FEDERAL HIGHWAY ADMINISTRATION

Long Term Pavement Performance Specific Pavement Studies

WASHINGTON SPS-2

Construction Report on Site 530200
"Strategic Study of Structural Factors for Rigid Pavements"
SR 395 - Adams County, Washington
Washington Department of Transportation

FINAL

Prepared by:

Western Region Contractor
Nichols Consulting Engineers, Chtd.

March 1997

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WA SPS-2

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March 7, 1997
File: 800.12.11.9.10, 5302

Mr. Robyn Moore
Assistant Materials Engineer
Washington State Department
of Transportation
Transportation Building
PO Box 47300
Olympia, WA 98504-7300

RE: Washington SPS-2 Construction Report

Dear Mr. Moore:

Enclosed is the final construction report for the LTPP SPS-2 experimental test sections constructed on SR-395 near Ritzville, Washington. Thank you for your valuable comments on the draft version.

This final report contains copies of the color photos and all construction data forms, both of which were omitted from the draft report. If you have any questions, please do not hesitate to call.

Sincerely,
NICHOLS CONSULTING ENGINEERS, Chtd.

Douglas J. Frith, P.E.
Co-Principal Investigator

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Enclosure

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CONSTRUCTION REPORT ON SITE 530200
"Strategic Study of Structural Factors for Rigid Pavements"
SR 395 - Adams County, Washington

I. INTRODUCTION

The SHRP SPS-2 experiment was designed to study the structural factors involved in rigid pavement design. The objective of this study was to more precisely determine the relative influence of the strategic factors that affect performance of rigid pavements. The primary factors addressed in this study include drainage, base type, concrete strength, concrete thickness, and lane width. The study objective included a determination of the influence of environmental region and soil type on these factors.

This report details the construction of the SPS-2 experimental test sections on SR 395 in Adams County, Washington, from February 1995 through November 1995. This section of roadway was opened to traffic November 21, 1995.

II. WASHINGTON SPS-2 PROJECT DESCRIPTION

Layout

The SHRP SPS-2 experiment consists of the construction of twelve test sections of Portland Cement Concrete (PCC) surface layers and base layers of varying thickness and material type. These are shown as sections 530201-530212 in figure 1. In addition, one supplemental test section, the typical section, designed by the Washington State Department of Transportation (WsDOT) was included and is listed as section 530259. This test section represents WsDOT's standard pavement design for this roadway.

Physical Attributes

The Washington SPS-2 project is located on SR 395 in southeast Washington, three miles south of Ritzville, Washington and Interstate 90, as shown in figure 2. The entire WsDOT project consisted of constructing new northbound lanes to upgrade SR 395 to a divided highway from Lind, Washington to Ritzville, Washington. The SHRP test sections are located in the travel lane of the newly constructed northbound lane, extending from milepost 91.57 to 93.39.

The land use in the area is agricultural and ranching. The route is located in a valley along Paha Coulee. The topography of the area is rolling hills. The new lanes were constructed uphill from the existing lanes. The approximate elevation of the test section is 1631 ft, with a longitude of 118°24' and a latitude of 47°04'.

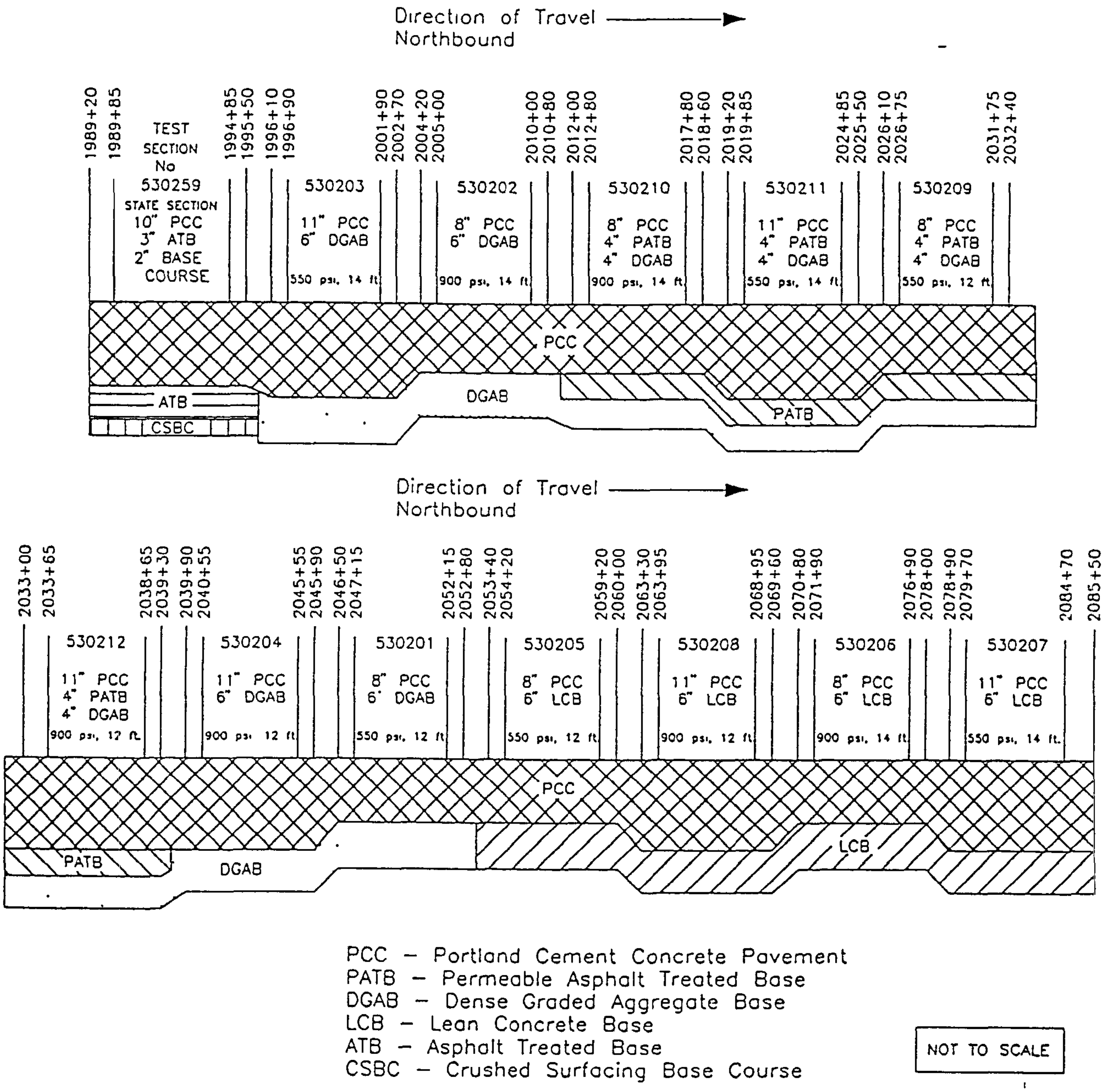


Figure 1. Layout of experimental test sections, Washington SPS-2 project, SR 395.

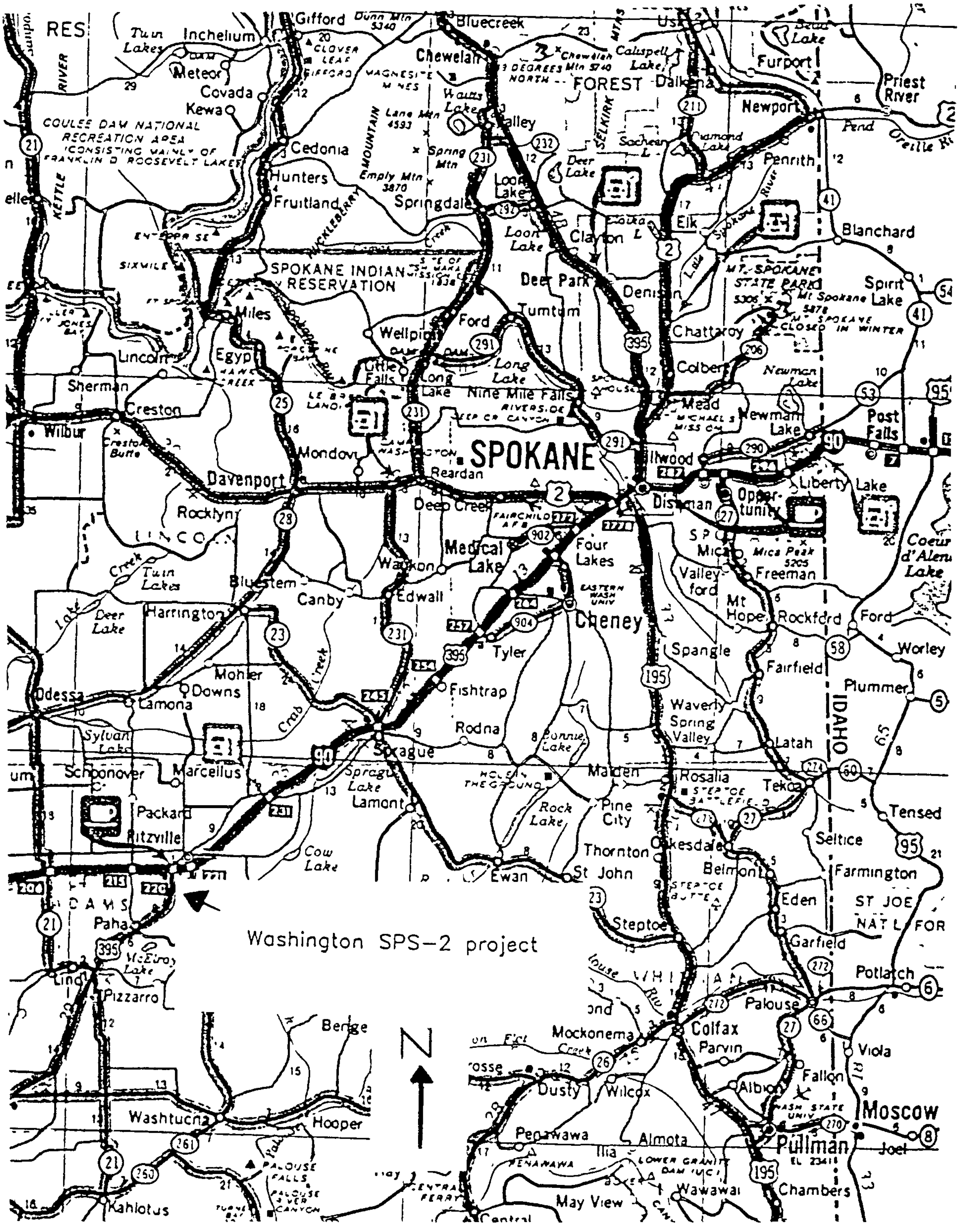


Figure 2. Location of Washington SPS-2 project.

Climate

The Washington SPS-2 site is located in the LTPP dry-freeze climatic zone within the United States (figure 3). The yearly rainfall totals for the past ten years are listed in table 1 and were obtained from a weather station one mile southeast of Ritzville. The average high and low temperatures for this area are based on the weather database used for the asphalt binder grade selection in the SHRP SPS-9A experiments using the Lind 3 NE Weather Station in Adams County. The average yearly high temperature for this area is 98.6°F, while the average yearly low temperature is minus 5.8°F.

Table 1. Yearly rainfall totals, Ritzville, Washington.

Year	Total Rainfall (in)
1985	7.4
1986	12.1
1987	10.9
1988	10.4
1989	10.2
1990	13.0
1991	11.5
1992	10.6
1993	14.0
1994	11.6
10-Year Average	11.2
Standard Deviation	1.8

Existing Soil

The soil in this area is a fine grained sandy-silt material. The Washington SPS-2 project fills the dry-freeze, fine subgrade "R" category in table 2, the experimental design for SPS-2 projects.

Traffic

The Annual Average Daily Traffic (AADT) was 18,000 in 1993. The design period is 40 years and design ESAL for the study lane is 875,000 per year, which equates to 35 million ESAL for the design period.

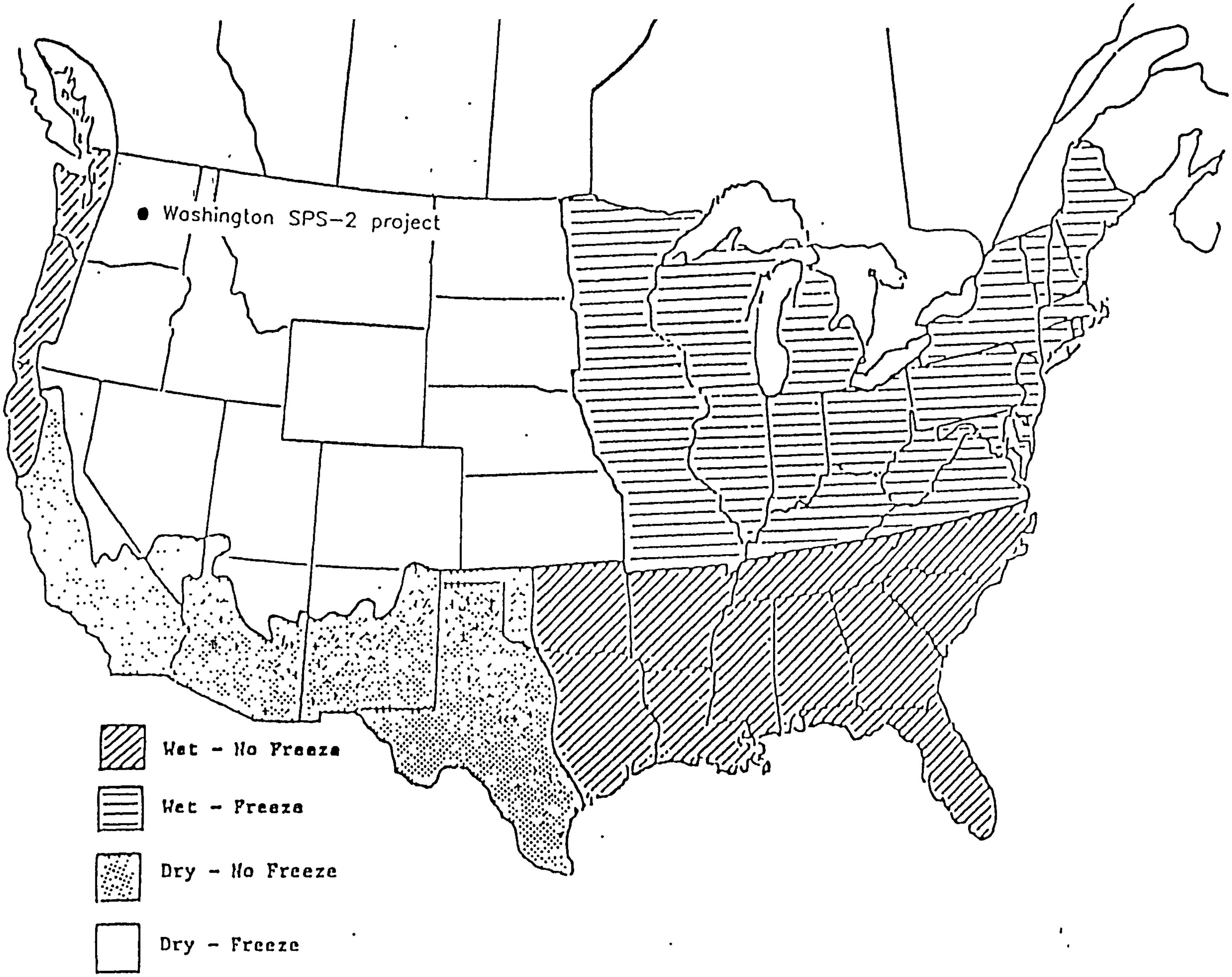


Figure 3. Environmental zones for SHRP-LTPP studies.

Table 2. Basic experiment doweled jointed plain concrete pavements (SPS-2)

Pavement Structure					Climate Zones, Subgrade Site															
Drain	Base Type	PCC		Lane Width	Wet								Dry							
					Freeze				No Freeze				Freeze				No Freeze			
		Thick	Strength		Fine		Coarse		Fine		Coarse		Fine		Coarse		Fine		Coarse	
		In	psi		J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
No	DGAB	8	550	12	J1		L1		N1		P1		R1		T1		V1		X1	
				14		K13		M13		O13		Q13		S13		U13		W13		Y13
			900	12		K14		M14		O14		Q14		S14		U14		W14		Y14
				14	J2		L2		N2		P2		R2		T2		V2		X2	
		11	550	12		K15		M15		O15		Q15		S15		U15		W15		Y15
				14	J3		L3		N3		P3		R3		T3		V3		X3	
			900	12	J4		L4		N4		P4		R4		T4		V4		X4	Y16
				14		K16		M16		O16		Q16		S16		U16		W16		Y16
No	LCB	8	550	12	J5		L5		N5		P5		R5		T5		V5		X5	
				14		K17		M17		O17		Q17		S17		U17		W17		Y17
			900	12		K18		M18		O18		Q18		S18		U18		W18		Y18
				14	J6		L6		N6		P6		R6		T6		V6		X6	
		11	550	12		K19		M19		O19		Q19		S19		U19		W19		Y19
				14	J7		L7		N7		P7		R7		T7		V7		X7	
			900	12	J8		L8		N8		P8		R8		T8		V8		X8	
				14		K20		M20		O20		Q20		S20		U20		W20		Y20
Yes	PATB DGAB	8	550	12	J9		L9		N9		P9		R9		T9		V9		X9	
				14		K21		M21		O21		Q21		S21		U21		W21		Y21
			900	12		K22		M22		O22		Q22		S22		U22		W22		Y22
				14	J10		L10		N10		P10		R10		T10		V10		X10	
		11	550	12		K23		M23		O23		Q23		S23		U23		W23		Y23
				14	J11		L11		N11		P11		R11		T11		V11		X11	
			900	12	J12		L12		N12		P12		R12		T12		V12		X12	
				14		K24		M24		O24		Q24		S24		U24		W24		Y24

Washington SPS-2 project

Geometrics

All test sections were constructed within a 1.8 mile segment of roadway between station 1980+20 and 2085+50. The test sections are situated on a slight curve to the left from the beginning to station 2050+00, where the alignment becomes horizontally straight throughout the remainder of the test sections. The vertical grade is generally plus or minus 0.5 percent, with a minimum of plus 0.14 percent from station 2070+00 to the end of the project, and a maximum of plus 0.86 percent from approximately station 2058+00 to station 2070+00. The superelevation on the curve reached a maximum of 3 percent. On the straight sections the roadway cross slope was 2 percent, sloping to the median.

Supplemental Test Section

State section 530259 was included to compare the performance of the typical State PCC design to the SHRP sections. The State design includes a 2" crushed surfacing base course, 3" of asphalt-treated base and 10" of PCC. In addition, the 14-day flexural strength of the PCC used on this section represented the standard PCC used on the project and had a design strength of 650 psi.

Project Personnel

Scarsella Brothers, Inc. of Seattle, Washington, was the primary contractor on this project, providing all earthwork on the subgrade and granular base course. ACME Materials and Construction of Spokane, Washington, was a subcontractor to Scarsella to construct the treated base courses and the PCC surface course. The rock crushing subcontractor to Scarsella was Deatly Company, Inc., of Lewiston, Idaho. Subcontractor KRC of Haydon Lake, Idaho placed all edge drains, PCC headwalls and monument casing covers.

Project superintendents were Bob Scarsella (Scarsella Brothers), Roberto Seghetti (ACME), Don Harnya (Deatly Company) and Scott Dickford (KRC). The project engineer for WsDOT was Ted Trepanier and the project inspector was Keith Martin. Mark Allen was the office and field engineer for WsDOT assigned to the SHRP sections. The LTPP field representative present throughout the project was Marco Fellin of Nichols Consulting Engineers, Chtd., Reno, Nevada.

WsDOT performed all materials sampling and testing. The Eastern Region Materials Lab of Spokane, Washington, was responsible for all bulk samples obtained. The Olympia Service Center Materials Laboratory of Olympia, Washington, was responsible for all coring done on the project. WsDOT field personnel at the site were responsible for nuclear density testing, elevation measurements and sampling coordination with the regional laboratories. Primary WsDOT field personnel were Mark Allen, Dan McKernan and Chad Hackworth.

III. CONSTRUCTION

SUBGRADE AND EMBANKMENT

Materials

Both soil and rock fills were used on this project as discussed in the following sections.

Natural Subgrade, Embankment Soil Classification

The soil material composing the subgrade/embankment on this project consisted of three sources:

- The fill material in sections 530208, 530206, and 530207 (station 2061 + 00 - 2085+50)
- The fill material in sections 530202, 530210, 530211, 530209, 530212, 530204, 530201, and 530205 (station 2003+00 - 2061+00)
- The natural material remaining in cut sections 530259 and 530203 (station 1989+20 - 2003+00)

The fill material in station 2061+00 - 2085+50 came from the cuts at the north end of the project while the fill in stations 2003+00 - 2061+00 came from the cut immediately prior to these stations.

Splitspoon sampling showed the material from all three sources was essentially the same, a sandy silt of very low to no plasticity. There was no variability within the 18" of splitspoon samples other than occasional small gravel fragments. The cut material splitspoon samples in the cut areas contained a very small amount of organic/root material, while the fill material was free of organic material. Auger probes and bulk samples showed the same consistency of materials within the sections. No auger probes were performed on the cut sections. The laboratory materials testing on the bulk samples will more closely identify the soil types within each section. Embankment depths ranged from 2.75 feet to 5.75 feet.

Fill Rock

The shotrock used below the embankment layer was a volcanic type rock that was approximately minus 18" material (photo 1 in appendix A). The shotrock was obtained from cut areas on the project, but outside of the experimental sections. The depth of fill rock was generally 1.5 feet thick.

Equipment and Construction Methods

The existing ground was cleared and grubbed using Cat 14D graders beginning in February. The material from approximately station 2004+00 to the end of the test sections was very saturated. The natural ground in this area formed a slight basin and, situated next to the raised existing roadbed, tended to hold water. A significant amount of rainfall fell in January, prior to beginning construction, as listed in table 3. The material near the beginning of the project (station 1989 + 20 - station 2004+00) was in a cut and was not as affected by the excessive moisture.

Table 3. Rainfall during SPS-2 embankment construction.

Month	Rainfall (in)
January	2.7
February	1.6
March	3.8
April	0.9
May	0.4
June	2.2
July 1 - July 13	0.5
Total	12.1
10 Year Yearly Average	11.2

Subexcavation and Embankment Material Placement

Due to the large amount of rainfall following the initial clearing and grubbing, the saturated subgrade material was excavated. This was done from approximately station 2004+00 to station 2085+50. Photo 2 in appendix A shows the subexcavation piles along the roadway. WsDOT then took elevation measurements at the bottom of the subexcavated layer. The contractor refilled the subexcavated area with shotrock to the original grade line. The shotrock was a volcanic type rock that was approximately minus 18" material (photo 1 in appendix A). The purpose of the shotrock was to serve as a drainage layer. It would also prevent the embankment from becoming saturated if water was present. On top of the shotrock, a loess, soft silty soil was placed as the embankment.

Table 4 lists the approximate depths of fill rock in each section. These depths were obtained from a slope stake survey following excavation. The depths are the average of depths obtained at approximately 50' intervals throughout each section. The fill rock was not placed at a uniform depth since only the saturated material in the sections was removed. Some areas within each section had no fill rock, while other areas may have had two feet or more.

The shotrock was obtained from cut areas on the project outside of the experimental section limits. The fill material placed north of the bridge (station 2061+00 - 2085+50) came from cuts north of the bridge, and the fill material south of the bridge (station 2004+00 - 2061+00) came from cuts south of the bridge. The fill material was placed in approximately 8" lifts, spread with dozers, watered periodically with water trucks, then bladed with graders. Compaction was accomplished with scrapers, water trucks and dozer traffic, all rubber-tired. Density tests were performed by WsDOT as the embankment was being placed to insure that compaction was being achieved. Table 5 lists the equipment used during initial subgrade construction. By April, most of the embankment in the test sections had been placed and compacted.

Table 4. Depths of fill rock by section.

Section	Average Depth of Fill Rock (feet)	Comments
530201	1.8	Rock only placed in last 100' of the section.
530202	No fill rock.	
530203	No fill rock.	
530204	1.8	
530205	1.6	
530206	1.5	No fill rock 1st 200' of the section.
530207	1.2	
530208	1.7	
530209	1.7	
530210	1.8	Rock only placed in last 200' of section.
530211	1.3	
530212	1.7	
530259	No fill rock.	

Table. 5 Subgrade equipment.

Equipment	Model
Scrapers	Catepillar 631D
Dozers	Catepillar 824B
Graders	Catepillar 14D
Water Trucks	Catepillar 633

Final Embankment Preparation

On June 29th, grading and final rolling of the subgrade began. A Catepillar 16G Grader cut and windrowed the subgrade material as necessary to achieve final grade. A Catepillar 623E Scraper picked up the windrowed material and hauled it away. Following the scraper, a Catepillar 631B Water Truck placed water on the subgrade. An Ingersoll-Rand SD-150D vibrating steel-wheeled roller with a 20,560 lb steel drum (34,140 lbs total equipment weight) made passes throughout the sections during the grading operations. Photo 3, appendix A shows the embankment preparation. Grading operations continued until July 7th, when final elevations were achieved.

On August 14th and 15th, sections 530205, 530206, 530207, and 530208, the sections with a lean concrete base, were retrimmed and compacted. Trimming was performed using a laser-controlled grader. It was determined by from the elevation survey that some points within these sections were as much as 0.1' below grade, so WsDOT decided to lower all four sections 0.1' below the design grade. This would ensure that the layers above the embankment would have a uniform thickness.

Weather During Subgrade/Embankment Construction

Table 3 showed that 9.4" of rain fell during embankment preparation from February through July 13, 1995, with 3.8" falling during March. The total rainfall through July 11th (the end of subgrade preparation) for 1995 was 12.1", exceeding the yearly average for the Ritzville area by 1". Several shutdowns occurred during rock and embankment placement in February and March, but no problems resulted from the high amount of rainfall other than the need to over excavate and replace with shotrock.

Quality Assurance Sampling and Testing

Initial Materials Sampling

On February 8th, natural subgrade sampling began. Due to excessive moisture in the soil, the sampling was difficult. Several Shelby tube samples were obtained, but later discarded due to their poor condition. Twenty-foot shoulder probes to determine the depth to a rigid layer were completed for each section. The complete natural subgrade sampling plan is shown in figure F1, appendix F.

Secondary Materials Sampling

On June 26th, materials sampling resumed following the embankment sampling layout in figure F2, appendix F. Shelby tube sampling was attempted on the embankment, but was not possible on most sections due to the hardness of the soil. A hard crust, 2-3" thick, developed on the surface of the embankment prior to sampling. This was possibly caused by the high rainfall in June, as was shown in table 3, as well as the heavy construction traffic prior to sampling. Six 2' samples were obtained from the three sample holes in section 530207, and one 2' sample was obtained from section 530201.

Splitspoon sampling was performed on June 27th adjacent to locations A1-A21 in figure F2. Blow counts from the splitspoon tests are listed in table 6, and show a consistent relative hardness of the soil throughout the sections.

Auger probes using a 6" continuous flight, solid, helical auger were performed at station 1+00, 2+50 and 4+00 of each section, 8' to the left of the pavement edge. The purpose of the probes was to find the depth to the fill rock from the top of the embankment in order to determine the thickness of the embankment layer. The fill rock started at station 4+00 of section 530210, and was continuous to the end of the project. Sections 530259 and 530203 were on a cut and did not contain embankment material. Section 530202 and most of section 530210 contained embankment material, but no fill rock. Table 7 shows the embankment depths obtained in each section.

Bulk sampling of the embankment was performed on June 29th at the locations shown in figure F2. Samples were removed with shovels and placed in cloth bags and shipped to the appropriate laboratory. The sample holes were filled in with similar material obtained from the shoulder, and subsequently recompacted with a roller. Moisture samples were obtained and density tests performed at each bulk sampling location. Table 8 lists the in-situ density and moisture test results. Figure 4 shows the density distribution on the project.

The average compaction achieved for the project was 100 percent of the optimum of 103.8 pcf, while the average moisture content was 10.7 percent, 5.8 percent below the optimum. The high density at a lower than optimum water content indicates that the large amount of construction traffic on the embankment provided a higher compaction effort than modeled during the initial proctor testing.

Densities retaken on sections 530205, 530206, 530207 and 530208 are shown in table 9. The densities did not change significantly after retrimming. These sections were retrimmed as discussed under "Equipment and Construction Methods".

FWD Testing

Falling Weight Deflectometer (FWD) testing was performed on July 6th, 7th and 8th, on the finished subgrade surface. Figures 5a and 5b show the 4,500 lb deflections for sensor one at the midlane within each section. The overall project average was 31.0 mils and the standard deviation was 5.5. The two cut sections at the beginning of the project, 530259 and 530203, had the most deflection variation, with section 530203 having deflections ranging from 16 to 57 mils. With the exception of the first two sections, the subgrade support based on the FWD testing is relatively uniform throughout the project. The subgrade was ready for dense-graded aggregate base placement on July 11th on the sections requiring it.

Table 6. Splitspoon sample blow numbers.

Section	Bore Hole No.	No. Blows for 6" Penetration	No. Blows for 12" Penetration	No. Blows for 18" Penetration
530202	A1	4	11	19
530202	A2	5	12	20
530202	A3	5	13	21
530211	A4	5	12	20
530211	A5	6	13	21
530211	A6	4	12	20
530212	A7	5	14	23
530212	A8	4	9	16
530212	A9	4	10	19
530201	A10	5	12	19
530201	A11	4	10	17
530201	A12	5	12	29
530208	A13	4	11	20
530208	A14	4	14	31
530208	A15	4	13	27
530203	A19	5	12	21
530203	A20	4	11	18
530203	A21	7	15	25
Average		5	12	21
Standard Deviation		0.8	1.5	4.1

Table 7. Depths to rock (embankment thickness) from auger borings (ft).

	Station				
Section	1+00	2+50	4+00	Average Embankment Thickness (feet)	Comments
530201	3'4"	3'3"	4'8"	3'9"	
530202	2'8" to native soil	3'5" to native soil	3' to native soil	3'0"	No rock
530203	No fill	No fill	No fill	No fill	No fill or rock
530204	4'3"	3'3"	2'5"	3'4"	
530205	2'7"	3'8"	4'6"	3'7"	
530206	2'9"	3'7"	2'11"	3'1"	
530207	4'7"	6'9"	6'0"	5'9"	
530208	2'8"	3'1"	2'6"	2'9"	
530209	4'4"	3'10"	3'7"	3'11"	
530210	3'9" to native soil	4'3" to native soil	4'2"	4'1"	
530211	4'4"	2'11"	3'9"	3'8"	
530212	3'10"	4'0"	5'0"	4'3"	
530259	No fill	No fill	No fill	No fill	No fill or rock

Table 8. Prepared embankment in-situ density and moisture tests.

Test No. from Figure F2	Section	In-Situ Dry Density (pcf)	% of Optimum Dry Density (103.8pcf, optimum)	In-Situ Moisture Content % (16.4%, optimum)
T47	530259	106.4	103	8.8
T48	530259	103.5	100	10.0
T49	530259	104.0	100	9.9
T50*	530259	106.3	102	12.1
T51	530203	109.0	105	9.8
T52	530203	107.0	103	9.9
T53	530203	105.6	102	9.1
T54	530202	104.2	100	9.5
T55	530202	100.3	97	10.3
T56	530202	102.2	98	10.1
T57*	530202	117.3	113	14.2
T58	530210	106.7	103	8.8
T59	530210	107.7	104	8.9
T60	530210	99.3	96	6.7
T61	530211	102.4	99	7.3
T62	530211	102.4	99	7.4
T63	530211	107.8	104	9.1
T64*	530211	103.3	100	12.0
T65	530209	111.4	107	9.4
T66	530209	114.6	110	8.3
T67	530209	114.6	110	7.9
T68	530212	101.0	97	8.4
T69	530212	100.6	97	12.6
T70	530212	99.1	95	11.4

Table 8. Prepared embankment in-situ density and moisture tests. (cont'd)

Test No. from Figure F2	Section	In-Situ Dry Density (pcf)	% of Optimum Dry Density (103.8 pcf, optimum)	In-Situ Moisture Content % (16.4%, optimum)
T71*	530212	100.8	97	15.0
T72	530204	104.7	101	10.5
T73	530204	101.3	98	10.5
T74	530204	99.2	96	10.0
T75	530201	103.7	100	11.7
T76	530201	102.9	99	9.0
T77	530201	100.8	97	10.2
T78*	530201	101.5	98	10.0
T79	530205	99.5	96	10.3
T80	530205	104.9	101	12.8
T81	530205	104.7	101	12.7
T82	530208	105.0	101	12.0
T83	530208	100.5	97	11.0
T84	530208	102.9	99	12.9
T85*	530208	101.6	98	9.2
T86	530206	99.7	96	13.5
T87	530206	96.1	93	14.3
T88	530206	96.5	93	15.6
T89	530207	97.5	94	15.4
T90	530207	104.2	100	11.0
T91	530207	103.4	100	13.2
T92*	530207	105.0	101	8.5
Average		103.8	100	10.7
Standard Deviation		4.4	4.2	2.2

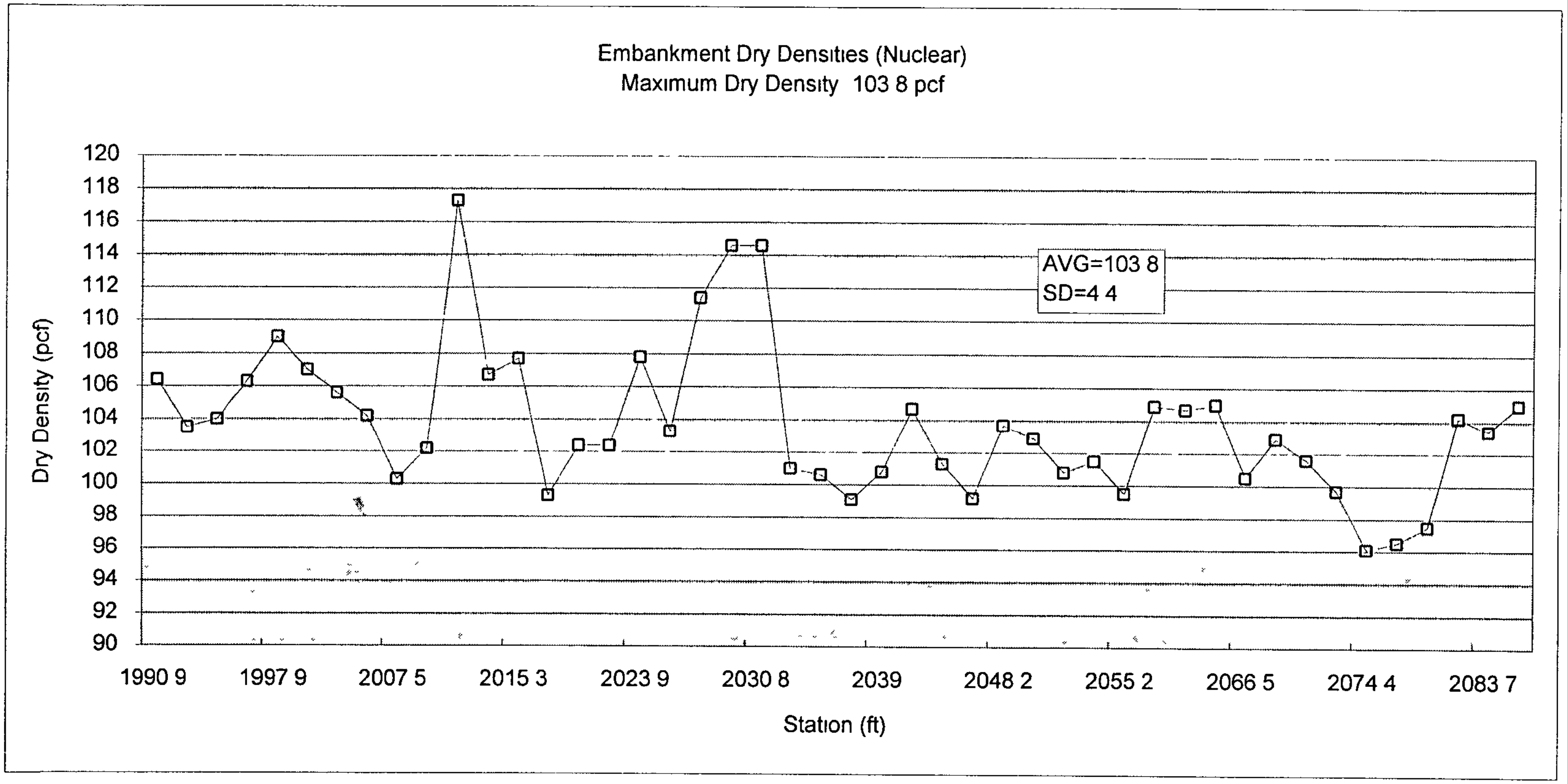


Figure 4. Embankment density distribution, Washington SPS-2.

Table 9. Prepared embankment in-situ dry density and moisture tests, retaken on LCB sections after re-trimming.

Test No from Figure F2	Section	In-Situ Density (pcf)	Original Density	% of Optimum Density (103.8 pcf optimum)	Original % of Optimum Density (103.8 pcf optimum)	In-Situ Moisture Content (%) (16.4% optimum)	Original In-Situ Moisture (%) (16.4% optimum)
T79	530205	99.5	100.2	96	97	10.3	8.9
T80	530205	104.9	105.1	101	101	12.8	10.0
T81	530205	104.7	102.7	101	99	12.7	9.6
T82	530208	105	104.7	101	101	12.0	12.3
T83	530208	100.5	105.2	97	101	11.0	12.1
T84	530208	102.9	102.3	99	99	12.9	10.9
T86	530206	99.7	99.1	96	95	13.5	12.5
T87	530206	96.1	97.4	93	94	14.3	12.1
T88	530206	96.5	97.7	93	94	15.6	17.6
T89	530207	97.5	98.2	94	95	15.4	14.1
T90	530207	104.2	103.8	100	100	11.0	10.7
T91	530207	103.4	104.4	100	101	13.2	9.9
Average		101.2	101.7	98	98	12.9	11.7
Standard Deviation		3.4	3.0	3.1	2.9	1.7	2.4

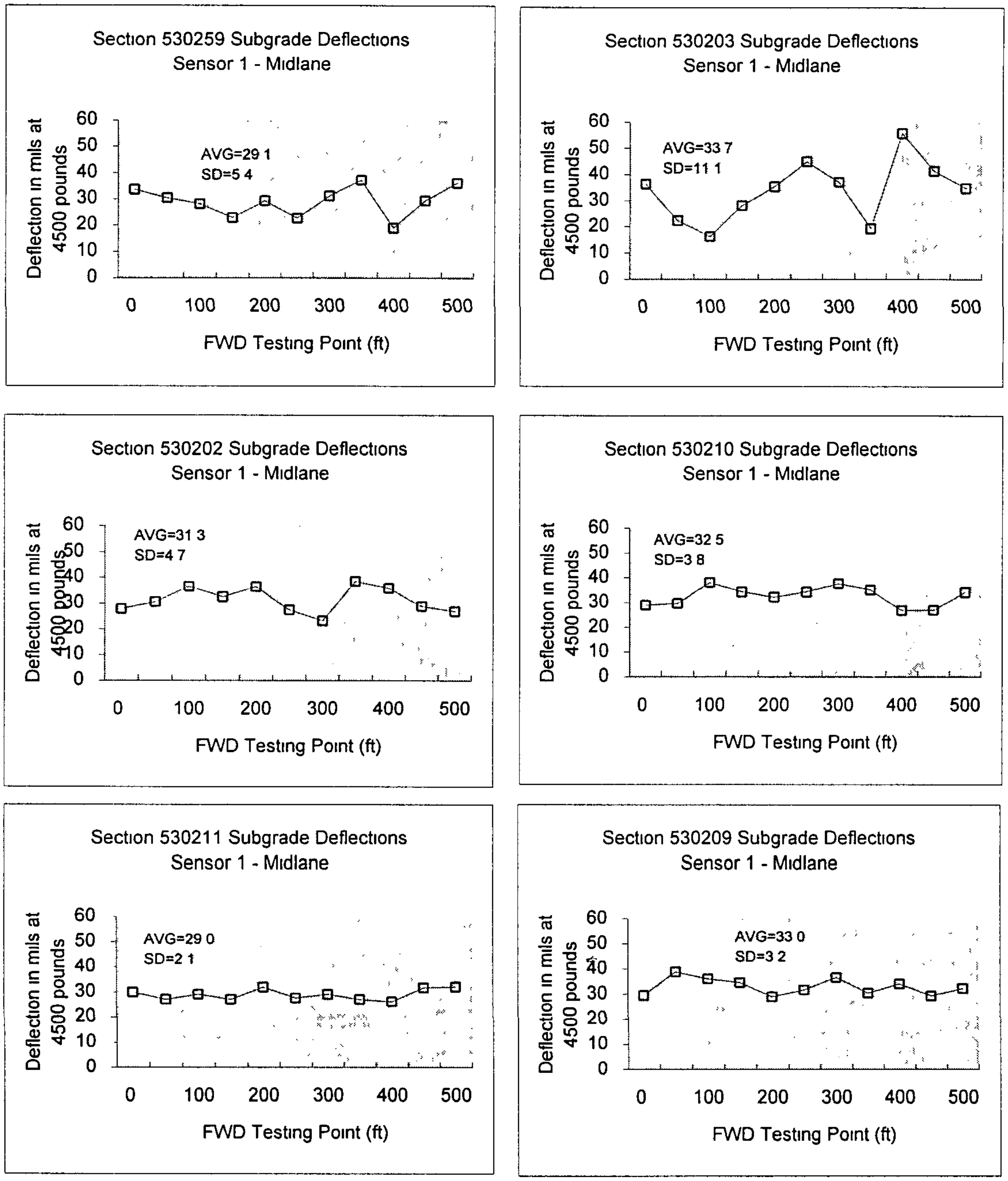


Figure 5a. Subgrade deflections, Washington SPS-2 (First six sections)

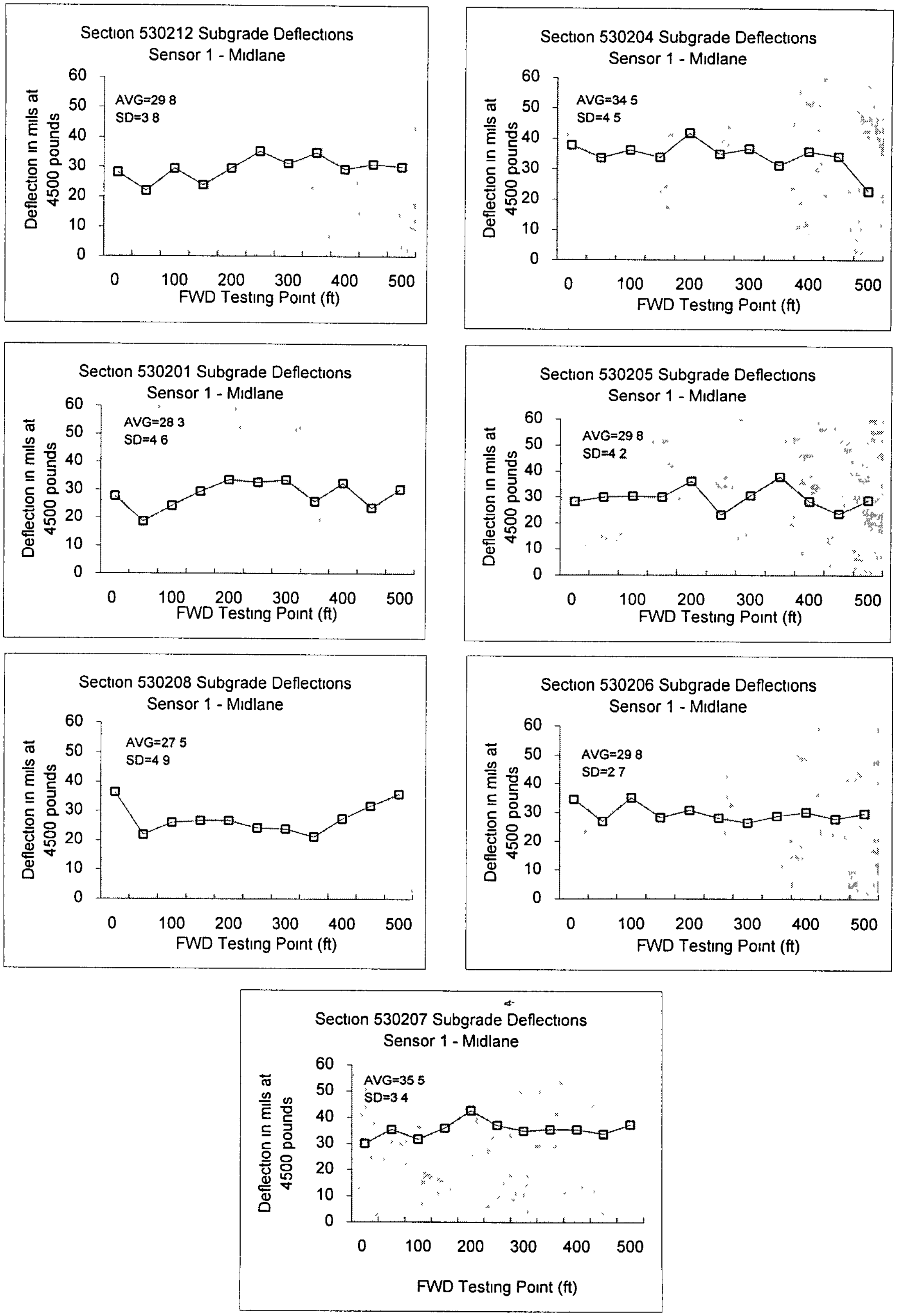


Figure 5b. Subgrade deflections, Washington SPS-2 (Last seven sections)

ROCK CRUSHING OPERATIONS

All crushed aggregates for the Washington SPS-2 project came from the Paha Material Deposit located 4 miles south of the beginning of the SHRP sections. The plant was located to the east side of the existing highway. The material deposit contained basalt rock. Deatly Company, Inc. of Lewiston Idaho was the crushing contractor, and Don Horyna was the crushing superintendent.

The plant was set up as shown in figure 6, photo 4, and appendix A. The basalt rock was fed into a Pioneer jaw crusher with front end loaders. The broken rock traveled to an Eljay Rollercone cone crusher. All rock was again crushed and sieved. The minus 1-¼" material fell onto sieves below the crusher. Depending on the gradation needed, the sieve sizes varied. From the cone crusher, the plus material traveled on belts to a set of Cedar Rapids roller crushers. Each crusher had a stack of 3 sieves. The material was sieved over the top plus 1-½" screen of roller crusher 1. The plus 1-½" material was fed into the crusher, and then onto a belt. The material was then split onto both crushers, and resieved over the plus 1-½" screens from each crusher. The material from both crushers then traveled up the belt, was split, and sieved again until all rock passed the 1-½" sieve.

The minus 1-½" material was screened over the bottom two sieves, and was then fed onto belts going to a loading hopper. The sieve sizes varied depending on the gradation needed.

Crushing of the PCC aggregates followed the same basic process with a few exceptions. First the minus 5/8" material was sieved out prior to the Eljay cone crusher. This material contained too many fines to be used in the PCC mix and was therefore discarded. In addition, all minus #4 material was fed away following the roller crushers on a belt to be stockpiled for the crushed fines portion of the PCC mix. All of the plus # 4 material was fed onto a belt to a wash. From there it was fed on a belt to the loading hopper.

The minus #4 material for the PCC mix was stock piled next to a natural sand stockpile to be washed. Figure 7 shows the washing set-up using 27" augering screws to wash the sands. The natural sand and crushed fines were fed into the auger at ration of 12 percent natural sand to 88 percent crushed fines. This fines mixture was the fine aggregate used for the PCC mixes.

The source of the natural sand was a material deposit 21 miles southwest of the Paha Material Deposit, near Kohootus, Washington. The material deposit is known as "Sand Hill", owned by Bob Williams.

DENSE-GRADED AGGREGATE BASE (DGAB)

Materials

The DGAB consisted of a high quality crushed stone having 100 percent fracture. The maximum top aggregate size was 1 ¼ inches. No additives other than water were included in the material.

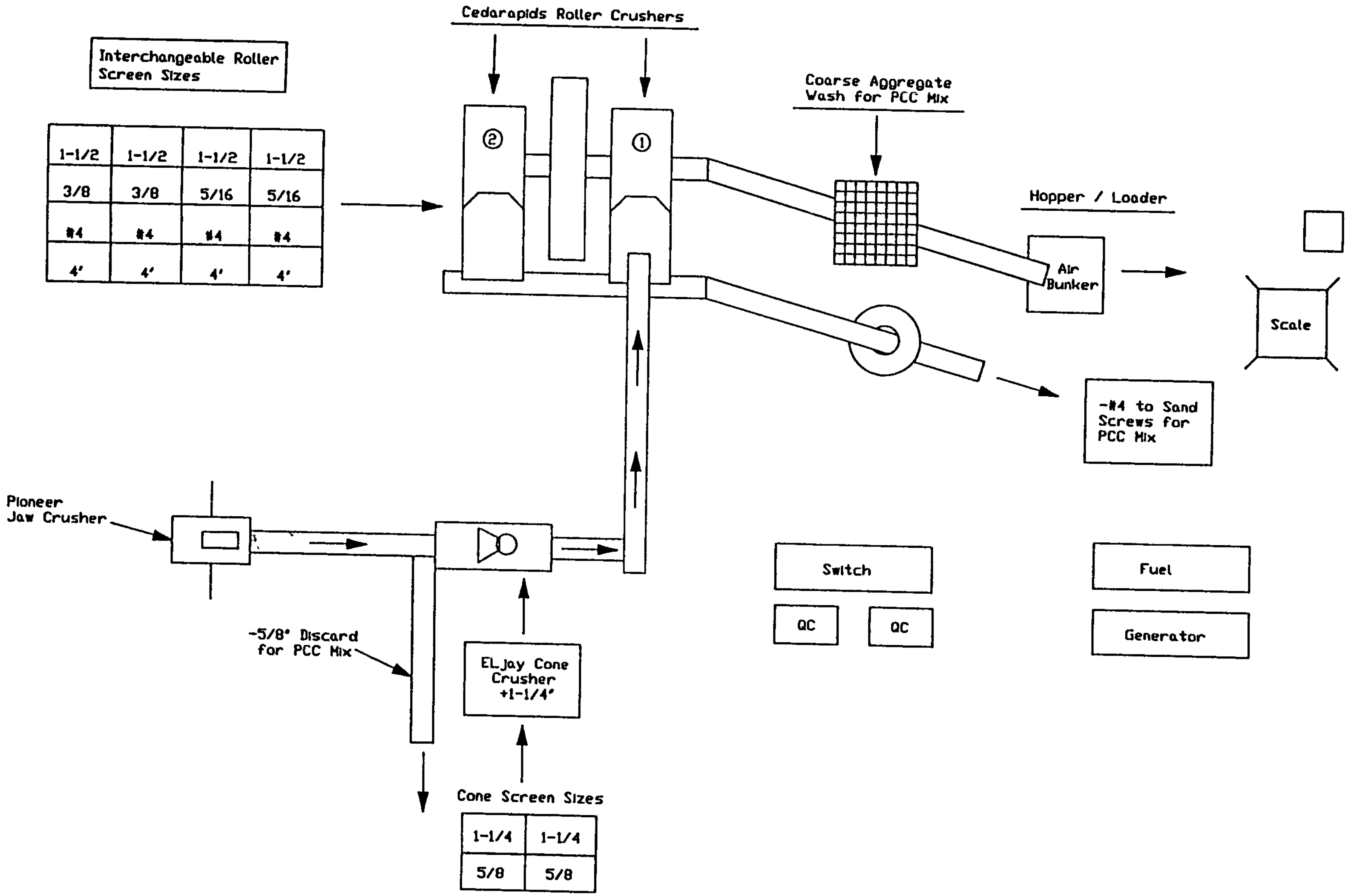


Figure 6. Rock crushing plant setup, WA SPS-2.

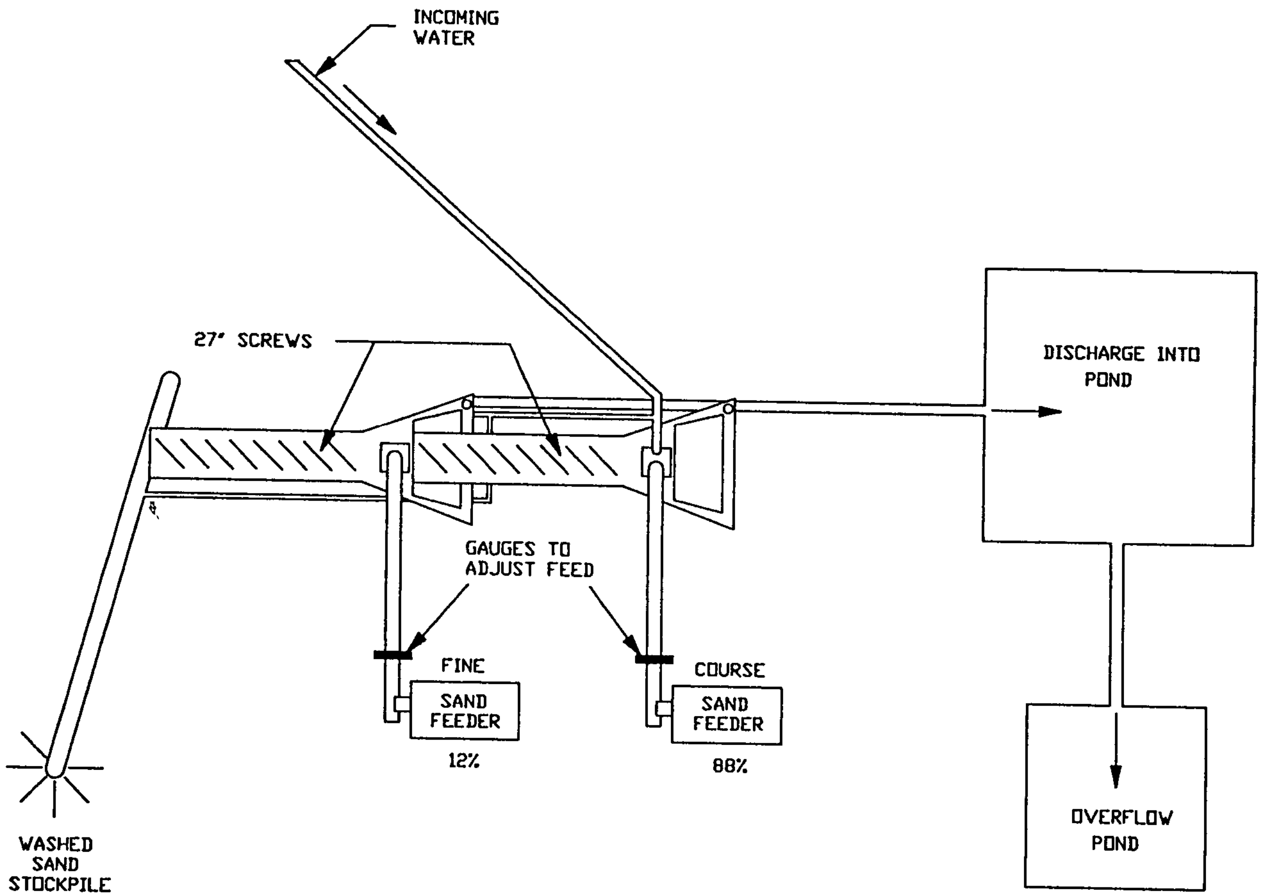


Figure 7. Fine aggregate wash setup, WA SPS-2.

