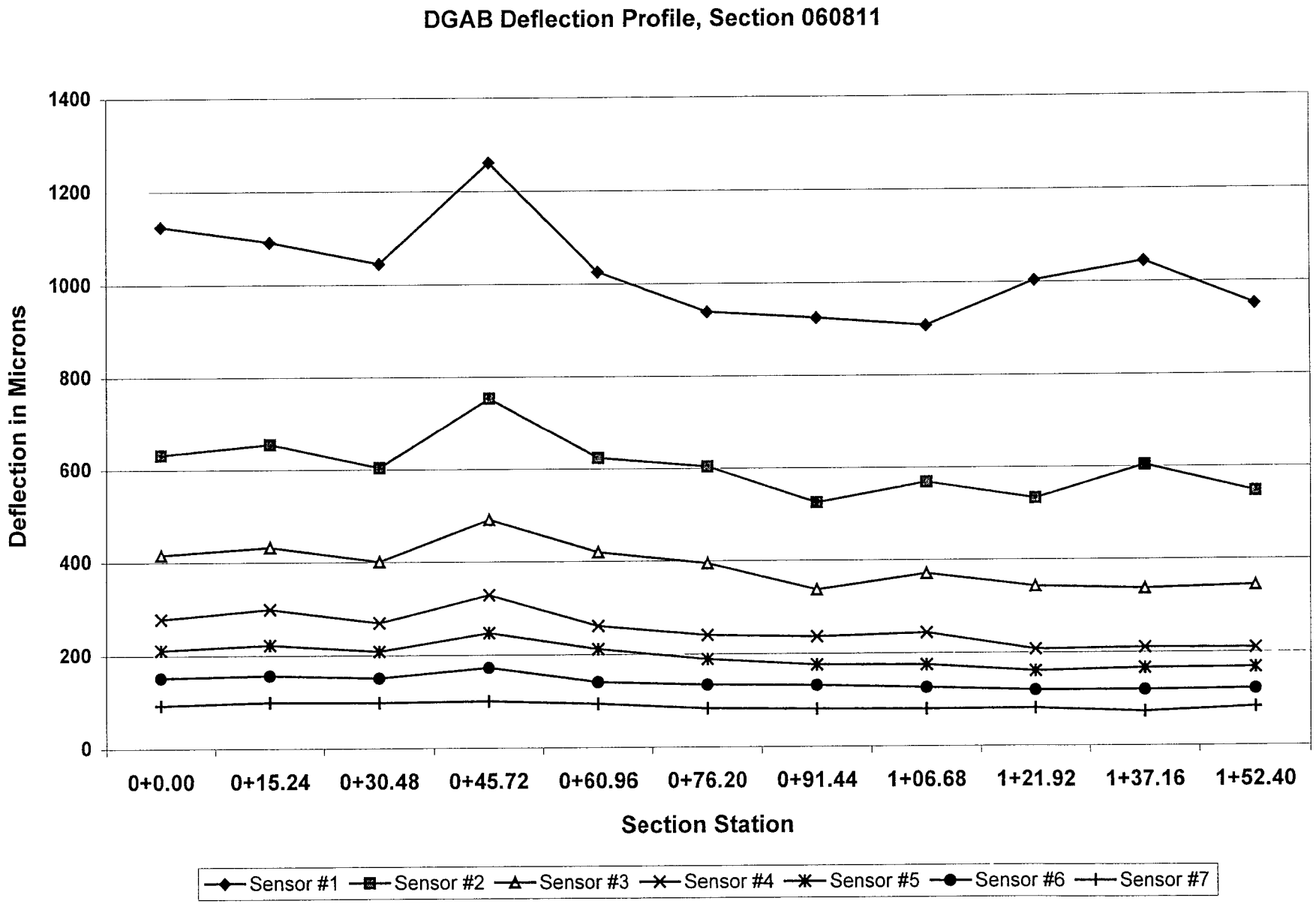


Figure 8. DGAB deflection profile, section 060811.

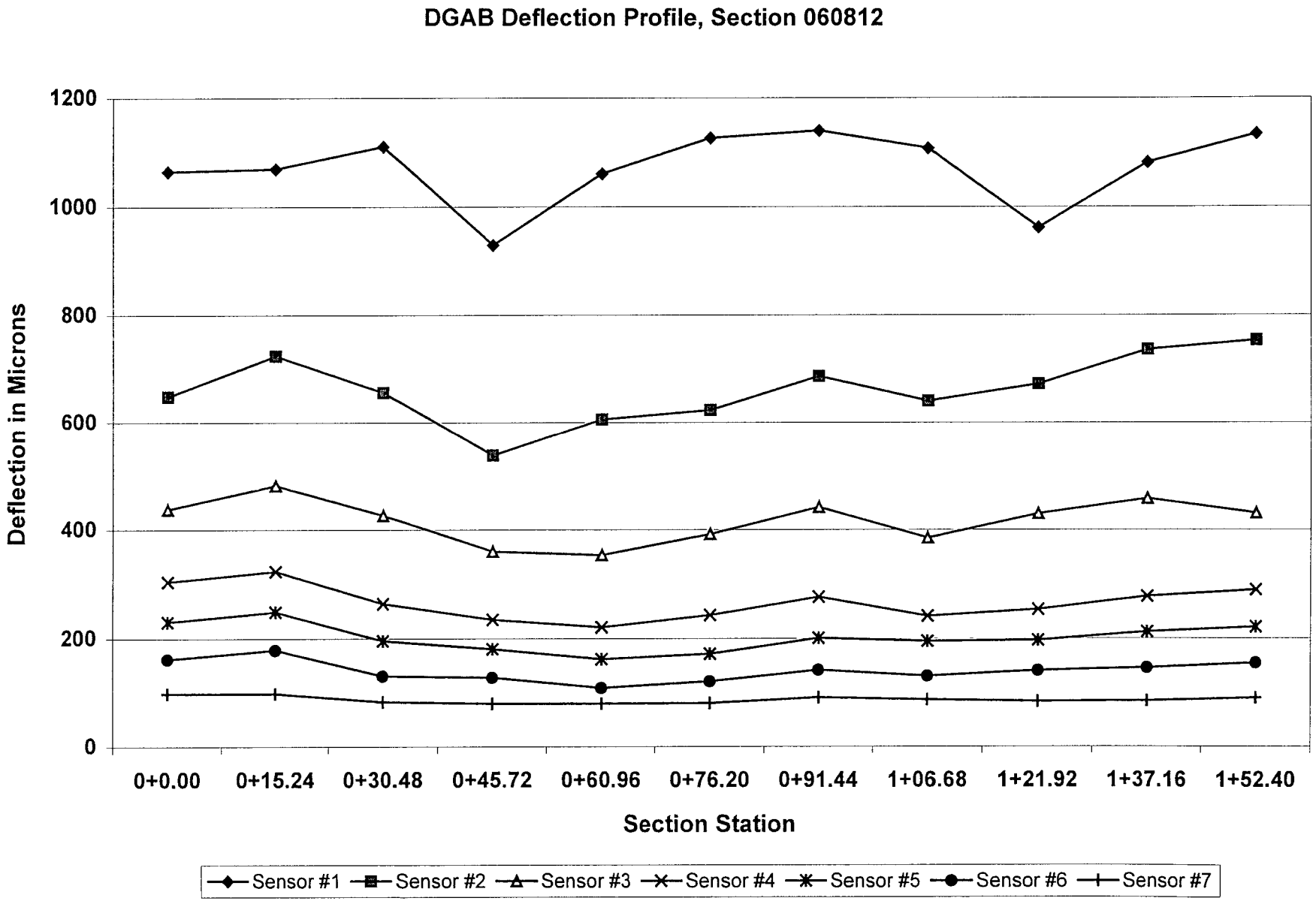


Figure 9. DGAB deflection profile, section 060812.

PORTLAND CEMENT CONCRETE (PCC) PAVEMENT

Construction of the PCC layer began on July 30, 1999. Both sections 060811 and 060812 were completed on the same day. Paving was done in a north to south pass. Photograph 7 in appendix A presents an overview of PCC paving operations. PCC for this SPS-8 paving was supplied from a transit plant about 0.5 Km from the beginning of the project's southern end. The concrete was brought in end dump trucks. The total travel time from the plant to the grade was under five minutes. A GOMACO model 2600 concrete track paver with hopper was used for PCC paving. The whole width of roadway (7.2m) was built in a single pass. The paver had a tie bar inserter at the centerline and an automatic floater trailing behind. Screed level was maintained by wire line electronic control system. The paver was trailed at a distance of 15m to 30m by a finishing machine to achieve the burlap drag finish, longitudinal tining, and spraying of curing compound.

The design and construction specifications called for placement of dowel bars across the transverse joints of test sections. The transverse joint locations were marked beforehand using spray paint. Dowel baskets were used to maintain the proper spacing and proper depth of dowels. A typical dowel basket is shown in photograph 8, appendix A. Both the basket and dowels were epoxy coated and were sprayed with diesel fuel before placement on the grade to prevent any sort of bonding between the concrete and the dowels. Initially the dowel baskets were nailed to the DGAB by hammering 150mm long 6mm dia nails. This worked well but was not keeping up with the paving speed. To speed up the nailing operation, Hilti nail guns were used to shoot 4mm dia, 100mm long nails with square washers to hold down the dowel baskets (photograph 9, appendix A). This method was quicker than the first method. The dowel baskets were placed and nailed just in front of the paving machine. Concrete from the transit truck was placed on the dowel baskets to help hold them in place. The dowel diameters were 37.5 mm and 45 mm respectively for sections 060811 and 060812. A front end loader was used to place fresh concrete on the dowel baskets to prevent movement during paving.