The gradation used for the DGAB is listed in table 10. The samples were taken from the cold feed belt by WsDOT for acceptance testing. The aggregate base material applied to the State supplemental section 530259 was designated as crush surfacing base course and had slightly different properties.

Table 10. DGAB cold feed gradations for WsDOT acceptance sampling and testing for SHRP sections.

Date	6/22/95	6/22/95	6/23/95	6/23/95	
Sample #	1	2	3	4	
Sieve Size	% Passing Sieve Size				Specification
1-¼"	100	100	100	100	100
#4	42	45	50	44	50 max
#30	12.6	14	14.7	14.1	None
#200	4.9	5	5	5	5
% Fracture	100	100	100	100	75 min

Equipment and Construction Methods

Placement of the dense-graded aggregate base (DGAB) began on July 13th at the south end of the SHRP sections (with the exception of State section 530259 which was completed on July 7, 1995, using the same procedure as for the SHRP sections). Mack trucks, 80,000 lb capacity, with "Load King" belly dumps were used to haul the DGAB to the sections. A Catepillar 14D grader was used to distribute the material on the roadway. Following the grader, a Catepillar 633 water truck periodically spread water. Photo 5 in appendix A shows the initial DGAB placement. The structural thicknesses for DGAB on this project were specified to be 4" and 6". Therefore, the DGAB was placed in one lift for all of the sections requiring it.

On July 18th, placement of the DGAB continued and was completed by days end. Bulk samples of the DGAB were obtained at the locations shown in figure F3 in appendix F. The weather during placement was generally in the 80°F to 90°F range, with no rainfall.

From July 18th until August 16th, travel on the DGAB included water trucks and construction traffic hauling asphalt to the State Asphalt-Treated Base (ATB) sections for several days. On

August 16th and 17th, belly dump trucks hauled concrete over the DGAB sections to the Lean Concrete Base (LCB) sections. The trucks hauled full loads in the travel lane and returned in the passing lane. No significant damage to the DGAB was evident due to the hauling.

Trimming and Compaction

The DGAB within the State section was trimmed prior to ATB placement on August 1st, and the procedures and equipment were the same as will be discussed for the SHRP sections.

On August 18th, a Catepillar 14G with a laser control running off of the wire line was used to trim the DGAB in sections 530209, 530210, 530211, and 530212. The Cat 14G windrowed the excess DGAB and a Catepillar 613C scraper picked up the windrows and dumped the material in a stockpile. An ACME water truck watered the DGAB as needed, and an Ingersoll Rand SP48D, 7-ton single vibrating steel drum roller compacted the base.

Sections 530201, 530202, 530203, and 530204 were trimmed and compacted on September 20th, using the same procedure as discussed for the other DGAB sections. These sections had some construction traffic on them prior to PCC construction. They were trimmed just prior to PCC construction to insure that proper elevations would be achieved.

Prime Coat Placement

On August 21st, following FWD testing, an RC-250 asphalt prime coat was applied to the DGAB on those sections receiving the Permeable Asphalt-Treated Base (PATB) at a rate of 0.58 gallons/yd^2. The purpose of the prime coat was to prevent fines from contaminating the PATB. The supplier was Sound Refining, Inc. of Tacoma, Washington. The transporting and application temperature was approximately 230° F. The prime coat application was sufficient to penetrate and seal the voids in the DGAB surface.

On August 28th and 29th, construction traffic traveled over sections 530209, 530210, 530211, and 530212 while placing the PATB. The truck traffic caused some of the prime coat to bleed to the surface. Tracking of the prime coat was evident, but was not significant enough to damage the DGAB surface.

Quality Assurance Sampling and Testing

Bulk samples of the DGAB were obtained at the locations shown in figure F3 in appendix F. Jar moisture samples were collected at the same time as nuclear density testing at the bulk locations shown in figure F3.

Density Testing

WsDOT performed nuclear moisture/density testing at the locations shown in figure F3, appendix F. The dry densities taken on the DGAB are plotted in figure 8. It should be noted that the State section 530259 had densities taken on August 3rd and was a different material. This section received very little construction traffic prior to taking the densities. The SHRP sections had construction traffic prior to measuring the densities.

The SHRP sections had construction traffic on the DGAB from the time it was placed on July 18th until it was trimmed. Most of the construction traffic was continued until August 29th, when the PATB sections were completed.

Figure 8 shows that State section 530259 had a lower density average than the SHRP sections. The SHRP section densities were consistent. The average percent compaction was 97.7 percent of the optimum density of 134.3 pcf.

DGAB Falling Weight Deflectometer (FWD) Testing

On August 20th, FWD testing was performed on all eight SHRP DGAB sections. No FWD testing was done on section 530259. At this time, four sections; 530209, 530210, 530211, and 530212, were trimmed, and four sections; 530201, 530202, 530203, and 530204 were untrimmed. Section 530201 had windrows of material, and could only be tested up to 300'. Testing was done every 50' in the midlane stating at 0+00, and every 50' in the outer wheel path starting at 0+25.

Figures 9a and 9b show that the deflections are consistent within the trimmed and untrimmed sections. The deflections in the untrimmed sections are lower than in the trimmed sections since the surface had not been scarified and reworked prior to FWD testing. Following scarifying and recompacting, the untrimmed sections deflections would likely be higher and closer to the trimmed sections deflections.

Based on the density and FWD testing, it appears that the DGAB structural support is very consistent throughout the sections.

Final Elevation Measurements

Elevation measurements were taken before and after DGAB placement. The elevations were taken every 50' at 0', 3', 6', 9', and 12' from the pavement edge. The measurements were averaged, and are listed in table 11 for each of the nine sections. As shown, the ranges in thickness within a given section are rather large, however, the standard deviations range from 0.5 to 0.7 inches. Large variations in thickness were not observed during placement or in deflection measurements, thereby causing questioning of some of these data points. In general, the average thickness for a given section is close to the specified thickness.

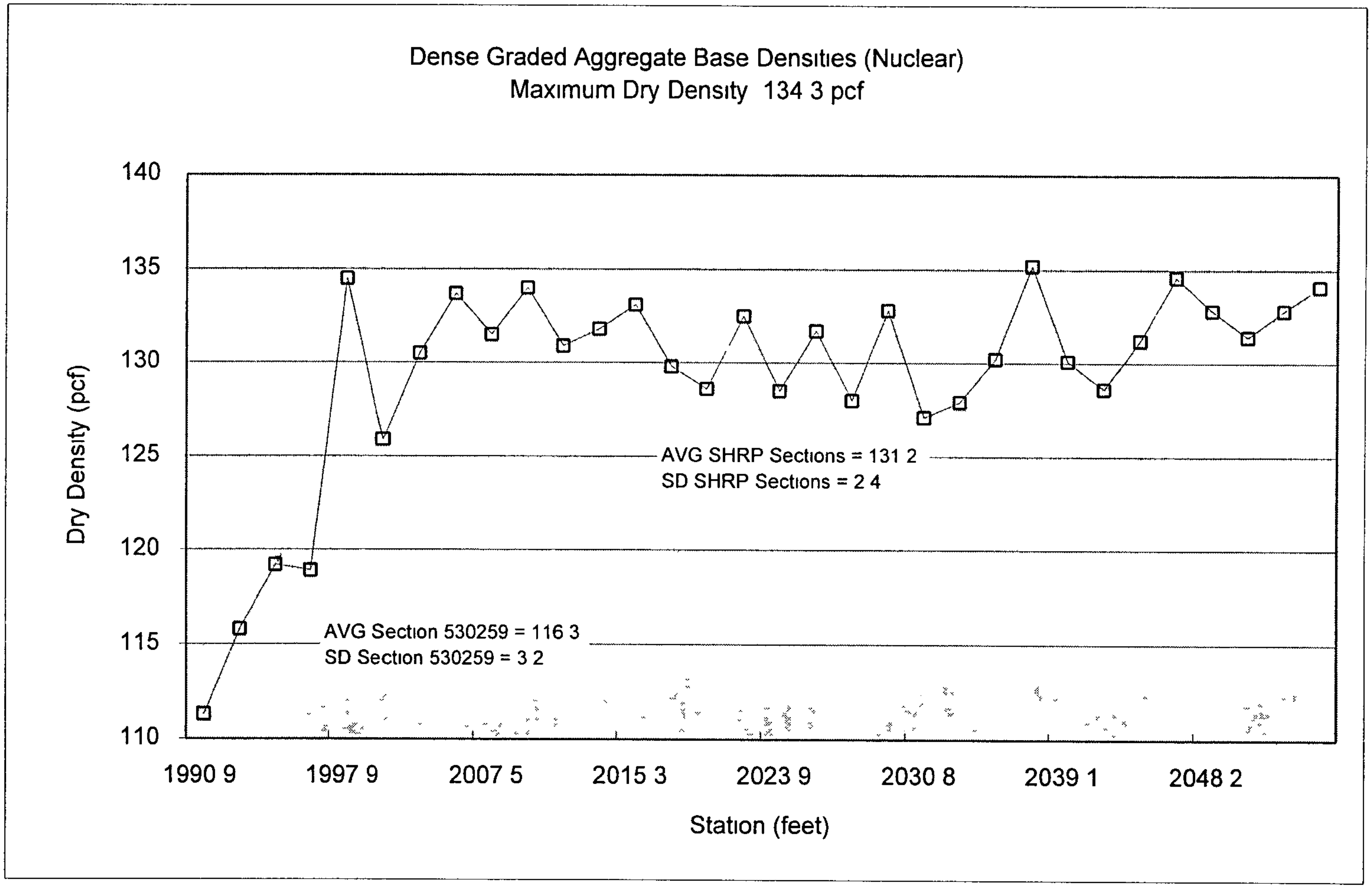


Figure 8. DGAB density distribution, Washington SPS-2.

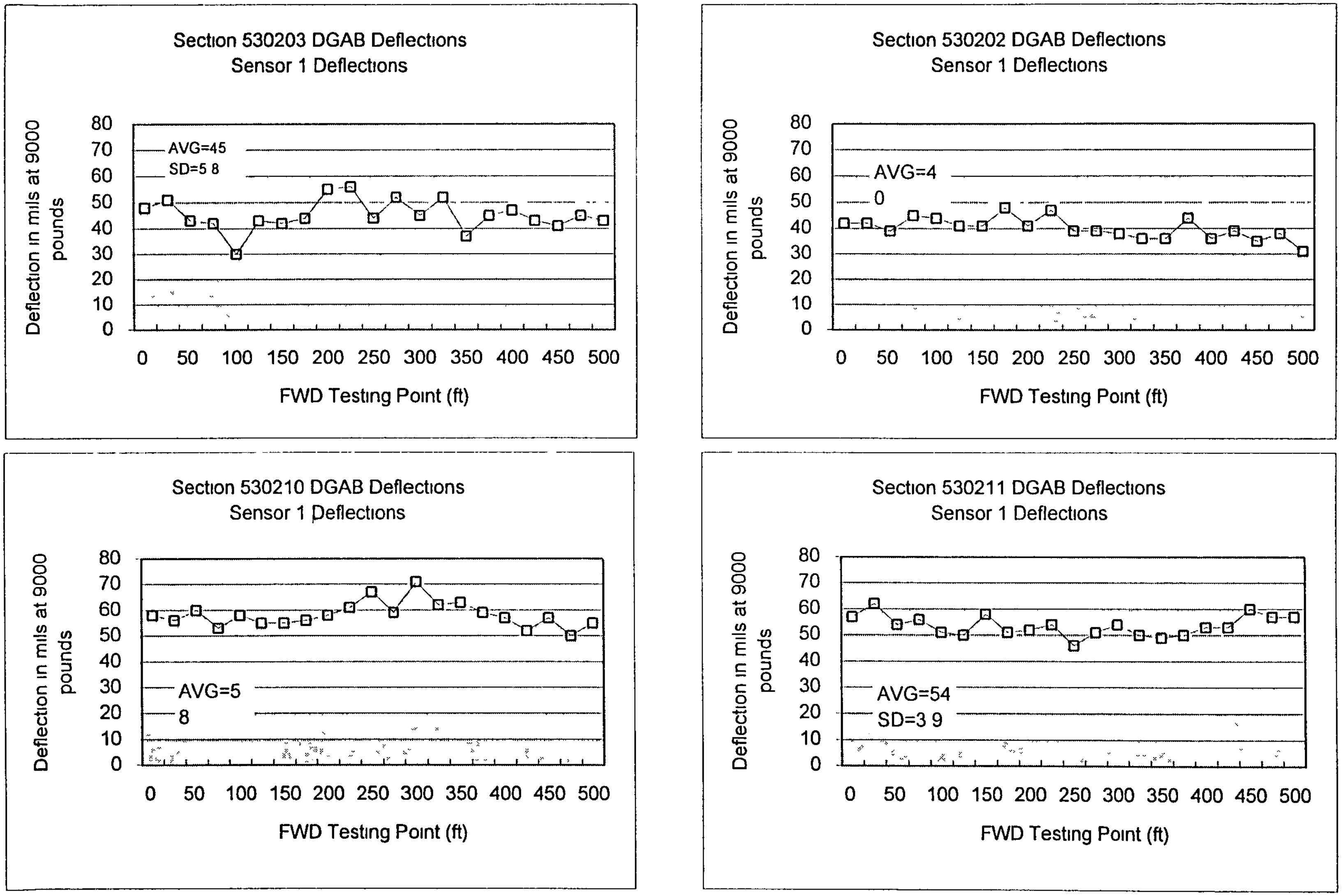


Figure 9a. DGAB FWD deflections.

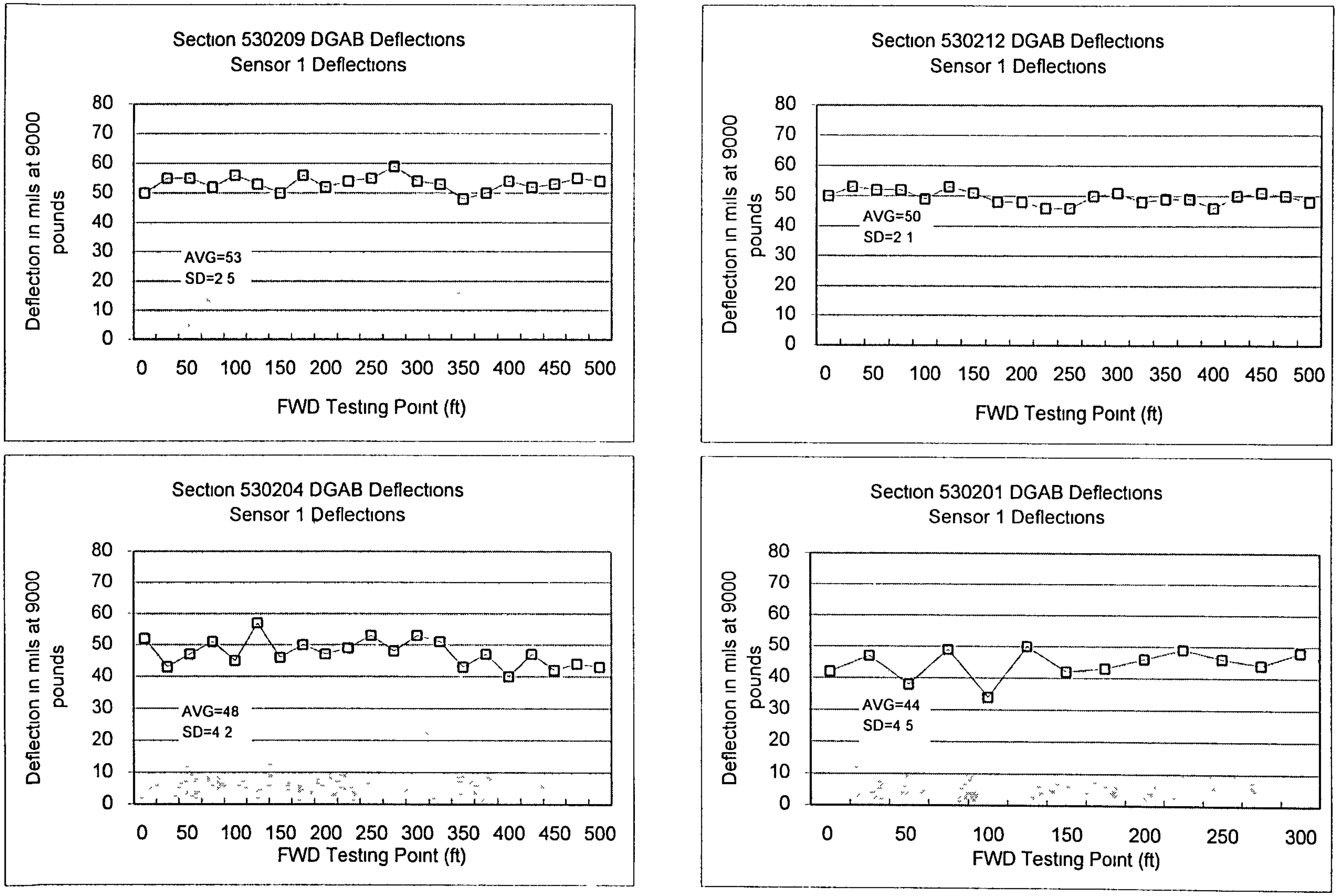


Figure 9b. DGAB FWD deflections.

Table 11. Dense-graded aggregate base measured layer thicknesses.

Section	Average Thickness (inch)	Specified Thickness (inch)	Low (inch)	High (inch)	Standard Deviation (inch)
530201	5.8	6.0	4.4	7.3	0.7
530202	6.5	6.0	5.6	7.7	0.6
530203	6.9	6.0	4.9	8.9	0.7
530204	5.9	6.0	4.8	7.1	0.5
530209	4.4	4.0	2.3	5.8	0.7
530210	4.5	4.0	3.4	6.0	0.6
530211	4.6	4.0	3.4	5.6	0.6
530212	4.6	4.0	2.6	6.1	0.5
530259	2.0	2.0	0.7	3.5	0.6

ASPHALT-TREATED BASE (ATB), STATE SECTION 530259

This section represented the typical State design for the entire project. Three inches of asphalt-treated base was placed in two lifts over two inches of crushed surfacing base course material.

Materials

Table 12 summarizes the mix design for the ATB mix, and appendix B contains the complete mix design. Appendix B also contains the properties of the asphalt cement used in the ATB mix. The aggregate was obtained from the Paha material deposit just south of the mix plant. The aggregate was crushed as previously discussed. Gradations taken from the cold feed belt during production are listed in table 13. The mix design required 4.5 percent AR4000W with 0.25 percent Aggrigrip antistrip agent to reduce the moisture susceptibility of the mixture.

Equipment and Construction Methods

The paver was a Blaw Knox PF150 with a Barber Greene elevator in front. The speed of the paver was 70-80'/minute. The paver had an electronic control on the right side to follow a wire line and used a 30' ski on the left side.

Table 12. Section 530259 ATB mix design summary.

Supplier	Exxon of Billings, MT via TAK Petroleum of Spokane, WA.
% Asphalt (by total mix)	4.5
Asphalt Grade	AR4000W
% Antistrip (by weight of asphalt)	0.25
Type of Antistrip	Aggrigrip (Koch Materials of Billings, Montana)
Rice Density lbs/ft^3	159.5
Approximate Voids (%)	7.5

Table 13. ATB aggregate gradations taken from cold feed belt for quality assurance.

Date	7/26	7/26	7/28	
Sieve Size	% Passing Sieve Size			Specification
2"	100	100	100	100
½"	88	88	84	56-100
¼"	58	57	53	40-78
#10	31	48	27	22-57
#40	15	15	13	8-32
#200	7.9	7.9	6.6	2-9

Belly dump trucks hauled the ATB to the grade, a distance of 3.4 miles. A Cedar Rapids drum mixing plant was used to produce the ATB mix.

Compaction was achieved as follows:

- 2 passes vibratory compaction with Dynapac CC50 Double Drum (34,200 lbs.)
- 2 passes static (finish) compaction with Hyster 66B Double Drum (21,00 lbs)

Detailed Construction

On August 3rd, the surface of the DGAB was rolled using a Hyster C766B double drum compactor in the static mode. This ensured a compacted surface prior to placing the ATB.

The surface of the DGAB was then watered with a water truck. The water was intended to prevent pushing and curling of the ATB under the roller. Early on during ATB placement in the non-SHRP section of the project, the ATB mix was moving under the roller. WsDOT personnel felt water would cure this problem by creating a bond between the aggregate and ATB. No pushing and curling was evident during paving within section 530259.

The first lift in the travel lane was placed from 2:30-2:45 p.m., in a 16' width going north. The air temperature was 80°F. Temperatures taken in the ATB behind the paver averaged 240°F. The paver then turned around and paved 50' to just prior to the end of the 500' section limit.

On August 4th, a sweeper was used to clear any debris that had accumulated close to the centerline joint. The DGAB surface was rolled using the Hyster C766B roller and then watered down. Paving took place going southbound in the passing lane from 7:00 a.m. until 7:20 a.m., with a seven minute delay close to the start to adjust the paving height. The paving width was 16'. The air temperature was 60°F.

Also on August 4th, belly dump trucks hauling ATB mix to the south traveled over the travel lane ATB. They had to traverse around a break in the wire line at station 2060+00, and proceed south to the paving train past section 530259. No damage was evident due to this traffic.

The approximate average compacted thickness for the first lift was 1.6", measured from both pavement edges at 50' intervals. The State specifications called for a 1.6" first lift and 1.4" second lift.

On Tuesday, August 8th, between 12:35 p.m. and 12:45 p.m., the second lift in the travel (SHRP) lane was placed. The width was 16' and the direction was northbound. The air temperature was 75°F. A CSS-1 tack coat was applied in the travel lane at a rate of 0.03 gallons/yd^2 prior to second lift ATB placement, up to the end of the transition.

The paving train turned around at 12:45 p.m. and paved the second lift of the passing lane the full 16' width to station 1993+25. The paving crew then scraped out the inside of the paver, and spread this mix from 1993+25 to 1992+00, less than full width and depth. The mix was very course. Up to 1992+00, no tack coat had been placed in the passing lane.

On August 9th, paving continued in the passing lane at 7:00 a.m., starting at station 1993+25 and going southbound. The temperature was 55°F. Paving finished at 7:15 a.m. A tack coat was placed starting at station 1993+25 and covered the rough mix from 1993+25 to 1992+00. Temperatures in the windrow ahead of the paver averaged 249° F. The paving width was 16'. The approximate average compacted thickness for the second lift was 1.5", measured with a steel pin. The nominal loose placement thickness averaged 1.8".

No problems were evident at the rough paving joint close to station 1993+00, and paving went smoothly to the end of the section.

Quality Assurance Sampling and Testing

During construction, a 100 pound sample of ATB material was taken from the window during placement of the top lift at station 2+50, and a five-gallon asphalt sample was taken at the plant after being heated for mixing. A complete materials sampling and testing layout for the ATB is shown in figure F4, appendix F.

Final Thicknesses and Densities

The final average measured ATB thickness was 2.6 inches, with a 0.4" standard deviation. The low measurement was 1.4" and the high 3.2". Elevation measurements were taken at 5 points transversely, 0', 3', 6', 9', 12', at 50' intervals longitudinally.

Table 14 lists densities taken at five locations on the top lift. The State compaction specification for the ATB was 80 percent of maximum density, therefore all density tests were passing.

Table 14. ATB densities during construction.

Station	Density (pcf) (max density = 157.9 pcf)	% of Maximum Density
0-44	130.0	82
1+00	131.8	83
2+50	134.5	85
4+00	131.6	83
5+42	137.4	87
Average	133.1	84
Standard Deviation	2.9	2.0

LEAN CONCRETE BASE

Sections 530205, 530206, 530207, and 530208 received a 6" lean concrete base (LCB). The LCB was placed in one lift on August 16th and August 17th, 1995. The paving width was 38'. Paving progressed from north to south.

Materials

The crushed aggregates used for the LCB mix were crushed at the Paha Material Deposit located at station 1770+00 on the project, as discussed previously. The crushed rock was a basalt. The percentage of natural sand in the fines was 12 percent. The cement and fly ash suppliers for the LCB were Holnam, Inc. of Spokane, Washington and Pozzolanic International of Mercer Island, Washington, respectively.

The preliminary mix design for the LCB mix was performed at the ACME materials laboratory in Spokane, Washington on July 5th. The mixture contained 20 percent Class F Fly Ash as well as water reducing and air entraining agents. The required 7-day compressive strength average for three cylinders was 500 to 750 psi. The initial mix averaged only 403 psi.

The second mix design averaged 600 psi, and was accepted. The complete mix design, actual trial batch worksheet, and cylinder breaks are located in appendix C. Table 15 summarizes the mix design. The mix design batches were 1/10 yd^3.

The gradations of samples taken on June 22, 1995 and June 23, 1995 for acceptance testing by WsDOT are shown in table 16.

A white pigmented curing compound was applied to all surfaces. The compound was "Sealtight 1600" manufactured by W.R. Meadows Company, and was wax based.

Equipment and Construction Methods

The LCB mix was hauled in 10 cubic yard batches in large ACME end-dump trucks. The trucks traveled over the existing embankment in route to the LCB sections. No pumping or significant damage was noted during the placement. The distance from the ACME PCC plant to the beginning of section 530205 was 4.7 miles. The PCC plant is discussed and described in detail in the PCC section.

Prior to paving, the embankment was watered down with a large water truck. The end-dump trucks backed up to the paver and dumped the LCB. A front end loader used its bucket to distribute the LCB across the roadway.

The paver was a Guntert and Zimmerman slipform with interval vibrators on the front, a hydraulic "plow" on the front to move material and a 5' long x 1' wide automatic trowel on the rear. Photos 17 & 18 in appendix A show the Guntert and Zimmerman paver. The paver is described in detail in the PCC section. Thirty-three (33) vibrators spaced at an average of 16 inches were used. Guide boxes were located front and rear on both sides of the paver. These boxes followed the wire line on both edges of the LCB and adjusted the paver for horizontal and vertical alignment.

Finishers rode on the rear of the paver and filled in any rough spots immediately with hand trowels. The machine trowel then applied a smooth finish. Rough spots remaining after machine troweling were finished by hand with large 3' by 1' trowels.

Table 15. LCB mix design summary - ACME const. (1/10 yd^3).

	Specified by ACME	Actual Mix Design
Holnam Type II Cement (lb)	22.5	22.5
Type F Fly Ash (lb)	2.5	2.5 (=10%)
WSDOT Class II Fine Aggregate (lb)	170.6	180.3 (5.7% moisture)
WSDOT Type II Course Aggregate (lb)	169.8	172.2 (1.4% moisture)
Water (lb)	27.0	25.7 (does not include rock moisture)
Water Reducer (oz)	1.5	1.5
Air Entraining (oz)	0.25	0.25
Slump (inches)	1.50	0.25
Air Content (%)	5.5	5.4
Water/Cement Ratio	1.08	1.03
Strength (psi) (3 Cylinder Average)	500-750	600

Table 16. Gradations for LCB from WsDOT acceptance testing.

Date	June 22, 1995	June 23, 1995	
Sample	1	2	Specification
% Passing 1-½"	100	100	100
1-¼"	97	99	95-100
3/4"	67	55	40-70
3/8"	16	8	5-20
#4	2	1	0-2
#200	0.4	0.3	0-0.5

Detailed Construction

Section 530205

Paving began in the monitoring section at 1:15 p.m. on August 17th. The weather was cloudy and windy, with a slight rain falling. The rain continued until 2:00 p.m.

Sampling was performed by WsDOT at 1:45 p.m., and yielded an air content of 6.4 percent and a slump of 0.8". Six cylinders were formed, and a vibrating wand was used during forming. The cylinders were stored under soil for 24 hours.

Placement of the curing compound started at 2:15 p.m., and from that time, the curing machine closely followed the paver.

Paving was completed in the monitoring section at 2:30 p.m. The surface required little hand finishing during paving, and had a uniform surface texture similar to sections 530207 and 530208. The paving continued into the transition area, and ended at station 2053+30, where a transverse edge was formed. This edge would later tie into the PATB layer during paving.

The water cement ratio during paving of this section averaged 1.02 with a standard deviation of 0.04.

Section 530206

Paving in the transition area began at 8:40 a.m. The weather was very windy, with a temperature of 55° F. The mix appeared to be wetter than earlier batches. The speed of the paver at this point was about 10' per minute, which was visibly faster than earlier in the morning.

Paving began in the monitoring section at 9:00 a.m. The mix at this point looked wetter than earlier batches, and flowed more when being worked in front of the paver. A sample taken by the contractor at 9:25 a.m. yielded a 1-¼" slump.

The State took a bulk sample at 9:35 a.m. and performed air and slump tests, yielding 6.0 percent air and 1.3" slump. Six cylinders were formed, and a vibrating wand was used for vibration. The cylinders were buried under soil for 24 hours to keep the temperature and humidity constant during curing.

Very little hand finishing was required in this section. The edges held up well behind the paver (photo 6, appendix A). Only a few pockets or rough spots were visible. Curing compound was applied about 50' behind the paver. Paving in the monitoring section was completed at 10:25 a.m.

From 9:45 until 10:25, the contractor performed several slump tests, yielding slumps in the 2" range. The contractor obtained a 2" slump at the same location that the State obtained a 1-¼" slump. The measuring method used by the contractor was different than the States, possibly causing this difference.

Table 17 lists water cement ratios for paving from 7:00 a.m. until 11:00 a.m. on August 17, 1995. The water cement ratios increased until 10:00, which possibly explains the wetter looking mix.

Table 17. Water/cement ratios, LCB paving in section 530206.

Date	Time	Batches	Average water/cement ratio (1.08 design)	Standard Deviation
August 17	7:00-8:00 a.m.	13	0.99	0.04
August 17	8:00-9:00 a.m.	15	1.02	0.03
August 17	9:00-10:00 a.m.	35	1.05	0.06
August 17	10:00-11:00 a.m.	34	1.03	0.04

Section 530207

Paving began in the transition area at 7:00 a.m. on August 16th. The air temperature was 50°F. The first 7 loads of LCB were rejected due to high air contents. The first load was placed at 8:00 a.m. The slump was 1" and the air content was 4.5 percent, tested by WsDOT where the load was dumped.

In front of the paver, water ran off the vibrated mix to the left side of the paver and formed a large puddle (photo 7, appendix A). At the same time, the mix on the right side of the paver was coming out very rough, requiring a lot of hand finishing. Workers on the rear of the paver were filling in holes and rough spots with a slurry mix obtained from the front of the paver. The temperature at 9:00 was 60°F. No pumping or damage to the embankment was evident due to the truck traffic.

At 9:00, finishers were still hand working the beginning of the pour. The paver stopped for 15 minutes at this time, station 2083+50, to let the finishers catch up and started again at 9:15 a.m. The front end loader formed a head of LCB in front of the paver to try to reduce the water runoff. Less runoff was evident after building up the LCB in front of the paver.

Several truckloads of mix that sat from 8:45 a.m. - 9:15 a.m. were removed with the front end loader, and dumped over the right shoulder.

At 9:50 a.m., the paver stopped and vibrators were being checked. The vibrator bar on the right side of the paver was rotated slightly, to get the vibrators deeper into the mix. Paving continued at 10:10 a.m. The air temperature was 68°F. At station 2083+00, the mix in front of the paver was not fluid as before.

Behind the paver, the mix was still very rough on the right side and wet on the left side. Water was hand sprayed onto the right side LCB at station 2083+00 to aid in finishing. The edges up to this point were rough, and not finished well.

At 10:50 a.m., the beginning of section 530207 was hand sprayed with water for curing purposed, while the CMI curing machine was being repaired.

At 11:00, the contractor placed about 10 extra vibrators onto the front vibrator bar. They were hung over the bar and allowed to drag through the mix.

At 11:10, WsDOT took an LCB sample with a wheelbarrow and shovel for slump and air tests, and for forming cylinders. The slump was 0.3" and the air content was 4.5 percent. Six cylinders were formed. They were hand rodded on a wooden table, and finished smooth on the tops. They were buried under soil at the roadside for 24 hours prior to transporting them to a Spokane WsDOT laboratory. The time to sample, test and mold cylinders was approximately 15 minutes.

At station 2082+25, the mix was rough across the width of the road. Hand curing with water was still being done at 11:30 a.m.

At 12:00, the curing machine was fixed. Curing with a white pigmented curing compound began at the north end of the section. The curing in the monitoring section began at 12:03 p.m. The machine was 50' behind the paver by 12:05, at station 1281+50.

At 12:30, the air temperature was 70°F. A large rough spot was present at station 2080+50. The front end loader drove over the wire line and dumped a small load behind the paver. The area was then hand finished. At this point, the contractor quit paving for the day. The paved surface was requiring too much hand finishing and the contractor wanted to work out the problems.

At station 2080+48, the LCB was sawed after it had set up, and the remaining slab was taken away with a loader. The LCB longitudinal joint was sawed at 6:00 a.m. on August 17, 1995, 16.5' from the left edge and 21.5' from the right edge. The depth of the saw cut was 1.7". A water cooled 0.175" diamond blade was used for cutting.

On August 17th, paving continued. The embankment was watered with a water truck. The first truck arrived at 7:20 a.m. The air temperature was 54°F. A sample taken by WsDOT yielded a ½" slump and 5.6 percent air. The paver had 33 vibrators, and the extra vibrators added on August 16 had been removed. The joint at station 2080+48 was hand finished to a smooth surface.

The mix at the beginning of the section came out smoother with less hand finishing. State personnel said that the speed of the paver had been increased slightly. There was still a slight slurry running off of the mix to the left side, even with the increased speed and hand finishing was still required. By 7:50 a.m., the paver was into the transition area of section 530206. Curing of the end of section 530207 began at 8:35 a.m. The curing machine then closely followed the paver the remainder of the section. The curing rate was approximately 1 gallon/120 ft^2.

Numerous mix problems arose in paving this section. Although the mix seemed to have ample water, it appeared dry behind the paver and required a large amount of hand finishing. During construction, several changes in method were tried, such as adding vibrators, changing the paving speed, keeping a head in front of the paver, etc. However, the major problem was likely a lack of proper mixing time at the batch plant. This would explain the excessive slurry ahead of the paver, but yet the dry mix behind. It also explains the variability in slump tests during placement.

Table 18 lists the water cement ratios from the LCB batches of August 16, 1995 and August 17, 1995 in section 530207. The design LCB water/cement ratio was 1.08. The last few hours on August 16 had water/cement ratios below 1.

Table 18. Water/cement ratios, LCB paving in section 530207.

Date	Time	Batches	Average Water/Cement Ratio (1.08 Design)	Standard Deviation
August 16	7:00-8:00 a.m.	2	1.07	0.03
August 16	8:00-9:00 a.m.	19	1.01	0.02
August 16	9:00-10:00 a.m.	none	----	----
August 16	10:00-11:00 a.m.	9	0.96	0.01
August 16	11:00-12:00 p.m.	24	0.99	0.02
August 17	7:00-8:00 a.m.	13	0.99	0.04

There were several rough spots following paving in the last 200' of the section. Photo 8 in appendix A shows some of the rough surface following paving near the end of the section.

Section 530208

Paving in the monitoring section began at 11:00 a.m. on August 17th. Several spots along the edges slumped slightly. The slumping was not significant enough to cause damage to the SHRP travel lane. The paving crew took a break from 11:15-11:30 for lunch. Curing began at 11:20 a.m. At 11:35 a.m., the air temperature was 60°F.

At 11:45 a.m., sampling was performed by WsDOT. The air content was 5.9 percent and the slump was 0.3". Six cylinders were formed, and a vibrating wand was used for consolidation. The cylinders were stored under soil for 24 hours. Although the mix appeared to be consistent, the fact that the edges were slumping and then a slump test resulted in 0.3" of slump seems to denote an inconsistent mix.

At 12:05 p.m., a slight rain began, and continued until 12:20 when paving was completed in the monitoring section. The rain was not significant enough to cause any ponding or damage to the LCB. The water cement ratio for 68 batches between 11:00-1:00 p.m. averaged 1.05, with a 0.03 standard deviation.

Longitudinal Joint Cutting

A water cooled 0.175" diamond blade was used to saw the longitudinal joint. Sawing began at 6:00 a.m. on August 17th in section 530207 and was finished by 8:00 a.m. Sawing began at 10:00 a.m. on August 18th, and was completed by 12:00 p.m. The depth of the cut averaged 1.7" and was located 16'8" from the right edge and 21'4" from the left edge. Figure 10 shows the location of the LCB joint relative to the PCC slab joints. The cut had to be placed in the SHRP monitoring lane in order to meet SHRP criteria of being no more than 3' from the centerline of the LCB width being constructed.

Quality Assurance Sampling and Testing

Bulk samples of LCB were taken at station 2+50 of each section. Slump and air tests were run and six cylinders were formed. Sampling is discussed in detail for each section under "Detailed Construction".

Profile Readings - LCB

The contractor performed a profile survey on the LCB on August 18th. The results are listed in table 19. No profile specification for the LCB was included by WsDOT, but the contractor ran this for his own use. The State specification for PCC surface is 7 inches/mile.

Table 19. LCB profile index results.

Section	Profile Index (Inches/Mile)
530205	3.6
530206	2.6
530207	3.4
530208	2.1
Average	2.9

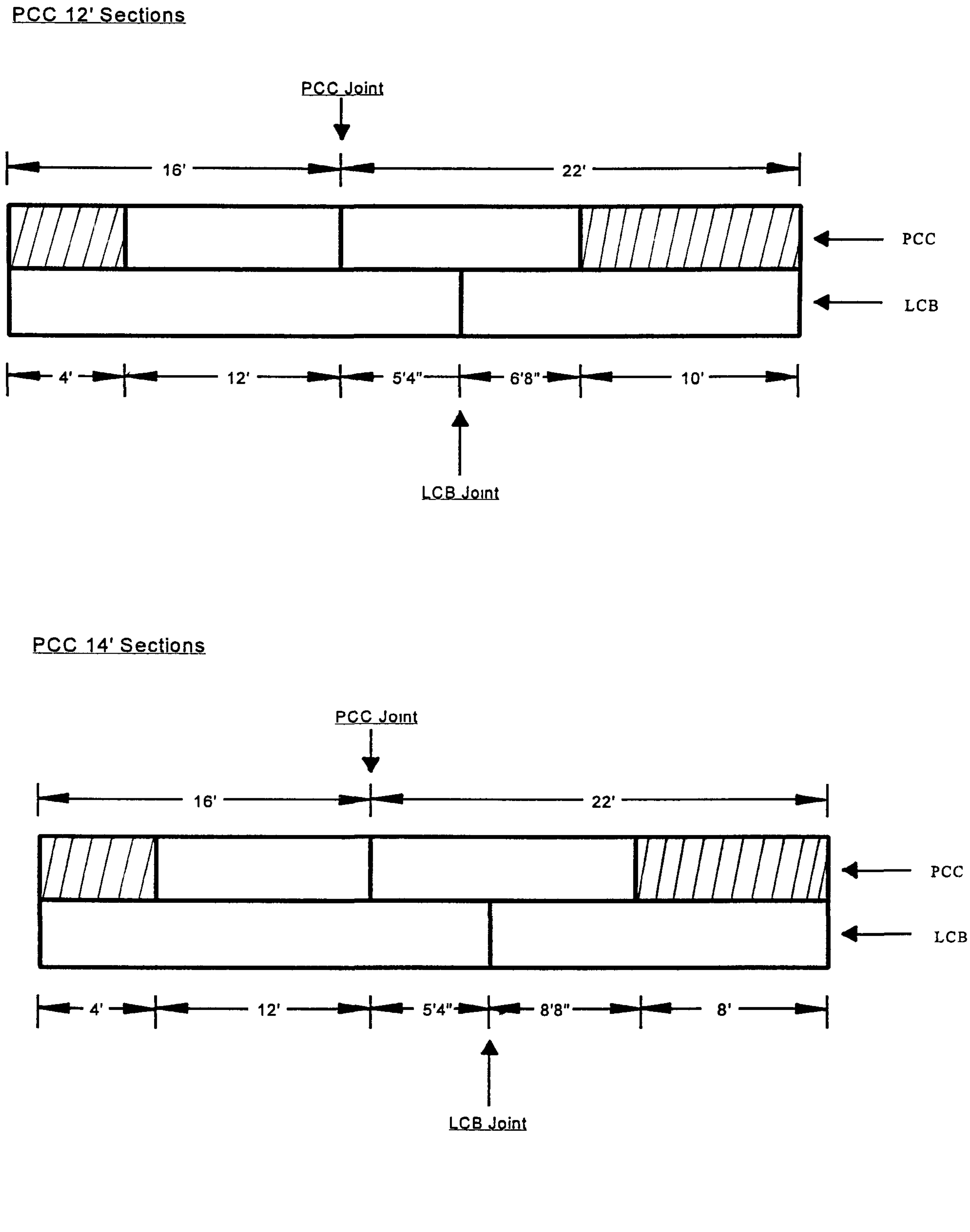


Figure 10. Location of LCB joint relative to PCC joint.

Distress Survey - LCB

On September 19th, all surface distresses on the LCB were mapped, and are discussed below by section. This survey included the entire LCB slab width.

Section 530205

One hairline transverse crack was present at 322 feet from the beginning of the section. No other distress was evident. There was no distress in the transition from section 530205 to 530208.

Section 530206

This section had one transverse crack starting from the outer edge. Several small longitudinal cracks were present in the outer shoulder. The transition from section 530206 to 530207 had 10-15 longitudinal and small transverse cracks in the outer shoulder.

Section 530207

The only distresses present were some small scattered cracks in the outer shoulder, 5 to 20 feet from the start of the section.

Section 530208

From 215' to 220' into the section, random transverse cracks were present 3 feet from the outer edge of the SHRP lane. From 219' to 221', several small longitudinal cracks were present within 3 feet of the LCB joint, also in the SHRP lane.

From 260' to 410', numerous small longitudinal edge cracks were present from 0' to 9' from the outer edge of the LCB. From 270' to 300', the longitudinal edge cracks were significant.

Only a few edge cracks were present in the transition from section 530208 to 530206.

Layer Thicknesses - LCB

Table 20 lists the final layer thicknesses and standard deviations for each LCB section compared to the specified thickness. The thicknesses were measured using an elevation survey at 5 locations transversely, 0, 3', 6', 9', and 12' from the pavement edge, and 50' intervals longitudinally. The average thicknesses were very close to the design thicknesses.

LCB Cylinder and Core Strengths

Table 21 lists the 14-day and 28-day compressive strengths obtained from cores and formed cylinders from each section.

Table 20. Lean concrete base measured layer thicknesses.

Section	Average Thickness (inch)	Specified Thickness (inch)	Low (inch)	High (inch)	Standard Deviation (inch)
530205	6.1	6.0	5.3	7.0	0.5
530206	6.2	6.0	5.6	7.1	0.4
530207	6.2	6.0	5.5	6.8	0.4
530208	6.1	6.0	5.0	7.0	0.5

PERMEABLE ASPHALT-TREATED BASE

Sections 530209, 530210, 530211, and 530212 received a 4" permeable asphalt-treated base (PATB) over a 4" dense-graded aggregate base. The PATB was placed in one lift with three passes. The inner pass was 12'6", the outer pass was 14' and the center pass was 11'6". The paving took place on August 28th and 29th. Longitudinal edge drains were placed from October 24, 1995 to October 31, 1995 at the edge of the inner shoulder.

Materials

Table 22 summarizes the mix design for the PATB mix, and appendix D contains the complete PATB mix design. Appendix D also contains the asphalt properties of the asphalt used for the PATB mix. The aggregate used was a basalt obtained from the Paha material deposits just south of the mix plant. A gradation taken from the cold feed belt for quality assurance is listed in table 23.

Table 22. PATB mix design summary.

Supplier	Exxon of Billings, MT via TAK Petroleum of Spokane
% Asphalt (by total mix)	2.5
Asphalt Grade	AR4000W
% Antistrip (by weight of asphalt)	0.25
Type of Antistrip	Aggrigrip (Koch Materials of Billings, MT)

Table 21. LCB core and cylinder compressive strengths.

Section	SHRP Specified 7- Day Compressive Strength (psi)	14-Day Core Compressive Strength (psi)	28-Day Core Compressive Strength (psi)	14-Day Cylinder Compressive Strength (psi)	28-Day Cylinder Compressive Strength (psi)
530205	500-750	607 * 587 **	783 * 881 **	300 310	590 570
	Average	597	832	305	580
	Standard Deviation	14	69	7	14
530206	500-750	716 * 695 **	527 * 1176 **	300 290	570 590
	Average	706	852	295	580
	Standard Deviation	15	459	7	14
530207	500-750	710 * 963 **	1284 * 1368 **	930 840	1820 1390
	Average	837	1326	885	1605
	Standard Deviation	179	59	64	304
530208	500-750	810 * 537 **	768 * 1073 **	500 510	1000 1180
	Average	674	921	505	1090
	Standard Deviation	193	216	7	127

* Beginning of section.
** End of section.

Table 23. PATB aggregate gradation from
cold feed belt for quality assurance on August 28, 1995.

Sieve Size	Percent Passing (%)	Specification	Percent Fractured Faces
1-½"	100	100	
1-¼"	99	95-100	100
3/4"	61	40-70	100
3/8"	13	5-20	100
¼"	4	not specified	
#4	3 *	0-2	100
#200	0.6 *	0-0.5	

* Although the #4 and #200 screens were slightly out of the SHRP specification, the material was within acceptable WsDOT tolerances.

Equipment and Construction Methods

The PATB mix was batched at the ACME Cedarapids batch plant located 3.3 miles from the beginning of section 530210. The approximate mixing temperature was 240°F. Load King belly dump trucks hauled the mix to the sections. The mix was windrowed in front of the paver, then a Barber Greene elevator conveyed it into the paver. The paver was a Blaw Knox PF150. A 30' ski was used on the left side for grade control on the inner and outer passes. On the right side, an electronic control box following the wire line was used. For the center pass an 8" ski on each side of the paver was used for grade control. The paver moved at approximately 18' per minute, faster or slower depending on the width being paved.

The outer pass was paved first going northbound, the inner pass second going southbound, and the middle pass third going southbound. Photo 9, appendix A shows the center pass being paved. Figure 11 lists the dates and sequence of paving. No truck traffic was allowed to drive on the PATB. Because of this restriction, the belly dump trucks backed up to the paver to pave the center pass. This caused some short 5-10 minute delays at the north end, as each truck had to back up to the paver then drive out. When the paver reached the end of section 530209, there were no delays, since the backing distance was shorter. The PATB mix temperature did not decrease significantly during these delays.

Some minor bleeding of the prime coat on the DGAB was noted due to truck traffic. The DGAB remained sealed and well coated despite the truck traffic and slight tracking.

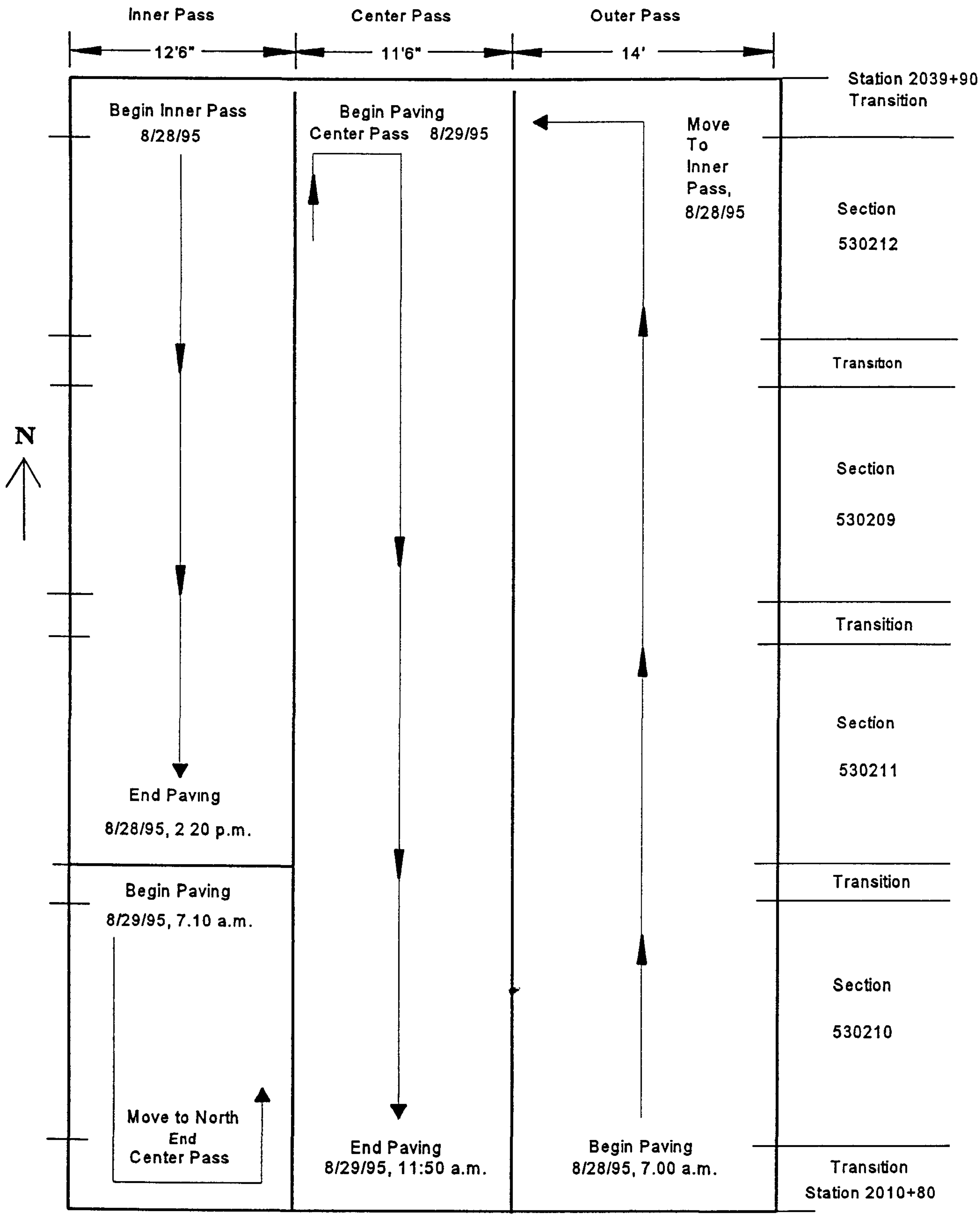


Figure 11. Sequence and dates of PATB paving.

Compaction

Inner and Outer Passes

The mix was allowed to cool to 150°F prior to compaction. The roller operator used a metal thermometer and took temperatures to determine how far he could proceed. The roller used was a C766B Hyster Double Drum Steel Vibratory roller used in the static mode. The total roller weight was 20,950 lbs. and the roller width was 5'.

Three passes were made over the entire width being paved. The outer passes were made first, and the center passes last for each paving width.

Center Lift

Initially, for the first 100' of paving, the mix was allowed to cool to 150°F prior to compaction. By letting the mix cool to 150°, the roller could not form a smooth seam between the center and outside passes and a small gap was present. After the first 100', the roller rolled about 8" into the center lift on both seams, while the mix was still near 180°F. This allowed the mix to move and form smooth seams on both sides of the center pass. After rolling the seams, the roller operator waited until the remaining PATB mix cooled to 150°, and then proceeded with compaction. All four sections were compacted using these same methods.

Detailed Construction

Section 530209

The outer pass was paved on August 28, 1995 from south to north. The paving temperatures averaged 179°F behind the paver. Paving took place from 10:00 until 10:35 a.m. After this pass, the mixing temperature was decreased 10-20°F at the plant due to the long cooling period needed prior to compaction. No change in aggregate coatings were evident from the decreased mixing temperature.

The inner pass was paved on August 28, 1995 from 1:00 p.m. until 1:35 p.m. Paving temperatures averaged 169°F behind the paver.

The center pass was paved from 9:35-10:05 a.m. on August 29, 1995. The paving temperatures taken from the mat behind the paver averaged 176°F.

The final average compacted layer thickness was 3.9" with a standard deviation of 0.4".

Section 530210

Paving began in the outer pass on August 28th at 7:00 a.m. The air temperature was 65°F. The initial 20 minutes were spent adjusting the screed depths on the paver. Wood blocks were used to set the depth to 5" at the rear of the paver. Several trucks sat from 7:10 until 7:30 while waiting for the paver to proceed.

By 7:45 a.m., the paver was into the 500' monitoring section. Temperatures taken in the window in front of the paver averaged 204°F.

Compaction did not begin until nearly 9:00 a.m., due to the waiting period needed for the mix to cool to 150°F. Paving was completed at 8:45 a.m.

Paving of the inner pass began on August 29, 1995 at 7:00 a.m., going southbound. The air temperature was 55°F. Paving was completed at 7:45 a.m. Temperatures taken in the mat behind the paver averaged 185°F.

From 11:00 a.m. to 11:40 a.m., August 29th, the center pass was paved from north to south. There was a 20 minute delay from 11:15 a.m. until 11:35 a.m. while the paver waited for trucks. Mat temperatures averaged 183°F.

The compacted thickness for this section averaged 3.8" with a standard deviation of 0.4".

Section 530211

The outer pass was paved from 9:10 a.m. to 9:40 a.m. on August 28, 1995. Paving mat temperatures averaged 187°F behind the paver.

The inner pass was paved from 1:45 p.m. to 2:15 p.m. on August 28th. The paving mat temperature averaged 166°F behind the paver. The temperatures were cooler due to decreasing mixing temperatures.

The center pass was paved on August 29th beginning at 10:16 a.m. and finishing at 10:45 a.m. The mat temperatures behind the paver averaged 177°F. The air temperature was 60°F. The final compacted thickness for this section averaged 3.9" with a standard deviation of 0.4".

Section 530212

On August 28th, the outer pass was paved from 10:45 a.m. until 11:30 a.m. Due to the mixing temperature at the plant being decreased, the paving temperature behind the paver averaged 164°F, cooler than the previous sections. Following this pass, the paver moved to the inner pass.

There was a slight delay starting the inner pass while the paving width was readjusted. Paving did not start until 12:05 p.m. on the transition, so this caused trucks to wait in line for 15-20 minutes prior to dumping. As a result, the paving temperatures behind the paver were cooler, and averaged 153°F for this pass. Paving was completed by 12:50 p.m.

The center pass was paved on August 29, 1995 starting at 8:30 a.m. and finishing at 9:22 a.m. This pass took longer to pave than the other sections. Belly trucks had to back up the length of the PATB sections to dump their loads, then drive out before another truck could begin backing in.

The average compacted layer thickness was 3.5" with a standard deviation of 0.4".

Quality Assurance Sampling and Testing

Seven small boxes of PATB mix were sampled from the center pass of each section at station 2+50. The samples were sent to the WsDOT testing laboratory in Olympia, Washington.

Table 24 shows the compacted thicknesses and standard deviations for the four PATB sections. The measurements were taken at five locations transversely. From the pavement edge, 0', 3', 6', 9', 12' and at 50' intervals longitudinally. The measurements were obtained by an elevation survey. Based on these elevation measurements, the average thickness for each section was slightly below the 4" specified thickness.

Table 24. Permeable asphalt-treated base measured layer thicknesses.

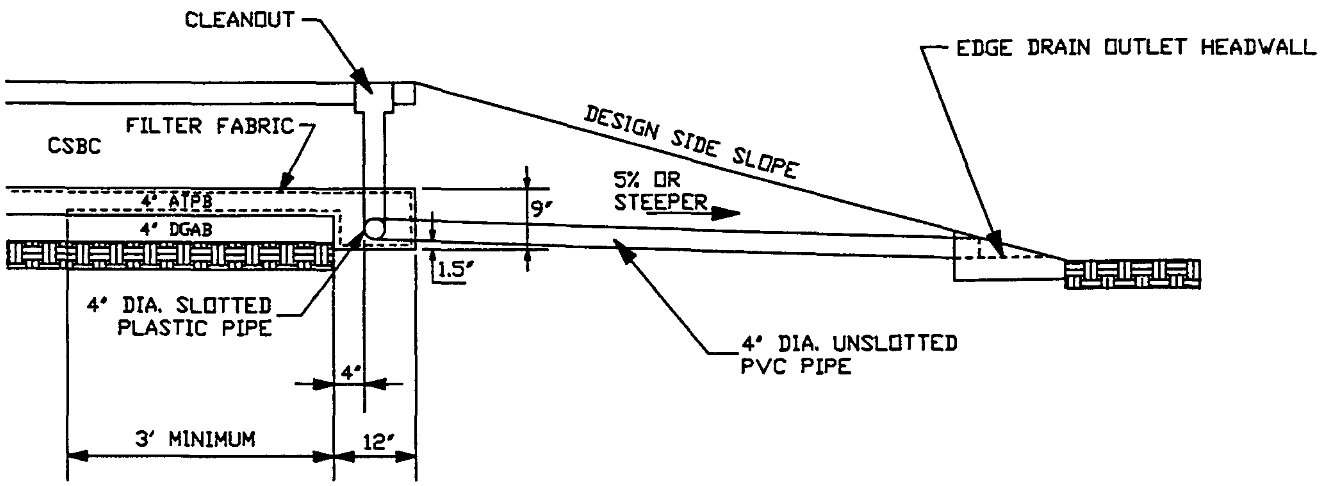
Section	Average Thickness (inch)	Specified Thickness (inch)	Low (inch)	High (inch)	Standard Deviation (inch)
530209	3.9	4.0	3.2	4.7	0.4
530210	3.8	4.0	2.9	4.4	0.4
530211	3.9	4.0	3.4	4.9	0.4
530212	3.5	4.0	2.8	4.3	0.4

Edge Drain Construction

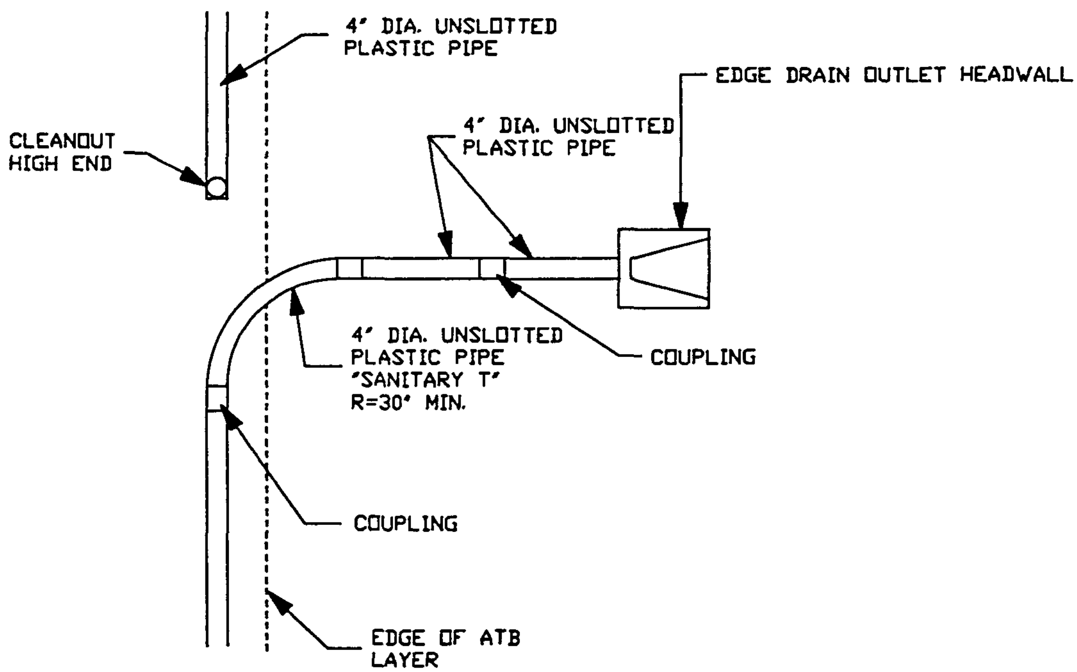
The PATB sections required longitudinal edge drains within each section. A geotextile fabric was required to extend from under the PATB layer, around the edge drain, and under the PCC layer. This fabric was intended to prevent the clogging of the PATB layer and edge drain system. Figure 12 shows a detail of the WsDOT drain specification with a plan view of the outlet detail.

The capped end was always the high end of the trench. Cleanouts were attached to each 200' section of pipe at the high end. Appendix D contains Standard Plan B-9, the headwall specification used by WsDOT.

The geotextile used was manufactured by AMOCO. The material was a polypropylene "Style CEF 4546". Appendix D contains the Geotextile Test Report for this fabric, tested by the WsDOT physical testing lab. The fabric met WsDOT and SHRP specifications.



SHRP SECTION EDGE DRAIN WITH OUTLET DETAIL



PLAN VIEW
EDGE DRAIN OUTLET DETAIL

Figure 12. Edge drain and outlet details, PATB sections, WA SPS-2.

The drainage pipe used was a PVC material. For the longitudinal drains, a 4" diameter perforated pipe was used. There were 2 rows of ¼" diameter holes on the underside of the pipe. The holes were spaced at 2". For the outlets, a 4" diameter unslotted pipe was used. The aggregate used in the edge drain was the PATB rock and remained untreated.

Detailed Edge Drain Construction

The edge drain construction on this project was somewhat of a challenge. Due to the PCC wire lines being located directly over the location specified for the edge drains, the construction of the drains was staged. In order to provide complete continuous coverage with the fabric in the trench, fabric was partially laid under the PATB, to be later wrapped around the trench. The PATB was placed, the PCC was placed, then the edge drains were trenched and constructed. Details of the construction follow.

On August 25th, prior to PATB Construction, a 6' width of fabric was placed. Two feet extended onto the primed DGAB. The fabric was held in place with large nails. The remaining 4' was folded up following PATB construction and kept in place with rocks and soil. The fabric was folded up to prevent sun damage. It was necessary to place the fabric prior to PATB construction in order to be able to tie into it later during edge drain construction.

On September 28th during PCC paving on section 530212, a 6' width of fabric was placed on the PATB, with 1' extending under the PCC. Due to the construction traffic, the spreader and paver, holes developed in the fabric.

Prior to edge drain construction, the prime contractor in charge of dirt work, by mistake, spread aggregate shoulder material on the PATB inner shoulder from station 2026+00 to the end of the PATB section 530212. The aggregate had to be removed with a grader, and in the process, the fabric on top of the PATB in section 530212 had to be removed. Also, from 2026+00 to the end of section 530212, (sections 530209 and 530212), the 6' piece of fabric under the PATB was damaged in many spots. The entire piece from 2035+00 to 2036+00 was damaged.

After the aggregate was removed, KRC personnel used an air hose to blow off the PATB surface on all four section. A cement slurry from the PCC construction covered parts of the PATB surface on all four sections.

On October 24th and 25th, the edge drain trench was dug using a backhoe. Figure 13 shows the edge drain profile detail. The drainage outlet pipes were located every 200' in this figure and the slope of each 200' trenched section was 0.5 percent. The slopes from station 2011+00 to station 2033+50 were -0.5 percent and from station 2033+50 to station 2039+50 were +0.5 percent. Following trenching, the piece of fabric that was placed under the PATB was laid into the trench. The fabric extended to about the top of the trench.

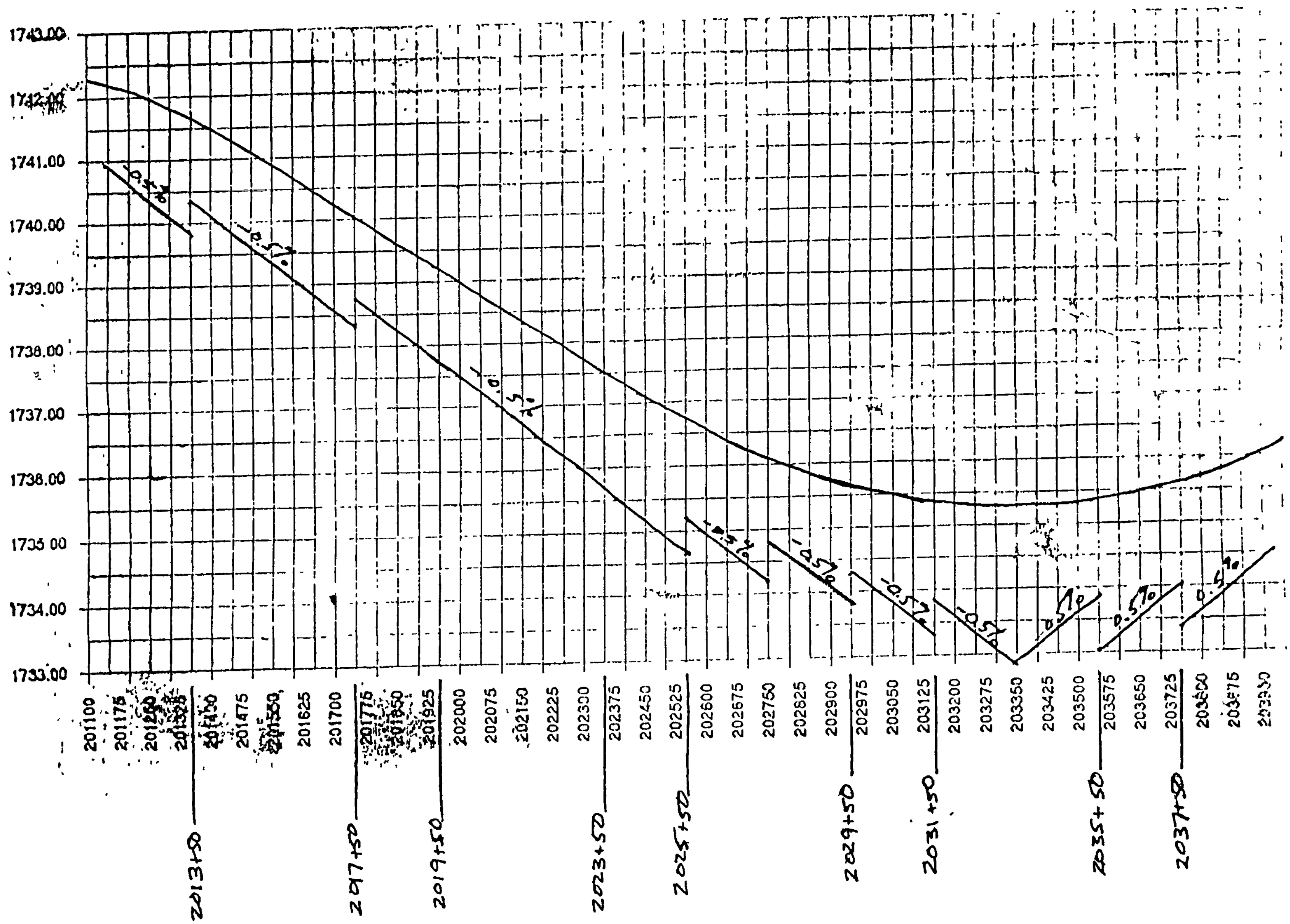


Figure 13. Edge drain profile detail.

The fabric that had been damaged was repaired at this time. For large patches, a large 6' wide piece of fabric was placed under the pipe and covered the entire drain. It was folded over the edge of the PATB. For small patches, a piece of fabric was placed over the hole and held up with drain rock. Two large patches were placed, one from station 2035+00 to 2036+00, and one in the transition between sections 530212 and 530209.

KRC laid the perforated pipe, (with the holes down) starting at the north end. Caps were placed on the high end of each 200' section. On the low end, a curved 90° elbow was placed and a 10' piece of pipe was connected to the elbow. Drain rock was placed under the pipe at 10' intervals. Elevations were taken at these 10' intervals, and rock was added or taken away until the elevation was to grade.

Once the pipe was to grade, a front end loader placed rock in the trench to the top. The edges of the fabric had to be held up to prevent sagging (photo 10, appendix A). The fabric from 2026+00 to the end of section 530212 was too short, and was buried when the trench was filled. KRC used shovels to remove enough rock to expose the fabric. During this process, some trenched dirt was mixed in with drain rock. The fabric in sections 530210 and 530211 was slightly longer and did not get buried when placing the drain rock.

Several of the patches in sections 530209 and 530212 did not entirely cover the holes, or sagged during placement of the rock, leaving the trenched soil exposed to the drain rock. No patches were needed in sections 530210 and 530211.

On October 30th, KRC placed a 6' width of fabric over the PATB. Prior to placing the fabric, an air hose was used to blow off the PATB. The fabric extended from the edge of the PCC to the outer edge of the drain. The fabric on the outer edge was overlapped with the short piece extending from the drain (photo 11, appendix A). The overlap of the fabric in sections 530209 and 530212 was about 4" in most locations. In sections 530210 and 530211, the overlap was closer to 1' due to the longer fabric. A front-end loader placed drain rock on top of the fabric to securely hold it in place.

On October 31st, the edge drain outlet trenches were finished to grade, and 20' of pipe was added to the 10' existing. The outlet grades had a minimum of 5 percent slope. A grader graded the trenched soil into the outlet trenches.

Belly dump trucks placed DGAB shoulder material onto the PCC surface, and a grader moved the material onto the shoulder, on top of the fabric. The fabric was not being pushed or torn. A grader then leveled the soil on top of the fabric, and a vibratory compactor followed. No compaction was done on the drain rock prior to placing the shoulder material.

Following the shoulder material placement, the capped ends of the drain pipes were dug up and cleanouts were connected. The cleanouts extended 3" above the DGAB shoulder. KRC placed the outlet headwalls on October 31st. The standard WsDOT concrete headwall design was used and rodent protectors were added.

On November 13th, the asphalt shoulder was paved around the cleanouts.

PORTLAND CEMENT CONCRETE

All thirteen Washington SPS-2 test sections received a Portland Cement Concrete (PCC) surface course. The thickness, width, and strength varied by section, as was shown in figure 1. State section 530259 had a 14' wide travel lane, a 10" thickness, and a 650 psi design strength. The SHRP sections had either a 12' or 14' travel lane width, an 8" or 11" thickness, and a 550 psi or 900 psi design strength. The shoulders were paved following PCC construction with an AC mixture.

Materials

Three different concrete mixes were used for the 13 test sections as listed in table 25.

Table 25. PCC mixes, WA SPS-2.

Section	Mix design 14-day flexural strength (psi)	Specified 14-day design strength (psi)
530259	694 *	650
530201, 530203, 530205, 530207, 530209, 530211	542 **	550
530202, 530204, 530206, 530208, 530210, 530212	933 **	900

* Center Point Loading, AASHTO
** Third Point Loading, AASHTO

Aggregates

Three aggregate types were used for the PCC mixes:

1. Crushed course aggregate.
2. Crushed fine aggregate.
3. Natural sand.

The crushed rock was crushed and washed as explained in the Rock Crushing Operations section.

The course aggregate used for the PCC mixes met WsDOT Type II specifications. Samples taken during production for WsDOT acceptance sampling and testing yielded the results listed in table 26.

Table 26. Course concrete aggregate acceptance sampling gradations, WsDOT.

Sieve Size	% Passing * (Average of 66 tests)	Standard Deviation (%)	Specification (%)
1-½"	100	0	100
1-¼"	98.4	1.0	95-100
3/4"	56.1	7.0	40-70
3/8"	10.7	3.1	5-20
#4	1.5	0.6 **	0-2

* Tests run from June 5, 1995 through August 8, 1995.
** 5 tests on June 6th were 2-4 percent, all other tests were 2 or under.

The fine aggregate used for the PCC mix consisted of approximately 12 percent natural sand and 88 percent crushed fines. The fine aggregate met WsDOT class II specifications. Originally the fine aggregate was to meet WsDOT class I specifications, but it was later determined by WsDOT that the class II specification would be accepted. Table 27 lists the results of WsDOT acceptance testing on the fine aggregate.

Table 27. Fine concrete aggregate acceptance sampling gradations, WsDOT.

Sieve Size	% Passing *(Average of 36 Tests)	Standard Deviation (%)	Specification (%)
3/8"	100	0	100
#4	99	1.2	95-100
#16	51	6.2	45-80
#50	19	4.1	10-30
#100	7	1.3	2-10
#200	1.5	0.4	0-2.5

* Tests run from June 23, 1995 through August 9, 1995.

Additives

Three additives were used during the mix design procedure as needed:

1. Pave Air 90 -- An air entraining admixture meeting AASHTO M154 specifications. The manufacturer was Master Builders, Inc., of Cleveland, Ohio.

2. Master Pave -- A Type A water reducing agent meeting AASHTO M194 specifications. The manufacturer was Master Builders, Inc., of Cleveland, Ohio.

3. Class F Fly Ash -- This conformed to AASHTO M295 specifications. The supplier was William T. Zuck and Pozzolanic of Rock Springs, Wyoming.

Cement and Fly Ash

The cement used for the PCC mixes was Type II. The manufacturer was Holnam, Inc. of Three Forks, Montana. The supplier was the Spokane, Washington Holnam Company.

The fly ash was class F. The manufacturer was Pozzolanic International of Mercer Island, Washington.

Appendix E contains the physical and chemical test results on both the cement and fly ash.

Mix Designs

The initial laboratory mix designs for the State 650 psi mix and the SHRP 550 psi and 900 psi mixes were performed at the ACME Spokane materials laboratory. The lab supervisor was Dave Fisher.

An 8 H.P. Essick revolving drum mixer was used for mixing. Beam molds 21" long, 6" in depth, and 6" in width were used. A vibrating flexible rod was used for consolidation. The standard AASHTO T126-86 procedure for fabricating and curing laboratory specimens was followed.

The center point loading method for flexural beam strength was used to test the State 650 psi beams. The third point loading method was used to test the SHRP 550 psi and 900 psi beams for flexural strength.

For the SHRP 900 psi mix, a field trial batch was performed at the ACME batch plant. A set of beams reached 865 psi from the laboratory mix design, and ACME wanted to verify this in the field.

The mixing was done at the ACME plant, and the mix was brought to the beam molds using a front end loader. Forming and finishing methods were according to AASHTO. The beams were cured with a white pigmented curing compound and then covered with an insulted blanket. After curing outside overnight, the beams were transported to the Spokane laboratory in a water bath. The field trial batch resulted in the 900 psi mix design.

Table 28 summarizes the accepted mix designs for all three mixes. The complete mix designs are found in appendix E.

Table 28. PCC mix design summary, WA SPS-2.

Ingredients (per yd^3)	550 psi mix	650 psi mix	900 psi mix
Holnam Type II Cement (lb)	423	451	925
Type F Fly Ash (lb)	47	113	0
WsDOT Class II F.A. (lb)	1395	1087	948
WsDOT Type II C.A. (lb)	1919	2103	1833
Water (lb)	230	237	285
Water Reducer (oz)	28.2	56.4	92.5
Air Entraining (oz)	4.7	5.6	5.1
Physical Properties (actual)			
Slump (inch)	0.3	0.3	1
Air Content (%)	4.7	5.6	6.2
Water Cement Ratio	0.49	0.42	0.29
14-Day Flexural Strength (psi) (3 Beam Average)	542	690	933

PCC Mixture Changes/Characteristics During Construction

During the four days of PCC paving, the contractor adjusted the water cement ratio and amounts of air entraining and water reducing agents based on the mix consistency on the road, and the air percent in the mix. Table 29 summarizes the changes made for all sections. The average water cement ratios and standard deviations for the 550 psi, 650 psi, and 900 psi sections is shown in table 30.

Table 30. Water cement ratio averages during PCC paving.

Mix Strength (psi)	Average W/C Ratio	Standard Deviation
550	0.455	0.014
650	0.360	0.004
900	0.286	0.009

Mix Consistency During Placement

The 550 psi mix was the coarsest of the three mixes placed. The surface texture behind the astroturf drag had a "grainy" look. The edges required a lot of finishing work due to the course mix not forming a smooth edge. Following tining and curing, the surface had a rough look (photo 12, appendix A).

Table 29. PCC mixture adjustments during paving.

Section	Day	Batch Time	Water Cement Ratio as Batched	Water Added or Lowered	Pave Air (oz/yd^3)	Masterpave (oz/yd^3)	Comments
530207	9/26/95	7:59 a.m.	.470		10.3	28.2	Beginning of 500 psi mix - dry mix
	9/26/95	8:17 a.m.	.477	Added	10.3	28.2	Beginning of 500' section
	9/26/95	8:37 a.m.	.485	Added	10.6	28.2	Dry mix
	9/26/95	10:18 a.m.	.483		11.2	28.2	Dry mix
	9/26/95	11:09 a.m.	.482	Added	11.2	47.0	
	9/26/95	12:42 p.m.	.482		11.2	47.0	End of 500' section
530206	9/26/95	1:16 p.m.	.298		15.0	92.5	Beginning of 900 psi mix
	9/26/95	1:31 p.m.	.300	Added	17.0	92.5	
	9/26/95	1:47 p.m.	.299		17.0	92.5	Beginning of 500' section
	9/26/95	2:53 p.m.	.301	Added	21.0	92.5	
	9/26/95	4:14 p.m.	.300	Lowered	20.0	92.5	
	9/26/95	4:24 p.m.	.296		20.0	92.5	End of 500' section

Table 29. PCC mixture adjustments during paving. (contd.)

Section	Day	Batch Time	Water Cement Ratio as Batched	Water Added or Lowered	Pave Air (oz/yd^3)	Masterpave (oz/yd^3)	Comments
530208	9/28/95	6:51 a.m.	.302		20.0	92.5	Beginning of 900 psi mix
	9/28/95	7:15 a.m.	.300		20.0	92.5	Beginning of 500' section
	9/28/95	7:31 a.m.	.296	Lowered	20.0	92.5	
	9/28/95	8:00 a.m.	.291	Lowered	20.0	92.5	
	9/28/95	8:30 a.m.	.286	Lowered	20.0	92.5	
	9/28/95	8:49 a.m.	.281	Lowered	20.0	92.5	End of 500' section
530205	9/28/95	10:30 am.	.465		11.2	47.0	Beginning of 500' section
	9/28/95	11:00 a.m.	.461	Lowered	10.2	47.0	
	9/28/95	11:14 a.m.	.451	Lowered	10.2	47.0	End of 500' section
530201	9/28/95	11:55 a.m.	.447		9.7	47	Beginning of 500' section
	9/28/95	12:00 p.m.	.452	Added	9.7	47	
	9/28/95	12:30 p.m.	.454	Added	9.7	47	
	9/28/95	12:47 p.m.	.454	Lowered	9.7	47	End of 500' section

Table 29. PCC mixture adjustments during paving. (contd.)

Section	Day	Batch Time	Water Cement Ratio as Batched	Water Added or Lowered	Pave Air (oz/yd³)	Masterpave (oz/yd³)	Comments
530204	9/28/95	1:42 p.m.	.280		20.0	92.5	Beginning of 500' section
	9/28/95	2:00 p.m.	.277	Lowered	20.0	92.5	
	9/28/95	2:30 p.m.	.277	Lowered	17.0	92.5	
	9/28/95	3:00 p.m.	.281	Added	17.0	92.5	
	9/28/95	3:00 p.m.	.281	Added	17.0	92.5	
	9/28/95	3:20 p.m.	.282		17.0	92.5	End of 500' section
530212	9/28/95	3:56 p.m.	.273		17.0	92.5	Beginning of 500' section
	9/28/95	4:30 p.m.	.274		17.0	92.5	
	9/28/95	5:00 p.m.	.276	Added	17.0	92.5	
	9/28/95	5:27 p.m.	.277		17.0	92.5	
	9/28/95	5:45 p.m.	.277		17.0	92.5	End f 500' section

Table 29. PCC mixture adjustments during paving. (contd.)

Section	Day	Batch Time	Water Cement Ratio as Batched	Water Added or Lowered	Pave Air (oz/yd^3)	Masterpave (oz/yd^3)	Comments
530209	9/28/95	6:53 p.m.	.449		8.2	47.0	Beginning of 500' section
	9/28/95	7:08 p.m.	.437	Lowered	8.2	47.0	
	9/28/95	7:40 p.m.	.437	Added	8.2	47.0	End of 500' section
530211	9/29/95	9:30 a.m.	.447		8.2	47.0	Beginning of 500' section
	9/29/95	10:00 a.m.	.454	Lowered	8.2	47.0	
	9/29/95	10:27 a.m.	.458	Added	8.2	47.0	
	9/29/95	11:06 a.m.	.450	Lowered	8.2	47.0	End of 500' section
530210	9/29/95	11:32 a.m.	.277		17.0	92.5	Beginning of 500' section
	9/29/95	12:00 p.m.	.289	Added	17.0	92.5	
	9/29/95	12:29 p.m.	.282	Lowered	17.0	92.5	
	9/29/95	12:45 p.m.	.283		17.0	92.5	End of 500' section

Table 29. PCC mixture adjustments during paving. (contd.)

Section	Day	Batch Time	Water Cement Ratio as Batched	Water Added or Lowered	Pave Air (oz/yd^3)	Masterpave (oz/yd^3)	Comments
530202	9/29/95	1:42 p.m.	.283		16.8	92.5	Beginning of 500' section
	9/29/95	2:00 p.m.	.282		16.8	92.5	
	9/29/95	2:30 p.m.	.281		16.8	92.5	
	9/29/95	3:00 p.m.	.285	Added	17.0	92.5	
	9/29/95	3:13 p.m.	.287	Added	17.0	92.5	End of 500' section
530203	9/29/59	4:13 p.m.	.456		8.2	47.0	Beginning of 500' section
	9/29/95	4:30 p.m.	.453	Lowered	8.2	47.0	
	9/29/95	5:00 p.m.	.449	Lowered	8.2	47.0	
	9/29/95	5:28 p.m.	.433	Lowered	8.2	47.0	
	9/29/95	5:39 p.m.	.433		8.2	47.0	End of 500' section

Table 29. PCC mixture adjustments during paving. (contd.)

Section	Day	Batch Time	Water Cement Ratio as Batched	Water Added or Lowered	Pave Air (oz/yd^3)	Masterpave (oz/yd^3)	Comments
530259	10/3/95	7:30 a.m.	.364		8.8	56.4	
	10/3/95	7:42 a.m.	.352	Lowered	9.2	56.4	Beginning of 500' section
	10/3/95	8:00 a.m.	.359	Added	9.5	56.4	
	10/3/95	8:17 a.m.	.362		9.5	56.4	
	10/3/95	8:35 a.m.	.363		9.5	56.4	
	10/3/95	8:49 a.m.	.361		9.8	56.4	End of 500' section

The State 650 mix was somewhat grainy, but not as grainy as the 550 mix. The edges and surface required some hand finishing, but usually not a significant amount. Following tining and curing, the surface looked more course than the 900 psi mix and smoother than the 550 psi mix.

The 900 psi mix had a relatively smooth surface texture compared to the 550 psi mix. The edges were usually smooth and straight behind the slipform paver. Less edge and surface finishing was required than with the 550 mix. Following tining and curing, the surface had a smooth look compared to the 550 mix (photo 13, appendix A).

Equipment and Construction Methods

PCC Mix Plant

The ACME PCC batch plant was located 3.4 miles south of the beginning of section 530259. The type of the plant was a Rex, Model "S". It consisted of 3 hoppers for aggregate, 1 silo each for fly ash and cement, and a double set of mixing drums. The aggregate was stored in stockpiles (watered with large sprinklers), and the additives in large plastic tanks. The course aggregate was watered mainly for dust control. Photo 14 in appendix A shows the ACME batch plant.

The course aggregate was added to two hoppers and the fine aggregate to the third. The bottom of the fine aggregate hopper had a moisture sensor to determine the moisture of each batch. The course aggregate hoppers did not have moisture sensors. According to the plant operator, the course aggregate did not contain enough moisture to make a difference in the mix. The water added to the mix could be adjusted for each batch if needed. Scales at the bottom of each hopper weight the amounts of aggregate needed for each mix. After weighing, the aggregate was fed on belts to mixing drum 1. The additives Masterpave and Pave Air were measured then added to the water supply.

The cement, fly ash if used, water, and additives were added at the inlet of mixing drum 1. The mixing drum had large 1' wide fins that mixed the material and smaller 6" fins that guided the material to the end of the drum for transferring to mix drum 2. The mixing time was about 25 seconds.

To transfer the mix to mixing drum 2, paddles at one end of the drum brought the mix to the top of the drum, a chute was left open, and the mix fell down the chute into mix drum 2. (During the mixing the chute was closed, and the mix fell back into the drum.) The transfer time was 35 seconds.

Following the transfer, the PCC was mixed for about 10 more seconds and then dumped into the haul trucks. A new batch could enter mix drum 1 as soon as it was completely emptied. The total mixing time was 70 seconds. The transfer time was considered to be part of the mixing time. Each mixing drum had a 12 yd^3 capacity. The 550 mix was batched in 10 yd^3 batches. Due to the cement scale having a weight limit, the 900 psi mix could only be batched in 7 yd^3 batches.

Dump trucks hauled the mix on a temporary haul road just outside of the inner shoulder. The road was watered down well to keep dust from accumulating on the bases prior to PCC placement.

Mix Transition Stations

During the PCC placement, the mix was changed back and forth between the 550 psi mix and the 900 psi mix seven times. The locations at each time are listed in table 31.

Roadway Watering Prior to Paving

All of the bases, the LCB, PATB, DGAB and ATB, were moistened prior to PCC placement. A large water truck with a side sprayer was used, and coverage was obtained by driving on both sides of the roadway. A hand held hose from the same truck was also used when needed. The PATB received more water than the other bases due to the water loss through the base.

Table 31. Location of PCC mix changes.

Station	Transition Sections	Mix Changed From/To
1995+80	530259 to 530203	650 psi to 550 psi
2004+10	530203 to 530202	550 psi to 900 psi
2019+65	530210 to 530211	900 psi to 550 psi
2032+90	530209 to 530212	550 psi to 900 psi
2046+20	530204 to 530201	900 psi to 500 psi
2063+00	530205 to 530208	550 psi to 900 psi
2078+70	530206 to 530207	900 psi to 550 psi

Dowels, Dowel Baskets, and Tie Bars

Two sizes of dowel bars were used for this project: 1-¼" diameter for 8" PCC and 1-½" diameter for 11" PCC. State section 530259 did not require dowel bars. The dowels were covered with 8 mils of epoxy coating, were 18" long, and met ASTM Type B specifications. They were placed mid-depth in basket assemblies as shown in figure 14, spaced at 15' intervals longitudinally. The dowels were required to be coated with grease or other suitable lubricant to prevent bonding to the PCC. Photo 15, appendix A shows the dowel basket assemblies on the PATB, and workers covering them with grease. The dowels on the LCB sections were covered with the curing compound during spraying on the LCB. The undersides were hand sprayed with the curing compound. All other dowels were hand greased with a thick black grease. The dowel baskets were secured to the different bases as follows:

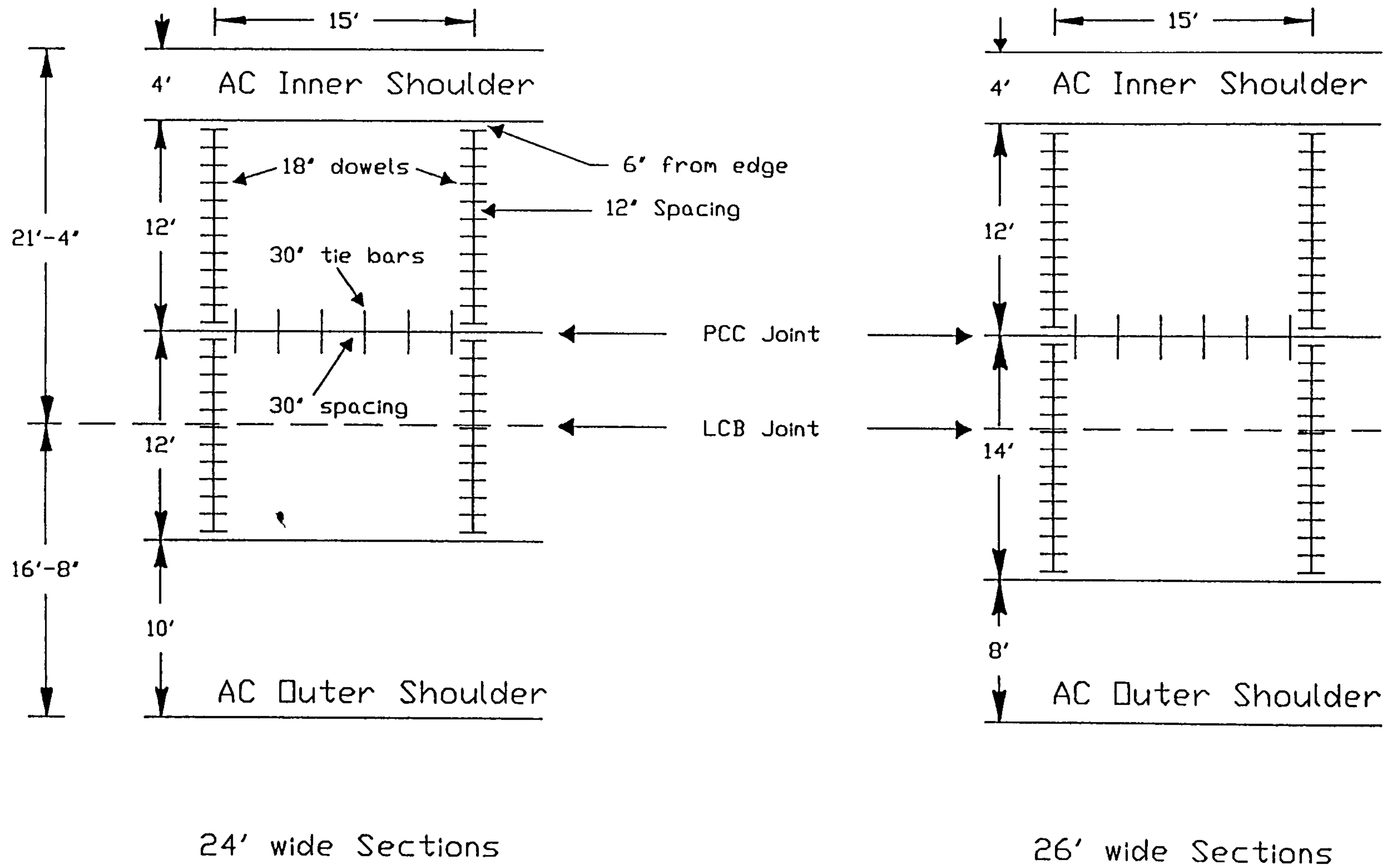


Figure 14. Dowel and tie bar configuration, WA SPS-2.

* DGAB - 12" long steel stake with connector on top
* PATB - 12" long steel stake with connector on top
* LCB - Concrete nails and metal ties

The dowel bar supplier was Birmingham Steel Corporation, Kankakee, Illinois. The dowels were coated by Midwest Pipe Coating, Schererville, Indiana. The dowel basket supplier was Dayton Superior of Miamisburg, Ohio. Appendix G shows the detail of the dowel basket assembly and connection stake.

The dowel basket assembly contained spacer wires. The manufacturer recommended in the drawing to cut the spacers after staking the assembly to grade. At the beginning of section 530207, the spacers were cut. The baskets were observed to be "bowing" and moving slightly under the load of the PCC. For the remainder of the project, WsDOT decided to notch each spacer wire with wire cutters. This meant cutting the wires about ½ way through. The notching was meant to weaken the spacer wire so it would break at the joints, yet still hold the basket together during construction. It is highly probable that the baskets deformed under the load of the concrete resulting in displacement of the dowel bars.

The alinement of all dowels and dowel baskets was checked prior to paving by LTPP personnel. Any bent baskets, broken welds, or misaligned dowels were corrected or fixed by ACME prior to paving. All dowel baskets were marked with a nail on both the inner and outer edge of the shoulder to allow marking of the PCC for saw cutting. After paving, dowel alinement was not checked

Tie bars were placed along the center line of the concrete surface. The tie bars used were 30" long epoxy coated number 5, grade 40 deformed steel bars. They were placed mechanically at the front of the paver, spaced 30 inches center to center (see figure 14). The tie bar supplier was Birmingham Steel, and the coating was done by Midwest Pipe Coating.

Both the dowels and tie bars were coated with SCOTCHKOTE Brand 413 fusion bonded epoxy coating. The supplier of the epoxy was 3M Corporation, New Ulm, Minnesota. Ends of the dowel and tie bars were not epoxy-coated.

Paving

The paving train consisted of a track mounted spreader, a track mounted paver, finishers, a tining machine, and a curing machine. The spreader had side loading conveyor belts. For the majority of the project, both belts were used. The left belt fed onto a belt feeding the right belt. The combined mix was then fed onto a rotating center belt which distributed the mix onto the roadway.

The mix distributed onto the roadway from the main center belt tended to segregate slightly. The fine mix would tend to stay on the belt longer and "squeegee" off into a pile below the spreader arm. The course mix would tend to "fly" off of the belt and accumulate above the fine pile against the spreader screed. When the spreader screed passed over the pile, the course mix would get pushed over the fine mix. Photo 16 in appendix A shows this process.

Guide boxes were located front and rear on both sides of the spreader for horizontal alinement. The height of the spreader had to be adjusted manually. The spreader was manufactured from Guntert and Zimmerman parts by ACME personnel.

The paver was a track mounted Guntert and Zimmerman slipform paver. For the 24' wide sections, 22 vibrators were spaced at 14" intervals on the front of the paver. For the 26' wide sections, 24 vibrators were used. Two curved vibrators were placed at the bottom of the tie bar inserter. A measuring wheel was mounted on the paver track to measure the progress of the paver. Every 30", a computer triggered the insertion of a tie bar after manually placing a tie bar into the inserter. The computer recorded the distance traveled and was programmed to skip the dowel baskets. A hydraulically-operated plow moved laterally on the front of the paver to distribute the mix. On the rear of the paver, a water bar periodically sprayed a mist of water onto a burlap cloth spread across the width of the PCC surface. A 13' long by 1' wide machine trowel was mounted 3' behind the rear of the paver for finishing. Following the trowel, an astroturf carpet was pulled over the PCC surface for texture.

Guide boxes were located front and rear on both sides of the paver. These boxes followed the wire line on both edges of the pavement and adjusted the paver for horizontal and vertical alinement. Floats mounted on long bars and edging tools were used by finishers following the paver. They removed any surface rough spots and cleaned up the edges of the PCC. Photos 17 and 18 show the Guntert and Zimmerman paver.

Tining

The tining machine consisted of an 8' tining bar moving laterally across the width of the pavement. The tines were 1/8" wide, 5" long, and were spaced ½" apart center to center. This left a 3/8" gap between tine marks. Before moving laterally, the tining bar was lowered so that 2-½" of the tines were below the surface at the edge of the PCC. This left about 1/8" grooves in the surface of the PCC.

Due to the differences in the 550, 650, and 900 psi mixes, they did not all set at the same time. Tining on the 900 psi mix could be done sooner than on the 550 psi mix, since the 900 psi mix set up faster. Depending on the air temperature, wind, and sun, the timing of the tining had to be judged carefully. Table 32 lists approximate average tining and curing times for each section.

Curing

The curing machine consisted of spray nozzles on a bar mounted to a raised motorized platform. The nozzles were spread at 14" spacing. Nozzles were also located on curved extensions at the end of the bar to reach the sides of the PCC. The machine moved at a speed sufficient to provide a uniform thin coating of white pigmented curing compound on the PCC surface. The brand of the cure was Sealtight 1600, supplied by W.R. Meadows Company of Hampshire, Illinois.

The curing compound was applied to the PCC surface at an average rate of 1 gallon/121 ft^2 for the four days of paving.

Table 32. Approximate tining and curing times after PCC placement.

Section/ Mix Type	Tining Time (minutes)	Curing Time (minutes)	Comments
530201 (550)	70	75	
530202 (900)	20	23	
530203 (550)	60	65	Wet mix
530204 (900)	20	25	
530205 (550)	80	85	
530206 (900)	20	25	
530207 (550)	60	68	After station 2082+50
530207 (550)	35	42	Beginning of section to station 2082+50
530208 (900)	90	10 water/ 95 cure compound	Sprayed water cure before tining
530209 (550)	80	85	
530210 (900)	25	30	Some water sprayed at beginning of section
530211 (550)	80	85	
530212(900)	20	25	

Joint Sawing

The SHRP sections required non-skewed transverse joints spaced at 15' intervals and a centerline longitudinal joint. State section 530259 required random, 14', 13', 9' and 10' joint spacings. The joints were skewed 2' in 12'. Diversified Concrete Cutting of Sparks, Nevada performed the sawing. Their procedure was as follows:

1. Wait minimum of 12 hours to begin sawing.
2. Use a screwdriver to scratch the surface. If it flaked too much, the surface was still too "green". Wait 1 hour and scratch again until okay to proceed.
3. Saw until concrete becomes "green" again.
4. Blow out all joints with pressurized air hose and water.

The transverse saw contained four 3/16" thick diamond blades. The blades were lined up on both sides of the PCC on marks left by the contractor. The marks were placed at the center of each dowel basket.

The longitudinal saw contained one 3/16" thick diamond blade. The saw was guided by a long arm with wheels which ran along the edge of the PCC. The target cutting depths were 2.7" for the 8" sections and 3.7" for the 11" sections.

The sawing began 12 hours following PCC placement. Due to the different setting rates for the 550 psi and 900 psi mixes, the contractor occasionally had to bypass a 550 psi section and move ahead to saw a 900 psi section. Table 33 lists the approximate sawing times for all sections. The sawed joints on the 900 psi sections were less jagged than on the 550 psi sections.

Table 33. Sawing times for transverse and longitudinal joints.

Sections Paved	Date Paved	Time Begin Paving	Time End Paving	Time, Date Begin Sawing	Time, Date End Sawing
530206, 530207	9/26/95	8:00 a.m.	5:00 p.m.	8:00 p.m., 9/26/95	5:00 a.m., 9/27/95
530201, 530204, 530205, 530208, 530209, 530212	9/28/95	7:00 a.m.	8:00 p.m.	7:00 p.m., 9/28/95	3:30 p.m., 9/29/95
530202, 530203, 530210, 530211	9/29/95	9:15 a.m.	6:00 p.m.	10:00 p.m, 9/29/95	11:00 a.m., 9/30/95
530259	10/3/95	7:00 a.m.	7:30 a.m.	7:00 p.m., 10/3/95	10:00 p.m., 10/3/95

Table 34 lists the average measured saw cut depths for both longitudinal and transverse joints.

On October 2nd (three to five days after paving), the widths of the transverse and longitudinal joints were measured. All of the longitudinal joints had a ¼" width. The uncracked transverse joints all had a ¼" width. Table 35 lists the average cracked transverse joint widths for each section. Cracking was determined by examining the exposed edges of the PCC. Observation showed the "working joints" were 5 to 6 panels apart.

Table 34. Average measured sawcut depths.

Section	Design Thickness (inches)	Average Transverse Sawcut Depth (inches)	Average Longitudinal Sawcut Depth (inches)
530201	8	2.7	2.5
530202	8	2.5	2.7
530203	11	3.1	3.3
530204	11	3.5	3.6
530205	8	2.5	2.6
530206	8	2.9	3.0
530207	11	3.3	2.8
530208	11	3.1	3.5
530209	8	2.5	3.4
530210	8	3.3	2.7
530211	11	2.7	3.2
530212	11	3.3	3.3
530259	10	2.7	3.0
Average	8" Thickness	2.7	2.8
Standard Deviation	8" Thickness	0.3	0.3
Average	11" Thickness	3.2	3.3
Standard Deviation	11" Thickness	0.3	0.3

Table 35. Average measured cracked joint widths.

Section	Mix Strength (psi)	PCC Thickness (inches)	Average Cracked Width (inches)
530201	550	8	¼
530202	900	8	5/16
530203	550	11	¼
530204	900	11	5/16
530205	550	8	No cracks
530206	900	8	5/16
530207	550	11	¼
530208	900	11	5/16
530209*	550	8	9/32
530210*	900	8	½
530211*	550	11	9/32
530212*	900	11	½
530259	650	10	¼

* PATB base

The 550 psi mix on the DGAB and LCB had hairline cracks at the joints, and the joints measured ¼", meaning that although the PCC had cracked, no measurable shrinkage at that joint had occurred. Section 530205, the 8" 550 psi mix on the LCB, did not have any joints that had cracked as of October 2, 1995. The 550 psi mix on the PATB sections had cracked joints measuring up to 5/16".

The 900 psi mix had larger cracked joint widths than the 550 psi mix on all of the sections, with the widths on the PATB sections averaging ½". One joint on section 530212, the 11" thick 900 psi section, measured 9/16". The dowel bars were clearly visible through the crack (photo 19, appendix A).

Joint Sealing

Joint sealing on the longitudinal and transverse joints was begun a minimum of one week after sawing. Diversified Concrete Cutting also performed the joint sealing. The joint sealant used was "Road Saver 515", supplied by Crafco, of Chandler, Arizona.

The sealant material was an asphaltic based, heated material. The sealant met the requirements of AASHTO M 173, Concrete Joint Sealer, Hot Poured Elastic Type. The sealing procedure was as follows:

1. Wait a minimum of 1 week following sawing.
2. Flush saw cut out with compressed air.
3. Heat self-leveling filler to 260°F.
4. Using a special thin tip, fill the joints from the bottom up per WsDOT specifications.

No backer rod was used, and the edges of the cuts were taped to prevent excess filler loss. WsDOT specifications called for the filler to be placed ¼" below the surface of the PCC to prevent loss due to traffic. The filler was usually placed about ¼" below the transverse joint, but was placed level with or slightly above the longitudinal joint surface. All of the transverse and longitudinal joints were well sealed following the filler application (photo 20, appendix A).

During initial contraction of the finished pavement, it was observed that the "working joints" were 5 to 6 panels apart. These working joints resulted in wide gaps prior to crack sealing. Subsequently, when the gaps closed, the sealant was forced out of the joint about an inch. The resulting protrusions were then flattened by traffic. WsDOT anticipates that the sealant will be pulled out of these joints prematurely.

AC Shoulder Paving

On November 6th, the inner and outer shoulders were paved with an AC mixture over a dense-graded aggregate base. The dense-graded base was placed over the underlying DGAB, PATB or LCB bases, and therefore varied in thickness. The AC surface thickness was 3" on both shoulders.

In April of 1996, the PCC lane/AC shoulder joints were sawed and sealed with a joint sealant. The saw cut was ½" wide and 1" deep. The joint sealant used was "Crafco Roadsaver 520".

Detailed Construction

PCC paving began on September 25th and completed on October 3rd. Table 36 shows the paving dates as well as temperature, wind speed, humidity, and solar radiation throughout each day.

On September 25th, paving was started at station 2085+50, the end of the transition area of section 530207. The 550 mix was very dry and course. The paver had several delays due to the mix not getting distributed evenly in front of the paver, leaving gaps in the rear. During the delays, the mix partially set up, and the paver began to spin its tracks. Paving was discontinued for the day at station 2084+70, and 30' of PCC was removed back to 2085+00. The PCC placed on the 25th was not included in any of the SHRP study. The 80' sampling area at the end of section 530207 was shortened to 30', from 2084+70 to 2085 + 00.

Table 36. PCC construction weather data.

Date	Sections Paved, in Order	Time	Average Temperature (°F)	Mean Windspeed (ft/s)	Minimum Relative Humidity (%)	Maximum Relative Humidity (%)	Average Solar Radiation Watts/ft^2
9/26	530207, 530206	7:00 a.m.	50.8	4.0	88.7	93.9	0.5
		12:00 p.m.	62.9	12.5	44.9	54.6	382.8
		5:00 p.m.	67.9	12.9	30.8	34.0	205.9
9/28	530208, 530205, 530201, 530204, 530212, 530209	7:00 a.m.	49.0	3.2	91.9	94.0	0.7
		12:00 p.m.	58.2	14.8	67.0	76.3	135.5
		5:00 p.m.	57.9	11.5	64.1	87.8	63.5
9/29	530211, 530210, 530202, 530203	7:00 a.m.	41.6	2.6	92.3	94.5	0.9
		12:00 p.m.	59.1	15.0	49.0	59.5	373.1
		5:00 p.m.	64.7	14.9	37.4	41.9	174.7
10/3	530259	7:00 a.m.	50.0	12.0	89.8	95.9	0.3

No paving was completed on September 27th due to the supply of cement not being delivered to the contractor. The following sections will discuss the paving details by section.

Section 530201 (8", 550 psi)

Paving in the 500' monitoring section began at 11:45 a.m. on September 28, 1995. The air temperature was 55°F, with clouds present, and a strong wind was blowing. Water was sprayed onto the DGAB prior to paving, using a side spray water truck.

The water cement ratio average 0.452. The amount of air entraining agent, and amount of water reducer stayed constant at 9.7 oz/yd^3 and 47 oz/yd^3, respectively.

Paving in the 500' monitoring section was completed at 12:50 p.m. Hand finishing was required throughout the section along the edges. The surface of the PCC mix was course but overall had a uniform appearance with few holes or indentation.

No sampling was performed during construction. Tining began at 1:10 p.m., and curing compound was applied soon after.

Section 530202 (8", 900 psi)

This section was paved on September 29, 1995, starting at 2:00 p.m. The weather was sunny and 62°F, with a slight wind. The speed of the paver at the start of the section was measured as 8'/minute. The DGAB was watered down prior to paving.

Sampling was done at 2:35 p.m., and six cylinders and three beams were formed. The slump measured 3/4" and the air content was 4.6 percent.

The surface of the PCC had many of the small surface indentations evident when paving section 530210.

The air entraining agent was increased from 16.8 to 17 oz/yd^3 at 3:00 p.m. The water reducing agent stayed constant at 92.5 oz/yd^3. The water cement ratio averaged 0.284.

Paving was completed at 3:25 p.m. Tining and curing in this section were completed 20-25 minutes behind the paver.

Section 530203 (8", 900 psi)

Paving took place on September 29, 1995, beginning at 4:35 p.m. The DGAB was watered prior to paving. The air temperature was 65°F and a strong wind was present.

The 550 psi mix looked wet at the start of the section. The water cement ratio was 0.453 at 4:30 p.m. As paving progressed, the inner edge was slumping significantly.

Sampling was performed at 5:05 p.m. The slump measured 2.8" and the air content was 6.4 percent. Following sampling, the water/cement ratio was reduced to 0.433. The air entraining and water reducing agents remained constant at 8.2 and 47 oz/yd^3, respectively.

During paving, forms had to be used several times along the inner edge to keep the PCC from slumping. The finishers spent a lot of time forming and finishing the inner edge.

Paving was completed at 5:42 p.m. The 550 psi mix ended at 1995+80, and a night joint was formed.

Section 530204 (11", 900 psi)

Paving in the transition began at 1:15 p.m. on September 28, 1995 at station 2046+20. The air temperature was 58°F. Clouds were present and a strong wind was blowing. Paving began in the 500' monitoring section at 1:55 p.m. Tining and curing were performed 15 to 20 minutes following paving to ensure that no shrinkage cracks would occur.

The water cement ratio averaged 0.279 for this section. The amount of air entraining agent was reduced to 17 oz/yd^3 from 20 oz/yd^3 at 2:30 p.m. The amount of water reducing agent stayed constant at 92.5 oz/yd^3.

Sampling was performed at 2:35 p.m. The slump was 1.8" and the air content was 5.2 percent. Paving in the 500' monitoring section was completed at 3:25 p.m.

Paving went smoothly, and only minimal hand finishing was required along the edges. No shrinkage cracks were present following paving on September 29, 1995.

Section 530205 (8", 550 psi)

Paving began in the transition at 9:45 a.m. on September 28, 1995 at station 2063+00. The temperature was 50°F and clouds were present. A second application of curing compound was applied to the LCB surface prior to paving to serve as a bond breaker.

The paver speed was about 12'/minute. Paving in the 500' monitoring portion began at 10:45 a.m. The water cement ratio was 0.465 at 10:30 a.m., and was lowered to 0.451 at 11:20 a.m.

Sampling took place at 11:00 a.m. Six cylinders and three beams were formed. The slump was measured at 1.5" and the air content was 6.4 percent. The amount of air entraining agent was reduced from 11.2 oz/yd^3 to 10.2 oz/yd^3 at 11:10 a.m., since the air content was near the 6.5 percent limit.

Tining began at 12:20 p.m., and curing compound was applied soon after. The edges in this section required a lot of hand finishing. The surface also required some hand finishing.

Section 530206 (8", 900 psi)

Paving took place on September 26, 1995. The transition from the 550 psi mix to the 900 psi mix of section 530206 began at station 2078+70, 70' prior to the start of the 110' sampling area for this section. At the start of the sampling area, the tining and curing machine was 20 minutes behind the paver.