The PCC was placed directly on the DGAB. PCC paving was carried out in north to south pass. Actual PCC paving started at 6:55 a.m., at project station 117+60.0 and proceeded to project station 113+40.0. There were several problems with the paver and coordination, leading to many short delays during the paving operations. Once the paver tracks dug into the DGAB layer resulting in the paver screed being raised, this was mitigated by placing plywood sheets under the paver tracks. Twice the paving was stopped for significant periods (> = 30 minutes). The first time paving stopped at 8:45 a.m. because of excess material in front of the paver (photograph 10, appendix A). Small piles of concrete were left on the grade between stations 116+70 and 117+00 for over an hour (photograph 11, appendix A). The second long delay occurred between section station 0+59.0 (project station 114+19.0) and section station 0+70.0 (project station 114+30.0) paving operations were stopped, as the tie bar inserter trailing the paver hooked a dowel basket at section station 0+59.0 bending it out of shape. The bent dowel basket was dug out manually and a new basket was placed before paving operation could proceed (photographs 12 and 13, appendix A). Mechanical compaction of the replaced concrete at this location was not performed. The paving operations stopped at 1:05 p.m., at section station 114+15 due to excess concrete in front of the paver and resumed at 1:45 p.m. The plan thickness of the PCC layers were 205mm for section 060811 and 280 mm for section 060812, as shown in figure 2.

Finishing the fresh PCC was achieved by a float trailing the paver and manual floating (photograph 14, appendix A). Burlap finishing (photograph 15, appendix A) and tining of PCC was carried out with an approximate time lag of 1.5 hours. The sawing of joints took place about four hours later.

Bulk Sampling of PCC

Bulk sampling of fresh PCC was performed on July 30, 1999. The sampling plan called for two bulk samples from section 060811 and 1 sample from 060812. The decision was made in the field to take two bulk samples from 060812 and one sample from 060811. This PCC was used to cast in situ cylinder and beam samples of PCC (photographs 16 and 17, appendix A) to determine the properties of the as-delivered concrete. It appeared that the confusion was due to the north to south pass of paving rather than south to north. The station locations of changed sampling locations and corresponding section numbers were noted on the sampling forms by the sampling personnel. The actual locations of PCC bulk samples are tabulated in table 10.

Table 10. PCC bulk sample locations, SPS-8 California.

Section No.	Bulk Sample No.	Section Station	Project Station	Source of Sample
060811	BZ 16	0+76.2	114+36.2	Truck
060812	BZ 17	0+30.5	116+10.5	Truck
060812	BZ 18	1+21.9	117+01.9	Truck

The detailed PCC mix design is appended in appendix B. A brief description of the mix design is presented in table 11.

Table 11. PCC mix design, California SPS-8.

Portland Cement Type II	264.4 Kgs.
Fly Ash	69.95 Kgs.
Fine Aggregate	659.2 Kgs.
Coarse Aggregate	1193.3 Kgs.
Potable Water	164 Liters

Core Sampling of PCC

The 14 day PCC core samples were cored and collected on August 11, 1999 (photograph 18, appendix A). Core location CZ21 was moved to station 113+49.5 because of the presence of a transverse joint. During the coring, a transverse crack in the PCC layer was observed in the vicinity of station 113+33.0 as shown in photograph 19, appendix A.

Finished PCC Surface Elevations

Elevation surveys on the surface of the prepared PCC surface were performed at the locations indicated in figure 5. The in-place thicknesses of the PCC layers are summarized in table 12. Table 12 shows that the average thickness for 060811 was slightly higher than the design thickness, while the average thickness for 060812 matched the design thickness precisely. Figure 10 provides the average thickness of the DGAB and PCC layers by station for both sections.

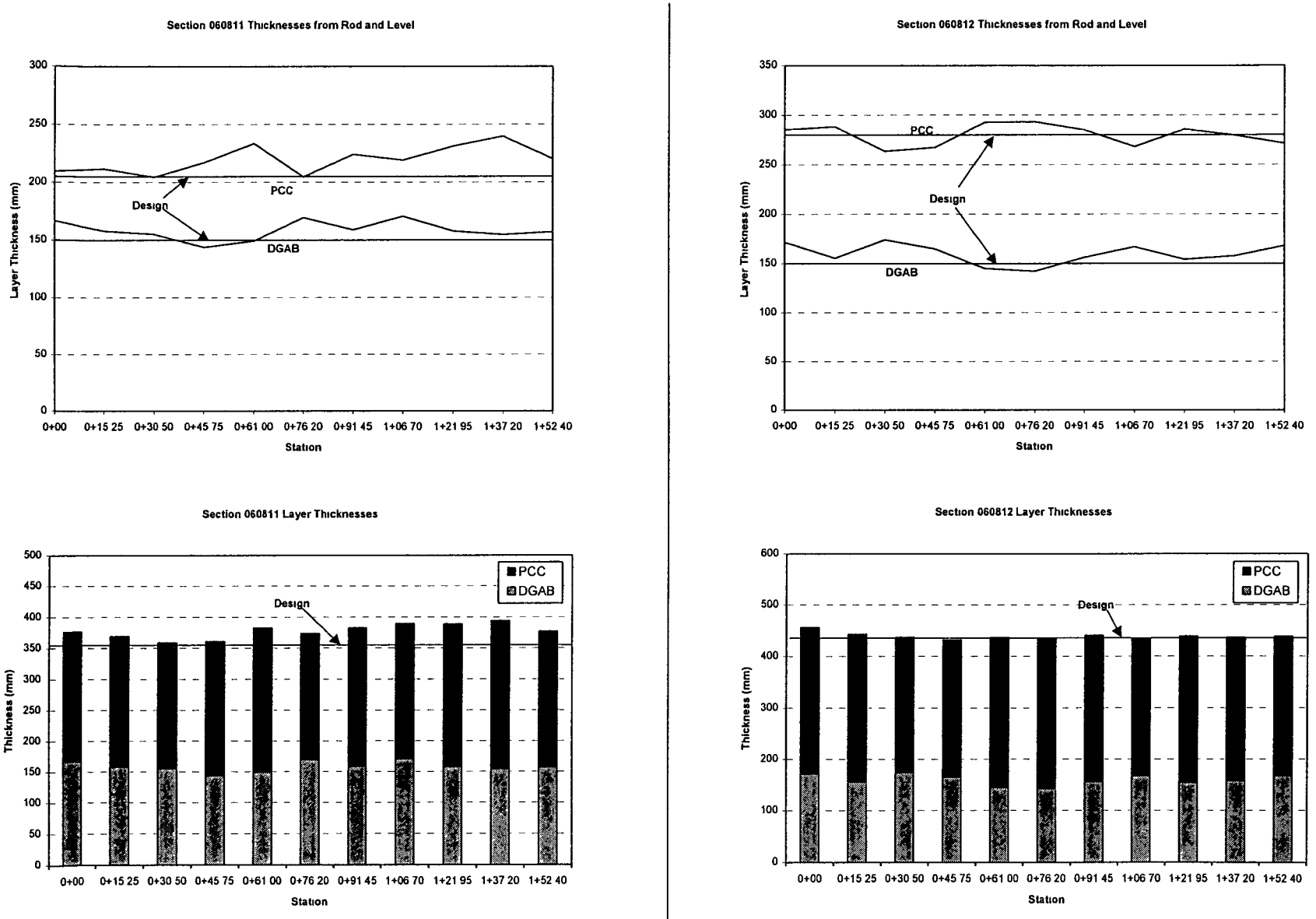


Figure 10. 060800 layer thickness.

Table 12. PCC thickness.

Section	Minimum Thickness (mm)	Maximum Thickness (mm)	Average Thickness (mm)	Design Thickness (mm)	Standard Deviation (mm)
060811	196	247	220	205	14
060812	242	306	280	280	13

FWD Testing

FWD testing of the PCC layer for section 060811 was performed on November 8, 1999, by the WRCOC. Section 060812 was tested on November 9, 1999. The testing was performed in accordance with LTPP testing guidelines and is summarized in figures 11 and 12. The second half of section 060811 was slightly stiffer than the first half of the section. This was not the case for section 060812.

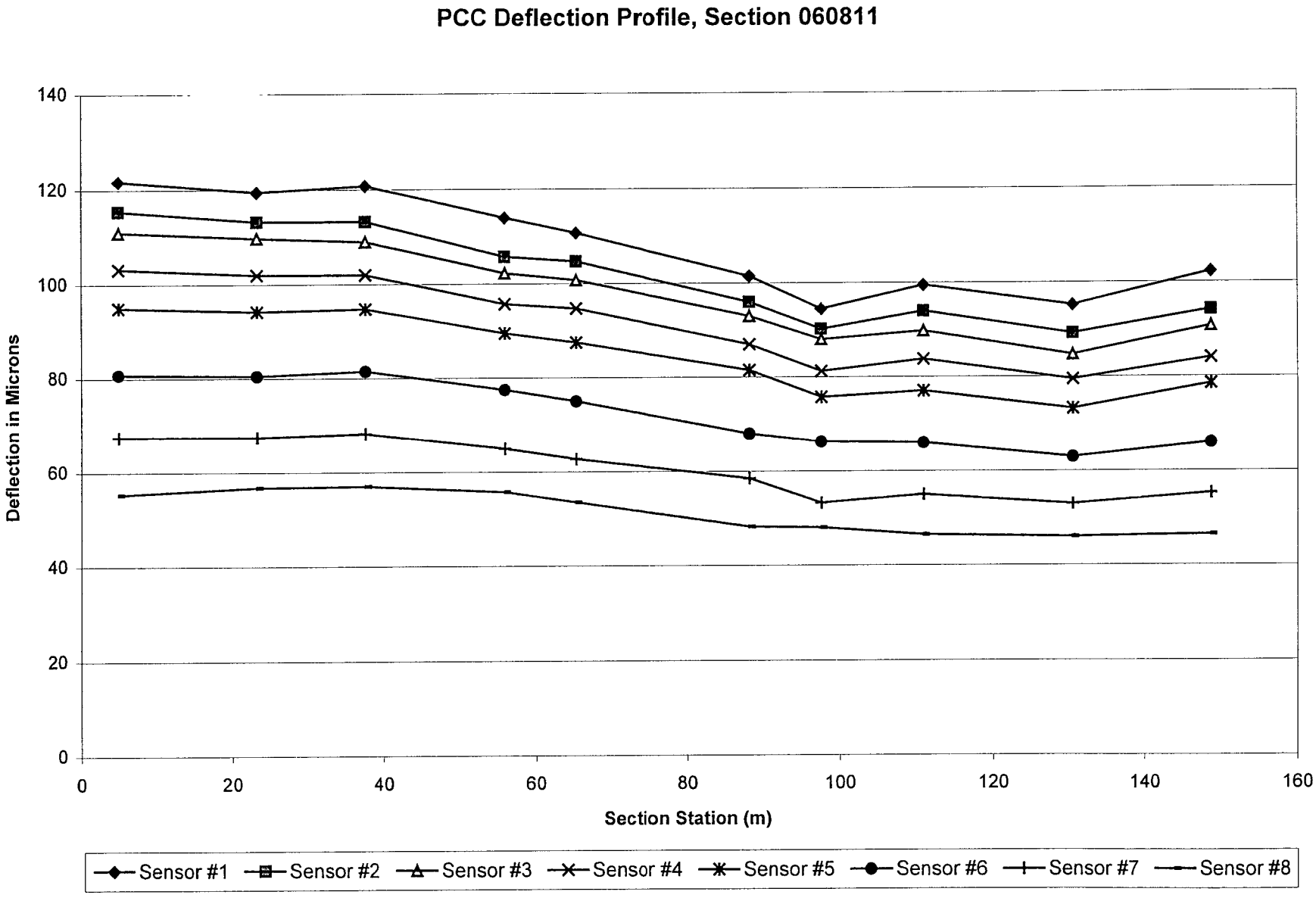


Figure 11. PCC deflection profile, section 060811.

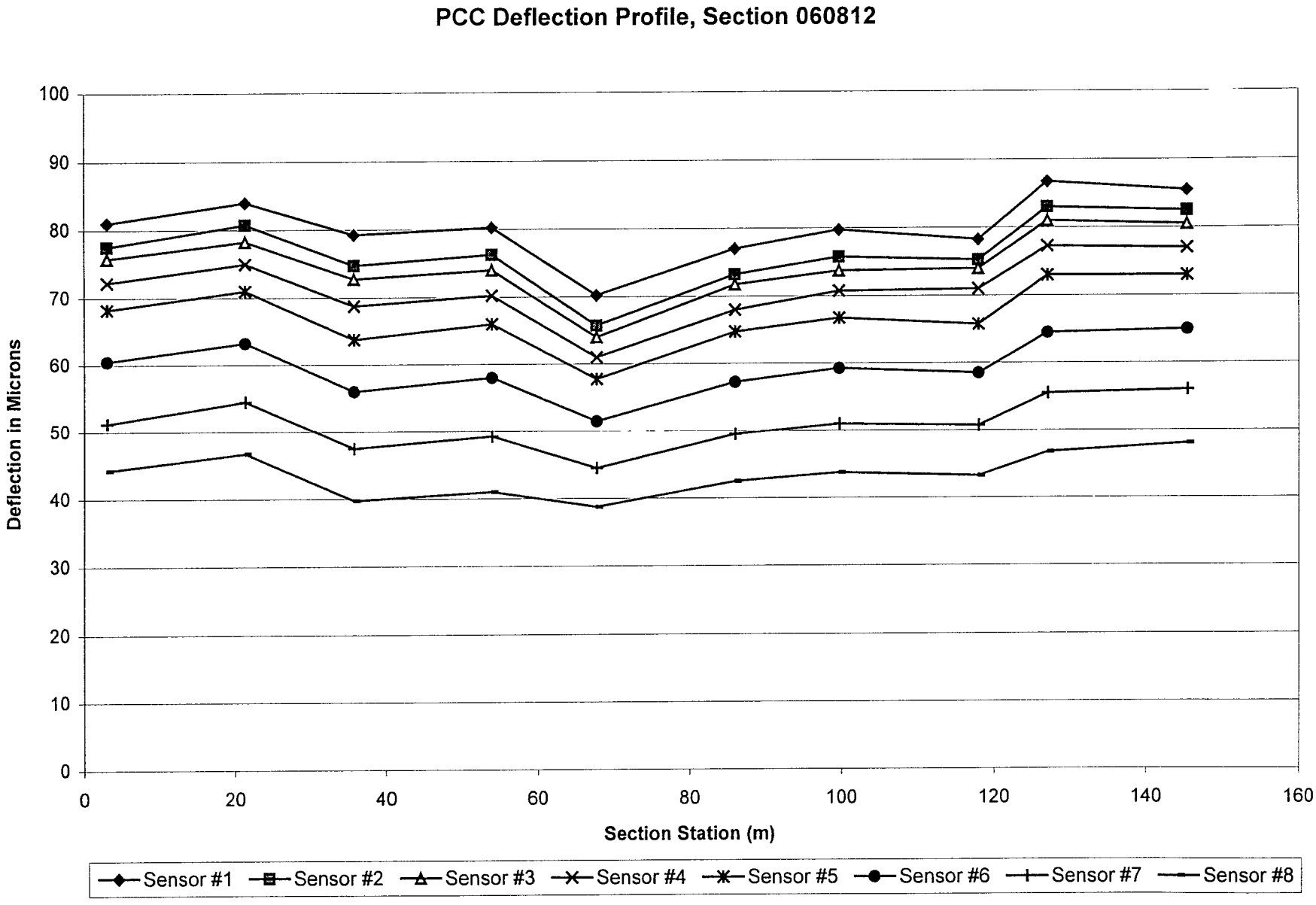


Figure 12. PCC deflection profile, section 060812.

IV. SUMMARY

Two SPS-8 test sections (060811 and 060812) were constructed on the northbound lane of Sycamore Street. Sycamore Street is a frontage road for US99 at Delhi, 29Km (18 miles) south of Modesto, California.

The SPS-8 sections were both PCC constructed the same base course material with a uniform thickness (160mm). Section 060811 has a 220mm thick surface layer and section 060812 a 280mm thick surface layer.

Prepared subgrade construction work began in May 1999 and was completed in July 1999. Dense graded aggregate base construction work began on July 25, 1999 and was completed on July 28, 1999. PCC paving operations were completed on July 30, 1999. The sections were opened to traffic on November 18, 1999.

Overall there were no major problems during any phase of construction of this project. Some minor problems/deviations that were observed and may affect pavement performance are recorded in section V.

V. KEY OBSERVATIONS

Key observations within each layer are discussed in this section.

SUBGRADE

Water table was found at a depth of 4.9m from surface at section 060811.

DENSE GRADED AGGREGATE BASE (DGAB)

Generally the DGAB construction went well without any problems. There were no deviations from the SPS-8 guidelines in the construction of DGAB layer.

PORTLAND CEMENT CONCRETE (PCC)

A number of observations were made during the PCC paving that could impact the performance of the test sections. There were two incidents of paving being stopped for periods exceeding 30 minutes, one of them resulted in small piles of concrete laying in front of the paver on section 060812 between section stations 0+70 and 0+80 for more than an hour. On section 060811, a dowel basket was hooked on by the tie bar inserter at section station 0+59.0 bending the dowel basket out of shape. The dowel basket was manually dug out and the resulting trench was back-filled with fresh concrete. Mechanical compaction of the PCC at this location was not performed. During the 14 day core sampling of PCC, core CZ21 had to be relocated due to the presence of a transverse joint at original core location. Finally, the joint sawing operations did not start within six hours of paving as intended.

APPENDIX A

CALIFORNIA SPS-8 CONSTRUCTION PHOTOGRAPHS

APPENDIX A - CALIFORNIA SPS-8 CONSTRUCTION PHOTOS

Appendix A consists of the following construction photos:

Photograph 1. An overview of subgrade layer, California SPS-8..
Photograph 2. Blading of subgrade layer, California SPS-8.
Photograph 3. Subgrade bulk sampling in progress, California SPS-8.
Photograph 4. Subgrade in-situ density test, California SPS-8.
Photograph 5. Subgrade FWD testing, California SPS-8.
Photograph 6. Finished DGAB layer, California SPS-8.
Photograph 7. Overview of PCC paving, California SPS-8.
Photograph 8. Typical dowel basket arrangement for California SPS-8.
Photograph 9. Dowel basket placement, California SPS-8.
Photograph 10. Excess PCC material in front of the paver, California SPS-8.
Photograph 11. Small piles of PCC on the grade in front of the paver lying between stations 116+70 and 117+00 for over an hour, California SPS-8.
Photograph 12. Partially bent dowel basket by the paver tie bar inserter, California SPS-8.
Photograph 13. PCC being removed from grade to replace the bent dowel basket, California SPS-8.
Photograph 14. Float finishing of fresh PCC, California SPS-8.
Photograph 15. Burlap finishing of fresh PCC pavement, California SPS-8.
Photograph 16. Fresh PCC bulk samples collected for in-situ PCC sample casting, California SPS-8.
Photograph 17. Fresh PCC in-situ beam sample casting, California SPS-8.
Photograph 18. 14 day PCC core sampling, California SPS-8.
Photograph 19. Transverse crack observed at section station 113+49.5 on section 060811, California SPS-8.