Paving in the 500' monitoring section began at 2:40 p.m. A second application of curing compound was sprayed on the LCB in the morning prior to paving to serve as a bond breaker. The paver speed was approximately 4' per minute. As was listed in table 29, the air entraining agent was gradually increased from 15 oz/yd^3 at the start of the 900 psi mix to 21 oz/yd^3 at the start of paving the 500' monitoring section. At 4:00, the air entraining agent was reduced to 20 oz/yd^3. The water reducing agent was kept constant at 92.5 oz/yd^3.

The surface of the 900 psi mix had a smooth, less grainy texture compared to the 550 psi mix. Tining could be performed much sooner on the 900 psi mix than on the 550 psi mix due to its faster setting/curing time. Less hand finishing along the edges and on the surface was required than with the 550 psi mix.

Starting at station 2076+65, 25' into the 500' monitoring section, the spacer wires on the dowel baskets were notched and not cut all the way through. This was to ensure that the baskets would not collapse during PCC placement.

Sampling was performed at station 2+50 within the section at 3:35 p.m. The hand vibrator broke prior to vibrating. The six cylinders formed were hand rodded at 3:50 p.m. A hand vibrator was obtained, and the three beams were vibrated at 4:00 p.m. The samples were finished at 4:05 p.m. The slump measured 1.5" and the air content was 6.5 percent.

Paving in the 500' monitoring portion of the section was completed at 4:30 p.m. Forms were used at the end of the 110' sampling section to transition from a 26' wide PCC section to a 24' wide section. The paving in this section went smoothly. The tining and curing machines were 20-25 minutes behind the paver.

The weather during the paving of this section was sunny and 64°F, and very windy with no clouds. The relative humidity was about 50 percent (see table 30).

Joint sawing took place from about 2:30 a.m. until 5:00 a.m. The 900 psi mix had a smoother cut than the 550 psi mix.

On September 27th, longitudinal shrinkage cracks were present on most of the slabs in this section. Nineteen of the thirty-two slabs in the section had more than 5 cracks. Only one slab had no cracks. The width of the cracks was generally 1/16", with several cracks having up to a 1/8" width. Photo 21 in appendix A shows the extent of the cracking.

Section 530207 (11", 550 psi)

Paving began at station 2085+00 at 7:45 a.m. on September 26, 1995. The air temperature was 52°F. Paving began in the 500' monitoring section at 8:20 a.m. A second application of curing compound was applied to the LCB in the morning prior to paving to serve as a bond breaker.

In this section only, the spacer wires on the dowel baskets, as shown in appendix F, were cut completely through. Based on how the dowel baskets moved during PCC placement, WsDOT decided to notch the wires for the remaining sections.

The 550 mix was dry starting out. The surface was very rough behind the paver and a lot of hand finishing was required. From 9:00 a.m. to 10:00 a.m., the paver moved only 15'. The paver tracks began to spin at 10:00 and large cables were hooked up to the spreader to move the paver along. The beginning of the section was tined and cured at about 10:15 a.m., 2 hours after placement.

The water cement ratio had been raised in the morning by .01 and the amount of air entraining agent was increased from 10.3 oz/yd^3 to 10.6 oz/yd^3. At 10:15 a.m., the Pave Air content was raised to 11.2 oz/yd^3. The mix was still dry and unworkable following this change. At 10:45, the paver was about 200' into the section, at station 2082+60. At 11:10, the amount of water reducer, Master pave, was increased from 28.2 oz/yd^3 to 47 oz/yd^3. The amount of surface and edge finishing was reduced following the mixture change. Sampling and testing was done at 11:25 at station 2+50 of the section. The air content was 4.6 percent, and the slump 3/4".

The paver increased its speed slightly following the water reducer change, at about station 2082+50. The inner edge of the PCC from station 2081+25 to 2082+50 had a rough honeycomb texture. Photo 22 in appendix A shows a photo of the surface at station 2083+00 following PCC placement, indicating gaps in the pavement. These surface voids occurred in several locations in the last 200' of the section.

At station 2082+60, 200' into the section, the tining and curing machines were about 1 hour behind the paver. At station 2080+50, the tining and curing machines were about 35 minutes behind. Paving in the monitoring section was completed at 12:45 p.m.

Sawing began at 8:00 p.m. on this section. The sawing took until about 2:30 a.m. due to the slow drying/curing time of the 550 psi mix.

Section 530208 (11", 900 psi)

Paving took place on September 28, 1995, starting at 7:00 a.m. The air temperature was 49°F, a slight wind was present, and it was cloudy. The relative humidity was over 90 percent. A curing compound was sprayed on the LCB prior to paving to serve as a bond breaker.

Both the left and right belts were being used on the spreader, and the paver speed was about 7 feet/minute. Paving in the 500' monitoring section began at 7:30 a.m. A water truck kept the

LCB watered down well prior to paving. From 7:30 a.m. until 9:00 a.m., the water cement ratio was gradually lowered from 0.296 to 0.281. The water reducer was kept constant at 92.5 oz/yd^3 and the air entraining agent kept constant at 20 oz/yd^3. Paving in the 500' monitoring section was completed at 9:10 a.m.

Tining began at the start of the section at 9:00 a.m. A mist of water was sprayed onto the surface of the PCC starting at 9:25 a.m., two hours following placement. Following the water cure, a curing compound was placed, starting at 10:15 a.m. No shrinkage cracks were present on any of the slabs within this section. Table 30 showed that the relative humidity was higher than during paving of section 530206.

Section 530209 (8", 550 psi)

Paving took place the evening of September 28, 1995. Paving in the 500' monitoring section began at 6:55 p.m. At 7:00 p.m. at station 2031+00, it was dark and lights were needed for paving. The air temperature was 58°F and clouds were present. A light wind was blowing.

The water cement ratio averaged 0.441. The amount of air entraining agent was reduced to 8.2 oz/yd^3 from 9.7 oz/yd^3 used earlier in the day in section 530201. The amount of water reducing agent stayed constant at 47 oz/yd^3.

From station 2028+00 to the beginning of the section, 125', there were no tie bars placed in the PCC. The contractor said the tie bar inserter was stuck, and due to the time constraints, did not stop paving to fix it. Paving was completed at 7:50 p.m.

Hand finishing was required on the edges due to the course 550 psi mix. No problems were encountered due to the lack of lighting. The night joint was formed at station 2025+85. Tining began at 8:30 p.m., and curing was done soon after.

Section 530210 (8", 900 psi)

Paving in the 500' monitoring section began at 12:00 p.m. on September 29. 1995. The weather was sunny with a slight wind, and the temperature was 60°F. The contractor sprayed a water mist onto the surface of the PCC for the first 100' of paving. The contractor sprayed the mist until the curing machine could catch up to the paver, then discontinued. The curing machine had lagged behind on the previous 550 psi section. The PATB was watered down thoroughly prior to paving.

The surface texture on this section had more open material deposits than any of the previous sections. Due to the water runoff from the slope of the road, the contractor turned off the mist spray bar just behind the paver at station 2015+00. The water was left off until station 2013+00. The lack of water did not allow the paver float to create a smooth finish.

The water cement ratio averaged 0.285. The air entraining and water reducing agents stayed constant at 17 and 92.5 oz/yd^3, respectively.

Paving was completed in the 500' monitoring section at 1:10 p.m. The tining and curing was done 20-25 minutes following paving, following the paver as closely as possible.

The surface texture of the PCC overall was consistent with the previous 900 psi sections, with the exception of the small holes present throughout the section.

Section 530211 (11", 550 psi)

Paving took place on September 29, 1995. The air temperature was 57°F, few clouds were present, and it was slightly windy. The relative humidity was 70 percent.

The tie bar inserter that was not working on the evening of September 28. 1995 was working for the paving of this section. Paving began in the 500' monitoring section at 9:45 a.m.

The water cement ratio averaged 0.452. The air entraining and water reducing agents were held constant at 8.2 and 47 oz/yd^3, respectively.

Sampling took pace at 10:40 a.m. The air temperature was 60°F. The PCC slump was 1.75" and the air content was 6 percent. Six cylinders and 3 beams were formed.

Paving was completed at 11:15 a.m. Tining began at the start of the section at 11:15 a.m., and curing compound was applied soon after.

The contractor by mistake switched to the 900 psi mix 20' out of the monitoring section. This left only 20' to take cores from, so the coring location was changed form 0-40' to 0-10'.

Section 530212 (11", 900 psi)

Paving took place on September 28. 1995. Paving in the 500' monitoring section began at 4:10 p.m. The air temperature was 58°F and clouds were present. The relative humidity was 75 percent. The wind let up slightly during paving of this section.

This section was the first of four PATB sections to be paved. An 8' width of fabric was laid on the PATB, with 5' on the PATB, and the remaining 3' rolled up. The paver ran directly over the fabric. Small holes were visible in the fabric where rocks were present. The whole piece of fabric was removed following construction due to the wear it received and some large holes present. It would be replaced using an alternate construction method. The replacement is discussed in the drainage section.

The PATB surface was watered prior to paving. The water cement ratio averaged 0.275, and the air entraining and water reducing agents stayed constant at 17 oz/yd^3 and 92.5 oz/yd^3, respectively. No sampling was performed in this section.

Tining was completed 15 to 20 minutes following paving, and application of the curing compound followed. No water curing was used on this section or section 530204 because the contractor felt that there was enough cloud cover and moisture in the air to prevent any shrinkage cracking. The wind during paving of this section was less than during paving of section 530206 when shrinkage cracking occurred. Paving was completed at 5:55 p.m.

Paving in this section went smooth, with only minimal hand finishing required along the edges. No shrinkage cracks occurred following paving.

Section 530259 (10", 650 psi)

This section consisted of the standard State 650 psi mix design used for the rest of the project. The section was paved on October 3, 1995 beginning at 7:40 a.m. The temperature was 49°F, and it was cloudy and windy.

The spreader was not used for this section since no dowel bars were required in the State design. No tie bars were used. A front end loader was used to distribute the mix in front of the paver.

Sampling was performed in three locations, at stations 1+00, 2+50 and 4+00. At 7:50 a.m. and station 4+00, the slump was 1.75" and the air content was 6.2 percent. At station 2+50 at 8:10 a.m., the slump was 0.75" and the air content was 4.7 percent. At 8:20 a.m. at station 1+00, the slump was 1.25" and the air content was 5.2 percent. The water cement ratio averaged 0.360. The water reducing agent stayed constant at 56.4 oz/yd^3. The amount of air entraining agent was raised from 9.2 oz/yd^3 at the start of the section to 9.8 oz/yd^3 at the end.

Paving was finished at 8:50 a.m. Tining and curing began about 2 hours after placement of the PCC, due to the "wet" properties of the mix.

Quality Assurance Sampling and Testing

Materials Sampling

Samples of PCC were taken from the roadway during construction on sections 530202, 530203, 530204, 530205, 530206, 530207, 530211, and 530259 by WsDOT personnel. The samples were taken at station 2+50 on the SHRP sections.

Air content and slump tests were performed immediately. The air and PCC temperatures were also recorded. A wood platform was placed level on the ground surface to perform the tests. For the SHRP sections, three beams and six cylinders were formed. For the State section 530259, nine beams and 18 cylinders were formed. The cylinders were formed on the wood platform, and the beams were formed on a level ground surface.

The insides of the plastic cylinder forms and beam molds were greased prior to molding. The cylinders were formed in two lifts, each lift being vibrated in three locations with a flexible shaft hand held vibrator. Following vibration, the cylinders were tamped on the outside with a rubber hammer. The beams were formed in one lift, and were vibrated in the center and 2-3" from each end.

The tops of the beams and cylinders were hand finished with a trowel. A white curing compound was sprayed on the surface of the beams, and a thin plastic sheet was then placed to cover all three beams. Plastic lids were placed on the cylinders (photo 23, appendix A).

The beams were left in place following forming. The cylinders were moved from the wood platform to a wood platform placed level next to the beams. Soil was piled over the beams and cylinders to aid in curing. Sampling, testing, and forming generally took 20-30 minutes.

The beams and cylinders were left to cure in the field for 24 plus or minus 4 hours, and then transported 2 miles to the WsDOT field office. The beams were again buried at least one day under soil and kept moist with sprinklers. The cylinders were placed in a water bath.

The beams and cylinders were then transported to the Spokane WsDOT lab in a pickup truck with a layer of sand on the bottom. The beams had a wet burlap cloth placed over them.

Table 37 lists the slump and air contents obtained during the placement of the PCC. Slump and air contents were not obtained for all sections. The air contents taken all fell within the 5.5 +/- 1 percent WsDOT specification range. The only excessively high slump was in section 530202 at 2.8".

In addition to beams and cylinders, cores of the surface were taken at 12-13 days and 24-27 days after placement to be tested at 14 and 28 days. Figure F5 in appendix F shows the locations and number of cores taken from each section. The compressive, flexural and tensile test results for all QA samples are listed in tables 38a and 38b.

Final PCC Thicknesses

Table 39 lists the measured PCC thicknesses for each section, as well as the standard deviations. The thicknesses were obtained using an elevation survey measured at five locations transversely from the slab edge. The locations for the 12' sections were 0', 3', 6', 9', and 12' from the slab edge. The locations for the 14' sections were 0', 5', 8', 11', and 14' from the slab edge. The measurements were obtained at 50' intervals longitudinally.

Profile Readings

On October 3rd, ACME construction ran a profilograph over the PCC surface on all sections. A California type profilograph was used with a computerized interpretation method.

Table 40 lists the initial average profile index reading for each section in inches/mile. Only six of the 13 sections were within the specification tolerances.

Following the initial profilograph, WsDOT ordered the stations shown in table 41 to be ground. The sections were ground to meet the WsDOT specification of 7 inches/mile.

Table 37. Slump and air contents by section, during PCC placement, WA SPS-2.

Section/Mix Strength	Sampling Station	Slump (inches)	Air Contents (%)
530201 (550 psi)	none		
530202 (900 psi)	2+50	0.8	4.6
530203 (550 psi)	2+50	2.8	6.4
530204 (900 psi)	2+50	1.8	5.2
530205 (550 psi)	2+50	1.5	6.4
530206 (900 psi)	2+50	1.5	6.5
530207 (550 psi)	2+50 0-30	0.8	4.7 6.0
530208 (900 psi)	None		
530209 (550 psi)	None		
530210 (900 psi)	None		
530211 (550 psi)	2+50	1.8	6.0
530212 (900 psi)	None		
530259 (650 psi)	1+00 2+50 4+00	1.3 0.8 1.8	5.2 4.7 6.2

Table 38a PCC beam, cylinder and core 14-day and 28-day flexural and compressive strengths

Section	SHRP Specified 14-Day Flexural Strength (psi)	14-Day Beam Flexural Strength (psi)	28-Day Beam Flexural Strength (psi)	14-Day Cylinder Compressive Strength (psi)	28-Day Cylinder Compressive Strength (psi)	14-Day Core Compressive Strength (psi)	28-Day Core Compressive Strength (psi)
530201	550	No test	No test	No test	No test	2368	3088
530203	550	413	622	2736	3413	2683	3399
530205	550	487	524	3395	4153	3287	3515
530207	550	546	611	3790	4987	2970	3613
530209	550	No test	No test	No test	No test	2853	3426
530211	550	494	709	3673	4324	2930	3107
Average	---	485	617	3399	4219	2849	3358
Standard Deviation	---	55	76	472	647	307	215
530259	650	618	683	4989	5867	4079	4479
530259	650	631	697	4772	6096	3603	4239
530259	650	587	609	4142	5024	2726	4919
Average	---	612	663	4634	5662	3469	4525
Standard Deviation	---	23	47	440	565	686	345
530202	900	823	1041	6651	7029	7158	7398
530204	900	870	915	5906	7544	5926	6681
530206	900	801	880	5990	6685	6450	7158
530208	900	No test	No test	No test	No test	6534	6705
530210	900	No test	No test	No test	No test	7127	8078
530212	900	No test	No test	No test	No test	6390	7496
Average	---	831	945	6182	7086	6598	7253
Standard Deviation	---	35	85	408	432	472	529

Table 38b. PCC cylinder and core 14-day and 28-day splitting tensile strengths.

Section	SHRP Specified 14-Day Flexural Strength (psi)	14-Day Cylinder Splitting Tensile Strength (psi)	28-Day Cylinder Splitting Tensile Strength (psi)	14-Day Core Splitting Tensile Strength (psi)	28-Day Core Splitting Tensile Strength (psi)
530201	550	No test	No test	405	477
530203	550	349	434	475	499
530205	550	373	452	467	418
530207	550	449	465	440	450
530209	550	No test	No test	463	462
530211	550	424	420	465	527
Average		399	443	453	472
Standard Deviation		46	20	26	38
530259	650	485	624	595	586
530259	650	485	507	475	655
530259	650	426	488	497	635
Average		465	540	522	625
Standard Deviation		34	74	64	36
530202	900	558	657	744	844
530204	900	608	670	768	744
530206	900	544	599	798	768
530208	900	No test	No test	732	738
530210	900	No test	No test	747	841
530212	900	No test	No test	741	796
Average		570	642	755	789
Standard Deviation		34	38	24	47

Table 39. PCC measured thicknesses.

Section	Specified Thickness (inch)	Average Measured Thickness (inch)	Low (inch)	High (inch)	Standard Deviation (inch)
530201	8	8.7	7.7	9.8	0.5
530202	8	8.3	7.6	9	0.3
530203	11	11.0	9.8	11.6	0.4
530204	11	11.1	10.1	12.1	0.4
530205	8	8.4	8.0	8.8	0.2
530206	8	8.6	8.0	9.0	0.2
530207	11	11.1	10.7	11.6	0.3
530208	11	10.7	10.1	11.3	0.3
530209	8	8.5	7.6	9.2	0.3
530210	8	8.3	7.7	9.1	0.3
530211	11	11.3	10.6	11.9	0.3
530212	11	10.9	10.2	11.6	0.3
530259	10	10.3	9.6	10.8	0.3

Table 40. Profile index readings.

Section	Profile Index (Inches/Mile)
530201	9.8
530202	12.2
530203	12.5
530204	12.8
530205	1.5
530206	6.2
530207	10.4
530208	4.3
530209	0.5
530210	2.9
530211	4.1
530212	0.5
530259	12.7

Table 41. Sections and stations which were ground following profilograph interpretation.

Section	Station to Station Grinding	Profile Index Before Grinding (inches/mile)	Profile Index Following Grinding (inches/mile)
530201	2046+50-2049+08	9.8	7.0
530202	2004+68-2009+96	12.2	6.7
530203	1995+80-2002+70	12.5	5.3
530204	2039+90-2046+50	12.8	3.8
530207	2079+80-2084+98	10.4	6.2
530208	2067+20-2068+20	4.3	4.0
530259	1990+52-1995+80	12.7	0.0

IV. SUMMARY

Construction on the Washington SPS-2 project began on February 1, 1995 with clearing and grubbing. It was determined after the initial subgrade sampling that the existing subgrade had to be removed due to excessive moisture.

One to two feet of material was subexcavated and replaced with a minus 18" shot rock to the original subgrade line. Two sections at the beginning of the project, 530203 and 530259, were in a cut and did not receive any fill rock. The next two sections, 530202 and most of 530210, were excavated but did not receive full rock. Two sections, 530201 and 530206 contained only partial rock fills.

On top of the shot rock, and in sections 530202 and 530210, a silty-loess material was placed 3-6' thick. The material was thoroughly compacted over the next month by construction traffic. On June 29th, the embankment was trimmed using grader and then re-compacted.

Section 530201, 530202, 530203, 530204, 530209, 530210, 530211, and 530212 received a DGAB in either 4" or 6" thicknesses. The DGAB was placed from July 13th to July 18th. From July 18th until August 16th, travel on the DGAB included water trucks and other construction traffic. The DGAB was trimmed and compacted in each section just prior to placing the next material.

Mix designs for the LCB and 550 psi, 650 psi, and 900 psi PCC mixes were performed at the ACME materials lab in Spokane, Washington in July, prior to LCB and PCC paving. One field trial batch was performed for the 900 psi mix at the ACME PCC plant close to the SHRP sections.

From August 3rd to August 8th, a 3" asphalt-treated base was placed in two lifts on State section 530259.

On August 16th and 17th, a 6" lean concrete base was placed on sections 530205, 530206, 530207, and 530208.

On August 28th and 29th, a 4" permeable asphalt-treated base layer was placed on sections 530209, 530210, 530211, and 530212.

PCC paving began at the north end of the project on September 26th, and was completed at the south end on October 3rd. Only the travel and passing lanes were paved, the shoulders were paved later with AC.

From October 24th to 31st, drainage trenches were dug and longitudinal and outlet drain pipes, rock and fabric were placed on the inner edge of sections 530209, 530210, 530211 and 530212.

Outlet pipes were placed every 200', and a drainage cleanout was placed at the high end of every 200' section of drainage pipe. The outlet pipe headwalls were paved with PCC and had a rodent protection screen placed.

On November 6th, the inner and outer shoulders were paved with AC. In April of 1996, the PCC/AC shoulder joints were sawed and then sealed.

Striping and sign placement was done during the weeks of November 6th and November 13th. The sections were opened to traffic on November 21st.

All of the layers on each section were sampled and tested as required in the SHRP SPS-2 guidelines. FWD testing was performed on the embankment, DGAB, and PCC surfaces. A profilometer was run on all of the sections by LTPP personnel.

Photo 24 in appendix A shows the completed roadway, just prior to opening to traffic.

The total cost for each section built is given in table 42. The State section 530259 was the least expensive to build, at $345,213/mile, while the 11", 900 psi, Lean Concrete Base Section 530208 was the most costly at $702,115/mile. These costs include both lanes and shoulders.

V. KEY OBSERVATIONS

Subgrade/Embankment/Rock Layer

The rock layer was not placed on all of the sections, and only partially on several others. Sections 530202, 530203, and 530259 did not receive fill rock. Sections 530201, 530206, and 530210 only received rock in part of the section; 530201 had rock only in the last 100' of the section, 530206 had rock only in the last 300' of the section, and 530210 had rock only in the last 200' of the section. Two of the sections, 530203 and 530259 were on a cut, while the other sections were on a fill.

Based on the density and FWD testing, the embankment layer had relatively uniform support. The overall average for FWD testing was 31 mils, with a standard deviation of 5.5. The two cut sections at the beginning of the project, 530203 and 530259, had the most deflection variation, with section 530203 having deflections ranging from 16 to 57 mils, and section 530259 having defections ranging from 19 to 38.

DGAB

The DGAB density measurements showed that the State section 530259 had an average density of 116.3 pcf while the remaining SHRP sections had an average of 131.2 pcf. In addition to the varying material, the density difference may be likely due to the fact that section 530259 received no construction traffic prior to density testing, while the remaining sections had over a month of construction traffic.

Table 42. Approximate costs/mile for Washington SPS-2 test sections.

Section	Surfacing	Contract Unit Price	Cost Per LF	Total Cost Per Mile (two lanes)
530201	8" PCC 550 psi, 24' wide section	$11.30/SY	$30.13	
	Epoxy-Coated Dowel Bar	$ 4 70/EA	$ 7 55	
	Epoxy-Coated Tie Bar	$ 1 15/EA	$ 0 46	
	6" DGAB	$ 5 80/Ton	$ 9.96	
	Shoulder Rock (CSBC)	$ 4 80/Ton	$ 4 98	
	ACP Class A (Shoulders)	$20 30/Ton	$ 5 94	
	Anti-stripping Additive	Calc.	$ 0 15	
	SHRP Subgrade Preparation	Lump Sum	$ 1.67	
	Soil Residual Herbicide	$ 0 08/SY	$ 0.12	
	Total		$60.96	$321,849.29/mi
530202	8" PCC 900 psi, 26' wide section	$16 50/SY	$47 67	
	Epoxy-Coated Dowel Bar	$ 4 70/EA	$ 8 20	
	Epoxy-Coated Tie Bar	$ 1 15/EA	$ 0 46	
	6" DGAB	$ 5 80/Ton	$ 9 96	
	Shoulder Rock (CSBC)	$ 4 80/Ton	$ 4.69	
	ACP Class A (Shoulders)	$20 30/Ton	$ 5.09	
	Anti-stripping Additive	Calc	$ 0.13	
	SHRP Subgrade Preparation	Lump Sum	$ 1.67	
	Soil Residual Herbicide	$ 0 08/SY	$ 0 11	
	Total		$77.24	$411,709.95/mi
530203	11" PCC 550 psi, 26' wide	$15 40/SY	$44.49	
	section	$ 4 70/EA	$ 8 20	
	Epoxy-Coated Dowel Bar	$ 1 15/EA	$ 0.46	
	Epoxy-Coated Tie Bar	$ 5 80/Ton	$ 9 96	
	6" DGAB Shoulder Rock	$ 4 80/Ton	$ 7.13	
	(CSBC)	$20 30/Ton	$ 5.09	
	ACP Class A (Shoulders)	Calc.	$ 0.13	
	Anti-stripping Additive	Lump Sum	$ 1 67	
	SHRP Subgrade Preparation	$ 0 08/SY	$ 0 11	
	Soil Residual Herbicide			
	Total		$77.24	$407,802.75/mi

Table 42. Approximate costs/mile for Washington SPS-2 test sections. (cont'd)

Section	Surfacing	Contract Unit Price	Cost Per LF	Total Cost Per Mile (two lanes)
530204	11" PCC 900 psi, 24' wide	$25 70/SY	$68.53	
	section	$ 4.70/EA	$ 7 55	
	Epoxy-Coated Dowel Bar	$ 1.15/EA	$ 0 46	
	Epoxy-Coated Tie Bar	$ 5.80/Ton	$ 9 96	
	6" DGAB	$ 4.80/Ton	$ 7 60	
	Shoulder Rock (CSBC)	$20 30/Ton	$ 5 94	
	ACP Class A (Shoulders)	Calc	$ 0.15	
	Anti-stripping Additive	Lump Sum	$ 1 67	
	SHRP Subgrade Preparation	$ 0 08/SY	$ 0 12	
	Soil Residual Herbicide			
	Total		$101 98	$538,434.89/mi
530205	8" PCC 550 psi, 24' wide section	$11 30/SY	$30.13	
	Epoxy-Coated Dowel Bar	$ 4 70/EA	$ 7.55	
	Epoxy-Coated Tie Bar	$ 1.15/EA	$ 0.46	
	6" LCB	$ 9.70/Ton	$40.96	
	Shoulder Rock (CSBC)	$ 4.80/Ton	$ 4.98	
	ACP Class A (Shoulders)	$20 30/Ton	$ 5.94	
	Anti-stripping Additive	Calc.	$ 0.15	
	SHRP Subgrade Preparation	Lump Sum	$ 1 67	
	Soil Residual Herbicide	$ 0 08/SY	$ 0 12	
	Total		$91.96	$485,529.29/mi
530206	8" PCC 900 psi, 26' wide section	$16.50/SY	$47.67	
	Epoxy-Coated Dowel Bar	$ 4.70/EA	$ 8 20	
	Epoxy-Coated Tie Bar	$ 1.15/EA	$ 0 46	
	6" LCB	$ 9.70/Ton	$40.96	
	Shoulder Rock (CSBC)	$ 4 80/Ton	$ 4 69	
	ACP Class A (Shoulders)	$20.30/Ton	$ 5.09	
	Anti-stripping Additive	Calc.	$ 0.13	
	SHRP Subgrade Preparation	Lump Sum	$ 1.67	
	Soil Residual Herbicide	$ 0.08/SY	$ 0 11	
	Total		$108 98	$575,389 95/mi

Table 42 Approximate costs/mile for Washington SPS-2 test sections. (cont'd)

Section	Surfacing	Contract Unit Price	Cost Per LF	Total Cost Per Mile (two lanes)
530207	11" PCC 550 psi, 26' wide section	$15.40/SY	$44.49	
	Epoxy-Coated Dowel Bar	$ 4 70/EA	$ 8.20	
	Epoxy-Coated Tie Bar	$ 1.15/EA	$ 0.46	
	6" LCB	$ 9 70/Ton	$40.96	
	Shoulder Rock (CSBC)	$ 4 80/Ton	$ 7.13	
	ACP Class A (Shoulders)	$20 30/Ton	$ 5 09	
	Anti-stripping Additive	Calc.	$ 0.13	
	SHRP Subgrade Preparation	Lump Sum	$ 1.67	
	Soil Residual Herbicide	$ 0 08/SY	$ 0 11	
	Total		$108 24	$571,482.75/mi
530208	11" PCC 900 psi, 24' wide section	$25 70/SY	$68 53	
	Epoxy-Coated Dowel Bar	$ 4 70/EA	$ 7.55	
	Epoxy-Coated Tie Bar	$ 1.15/EA	$ 0 46	
	6" LCB	$ 9.70/Ton	$40.96	
	Shoulder Rock (CSBC)	$ 4 80/Ton	$ 7 60	
	ACP Class A (Shoulders)	$20 30/Ton	$ 5 94	
	Anti-stripping Additive	Calc	$ 0.15	
	SHRP Subgrade Preparation	Lump Sum	$ 1.67	
	Soil Residual Herbicide	$ 0 08/SY	$ 0 12	
	Total		$132 98	$702 114 89/mi

Table 42. Approximate costs/mile for Washington SPS-2 test sections. (cont'd)

Section	Surfacing	Contract Unit Price	Cost Per LF	Total Cost Per Mile (two lanes)
530209	8" PCC 550 psi, 24' wide section	$11.30/SY	$30.13	
	Epoxy-Coated Dowel Bar	$ 4.70/EA	$ 7.55	
	Epoxy-Coated Tie Bar	$ 1.15/EA	$ 0.46	
	4" PATB	$15.80/Ton	$10.37	
	4" DGAB	$ 5.80/Ton	$ 6.64	
	Shoulder Rock (CSBC)	$ 4.80/Ton	$ 5.86	
	ACP Class A (Shoulders)	$20.30/Ton	$ 5.94	
	Anti-stripping Additive	Calc.	$ 0.15	
	Asphalt RC-250	$290.00/Ton	$ 2.36	
	Misc. Drainage Items*	Lump Sum	$ 2.66	
	Construction Geotextile	$ 1.00/SY	$ 1.30	
	SHRP Subgrade Preparation	Lump Sum	$ 1.67	
	Soil Residual Herbicide	$ 0.08/SY	$ 0.12	
	Total		$75.21	$397,089.29/mi
530210	8" PCC 900 psi, 26' wide section	$16.50/SY	$47.67	
	Epoxy-Coated Dowel Bar	$ 4.70/EA	$ 8.20	
	Epoxy-Coated Tie Bar	$ 1.15/EA	$ 0.46	
	4" PATB	$15.80/Ton	$10.37	
	4" DGAB	$ 5.80/Ton	$ 6.64	
	Shoulder Rock (CSBC)	$ 4.80/Ton	$ 5.59	
	ACP Class A (Shoulders)	$20.30/Ton	$ 5.09	
	Anti-stripping Additive	Calc.	$ 0.13	
	Asphalt RC-250	$290.00/Ton	$ 2.36	
	Misc. Drainage Items*	Lump Sum	$ 2.66	
	Construction Geotextile	$ 1.00/SY	$ 1.30	
	SHRP Subgrade Preparation	Lump Sum	$ 1.67	
	Soil Residual Herbicide	$ 0.08/SY	$ 0.11	
	Total		$92.25	$487,055.55/mi

Table 42. Approximate costs/mile for Washington SPS-2 test sections. (cont'd)

Section	Surfacing	Contract Unit Price	Cost Per LF	Total Cost Per Mile (two lanes)
530211	11" PCC 550 psi, 26' wide section	$15 40/SY	$44 49	
	Epoxy-Coated Dowel Bar	$ 4 70/EA	$ 8.20	
	Epoxy-Coated Tie Bar	$ 1.15/EA	$ 0.46	
	4" PATB	$15.80/Ton	$10 37	
	4" DGAB	$ 5 80/Ton	$ 6.64	
	Shoulder Rock (CSBC)	$ 4.80/Ton	$ 8.20	
	ACP Class A (Shoulders)	$20.30/Ton	$ 5.09	
	Anti-stripping Additive	Calc.	$ 0.13	
	Asphalt RC-250	$290 00/Ton	$ 2.36	
	Misc Drainage Items*	Lump Sum	$ 2 66	
	Construction Geotextile	$ 1 00/SY	$ 1 30	
	SHRP Subgrade Preparation	Lump Sum	$ 1 67	
	Soil Residual Herbicide	$ 0.08/SY	$ 0.11	
	Total		$91 68	$484,045 95/mi
530212	11" PCC 900 psi, 24' wide section	$25 70/SY	$68.53	
	Epoxy-Coated Dowel Bar	$ 4.70/EA	$ 7.55	
	Epoxy-Coated Tie Bar	$ 1 15/EA	$ 0 46	
	4" PATB	$15 80/Ton	$10 37	
	4" DGAB	$ 5 80/Ton	$ 6 64	
	Shoulder Rock (CSBC)	$ 4 80/Ton	$ 8.66	
	ACP Class A (Shoulders)	$20 30/Ton	$ 5.94	
	Anti-stripping Additive	Calc	$ 0.15	
	Asphalt RC-250	$290 00/Ton	$ 2.36	
	Misc. Drainage Items*	Lump Sum	$ 2.66	
	Construction Geotextile	$ 1.00/SY	$ 1.30	
	SHRP Subgrade Preparation	Lump Sum	$ 1 67	
	Soil Residual Herbicide	$ 0 08/SY	$ 0.12	
	Total		$116.41	$614,625 29/mi

Table 42. Approximate costs/mile for Washington SPS-2 test sections. (cont'd)

Section	Surfacing	Contract Unit Price	Cost Per LF	Total Cost Per Mile (two lanes)
530259	10" PCC, 26' wide section	$13 65/SY	$39 43	
	3" ATB	$15.80/Ton	$10.30	
	2" CSBC & Shoulder Rock	$ 4 80/Ton	$ 8 66	
	ACP Class A (Shoulders)	$20 30/Ton	$ 5 09	
	Anti-stripping Additive	Calc	$ 0.45	
	Longitudinal Joint Seal	$ 0 67/LF	$ 1 34	
	Soil Residual Herbicide	$ 0 08/SY	$ 0.11	
	Total		$65.38	$345,213.36/mi
AVERAGE COST PER MILE (two lanes)				**$487,873.00**

* Note: Miscellaneous drainage items include. Slotted and Unslotted 4" Diameter Plastic Pipe
Clean out case w/locking cap (13)
Concrete headwall with screen and chain (13)
Excavation and backfill

FWD measurements were not taken on section 530259. On the SHRP sections, the DGAB support was uniform for the sections that had been trimmed at the time of FWD testing. The sections that had not been trimmed yet, had lower deflections that were similar between sections. It is likely the untrimmed sections would have had slightly higher deflections following trimming due to the hard DGAB being softened up some by the trimming. Six of the eight DGAB sections had average thicknesses between 0.4 and 0.9 inches greater than the specified thickness. Section 530203 had a thickness 0.9" greater than the specified 6".

ATB

In the passing lane from 1992+00 to 1996+00, no tack coat was placed between lifts of ATB. The following morning, the remainder of the 1st lift was tacked in the passing lane.

The average compacted thickness was 2.6" with a 0.4" standard deviation. The specified thickness was 3.0".

LCB

Paving in section 530207 was slow and there were many delays. The cylinders and cores from this section yielded 14-day and 28-day compressive strengths up to 2-½ times as high as the other LCB sections as shown in table 21. The average water cement ratio in the hour that the cylinders were formed was 0.96, while the design was close to 1.08.

The 14-day core compressive strengths for sections 530205, 530206, and 530208 all averaged within the 500-750 psi strength specified by SHRP.

The 14-day cylinder compressive strengths for sections 530205 and 530206 were approximately to 300 psi.

A transverse joint in the LCB was placed at station 2080+48 (within section 530207) following the first day of paving.

The average thicknesses obtained for all four sections were either 6.1" or 6.2", close to the specified 6".

PATB/Edge Drains

Paving of the PATB went as planned, with no problems encountered. The average thicknesses measured were near the 4" specified, with the section 530212 having a 3.5" thickness, and the other 3 sections having either a 3.8" or 3.9" thickness. The PATB was not traveled on, (except for forklifts placing dowel baskets) and no damage was done to the surface.

Sections 530209 and 530212 had significant patching done to the fabric in the edge drains due to a contractor mistake. Also, due to the fabric being too short initially on these two sections, some minor contamination of the drain rock occurred. Sections 530210 and 530211 had no patching done and very little contamination to the drain rock.

Embankment material was accidentally placed on the shoulder in sections 530209 and 530212, and then scraped off and air blown out. It is likely some of the soil penetrated the PATB voids.

Parts of the 4-foot shoulder surface of the PATB in all of the sections was contaminated with slurry from the PCC paving. The slurry was scraped off, but likely penetrated some of the voids in the PATB.

Overall, the PATB and drains should serve their purpose of taking water away from the pavement, but the deviations should be noted.

PCC

With the exception of sections 530203 and 530207, the amounts of additives and water cement ratios during paving remained relatively consistent for each mix.

The water/cement ratio for the 500 psi mix averaged 0.455 with a standard deviation of 0.014, for the 650 psi mix 0.360 with a 0.004 standard deviation, and for the 900 psi mix 0.286 with a 0.009 standard deviation.

The water reducing agent was increased from 28.2 oz/yd^3 to 47.0 oz/yd^3 at station 2082+50 of section 530207. Therefore, the first 300' of the section had a different mix than the last 200'. The mix in the last 200' was dry and very hard to place and finish. The day following paving, the surface had voids extending down into the PCC, indicating an unconsolidated mix. The mix in the first 300' of the section was more workable and had a more uniform appearance following paving.

Section 530203, the last SHRP section paved, had a high slump, 2.8", at station 2+50. The water/cement ratio was reduced at this point from 0.450 to 0.433 for the remainder of the section. The mix looked wetter than the other 500 psi mixes, and the edges slumped significantly in a few locations along the inner edge.

Table 38a showed that the 14-day beam flexural strengths from each section are consistent and close to the design strength. The cylinder and core compressive and splitting tensile strengths also show consistency within each design strength. Section 530207 had the highest beam and cylinder 14-day compressive strengths within the 550 psi sections, likely due to the dry mix within much of the section.

Following paving, section 530206 had shrinkage cracks throughout the section. Nineteen of the 32 slabs had more than five cracks, while only one slab was crack free. The width of the cracks was generally 1/16", with several cracks having up to a 1/8" width. Cracking was not present in other sections.

The widths of the cracked transverse joints on the PATB sections averaged 9/16" for the 550 psi sections and ½" for the 900 psi sections. The largest cracked joint width for any other section was 5/16". Section 530205, the 8" 550 psi mix on LCB, did not have any cracked joints as of October 2nd. Subsequent reviews showed that as the working joints closed, the sealant was forced out of the joint about an inch. The resulting protrusions were flattened by traffic. WsDOT anticipates the sealant to prematurely be pulled out of these joints.

The 8" PCC sections all had average thicknesses ranging from 0.3" to 0.7" thicker than the specified 8". Three sections, 530201, 530206 and 530209 had thicknesses of 8.7", 8.6", and 8.5", respectively. The 11" PCC sections all had average thicknesses within 0.3" of the specified 11".

Completed Project

Considering SHRP construction specifications, section 530207 deviated most significantly, having high 14-day and 28-day LCB compressive strengths, and a variable PCC mixture on the surface.

The embankment layer and PATB, DGAB, and remaining LCB bases were constructed uniformly and should provide relatively uniform support for the PCC layer.

In summary, with the exception of sections 530203 and 530207, the PCC mixture characteristics (slump, air content, admixtures, surface texture, compressive strengths) were relatively consistent for each mix.

APPENDIX A
PHOTOGRAPHS OF SPS-2 CONSTRUCTION

Washington SPS-2 Photos, Appendix A

1. Fill shot rock, -18".
2. Subexcavation along roadway.
3. Embankment preparation.
4. Rock crushing plant set-up.
5. DGAB placement.
6. Smooth LCB surface, Section 530206.
7. LCB slurry on left side of paver, Section 530207.
8. Rough LCB surface, Section 530207.
9. PATB paving process.
10. Fabric being held up during rock placement.
11. Overlap of fabric.
12. 550 psi mix, rough texture.
13. 900 psi mix, smooth texture.
14. PCC plant, silos, and double mixing drum.
15. Dowel basket assemblies on PATB, workers placing grease on bars.
16. Slight segregation of mix coming off the spreader belt.
17. Front of Guntert and Zimmerman paver.
18. Plow spreading mix in front of paver.
19. 9/16" crack, PATB Section 5301\212, 900 psi strength and 11" thick.
20. Typical sealed joint.
21. Shrinkage cracks, Section 530206.
22. Surface voids in PCC near the end of Section 530207.
23. Beams and cylinders following forming.
24. Completed Washington SPS-2 project.

Photo 1. Fill shot rock, -18".

Photo 2. Subexcavation along roadway.

Photo 3. Embankment preparation.

Photo 4. Rock crushing plant set-up.

Photo 5. DGAB placement.

Photo 6. Smooth LCB surface, Section 530206.

Photo 7. LCB slurry on left side of paver, Section 530207.

Photo 8. Rough LCB surface, Section 530207.

Photo 9. PATB paving process.

Photo 10. Fabric being held up during rock placement.

Photo 11. Overlap of fabric.

Photo 12. 550 psi mix, rough texture.

Photo 13. 900 psi mix, smooth texture.

Photo 14. PCC plant, silos, and double mixing drum.

Photo 15. Dowel basket assemblies on PATB, workers placing grease on bars.

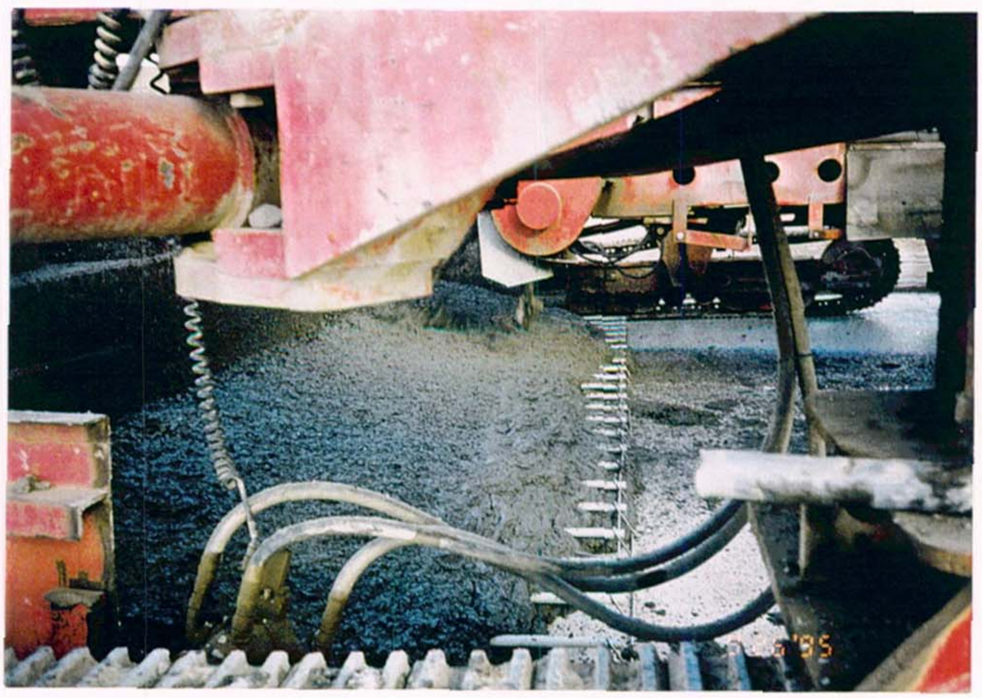


Photo 16. Slight segregation of mix coming off the spreader belt.

Photo 17. Front of Guntert and Zimmerman paver.

Photo 18. Plow spreading mix in front of paver.

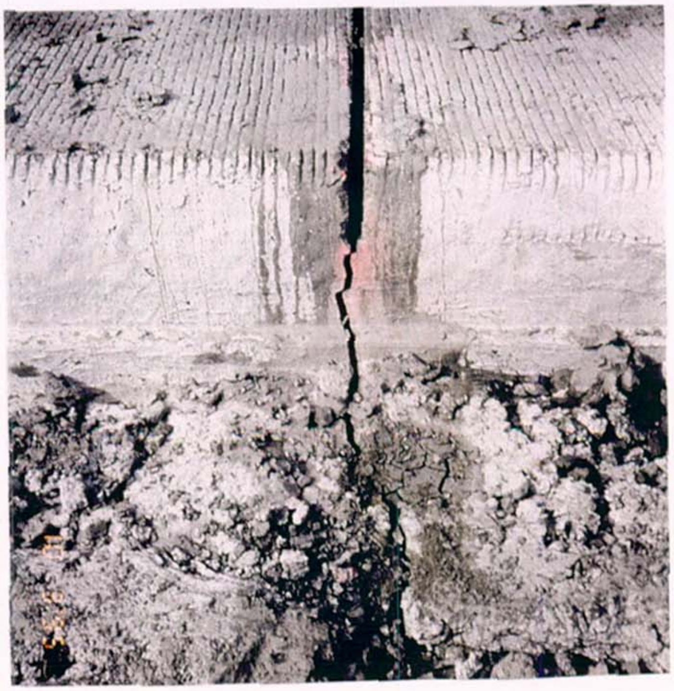


Photo 19. 9/16" crack, PATB Section 530212, 900 psi strength and 11" thick.

Photo 20. Typical sealed joint.

Photo 21. Shrinkage cracks, Section 530206.

Photo 22. Surface voids in PCC near the end of Section 530207.

Photo 23. Beams and cylinders following forming.

Photo 24. Completed Washington SPS-2 project.

APPENDIX B

ATB MIX DESIGN (STATE SECTION 530259)

Washington State Department of Transportation - Materials Laboratory
PO Box 167 Olympia / 1655 S 2nd Ave Tumwater / WA 98504
BITUMINOUS SECTION TEST REPORT

WORK ORDER NO: 004489
LAB ID NO: 0000100438
TRANSMITTAL NO: 276224
MIX ID NO: G7561
BID ITEM NO:

TEST OF: A.C.P. JOB MIX DESIGN CLASS ATB
DATE SAMPLED: 06/07/95
DATE RECVD HQS: 06/09/95
SR NO: 395
SECTION: LIND TO RITZVILLE

-*-*-*-*-*-*-*-*-*-*-*-*-*-*CONTRACTOR'S PROPOSAL*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

Mat'l:	MIN. AGG.	Combined	Specifications
Source:	R/W		
Ratio:	100.0%	100%	
---	100.0	100	
---	100.0	100	
2	100.0	100	100
1/2	83.5	84	56-100
1/4	53.2	53	40-78
10	27.2	27	22-57
40	13.5	14	8-32
200	7.00	7.0	2-9

-*-*-*-*-*-*-*-*-*-*-*-*-*-*-LABORATORY ANALYSIS-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

Asph % by Wt of Total Mix:	2.9	3.4	3.9	4.3	4.8	5.2
Stabilometer "S" Value:			42	48	48	48
Cohesiometer "C" Value:			168	173	208	206
Density (lbs/cf):	142.8	143.8	144.8	147.1	148.2	149.2
% Voids - Volume in Mix:	12.7	11.4	10.1	8.0	6.7	5.3
% Voids in Mineral Agg:	15.2	15.1	14.8	13.9	13.7	13.5
Max Density from Rice:	166.1	164.0			159.0	157.2

-*-*-*-*-*-*-*-*-*-*-*-*-*LOTTMAN STRIPPING EVALUATION*-*-*-*-*-*-*-*-*-*-*-*-

		0%	1/4%	1/2%	3/4%	1%
TAK	Visual Appearance:	NONE	NONE	NONE	NONE	NONE
	% Retained Strength:	70	82	84	84	78

-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-RECOMMENDATIONS-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

Supplier	TAK EXXON
% Asphalt (by total mix)	4.5
Grade of Asphalt	AR4000W
% Anti Strip (by wt asph)	0.25
Type of Anti Strip	AGGRIGRIP
Rice Density lbs/cf	159.5

RECEIVED
JUL 10 1995
T.J. [illegible] P.E.

NUCLEAR CALIBRATION NUMBER: 00977
MIX ID NUMBER: 7561

Remarks:

==

Headquarters:
Construction Engineer x
Materials File x
General File x
Bituminous Section x
Region: Eastern
Administrator 46 x
Materials Engr 46 x

T160-1
T166-
T172-
T175-

Dennis C. Jackson, P.E.
Materials Engineer
By: James P. Walter P.E. [
(360) 753-7107
Date: 7/5/95

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

NUCLEAR ASPHALT CONTENT JOB MIX CALIBRATION

HQ Lab Number: G7561

Date: 06/29/95 Class: ATB

Nuclear Calibration No: 00977

Mix ID: 7561 Pit #: R/W MIN. AGG. %: 100.0

Master Gauge Serial No: 1630

CALIBRATION LOCATION: HQ

Asph Supplier: TAK
Asph Manufacturer: EXXON
Asph Grade: AR4000W

MASTER GAUGE CROSS-CALIBRATION INFORMATION:

CROSS-CALIBRATION BACKGROUND 2272 CROSS-CAL DATE: 01/06/94

PANS 1. 2396 2. 2701 3. 3070 4. 3464 5. 3946 6. 4492

RAP MIX DESIGN ?? NO JMF ASPHALT %: 4.5 W/ 0.25 % AGGRIGRIP
Total Wt of Sample 7500

	CALIBRATION PAN 1	PAN 2	PAN 3	PAN 4	** FIELD VERIFICATION TEST
A. Total Asphalt % required	3.7	4.5	5.3	6.1	4.5
. Total Wt of asphalt	288	353	420	487	353
C. Wt to be mixed	7788	7853	7920	7987	7853
D. Wt of mix placed in cal pan = blank wt.	6900	6900	6900	6900	6900
E. Gauge count on pans	2627	2843	3026	3178	
F. Field Verification % Asphalt					
G. Difference (A-F)					
H bration Acceptable (Yes,No) "Yes" if 0.3% or less					

RECE...
JUL 10 1995

CALIBRATION BACKGROUND COUNT: 2152 BLANK WT: 6900.0

A1: 9.529728 (INTERCEPT) A2: -7.642581 (SLOPE) A3: 20.648452 COEFF FIT: 1.000
Calibration Temp F 275

Calibrated By: SLM

The Calibration Pan was sent to: EASTERN REGION LAB

Comments:

** If field verification is done distribute to: Headquarters Construction, Headquarters Bituminous Section, District Lab, Project Engineer

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 167 OLYMPIA, WA. 98507-0167/1655 SO. 2ND AVE TUMWATER, WA. 98512

ysical Testing Section
gregate Test Report
WSDOT Test Methods

Work Order No. 004489
Lab ID No. 0000100438
Lab Number G -957561
Trans. No. 276224
Bid. Item No. 80.00
Org. No. 464304
F.A. No. ACDPS-0027(001)

ate Sampled: 06/07/95
Sampled By: CONTRACTOR
Date Recvd HQ: 06/09/95
.R. No.: 395
ection: LIND TO RITZVILLE
Contractor: SCARSELLA BROS, INC

===

aterial: MIN AGG FOR ACP CL ATB

ccpt.Samp.No.: Pit No.: PAHA

ample Loc.:PAHA I/C

est Loc.: By:

Fracture: (WSDOT Test Method No.103)

Sieve Size	Single Face	Double Face
1 1/4"		
1"		
3/4"		
5/8"		
1/2"		
3/8"		
1/4"		
No.4		
No.8		
No.10		

Asphalt Content-Recycle Mat.:(Std. Specs. 9-03.11)

Sand Equivalent: (WSDOT Test Method No.109) 65

===

Distribution:		
Materials File		X
General File		X
Region Administrator	46	X
Project Engineer:		
T. TREPANIER		X(2)
Physical Testing		X

Result: INFORMATIONAL
Remarks:

RECEIVED
JUL 10 1995
T. TREPANIER P.E.

RODNEY G. FINKLE, P.E.
MATERIALS ENGINEER

By: Dick Foster, P.E. BH

Date: 06/16/95
Phone: (360)753-2182

T43B-1.0	T43M-	T44C-
T43C-	T43N-35.0	T44T-
T43L-	T44B-1.0	T44U-

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 167 OLYMPIA/1655 S. 2nd AVE TUMWATER/ WA 98504

BITUMINOUS SECTION TEST REPORT
TEST OF PAVING ASPHALTS

GRADE:	AR4000W	Antistrip: % 0.25	WORK ORDER # 004489
SUPPLIER:	EXXON	Type:AGGRIGRIP	TRANS. LTR.# 248635
SHIPPER:	KOCH MATERIALS		LAB.IDENT. # 00001019
DATE RECD:	07/18/95		ASPH. LAB. # A950773
SR NO:	395	COUNTY:ADAMS	BID ITEM. #
SECTION:	LIND TO RITZVILLE		REGION # 46

ACCEPTANCE NO.	ASSURANCE NO.	IAS NO.	CERT NO.	DATE SAMPLED
7	7		3600	

TEST:	RESULTS:	SPECIFICATIONS:
ORIGINAL PROPERTIES:		
Penetration of Orig. @77F, 100g/5sec.	81	
Penetration of Orig. @39.2F, 200g/60sec.	29	
Penetration Ratio, (39.2F/77F)	36	
Absolute Visc. of Orig. @140F,Poise	1502	
Kinematic Visc. of Orig. @275F, cSt.	367	
C.O.C. Flash Point, F	510+	440 MIN.
Solubility in TCE, %	100.0	99.0 MIN.
RESIDUE PROPERTIES:		
Penetration of Res. @77F, 100g/5sec.	54	40 MIN.
Penetration, Res. % of Orig.@ 77F	76	45 MIN.
Penetration of Res. @39.2F, 200g/60sec.	15	
Absolute Visc. of Res. @140F,Poise	4402	2500-5000
Absolute Visc. Ratio (Res./Orig.) @140F	2.9	
Kinematic Visc. of Res. @275F, cSt.	560	275 MIN.
Ductility of Res. @77, F	120	
Ductility of Res. @45, F	10	10 MIN.
Mass Loss after RTFO, %	0.22	

HEADQUARTERS:		
Materials File		X
General File		X
REGION:Eastern		
Administrator	46	X
Materials Engineer	46	X
PE:T. TREPANIER		X(2)
KOCH MATERIALS		X

K. Martin X

Material does meet specification requirements.
Remarks:
Sample taken at the tanker.

DENNIS C. JACKSON, P.E.
Materials Engineer

By: James P. Walter, P.E.