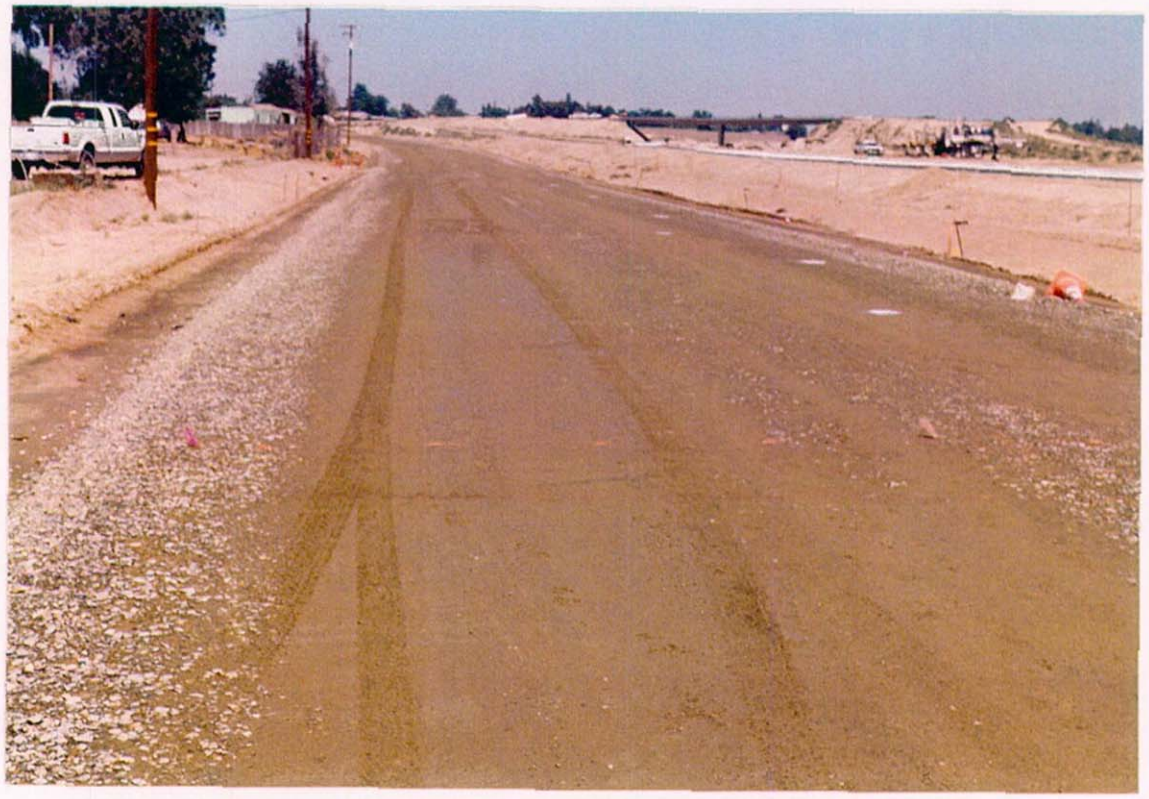
Photograph 1. An overview of subgrade layer, California SPS-8

Photograph 2. Blading of subgrade layer, California SPS-8.

Photograph 3. Subgrade bulk sampling in progress, California SPS-8.

Photograph 4. Subgrade in-situ density test, California SPS-8.

Photograph 5. Subgrade FWD testing, California SPS-8.



Photograph 6. Finished DGAB layer, California SPS-8.

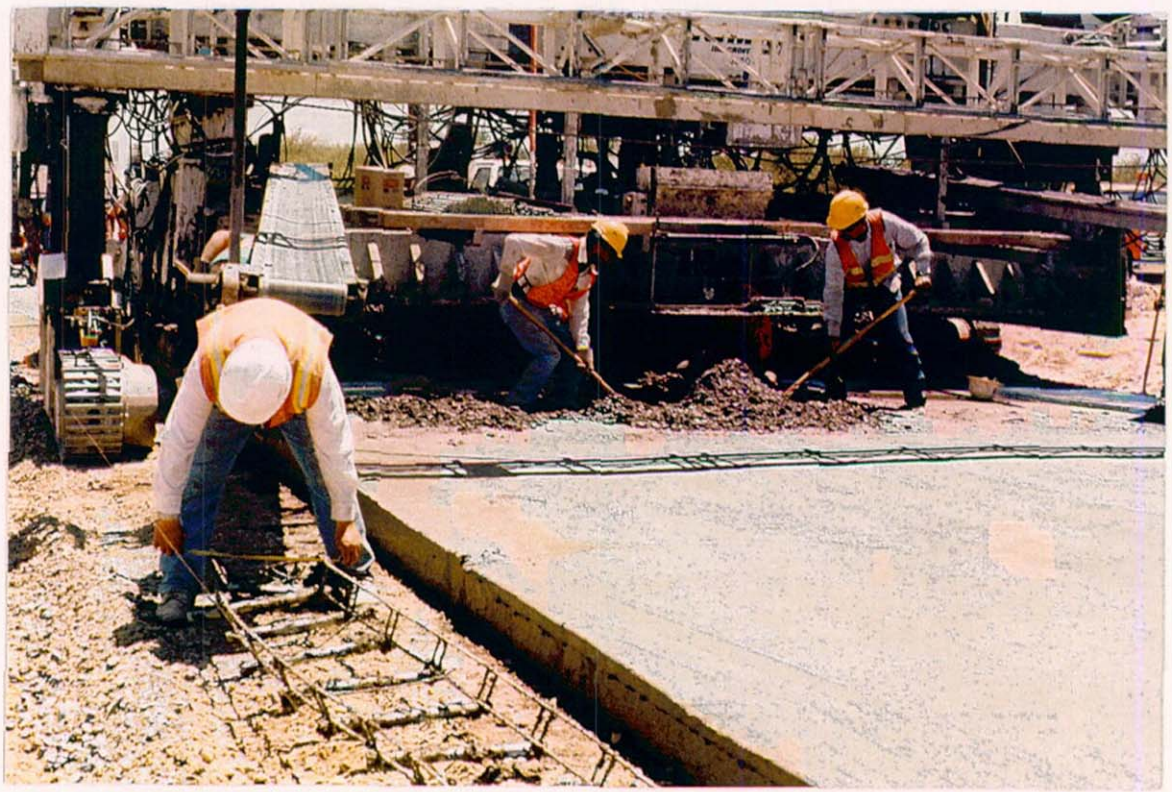
Photograph 7. Overview of PCC paving, California SPS-8.

Photograph 8. Typical dowel basket arrangement for, California SPS-8.

Photograph 9. Dowel basket placement, California SPS-8.

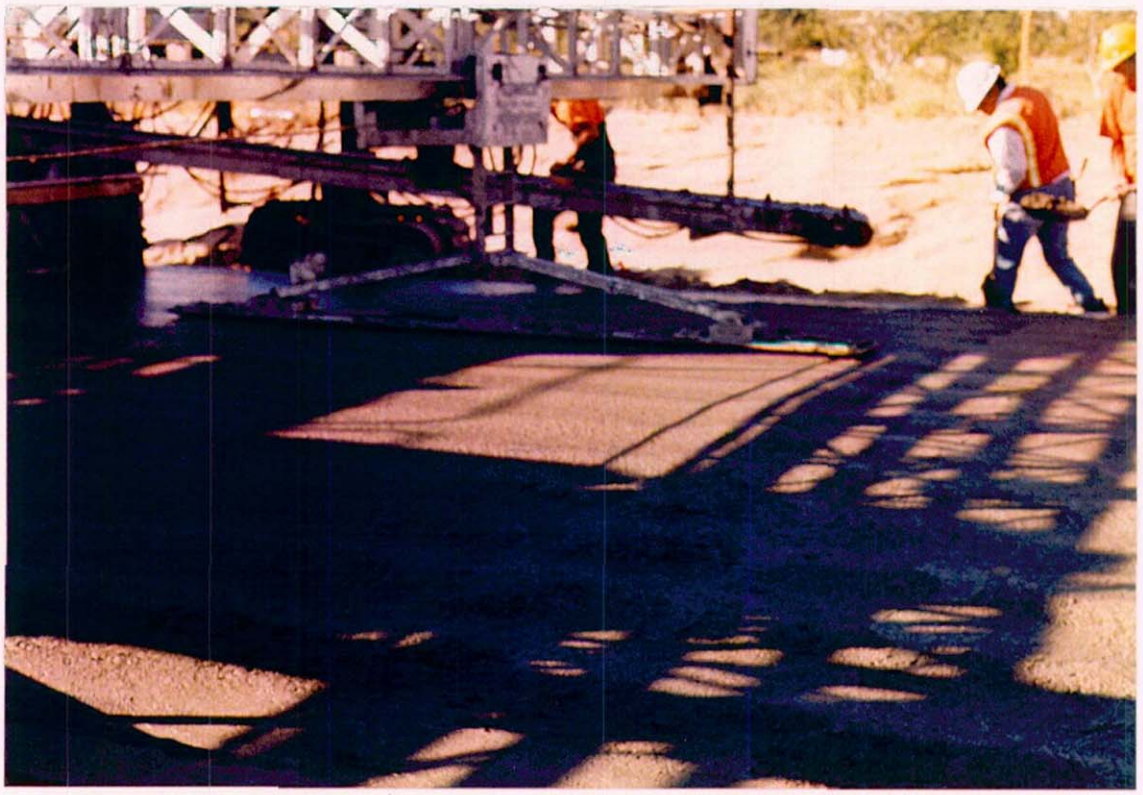
Photograph 10. Excess PCC material in front of the paver, California SPS-8.

Photograph 11. Small piles of PCC on the grade in front of the paver lying between stations 116+70 and 117+00 for over an hour, California SPS-8



Photograph 12. Partially bent dowel basket by the paver tie bar inserter, California SPS-8

Photograph 13. PCC being removed from grade to replace the bent dowel basket, California SPS-8.



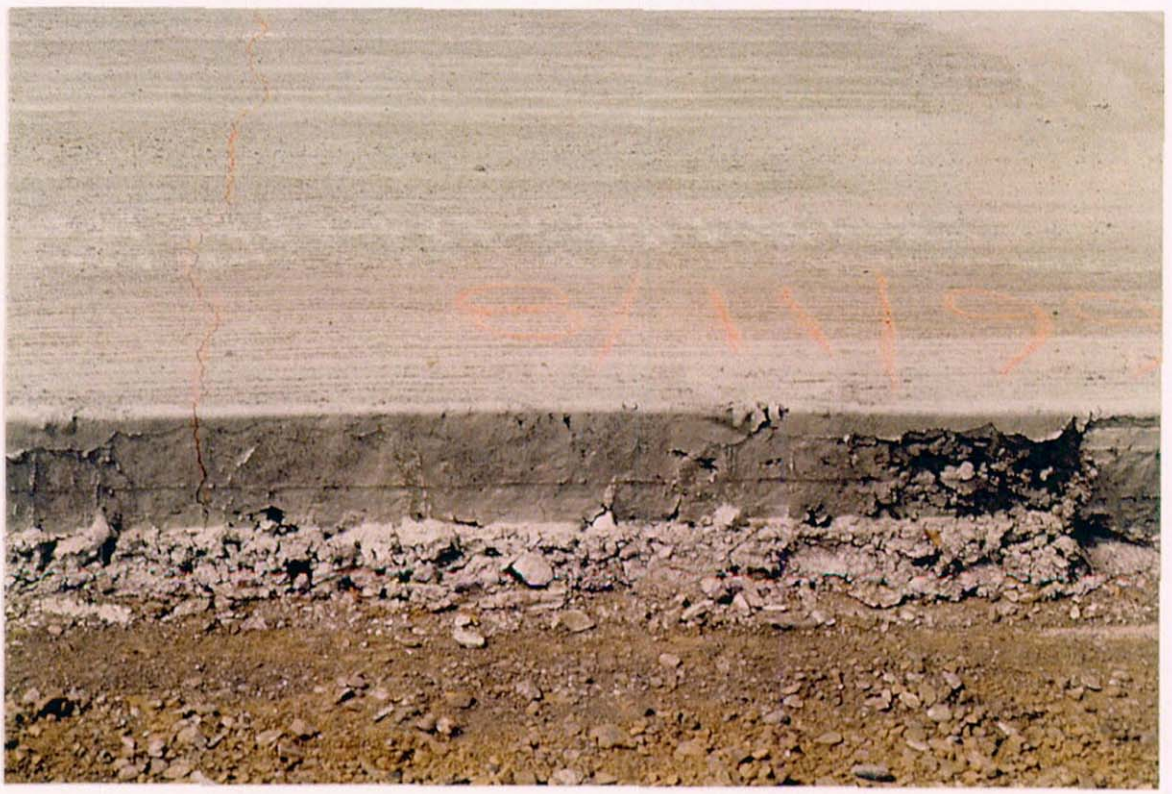
Photograph 14. Float finishing of fresh PCC, California SPS-8.

Photograph 15. Burlap finishing of fresh PCC pavement, California SPS-8.

Photograph 16. Fresh PCC Bulk samples collected for in situ PCC sample casting, California SPS-8

Photograph 17. Fresh PCC in situ beam sample casting, California SPS-8

Photograph 18. 14 day PCC core sampling, California SPS-8.



Photograph 19. Transverse crack observed at section station 113+49.5 on section 060811, California SPS-8.

APPENDIX B

CALIFORNIA SPS-8 MIX DESIGN

AMERICAN TRANSIT-MIX CO., INC.

Main Office. 318 Beard Avenue, Modesto, CA 95354 Office (209) 529-4115 FAX: (209) 521-8546
Dispatch: Central Valley (209) 524-6322 - Fresno (559) 434-2200 - Bakersfield (661) 325-8614
Plants: Stockton - Tracy - Modesto - Newman - Turlock - Madera - Fresno - Bakersfield

Group 268	Mix Number 29733

Report No. 56921
04/06/2000
05050004

MET 1.5 5.0 C+F (25%)

FCI
ATTN: GREG

#10-0437U4 DELHI PROJECT
DELHI, CA

MATERIALS DESCRIPTION

CEMENT TYPE II MODIFIED ASTM C-150
BORAL FLY ASH ASTM C-618 CLASS F
WATERFORD 1 1/2" X 3/4" ASTM C-33 SIZE 4
WATERFORD 1" X #4 ASTM C-33 SIZE 57
WATERFORD CONCRETE SAND ASTM C-33

This mix will produce concrete meeting the design criteria when produced, sampled and tested in accordance with ASTM C-94 and UBC.
Mix will be adjusted as required by UBC Section 1905 to maintain the noted strength level.

Cementitious Material	5.00	sk.
Maximum Size Aggregate	1.5	in.
Slump	See Note.	in.
W/C+F ratio	0.51	
Entrained Air	n/a	%

Code	Material	Solid Volume	SSD Quantity
1011	CEMENT TYPE II MODIFIED	1.79 cf	352 lbs
9100	BORAL FLY ASH	0.89 cf	118 lbs
1135	WATERFORD 1 1/2" X 3/4"	7.26 cf	1246 lbs
1136	WATERFORD 1" X #4	5.24 cf	900 lbs
2118	WATERFORD CONCRETE SAND	7.70 cf	1253 lbs
	Air (1.00 %)	0.27 cf	
	Water (28.8 gal.)	3.85 cf	240 lb
	Totals.	27.00 cf	. . .4109 lbs

Uses: CONCRETE PAVING.
Note: NOMINAL PENETRATION 0-1 INCH.
REPLACES REPORT 55878 MIX 29246.
Note : METRIC MIX BATCHED AND ORDERED IN POUNDS/CUBIC YARDS. ONE CUBIC YARD APPROXIMATELY 0.75 CUBIC METERS.
Note : PLEASE FORWARD STRENGTH DATA TO AMERICAN TRANSIT MIX FOR STATISTICAL ANALYSIS PER ASTM C-94 SECTION 14.4

Additions

METRIC CONVERSIONS FOR CONCRETES, MORTARS AND GROUTS

4/6/2000

FCI

Report #	56921	56922
Mix #	29733	29733

#10-043704 DELHI PROJECT

Cementitious Sacks		5 00				Adjusted Metric	Adjusted Metric
Material	%	Wt lb	Sp Gr	Volume cf	Volume cy	Volume m3	Weight kg/m3
Cement		352	3.15	1.79	0 07	0 00	0.00
Flyash		118	2.15	0.88	0.03	0.00	0.00
Waterford 1 1/2"		1246	2.75	7.26	0.27	0.27	739.22
Waterford 1"		900	2 75	5.24	0.19	0.19	533.95
Waterford Conc Sand Floats		1256	2.61	7 71	0.29	0 29	744.89
Air	1 0%			0.27	0 01	0.01	
Water	28.80	240	1 00	3.84	0.14	0 14	142.33
TOTAL		4111		27.00	1 00	0.90	2160.39

Admixture:			oz/cy	ml/m3	ml/ckg
	0 00		0	0	0.00
				0	0.00

			kg	Order concrete by cubic yard
Cement per Caltrans Class or Spec				
Cement Reduction Water Reducer			0%	**Abbreviations:**
Adjusted Cement Required kg			0	cf = cubic feet
Cement Used			278 847	cy = cubic yards
	%	kg/m3	lb/cy	gal = gallons
Portland Cement	75%	0	352.00	lb = pounds
Fly ash	25%	0	118 00	oz = fluid ounces
Total Cementitious		0.00	470	470 lb/cy

	ConversionFactor English to Metric
m3 = cubic meters	0.764555
l = liters	3 785412
kg = kilograms	0 453592
ml = milliliters	29 57353
kg/m3	0 593276

APPENDIX C

CALIFORNIA SPS-8 SAMPLING PLAN

Table 4. Field and laboratory test plan for **Natural Subgrade** materials.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Sieve Analysis	SS01	Ship to FHWA Lab[1]	2	BZ3,BZ4
Hydrometer to 0.01mm	SS02	Ship to FHWA Lab[1]	2	BZ3,BZ4
Atterberg Limits	SS03	Ship to FHWA Lab[1]	2	BZ3,BZ4
Classification & Type of Subgrade*	SS04	Ship to FHWA Lab	2	BZ3,BZ4
Moisture-Density Relations	SS05	Ship to FHWA Lab[1]	2	BZ3,BZ4
Resilient Modulus	SS07	Ship to FHWA Lab[1]	2	BZ3,BZ4
Natural Moisture Content	SS09	Ship to FHWA Lab[1]	2	BZ3,BZ4
In-Place Density		SHRP-LTPP Method	8	TZ9-TZ13

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

Table 12. Field and laboratory test plan for **Dense Graded Aggregate Base** materials.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Particle Size Analysis	UG01	Ship to FHWA lab[1]	2	BZ11,BZ12
Sieve Analysis (washed)	UG02	Ship to FHWA lab[1]	2	BZ11,BZ12
Atterberg Limits	UG04	Ship to FHWA lab[1]	2	BZ11,BZ12
Moisture-Density Relations	UG05	Ship to FHWA lab[1]	2	BZ11,BZ12
Resilient Modulus	UG07	Ship to FHWA lab[1]	2	BZ11,BZ12
Classification	UG08	Ship to FHWA lab[1]	2	BZ11,BZ12
Permeability	UG09	P48	2	BZ11
Natural Moisture Content	UG10	Ship to FHWA lab[1]	2	BZ1,BZ12
In-Place Density		SHRP-LTPP Method	8	TZ41-TZ48

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

Table 15. Field and laboratory test plan for as delivered **PCC** materials.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Portland Cement Concrete - As Delivered				
Compressive Strength	PC01	P61		
14 Day			3	BZ16-BZ18[1]
28 Day			3	
1 Year			3	
Splitting Tensile Strength	PC02	P62		
14 Day			3	BZ16-BZ18
28 Day			3	
1 Year			3	
Flexural Strength	PC09	P69		
14 Day			3	BZ16-BZ18
28 Day			3	
1 Year			3	
Air Content	ASTM C231	LTPP Method	3	BZ16-BZ18
Slump	ASTM C143	LTPP Method	3	BZ16-BZ18
Temperature	ASTM C1064	LTPP Method	3	BZ16-BZ18

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

Table 16. Bulk samples and molded specimens from PCC mix.