Date 08/04/95
Telephone 234-7107

0342

T130- 1	T136- 1
T131- 1	T141- 1
T132- 5	T169-
T133- 4	T170-
T134- 1	T173-
T135- 1	T174-

APPENDIX C

LCB MIX DESIGN

ACME MATERIALS AND CONSTRUCTION COMPANY
P.O.BOX 2503 T.A.
SPOKANE, WA 99220
(509) 535-3081

CONCRETE MIX DESIGN

MIX ID : RITZVILLE LCB [2] 625 PSI 08/01/95

CONTRACTOR : ACME MATERIALS AND CONSTRUCTION CO
PROJECT : LIND TO RITZVILLE, CONTRACT NO 4489
SOURCE OF CONCRETE : ACME MATERIALS AND CONSTRUCTION CO
CONSTRUCTION TYPE : 14 DAY CONCRETE PAVING, LCB
PLACEMENT : SLIPFORM

WEIGHTS PER CUBIC YARD (SATURATED, SURFACE-DRY)

		YIELD, CU FT
HOLNAM CEMENT, TYPE II, LB	225	1.14
POZZOLANIC INTERNATIONAL, TYPE F, LB	25	0.17
WSDOT CLASS 1, PAHA PIT, LB	1705	9.93
WSDOT TYPE II, PAHA PIT, LB	1699	9.93
WATER, LB (GAL-US)	270 (32.4)	4.33
TOTAL AIR, %	5.5 +/- 1.0	1.49
		=======
	TOTAL	27.00
MASTER BUILDERS, MASTER PAVE, OZ-US	15.00	
MASTER BUILDER, PAVE AIR 90, OZ-US	2.5	
WATER/CEMENT RATIO, LBS/LB	1.08	
SLUMP, IN	1.50	
CONCRETE UNIT WEIGHT, PCF	145.3	

ACTUAL BATCH WEIGHTS WILL VARY DEPENDING ON THE MOISTURE CONTENT OF THE SAND AND AGGREGATE.

PREPARED BY :

ACME QUALITY CONTROL

8.33

ACME MATERIALS & CONSTRUCTION

P.O. BOX 2503 T.A.
SPOKANE WA 99220-2503
(509) 535-3081

FIELD AND LAB RESULTS ON CONCRETE COMPRESSION SPECIMENS

TICKET INFORMATION

TE MOLDED 7/12/95 CONTRACTOR Acme

JOB NAME US 395 Lind to Ritzville. JOB ADDRESS Ritzville

...HERE PLACED slipform HOW PLACED

UCK # MIX # Ritzville LCB (2) TICKET# F'C 0

FIELD DATA

TIME BATCHED 3:50 TIME SAMPLED 4:00 LOAD SIZE 10 1/10

SLUMP 1/4 AIR 5.4 CON. TEMP. 77° AIR TEMP. 75°

'OT. WT. CEMENT WT. 225 FLY ASH WT. 25 BUCKET WT. 43.8

BUCKET TARE BUCKET FAC. UNIT WT. 144.4 YIELD CF/CY 27.05

CEMENT FAC. VARIANCE YDS/TR .1003 ADDED H2O

TESTED BY DF RC

LAB DATA

CYLINDER NUMBER	TEST@ DAY	WEIGHT LBS	AREA SQ. IN.	DATE RECIEVED	DATE TESTED	APPLIED LOAD	PSI
9006	2			7-13-95	7-14-95	10280	365
9007	5				7-17-95	15260	540
9008	5				7-17-95	15540	550
9009	6				7-18-95	15880	560
9010	6				7-18-95	15840	560
9011	7				7-19-95	16600	590
9012	7				7-19-95	15660	550
9013	7				7-19-95	18540	660

Air Pocket Cyl

7 Day Avg. — 600

UNIT WT.=(BUCKET-TARE) (FACTOR) CEMENT FAC.=BATCH CEMENT/YDS TYR
CF/CY=(TOTAL WT./UNIT WT.)/(LOAD SIZE YDS/TR=(TOTAL WT./UNITWT.)/(27)
VARIANCE =(CEM. FAC. -THEO. CEM.)/(THEO. CEM.) 100

C

ACME MATERIALS AND CONSTRUCTION CO, INC
Trail Batch Worksheet
Park Road Materials

Mix No: Ritzville LCB (2) Date: 7/12/95

Materials	1 Yard SSD	1/10th yard	% Moisture	Moist Amt	Corrected Batch Wts
1 1/2"					
WSDOT Type II 3/4"	1698	169.8	1.4	2.4	172.2
3/8"					
WSDOT Type C.S. Class	1706	170.6	5.7	9.7	180.3
M.S.					
Cement	225	22.5			22.5
Water	~~280~~ 270	27.0			27.0 - ~~[illegible]~~ 12.1 = 14.9 - 1 30 = (
Fly Ash Admixes	25	2.5			2.5
Pave Air 90 AEA	2.5	.25			7.5 ml
Master Pave WRA	15.0	1.5			45 ml
Other					

3.4
2.0
1.4

Total | | | 9.2 3.5 5.7 | | 391.10

TEST RESULTS

Slump	1/4"	Bucket Wt	43.8
Air	5.4	Tare	7.85
Con Temp	77	Factor	4017
Air Temp	72°	Unit Wt	144.4
Time Batched	3:50	Cement Factor	
Time Sampled	4:00	Yds/Batch	.1003
Yield	27.08	Variance	

REMARKS: Actual W/C ratio = 1.03. = $\frac{(13.6 + 2.4 + 9.7)}{(22.5 + 2.5)}$

Tests Conducted by:

9

APPENDIX D

PATB MIX DESIGN, GEOTEXTILE STRENGTH TEST, WDOT HEADWALL PLAN

PATB MIX DESIGN

Washington State Department of Transportation - Materials Laboratory
PO Box 167 Olympia / 1655 S 2nd Ave Tumwater / WA 98504
BITUMINOUS SECTION TEST REPORT

WORK ORDER NO: 004489
LAB ID NO: 0000101004
TRANSMITTAL NO: 276225
MIX ID NO: G7582
BID ITEM NO:

TEST OF: A.C.P. JOB MIX DESIGN CLASS ATPB
ATE SAMPLED: 06/22/95
ATE RECVD HQS: 06/26/95
SR NO: 395
CTION: LIND TO RITZVILLE

--*-*-*-*-*-*-*-*-*-*-*-*CONTRACTOR'S PROPOSAL*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

Mat'l:	MIN. AGG.	Combined	Specifications
urce:	R/W		
atio:	100.0%	100%	
---	100.0	100	
---	100.0	100	
---	100.0	100	
/4	98.1	98	100
1	48.0	48	85-100
5/8	8.0	8	45-70
1/4	1.1	1	0-15
00	0.50	0.5	0-5

-*-*-*-*-*-*-*-*-*-*-*-*-*-*-LABORATORY ANALYSIS-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

Asph % by Wt of Total Mix:
Stabilometer "S" Value:
Cohesiometer "C" Value:
Density (lbs/cf):
% Voids - Volume in Mix:
% Voids in Mineral Agg:
Max Density from Rice:

-*-*-*-*-*-*-*-*-*-*-*-*-*LOTTMAN STRIPPING EVALUATION*-*-*-*-*-*-*-*-*-*-*-*-

		0%	1/4%	1/2%	3/4%	1%
TAK	Visual Appearance:	SLIGHT	NONE	NONE	NONE	NONE
	% Retained Strength:					

-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-RECOMMENDATIONS-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

ıpplier	TAK EXXON
% Asphalt (by total mix)	2.5
rade of Asphalt	AR4000W
Anti Strip (by wt asph)	0.25
Type of Anti Strip	AGGRIGRIP
Rice Density lbs/cf	

NUCLEAR CALIBRATION NUMBER: NO
MIX ID NUMBER: CALIB

RECEIVED
JUL 13 1995

emarks:

==

Headquarters:

Construction Engineer	x	T160-1
Materials File	x	T166-
General File	x	T172-
Bituminous Section	x	T175-
egion: Eastern		
Administrator	46 x	
Materials Engr	46 x	

Dennis C. Jackson, P.E.
Materials Engineer
By: James P. Walter P.E.
(360) 753-7107
Date: 7/10/95

ON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
167 OLYMPIA, WA. 98507-0167/1655 SO. 2ND AVE TUMWATER, WA. 98512

ical Testing Section
[redacted]regate Test Report
[redacted]OT Test Methods

ate Sampled: 06/22/95
[redacted]pled By: CONTRACTOR
ate Recvd HQ: 06/26/95
.R. No.: 395
[redacted]tion: LIND TO RITZVILLE
[redacted]tractor: SCARSELLA BROS, INC

Work Order No. 004489
Lab ID No. 0000101004
Lab Number G -957582
Trans. No. 276225
Bid. Item No. 81.00
Org. No. 464304
F.A. No.ACDPS-0027(001)

==

[redacted]terial: MIN AGG FOR ACP CL ATPB

ccpt. Samp.No.:

Pit No.: PAHA

ple Loc.:PAHA I/C

Test Loc.:

By:

Fracture: (WSDOT Test Method No.103)

Sieve Size	Single Face	Double Face
1 1/4"		
1"	100	
3/4"		
5/8"	100	
1/2"		
3/8"		
1/4"	100	
No.4		
No.8		
No.10		

Asphalt Content-Recycle Mat.:(Std. Specs. 9-03.11)

Sand Equivalent: (WSDOT Test Method No.109)

==

Distribution:
Materials File X
General File X
Region Administrator 46 X
Project Engineer:
. TREPANIER X(2)
hysical Testing X

Result: INFORMATIONAL
Remarks:

RECEIVED
JUL 13 1995

RODNEY G. FINKLE, P.E.
MATERIALS ENGINEER

By: Dick Foster, P.E. BH

Date: 06/29/95
Phone: (360)753-2182

T43B-1.0 T43M- T44C-
T43C-1.0 T43N-12.5 T44T-
T43L- T44B- T44U-

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 167 OLYMPIA/1655 S. 2nd AVE TUMWATER/ WA 98504

BITUMINOUS SECTION TEST REPORT
TEST OF PAVING ASPHALTS

GRADE:	AR4000W	Antistrip: % 0.25	WORK ORDER # 004489
SUPPLIER:	EXXON	Type:AGGRIGRIP	TRANS. LTR.# 248635
SHIPPER:	KOCH MATERIALS		LAB.IDENT. # 00001019
DATE RECD:	07/18/95		ASPH. LAB. # A950773
SR NO:	395	COUNTY:ADAMS	BID ITEM. #
SECTION:	LIND TO RITZVILLE		REGION # 46

ACCEPTANCE NO.	ASSURANCE NO.	IAS NO.	CERT NO.	DATE SAMPLED
7	7		3600	

TEST:	RESULTS:	SPECIFICATIONS:
ORIGINAL PROPERTIES:		
Penetration of Orig. @77F, 100g/5sec.	81	
Penetration of Orig. @39.2F, 200g/60sec.	29	
Penetration Ratio, (39.2F/77F)	36	
Absolute Visc. of Orig. @140F,Poise	1502	
Kinematic Visc. of Orig. @275F, cSt.	367	
C.O.C. Flash Point, F	510+	440 MIN.
Solubility in TCE, %	100.0	99.0 MIN.
RESIDUE PROPERTIES:		
Penetration of Res. @77F, 100g/5sec.	54	40 MIN.
Penetration, Res. % of Orig.@ 77F	76	45 MIN.
Penetration of Res. @39.2F, 200g/60sec.	15	
Absolute Visc. of Res. @140F,Poise	4402	2500-5000
Absolute Visc. Ratio (Res./Orig.) @140F	2.9	
Kinematic Visc. of Res. @275F, cSt.	560	275 MIN.
Ductility of Res. @77, F	120	
Ductility of Res. @45, F	10	10 MIN.
Mass Loss after RTFO, %	0.22	

HEADQUARTERS:		
Materials File		X
General File		X
REGION:Eastern		
Administrator	46	X
Materials Engineer	46	X
PE:T. TREPANIER		X(2)
KOCH MATERIALS		X

Material does meet specification requirements.
Remarks:
Sample taken at the tanker.

DENNIS C. JACKSON, P.E.
Materials Engineer

K. Martin X

By: James P. Walter, P.E.

0342

T130- 1	T136- 1
T131- 1	T141- 1
T132- 5	T169-
T133- 4	T170-
T134- 1	T173-
T135- 1	T174-

Date 08/04/95
Telephone 234-7107

GEOTEXTILE STRENGTH TEST

PATB

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
[redacted]O BOX 167 OLYMPIA, WA. 98507-0167/1655 SO. 2ND AVE TUMWATER, WA. 98512

ysical Testing Section		Work Order No.	004489
[redacted]textile Test Report		Lab ID No.	0000102421
[redacted]OT Test Methods		Lab No.	FA-950950
		Transmittal No.	272803
ate Sampled:	07/25/95	Bid Item No.	
[redacted]pled By:	L. CHRISTENSEN	Org. No.	464304
ate Recvd HQ:	07/25/95	F.A. No.	
.R. No.:	395		
[redacted]tion:	LIND TO RITZVILLE-STAGE 1		
[redacted]tractor:	SBI		

==

rial: STYLE CEF 4546
facturer: AMOCO — Type/No.: POLYPROPYLENE
sage: UNDERGROUND DRAINAGE
c. Samp.#: — Roll No. 0339426 — Lot No.12956
[redacted]ssification — Survivability

	Test Results	Specifications	
[redacted]S (mm)	0.17	0.21	Max.
Permeability (cm/sec)	0.279	0.080	Min.
[redacted]rmittivity (sec-1)			Min.
Seam Strength (Lbs.)			Min.
Burst (Lbs.)	294	140	Min.
[redacted]uncture (Lbs.)	86	40	Min.
Ultra-Violet Stability (% by Cert.)			Min.
[redacted]Strength Retained After 500 Hrs.)			
[redacted]hickness (cm)	0.135		

	Machine Dir. Test Result	Machine Dir. Specifications		Cross Machine Dir. Test Result	Cross Machine Dir. Specifications	
rab Brk. Load (Lbs.)	122	90	Min.	175	90	Min.
Elong. (%)						
Strength (Lbs.)	63	30	Min.	104	30	Min.
/W Ult.Tensile (Lbs./In.)			Min.			Min.
Strain @ Ult. (%)			Min.			Min.

==

Distribution:		
erials File		X
eneral File		X
Regional Administrator	46	X
Project Engineer:		
[redacted] ~~TREPANIER~~		X(2)
Physical Testing		X

Results: MEETS SPECIFICATIONS
Remarks:
FOR LOW SURVIVABILITY.

RECEIVED
AUG 14 1995
T.J. TREPANIER P.E.

DENNIS C. JACKSON, P.E.
MATERIALS ENGINEER
By: LEP

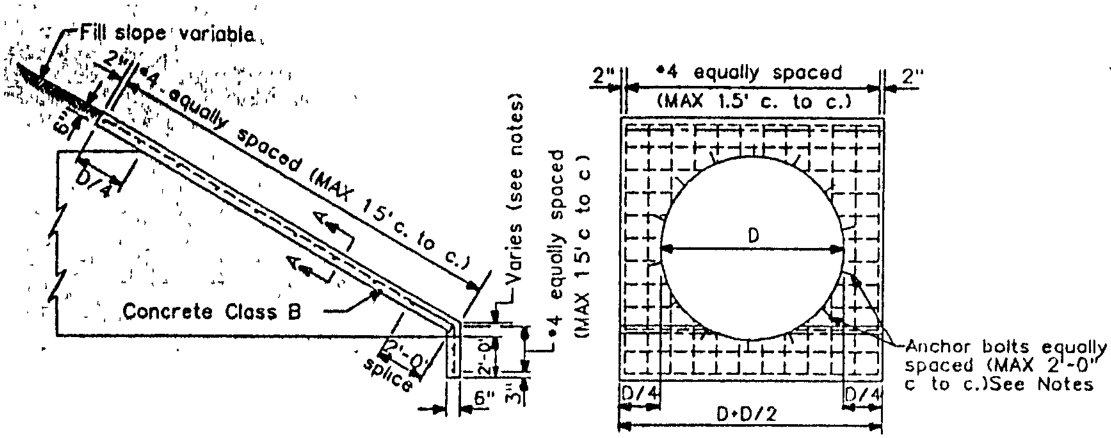
[redacted]

T48A 1.0		
T48B	T48E 1.0	T48J
48C	T48F 1.0	T48K 1.0
48D 1.0	T48H	T48L 1.0

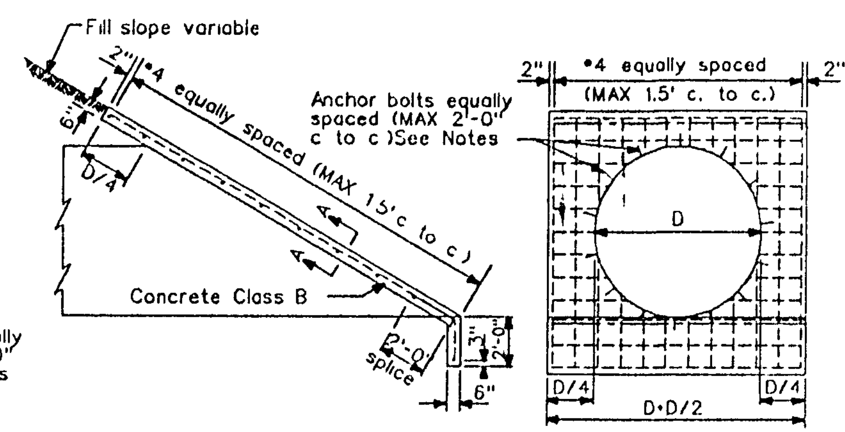
Date: 08/09/95
Phone: (360)753-2182

D Marh

STANDARD WDOT HEADWALL PLAN



STEP MITERED PIPE



FULL MITERED PIPE

PIPES AND STRUCTURAL PLATE PIPES

NOTES

Unless otherwise specified, round pipes and round structural plate pipes shall be full mitered in conformance with the details shown hereon

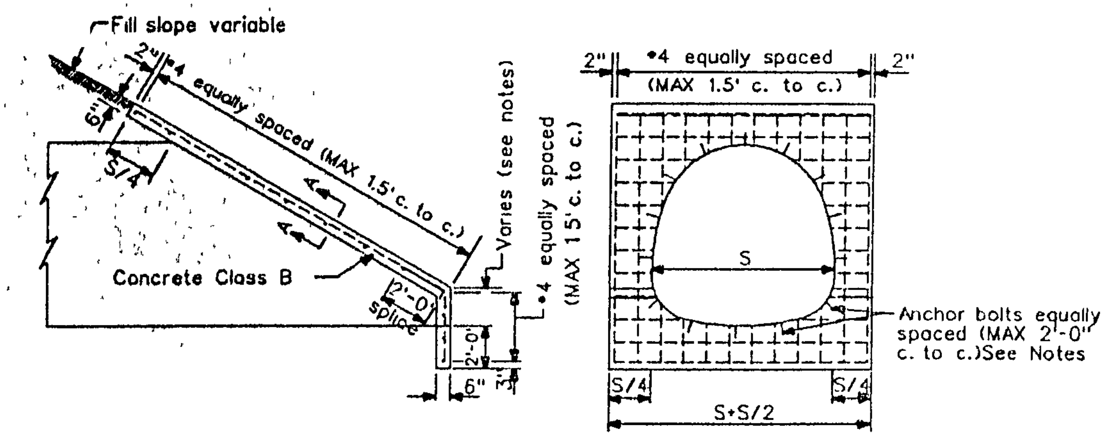
The variable dimension indicated for the height of step for step mitered pipes shall conform to manufacturers recommendations unless specified differently on the plans or in the special provisions

Anchor bolts of the size shown hereon shall conform with ASTM Designation A307 and shall be galvanized in accordance with AASHTO M 232 for either steel or aluminum pipes, or shall conform with ASTM Designation B211, alloy 2024-T4, treated with zinc chromate paint for aluminum pipes only

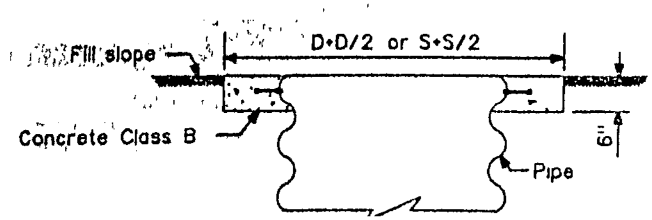
Reinforcing steel shall have 1 1/2 inch clear cover to all concrete surfaces and shall be Grade 40 or Grade 60.

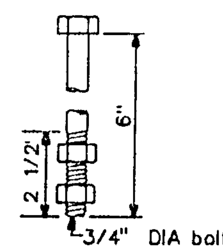
Headwalls for concrete culvert pipe shall omit anchor bolt attachment

When steel pipe safety bars are used, headwall thickness is increased to 8 inches



STRUCTURAL PLATE PIPE ARCHES AND UNDERPASSES





ANCHOR BOLT DETAILS

DATE	REVISION	BY	APPR'D
9-20-89	Revised Notes	ST	
8-12-88	Added notes, new signature	ST	

HEADWALLS FOR CULVERT PIPES

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
OLYMPIA, WASHINGTON

APPROVED

PROJECT DEVELOPMENT ENGINEER

APPENDIX E

- WDOT ACCEPTANCE LETTERS (PCC AND LCB MIXES)
- PCC MIX DESIGNS (SHRP 550 MIX, STATE 650 MIX, SHRP 900 MIX)
- CONCRETE AND FLY ASH CERTIFICATES

WDOT ACCEPTANCE FOR PCC MIXES

Washington State
Department of Transportation

Memorandum

Date: August 8, 1995

From: James P. Walter/F.A. Rickert
Phone: (360) 753-2181

Subject: Contract 4489 SR-395
Lind to Ritzville - Stage 1
Review of Concrete Mix Design

To: T.J. Trepanier/ M. Wilson

The OSC Mats Lab has reviewed the Concrete Mix Designs received from the Project Engineer submitted by Acme Material and Construction.. The review comments for the mix designs are as follows:

Standard 14 day Paving – Contractor Alternate

The mix design designated as Ritzville(9) has the same cement and flyash content as both trial mixes with only slight adjustments to the coarse and fine aggregate weights. This mix meets the requirements of section 5-05.3(1)A for a Contractor Alternate Paving Concrete Mix. Approval of this mix design is recommended.

Lean Concrete Base

The mix design designated as Ritzville LCB (2) meets the requirements of the contract for Lean Concrete Base. Approval of this mix design is recommended.

Concrete Paving 550 psi Mix

Three trial batches were made and tested mixes Ritzville 550(1), Ritzville 550(2), and Ritzville 550(3). After reviewing the test data the mix designated Ritzville 550(2) is recommended for approval. One of the mixes, Ritzville 550(3), fails to meet the minimum strength requirement while the other Ritzville 550(1), is crowding the upper limits of the specification.

If there are any questions concerning this mix design please contact me at (360) 753-2181.

JPW/FAR
far

cc: Robin Moore

RECEIVED
AUG 10 1995
T.J. TREPANIER P.E

3295 C:\winword\con_mix\4489mixs.doc

MARCO

Washington State
Department of Transportation

Memorandum

DATE: September 12 1995

FROM: Theodore J. Trepanier, P.E.

PHONE: (509) 921-2402

SUBJECT: Contract 4489 SR 395
Lind to Ritzville - Stage 1
Review of 900 psi PCCP Mix Design

TO: Francis Rickert, OSC Mats Lab

Attached is a letter from Acme Materials and Construction, the Portland Cement Concrete Paving subcontractor on the referenced project.

They are submitting data for the 900 psi flexural strength mix design for the SHRP Section. The 900 psi specifications are found on pages 63 and 64 of the Contract Special Provisions.

The Contractor has made three trial batches, with each trial batch consisting of 3 beams which were broken at 14 days as required by the Special Provisions.

Mix ID Ritzville 900 (16) and Ritzville 900 (18) are very similar mixes. Average flexural strength for (16) is 931 psi. It has slightly less cement than (18) but all the weights of both are within 100 pound of both mix designs. Average flexural strength for mix design (18) is 933.

All averages are within the allowed 250 psi and between the allowed 860 to 940 psi. While the quality level is not a factor in these mix designs the 900 (18) has the highest quality level of 75.

Attached are our observations of the beam breaks. We would recommend using the 900 (18) mix design.

Your concurrence is requested.

TJT:sh
Attachments

cc: Eastern Region Const. w/attach
Eastern Region Mats Lab w/attach
Doug Frith, Nichols Engineering w/attach
Keith Martin w/attach
file w/attach

SEP 14 1995

SHRP 550 PSI MIX

ACME MATERIALS AND CONSTRUCTION COMPANY
P.O.BOX 2503 T.A.
SPOKANE, WA 99220
(509) 535-3081

CONCRETE MIX DESIGN

MIX ID : RITZVILLE 550 [2] 550 PSI 08/01/95

CONTRACTOR :	ACME MATERIALS AND CONSTRUCTION CO
PROJECT :	LIND TO RITZVILLE, CONTRACT NO 4489
SOURCE OF CONCRETE :	ACME MATERIALS AND CONSTRUCTION CO
CONSTRUCTION TYPE :	14 DAY CONCRETE PAVING, SHRP 550 FLEX
PLACEMENT :	SLIPFORM

WEIGHTS PER CUBIC YARD (SATURATED, SURFACE-DRY)

		YIELD, CU FT
HOLNAM CEMENT, TYPE II, LB	423	2.15
POZZOLANIC INTERNATIONAL, TYPE F, LB	47	0.33
WSDOT CLASS 1, PAHA PIT, LB	1395	8.13
WSDOT TYPE II, PAHA PIT, LB	1919	11.22
WATER, LB (GAL-US)	230 (27.6)	3.69
TOTAL AIR, %	5.5 +/- 1.0	1.49
		=======
	TOTAL	27.00
MASTER BUILDERS, MASTER PAVE, OZ-US	28.20	
MASTER BUILDER, PAVE AIR 90, OZ-US	4.7	
WATER/CEMENT RATIO, LBS/LB	0.49	
SLUMP, IN	1.50	
CONCRETE UNIT WEIGHT, PCF	148.6	

ACTUAL BATCH WEIGHTS WILL VARY DEPENDING ON THE MOISTURE CONTENT OF THE SAND AND AGGREGATE.

PREPARED BY :

ACME QUALITY CONTROL

ACME MATERIALS & CONSTRUCTION

P O. BOX 2503 T A
SPOKANE WA 99220-2503
(509) 535-3081

FIELD AND LAB RESULTS ON CONCRETE COMPRESSION SPECIMENS

TICKET INFORMATION

DATE MOLDED 7/6/95 CONTRACTOR Acme Trial

JOB NAME US 395 Ritzville to Lind JOB ADDRESS Paha

WHERE PLACED slipform HOW PLACED

TRUCK # MIX # Ritzville 550 (2) TICKET# F'C 550 Flex

FIELD DATA

TIME BATCHED 12^{30} TIME SAMPLED 12^{45} LOAD SIZE 1/8

SLUMP 1/4" AIR 4.7 Holman CON. TEMP. 75 AIR TEMP. 79°

TOT. WT. CEMENT WT. FLY ASH WT. BUCKET WT.

BUCKET TARE BUCKET FAC. UNIT WT. 149.2 YIELD CF/CY 26.91

CEMENT FAC. VARIANCE YDS/TR .1246 ADDED H2O

TESTED BY DF RC DC

LAB DATA

CYLINDER NUMBER	TEST@ DAY	WEIGHT LBS	AREA SQ. IN.	DATE RECIEVED	DATE TESTED	APPLIED LOAD	PSI
8973	7			7-7-95	7-13-95	82440	2920
8974	14				7-20-95	109420	3870
8975	7	d-6.00 W-6.00			7-13	5580	465
8976	7	d-6.00 W-5.99			7-13	5960	500
8977	14	d-6.00 W-6.02			7-20-95	6000	500
8978	14	d-6.01 W-6.01			7-20	6140	510
8979	14	d-6.00 W-6.01			7-20	7380	615

14 Day Avg. – 542

UNIT WT.=(BUCKET-TARE) (FACTOR) CEMENT FAC.=~~BATCH CEMENT/YDS TYR~~
CF/CY=(TOTAL WT./UNIT WT.)/(LOAD SIZE YDS/TR=(TOTAL WT./UNITWT)/(27)
VARIANCE =(CEM. FAC. -THEO. CEM)/(THEO. CEM) 100

ACME MATERIALS AND CONSTRUCTION CO, INC
Trail Batch Worksheet
Park Road Materials

Mix No: Ritzville 550 (2)

Date: 7/6/95

Materials	1 Yard SSD	1/10th yard	% Moisture	Moist Amt	Corrected Batch Wts
1 1/2"					
WSDOT Type II 3/4"	1919	239.9	.4	1.0	240.9
3/8"					
WSDOT Class 1 C.S.	1395	174.4	4.7	8.2	182.6
M.S.					
Cement	423	52.9			52.9
Water	230	28.75			28.75 − 9.2 = 19.55
Fly Ash Class F Admixes	47	5.9			5.9
AEA	4.7	.5875			17.6 ml
WRA	28.20	3.525			105.75
Other					

Total			501.85

TEST RESULTS

Slump	1/4"	Bucket Wt	45.00
Air	4.7%	Tare	7.85
Con Temp	75°	Factor	4.017
Air Temp	79°	Unit Wt	149.2
Time Batched	12:30	Cement Factor	
Time Sampled	12:45	Yds/Batch	.1246
Yield	26.91	Variance	

REMARKS: Actual w/c ratio = 0.49 = [[19.55 + 1.0 + 8.2] / [52.9 + 5.9]]

Tests Conducted by:

15

STATE 650 PSI MIX

ACME MATERIALS AND CONSTRUCTION COMPANY
P.O.BOX 2503 T.A.
SPOKANE, WA 99220
(509) 535-3081

CONCRETE MIX DESIGN

MIX ID : RITZVILLE 650 [9] 650 PSI 08/01/95

CONTRACTOR : ACME MATERIALS AND CONSTRUCTION CO
PROJECT : LIND TO RITZVILLE, CONTRACT NO 4489
SOURCE OF CONCRETE : ACME MATERIALS AND CONSTRUCTION CO
CONSTRUCTION TYPE : 14 DAY CONCRETE PAVING, WSDOT SPEC 5-05
PLACEMENT : SLIPFORM

WEIGHTS PER CUBIC YARD (SATURATED, SURFACE-DRY)

		YIELD, CU FT
HOLNAM CEMENT, TYPE II, LB	451	2.30
POZZOLANIC INTERNATIONAL, TYPE F, LB	113	0.79
WSDOT CLASS 11, PAHA PIT, LB	1087	6.34
WSDOT TYPE II, PAHA PIT, LB	2103	12.30
WATER, LB (GAL-US)	237 (28.4)	3.80
TOTAL AIR, %	5.5 +/- 1.0	1.49
	TOTAL	27.00
MASTER BUILDERS, MASTER PAVE, OZ-US	56.40	
MASTER BUILDER, PAVE AIR 90, OZ-US	5.6 — Higher in Field mixer	
WATER/CEMENT RATIO, LBS/LB	0.42 — actual = 0.41 mix Design	
SLUMP, IN	1.50	
CONCRETE UNIT WEIGHT, PCF	147.8	

ACTUAL BATCH WEIGHTS WILL VARY DEPENDING ON THE MOISTURE CONTENT OF THE SAND AND AGGREGATE.

PREPARED BY :

ACME QUALITY CONTROL

ACME MATERIALS & CONSTRUCTION

P.O. BOX 2503 T.A.
SPOKANE WA 99220-2503
(509) 535-3081

FIELD AND LAB RESULTS ON CONCRETE COMPRESSION SPECIMENS

TICKET INFORMATION

DATE MOLDED 7-18-95 CONTRACTOR Acme

JOB NAME US 395 Lind to Ritzville JOB ADDRESS Paha

WHERE PLACED Slipform HOW PLACED

TRUCK # MIX # Ritzville 650 (9) TICKET# F'C 650 76x

FIELD DATA

TIME BATCHED 12^{30} TIME SAMPLED 12^{40} LOAD SIZE 1/8

SLUMP 1/4" AIR 5.6 CON. TEMP. 77° AIR TEMP. 78°

TOT. WT. 496.1 CEMENT WT. 451 FLY ASH WT. 113 BUCKET WT. 44.65

BUCKET TARE 7.85 BUCKET FAC. 4.017 UNIT WT. 147.8 YIELD CF/CY 26.85

CEMENT FAC. VARIANCE YDS/TR .1243 ADDED H2O -1.35

TESTED BY DF DC RC

LAB DATA

215.28

CYLINDER NUMBER	TEST@ DAY	WEIGHT LBS	AREA SQ. IN.	DATE RECIEVED	DATE TESTED	APPLIED LOAD	PSI
9046	7	[illegible]		7-19-95	7-25-95	4480	560
9047	14	w-5.99 d-6.03			8-1-95	5660	700
9048	14	w-6.01 d-6.03			8-1	5740	710
9049	14	w-6.02 d-6.01			8-1	5820	725
9050	14	w-5.99 d-6.01			8-1	5420	675
9051	14	w-5.98 d-6.01			8-1	5260	660

14 Day Avg. — 694 Quality Level - 99

UNIT WT.=(BUCKET-TARE) (FACTOR) CEMENT FAC.=BATCH CEMENT/YDS TYR
CF/CY=(TOTAL WT./UNIT WT.)/(LOAD SIZE YDS/TR=(TOTAL WT./UNITWT.)/(27)
VARIANCE =(CEM. FAC. -THEO. CEM.)/(THEO. CEM.) 100

ACME MATERIALS AND CONSTRUCTION CO, INC
Trail Batch Worksheet
Park Road Materials

Mix No: Ritzville 650 (8) Date: 7/18/95

Materials	1 Yard SSD	1/8 ~~1/10th~~ yard	% Moisture	Moist Amt	Corrected Batch Wts
1 1/2"					
WSDOT Type II 3/4"	2093	261.6	1.5	3.9	265.5
3/8"					
WSDOT Class 1 C.S.	1081	135.1	4.6	6.2	141.3
M.S.					
Cement	451	56.4			56.4
Water	242	30.25			30.25-10.1= 20.15-1.35=18
Admixes	113	14.1			14.1
AEA	5.64	.705			21.2 ml
WRA	5640	7.05			211.5 ml
Other					

Total | | | 496.1

TEST RESULTS

Slump	1/4	Bucket Wt	44.65
Air	5.6	Tare	7.85
Con Temp	77°	Factor	4.017
Air Temp	78°	Unit Wt	147.8
Time Batched	12:30	Cement Factor	
Time Sampled	12:40	Yds/Batch	.1243
Yield	26.85	Variance	

REMARKS: Actual W/C-Ratio = 0.41 = [(18.8+3.9+6.2)/[56.4+14.1]]

Tests Conducted by:

④

SHRP 900 PSI MIX

ACME MATERIALS AND CONSTRUCTION COMPANY
P.O.BOX 2503 T.A.
SPOKANE, WA 99220
(509) 535-3081

CONCRETE MIX DESIGN

IIX ID : RITZVILLE 900 [18] [redacted] PSI 09/05/95
900

CONTRACTOR : ACME MATERIALS AND CONSTRUCTION CO
PROJECT : LIND TO RITZVILLE-CONTRACT 4489
SOURCE OF CONCRETE : ACME MATERIALS AND CONSTRUCTION CO
CONSTRUCTION TYPE : 14DAY CONCRETE PAVING, WSDOT SPEC 5-05
PLACEMENT : SLIPFORM

WEIGHTS PER CUBIC YARD (SATURATED, SURFACE-DRY)

		YIELD, CU FT
HOLNAM CEMENT, TYPE II, LB, LB	925	4.71
WSDOT CLASS 1, PAHA PIT,LB, LB	948	5.52
WSDOT TYPE II, PAHA PIT, LB, LB	1833	10.72
WATER, LB (GAL-US)	285 (34.2)	4.57
TOTAL AIR, %	5.5 +/- 1.0	1.49
	TOTAL	27.01

ASTER BUILDERS, MASTER PAVE, OZ-US, OZ 92.50
ASTER BUILDERS, PAVE AIR 90,OZ-US, OZ- 13.9 - Higher in Field Mixes

WATER/CEMENT RATIO, LBS/LB 0.31 - Actual Mix = 0.29
SLUMP, IN 1.50 Design
CONCRETE UNIT WEIGHT, PCF 147.8

TUAL BATCH WEIGHTS WILL VARY DEPENDING ON THE MOISTURE CONTENT
)F THE COURSE AND FINE AGGREGATES.

REPARED BY :

CME MATERIALS AND CONSTRUCTION CO

ACME MATERIALS & CONSTRUCTION

P O BOX 2503 A
SPOKANE WA 99220-2503
(509) 535-3081

FIELD AND LAB RESULTS ON CONCRETE COMPRESSION SPECIMENS

TICKET INFORMATION

DATE MOLDED 8-17-95 CONTRACTOR Acme Trial 900 (18)

JOB NAME 395 - Ritzville to Lind JOB ADDRESS Pqhq

WHERE PLACED Pavement HOW PLACED Truck/Slipform

TRUCK # ______ MIX # Ritzville 900 (18) TICKET# ______ F'C 900 Flex

FIELD DATA

TIME BATCHED 4:22 TIME SAMPLED 4:30 LOAD SIZE 4yds

SLUMP 1" AIR 6.2% CON. TEMP. 72° AIR TEMP. 68°

TOT. WT. 15789 CEMENT WT. 3710 FLY ASH WT. — BUCKET WT. 44.30

BUCKET TARE 7.55 BUCKET FAC. 3.982 UNIT WT. 146.34 YEILD CF/CY 26.97

CEMENT FAC. 928 VARIANCE .32 YDS/TR 3.996 ADDED H2O ______

TESTED BY JA, KC

LAB DATA

CYLINDER NUMBER	TEST@ DAY	WEIGHT LBS	AREA SQ. IN.	DATE RECIEVED	DATE TESTED	APPLIED LOAD	P.
9227	7	5.96 W	6.01 D	8-18-95	8-24-95	9020	755
9228	14	5.94	6.02		8-31-95	10740	900
9229	14	5.94	6.02			11020	920
9230	14	5.95	6.02			11740	980

Avg. = 933

UNIT WT =(BUCKET-TARE) (FACTOR) CEMENT FAC =BATCH CEMENT/YDS TYR
CF/CY=(TOTAL WT /UNIT WT.)/(LOAD SIZE YDS/TR=(TOTAL WT /UNITWT)/(27)
VARIANCE =(CEM FAC. -THEO. CEM)/(THEO. CEM) 100

FLY ASH AND CONCRETE CERTIFICATES

HOLNAM
Trident Plant
4070 Trident Road
Three Forks, Montana 59752

SILO TEST CERTIFICATE
AVERAGE OF TEST RESULTS

MILL TEST NO : T-167

PORTLAND CEMENT TYPE: I-II (10-20)
GRIND DATE: MAY 15-17, 1995

CANADIAN: CAN3-A5-93
ASTM DESIGNATION: C150-94
AASHTO DESIGNATION M85-89I

CHEMICAL COMPOSITION		PERCENT
	SILICON DIOXIDE (SiO_2)	23.0
	ALUMINUM OXIDE (Al_2O_3)	3.9
	FERRIC OXIDE (Fe_2O_3)	2 0
	CALCIUM OXIDE (CaO)	65.1
	MAGNESIUM OXIDE (MgO)	1.4
	SULFUR TRIOXIDE (SO_3)	2.4
	LOSS ON IGNITION	1.4
	INSOLUBLE RESIDUE	0.23
	TRICALCIUM SILICATE (C_3S)	54
	DICALCIUM SILICATE (C_2S)	25
	TRICALCIUM ALUMINATE (C_3A)	7.1
	TETRACALCIUM ALUMINOFERRITE (C_4AF)	6
	ALKALIES (Na_2O EQUIVALENT)	0 42
SPECIFIC SURFACE:	BLAINE (meters^2/kg)	370
	-325 mesh fineness	94 2
SOUNDNESS:	AUTOCLAVE EXPANSION	0,01
TIME OF SETTING:	VICAT, (INITIAL SET,minutes)	115
	VICAT, (FINAL SET,minutes)	255
COMPRESSIVE STRENGTHS:	3 DAY BREAKS (lbs./in.^{2})	3000
	7 DAY BREAKS (lbs./in.^{2})	4390
	28 DAY BREAKS (lbs./in.^{2})	
AIR CONTENT:	PERCENT BY VOLUME	7.4

HOLNAM CEMENT IS WARRANTED TO CONFORM AT THE TIME OF SHIPMENT WITH THE SPECIFICATION DESIGNATED ABOVE. NO OTHER WARRANTY IS MADE OR IMPLIED HAVING NO CONTROL OVER THE USE OF IT'S CEMENTS, HOLNAM DOES NOT GUARANTEE FINISHED WORK.

HOLNAM, INC.
TRIDENT PLANT
BY Britt Slovensky for Ralph Dickman
QUALITY CONTROL SUPERVISOR

COMMERCIAL TESTING LABORATORIES

A DIVISION OF CTL/THOMPSON, INC.

CHEMICAL AND PHYSICAL ANALYSES OF FLY ASH

TICKET NUMBER: 9813- 6395 Job Number: 9813 REPORT DATE: 06/12/95

REPORT TO: Pozzolanic International
7525 SE 24th Street
Suite 630
Mercer Island , WA 98040

LANT OF ORIGIN : Jim Bridger
AMPLE ID : 7-95
DOCKETS : T.R. 12547-12675 R.R. 52579-52655
DATE SAMPLED : 04/15/95 -
DATE RECEIVED : 04/21/95

			ASTM: C 618-94a SPECIFICATIONS CLASS F	CLASS C
CHEMICAL COMPOSITION(%):				
Silicon Dioxide	61.17			
Aluminum Oxide	19.44			
Iron Oxide	4.53			
* * * Total		85.14	70.0 Min	50.0 Min
Sulfur Trioxide		0.44	5.0 Max	5.0 Max
Calcium Oxide		6.52		
Moisture Content		0.04	3.0 Max	3.0 Max
Loss on Ignition		0.18	6.0 Max	6.0 Max
PHYSICAL TEST RESULTS:				
Fineness				
Retained on #325 sieve, (%)		25.69	34 Max	34 Max
Strength Activity Index				
With Portland Cement (%)				
Ratio to Control @ 7 days		73.1		
Ratio to Control @ 28 days		88.0	75 Min	75 Min
Water Requirement, % of Control		93.4	105 Max	105 Max
Soundness				
Autoclave Expansion (%)		-0.010	0.8 Max	0.8 Max
Density		2.19		

COMMENTS:

COMMERCIAL TESTING LABORATORIES

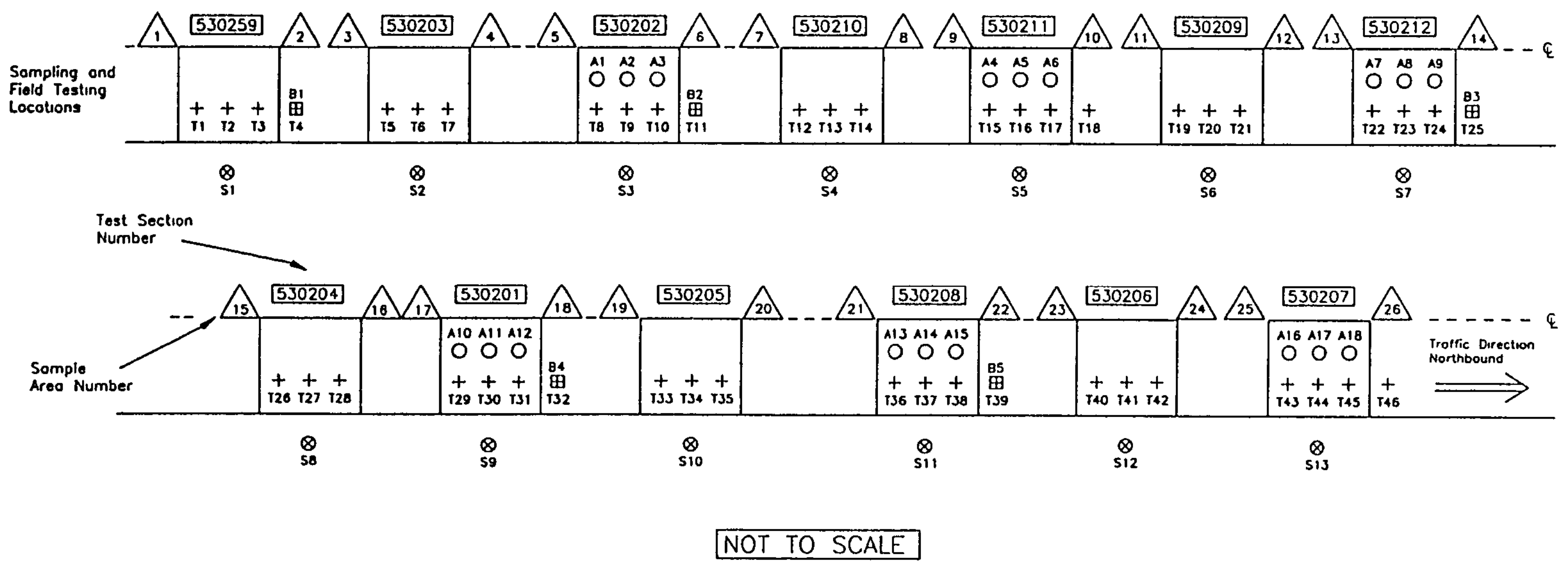
COLORADO REGISTERED PROFESSIONAL ENGINEER ORVILLE R. WERNER II 14540

By

Orville R. Werner II, P.E.

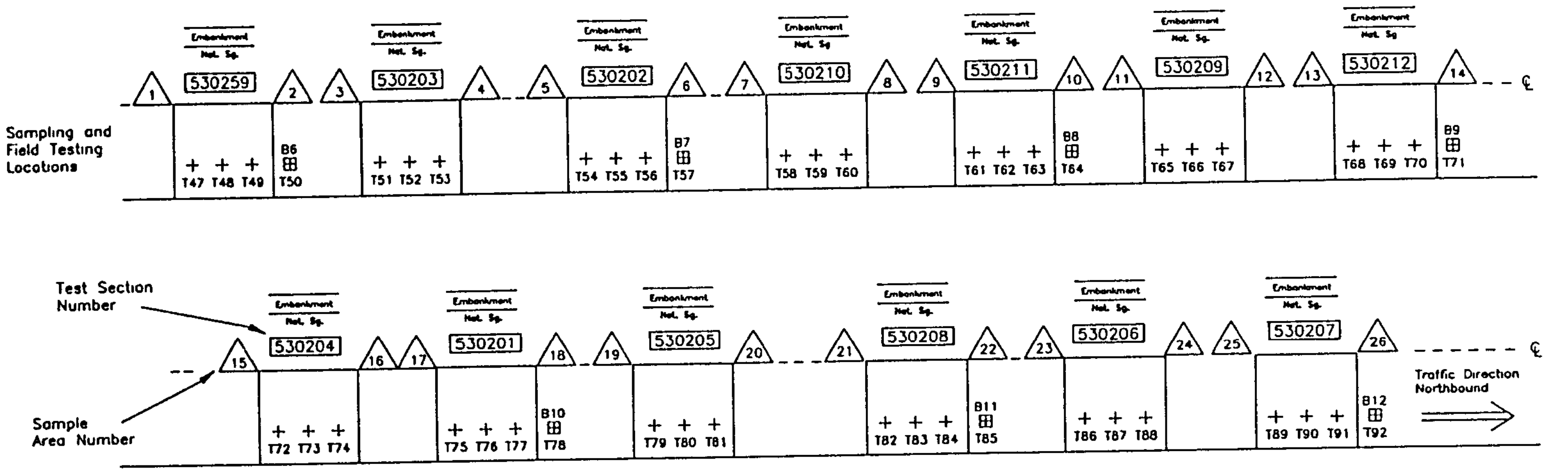
APPENDIX F

MATERIALS SAMPLING AND TESTING LAYOUTS



□ 2' x 2' bulk sampling location (B1–B5) to 12" below top of natural subgrade
○ Shelby tube/splitspoon sampling to 4' below top of natural subgrade (A1–A18)
⊗ Shoulder probe (S1–S13)
+ Location of nuclear moisture–density tests (T1–T46)
△ Sample areas

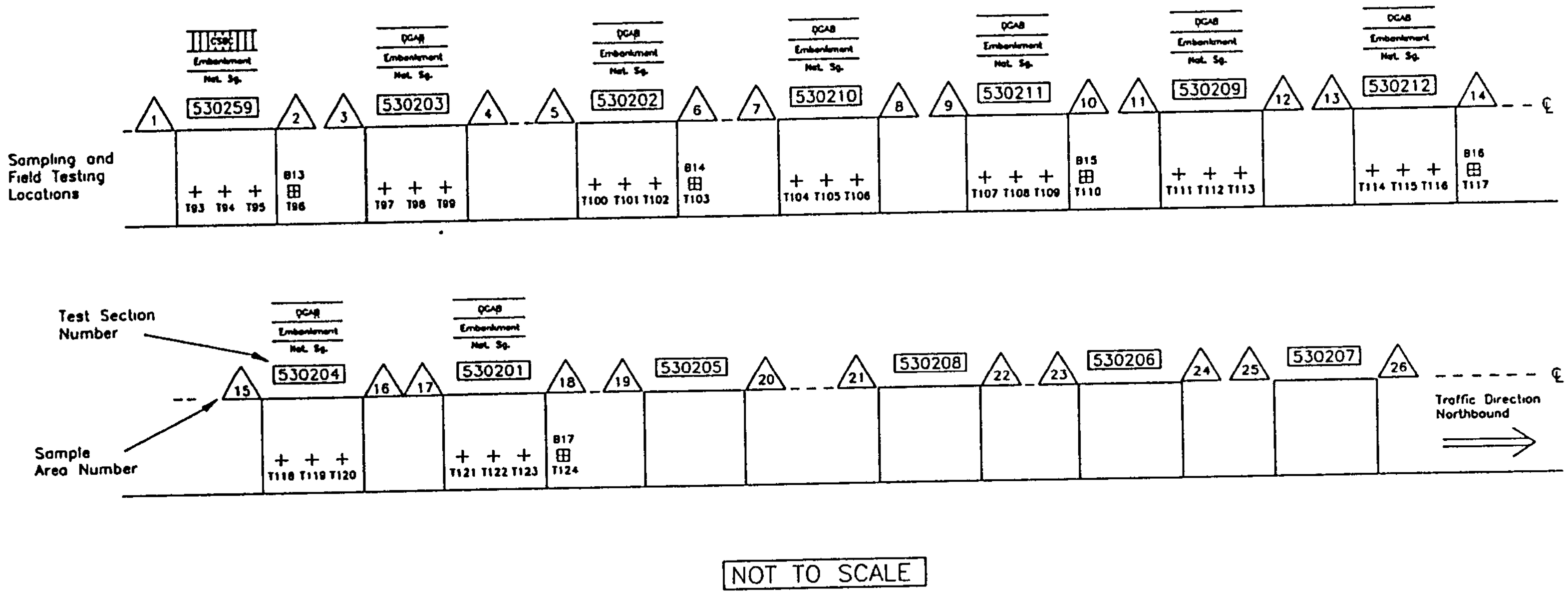
Figure F1. Overview of material sampling and testing on Natural Subgrade, SPS–2 Washington



NOT TO SCALE

□ 2' x 2' bulk sampling location (B6–B12) to 12" below top of embankment
\+ Location of nuclear moisture–density tests (T47–T92)
△ Sample areas
Nat Sg. – Natural subgrade

Figure F2. Overview of material sampling and testing on Prepared Subgrade or Embankment, SPS–2 Washington



□ 2' x 2' bulk sampling location (B13–B17) to 12" below top of subgrade

\+ Location of nuclear moisture–density tests (T93–T124)

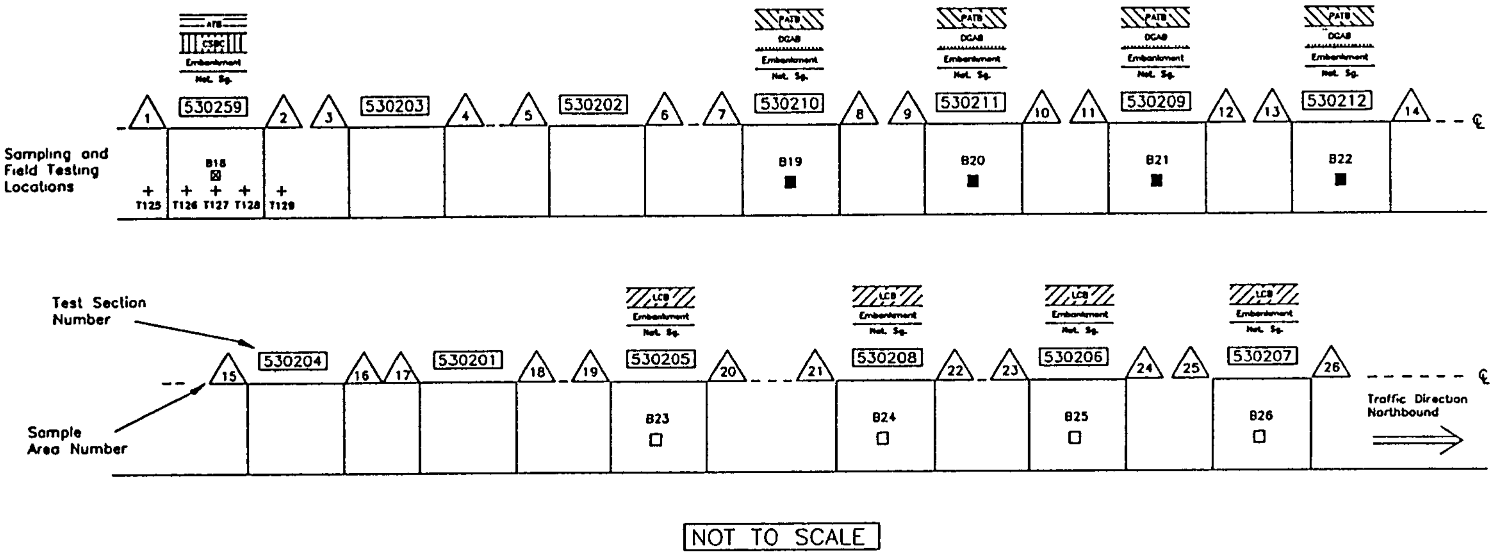
△ Sample areas

Nat. Sg. – Natural Subgrade

DGAB – Dense Graded Aggregate Base

CSBC – Crushed Surfacing Base Course

Figure F3. Overview of material sampling and testing on Dense Graded Aggregate Base and Crushed Surfacing Base Course, SPS–2 Washington



⊠ Bulk ATB samples (B18)

■ Bulk PATB samples (B19–B22)

□ Bulk LCB samples (B23–B26)

+ Location of nuclear moisture–density tests (T125–T129)

△ Sample areas

Nat. Sg. – Natural Subgrade

LCB – Lean Concrete Base

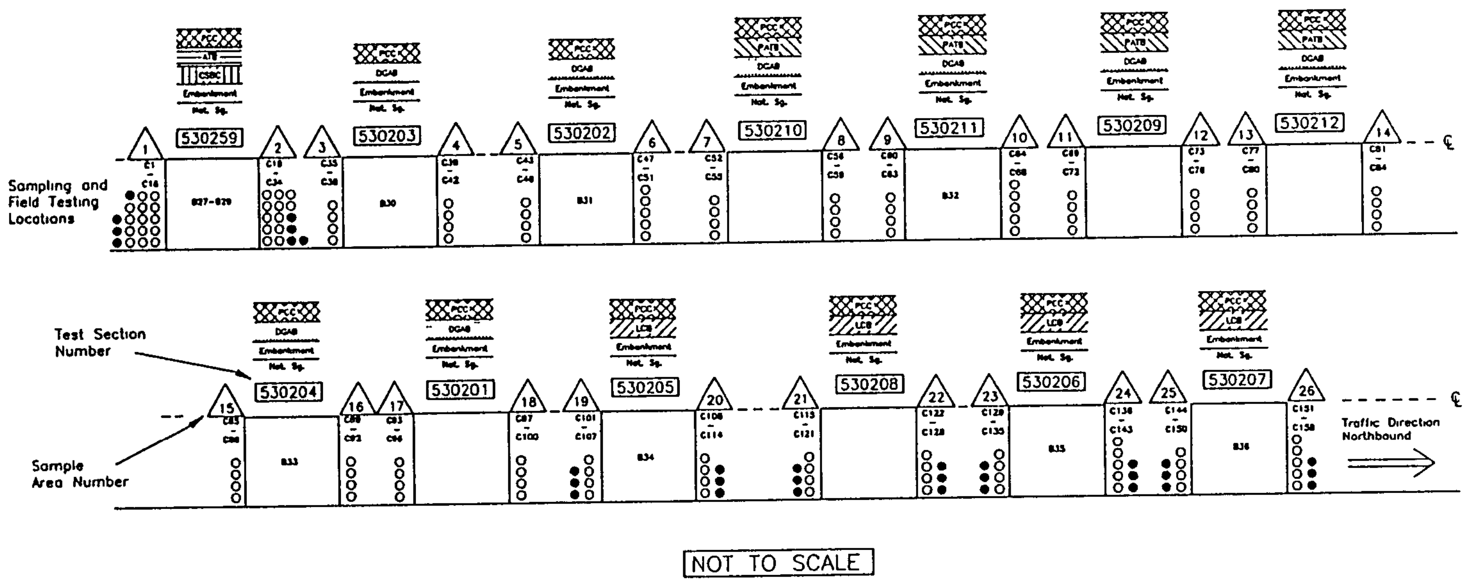
DGAB – Dense Graded Aggregate Base

PATB – Permeable Asphalt Treated Base

ATB – Asphalt Treated Base

CSBC – Crushed Surfacing Base Course

Figure F4. Overview of material sampling and testing on Asphalt Treated Base, Lean Concrete Base and Permeable Asphalt Treated Base, SPS–2 Washington



- • 4" core of finished PCC and/or ATB/LCB layers (C1–C4, C31–C34, C101–C103, C112–C117, C126–C131, C141–C146, C156–C158)
- o 4" core of finished PCC surface only (C5–C30, C35–C100, C104–C111, C118–C125, C132–C140, C147–C155)
- Δ Sample areas

Test sections from which bulk samples of PCC obtained (B27–B36)

Nat. Sg. – Natural Subgrade

LCB – Lean Concrete Base

DGAB – Dense Graded Aggregate Base

PATB – Permeable Asphalt Treated Base

ATB – Asphalt Treated Base

CSBC – Crushed Surfacing Base Course

Figure F5. Overview of sampling, testing, and coring plan for surface of test sections, SPS–2 Washington

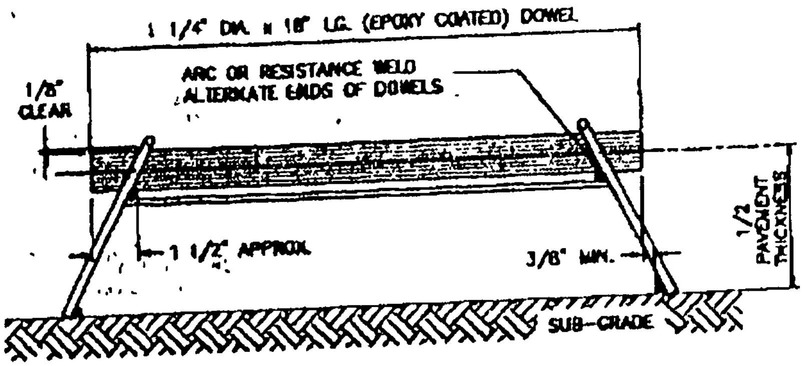
APPENDIX G

DOWEL BASKET ASSEMBLY DETAIL

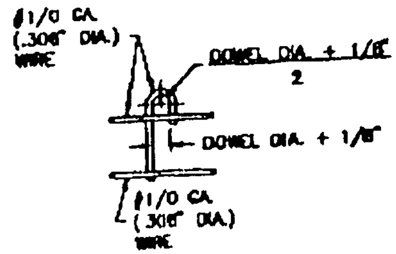
Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 1

To Mark Allen	From M. Martin
Co.	Co.
Dept.	Phone # 324-6157
Fax # 659-1814	Fax #

MAY 12 1994
K.P. OLSON



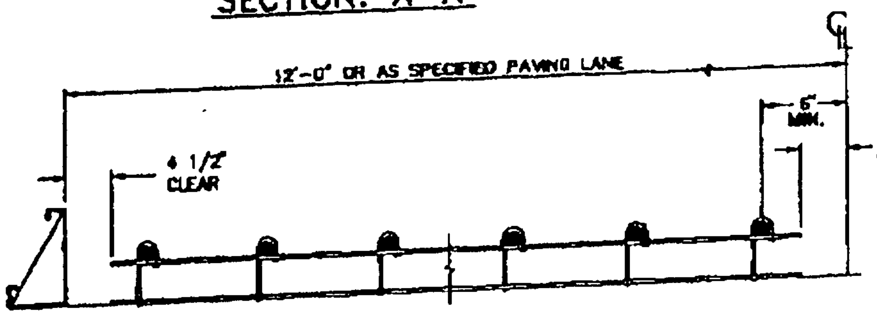
SECTION: A–A'



DETAIL: J–LEG

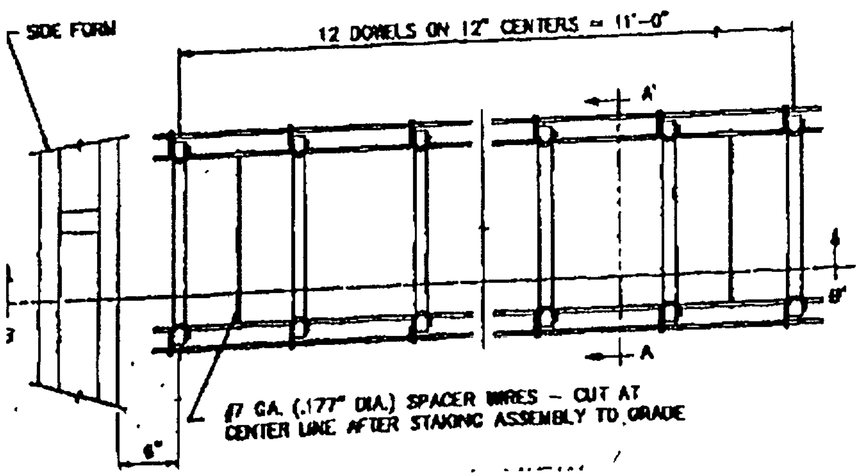
NOTES:

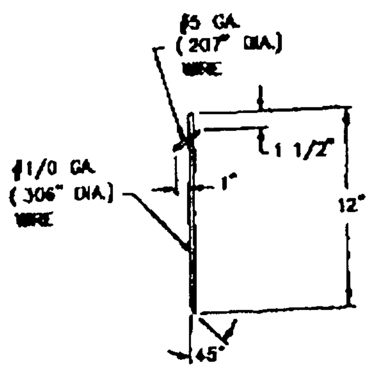
1) DOWELS TO BE BILLET STEEL BARS PER AASHTO SPECIFICATION M-31 GR. 60 LATEST REV. (ASTM A-615 GR. 60).
2) DOWELS ARE TO BE EPOXY COATED PER AASHTO SPECIFICATION M-284 LATEST REV. WITH ENDS TOUCHED UP.
3) DOWELS ARE TO BE SAW CUT AND DEBURRED.
4) WIRE SIZES SHOWN ARE MINIMUM REQ'D.
5) ALL WIRE INTERSECTIONS ARE TO BE RESISTANCE WELDED.
6) STAKES, 8 PER ASSEMBLY ARE TO BE APPLIED AT WORKING END OF DOWELS ONLY.
7) TOLERANCES:
   A) ±1/8" UNLESS OTHERWISE SPECIFIED.
   B) CENTERLINE OF INDIVIDUAL DOWELS SHALL BE PARALLEL TO SUBGRADE AND ALL OTHER DOWELS IN ASSEMBLY WITHIN ±1/8".



SECTION: B–B'

FILED: \WDA\CONTR\BHB602





DETAIL: STAKE

DAYTON SUPERIOR®

721 RICHARD ST. – MIAMISBURG, OH 45342
1900 WILSON AVE. – P.O. BOX 768 – PARSONS, KS 67357

ITEM	WELDED DOWEL ASSEMBLY (WDA) CONTRACTION TYPE		
PROJECT	U.A.B. PROJECT I-90		
LOCATION	SPOKANE, WA.		
ACCOUNT	MACON SUPPLY		
SCALE	NOT TO SCALE	DRAWING NO.	
DRAWN	TODD JONES	BHB-602	
DATE	5-11-94	SHEET 1 OF 1	

APPENDIX H

CONSTRUCTION DATA COLLECTION FORMS

Project Level

07 March 1995

SPS CONSTRUCTION DATA SHEET 1 PROJECT IDENTIFICATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 0]

* 1. DATE OF DATA COLLECTION OR UPDATE (Month/Year) [0 9/9 5]

* 2. STATE HIGHWAY AGENCY (SHA) DISTRICT NUMBER [0 6]

* 3. COUNTY OR PARISH Adams County [0 0 1]

4. FUNCTIONAL CLASS (SEE TABLE A.2, APPENDIX A) [1 2]

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

* 6. ROUTE NUMBER [_ _ 3 9 5]

7. NUMBER OF THROUGH LANES (ONE DIRECTION) [2]

* 8. DATE OF CONSTRUCTION COMPLETION (Month/Year) [1 1/9 5]

* 9. DATE OPENED TO TRAFFIC (Month/Year) [1 1/9 5]

10. CONSTRUCTION COSTS PER LANE MILE (In $1000) 1.82 miles 2 Lanes [_ _ 2 4 4]

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

PROJECT STARTING POINT LOCATION

*12. MILEPOINT [_ 9 1 . 5 7]

*13. ELEVATION [_ 1 6 3 1]

*14. LATITUDE [4 7° 0 0' 0 0 . _ _"]

*15. LONGITUDE [1 1 8° 3 5' 0 0 . _ _"]

16. ADDITIONAL LOCATION INFORMATION (SIGNIFICANT LANDMARKS): [2 miles South of InterState 90.
]

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

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

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SPS-1 CONSTRUCTION DATA SHEET 3 REFERENCE PROJECT STATION TABLE	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 0]

ORDER	*1 TEST SECTION ID NO	REFERENCE PROJECT STATION NUMBER *2 START	*3 END	*4 CUT-FILL[1] TYPE	STATION
1	530259	0+00	5+00	1	+
2	530203	7+05	12+05	1	+
3	530202	15+15	20+15	2	+
4	530210	22+95	27+95	2	+
5	530211	30+00	35+00	2	+
6	530209	36+90	41+90	2	+
7	530212	43+80	48+80	2	+
8	530204	50+70	55+70	2	+
9	530201	57+30	62+30	2	+
10	530205	64+35	69+35	2	+
11	530208	74+10	79+10	2	+
12	530206	82+05	87+05	2	+
13	530207	89+85	94+85	2	+
14		+	+		+
15		+	+		+
16		+	+		+
17		+	+		+
18		+	+		+
19		+	+		+
20		+	+		+

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*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 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.

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SPS-2 CONSTRUCTION DATA SHEET 7 CUT-FILL SECTION LOCATIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 0]

ORDER	*1 CUT-FILL[1]	REFERENCE PROJECT STATION NUMBER		*4 TEST SECTION NUMBER [2]
		*2 START	*3 END	
1	1	0 + 00	5 + 00	530259
2	1	7 + 05	12 + 05	530203
3	2	15 + 15	20 + 15	530202
4	2	22 + 95	27 + 95	530210
5	2	30 + 00	35 + 00	530211
6	2	36 + 90	41 + 90	530209
7	2	43 + 80	48 + 80	530212
8	2	50 + 70	55 + 70	530204
9	2	57 + 30	62 + 30	530201
10	2	64 + 35	69 + 35	530205
11	2	74 + 10	79 + 10	530208
12	2	82 + 05	87 + 05	530206
13	2	89 + 85	94 + 85	530207
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.

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530201

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

*1. LANE WIDTH (FEET) [1 2]

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 ______	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[1 0]
*7. PAVED WIDTH (FEET)	[0 4]	[1 0]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[1 1. 0]	[1 1. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [4. N]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [1 7]

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SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches) AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]				
2	[1 1]	[6 5]	[21.6]	0.	24.0	11.2
3	[1 1]	[5 5]	[45.0]	39.0	56.0	9.5
4	[0 5]	[2 3]	[5.8]	4.4	7.3	0.7
5	[0 3]	[0 4]	[8.7]	7.7	9.8	0.5
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) (Rock, Stone, Dense Shale) [_ _ . _] N.

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NOTES:

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

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

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 (Appendix B of SPS-2 Data Collection Guide).

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

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SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET ____ OF ____

STATION NUMBER	OFFSET (Inches)	DENSE GRADED AGGREGATE BASE	~~PERMEABLE ASPHALT TREATED~~ BASE	~~LEAN CONCRETE BASE~~	PCC SURFACE
0+00	0	5.0			8.0
	36	5.2			8.5
	72	4.6			9.1
	108	5.8			8.2
	144	6.1			7.7
0+50	0	4.6			8.5
	36	4.8			8.5
	72	4.4			8.5
	108	4.7			8.4
	144	5.0			8.2
1+00	0	5.6			8.5
	36	5.5			9.0
	72	5.5			9.2
	108	6.2			8.8
	144	6.8			8.6
1+50	0	4.9			8.5
	36	5.3			8.4
	72	5.4			8.5
	108	6.6			7.8
	144	7.0			7.7
2+00	0	5.4			9.2
	36	5.0			9.2
	72	5.4			9.7
	108	5.9			9.1
	144	6.7			9.1
2+50	0	6.4			8.8
	36	6.7			8.9
	72	6.6			9.0
	108	6.7			8.6
	144	7.1			8.5
3+00	0	4.8			9.8
	36	5.2			9.6
	72	5.0			9.6
	108	5.0			9.4
	144	5.6			9.0
LAYER NUMBER[1]		4			5

[1] from Construction Data Sheet 4

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PREPARER Marco Foin EMPLOYER NCE DATE 1/3/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET ___ OF ___

STATION NUMBER	OFFSET (Inches)	DENSE GRADED AGGREGATE BASE	~~PERMEABLE ASPHALT TREATED BASE~~	~~LEAN CONCRETE BASE~~	PCC SURFACE
3+50	0	6.4			8.8
	36	6.4			8.8
	72	5.9			8.8
	108	5.5			8.2
	144	6.5			7.7
4+00	0	7.1			7.9
	36	7.3			8.2
	72	6.7			8.2
	108	6.0			8.3
	144	6.4			7.9
4+50	0	5.6			8.5
	36	5.5			8.4
	72	5.4			8.3
	108	5.2			8.2
	144	4.7			8.2
5+00	0	5.4			9.2
	36	5.6			9.2
	72	5.3			9.4
	108	5.6			9.2
	144	6.6			9.0
+					
+					
+					
LAYER NUMBER[1]		4			5

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[1] from Construction Data Sheet 4

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [0 2-0 1-9 5]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [0 7-0 9-9 5]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) [__ 8.0]
(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.) Original Subgrade from Station 2665+00 to E.O.P. was Subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, ~~and~~ ~~530210~~ received fill rock. 53021 received ~~some~~ partial fill rock.

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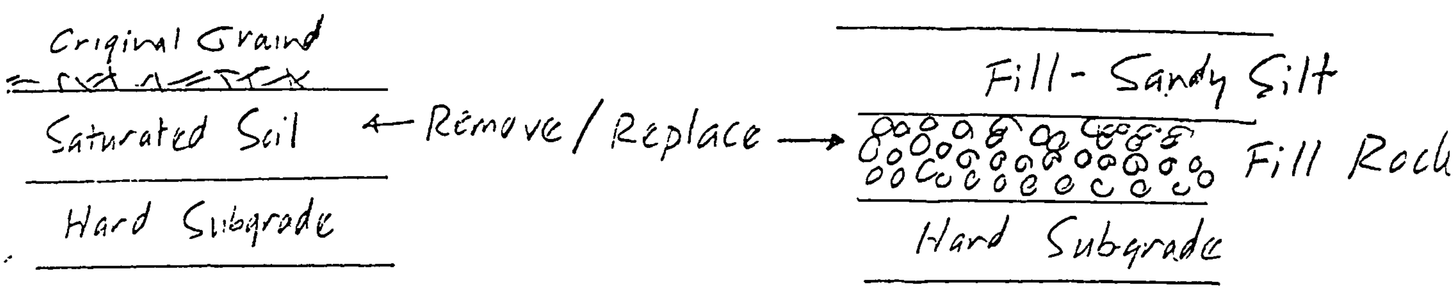
By ______

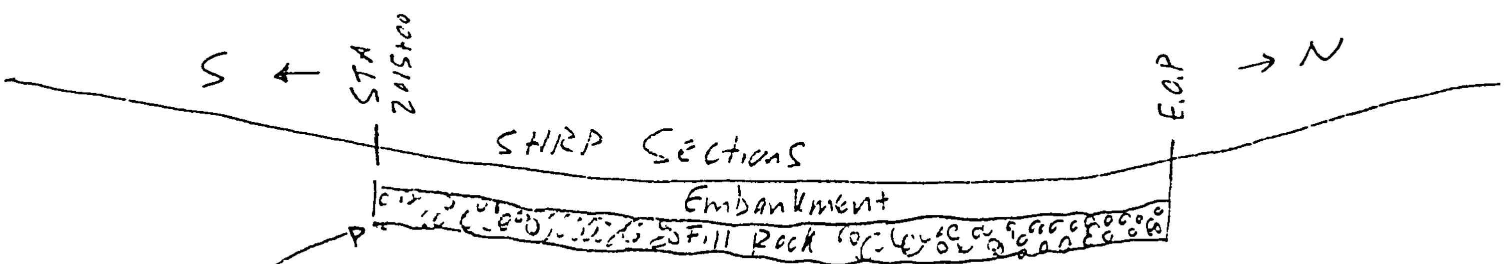
PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

Station 2015+00 to E.O.P. North:

- Before - — After —





Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumula in this low area.

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SPS-2 CONSTRUCTION DATA SHEET 9 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [07-13-95]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [09-18-95]

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

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) [_ 7.0]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (Inches) [_ 6.0]

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.) Construction traffic on DGAB 7/18 to ~~8/31~~ 9/18. Trimmed prior to placing next layer.

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SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

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

* 6. ROUND DOWEL DIAMETER (Inches) [1.2 5]

* 7. DOWEL SPACING (Inches) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6.0]

9. DOWEL LENGTH (Inches) [1 8.]

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)

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February 1992

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ________________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [2.7 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 5.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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).. [0.2 5]

9. DEPTH, (Inches).. [2.7 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches).. [0.2 5]

11. DEPTH, (Inches).. [2.5 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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15. WIDTH, (Inches).. [N.__ __] Spring 96

16. DEPTH, (Inches).. [N.__ __]

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SPS-2 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA 550 PSI Mix	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).................................... [1 9 1 9.]

*3. Fine Aggregate (Pounds)...................................... [1 3 9 5.]

*4. Cement (Pounds).. [_ ~~4 7 0~~.] 423

*5. Water (Pounds)... [_ 2 3 0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE	AMOUNT
*8.	ADMIXTURE #1	[0,1] .01	28.2 oz. 0.[0 0 4,_]
*9.	ADMIXTURE #2	[0,8] .08	4.7 oz. 0.[0 0 1,_]
*10.	ADMIXTURE #3	[~~1,0~~] ~~10~~ 10	[_ 1 0.0]

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

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

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
11.	Coarse	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 19 550 PSI Mix PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 (SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9) [0 7.]

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ 9 7
7/8"......	_ _ _
3/4"......	_ ~~6 2~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 8-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 8-9 5]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[_ 1 0]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sid

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 4.0]

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

11. NUMBER OF VIBRATORS [2 2]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

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

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 [7]

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

3, 5, and 1, in order.

ENTERED
FEB 24 1997
By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 1 - 0 3 - 9 5]

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

3. PROFILE INDEX (Inches/Mile). [7.0]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]

6. CUTOFF HEIGHT (Inches) [0.3 0]

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

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

IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [1 1-0 5-9 5]

10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [1 1-0 5-9 5]

*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) [__ 3 6 .0 0]

14. AVERAGE GROOVE WIDTH (Inches) [0 .1] (1/8")

15. AVERAGE SPACING BETWEEN BLADES (Inches) [0.1] (1/8")

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FEB 24 1997
By LN

Marco Fellin EMPLOYER NCE DATE 1/12/96

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 1]

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

1st 400' of Section has no fill rock. Last 100' has 1.6' avg fill rock.

ENTERED
FEB 24 1997
By JN

PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530202

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

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
0+00	0	6.5			8.4
	60	7.4			7.9
	96	7.4			8.0
	132	5.6			9.0
	168	6.1			8.5
0+50	0	5.9			8.8
	60	6.7			8.3
	96	6.7			8.4
	132	6.4			8.5
	168	6.6			8.5
1+00	0	6.6			8.0
	60	7.2			8.5
	96	6.6			8.5
	132	6.6			8.0
	168	7.2			8.2
1+50	0	6.5			8.0
	60	6.2			8.3
	96	5.9			8.6
	132	6.0			8.6
	168	7.0			8.2
2+00	0	5.8			8.4
	60	6.4			8.0
	96	5.8			8.5
	132	6.4			7.8
	168	7.2			7.6
2+50	0	5.6			8.4
	60	6.2			8.0
	96	5.9			8.4
	132	6.1			8.4
	168	6.8			8.0
3+00	0	5.8			8.3
	60	6.5			8.3
	96	6.0			8.5
	132	6.5			8.5
	168	6.7		ENTERED	8.[illegible]
LAYER NUMBER[1]		3		FEB 24 1997	4

By LV

[1] from Construction Data Sheet 4

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

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
3+50	0	5.6			8.6
	60	5.9			8.3
	96	6.1			8.3
	132	6.6			8.5
	168	6.8			8.4
4+00	0	5.9			9.0
	60	6.7			8.2
	96	6.5			8.4
	132	6.7			8.7
	168	7.3			8.2
4+50	0	6.1			8.3
	60	7.0			7.9
	96	6.5			7.8
	132	7.3			7.6
	168	7.4			8.0
5+00	0	5.9			8.9
	60	6.8			8.4
	96	6.8			8.3
	132	7.6			8.0
	168	7.7			7.8
LAYER NUMBER[1]		3			4

ENTERED
FEB 24 1997
By [illegible]

[1] from Construction Data Sheet 4

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE * SPS PROJECT CODE * TEST SECTION NO.	[5 3] [0 2] [0 2]

*1. LANE WIDTH (FEET) [1 4]

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 ______	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[0 8]
*7. PAVED WIDTH (FEET)	[0 4]	[0 8]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[1 1. 0]	[1 1. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [_. N]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [1 7]

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FEB 24 1997
By LN

PREPARER Marco Fellin EMPLOYER NCE DATE 11/18/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]				
2	[1 1]	[5 5]	[_ 3 6.3]	_ 3 2.0	_ 4 1.0	_ _ 4.5
3	[0 5]	[2 3]	[_ _ 6.5]	_ _ 5.6	_ _ 7.7	_ _ 0.6
4	[0 3]	[0 4]	[_ _ 8.3]	_ _ 7.6	_ _ 9.0	_ _ 0.3
5	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) [__ U . __]
(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 (Appendix B of SPS-2 Data Collection Guide).

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

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FEB 24 1997
By HN

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [0 2-0 1-9 5]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [0 7-0 9-9 5]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7.1]

		TYPE	PERCENT
*5.	STABILIZING AGENT 1	[N]	[__ __.__]
*6.	STABILIZING AGENT 2	[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) [__ 8.0]
(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.) Original Subgrade from Station 2005+00 to E.O.P. was Subexcavated due to excessive moisture, and replaced with -18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~530210~~ received fill rock. 53021 received ~~sand~~ partial fill rock.

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By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

Station 2004+00 to 2015+00 (Sections 530202, 530210):

— Before —

Original Ground

Saturated Soil ← Remove/Replace → Fill - Sandy Silt

Hard Subgrade

— After —

Fill - Sandy Silt

Fill - Sandy Silt

Hard Subgrade

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 9 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [07-13-95]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [09-18-95]

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

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) [_ 7.0]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (Inches) [_ 6.0]

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.) Construction Traffic on DGAB 7/18 to 9/18. Trimmed prior to placing next layer.

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FEB 24 1997
By LV

PREPARER [illegible] EMPLOYER NCE DATE 8-21-95

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

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

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

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

* 6. ROUND DOWEL DIAMETER (Inches) [1.2 5]

* 7. DOWEL SPACING (Inches) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6._]

9. DOWEL LENGTH (Inches) [1 8.]

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)

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FEB 25 1997
By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

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

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______________________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [2.5 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 3.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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).. [0.3 1]

9. DEPTH, (Inches).. [2.5 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)... [0.2 5]

11. DEPTH, (Inches)... [2.7 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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15. WIDTH, (Inches)... [_._ _] Spring '96

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

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SPS-2 CONSTRUCTION DATA SHEET 18 900 psi mix PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

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

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds) .... [1 8 3 3.]

*3. Fine Aggregate (Pounds) .... [_ 9 4 8.]

*4. Cement (Pounds) .... [_ 9 2 5.]

*5. Water (Pounds) .... [_ 2 8 5.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

	TYPE CODE	AMOUNT
*8. ADMIXTURE #1	[0, 1] .01	92.5 oz. [.0 0 6._]
*9. ADMIXTURE #2	[0, 8] 08	5.1 oz [.0 0 0 3]
*10. ADMIXTURE #3	[~~1, 0~~] ~~10~~	[_ _ _._]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

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PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS 900 psi MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

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

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ ~~9 7~~
7/8"......	_ _ _
3/4"......	_ ~~6 2~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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FEB 25 1997
By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 9-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 9-9 5]

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

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 4]	[_ _ 8]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Side

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 6.0]

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

11. NUMBER OF VIBRATORS [2 4]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

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

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

3, 5, and 1, in order

ENTERED
FEB 25 1997
By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 0 - 0 5 - 9 5]

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

3. PROFILE INDEX (Inches/Mile) [6.7]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]

6. CUTOFF HEIGHT (Inches) [0.3 0]

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

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

IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [1 0-2 9-9 5]

10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [1 0-2 9-9 5]

*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) [__ 3 6 .0 0]

14. AVERAGE GROOVE WIDTH (Inches) [0 .1] (1/8"

15. AVERAGE SPACING BETWEEN BLADES (Inches) [0.1] (1/8")

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SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 2]

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

This section did not contain fill rock below the embankment.

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By JLV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530203

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

*1. LANE WIDTH (FEET) [1 4]

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 ______________	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[0 8]
*7. PAVED WIDTH (FEET)	[0 4]	[0 8]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[1 4. 0]	[1 4. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [_. N]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [1 7]

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By LW

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SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 5]				
2	[0 5]	[2 3]	[_ _ 6.9]	_ _ 4.9	_ _ 8.9	_ _ 0.7
3	[0 3]	[0 4]	[_ 11.0]	_ _ 9.8	_ 11.6	_ _ 0.4
4	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
5	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) [_~~3~~ . 9]
(Rock, Stone, Dense Shale) U

NOTES:

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

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

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 (Appendix B of SPS-2 Data Collection Guide).

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

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SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

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
0+00	0	5.9	.	.	10.9
	60	5.7	.	.	10.9
	96	6.1	.	.	11.0
	132	6.5	.	.	10.8
	168	6.7	.	.	10.8
0+50	0	5.8	.	.	11.6
	60	6.7	.	.	10.7
	96	6.4	.	.	10.4
	132	5.5	.	.	10.9
	168	4.4	.	.	11.2
1+00	0	6.6	.	.	10.8
	60	8.2	.	.	10.6
	96	7.4	.	.	10.9
	132	7.3	.	.	10.7
	168	7.2	.	.	11.0
1+50	0	7.4	.	.	10.3
	60	7.7	.	.	10.7
	96	7.1	.	.	10.6
	132	7.9	.	.	11.4
	168	7.4	.	.	11.4
2+00	0	7.3	.	.	10.3
	60	7.3	.	.	11.6
	96	7.0	.	.	11.0
	132	6.2	.	.	11.3
	168	6.0	.	.	11.3
2+50	0	7.2	.	.	10.6
	60	6.5	.	.	11.3
	96	7.0	.	.	11.3
	132	6.7	.	.	10.8
	168	6.5	.	.	11.2
3+00	0	7.4	.	.	9.8
	60	7.2	.	.	11.3
	96	7.0	.	.	11.0
	132	6.5	.	.	11.0
	168	6.6	.	.	11.0
LAYER NUMBER[1]		2			3

[1] from Construction Data Sheet 4

ENTERED
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By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

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
3+50	0	6.1			10.8
	60	6.6			10.8
	96	6.4			10.7
	132	7.0			10.6
	168	5.6			10.8
4+00	0	5.9			11.0
	60	6.5			11.7
	96	6.6			11.4
	132	6.7			11.4
	168	7.1			11.2
4-50	0	7.4			10.6
	60	8.9			10.8
	96	7.3			11.6
	132	7.3			11.2
	168	7.0			11.4
5-00	0	6.6			11.2
	60	7.4			11.2
	96	7.9			11.3
	132	7.7			11.2
	168	7.6			11.6
+					
+					
+					
LAYER NUMBER[1]		2			3

[1] from Construction Data Sheet 4

ENTERED
FEB 25 1997
By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [0 2-0 1-9 5]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [0 7-0 9-9 5]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) [__ 8.0]
(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.) Original Subgrade from Station 2665+00 to E.O.P. was Subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~530201~~ received fill rock. 53021 received ~~partial~~ partial fill rock.

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By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

No Excavation, Backfilling

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 9 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [07-13-95]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [09-18-95]

*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) [_ 7.0]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (Inches) [_ 6.0]

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.) Construction Traffic on DGAB 7/18 to ~~8/1~~ 9/18. Trimmed prior to placing next layer.

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By LW

PREPARER Marc Fe[illegible]n EMPLOYER NCE DATE 5 24 [illegible]

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

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

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

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

* 6. ROUND DOWEL DIAMETER (Inches) [1.5 0]

* 7. DOWEL SPACING (Inches) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6._]

9. DOWEL LENGTH (Inches) [1 8.]

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)

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By AN

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______________________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [3.1 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 5.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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).. [0.2 5]

9. DEPTH, (Inches).. [3.1 6]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)... [0.2 5]

11. DEPTH, (Inches)... [3.3 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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

16. DEPTH, (Inches)... [_.__ _] SDR

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February 1992

SPS-2 CONSTRUCTION DATA 550 PSI Mix SHEET 18 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

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

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds) .... [1 9 1 9.]

*3. Fine Aggregate (Pounds) .... [1 3 9 5.]

*4. Cement (Pounds) .... [_ 4 2 3.]

*5. Water (Pounds) .... [_ 2 3 0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE	AMOUNT
*8.	ADMIXTURE #1	[0,1] .01	28.2 oz. 0.[0 0 4,_]
*9.	ADMIXTURE #2	[0,8] .08	4.7 oz. 0.[0 0 1,_]
*10.	ADMIXTURE #3	[1,0] 10	[_ 1 0. 0]

(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	[0 1]	[_ 2 2. 0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

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By LW

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SPS-2 CONSTRUCTION DATA SHEET 19 550 PSI Mix PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

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

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ _ _
7/8"......	_ _ _
3/4"......	_ 5 6
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ 1 1
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 9-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 9-9 5]

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

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 4]	[_ _ 8]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sid

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 6.0]

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

11. NUMBER OF VIBRATORS [2 4]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

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

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

3, 5, and 1, in order.

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FEB 25 1997
By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 0 - 0 5 - 9 5]
2. PROFILOGRAPH TYPE California... 1 Rainhart... 2 [1]
3. PROFILE INDEX (Inches/Mile). [5.3]
4. INTERPRETATION METHOD Manual.. 1 Mechanical.. 2 Computer.. 3 [3]
5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]
6. CUTOFF HEIGHT (Inches) [0.3 0]
7. SURFACE PROFILE USED AS BASIS OF INCENTIVE PAYMENT? (YES, NO) [YES]
8. WAS SURFACE PROFILE CORRECTED BY DIAMOND GRINDING? (YES, NO) [YES]

   IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [1 0-2 9-9 5]
10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [1 0-2 9-9 5]

*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) [_ 3 6 .0 0]
14. AVERAGE GROOVE WIDTH (Inches) [0 .1] (1/8"
15. AVERAGE SPACING BETWEEN BLADES (Inches) [0.1] (1/8"

ENTERED
FEB 25 1997
By LW

Marco Fellin EMPLOYER NCE DATE 1/12/96

February 1992

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 3]

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

This section was on a cut. The subgrade had the same material as the fill sections.

The water cement ratio was lowered from 0.456 at the beginning of the section to 0.433 at the end of the section, during PCC paving.

The amount of air entraining agent for this section was 8.2 oz./yd.3.

During paving in this section the inner edge was slumping significantly. At Station 2+50 the slump measured 2.8", and the air content was 6.4%. Forms had to be used several times during paving along the inner edge to keep the PCC from slumping.

The wet mix segregated slightly coming off the spreader belt, with the wet slurry falling straight down into a pile, and the course aggregate accumulating in a pile above the wet slurry.

The 0.456 w/c ratio was consistent with the previous 550 psi sections. It is possible that the stockpiles had more water thus contributing to the wet mix.

ENTERED
FEB 25 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530204

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

*1. LANE WIDTH (FEET) [1 2]

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 ______	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[1 0]
*7. PAVED WIDTH (FEET)	[0 4]	[1 0]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[1 4. 0]	[1 4. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [N. _]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [1 7]

ENTERED
FEB 25 1997
By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/18/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]				
2	[1 1]	[6 5]	[_21.6]	_17.0	_36.1	__7.8
3	[1 1]	[5 5]	[_39.7]	_29.0	_51.0	_11.0
4	[0 5]	[2 3]	[__5.9]	__4.8	__7.1	__0.5
5	[0 3]	[0 4]	[_11.1]	_10.1	_12.1	__0.4
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) [_~~7.1~~] U
(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 (Appendix B of SPS-2 Data Collection Guide).

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

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PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET ____ OF ____

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS (INCHES) DENSE GRADED AGGREGATE BASE	~~PERMEABLE ASPHALT TREATED~~ BASE	~~LEAN~~ C~~ONCRETE~~ ~~BASE~~	PCC SURFACE
0+00	0	5.6			10.8
	36	5.7			10.9
	72	5.9			11.0
	108	6.0			10.6
	144	5.9			10.8
0+50	0	5.6			10.6
	36	5.8			11.0
	72	5.6			11.0
	108	6.2			10.8
	144	6.7			10.6
1+00	0	5.9			10.8
	36	5.5			10.8
	72	5.5			11.6
	108	6.4			11.4
	144	5.6			11.0
1+50	0	5.3			10.7
	36	5.6			11.0
	72	4.8			11.5
	108	5.5			11.3
	144	6.2			10.7
2+00	0	5.2			10.3
	36	5.6			10.8
	72	5.5			11.0
	108	4.9			11.0
	144	5.4			11.0
2+50	0	6.6			10.1
	36	7.0			10.6
	72	6.4			11.3
	108	6.2			11.2
	144	6.8			11.3
3+00	0	6.0			10.9
	36	6.1			11.6
	72	5.4			12.0
	108	5.4			11.5
	144	5.5			1[illegible].4
LAYER NUMBER[1]		4			5

[1] from Construction Data Sheet 4

ENTERED
FEB 25 1997
By [illegible]

PREPARER Marc: Felin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

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
3+50	0	6.8			11.3
	36	7.1			11.6
	72	5.4			12.1
	108	6.4			11.4
	144	6.5			11.3
4+00	0	5.7			11.3
	36	5.8			11.4
	72	5.4			11.6
	108	5.9			11.0
	144	6.0			10.8
4+50	0	6.7			10.8
	36	6.8			11.4
	72	6.2			11.8
	108	6.4			11.2
	144	6.5			11.0
5+00	0	5.6			11.0
	36	5.6			11.3
	72	5.2			11.6
	108	5.6			11.0
	144	5.5			11.0
__+__ __					
__+__ __					
__+__ __					
LAYER NUMBER[1]		4			5

[1] from Construction Data Sheet 4

ENTERED
FEB 25 1997
By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [0 2-0 1-9 5]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [0 7-0 9-9 5]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) [__ 8.0]
(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.) Original Subgrade from Station 2005+00 to E.O.P. was Subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~[illegible]~~ received fill rock. 53021 received ~~some~~ partial fill rock.

ENTERED
FEB 25 1997
By [illegible]

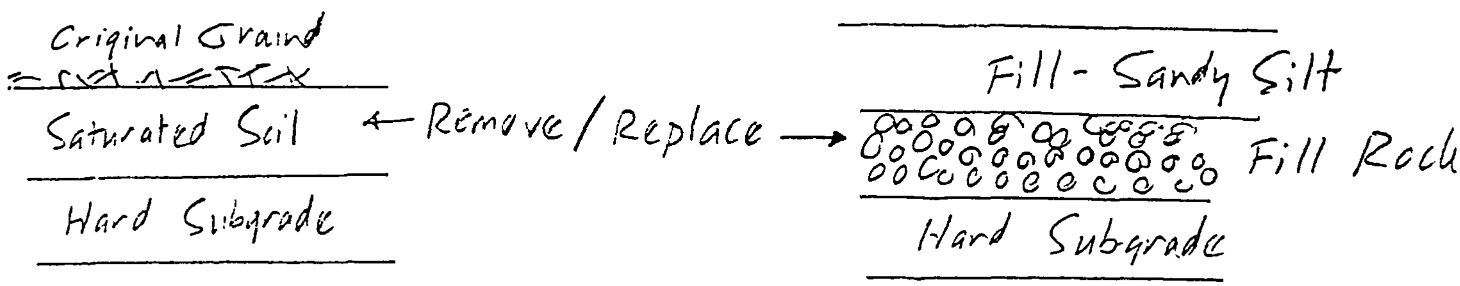
PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

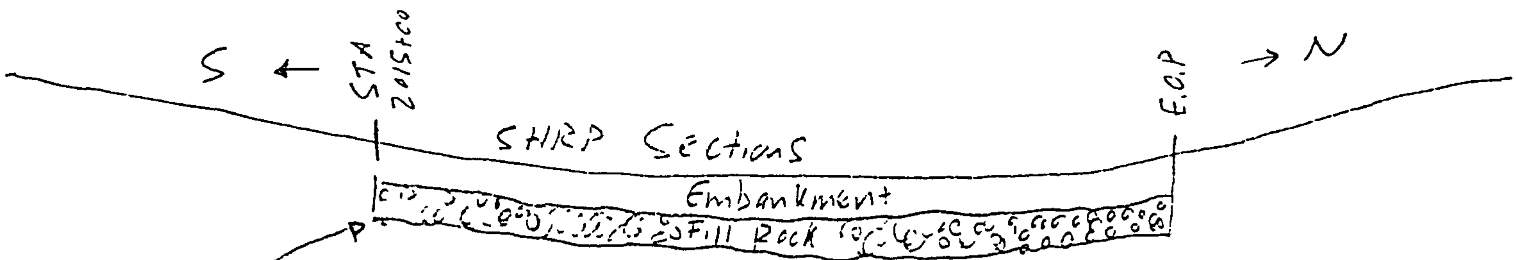
SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

Station 2015+00 to E.O.P. North:

- After -

- Before -





Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumulate in this low area.

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 9 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [07-13-95]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [09-18-95]

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

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) [_ 7.0]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (Inches) [_ 6.0]

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.) Construction Traffic on DGAB 7/18 to ~~[illegible]~~ 9/18. Trimmed prior to placing next layer.

ENTERED
FEB 25 1997
By [illegible]

PREPARER Marco Ferrin   EMPLOYER NCE   DATE 8/24/95

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

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

* 6. ROUND DOWEL DIAMETER (Inches) [1.5 0]

* 7. DOWEL SPACING (Inches) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6.0]

9. DOWEL LENGTH (Inches) [1 8.]

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)

ENTERED
FEB 25 1997
By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [3.5 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 3.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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)... [0.3 1]

9. DEPTH, (Inches)... [3.5 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)... [0.2 5]

11. DEPTH, (Inches)... [3.6 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

15. WIDTH, (Inches)... [~~0~~.__ __] Spring 96

16. DEPTH, (Inches)... [~~0~~.__ __]

ENTERED
FEB 25 1997
By LV

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 18 -900 psi PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).................................. [1 8 3 3.]

*3. Fine Aggregate (Pounds).................................... [_ 9 4 8.]

*4. Cement (Pounds).. [_ 9 2 5.]

*5. Water (Pounds)... [_ 2 8 5]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE	AMOUNT
*8.	ADMIXTURE #1	[0,1] .01	92.5oz. [.0 0 6. _]
*9.	ADMIXTURE #2	[0,8] .08	5.10 oz [.0 0 0 3]
*10.	ADMIXTURE #3	[1,0] 10	[_ _ _._]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

ENTERED
FEB 25 1997
By JH

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS 900 psi MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ ~~9 7~~
7/8"......	_ _ _
3/4"......	_ ~~6 2~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

ENTERED
FEB 25 1997
By HV

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-28-95]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [09-28-95]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[_ 1 0]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert & Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sid

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert & Zimmerman Parts, Manufactured by ACME Materials & Const, no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [24.0]

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

11. NUMBER OF VIBRATORS [22]

12. VIBRATOR SPACING (Inches) [14]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

ENTERED
FEB 25 1997
By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

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

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

3, 5, and 1 in order.

ENTERED
FEB 25 1997
By HW

PREPARER Marco Fellin   EMPLOYER NCE   DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 1 - 0 3 - 9 5]

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

3. PROFILE INDEX (Inches/Mile). [3.8]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]

6. CUTOFF HEIGHT (Inches) [0.3 0]

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

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

   IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [1 1-0 5-9 5]

10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [1 1-0 5-9 5]

*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) [__ 3 6 .0 0]

14. AVERAGE GROOVE WIDTH (Inches) [0 .1] (1/8")

15. AVERAGE SPACING BETWEEN BLADES (Inches) [0.1] (1/8")

ENTERED
FEB 25 1997
By HV

Marco Fellin EMPLOYER NCE DATE 1/12/96

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 4]

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

The amount of air entraining agent was lowered from 20 oz./yd.^{3} to 17 oz./yd.^{3} half way through the section. The water cement ratio stayed fairly constant.

ENTERED
FEB 25 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530205

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

*1. LANE WIDTH (FEET) [1 2]

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 ______	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[1 0]
*7. PAVED WIDTH (FEET)	[0 4]	[1 0]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[_ 5. 0]	[_ 5. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [_. N]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [2 3]

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SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]				
2	[1 1]	[6 5]	[19.2]	7.2	32.4	12.7
3	[1 1]	[5 5]	[43.0]	31.0	54.0	11.5
4	[0 5]	[3 7]	[6.1]	5.3	7.0	0.5
5	[0 3]	[0 4]	[8.4]	8.0	8.8	0.2
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) (Rock, Stone, Dense Shale) ~~[9 9 . 9]~~ U

NOTES:

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

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

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 (Appendix B of SPS-2 Data Collection Guide).

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

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SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET ___ OF ___

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS (INCHES): ~~DENSE~~ GR~~ADED~~ A~~GGREGATE~~ ~~BASE~~	~~PERMEABLE ASPHALT~~ TR~~EATED~~ ~~BASE~~	LEAN CONCRETE BASE	PCC SURFACE
0+00	6			6.4	8.2
	36			6.0	8.4
	72			6.2	8.3
	108			6.1	8.4
	144			6.4	8.0
0+50	6			6.6	8.6
	36			6.1	8.6
	72			6.5	8.5
	108			6.2	8.4
	144			6.0	8.4
1+00	6			7.0	8.3
	36			6.5	8.4
	72			6.7	8.3
	108			6.8	8.3
	144			6.5	8.2
1+50	6			6.4	8.3
	36			6.1	8.2
	72			6.5	8.2
	108			6.6	8.2
	144			6.5	8.2
2+00	6			5.9	8.4
	36			5.5	8.5
	72			6.0	8.4
	108			6.0	8.4
	144			5.8	8.2
2+50	6			5.6	8.8
	36			5.6	8.8
	72			5.5	8.8
	108			5.5	8.6
	144			6.0	8.5
3+00	6			7.0	8.4
	36			6.5	8.3
	72			6.5	8.3
	108			6.5	8.3
	144			6.4	8.2
LAYER NUMBER[1]				4	5

[1] from Construction Data Sheet 4

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SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET ___ OF ___

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS (INCHES): ~~DENSE GRADED~~ AG~~GREGATE~~ BASE	~~PERMEABLE ASPHALT TREATED BASE~~	LEAN CONCRETE BASE	PCC SURFACE
3+50	0	.	.	6.6	8.3
	36	.	.	6.6	8.4
	72	.	.	6.6	8.3
	108	.	.	6.5	8.4
	144	.	.	6.2	8.3
4+00	0	.	.	5.9	8.5
	36	.	.	5.6	8.4
	72	.	.	5.9	8.4
	108	.	.	6.0	8.5
	144	.	.	5.6	8.4
4-50	0	.	.	5.6	8.8
	36	.	.	5.6	8.6
	72	.	.	5.5	8.6
	108	.	.	5.6	8.6
	144	.	.	5.6	8.5
5-00	0	.	.	5.4	8.6
	36	.	.	5.4	8.5
	72	.	.	5.5	8.4
	108	.	.	5.5	8.6
	144	.	.	5.3	8.3
+		.	.	.	.
+		.	.	.	.
+		.	.	.	.
LAYER NUMBER[1]				4	5

[1] from Construction Data Sheet 4

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SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [0 2-0 1-9 5]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [0 8-1 5-9 5]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7.1]

		TYPE	PERCENT
*5.	STABILIZING AGENT 1	[N]	[__ __.__]
*6.	STABILIZING AGENT 2	[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) [__ 8.0]
(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.) Original Subgrade from Station 2065+00 to E.O.P. was subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~[illegible]~~ received fill rock. 5302 received ~~some~~ partial fill rock.

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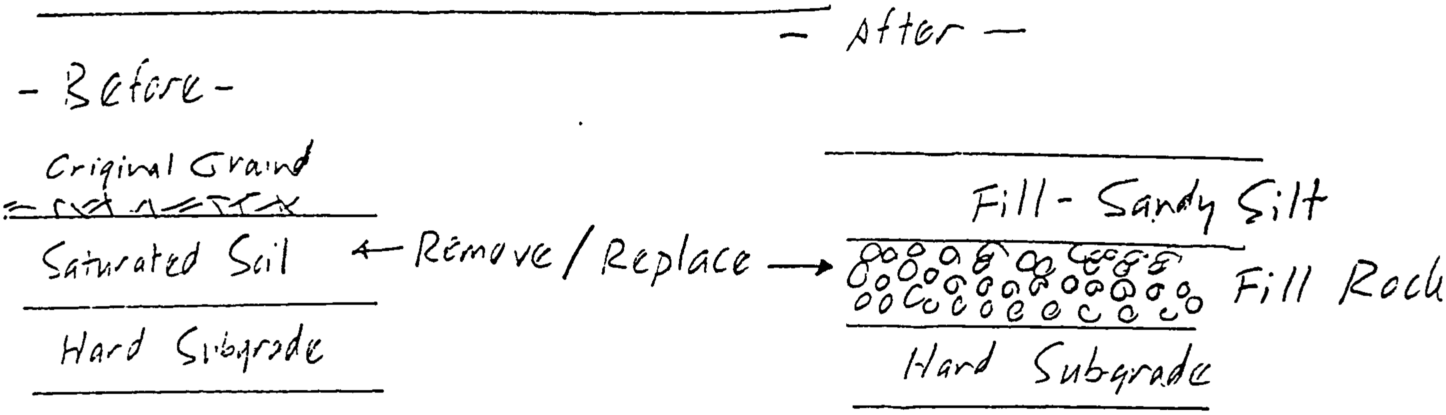
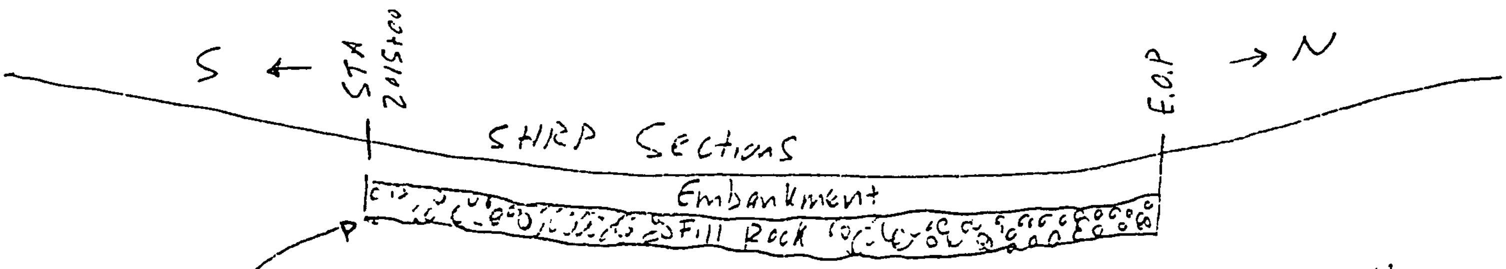
SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

Station 2015+00 to E.O.P. North:





Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumulate in this low area.

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SPS-2 CONSTRUCTION DATA LCB SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

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

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

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

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

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

* 6. ROUND DOWEL DIAMETER (Inches) [N._ _]

* 7. DOWEL SPACING (Inches) [_ N.]

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

9. DOWEL LENGTH (Inches) [_ N.]

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

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

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

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

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SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D LCB	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

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

* 2. METHOD USED TO FORM TRANSVERSE JOINTS [N]
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]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ________________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [1.7 _]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 2 3.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [N]
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).. [N._ _]

9. DEPTH, (Inches).. [N._ _]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches).. [N._ _]

11. DEPTH, (Inches).. [N._ _]

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

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

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

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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

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

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SPS-2 CONSTRUCTION DATA SHEET 18 LCB PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

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

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).. [1 6 9 9.]

*3. Fine Aggregate (Pounds).. [1 7 0 5.]

*4. Cement (Pounds).. [_ 2 2 5.]

*5. Water (Pounds)... [_ 2 7 0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE			AMOUNT
*8.	ADMIXTURE #1	[0,1]	01	Water Reducer	0[.0 0 4,_]
*9.	ADMIXTURE #2	[0,8]	08	Air Entraining	0.0 0 1,_]
*10.	ADMIXTURE #3	[1,0]	10	Class F - Fly A	[_ 1 0.0]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

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SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS LCB MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

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

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ _ _
7/8"......	_ _ _
3/4"......	_ 5 6
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ 1 1
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA LCB	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8-1 7-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8-1 7-9 5]

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

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[_ 1 0]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert and Zimmerman

7. SPREADER TYPE (if applicable) Not Used

8. SPREADER MANUFACTURER AND MODEL NUMBER Not Used

9. WIDTH PAVED IN ONE PASS (Feet) [3 8.0]

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

11. NUMBER OF VIBRATORS [3 3]

12. VIBRATOR SPACING (Inches) [1 6]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS LCB PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 Z] * TEST SECTION NO. [0 5]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets........ 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) ______ 8

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

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SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER LCB PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

1. DATE PROFILE MEASURED (Month-Day-Year) [08-18-95]

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

3. PROFILE INDEX (Inches/Mile) [3.6]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 _]

6. CUTOFF HEIGHT (Inches) [0.3 _]

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

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

IF YES COMPLETE THE FOLLOWING:

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

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

*11. REASON FOR GRINDING [N]
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) [_ _ N._ _]

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

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

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SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

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

* 6. ROUND DOWEL DIAMETER (Inches) [1.2 5]

* 7. DOWEL SPACING (Inches) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6.0]

9. DOWEL LENGTH (Inches) [1 8.]

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)

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SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 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 [1]
Butt..................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [2.50]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 5.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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).. [0.25]

9. DEPTH, (Inches).. [2.50]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)... [0.25]

11. DEPTH, (Inches)... [2.60]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [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) Spring '96

15. WIDTH, (Inches)... [N.__ __]

16. DEPTH, (Inches)... [N.__ __]

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By JW

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 18 550 PSI Mix PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).................................. [1 9 1 9.]

*3. Fine Aggregate (Pounds).................................. [1 3 9 5.]

*4. Cement (Pounds).................................. [_ ~~4 7 0~~.] 42

*5. Water (Pounds).................................. [_ 2 3 0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE		AMOUNT
*8.	ADMIXTURE #1	[0 1] .01	28.2 oz.	0.[0 0 4.__]
*9.	ADMIXTURE #2	[0 8] .08	4.7 oz.	0.[0 0 1.__]
*10.	ADMIXTURE #3	[~~1 0~~] ~~10~~ 10		[_ 1 0.__]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[__ __]	[__ __ __.__]
13.	Coarse	[__ __]	[__ __ __.__]
14.	Coarse and Fine	[__ __]	[__ __ __.__]

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PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 19 550 PSI Mix PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ 9 7
7/8"......	_ _ _
3/4"......	56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

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12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 8-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 8-9 5]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[_ 1 0]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sic

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 4 . 0]

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

11. NUMBER OF VIBRATORS [2 2]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0 . 8]

14. ADDITIONAL VIBRATION APPLIED None

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PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets......... 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) ______ 8

4. TEXTURING [7]
   Tine.......................... 1
   Broom......................... 2
   Burlap Drag................... 3
   Grooved Float................. 4
   Astro Turf.................... 5
   None.......................... 6
   Other (Specify) 7 ______ 7
   3, 5, and 1, in order.