Sample Number	Test Age After Molding	Specimen Number			Test Section
		152x305mm Cylinder Compression Test	152x305mm Cylinder Indirect Tensile	152x152x508mm Beam Flexural Strength	
B10	14 days	GXZ01	GXZ04	FXZ01	060811
	28 days	GYZ02	GYZ05	FYZ02	
	1 year	GZZ03	GZZ06	FZZ03	
B11	14 days	GXZ07	GXZ10	FXZ04	060811
	28 days	GYZ08	GYZ11	FYZ05	
	1 year	GZZ09	GZZ12	FZZ06	
B12	14 days	GXZ13	GXZ16	FXZ07	060812
	28 days	GYZ14	GYZ17	FYZ08	
	1 year	GZZ15	GZZ18	FZZ09	

Table 17. Field and laboratory test plan for as-placed **PCC** materials.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Portland Cement Concrete - As Placed				
Compressive Strength	PC01	P61		
14 Day			3	CZ17,CZ26,CZ36
28 Day			3	CZ18,CZ27,CZ35
1 Year			3	CZ20,CZ29,CZ38
Splitting Tensile Strength	PC02	P62		
14 Day			3	CZ21,CZ30,CZ39
28 Day			3	CZ22,CZ31,CZ40
1 Year			3	CZ24,CZ33,CZ42
PCC Unit Weight	PC05	P65	9	All compressive strength cores
Static Modulus of Elasticity	PC04	PC64		
28 Day			3	CZ19,CZ20,CZ37
1 Year			3	CZ23,CZ32,CZ41
Air Content @ 28 Days	PC08	PC68	1	CZ25
PCC Thermal Coefficient		Ship to FHWA	1	CZ34
Core Examination	PC06	P66	26	All cores

APPENDIX D

CALIFORNIA SPS-8 CONSTRUCTION DATA FORMS

– SPS-8 CONSTRUCTION DATA SHEET 1 PROJECT IDENTIFICATION	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO [02]

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

*2. STATE HIGHWAY AGENCY (SHA) DISTRICT NUMBER [10.]

*3. COUNTY OR PARISH [47.]

4. FUNCTIONAL CLASS (SEE TABLE A.2, APPENDIX A) [09.]

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

*6. ROUTE NUMBER [_____.]

7. TYPE OF PAVEMENT (01 for Granular Base, 02 for Treated Base) [17.]

8. NUMBER OF THROUGH LANES (ONE DIRECTION) [1.]

*9. DATE OF CONSTRUCTION COMPLETION (Month/Year) [0299]

*10. DATE OPENED TO TRAFFIC (Month/Year) [1199]

11. CONSTRUCTION COSTS PER LANE MILE (In $1000) [___70.]

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

PROJECT STARTING POINT LOCATION

*13. MILEPOINT [33.21]

*14. ELEVATION [__118]

*15. LATITUDE [37°25'25.74"]

*16. LONGITUDE [120°46'09.84"]

17. ADDITIONAL LOCATION INFORMATION (SIGNIFICANT LANDMARKS): [_____]

18. HPMS SAMPLE NUMBER (HPMS ITEM 28) [_____]

19. HPMS SECTION SUBDIVISION (HPMS ITEM 29) [_.]

PREPARER Tom Pierucci EMPLOYER NP DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [04] * SPS PROJECT CODE [06] * TEST SECTION NO. [01]

.412

*1. LANE WIDTH (FEET) [12.]

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

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

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

	SHOULDER DATA	INSIDE SHOULDER	OUTSIDE SHOULDER
*5.	SURFACE TYPE Turf... 1 Granular.... 2 Asphalt Concrete... 3 Concrete... 4 Surface Treatment... 5 Other (Specify)... 6 _____	[N.]	[3.]
*6.	TOTAL WIDTH (FEET)	[__N.]	[__4.]
*7.	PAVED WIDTH (FEET)	[__N.]	[__4.]
8.	SHOULDER BASE TYPE (CODES-TABLE A.6)	[__N.]	[23.]
9.	SURFACE THICKNESS (INCHES)	[__ __.N]	[__6.0]
10.	SHOULDER BASE THICKNESS (INCHES)	[__ __.N]	[__8.0]
11.	DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES)		[__.N]
12.	SPACING OF LATERALS (FEET)		[__ __N.]

ENT'D JUN 01 2001

PREPARER Jason Purcarelli EMPLOYER NIE DATE 5-29-01

SPS-6 CONSTRUCTION DATA SHEET 3 REFERENCE PROJECT STATION TABLE	• STATE CODE [04] • SPS PROJECT CODE [0204] • TEST SECTION NO [02]

ORDER	*1 TEST SECTION ID NO	REFERENCE PROJECT STATION NUMBER		*4 CUT-FILL TYPE
		*2 START	*3 END	
1	060811	0+00	1+52	2
2	060812	1+93	3+45	2
3		+	+	
4		+	+	
5		+	+	
6		+	+	
7		+	+	
8		+	+	
9		+	+	
10		+	+	
11		+	+	
12		+	+	
13		+	+	
14		+	+	
15		+	+	
16		+	+	
17		+	+	
18		+	+	
19		+	+	
20		+		

ENT'D JUN 01 2001

*5 INTERSECTIONS BETWEEN TEST SECTION ON THE PROJECT

ROUTE	PROJECT STATION NO.	RAMPS EXIT	RAMPS ENT	INTERSECTION STOP	INTERSECTION SIGNAL	INTERSECTION UNSIG
	+__					
	+__					
	+__					

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

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

PREPARER Jason Purcell EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO. [1 4]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[58]	[redacted]	[redacted]	[redacted]	[redacted]
2	[05]	[23]	[__6.2]	__5.1	__7.0	__0.4
3	[03]	[04]	[__8.6]	__7.7	__9.7	__0.5
4	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
5	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
11	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
12	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
13	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
14	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
15	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

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

NOTES:

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

2. Layer description codes:

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

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

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

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [06] * SPS PROJECT CODE [02] * TEST SECTION NO. [11]

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches)			
		DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
0+00	0	6.43	8.5	— — . —	— — . —
	36	7.0	7.8	— — . —	— — . —
	72	6.2	8.1	— — . —	— — . —
	108	6.6	8.5	— — . —	— — . —
	144	6.4	8.5	— — . —	— — . —
0+50	0	6.9	8.3	— — . —	— — . —
	36	6.8	7.8	— — . —	— — . —
	72	6.3	8.6	— — . —	— — . —
	108	5.9	8.8	— — . —	— — . —
	144	5.2	8.9	— — . —	— — . —
1+00	0	6.1	7.8	— — . —	— — . —
	36	6.3	7.7	— — . —	— — . —
	72	6.1	8.0	— — . —	— — . —
	108	6.1	8.1	— — . —	— — . —
	144	5.8	8.4	— — . —	— — . —
1+50	0	5.7	9.0	— — . —	— — . —
	36	6.1	8.0	— — . —	— — . —
	72	5.8	8.4	— — . —	— — . —
	108	5.5	8.6	— — . —	— — . —
	144	5.2	8.4	— — . —	— — . —
2+00	0	6.0	9.3	— — . —	— — . —
	36	6.6	9.1	— — . —	— — . —
	72	6.4	8.8	— — . —	— — . —
	108	5.9	8.4	— — . —	— — . —
	144	5.1	9.1	— — . —	— — . —
2+50	0	6.2	8.5	— — . —	— — . —
	36	6.0	8.7	— — . —	— — . —
	72	6.4	8.9	— — . —	— — . —
	108	6.4	8.6	— — . —	— — . —
	144	6.1	8.3	— — . —	— — . —
3+00	0	6.8	9.6	— — . —	— — . —
	36	7.0	9.0	— — . —	— — . —
	72	6.7	8.8	— — . —	— — . —
	108	6.6	8.5	— — . —	— — . —
	144	6.5	8.5	— — . —	— — . —
LAYER NUMBER		02	03	— —	— —

ENT'D JUN 01 2001

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA
SHEET 11
LAYER THICKNESS MEASUREMENTS

* STATE CODE: 06
* SPS PROJECT CODE: 0A
* TEST SECTION NO: 11

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches): DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
3+50	0	6.8	8.8		
	36	7.0	8.2		
	72	6.7	8.5		
	108	6.6	8.7		
	144	6.5	8.6		
4+00	0	6.2	9.5		
	36	6.3	8.9		
	72	6.2	9.0		
	108	6.3	9.1		
	144	6.0	9.0		
4+50	0	6.0	9.7		
	36	6.3	9.2		
	72	6.3	9.1		
	108	6.1	9.6		
	144	5.9	9.7		
5+00	0	6.2	9.1		
	36	6.3	8.5		
	72	6.2	8.5		
	108	6.4	8.3		
	144	5.8	9.0		
5+66	0	6.3	8.9		
	36	6.4	8.5		
	72	6.1	8.7		
	108	6.2	8.3		
	144	5.7	9.6		
LAYER NUMBER		02	03		

do not enter [illegible]

ENT'D JUN 01 2001

-- SPS-8 CONSTRUCTION DATA SHEET 13 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO [11]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [07-23-99]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [07-27-99]

*3. LAYER NUMBER (From Sheet 4) [2]

PRIMARY COMPACTION EQUIPMENT

*4. CODE TYPE [3]

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) [11.5]

*6. LIFT THICKNESSES
Nominal First Lift Placement Thickness (inches) [__8]
Nominal Second Lift Placement Thickness (inches) [____]
Nominal Third Lift Placement Thickness (inches) [____]
Nominal Fourth Lift Placement Thickness (inches) [____]

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

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

PREPARER Jason Pizzinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 14 SUBGRADE PREPARATION	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO. [11]

*1 SUBGRADE PREPARATION BEGAN (Month-Day-Year) [05-15-99]

*2 SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [07-21-99]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [04]

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) [11.5]

		TYPE	PERCENT
*5.	STABILIZING AGENT 1	[N]	[__.N]
*6.	STABILIZING AGENT 2	[N]	[__.N]

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) [11]
(For Fill Sections Only)

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

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

PREPARER Jason Purswell EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 15 CUT-FILL SECTION LOCATIONS	* STATE CODE [04] * SPS PROJECT CODE [08] * TEST SECTION NO [11]

ORDER	*1 CUT-FILL TYPE	TEST SECTION STATION NUMBER	
		*2 START	*3 END
1		0 + 0 0	+
2		+	+
3		+	+
4		+	+
5		+	+
6		+	+
7		+	+
8		+	+
9		+	+
10		+	+

NOTES

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

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

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

PREPARER _____ EMPLOYER _____ DATE _____

SPS-8 CONSTRUCTION DATA SHEET 16 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [04] * SPS PROJECT CODE [08] * TEST SECTION NO. [11]

SPS-8 CONSTRUCTION DATA SHEET 17 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO. [11]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [15.0]

3 (RANDOM JOINT SPACING, IF ANY: _____)

* 4. SKEWNESS OF JOINTS (ft/lane) [.0]

* 5. TRANSVERSE CONTRACTION JOINT LOAD TRANSFER SYSTEM [1]
Round Dowels..... 1
Aggregate Interlock..... 2
Other (Specify) _____ 3

* 6. ROUND DOWEL DIAMETER (Inches) [1.25]

* 7. DOWEL SPACING (Inches) [12.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [12.0]

9. DOWEL LENGTH (Inches) [18.]

10. DOWEL COATING [5]
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 [1]
Preplaced on Baskets..... 1
Mechanically Installed..... 2
Other (Specify) _____ 3

12. DOWEL ALIGNMENT CHECKED BEFORE PLACEMENT (Y/N) [Y]

13. DOWEL ALIGNMENT CHECKED AFTER PLACEMENT (Y/N) [N]

If Yes, describe method used _____
(e.g. Pachometer, Ground Penetrating Radar)

SPS-8 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA (CONTINUED)	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO. [1L]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

* 2. METHOD USED TO FORM TRANSVERSE JOINTS [1]
Sawed..... 1 Metal Insert 3
Plastic Insert..... 2
Other (Specify) _____ 4

* 3. TYPE OF LONGITUDINAL JOINT (BETWEEN LANES) [2]
Butt..... ..... 1 Insert Weakened Plane ... 3
Sawed Weakened Plane..... 2
Other (Specify) _____ 4

* 4 TYPE OF SHOULDER-TRAFFIC LANE JOINT [N] 1
Butt..... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane..... 2
Other (Specify) _____ 4

*5 AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)..... [2.75]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)..... [_10.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [4]
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)..... [0.50]

9. DEPTH, (Inches)..... [0.50]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)..... [0.50]

11 DEPTH, (Inches) .. .. [0.50]

12 BETWEEN LANE TIE BAR DIAMETER (Inches) [0.63]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [30.]

14. BETWEEN LANE TIE BAR SPACING (Inches) 30.0 [~~30.5~~]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

15. WIDTH, (Inches)..... [_._N]

16. DEPTH, (Inches)..... [_._N]

5-29-01

SPS-8 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO [11]

*1 LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds) [2631.]

*3. Fine Aggregate (Pounds) [1453.]

*4 Cement (Pounds) [583.]

*5. Water (Pounds) [361.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [42]
(If Other, Specify _____)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [0.6]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE	AMOUNT
*8.	ADMIXTURE #1	[10]	[33.5]
*9.	ADMIXTURE #2	[__ __]	[__ __.__]
*10.	ADMIXTURE #3	[__ __]	[__ __.__]

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

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

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

ENT'D JUN 0 1 2001

Jason Pierrell NCE 5-24-01

SPS-8 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO. [11]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

COMPOSITION OF COARSE AGGREGATE	TYPE	PERCENT
* 2.	[3]	[100.]
* 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 [__N.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE	TYPE	PERCENT
* 6.	[1]	[100.]
* 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) [__N.]

10. GRADATION OF COARSE AGGREGATE

Sieve Size	% Passing
2".....	100
1 1/2"....	97
1".....	72
7/8".....	
3/4".....	60
5/8".....	
1/2".....	
3/8".....	44
No. 4.....	38

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	31
No. 10....	
No. 16....	25
No. 30. ..	10
No. 40....	
No. 50....	8
No. 80....	
No. 100...	3
No. 200...	1

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.750]

13. Fine Aggregate (AASHTO T84 or ASTM C128) [2.610]

SPS-8 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [0 6] * SPS PROJECT CODE [0 8] * TEST SECTION NO [1 1]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [07-30-99]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [07-30-99]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	_____	[__1]	[__5]
Plant 2	_____	[___]	[___]
Plant 3	_____	[___]	[___]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Gomaco model #2600

7. SPREADER TYPE (if applicable) Concrete Paver

8. SPREADER MANUFACTURER AND MODEL NUMBER Gomaco GP-2600

9. WIDTH PAVED IN ONE PASS (Feet) [23.6]

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

11. NUMBER OF VIBRATORS [11]

12. VIBRATOR SPACING (Inches) [24]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [5.0]

14. ADDITIONAL VIBRATION APPLIED _____

ENT'D JUN 04 2001

SPS-8 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO [11]

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

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

3. CURING [1]

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 [1]

Tine.....	1	Grooved Float.....	4
Broom.....	2	Astro Turf.....	5
Burlap Drag.....	3	None.....	6
Other (Specify)_____	7		

SPS-8 CONSTRUCTION DATA SHEET 23 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO. [11]

1. DATE PROFILE MEASURED (Month-Day-Year) [__ __ - __ __ - __ __]

2. PROFILOGRAPH TYPE California.. 1 Rainhart . 2 [1]

3. PROFILE INDEX (Inches/Mile) [__ __]

4. INTERPRETATION METHOD Manual.. 1 Mechanical . 2 Computer . 3 [3]

5. HEIGHT OF BLANKING BAND (Inches) [__.__ __]

6. CUTOFF HEIGHT (Inches) [__.__ __]

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

8. WAS SURFACE PROFILE CORRECTED BY DIAMOND GRINDING? (YES, NO) [Y]

IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [__ __-__ __-__ __]

10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [__ __-__ __-__ __]

*11. REASON FOR GRINDING [5]
Elimination of Faulting... 1 Elimination of Slab Warping... 2
Improve Skid Resistance... 3
Restoration of Transverse Drainage Slope... 4
Correction of Construction Deficiencies...5
Other (Specify)... 6 _____

12. AVERAGE DEPTH OF CUT (Inches) [__.__ N]

13. CUTTING HEAD WIDTH (Inches) [48.00]

14. AVERAGE GROOVE WIDTH (Inches) [__.N]

15. AVERAGE SPACING BETWEEN BLADES (Inches) [__.N]

SPS-8 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [04] * SPS PROJECT CODE [08] * TEST SECTION NO [12]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[58]	[redacted]	[redacted]	[redacted]	[redacted]
2	[05]	[23]	[_ _6.2]	_ _5.3	_ _7.5	_ _0.5
3	[03]	[04]	[_ 11.1]	_ _9.5	_ 12.2	_ _0.6
4	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
5	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
11	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
12	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
13	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
14	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
15	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

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

NOTES:

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

2. Layer description codes.

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

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

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

DPG-8 CONSTRUCTION DATA
SHEET 12
LAYER THICKNESS MEASUREMENTS

* STATE CODE: 06
* SPS PROJECT CODE: 0801
* TEST SECTION NO: 12

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches)			
		DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
0-00	0	6.7	8.5	—	—
	36	6.7	8.8	—	—
	72	6.8	8.8	—	—
	108	6.7	8.5	—	—
	144	6.7	8.5	—	—
0-50	0	6.0	8.3	—	—
	36	5.9	8.2	—	—
	72	6.2	8.2	—	—
	108	6.2	8.5	—	—
	144	6.4	8.4	—	—
1-00	0	7.5	8.1	—	—
	36	7.1	8.2	—	—
	72	7.1	8.0	—	—
	108	6.3	8.1	—	—
	144	6.3	8.4	—	—
1-50	0	6.5	9.0	—	—
	36	6.6	8.8	—	—
	72	6.6	8.8	—	—
	108	6.5	8.8	—	—
	144	6.3	8.8	—	—
2-00	0	5.7	9.3	—	—
	36	5.6	9.2	—	—
	72	5.6	9.2	—	—
	108	5.6	9.2	—	—
	144	5.4	9.1	—	—
2-50	0	6.5	9.3	—	—
	36	6.5	9.3	—	—
	72	6.5	9.3	—	—
	108	6.5	9.3	—	—
	144	6.5	9.3	—	—
3-00	0	6.6	9.2	—	—
	36	6.6	9.2	—	—
	72	6.4	8.8	—	—
	108	6.6	8.8	—	—
	144	6.6	8.8	—	—
LAYER NUMBER		02	03	— —	— —