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By UV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 1 - 0 3 - 9 5]

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

3. PROFILE INDEX (Inches/Mile). [1 . 5]

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

5. HEIGHT OF BLANKING BAND (Inches) [0 . 2 0]

6. CUTOFF HEIGHT (Inches) [0 . 3 0]

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

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

IF YES COMPLETE THE FOLLOWING:

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

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

*11. REASON FOR GRINDING [~~0~~] N
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) N [_ ~~36.00~~]

14. AVERAGE GROOVE WIDTH (Inches) N [~~0.1~~] (1/8

15. AVERAGE SPACING BETWEEN BLADES (Inches) N [~~0.1~~] (11/8"

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Marco Fellin EMPLOYER NCE DATE 1/12/96

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 5]

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

The water cement ratio was gradually lowered during paving as follows:
10:30 a.m.: 0.465, 11:00 a.m., 0.461, 11:15 a.m., 0.451.

The amount of air entraining agent was lowered from 11.2 oz/yd.^{3} at 10:30 a.m. to 10.2 oz./yd.^{3} at 11.15 a.m.

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PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530206

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE * SPS PROJECT CODE * TEST SECTION NO.	[5 3] [0 2] [0 6]

*1. LANE WIDTH (FEET) [1 4]

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 ____________	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[0 8]
*7. PAVED WIDTH (FEET)	[0 4]	[0 8]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[_ 5. 0]	[_ 5. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [N. _]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [2 3]

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By LLV

PREPARED Marco Fellin EMPLOYER NCE DATE 11/18/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 7] * TEST SECTION NO. [0 6]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]	[redacted]	[redacted]	[redacted]	[redacted]
2	[1 1]	[6 5]	[_ 18.0]	_ _ 0.0	_ 36.0	_ _ 8.8
3	[1 1]	[5 5]	[_ 37.0]	_ 33.0	_ 43.0	_ _ 5.3
4	[0 5]	[3 7]	[_ _ 6.2]	_ _ 5.5	_ _ 6.8	_ _ 0.4
5	[0 3]	[0 4]	[_ _ 8.6]	_ _ 8.0	_ _ 9.0	_ _ 0.2
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) (Rock, Stone, Dense Shale) [~~1 0 . 0~~] U

NOTES:

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

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

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 (Appendix B of SPS-2 Data Collection Guide).

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

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PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

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
0+00	0			6.5	8.6
	60			5.8	8.6
	96			5.5	8.8
	132			5.7	8.8
	168			5.6	8.8
0+50	0			5.5	8.4
	60			5.7	8.4
	96			6.1	8.4
	132			6.1	8.4
	168			5.8	8.6
1+00	0			6.6	8.0
	60			6.3	8.5
	96			6.3	8.5
	132			6.3	8.8
	168			6.4	8.8
1+50	0			6.7	8.7
	60			6.2	8.5
	96			6.4	8.5
	132			6.4	8.8
	168			6.0	8.8
2+00	0			5.8	8.4
	60			6.0	8.6
	96			6.5	8.6
	132			6.6	8.8
	168			5.9	8.8
2+50	0			5.9	8.6
	60			6.0	8.6
	96			6.1	8.9
	132			6.4	8.9
	168			6.4	8.9
3+00	0			6.4	8.6
	60			6.1	8.9
	96			6.0	8.9
	132			6.2	8.9
	168			5.8	8.9
LAYER NUMBER[1]				4	5

[1] from Construction Data Sheet 4

ENTERED
FEB 25 1997
By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET ____ OF ____

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS (INCHES) ~~DENSE~~ GRA~~DED~~ ~~AGGREGATE~~ ~~BASE~~	~~PERMEABLE~~ A~~SPHALT~~ ~~TREATED~~ ~~BASE~~	LEAN CONCRETE BASE	PCC SURFACE
3+50	0			6.0	8.6
	60			6.2	8.8
	96			6.4	8.9
	132			6.7	8.9
	168			6.5	9.0
4+00	0			6.2	8.5
	60			5.9	8.6
	96			6.1	8.6
	132			6.1	8.8
	168			6.0	8.6
4-50	0			6.8	8.2
	60			6.4	8.5
	96			6.6	8.5
	132			6.6	8.6
	168			6.0	8.6
5-00	0			6.7	8.4
	60			6.4	8.4
	96			6.2	8.5
	132			6.2	8.5
	168			5.9	8.5
__+__ __					
__+__ __					
__+__ __					
LAYER NUMBER[1]				ENTERED	

ENTERED
FEB 25 1997
By LLV

[1] from Construction Data Sheet 4

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [02-01-95]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [08-15-95]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) [__ 8.0]
(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.) Original Subgrade from Station 2005+00 to E.O.P. was Subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill roc. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~[illegible]~~ received fill rock. 53021 received ~~[illegible]~~ partial fill rock.

ENTERED
FEB 25 1997
By [signature]

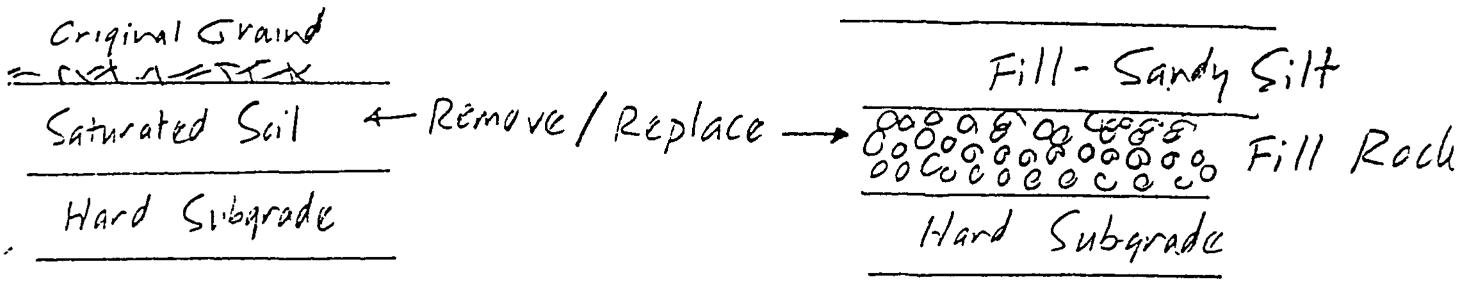
PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

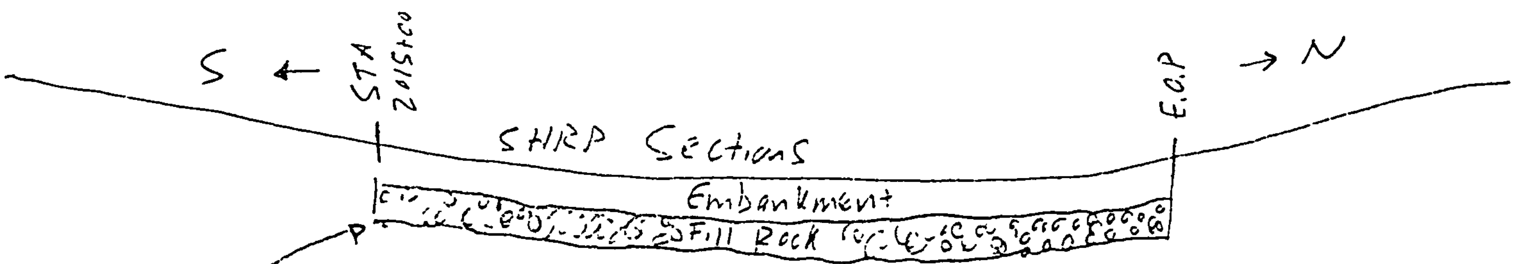
SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

Station 2015+00 to E.O.P. North:

- After -

- Before -





Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumulate in this low area.

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 15 LCB PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

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

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

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

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

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

* 6. ROUND DOWEL DIAMETER (Inches) [N._ _]

* 7. DOWEL SPACING (Inches) [_ N.]

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

9. DOWEL LENGTH (Inches) [_ N.]

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

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

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

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

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By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 16 LCB PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

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

* 2. METHOD USED TO FORM TRANSVERSE JOINTS [N]
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]
Butt..................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches).............. [1.7 _]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 2 4.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [N]
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).. [N._ _]

9. DEPTH, (Inches).. [N._ _]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches).. [N._ _]

11. DEPTH, (Inches).. [N._ _]

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

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

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

ENTERED
FEB 25 1997
By LN

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 18 LCB PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

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

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).................................... [1 6 9 9.]

*3. Fine Aggregate (Pounds)...................................... [1 7 0 5.]

*4. Cement (Pounds).. [_ 2 2 5.]

*5. Water (Pounds)... [_ 2 7.0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE		AMOUNT
*8.	ADMIXTURE #1	[0,1] .01	Water Reducer	0[.0 0 4, _]
*9.	ADMIXTURE #2	[0,8] 08	Air Entraining	0.[0 0 1, _]
*10.	ADMIXTURE #3	[1,0] 10	Class F - Fly Ash	[_ 1 0.0]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

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By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS LCB MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

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

COMPOSITION OF COARSE AGGREGATE — TYPE — PERCENT

* 2. [1] [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 (SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9) [0 7.]

COMPOSITION OF FINE AGGREGATE — TYPE — PERCENT

* 6. [1] [_ 1 2.]

* 7. [2] [_ 8 8.]

* 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"	1 0 0
1"	~~9 8~~
7/8"	
3/4"	~~6 1~~ 56
5/8"	
1/2"	
3/8"	~~1 2~~ 11
No. 4	2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8	~~1 0 0~~
No. 10	
No. 16	51
No. 30	
No. 40	
No. 50	19
No. 80	
No. 100	7
No. 200	~~1 8~~ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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FEB 25 1997
By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS LCB PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8-1 7-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8-1 7-9 5]

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

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[1 0 _]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert and Zimmerman

7. SPREADER TYPE (if applicable) Not Used

8. SPREADER MANUFACTURER AND MODEL NUMBER Not Used

9. WIDTH PAVED IN ONE PASS (Feet) [3 8.0]

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

11. NUMBER OF VIBRATORS [3 3]

12. VIBRATOR SPACING (Inches) [1 6]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

ENTERED
FEB 25 1997
By JHV

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS LCB PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets........ 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) ______ 8

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

ENTERED
FEB 25 1997
By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER LCB PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

1. DATE PROFILE MEASURED (Month-Day-Year) [0 8 - 1 8 - 9 5]

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

3. PROFILE INDEX (Inches/Mile) [2 . 3]

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

5. HEIGHT OF BLANKING BAND (Inches) [0 . 2 __]

6. CUTOFF HEIGHT (Inches) [0 . 3 __]

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

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

IF YES COMPLETE THE FOLLOWING:

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

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

*11. REASON FOR GRINDING [N]
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) [__ __ N .__ __]

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

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

ENTERED
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By HN

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

* 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) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6.0]

9. DOWEL LENGTH (Inches) [1 8.]

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)

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By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [2.9 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 3.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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).. [0.3 1]

9. DEPTH, (Inches).. [2.9 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches).. [0.2 5]

11. DEPTH, (Inches).. [3.0 _]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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15. WIDTH, (Inches).. [~~0~~._ _] Spring '9

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 18 900 psi mix PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds)................................ [1 8 3 3.]

*3. Fine Aggregate (Pounds).................................. [_ 9 4 8.]

*4. Cement (Pounds).. [_ 9 2 5.]

*5. Water (Pounds)... [_ 2 8 5.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE		AMOUNT
*8.	ADMIXTURE #1	[0 1] 01	92.5 oz.	[.0 0 6._]
*9.	ADMIXTURE #2	[0 8] .08	5.1 oz	[.0 0 0 3]
*10.	ADMIXTURE #3	[1 0] 10		[_ _ _._]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

ENTERED
FEB 25 1997
By JW

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 19 900 psi mix PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 (SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9) [0 7.]

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ ~~9 7~~
7/8"......	_ _ _
3/4"......	_ ~~6 2~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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FEB 25 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 6-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 6-9 5]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[_ 1 0]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sid

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 6.0]

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

11. NUMBER OF VIBRATORS [2 4]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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FEB 25 1997
By LH

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets......... 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) ______ 8

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

3, 5, and 1, in order

ENTERED
FEB 25 1997
By JW

PREPARER Marco Fellin   EMPLOYER NCE   DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 0 - 0 6 - 9 5]
2. PROFILOGRAPH TYPE California... 1 Rainhart... 2 [1]
3. PROFILE INDEX (Inches/Mile) [6.2]
4. INTERPRETATION METHOD Manual.. 1 Mechanical.. 2 Computer.. 3 [3]
5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]
6. CUTOFF HEIGHT (Inches) [0.3 0]
7. SURFACE PROFILE USED AS BASIS OF INCENTIVE PAYMENT? (YES, NO) [YES]
8. WAS SURFACE PROFILE CORRECTED BY DIAMOND GRINDING? (YES, NO) [~~YES~~] No

IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [_ N-_ _-_ _]
10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [_ N-_ _-_ _]

*11. REASON FOR GRINDING [N]
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) N [~~36.00~~]
14. AVERAGE GROOVE WIDTH (Inches) N [~~0.1~~] ~~(1/8")~~
15. AVERAGE SPACING BETWEEN BLADES (Inches) N [~~0.1~~] ~~(1/8")~~

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FEB 26 1997
By HV

Marco Fellin EMPLOYER NCE DATE 1/12/96

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 6]

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

The weather during the paving of this section contributed to the significant amount of shrinkage cracks present the day after paving. The windspeed was high, (13 ft./sec.), the relative humidity was low, (32%), and the solar radiation was high, (250 watts/ft.^{2}). This created dry conditions. Even though the curing machine was close behind the paver, the fast setting 900 psi mix combined with the dry conditions led to cracking. Nineteen of the 32 full slabs in the section had more than 5 low severity cracks. Only one slab had no cracks. The width of the cracks was generally 1/2-1 mm, with several cracks having up to a 2 mm width.

The cracking may have an effect on the future performance of the sections.

The amount of air entraining agent was increased from 17 oz./yd.^{3} at the beginning of the section to 20 oz./yd.^{3} following paving.

ENTERED
FEB 26 1997
By JN

PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530207

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

*1. LANE WIDTH (FEET) [1 4]

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 ______	[3]	[3]
*6.	TOTAL WIDTH (FEET)	[0 4]	[0 8]
*7.	PAVED WIDTH (FEET)	[0 4]	[0 8]
8.	SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9.	SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10.	SHOULDER BASE THICKNESS (INCHES)	[_ 8. 0]	[_ 8. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [_. N]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [2 3]

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FEB 26 1997
By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 11/18/95

SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]	[redacted]	[redacted]	[redacted]	[redacted]
2	[1 1]	[6 5]	[14.4]	0.0	28.8	8.9
3	[1 1]	[5 5]	[69.7]	56.0	81.0	12.7
4	[0 5]	[3 7]	[6.1]	5.0	7.0	0.5
5	[0 3]	[0 4]	[11.1]	10.7	11.6	0.3
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) ~~[9 9 . 9]~~ U
(Rock, Stone, Dense Shale)

ENTERED
FEB 26 1997
By JW

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 (Appendix B of SPS-2 Data Collection Guide).

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

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

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
0+00	0			5.8	10.8
	66			6.3	10.8
	96			6.3	10.8
	132			6.2	10.9
	168			5.9	10.9
0+50	0			5.8	11.3
	66			5.4	11.4
	96			5.2	11.5
	132			5.0	11.6
	169			5.4	11.2
1+00	0			6.7	11.2
	66			6.5	11.3
	96			6.4	11.3
	132			6.4	11.4
	168			6.1	11.3
1+50	0			5.9	11.4
	66			5.9	11.5
	96			6.2	11.5
	132			6.4	11.5
	168			6.0	11.6
2+00	0			5.3	11.3
	66			5.6	11.2
	96			5.7	11.0
	132			6.0	11.3
	168			6.0	11.2
2+50	0			6.8	10.7
	66			5.9	10.9
	96			5.7	10.7
	132			5.5	10.8
	168			5.5	10.8
3+00	0			5.9	10.9
	66			6.1	11.0
	96			6.2	11.0
	132			6.9	11.0
	168			6.9	11.0
LAYER NUMBER[1]				4	5

ENTERED

[1] from Construction Data Sheet 4

FEB 26 1997

By LN

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

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
3+50	0 60 96 132 168			6.4 6.1 6.2 6.2 6.1	11.2 11.3 11.3 11.5 11.4
4+00	0 60 96 132 168			6.1 6.1 6.8 7.0 7.0	10.9 11.0 10.9 11.2 10.9
4+50	0 60 96 132 168			6.0 5.9 5.8 5.9 5.7	10.7 10.9 10.9 11.0 11.3
5+00	0 60 96 132 168			6.2 6.0 6.1 5.9 5.8	10.9 10.9 11.0 11.3 11.3
__+__ __					
__+__ __					
__+__ __					
LAYER NUMBER[1]				4	5

[1] from Construction Data Sheet 4

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FEB 26 1997
By JW

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [02-01-95]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [08-15-95]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [17.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) [__ 8.0]
(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.) Original Subgrade from Station 2005+00 to E.O.P. was Subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill roc. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~530210~~ received fill rock. 53021 received ~~some~~ partial fill rock.

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By ______

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

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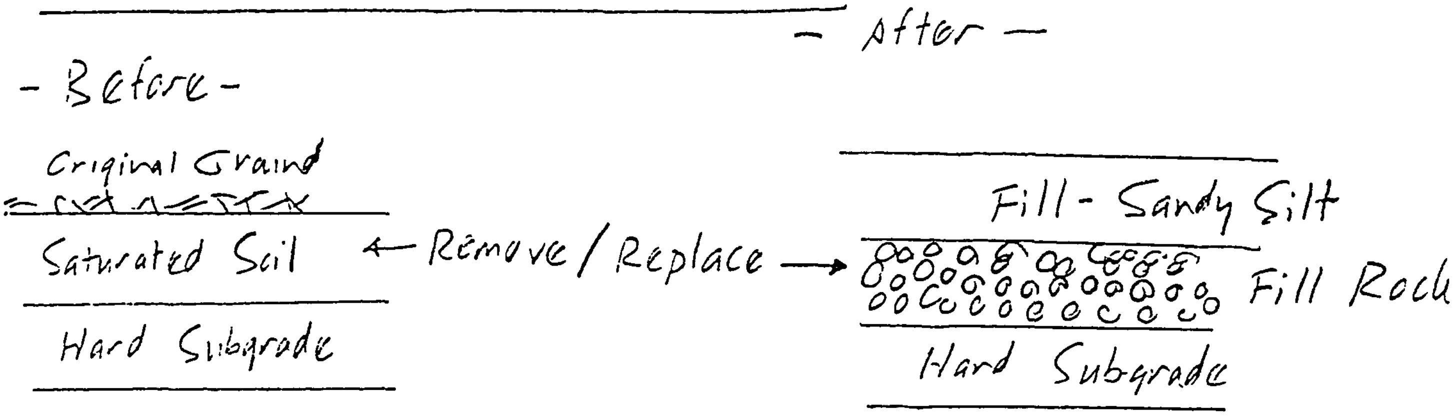
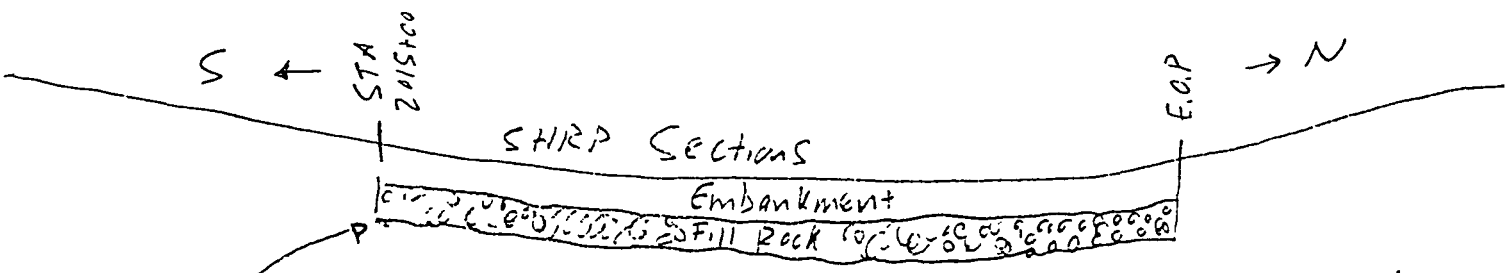
SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

Station 2015+00 to E.O.P. North:





Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumulate in this low area.

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 15 LCB PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

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

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

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

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

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

* 6. ROUND DOWEL DIAMETER (Inches) [N. _ _]

* 7. DOWEL SPACING (Inches) [_ N.]

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

9. DOWEL LENGTH (Inches) [_ N.]

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

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

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

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

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By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 16 LCB PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

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

* 2. METHOD USED TO FORM TRANSVERSE JOINTS [N]
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]
Butt..................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______________________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [1.7 _]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 2 2.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [N]
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).. [N._ _]

9. DEPTH, (Inches).. [N._ _]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches).. [N._ _]

11. DEPTH, (Inches).. [N._ _]

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

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

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

ENTERED
FEB 26 1997
By [illegible]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 18 LCB PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

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

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).................................... [1 6 9 9.]

*3. Fine Aggregate (Pounds).................................... [1 7 0 5.]

*4. Cement (Pounds).................................... [_ 2 2 5.]

*5. Water (Pounds).................................... [_ 2 7.0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

	TYPE CODE		AMOUNT
*8. ADMIXTURE #1	[0, 1] .01	Water Reducer	0 [.0 0 4, _]
*9. ADMIXTURE #2	[0, 8] .08	Air Entraining	0 [.0 0 1, _]
*10. ADMIXTURE #3	[1, 0] 10	Class F - Fly Ash	[_ 1 0.0]

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

ENTERED
FEB 26 1997
By LN

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

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
11.	Coarse	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS LCB MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

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

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ ~~9 8~~
7/8"......	_ _ _
3/4"......	_ ~~4 1~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	~~1 0 0~~
No. 10....	_ _ _
No. 16....	_ _ _ 51
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ _ 19
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ ~~1 8~~ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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By ______

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS LCB PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8-1 6-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8-1 7-9 5]

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

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[1 0 _]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert and Zimmerman

7. SPREADER TYPE (if applicable) Not Used

8. SPREADER MANUFACTURER AND MODEL NUMBER Not Used

9. WIDTH PAVED IN ONE PASS (Feet) [3 8.0]

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

11. NUMBER OF VIBRATORS [3 3]

12. VIBRATOR SPACING (Inches) [1 6]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

ENTERED
FEB 26 1997
By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS LCB PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 7] * TEST SECTION NO. [0 7]

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

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

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FEB 26 1997
By HN

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER LCB PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

1. DATE PROFILE MEASURED (Month-Day-Year) [0 8 - 1 8 - 9 5]

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

3. PROFILE INDEX (Inches/Mile) [3 . 4]

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

5. HEIGHT OF BLANKING BAND (Inches) [0 . 2 __]

6. CUTOFF HEIGHT (Inches) [0 . 3 __]

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

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

IF YES COMPLETE THE FOLLOWING:

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

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

*11. REASON FOR GRINDING [N]
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) [__ __ N .__ __]

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

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

ENTERED
FEB 26 1997
By LN

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

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

* 6. ROUND DOWEL DIAMETER (Inches) [1.5 0]

* 7. DOWEL SPACING (Inches) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6.0]

9. DOWEL LENGTH (Inches) [1 8.]

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)

ENTERED
FEB 26 1997
By LV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ________________________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [3.3 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 5.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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).. [0.2 5]

9. DEPTH, (Inches).. [3.3 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)... [0.2 5]

11. DEPTH, (Inches)... [2.8 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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FEB 26 1997
By HN

15. WIDTH, (Inches)... [~~0~~._ _] Spring '96

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA 550 PSI Mix	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds)................................... [1 9 1 9.]

*3. Fine Aggregate (Pounds).................................... [1 3 9 5.]

*4. Cement (Pounds).. [_ ~~4 7 0~~.] 47?

*5. Water (Pounds)... [_ 2 3 0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ________________________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE		AMOUNT
*8.	ADMIXTURE #1	[0,1] .01	28.2 oz	0.[0 0 4,_]
*9.	ADMIXTURE #2	[0,8] .08	4.7 oz.	0.[0 0 1,_]
*10.	ADMIXTURE #3	[~~1,0~~] ~~10~~		[_ _ _._]

(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	[0 1]	[_ 22.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

ENTERED
FEB 26 1997
By LLV

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 19 550 PSI Mix PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ ~~9 7~~
7/8"......	_ _ _
3/4"......	_ ~~6 2~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]
13. Fine Aggregate (AASHTO T84 or ASTM C128) [_._ _ _]

ENTERED
FEB 26 1997
By LHN

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 6-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 6-9 5]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[_ 1 0]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sid.

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 6.0]

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

11. NUMBER OF VIBRATORS [2 4]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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By LL

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

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

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

3. CURING [1]

   Membrane Curing Compound...... 1
   Burlap Curing Blankets........ 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) ______ 8

4. TEXTURING [7]

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

3, 5, and 1, in order

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PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 0 - 0 6 - 9 5]

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

3. PROFILE INDEX (Inches/Mile). [6.2]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]

6. CUTOFF HEIGHT (Inches) [0.3 0]

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

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

IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [1 1-0 5-9 5]

10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [1 1-0 5-9 5]

*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) [_ 3 6 . 0 0]

14. AVERAGE GROOVE WIDTH (Inches) [0 .1] (1/8")

15. AVERAGE SPACING BETWEEN BLADES (Inches) [0.1] (1/8")

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By ____

Marco Fellin EMPLOYER NCE DATE 1/12/96

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 7]

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

The spacer wires on the dowel baskets were cut all the way through on this section only. On the other sections, the spacer wires were notched.

The 550 psi mix was very dry and rough during the first 200' of paving. Paving started at the north end, going south. At Station 2082+60, the water reducer was increased from 28.2 oz./yd.^{3} to 47 oz./yd. At Station 2082+70, the air entraining agent was increased from 10.3 oz./yd.^{3} to 11.2 oz./yd.^{3}. Following the changes at 2082+60, the mix flowed better and the surface was smoother.

Following paving, there were holes in the surface of the PCC from 2082+60 to 2084+70. This indicates that internally the PCC may have a honeycomb texture in this area.

The performance from Sta 2082+60 to Sta 2084+70 may differ from that from 2082+60 + B.O.P. due to the admixture changes.

The surface of the PCC from 2082+00 to B.O.P was free of any significant gaps or holes.

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By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

530208

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE * SPS PROJECT CODE * TEST SECTION NO.	[5 3] [0 2] [0 8]

*1. LANE WIDTH (FEET) [1 2]

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 ____________	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[1 0]
*7. PAVED WIDTH (FEET)	[0 4]	[1 0]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[_ 8. 0]	[_ 8. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [N. _]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [2 3]

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By JN

PREPARER Marco Fellin EMPLOYER NCE DATE 11/18/95

SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]				
2	[1 1]	[6 5]	[20.4]	10.8	32.4	5.5
3	[1 1]	[5 5]	[33.0]	30.0	37.0	3.6
4	[0 5]	[3 7]	[6.2]	5.6	7.1	0.4
5	[0 3]	[0 4]	[10.7]	10.0	11.3	0.3
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) (Rock, Stone, Dense Shale) [~~5.4~~]
U

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FEB 26 1997
By LN

NOTES:

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

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

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 (Appendix B of SPS-2 Data Collection Guide).

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

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

LAYER THICKNESS MEASUREMENTS (Inches) SHEET ___ OF ___

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS (INCHES)			
		~~DENSE GRADED~~ A~~GGREGATE BASE~~	~~PERMEABLE~~ AS~~PHA~~LT ~~TREATED BASE~~	LEAN CONCRETE BASE	PCC SURFACE
0+00	0			6.7	10.4
	36			6.8	10.7
	72			7.1	10.6
	108			7.2	10.6
	144			6.6	10.2
0+50	0			6.1	10.6
	36			6.2	10.7
	72			6.5	10.6
	108			6.6	10.7
	144			6.4	10.4
1+00	0			6.4	10.8
	36			6.3	10.8
	72			6.4	10.7
	108			6.5	10.8
	144			6.3	10.7
1+50	0			6.1	10.1
	36			6.0	10.3
	72			6.2	10.2
	108			6.6	10.2
	144			6.5	10.3
2+00	0			6.2	10.2
	36			5.9	10.6
	72			5.9	10.6
	108			5.9	10.7
	144			6.0	10.6
2+50	0			6.0	10.4
	36			6.0	10.6
	72			6.3	10.6
	108			6.4	10.6
	144			6.3	10.4
3+00	0			6.4	10.7
	36			6.5	10.9
	72			6.7	10.9
	108			6.7	10.9
	144			6.3	10.8
LAYER NUMBER[1]				4	5

ENTERED

[1] from Construction Data Sheet 4

FEB 28 1997

By

ENTERED

FEB 27 1997

By

PREPARER Marco Felin EMPLOYER NCE DATE 1.13.95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

LAYER THICKNESS MEASUREMENTS (Inches)

SHEET ____ OF ____

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS (INCHES): ~~DENSE GRADED AGGREGATE BASE~~	LAYER THICKNESS (INCHES): ~~PERMEABLE ASPHALT TREATED BASE~~	LAYER THICKNESS (INCHES): LEAN CONCRETE BASE	LAYER THICKNESS (INCHES): PCC SURFACE
3+50	0			6.2	10.7
	36			5.9	10.6
	72			6.1	10.9
	108			6.2	10.9
	144			5.7	10.8
4+00	0			6.5	10.7
	36			6.1	10.9
	72			6.1	10.9
	108			6.0	10.9
	144			5.9	10.8
4+50	0			5.8	11.0
	36			5.6	11.2
	72			5.9	11.0
	108			5.9	11.2
	144			5.7	11.2
5+00	0			6.5	10.9
	36			6.1	11.3
	72			6.1	11.3
	108			6.6	11.3
	144			5.8	11.2
__+__ __					
__+__ __					
__+__ __					
LAYER NUMBER[1]				4	5

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FEB 28 1997
By

[1] from Construction Data Sheet 4

PREPARER *Marco Fellin* EMPLOYER *NCE* DATE *6/30/95*

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [02-01-95]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [08-15-95]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [17.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) [__ 8.0]
(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.) Original Subgrade from Station 2005+00 to E.O.P. was Subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~[illegible]~~ received fill rock. 53021 received ~~[illegible]~~ partial fill rock.

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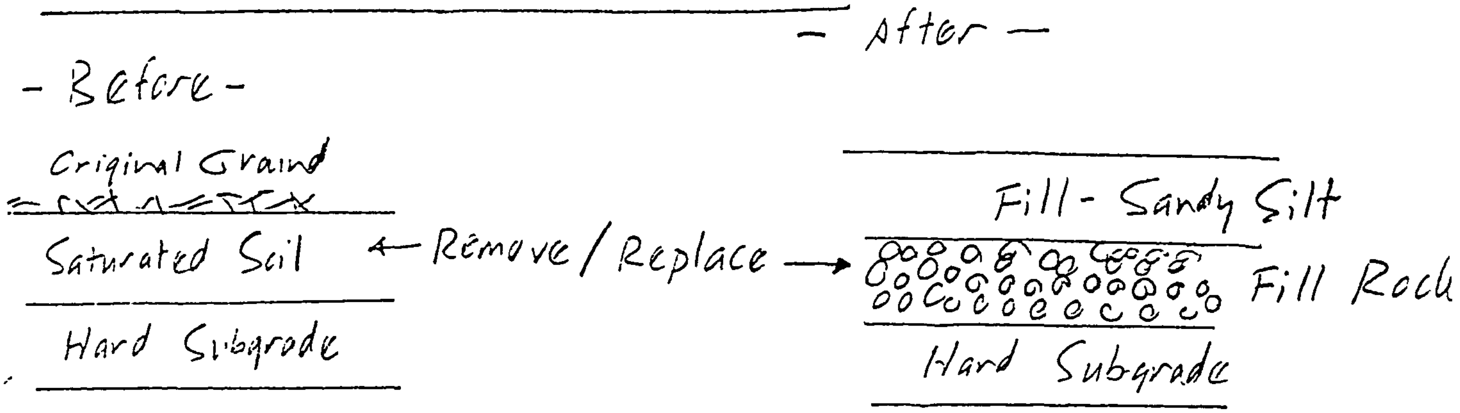
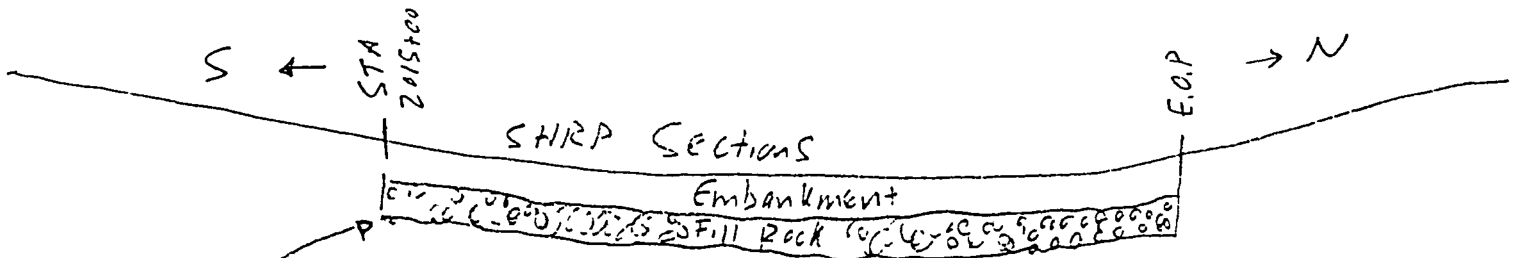
FEB 27 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

Station 2015+00 to E.O.P. North:





Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumulate in this low area.

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA LCB SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

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

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

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

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

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

* 6. ROUND DOWEL DIAMETER (Inches) [N. _ _]

* 7. DOWEL SPACING (Inches) [_ N.]

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

9. DOWEL LENGTH (Inches) [_ N.]

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

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

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

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

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By HN

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D LCB	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

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

* 2. METHOD USED TO FORM TRANSVERSE JOINTS [N]
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]
Butt..................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______________________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [1.7 _]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 2 3.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [N]
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)... [N._ _]

9. DEPTH, (Inches)... [N._ _]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)... [N._ _]

11. DEPTH, (Inches)... [N._ _]

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

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

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

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FEB 27 1997
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SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA LCB	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

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

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).................................... [1 6 9 9.]

*3. Fine Aggregate (Pounds)...................................... [1 7 0 5.]

*4. Cement (Pounds).. [_ 2 2 5.]

*5. Water (Pounds)... [_ 2 7 0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE			AMOUNT
*8.	ADMIXTURE #1	[0,1]	.01	Water Reducer	0[.0 0 4, _]
*9.	ADMIXTURE #2	[0,8]	08	Air Entraining	0[.0 0 1, _]
*10.	ADMIXTURE #3	[1,0]	10	Class F - Fly Ash	[_ 1 0.0]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

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By JJV

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED) LCB	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

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

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ ~~9 8~~
7/8"......	_ _ _
3/4"......	_ ~~6 7~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	~~1 0 0~~
No. 10....	_ _ _
No. 16....	_ _ _ 51
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ _ _ 19
No. 80....	_ _ _
No. 100...	_ _ _ 7
No. 200...	_ ~~1 8~~ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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FEB 27 1997
By HW

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS LCB PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8-1 7-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8-1 7-9 5]

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

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[_ 1 0]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert and Zimmerman

7. SPREADER TYPE (if applicable) Not Used

8. SPREADER MANUFACTURER AND MODEL NUMBER Not Used

9. WIDTH PAVED IN ONE PASS (Feet) [3 8.0]

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

11. NUMBER OF VIBRATORS [3 3]

12. VIBRATOR SPACING (Inches) [1 6]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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FEB 27 1997
By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED) LCB	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets........ 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) ______ 8

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

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By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/18/95

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER LCB PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

1. DATE PROFILE MEASURED (Month-Day-Year) [0 8 - 1 8 - 9 5]

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

3. PROFILE INDEX (Inches/Mile) [1.4]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 __]

6. CUTOFF HEIGHT (Inches) [0.3 __]

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

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

   IF YES COMPLETE THE FOLLOWING:

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

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

*11. REASON FOR GRINDING [N]
    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) [__ __ N.__ __]

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

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

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PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]
* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]
3. (RANDOM JOINT SPACING, IF ANY: ____________________)
* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]
* 5. TRANSVERSE CONTRACTION JOINT LOAD TRANSFER SYSTEM [1]
   - Round Dowels.......................... 1
   - Aggregate Interlock.................... 2
   - Other (Specify) ____________ 3
* 6. ROUND DOWEL DIAMETER (Inches) [1.5 0]
* 7. DOWEL SPACING (Inches) [1 2.]
8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6.0]
9. DOWEL LENGTH (Inches) [1 8.]
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)

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PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

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SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 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 [1]
Butt..................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ____________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [3.1 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 3.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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).. [0.3 1]

9. DEPTH, (Inches).. [3.1 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)... [0.2 5]

11. DEPTH, (Inches)... [3.5 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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By AW

Spring '96

15. WIDTH, (Inches)... [N.__ __]

16. DEPTH, (Inches)... [N.__ __]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA 900 psi Mix	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).................................... [1 8 3 3.]

*3. Fine Aggregate (Pounds).................................... [_ 9 4 8.]

*4. Cement (Pounds).................................... [_ 9 2 5.]

*5. Water (Pounds).................................... [_ 2 8 5.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE		AMOUNT
*8.	ADMIXTURE #1	[0, 1] .01	92.5 oz.	[.0 0 6._]
*9.	ADMIXTURE #2	[0, 8] .08	5.1 oz.	[.0 0 0 3]
*10.	ADMIXTURE #3	[1, 0] 10		[_ _ _._]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

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By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 19 900 psi mix PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 (SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9) [0 7.]

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ 9 7
7/8"......	_ _ _
3/4"......	_ ~~6 2~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

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12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 8-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 8-9 5]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 5]	[_ 1 0]
Plant 2	____	[_ _ _]	[_ _ _]
Plant 3	____	[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sid

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 4 . 0]

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

11. NUMBER OF VIBRATORS [2 2]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0 . 8]

14. ADDITIONAL VIBRATION APPLIED None

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PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets........ 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) ______ 8

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

3, 5, and 1, in order

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By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 1 - 0 3 - 9 5]

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

3. PROFILE INDEX (Inches/Mile) [4.2]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]

6. CUTOFF HEIGHT (Inches) [0.3 0]

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

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

IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [1 1-0 5-9 5]

10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [1 1-0 5-9 5]

*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) [__ 3 6.0 0]

14. AVERAGE GROOVE WIDTH (Inches) [0.1] (1/8"

15. AVERAGE SPACING BETWEEN BLADES (Inches) [0.1] (1/8"

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Marco Fellin EMPLOYER NCE DATE 1/12/96

February 1992

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 8]

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

From the beginning of paving at 7.15 a.m. until the end of the section at 8:50 a.m., the water cement ratio was lowered as follows:
7:15 a.m., 0.300, 7:31 a.m., 0.296, 8:00 a.m., 0.291, 8:30 a.m., 0.286, 8:49 a.m., 0.281.
The water reducing and air entraining agents were kept constant during paving.

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FEB 27 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE ____________

530209

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE * SPS PROJECT CODE * TEST SECTION NO.	[5 3] [0 2] [0 9]

*1. LANE WIDTH (FEET) [1 2]

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 [1]
Continuous Along Test Section 1
Intermittent ... 2 None 3

*4. SUBSURFACE DRAINAGE TYPE [6]
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 ____________	[3]	[3]
*6.	TOTAL WIDTH (FEET)	[0 4]	[1 0]
*7.	PAVED WIDTH (FEET)	[0 4]	[1 0]
8.	SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9.	SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10.	SHOULDER BASE THICKNESS (INCHES)	[_ 5. 0]	[_ 5. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [4. 0]

12. SPACING OF LATERALS (FEET) [~~2~~] N

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [2 0]

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By LH

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SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]				
2	[1 1]	[6 5]	[20.4]	12.0	42.0	9.5
3	[1 1]	[5 5]	[47.0]	43.0	52.0	4.6
4	[0 6]	[2 3]	[4.4]	2.3	5.8	0.7
5	[0 5]	[3 1]	[3.9]	3.2	4.7	0.4
6	[0 3]	[0 4]	[8.5]	7.6	9.2	0.3
7	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[_ _]	[_ _]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) (Rock, Stone, Dense Shale) [_ 2. 6]

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 (Appendix B of SPS-2 Data Collection Guide).

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

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By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

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
0+00	0	4.0	4.6		8.4
	36	3.4	4.5		8.5
	72	5.-	4.3		8.8
	108	4.0	4.1		8.5
	144	4.4	3.9		8.6
0+50	0	4.8	4.7		7.6
	36	4.6	4.1		8.4
	72	4.6	3.7		8.8
	108	4.8	3.8		8.9
	144	5.0	3.7		8.8
1+00	0	4.8	4.6		8.2
	36	4.9	4.1		8.6
	72	5.0	3.3		9.2
	108	5.0	3.3		9.0
	144	5.3	3.3		8.9
1+50	0	4.9	4.4		8.0
	36	4.9	4.3		8.3
	72	5.4	3.3		8.8
	108	4.9	3.9		8.4
	144	5.4	3.8		8.5
2+00	0	5.5	4.2		8.2
	36	5.3	3.6		8.9
	72	5.3	3.2		9.1
	108	5.3	3.3		9.0
	144	5.4	3.7		8.6
2+50	0	4.0	4.7		7.7
	36	4.3	4.1		8.3
	72	4.2	3.5		8.6
	108	4.0	4.0		8.4
	144	4.3	3.9		8.4
3+00	0	3.8	4.3		8.0
	36	4.3	3.9		8.3
	72	4.1	3.6		8.8
	108	4.4	3.8		8.4
	144	4.8	3.7		8.5
LAYER NUMBER[1]		4	5		6

[1] from Construction Data Sheet 4

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LN
By ____

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

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
3+50	0	4.4	4.1	.	7.9
	36	4.5	3.8	.	8.4
	72	4.7	3.4	.	8.6
	108	4.4	3.7	.	8.6
	144	4.3	3.7	.	8.6
4+00	0	3.7	4.5	.	8.3
	36	4.4	3.4	.	8.9
	72	4.3	3.8	.	8.8
	108	4.6	4.4	.	8.5
	144	5.8	4.1	.	8.4
4+50	0	3.3	4.1	.	7.9
	36	3.5	3.7	.	8.4
	72	4.1	3.2	.	8.8
	108	3.[illegible]	3.7	.	8.5
	144	4.4	3.8	.	8.2
5+00	0	3.3	4.3	.	7.9
	36	2.2	3.8	.	8.5
	72	3.6	3.9	.	8.6
	108	4.0	3.9	.	8.6
	144	4.9	4.0	.	8.5
__+__ __		.	.	.	.
__+__ __		.	.	.	.
__+__ __		.	.	.	.
LAYER NUMBER[1]		4	5		6

[1] from Construction Data Sheet 4

ENTERED
FEB 28 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [0 2-0 1-9 5]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [0 7-0 9-9 5]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) (For Fill Sections Only) [__ 8.0]

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

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) Original Subgrade from Station 2005+00 to E.O.P. was subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~[illegible]~~ received fill rock. 53021 received partial fill rock.

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FEB 27 1997
By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

Station 2015+00 to E.O.P. North:

- Before -

Original Ground

Saturated Soil

Hard Subgrade

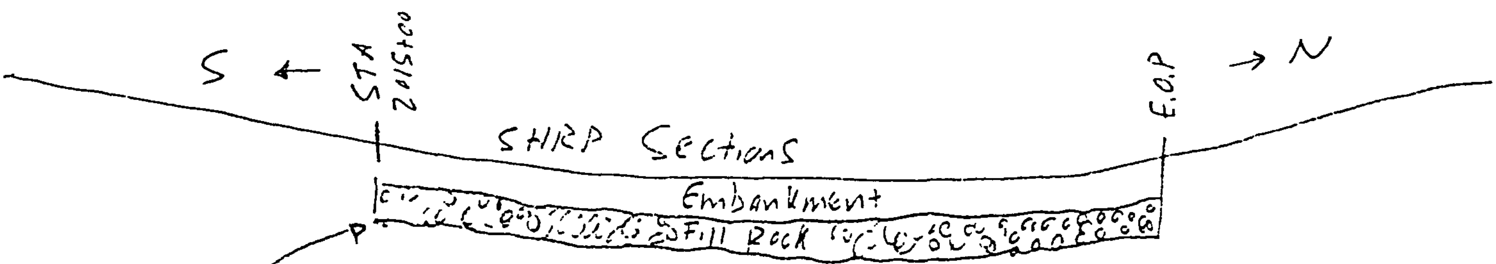
← Remove/Replace →

- After -

Fill - Sandy Silt

Fill Rock

Hard Subgrade



Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumulate in this low area.

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 9 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [5 3] * SPS PROJECT CODE [C 2] * TEST SECTION NO. [0 9]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [0 7 - 1 3 - 9 5]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [0 8 - 1 8 - 9 5]

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

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) [_ 7.0]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (Inches) [_ 4.0]

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 S-1

7. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) Construction-Traffic on DGAB 7/18 to 8/18. Trimmed prior to placing next layer.

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FEB 27 1997
By [illegible]

PREPARER [illegible] EMPLOYER [illegible] DATE 8/24/95

SPS-2 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES PATB	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

	COMPOSITION OF COARSE AGGREGATE	TYPE	PERCENT
* 2.		[1]	[1 0 0.]
* 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.		[2]	[1 0 0.]
* 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 [N]
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) [2.7 4 0]

*10. FINE AGGREGATE (AASHTO T84 or ASTM C128) [2.7 5 0]

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

*12. AGGREGATE COMBINATION (CALCULATED) [2.7 4 0]

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

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

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
14.	Coarse	[0 1]	[_ 2 2.0]
15.	Coarse	[_ _]	[_ _ _._]
16.	Coarse	[_ _]	[_ _ _._]
17.	Coarse and Fine - Combined	[_ _]	[_ _ _._]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS PATB ASPHALT CEMENT PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [c 2] * TEST SECTION NO. [0 9]

*1. LAYER NUMBER (FROM CONSTRUCTION SHEET 4) [5]

*2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 9]
(IF OTHER, SPECIFY) ______

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [4 6]
(IF OTHER, SPECIFY) ______

4. SPECIFIC GRAVITY OF ASPHALT CEMENT [1.0 3 4]
(AASHTO T228)

ORIGINAL ASPHALT CEMENT PROPERTIES **(If available from supplier)**

5. VISCOSITY OF ASPHALT AT 140°F (Poises) [_ _ 1 5 0 2.]
(AASHTO T202)

6. VISCOSITY OF ASPHALT AT 275°F (Centistokes) [_ 3 6 7.0 _]
(AASHTO T202)

7. PENETRATION AT 77°F (AASHTO T49) (Tenths of a mm) [_ _ 8 1.]
(100 g., 5 sec.)

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

	TYPE	QUANTITY (%)
8. MODIFIER #1	[N _]	[_ _.]
9. MODIFIER #2 (IF OTHER, SPECIFY) ______	[N _]	[_ _.]

10. DUCTILITY AT 77°F (cm) [_ _ N.]
(AASHTO T51)

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11. DUCTILITY AT 39.2°F (cm) [_ _ N.]
(AASHTO T51)

12. TEST RATE FOR DUCTILITY MEASUREMENT [_ _ N.]
AT 39.2°f (cm/Min)

13. PENETRATION AT 39.2°F (AASHTO T49) (Tenths of a mm) [_ 2 9.]
(200 g., 60 sec.)

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [_ _ N.]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

SPS-2 CONSTRUCTION DATA SHEET 12 PLANT-MIXED ASPHALT BOUND LAYERS PATB MIXTURE PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) No Mix Design run by the State [5]

*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 [__ __]

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FEB 28 1997
By [signature]

*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 [7 0]
(SEE TYPE CODES, TABLE A.21) OTHER (SPECIFY) Aggrigrip - Koch Materials

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

*22. AMOUNT OF ANTISTRIPPING AGENT USED (Percent) [__ 0.3]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 1/15/96

February 1992

SPS-2 CONSTRUCTION DATA SHEET 13 PLANT-MIXED ASPHALT BOUND LAYERS PATB PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 7] * TEST SECTION NO. [0 9]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8-2 8-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8-2 9-9 5]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Number
Plant 1	[2]	Acme Materials	[_ _ 4]	[_ 8]	[_ 5]
Plant 2	[_]	______	[_ _ _]	[_ _]	[_ _]

Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify______

4. MANUFACTURER OF ASPHALT CONCRETE PAVER Blaw Knox

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER PF-150

6. SINGLE PASS LAYDOWN WIDTH (Feet) [1 2.5]

7. PATB PLACEMENT LIFTS: Layer Number [_ 5]

Nominal First Lift Placement Thickness (Inches) [4.5]

Nominal Second Lift Placement Thickness (Inches) [N._]

Nominal Third Lift Placement Thickness (Inches) [N._]

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.) No problems, disruptions.

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By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

SPS-2 CONSTRUCTION DATA SHEET 14 PLANT-MIXED ASPHALT BOUND LAYERS PATB COMPACTION DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 6-2 8-9 5]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 6-2 9-9 5]
*3. LAYER NUMBER [5]

*4. MIXING TEMPERATURE (°F) [2 2 0.]

5. LAYDOWN TEMPERATURES (°F)
Mean................ [1 7 6] Number of Tests .... [3 4.]
Minimum............. [1 5 0] Maximum........ .. [1 9 0.]
Standard Deviation... [1 0.3]

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	__ __.__				
7	B	Steel-Whl Tandem	__ __.__				
8	C	Steel-Whl Tandem	__ __.__				
9	D	Steel-Whl Tandem	__ __.__				
10	E	Pneumatic-Tired	__ __.__	__ __ __ __ __.			
11	F	Pneumatic-Tired	__ __.__	__ __ __ __ __.			
12	G	Pneumatic-Tired	__ __.__	__ __ __ __ __.			
13	H	Pneumatic-Tired	__ __.__	__ __ __ __ __.			
14	I	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
15	J	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
16	K	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
17	L	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
18	M	Double-Drum Vibr.	1 0.5		__ __ __ 0.	.__ __ 0	__ __.__
19	N	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
20	O	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
21	P	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	__	__	__
24	Coverages	__ 1.	__ __.	__ __.	__ __.
	INTERMEDIATE				
25	Roller Code (A-Q)	M	__	__	__
26	Coverages	__ 1.	__ __.	__ __.	__ __.
	FINAL				
27	Roller Code (A-Q)	M	__	__	__
28	Coverages	__ 1.	__ __.	__ __.	__ __.
29	Air Temperature (°F)	__ 6 5.	__ __ __.	__ __ __.	__ __ __.
30	Compacted Thickness (In)	3.9	__.__	__.__	__.__
31	Curing Period (Days)	3 0.__	__ __.__	__ __.__	__ __.__

ENTERED
FEB 27 1997
By AW

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

* 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) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6.0]

9. DOWEL LENGTH (Inches) [1 8.]

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)

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By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches).............. [2.5 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 5.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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).. [0.2 8]

9. DEPTH, (Inches).. [2.5 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)... [0.2 5]

11. DEPTH, (Inches)... [3.4 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) ENTERED [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT) FEB 27 1997

Spring '9

15. WIDTH, (Inches).............................By W [~~0~~._ _]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA 550 PSI Mix	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds) .... [1 9 ~~1~~ 9.]

*3. Fine Aggregate (Pounds) .... [1 3 9 5.]

*4. Cement (Pounds) .... [_ ~~4 7 0~~.] 423

*5. Water (Pounds) .... [_ 2 3 0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE		AMOUNT
*8.	ADMIXTURE #1	[0, 1] .01	28.2 oz.	0.[0 0 4, _]
*9.	ADMIXTURE #2	[0, 8] .08	4.7 oz.	0.[0 0 1, _]
*10.	ADMIXTURE #3	[~~1, 0~~] ~~10~~		[_ _ _._]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

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FEB 27 1997
By HN

PREPARER Marco Fellin EMPLOYER NCE DATE 8/~~23~~/95

SPS-2 CONSTRUCTION DATA SHEET 19 550 PSI Mix PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

COMPOSITION OF COARSE AGGREGATE

		TYPE	PERCENT
* 2.		[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

		TYPE	PERCENT
* 6.		[1]	[_ 1 2.]
* 7.		[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ 9 7
7/8"......	_ _ _
3/4"......	_ ~~6 2~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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FEB 27 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 8-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2-8-9 5]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 4]	[_ _ 8]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sic

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 4.0]

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

11. NUMBER OF VIBRATORS [2 2]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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FEB 27 1997
By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets........ 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) __________ 8

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

3, 5, and 1, in order.

ENTERED
FEB 27 1997
By LW

PREPARER Marco Fellin   EMPLOYER NCE   DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

1. DATE PROFILE MEASURED (Month-Day-Year) [11-03-95]

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

3. PROFILE INDEX (Inches/Mile). [0.5]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.20]

6. CUTOFF HEIGHT (Inches) [0.30]

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

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

IF YES COMPLETE THE FOLLOWING:

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

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

*11. REASON FOR GRINDING N~~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) N [~~36.00~~]

14. AVERAGE GROOVE WIDTH (Inches) N [~~0.1~~] ~~(1/8")~~

15. AVERAGE SPACING BETWEEN BLADES (Inches) N [~~0.1~~] ~~(1/8")~~

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FEB 27 1997
By LW

Marco Fellin EMPLOYER NCE DATE 1/12/96

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [0 9]

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

From Station 2028+00 to the beginning of the Section, no tie bars were placed in the PCC, about 125' were affected. The tie bar inserter during placement was malfunctioning.

The water cement ratio was lowered from 0.449 at the beginning of paving to 0.437 at the end of the section.

The amount of air entraining agent in this Section was 8.2 oz./yd.^{3} compared to a low of 9.7 oz./yd.^{3} in the previous 3 550 psi Sections paved.

ENTERED
FEB 27 1997
By

PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530210

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1. LANE WIDTH (FEET) [1 4]

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 [1]
   Continuous Along Test Section 1
   Intermittent ... 2 None 3

*4. SUBSURFACE DRAINAGE TYPE [6]
   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 ______	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[0 8]
*7. PAVED WIDTH (FEET)	[0 4]	[0 8]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[_ 5. 0]	[_ 5. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [4. 0]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [2 0]

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FEB 27 1997
By ddV

PREPARER Marco Fellin EMPLOYER NCE DATE 11/18/95

SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]				
2	[1 1]	[5 5]	[_ 48.7]	_ 45.0	_ 51.0	_ _ 3.2
3	[0 6]	[2 3]	[_ _ 4.5]	_ _ 3.4	_ _ 6.0	_ _ 0.6
4	[0 5]	[3 1]	[_ _ 3.8]	_ _ 2.9	_ _ 4.4	_ _ 0.4
5	[0 3]	[0 4]	[_ _ 8.3]	_ _ 7.7	_ _ 9.1	_ _ 0.3
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

ENTERED
FEB 27 1997
By

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) (Rock, Stone, Dense Shale) [_ ~~4 . 0~~]
U.