SPS-8 CONSTRUCTION DATA
SHEET 12
LAYER THICKNESS MEASUREMENTS

* STATE CODE [0 6]
* SPS PROJECT CODE [0 8]
* TEST SECTION NO [1 2]

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches): DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
3-50	0	6.8	8.8		
	36	7.0	8.5		
	72	6.7	8.5		
	108	6.6	8.7		
	144	6.5	8.6		
4-00	0	6.2	9.5		
	36	6.3	8.9		
	72	6.2	9.0		
	108	6.3	9.1		
	144	6.0	9.0		
4-50	0	6.0	9.7		
	36	6.3	9.2		
	72	6.3	9.1		
	108	6.1	9.6		
	144	5.9	9.7		
5-00	0	6.2	9.1		
	36	6.3	8.5		
	72	6.2	8.5		
	108	6.4	8.3		
	144	5.8	9.0		
5-50	0	6.3	8.9		
	36	6.4	8.5		
	72	6.1	8.7		
	108	6.2	8.3		
	144	5.7	9.6		
LAYER NUMBER		02	03		

ENT'D JUN 04 2001

PREPARED BY Jason Pincinelli EMPLOYER NCE DATE 5-29-01

-- SPS-8 CONSTRUCTION DATA SHEET 13 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [06] * SPS PROJECT CODE [083] * TEST SECTION NO [12]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) ~~[05-15-99]~~ [07-23-99]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) ~~[07-21-99]~~ [07-27-99]

*3. LAYER NUMBER (From Sheet 4) [2]

PRIMARY COMPACTION EQUIPMENT

*4. CODE TYPE [3]

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) [11.5]

*6. LIFT THICKNESSES
Nominal First Lift Placement Thickness (inches) [8]
Nominal Second Lift Placement Thickness (inches) [__]
Nominal Third Lift Placement Thickness (inches) [__]
Nominal Fourth Lift Placement Thickness (inches) [__]

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

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

PREPARER Jason Pinnelli EMPLOYER NLE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 14 SUBGRADE PREPARATION	* STATE CODE [0 6] * SPS PROJECT CODE [0 8] * TEST SECTION NO [1 2]

*1 SUBGRADE PREPARATION BEGAN (Month-Day-Year) [05-15-99]

*2 SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [07-21-99]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [14]

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) [11.5]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[0.N]
*6. STABILIZING AGENT 2	[N]	[.N]

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) [11]
(For Fill Sections Only)

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

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

PREPARER Jason Pinnarelli EMPLOYER ERE DATE 5-29-01

September 1992

SPS-8 CONSTRUCTION DATA SHEET 17 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [06] * SPS PROJECT CODE [0803] * TEST SECTION NO. [12]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [15.0]

3. (RANDOM JOINT SPACING, IF ANY: _____)

* 4. SKEWNESS OF JOINTS (ft/lane) [.0]

* 5. TRANSVERSE CONTRACTION JOINT LOAD TRANSFER SYSTEM [1]
   - Round Dowels..... 1
   - Aggregate Interlock..... 2
   - Other (Specify) _____ 3

* 6. ROUND DOWEL DIAMETER (Inches) [1.50]

* 7. DOWEL SPACING (Inches) [12.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [12.0]

9 DOWEL LENGTH (Inches) [18.]

10. DOWEL COATING [5]
   - 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 [1]
   - Preplaced on Baskets..... 1
   - Mechanically Installed..... 2
   - Other (Specify) _____ 3

12. DOWEL ALIGNMENT CHECKED BEFORE PLACEMENT (Y/N) [Y]

13. DOWEL ALIGNMENT CHECKED AFTER PLACEMENT (Y/N) [N]

If Yes, describe method used _____
(e g. Pachometer, Ground Penetrating Radar)

SPS-8 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA (CONTINUED)	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO. [12]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

* 2. METHOD USED TO FORM TRANSVERSE JOINTS [1]
Sawed..... 1 Metal Insert.....3
Plastic Insert..... 2
Other (Specify) _____ 4

* 3. TYPE OF LONGITUDINAL JOINT (BETWEEN LANES) [2]
Butt..... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane..... 2
Other (Specify) _____ 4

* 4. TYPE OF SHOULDER-TRAFFIC LANE JOINT [N] 1
Butt..... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane..... 2
Other (Specify) _____ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)..... [3.75]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)..... [_10.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [4]
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)..... [0.50]

9. DEPTH, (Inches)..... [0.50]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)..... [0.50]

11. DEPTH, (Inches)..... [0.50]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) [0.63]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [30.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [30.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

15. WIDTH, (Inches)..... ENT'D JUN 04 2001 ..... [_._N]

16. DEPTH, (Inches)..... [_._N]

SPS-8 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO. [12]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds) [2631.]

*3. Fine Aggregate (Pounds) [1453.]

*4. Cement (Pounds) [583.]

*5. Water (Pounds) [361.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [42]
(If Other, Specify _____)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [0.6]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE	AMOUNT
*8.	ADMIXTURE #1	[10]	[33.5]
*9.	ADMIXTURE #2	[__ __]	[__ __.__]
*10.	ADMIXTURE #3	[__ __]	[__ __.__]

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

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

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

ENT'D JUN 04 2001

Tom Pierzalli NCE DATE 5-24-01

SPS-8 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [0 6] * SPS PROJECT CODE [0 0 0 1] * TEST SECTION NO [1 2]

* 1 LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

COMPOSITION OF COARSE AGGREGATE	TYPE	PERCENT
* 2	[3]	[1 0 0.]
* 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 [__ N.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE	TYPE	PERCENT
* 6.	[1]	[1 0 0.]
* 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) [__ __ N.]

10. GRADATION OF COARSE AGGREGATE

Sieve Size	% Passing
2".....	1 0 0
1 1/2"....	__ 9 7
1".....	__ 7 2
7/8".....	__ __ __
3/4".....	__ 6 0
5/8".....	__ __ __
1/2".....	__ __ __
3/8".....	__ 4 4
No. 4.....	__ 3 8

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	__ 3 1
No. 10....	__ __
No 16....	__ 2 5
No. 30....	__ 1 5
No. 40....	__ __
No. 50....	__ __ 3
No. 80 ...	__ __
No. 100...	__ __ 1
No. 200...	__ __ 1

BULK SPECIFIC GRAVITIES:

12 Coarse Aggregate (AASHTO T85 or ASTM C127) [2.750]

ENTD JUN 04 2001

13 Fine Aggregate (AASHTO T84 or ASTM C128) [2.610]

SPS-8 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [0 6] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [1 2]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [07-30-99]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [07-30-99]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [3]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	_____	[1]	[5]
Plant 2	_____	[ ]	[ ]
Plant 3	_____	[ ]	[ ]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Gomaco model #2600

7. SPREADER TYPE (if applicable) Concrete Paver

8. SPREADER MANUFACTURER AND MODEL NUMBER Gomaco GP-2600

9. WIDTH PAVED IN ONE PASS (Feet) [23.6]

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

11. NUMBER OF VIBRATORS [11]

12. VIBRATOR SPACING (Inches) [24]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [5.0]

14. ADDITIONAL VIBRATION APPLIED _____

ENT'D JUN 04 2001

Thomas D. Kuennen NCE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [06] * SPS PROJECT CODE [08] * TEST SECTION NO [12]

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

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

3. CURING [1]

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 [1]

Tine.....	1	Grooved Float.....	4
Broom.....	2	Astro Turf.....	5
Burlap Drag.....	3	None.....	6
Other (Specify)_____	7		

Jason Pinnell XLE 2-19-01

SPS-8 CONSTRUCTION DATA SHEET 23 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [0 6] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [1 2]

1. DATE PROFILE MEASURED (Month-Day-Year) [__ __ - __ __ - __ __]

2 PROFILOGRAPH TYPE California... 1 Rainhart... 2 [1]

3 PROFILE INDEX (Inches/Mile) [__ __]

4. INTERPRETATION METHOD Manual.. 1 Mechanical.. 2 Computer.. 3 [3]

5. HEIGHT OF BLANKING BAND (Inches) [__.__ __]

6. CUTOFF HEIGHT (Inches) [__ __ __]

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

8. WAS SURFACE PROFILE CORRECTED BY DIAMOND GRINDING? (YES, NO) [Y]

IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [__ __-__ __-__ __]

10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [__ __-__ __-__ __]

*11. REASON FOR GRINDING [5]
Elimination of Faulting... 1 Elimination of Slab Warping... 2
Improve Skid Resistance... 3
Restoration of Transverse Drainage Slope.. 4
Correction of Construction Deficiencies...5
Other (Specify)... 6 _____

12. AVERAGE DEPTH OF CUT (Inches) [__.__ N]

13. CUTTING HEAD WIDTH (Inches) [48.00]

14. AVERAGE GROOVE WIDTH (Inches) [__.N]

15. AVERAGE SPACING BETWEEN BLADES (Inches) [__.N]

Jason Pinnell NCE 5-29-01