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 (Appendix B of SPS-2 Data Collection Guide).

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

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

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
0+00	0	4.2	4.4	.	7.9
	66	4.3	4.2	.	7.9
	96	4.1	4.1	.	8.0
	132	3.5	4.3	.	8.0
	168	4.5	4.1	.	8.2
0+50	0	4.6	4.2	.	8.2
	60	4.4	4.3	.	8.3
	96	4.8	4.2	.	8.3
	132	5.3	4.0	.	8.4
	168	5.4	3.7	.	8.3
1-00	0	4.2	4.1	.	8.2
	60	4.9	3.8	.	8.2
	96	4.3	3.2	.	[illegible].8
	132	4.3	3.4	.	9.0
	168	4.9	3.0	.	9.1
1+50	0	4.8	4.0	.	7.8
	60	4.8	3.8	.	7.9
	96	4.7	3.1	.	8.4
	132	4.2	3.2	.	8.4
	168	4.9	2.9	.	8.5
2+00	0	5.2	4.3	.	8.2
	60	4.9	4.1	.	8.2
	96	4.0	3.6	.	8.8
	132	4.1	3.6	.	8.6
	168	4.7	3.4	.	8.6
2+50	0	3.7	4.4	.	8.0
	60	4.4	4.1	.	7.9
	46	4.5	3.8	.	8.4
	132	4.6	3.7	.	8.3
	168	6.0	3.5	.	8.2
3+00	0	3.7	4.3	.	8.0
	60	5.6	3.7	.	8.3
	96	5.0	3.5	.	8.9
	132	4.1	3.7	.	8.8
	168	4.4	3.6	.	8.4
LAYER NUMBER[1]		3	4		5

[1] from Construction Data Sheet 4

ENTERED
FEB 20 1997
By

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

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
3+50	0	4.8	4.1	.	8.0
	60	4.3	4.0	.	8.3
	96	4.3	3.6	.	8.8
	132	3.7	4.0	.	8.5
	168	4.4	3.6	.	8.3
4+00	0	4.6	4.3	.	7.7
	60	3.7	4.0	.	8.0
	96	3.7	3.6	.	8.4
	132	3.7	3.6	.	8.2
	168	4.2	3.4	.	8.0
4+50	0	4.7	3.8	.	7.9
	60	4.1	3.8	.	8.2
	96	3.8	3.6	.	8.6
	132	3.4	3.8	.	8.6
	168	3.7	3.7	.	8.8
5+00	0	4.0	4.0	.	8.0
	60	4.6	3.8	.	8.3
	96	5.3	4.2	.	8.0
	132	4.7	4.0	.	8.2
	168	4.9	4.1	.	7.9
+		.	.	.	.
+		.	.	.	.
+		.	.	.	.
LAYER NUMBER[1]		3	4	—	5

ENTERED
FEB 28 1997
By JL

[1] from Construction Data Sheet 4

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [0 2-0 1-9 5]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [0 7-0 9-9 5]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) [__ 8.0]
(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.) Original Subgrade from Station 2005+00 to E.O.P. was Subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~[illegible]~~ received fill rock. 53021 received ~~[illegible]~~ partial fill rock.

ENTERED
FEB 27 1997
By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

Station 2004+00 to 2015+00 (Sections 530202, 530210):

— Before —

Original Ground

Saturaded Soil ← Remove/Replace → Fill - Sandy Silt

Hard Subgrade

— After —

Fill - Sandy Silt

Fill - Sandy Silt

Hard Subgrade

Station 2015+00 to E.O.P. North:

- Before -

Original Graund

Saturated Soil ← Remove/Replace →

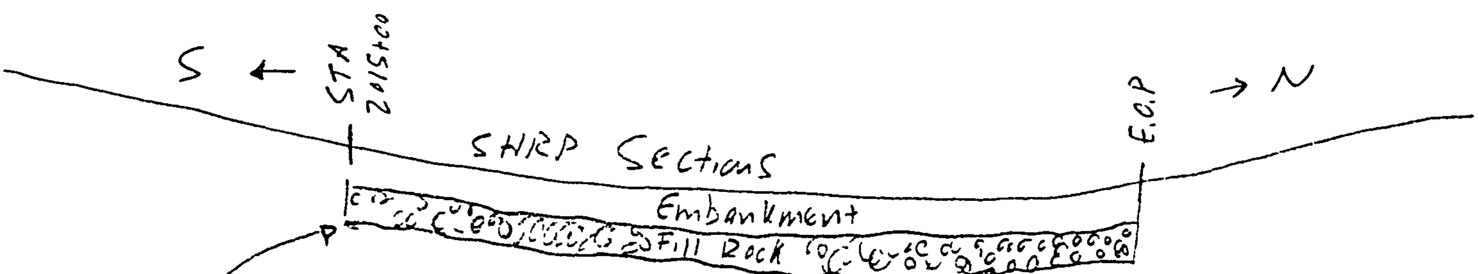
Hard Subgrade

— After —

Fill - Sandy Silt

Fill Rock

Hard Subgrade



Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumulate in this low area.

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 9 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [0 7 - 1 3 - 9 5]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [0 8 - 1 8 - 9 5]

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

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) [_ 7 0]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (Inches) [_ 4 . 0]

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 S-1

7. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) Construction traffic on DGAB 7/18 to 8/18. Trimmed prior to placing next layer.

ENTERED
FEB 27 1997
By LN

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

SPS-2 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS PATB -- AGGREGATE PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

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

COMPOSITION OF COARSE AGGREGATE — TYPE — PERCENT

* 2. [1] [1 0 0.]

* 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. - [2] [1 0 0.]

* 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 [N]
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) [2.7 4 0]

*10. FINE AGGREGATE (AASHTO T84 or ASTM C128) [2.7 5 0]

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

*12. AGGREGATE COMBINATION (CALCULATED) [2.7 4 0]

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

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

ENTERED
FEB 27 1997
By HV

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
14.	Coarse	[0 1]	[_ 2 2.0]
15.	Coarse	[_ _]	[_ _ _._]
16.	Coarse	[_ _]	[_ _ _._]
17.	Coarse and Fine - Combined	[_ _]	[_ _ _._]

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

dS 3/3/97

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS PATB ASPHALT CEMENT PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

*1. LAYER NUMBER (FROM CONSTRUCTION SHEET 4) [~~5~~ 4]

*2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 9]
(IF OTHER, SPECIFY) ______

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [4 6]
(IF OTHER, SPECIFY) ______

4. SPECIFIC GRAVITY OF ASPHALT CEMENT [1.0 3 4]
(AASHTO T228)

ORIGINAL ASPHALT CEMENT PROPERTIES (If available from supplier)

5. VISCOSITY OF ASPHALT AT 140°F (Poises) [_ _ 1 5 0 2.]
(AASHTO T202)

6. VISCOSITY OF ASPHALT AT 275°F (Centistokes) [_ 3 6 7.0 _]
(AASHTO T202)

7. PENETRATION AT 77°F (AASHTO T49) (Tenths of a mm) [_ _ 8 1.]
(100 g., 5 sec.)

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

	TYPE	QUANTITY (%)
8. MODIFIER #1	[N _]	[_ _.]
9. MODIFIER #2 (IF OTHER, SPECIFY) ______	[N _]	[_ _.]

10. DUCTILITY AT 77°F (cm) [_ _ N.]
(AASHTO T51)

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FEB 27 1997
By [signature]

11. DUCTILITY AT 39.2°F (cm) [_ _ N.]
(AASHTO T51)

12. TEST RATE FOR DUCTILITY MEASUREMENT [_ _ N.]
AT 39.2°f (cm/Min)

13. PENETRATION AT 39.2°F (AASHTO T49) (Tenths of a mm) [_ 2 9.]
(200 g., 60 sec.)

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [_ _ N.]

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

dks 3/3/97

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

SPS-2 CONSTRUCTION DATA SHEET 12 PLANT-MIXED ASPHALT BOUND LAYERS PATB -- MIXTURE PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) No Mix Design run by the State [5]

*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)

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FEB 28 1997
By HN

*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 [7 0]
(SEE TYPE CODES, TABLE A.21) OTHER (SPECIFY) Aggrigrip - Koch Materials

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

*22. AMOUNT OF ANTISTRIPPING AGENT USED (Percent) [___ 0.3]

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

PREPARER Marco Fellin EMPLOYER NCE 3/3/97 DATE 1/15/96

SPS-2 CONSTRUCTION DATA SHEET 13 PLANT-MIXED ASPHALT BOUND LAYERS PATB -- PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8-2 8-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8-2 9-9 5]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Number
Plant 1	[2]	Acme Materials	[_ _ 4]	[_ 8]	[_ ~~5~~ 4]
Plant 2	[_]		[_ _ _]	[_ _]	[_ _]

Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify________

4. MANUFACTURER OF ASPHALT CONCRETE PAVER Blaw Knox

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER PF-150

6. SINGLE PASS LAYDOWN WIDTH (Feet) [1 2.5]

7. PATB PLACEMENT LIFTS: Layer Number [_ ~~5~~ 4]

Nominal First Lift Placement Thickness (Inches) [4.5]

Nominal Second Lift Placement Thickness (Inches) [N._]

Nominal Third Lift Placement Thickness (Inches) [N._]

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.) No problems, disruptions.

JS 3/3/97

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

SPS-2 CONSTRUCTION DATA
SHEET 14
PLANT-MIXED ASPHALT BOUND LAYERS PATB
COMPACTION DATA

* STATE CODE [5 3]
* SPS PROJECT CODE [0 2]
* TEST SECTION NO. [1 0]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 6-2 5-9 5]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 6-2 9-9 5]
*3. LAYER NUMBER [4]

*4. MIXING TEMPERATURE (°F) [2 2 0.]

5. LAYDOWN TEMPERATURES (°F)
Mean................. [1 8 4]
Minimum.............. [1 5 5.]
Standard Deviation... [1 1.5]
Number of Tests .... [2 1.]
Maximum..... ... . [2 0 5.]

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	__ __.__				
7	B	Steel-Whl Tandem	__ __.__				
8	C	Steel-Whl Tandem	__ __.__				
9	D	Steel-Whl Tandem	__ __.__				
10	E	Pneumatic-Tired	__ __.__	__ __ __ __.			
11	F	Pneumatic-Tired	__ __.__	__ __ __ __.			
12	G	Pneumatic-Tired	__ __.__	__ __ __ __.			
13	H	Pneumatic-Tired	__ __.__	__ __ __ __.			
14	I	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
15	J	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
16	K	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
17	L	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
18	M	Double-Drum Vibr.	1 0.5		0.	.0	__ __.__
19	N	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
20	O	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
21	P	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	__		__
24	Coverages	1.	__ __.		__ __.
	INTERMEDIATE				
25	Roller Code (A-Q)	M	__		__
26	Coverages	1.	__ __.		__ __.
	FINAL				
27	Roller Code (A-Q)	M	__	__	__
28	Coverages	1.	__ __.	__ __.	__ __.
29	Air Temperature (°F)	6 5.	__ __ __	__ __ __.	__ __ __.
30	Compacted Thickness (In)	3.8	__ __	__.__	__.__
31	Curing Period (Days)	3 0.__	__ __ __	__ __ __	__ __.__

ENTERED
FEB 28 1997
By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

* 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) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6._]

9. DOWEL LENGTH (Inches) [1 8.]

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)

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PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ____________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches).............. [3.3 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 3.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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).. [0.5 0]

9. DEPTH, (Inches).. [3.3 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches).. [0.2 5]

11. DEPTH, (Inches).. [2.7 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.8 0]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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

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

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By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA 900 psi	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).................................. [1 8 3 3.]

*3. Fine Aggregate (Pounds).................................. [_ 9 4 8.]

*4. Cement (Pounds).................................. [_ 9 2 5.]

*5. Water (Pounds).................................. [_ 2 8 5.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE		AMOUNT
*8.	ADMIXTURE #1	[0, 1] .01	92.5 oz	[.0 0 6._]
*9.	ADMIXTURE #2	[0, 8] 08	5.1 oz	[.0 0 1._]
*10.	ADMIXTURE #3	[1, 0] 10		[_ _ _._]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

ENTERED
FEB 28 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED) 900 psi	* STATE CODE [53] * SPS PROJECT CODE [02] * TEST SECTION NO [E 0_]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 (SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9) [0 7.]

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ ~~2 3~~
7/8"......	_ _ _
3/4"......	_ ~~6 2~~ 56
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 11
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 9-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 9-9 5]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 4]	[_ _ 8]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sid

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const, no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 6.0]

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

11. NUMBER OF VIBRATORS [2 4]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets........ 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) ____ 8

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

   3, 5, and 1, in order

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By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 0 - 0 5 - 9 5]

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

3. PROFILE INDEX (Inches/Mile) [2.9]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]

6. CUTOFF HEIGHT (Inches) [0.3 0]

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

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

IF YES COMPLETE THE FOLLOWING:

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

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

*11. REASON FOR GRINDING N [~~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) N [~~36.00~~]

14. AVERAGE GROOVE WIDTH (Inches) N [~~0.1~~] ~~(1/8")~~

15. AVERAGE SPACING BETWEEN BLADES (Inches) N [~~0.1~~] ~~(1/8")~~

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Marco Fellin EMPLOYER NCE DATE 1/12/96

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 0]

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

The amount of air entraining used in this section was 17.0 oz./yd3.

Water was sprayed onto the surface of the PCC from Station 2017+00 to the E.O.S. until the curing machine caught up from the previous section.

Fill rock below the embankment was only placed in the last 200' of the section.

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By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530211

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE * SPS PROJECT CODE * TEST SECTION NO.	[5 3] [0 2] [1 1]

*1. LANE WIDTH (FEET) [1 4]

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 [1]
Continuous Along Test Section 1
Intermittent ... 2 None 3

*4. SUBSURFACE DRAINAGE TYPE [6]
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 ______	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[0 8]
*7. PAVED WIDTH (FEET)	[0 4]	[0 8]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[_ 8. 0]	[_ 8. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [4. 0]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [2 0]

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By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 11/18/95

SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]				
2	[1 1]	[6 5]	[_15.0]	0.	36.0	11.2
3	[1 1]	[5 5]	[_44.0]	35.0	52.0	8.5
4	[0 6]	[2 3]	[_ _4.6]	3.4	5.6	0.6
5	[0 5]	[3 1]	[_ _3.9]	3.4	4.9	0.4
6	[0 3]	[0 4]	[_11.3]	10.6	11.9	0.3
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) (Rock, Stone, Dense Shale) [_4.1]

U.

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 (Appendix B of SPS-2 Data Collection Guide).

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

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By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

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
0+00	0	4.0	4.1		10.9
	60	4.6	3.8		11.3
	96	4.2	3.8		11.8
	132	4.0	3.8		11.6
	168	4.8	3.6		11.5
0+50	0	4.0	4.4		10.9
	60	5.2	3.8		11.6
	96	4.6	4.1		11.6
	132	4.3	4.1		11.5
	168	5.2	3.7		11.5
1+00	0	3.6	4.9		10.8
	60	4.8	4.1		11.4
	96	4.2	4.1		11.6
	132	4.4	3.8		11.4
	168	5.0	3.8		11.5
1+50	0	4.3	4.1		10.9
	60	5.3	3.6		11.3
	96	4.7	3.6		11.8
	132	4.4	3.4		11.4
	168	4.8	3.7		11.4
2+00	0	3.7	4.7		10.9
	60	5.2	3.8		11.5
	96	4.3	4.2		11.5
	132	4.6	4.3		11.3
	168	5.6	3.8		11.2
2+50	0	4.2	4.2		10.7
	60	4.7	3.7		11.0
	96	4.7	3.6		11.4
	132	4.8	3.6		11.4
	168	5.0	4.0		11.0
3+00	0	3.6	4.3		10.8
	60	4.1	3.8		11.3
	96	4.2	3.8		11.4
	132	3.8	4.1		11.3
	168	4.7	4.0		11.0
LAYER NUMBER[1]		4	5		6

[1] from Construction Data Sheet 4

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By

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

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
3+50	0	4.6	4.6		10.6
	60	4.4	4.1		11.2
	96	5.2	3.2		11.4
	132	4.8	3.7		11.2
	168	5.2	3.7		11.3
4+60	0	4.6	4.4		10.8
	60	5.0	3.8		11.3
	96	5.0	3.5		11.4
	132	4.9	3.5		11.3
	168	5.6	3.5		11.0
4+50	0	4.7	4.1		10.7
	60	5.6	3.7		11.3
	96	4.3	4.0		11.3
	132	4.3	4.2		11.0
	168	[illegible].2	3.7		11.2
5+00	0	3.7	4.4		11.0
	60	3.4	4.0		11.8
	96	3.5	3.8		11.8
	132	3.7	3.7		11.6
	168	4.9	3.5		11.9
__+__ __					
__+__ __					
__+__ __					
LAYER NUMBER[1]		4	5		6

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BY HW

[1] from Construction Data Sheet 4

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [02-01-95]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [07-09-95]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [17.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) [_ 8.0]
(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.) Original Subgrade from Station 2005+00 to E.O.P. was Subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~[illegible]~~ received fill rock. 53021 received ~~[illegible]~~ partial fill rock.

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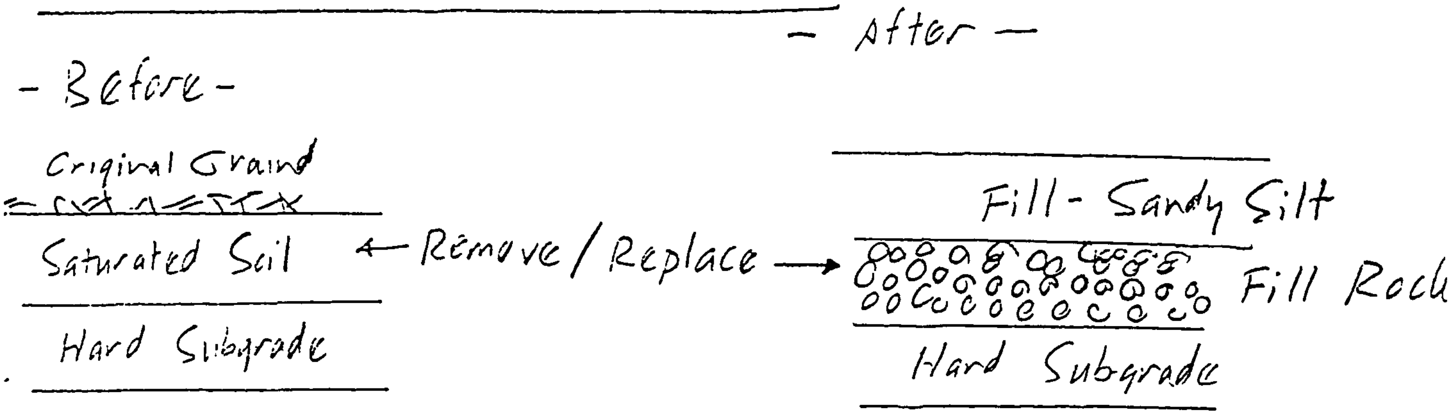
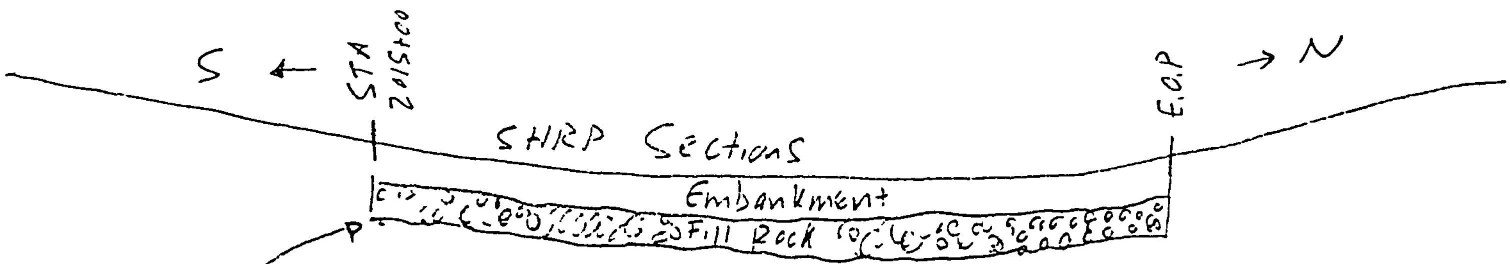
FEB 28 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 7]

Station 2015+00 to E.O.P. North:





Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumulate in this low area.

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 9 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [5 3] * SPS PROJECT CODE [C 2] * TEST SECTION NO. [1 1]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [07-13-95]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [08-18-95]

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

PRIMARY COMPACTION EQUIPMENT

*4. CODE TYPE [2]

COMPACTION TYPE CODES
Pneumatic - Tired. . 1 Steel Wheel Tandem... 2 Single Drum Vibr.. . 3
Double Drum Vibr -
Other (Specify).. 5 ______

*5. GROSS WEIGHT (Tons [_ 7.0]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (Inches) [_ 4.0]

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.) Construction traffic on DGAB 7/18 to 8/18. Trimmed prior to placing next layer.

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By HN

PREPARER Marco Fellin EMPLOYER WCE DATE 8/24/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS PATB -- AGGREGATE PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

COMPOSITION OF COARSE AGGREGATE — TYPE — PERCENT

* 2. [1] [1 0 0.]

* 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. - [2] [1 0 0.]

* 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 [N]
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) [2.7 4 0]

*10. FINE AGGREGATE (AASHTO T84 or ASTM C128) [2.7 5 0]

*11. MINERAL FILLER (AASHTO T100 or ASTM D854) [N.__ __ __]

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*12. AGGREGATE COMBINATION (CALCULATED) [2.7 4 0]

13. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED) [N.__ __ __]

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

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
14.	Coarse	[0 1]	[__ 2 2.0]
15.	Coarse	[__ __]	[__ __ __.__]
16.	Coarse	[__ __]	[__ __ __.__]
17.	Coarse and Fine - Combined	[__ __]	[__ __ __.__]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS PATR ..ASPHALT CEMENT PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

*1. LAYER NUMBER (FROM CONSTRUCTION SHEET 4) [5]

*2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 9]
(IF OTHER, SPECIFY) ______

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [4 6]
(IF OTHER, SPECIFY) ______

4. SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T228) [1.0 3 4]

ORIGINAL ASPHALT CEMENT PROPERTIES (If available from supplier)

5. VISCOSITY OF ASPHALT AT 140°F (Poises) (AASHTO T202) [_ _ 1 5 0 2.]

6. VISCOSITY OF ASPHALT AT 275°F (Centistokes) (AASHTO T202) [_ 3 6 7.0 _]

7. PENETRATION AT 77°F (AASHTO T49) (Tenths of a mm) (100 g., 5 sec.) [_ _ 8 1.]

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

	TYPE	QUANTITY (%)
8. MODIFIER #1	[N _]	[_ _.]
9. MODIFIER #2 (IF OTHER, SPECIFY) ______	[N _]	[_ _.]

10. DUCTILITY AT 77°F (cm) (AASHTO T51) [_ _ N.]

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11. DUCTILITY AT 39.2°F (cm) (AASHTO T51) [_ _ N.]

12. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°f (cm/Min) [_ _ N.]

13. PENETRATION AT 39.2°F (AASHTO T49) (Tenths of a mm) (200 g., 60 sec.) [_ 2 9.]

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [_ _ N.]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

SPS-2 CONSTRUCTION DATA SHEET 12 PLANT-MIXED ASPHALT BOUND LAYERS PATB -- MIXTURE PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) No Mix design run by the State [5]

*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 [_ _]

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*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 [7 0]
(SEE TYPE CODES, TABLE A.21) OTHER (SPECIFY) Aggrigrip - Koch Materials

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

*22. AMOUNT OF ANTISTRIPPING AGENT USED (Percent) [_ 0.3]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 1/15/96

SPS-2 CONSTRUCTION DATA SHEET 13 PLANT-MIXED ASPHALT BOUND LAYERS PATB PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 7] * TEST SECTION NO. [1 1]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8-2 8-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8-2 9-9 5]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Number
Plant 1	[2]	Acme Materials	[_ _ 4]	[_ 8]	[_ 5]
Plant 2	[_]	______	[_ _ _]	[_ _]	[_ _]

Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify________

4. MANUFACTURER OF ASPHALT CONCRETE PAVER Blaw Knox

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER PF-150

6. SINGLE PASS LAYDOWN WIDTH (Feet) [1 2.5]

7. PATB PLACEMENT LIFTS: Layer Number [_ 5]

Nominal First Lift Placement Thickness (Inches) [4.5]

Nominal Second Lift Placement Thickness (Inches) [N._]

Nominal Third Lift Placement Thickness (Inches) [N._]

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.) No problems, disruptions.

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FEB 28 1997
By HN

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

SPS-2 CONSTRUCTION DATA SHEET 14 PLANT-MIXED ASPHALT BOUND LAYERS PATB COMPACTION DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8 - 2 8 - 9 5]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8 - 2 9 - 9 5]
*3. LAYER NUMBER [5]

*4. MIXING TEMPERATURE (°F) [2 2 0.]

5. LAYDOWN TEMPERATURES (°F)
Mean.................. [1 7 5.] Number of Tests .... [2 9.]
Minimum............... [1 5 5] Maximum .... [1 9 0.]
Standard Deviation... [_ 9.5]

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	__ __.__				
7	B	Steel-Whl Tandem	__ __.__				
8	C	Steel-Whl Tandem	__ __.__				
9	D	Steel-Whl Tandem	__ __.__				
10	E	Pneumatic-Tired	__ __.__	__ __ __ __.			
11	F	Pneumatic-Tired	__ __.__	__ __ __ __.			
12	G	Pneumatic-Tired	__ __.__	__ __ __ __.			
13	H	Pneumatic-Tired	__ __.__	__ __ __ __.			
14	I	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
15	J	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
16	K	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
17	L	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
18	M	Double-Drum Vibr.	1 0.5		__ __ __ 0.	.__ __ 0	__ __.__
19	N	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
20	O	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
21	P	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	__	__	__
24	Coverages	__ 1.	__ __.	__ __.	__ __.
	INTERMEDIATE				
25	Roller Code (A-Q)	M	__	__	__
26	Coverages	__ 1.	__ __.	__ __.	__ __.
	FINAL				
27	Roller Code (A-Q)	M	__	__	__
28	Coverages	__ 1.	__ __.	__ __.	__ __.
29	Air Temperature (°F)	__ 6 5.	__ __ __.	__ __ __.	__ __ __.
30	Compacted Thickness (In)	3.9	__.__	__.__	__.__
31	Curing Period (Days)	3 0.__	__ __ __.	__ __.__	__ __.__

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By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

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

* 6. ROUND DOWEL DIAMETER (Inches) [1.5 0]

* 7. DOWEL SPACING (Inches) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6._]

9. DOWEL LENGTH (Inches) [1 8.]

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)

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FEB 28 1997
By LW

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ______ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [2.7 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 5.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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)... [0.2 8]

9. DEPTH, (Inches)... [2.7 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches).. [0.2 5]

11. DEPTH, (Inches).. [3.2 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT) spring '96

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

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 18 550 PSI Mix PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds)........................ [1 9 ~~1~~ 9.]

*3. Fine Aggregate (Pounds)........................ [1 3 9 5.]

*4. Cement (Pounds)........................ [~~4 7 0~~.] 423

*5. Water (Pounds)........................ [_ 2 3 0.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE		AMOUNT
*8.	ADMIXTURE #1	[0,1] .01	28.2 oz.	0.[0 0 4, _]
*9.	ADMIXTURE #2	[0,8] .08	4.7 oz.	0.[0 0 1, _]
*10.	ADMIXTURE #3	[~~1 0~~] 10		[_ 1 0. _]

(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	[0 1]	[_ 2 2. 6]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

ENTERED
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By HW

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 19 550 PSI Mix PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 [0 7.]
(SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9)

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"	1 0 0
1"	_ ~~9 7~~
7/8"	_ _ _
3/4"	_ ~~6 2~~ 56
5/8"	_ _ _
1/2"	_ _ _
3/8"	_ ~~1 2~~ 11
No. 4	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8	_ _ _
No. 10	_ _ _
No. 16	_ 5 1
No. 30	_ _ _
No. 40	_ _ _
No. 50	_ 1 9
No. 80	_ _ _
No. 100	_ _ 7
No. 200	_ _ 2

BULK SPECIFIC GRAVITIES:

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12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/23/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 9-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 9-9 5]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 4]	[_ _ 8]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sio

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 6.0]

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

11. NUMBER OF VIBRATORS [2 4]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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By

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets........ 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............ 6
   Hay.......................... 7
   Other (Specify) ______ 8

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

3, 5, and 1, in order.

ENTERED
FEB 28 1997
By ______

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 0 - 0 5 - 9 5]

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

3. PROFILE INDEX (Inches/Mile) [5.1]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]

6. CUTOFF HEIGHT (Inches) [0.3 0]

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

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

IF YES COMPLETE THE FOLLOWING:

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

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

*11. REASON FOR GRINDING N [~~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) N [~~36.00~~]

14. AVERAGE GROOVE WIDTH (Inches) N [~~0.1~~] ~~(1/8")~~

15. AVERAGE SPACING BETWEEN BLADES (Inches) N [~~0.1~~] ~~(1/8")~~

ENTERED
FEB 28 1997
By

Marco Fellin EMPLOYER NCE DATE 1/12/96

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 1]

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

The amount of air entraining agent in this section was 8.2 oz./yd.^{3}.

ENTERED
FEB 28 1997
By

PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530212

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1. LANE WIDTH (FEET) [1 2]

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 [1]
   Continuous Along Test Section 1
   Intermittent ... 2   None 3

*4. SUBSURFACE DRAINAGE TYPE [6]
   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 ______	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[1 0]
*7. PAVED WIDTH (FEET)	[0 4]	[1 0]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[_ 8. 0]	[_ 8. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [4. 0]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [2 0]

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PREPARER Marco Fellin   EMPLOYER NCE   DATE 11/18/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[6 2]				
2	[1 1]	[6 5]	[20.4]	12.0	42.0	10.6
3	[1 1]	[5 5]	[51.3]	46.0	60.0	7.6
4	[0 6]	[2 3]	[4.6]	2.6	6.1	0.5
5	[0 5]	[3 1]	[3.5]	2.8	4.3	04
6	[0 3]	[0 4]	[10.9]	10.2	11.6	0.3
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) (Rock, Stone, Dense Shale) [2.8]

U.

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 (Appendix B of SPS-2 Data Collection Guide).

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

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PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

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
0+00	0	4.1	3.8	.	10.7
	36	4.1	3.5	.	11.3
	72	4.3	3.2	.	11.4
	108	4.8	3.5	.	11.3
	144	4.7	3.7	.	11.2
0+50	0	4.7	3.6	.	10.6
	36	4.7	3.1	.	11.3
	72	4.9	3.2	.	11.2
	108	4.8	3.6	.	11.2
	144	5.4	3.5	.	11.0
1+00	0	4.8	3.5	.	10.2
	36	5.0	3.4	.	10.6
	72	4.7	3.2	.	10.9
	108	4.1	4.0	.	10.9
	144	6.1	3.2	.	10.8
1+50	0	4.9	3.7	.	10.4
	36	4.9	3.6	.	10.7
	72	5.5	2.9	.	10.6
	108	4.9	3.6	.	10.6
	144	5.3	3.7	.	10.3
2+00	0	4.3	3.5	.	10.3
	36	4.4	3.0	.	11.0
	72	4.0	3.1	.	10.9
	108	3.8	4.1	.	10.6
	144	4.7	3.6	.	10.8
2+50	0	4.7	3.1	.	10.7
	36	4.6	2.9	.	11.5
	72	4.1	3.6	.	11.5
	108	4.0	3.5	.	11.6
	144	4.8	3.5	.	11.4
3+00	0	4.4	3.6	.	10.7
	36	4.3	3.4	.	11.0
	72	4.7	3.5	.	11.0
	108	4.4	3.8	.	10.9
	144	4.9	4.0	.	10.8
LAYER NUMBER[1]		4	5		6

ENTERED

[1] from Construction Data Sheet 4

FEB 28 1997

By HW

PREPARER Marco Felix EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

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
3+50	0	4.1	3.5		10.6
	36	4.2	3.2		11.3
	72	4.2	3.5		11.3
	108	4.2	3.8		11.0
	144	4.9	3.7		11.0
4+00	0	4.3	3.1		10.6
	36	4.7	3.1		11.0
	72	5.0	3.0		11.0
	108	4.4	3.5		10.9
	144	4.6	3.6		11.0
4+50	0	4.6	3.4		10.2
	36	4.8	2.8		11.0
	72	4.4	3.2		11.2
	108	4.6	3.5		10.9
	144	5.0	3.4		11.0
5+00	0	3.7	3.6		10.6
	36	4.1	3.0		11.3
	72	4.1	3.7		10.6
	108	2.6	4.3		10.8
	144	4.1	3.4		10.9
+					
+					
+					
LAYER NUMBER[1]		4	5		6

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[1] from Construction Data Sheet 4

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 --SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [0 2-0 1-9 5]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [0 7-0 9-9 5]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7.1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[_ _._]
*6. STABILIZING AGENT 2	[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) [_ 8.0]
(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.) Original Subgrade from Station 2005+00 to E.O.P. was subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~[illegible]~~ received fill rock. 53021 received ~~[illegible]~~ partial fill rock.

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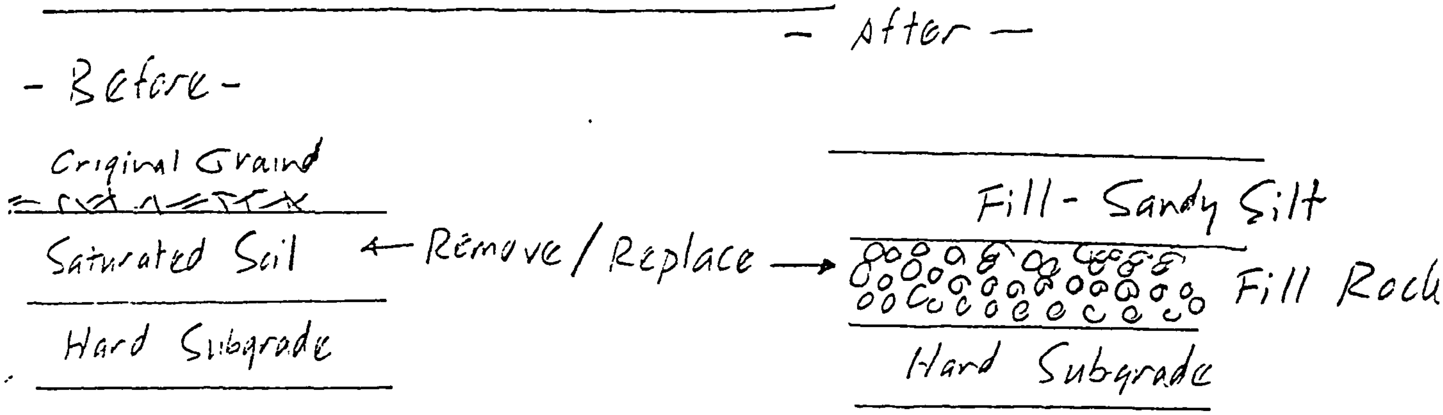
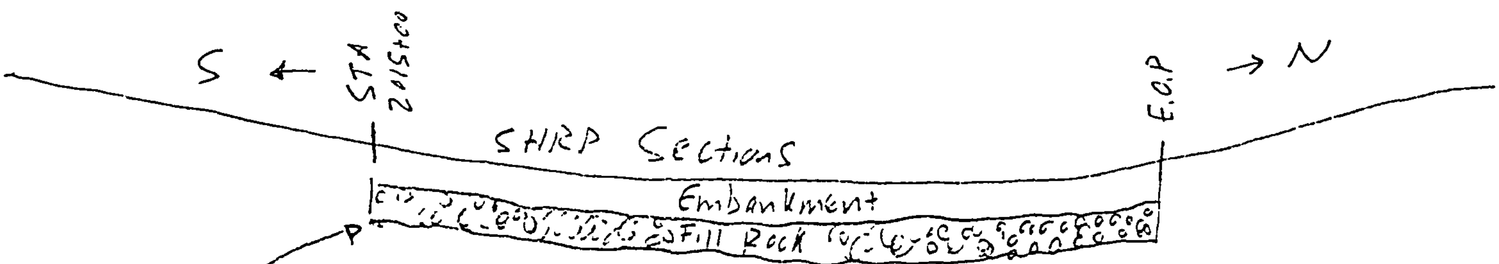
By ______

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

Station 2015+00 to E.O.P. North:





Fill Rock Added in place of Saturated Soil to enhance the drainage potential in the future. The water tends to accumulate in this low area.

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 9 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [07-13-95]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [08-18-95]

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

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) [_ 7.0]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (Inches) [_ 4.0]

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.) Construction Traffic on DGAB 7/18 to 8/18. Trimmed prior to placing next layer.

ENTERED
FEB 28 1997
By [illegible]

PREPARER Marco Fe[illegible] EMPLOYER NCE DATE 8/24/95

SPS-2 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS PATB -- AGGREGATE PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

	COMPOSITION OF COARSE AGGREGATE	TYPE	PERCENT
* 2.		[1]	[1 0 0.]
* 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.	-	[2]	[1 0 0.]
* 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 [N]
Stone Dust... 1 Hydrated Lime... 2 Portland Cement... 3
Fly Ash... 4 Other (Specify)... 5 ________________

BULK SPECIFIC GRAVITIES:

* 9. COARSE AAGGREGATE (AASHTO T85 or ASTM C127) [2.7 4 0]

*10. FINE AGGREGATE (AASHTO T84 or ASTM C128) [2.7 5 0]

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

*12. AGGREGATE COMBINATION (CALCULATED) [2.7 4 0]

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

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

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
14.	Coarse	[0 1]	[_ 2 2.0]
15.	Coarse	[_ _]	[_ _ _._]
16.	Coarse	[_ _]	[_ _ _._]
17.	Coarse and Fine - Combined	[_ _]	[_ _ _._]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

SPS-2 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS PATB ASPHALT CEMENT PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1. LAYER NUMBER (FROM CONSTRUCTION SHEET 4) [5]

*2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 9]
(IF OTHER, SPECIFY) ____

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [4 6]
(IF OTHER, SPECIFY) ____

4. SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T228) [1.0 3 4]

ORIGINAL ASPHALT CEMENT PROPERTIES (If available from supplier)

5. VISCOSITY OF ASPHALT AT 140°F (Poises) (AASHTO T202) [_ _ 1 5 0 2.]

6. VISCOSITY OF ASPHALT AT 275°F (Centistokes) (AASHTO T202) [_ 3 6 7.0 _]

7. PENETRATION AT 77°F (AASHTO T49) (Tenths of a mm) (100 g., 5 sec.) [_ _ 8 1.]

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

	TYPE	QUANTITY (%)
8. MODIFIER #1	[N _]	[_ _.]
9. MODIFIER #2	[N _]	[_ _.]

(IF OTHER, SPECIFY) ____

10. DUCTILITY AT 77°F (cm) (AASHTO T51) [_ _ N.]

11. DUCTILITY AT 39.2°F (cm) (AASHTO T51) [_ _ N.]

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By HV

12. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°f (cm/Min) [_ _ N.]

13. PENETRATION AT 39.2°F (AASHTO T49) (Tenths of a mm) (200 g., 60 sec.) [_ 2 9.]

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [_ _ N.]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

SPS-2 CONSTRUCTION DATA SHEET 12 PLANT-MIXED ASPHALT BOUND LAYERS PATB -- MIXTURE PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

No Mix Design Run By the State

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [5]

*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 [__]

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By [signature]

*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 [7 0]
(SEE TYPE CODES, TABLE A.21) OTHER (SPECIFY) Aggrigrip - Koch Materials

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

*22. AMOUNT OF ANTISTRIPPING AGENT USED (Percent) [_ 0.3]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 1/15/96

SPS-2 CONSTRUCTION DATA SHEET 13 PLANT-MIXED ASPHALT BOUND LAYERS PATB -- PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8-2 8-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8-2 9-9 5]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Number
Plant 1	[2]	Acme Materials	[_ _ 4]	[_ 8]	[_ 5]
Plant 2	[_]	____________	[_ _ _]	[_ _]	[_ _]

Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify____________

4. MANUFACTURER OF ASPHALT CONCRETE PAVER Blaw Knox

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER PF-150

6. SINGLE PASS LAYDOWN WIDTH (Feet) [1 2.5]

7. PATB PLACEMENT LIFTS: Layer Number [_ 5]

Nominal First Lift Placement Thickness (Inches) [4.5]

Nominal Second Lift Placement Thickness (Inches) [N._]

Nominal Third Lift Placement Thickness (Inches) [N._]

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.) No problems, disruptions.

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FEB 28 1997
By HN

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

SPS-2 CONSTRUCTION DATA SHEET 14 PLANT-MIXED ASPHALT BOUND LAYERS PATB COMPACTION DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [08-28-95]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [08-29-95]
*3. LAYER NUMBER [5]

*4. MIXING TEMPERATURE (°F) [220.]

5. LAYDOWN TEMPERATURES (°F)
Mean.................. [167.] Number of Tests .... [33.]
Minimum.............. [150.] Maximum............ .... .. [185.]
Standard Deviation... [11.1]

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	__ __.__				
7	B	Steel-Whl Tandem	__ __.__				
8	C	Steel-Whl Tandem	__ __.__				
9	D	Steel-Whl Tandem	__ __.__				
10	E	Pneumatic-Tired	__ __.__	__ __ __ __ __.			
11	F	Pneumatic-Tired	__ __.__	__ __ __ __ __.			
12	G	Pneumatic-Tired	__ __.__	__ __ __ __ __.			
13	H	Pneumatic-Tired	__ __.__	__ __ __ __ __.			
14	I	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
15	J	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
16	K	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
17	L	Single-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
18	M	Double-Drum Vibr.	10.5		__ __ __ 0.	.__ __ 0	__ __.__
19	N	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
20	O	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
21	P	Double-Drum Vibr.	__ __.__		__ __ __ __.	.__ __ __	__ __.__
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	__	__	__
24	Coverages	__ 1.	__ __.	__ __.	__ __.
	INTERMEDIATE			ENTERED	
25	Roller Code (A-Q)	M	__	FEB 23 1997	__
26	Coverages	__ 1.	__ __.		__ __.
	FINAL			By	
27	Roller Code (A-Q)	M	__	__	__
28	Coverages	__ 1.	__ __.	__ __.	__ __.
29	Air Temperature (°F)	__ 65.	__ __ __.	__ __ __.	__ __ __.
30	Compacted Thickness (In)	3.5	__.__	__.__	__.__
31	Curing Period (Days)	30.__	__ __.__	__ __.__	__ __.__

PREPARER Marco Fellin EMPLOYER NCE DATE 9/21/95

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [0.0]

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

* 6. ROUND DOWEL DIAMETER (Inches) [1.5 0]

* 7. DOWEL SPACING (Inches) [1 2.]

8. DISTANCE OF NEAREST DOWEL FROM OUTSIDE LANE-SHOULDER EDGE (Inches) [_ 6.0]

9. DOWEL LENGTH (Inches) [1 8.]

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)

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FEB 28 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

* 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 [1]
- Butt...................... 1
- Insert Weakened Plane..... 3
- Sawed Weakened Plane...... 2
- Other (Specify) ____________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [3.3 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 3.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
- 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).. [0.5 0]

9. DEPTH, (Inches).. [3.3 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches).. [0.2 5]

11. DEPTH, (Inches).. [3.3 0]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) # 5 Grade 40 Steel [0.6 3]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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Spring '9

15. WIDTH, (Inches).. [~~8~~.__ __]

16. DEPTH, (Inches).. [__.__ __]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 18 900 psi PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds) .... [1 8 3 3.]

*3. Fine Aggregate (Pounds) .... [_ 9 4 8.]

*4. Cement (Pounds) .... [_ 9 2 5.]

*5. Water (Pounds) .... [_ 2 8 5.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

		TYPE CODE		AMOUNT
*8.	ADMIXTURE #1	[0,1] .01	92.5oz	[.0 0 6._]
*9.	ADMIXTURE #2	[0,8] .08	5.10oz	[.0 0 0 3]
*10.	ADMIXTURE #3	[~~10~~] ~~10~~		[_ _ _._]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

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PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS 900 psi MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

* 1. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 (SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9) [0 7.]

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ ~~9 7~~
7/8"......	_ _ _
3/4"......	_ ~~6 2~~ 5 6
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ ~~1 2~~ 1 1
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 7
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

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12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 8-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 8-9 5]

*3. LAYER NUMBER (FROM CONSTRUCTION DATA SHEET 4) [6]

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 4]	[_ _ 8]
Plant 2		[_ _ _]	[_ _ _]
Plant 3		[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sic

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const., no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 4.0]

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

11. NUMBER OF VIBRATORS [2 2]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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PREPARER Marco Fellin EMPLOYER NCE DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

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

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

3. CURING [1]
   Membrane Curing Compound...... 1
   Burlap Curing Blankets........ 2
   Waterproof Paper Blankets..... 3
   White Polyethylene Sheeting... 4
   Burlap-Polyethylene Blanket... 5
   Cotton Mat Curing............. 6
   Hay........................... 7
   Other (Specify) ________ 8

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

   3, 5, and 1, in order.

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By [signature]

PREPARER Marco Fellin   EMPLOYER NCE   DATE 11/15/95

SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 1 - 0 3 - 9 5]

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

3. PROFILE INDEX (Inches/Mile). [0.5]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]

6. CUTOFF HEIGHT (Inches) [0.3 0]

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

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

IF YES COMPLETE THE FOLLOWING:

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

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

*11. REASON FOR GRINDING [~~0~~] N
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) N [~~36.00~~]

14. AVERAGE GROOVE WIDTH (Inches) N [~~0.1~~] ~~(1/8")~~

15. AVERAGE SPACING BETWEEN BLADES (Inches) N [~~0.1~~] ~~(1/8")~~

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By HV

Marco Fellin EMPLOYER NCE DATE 1/12/96

February 1992

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [1 2]

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

The fabric placed under the PATB on this section was ripped in a few places by a grader. The tears and rips were repaired.

The fabric laid into the ditch did not extend all the way to the top of the opposite side, and as a result, some soil contaminated the drain in parts of the section. The amount of contamination should not significantly alter the performance of the section.

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FEB 28 1997
By [signature]

PREPARER Marco Fellin EMPLOYER NCE DATE 11/20/95

530259

07 March 1995

SPS CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

*1. LANE WIDTH (FEET) [1 4]

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 ______	[3]	[3]
*6. TOTAL WIDTH (FEET)	[0 4]	[0 8]
*7. PAVED WIDTH (FEET)	[0 4]	[0 8]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3]	[2 3]
9. SURFACE THICKNESS (INCHES)	[_ 3. 0]	[_ 3. 0]
10. SHOULDER BASE THICKNESS (INCHES)	[1 2. 0]	[1 2. 0]

11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES) [N. _]

12. SPACING OF LATERALS (FEET) [_ _ N]

13. TYPE OF PAVEMENT (See APPENDIX B, Table A.4 Pavement Type Codes) [2 0]

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By HN

PREPARER Marco Fellin EMPLOYER NCE DATE 11/18/95

SPS-2 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 5]				
2	[0 6]	[2 3]	[2.0]	0.7	3.5	0.6
3	[0 5]	[2 8]	[2.6]	1.4	3.2	0.4
4	[0 3]	[0 4]	[10.3]	9.6	10.8	0.3
5	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (Feet) (Rock, Stone, Dense Shale) [12.4]

U.

ENTERED
FEB 28 19[illegible]7
By JW

NOTES:

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

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

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 (Appendix B of SPS-2 Data Collection Guide).

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

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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
0+00	0 60 96 132 168	2.5 2.1 1.9 2.3 2.7	2.6 2.3 2.5 2.5 2.4		9.7 10.1 10.1 10.1 10.2
0+50	0 60 96 132 168	2.4 1.5 1.3 2.0 0.7	3.2 2.6 2.7 2.8 3.2		10.0 10.3 10.6 10.7 10.7
1+00	0 60 96 132 168	1.2 1.6 1.3 1.3 2.1	2.6 2.6 2.4 2.8 2.7		10.0 10.4 10.6 10.3 10.6
1+50	0 60 96 132 168	1.9 2.3 2.3 2.5 3.4	2.2 1.9 2.1 2.2 2.1		10.0 10.4 10.4 10.4 10.6
2+00	0 60 96 132 168	2.1 2.2 1.9 1.6 1.7	2.5 2.5 2.7 2.8 2.7		9.8 10.2 10.4 10.3 10.4
2+50	0 60 96 132 168	3.0 2.8 2.1 2.2 2.3	1.4 1.8 2.2 2.0 2.1		10.0 10.3 10.4 10.4 10.3
3+00	0 60 96 132 168	1.4 2.3 1.8 2.2 3.0	2.8 2.3 2.5 2.4 2.4		9.8 10.1 10.1 10.1 10.1
LAYER NUMBER[1]		2	3		4

[1] from Construction Data Sheet 4

ENTERED
FEB 28 1997
By ____

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 5 LAYER THICKNESS MEASUREMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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
3+50	0	3.0	2.6		9.7
	60	2.0	2.7		10.4
	96	1.6	2.8		1[illegible].7
	132	1.4	2.9		10.6
	168	2.[illegible]	2.9		10.3
4+00	0	2.3	2.7		9.6
	60	2.4	2.5		10.2
	96	1.9	2.6		10.2
	132	1.6	2.8		10.2
	168	1.5	2.8		10.0
4+50	0	1.9	2.8		10.1
	60	1.8	2.8		10.6
	96	1.1	2.9		10.8
	132	1.2	3.1		10.7
	168	1.3	2.9		10.8
5+00	0	1.5	3.3		10.3
	60	1.9	2.8		10.6
	96	1.4	2.6		1[illegible].7
	132	2.5	2.5		10.7
	168	2.3	2.8		10.4
+					
+					
+					
LAYER NUMBER[1]		2	3		4

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By: [signature]

[1] from Construction Data Sheet 4

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 6 SUBGRADE PREPARATION	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [0 2 - 0 1 - 9 5]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [0 6 - 3 0 - 9 5]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

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) [1 7 . 1]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__ __.__]
*6. STABILIZING AGENT 2	[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) [__ 8 . 0]
(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.) Original Subgrade from Station 2005+00 to E.C.P. was subexcavated due to excessive moisture, and replaced with ~18" fill rock. Embankment was placed on top of the fill rock. All but 530259 and 530203 received Fill Embankment. All but 530259, 530203, 530202, and ~~[illegible]~~ received fill rock. 530210 received ~~[illegible]~~ partial fill rock.

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FEB 28 1997
By HV

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 8 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

No Excavation, Backfilling.

PREPARER Marco Fellin EMPLOYER NCE DATE 6/30/95

SPS-2 CONSTRUCTION DATA SHEET 9 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [07-07-95]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [07-07-95]

*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) [_ 7.0]

*6. LIFT THICKNESSES

Nominal First Lift Placement Thickness (Inches) [_ 2.0]

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.) ~~[illegible]~~

ENTERED
FEB 28 1997
By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS ATB AGGREGATE PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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

COMPOSITION OF COARSE AGGREGATE — TYPE — PERCENT

* 2. [1] [1 0 0.]

* 3. [N] [_ _ _.]

* 4. [N] [_ _ _.]

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. [2] [1 0 0.]

* 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 [N]
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) ENTERED [2.7 4 0]

*10. FINE AGGREGATE (AASHTO T84 or ASTM C128) FEB 28 1997 [2.7 5 0]

*11. MINERAL FILLER (AASHTO T100 or ASTM D854) By LW [N._ _ _]

*12. AGGREGATE COMBINATION (CALCULATED) [2.7 4 0]

13. EFFECTIVE SPECIFIC GRAVITY OF AGGREGATE COMBINATION (CALCULATED) [2.7 3 1]

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

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
14.	Coarse	[_ 1]	[_ 2 2.0]
15.	Coarse	[_ _]	[_ _ _._]
16.	Coarse	[_ _]	[_ _ _._]
17.	Coarse and Fine - Combined	[_ _]	[_ _ _._]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS ATB ASPHALT CEMENT PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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

*2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 9]
(IF OTHER, SPECIFY) ______

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [4 6]
(IF OTHER, SPECIFY) ______

4. SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T228) [1.0 3 4]

ORIGINAL ASPHALT CEMENT PROPERTIES **(If available from supplier)**

5. VISCOSITY OF ASPHALT AT 140°F (Poises) (AASHTO T202) [_ _ 1 5 0 2.]

6. VISCOSITY OF ASPHALT AT 275°F (Centistokes) (AASHTO T202) [_ 3 6 7.0 _]

7. PENETRATION AT 77°F (AASHTO T49) (Tenths of a mm) (100 g., 5 sec.) [_ _ 8 1.]

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

	TYPE	QUANTITY (%)
8. MODIFIER #1	[_ N]	[_ _.]
9. MODIFIER #2 (IF OTHER, SPECIFY) ______	[_ N]	[_ _.]

10. DUCTILITY AT 77°F (cm) (AASHTO T51) [_ _ N.]

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Feb 28 1997
By JW

11. DUCTILITY AT 39.2°F (cm) (AASHTO T51) [_ _ N.]

12. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°f (cm/Min) [_ _ N.]

13. PENETRATION AT 39.2°F (AASHTO T49) (Tenths of a mm) (200 g., 60 sec.) [_ 2 9.]

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [_ _ N.]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 12 PLANT-MIXED ASPHALT BOUND LAYERS ATB MIXTURE PROPERTIES	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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

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

*3. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) [2.5 4 3]
(AASHTO T209 OR ASTM D2041)

BULK SPECIFIC GRAVITY (ASTM D1188)

*4. MEAN [2.3 5 9] NUMBER OF TESTS [__ 1.]
5. MINIMUM [N.__ __ __] MAXIMUM [N.__ __ __]
6. STD. DEV. [N.__ __ __]

ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX - AASHTO T164 OR ASTM D2172)

*7. MEAN [4.5 __ __] NUMBER OF SAMPLES [__ 1.]
8. MINIMUM [N.__ __ __] ENTERED MAXIMUM [N.__ __ __]
9. STD. DEV. [N.__ __ __]

PERCENT AIR VOIDS FEB 28 1997

*10. MEAN [7.3 __ __] By W NUMBER OF SAMPLES [__ 1.]
11. MINIMUM [N.__ __ __] MAXIMUM [N.__ __ __]
12. STD. DEV. [N.__ __ __]

*13. VOIDS IN MINERAL AGGREGATE (Percent) [1 7.8]

*14. EFFECTIVE ASPHALT CONTENT (Percent) [__ N.__]

*15. MARSHALL STABILITY (lbs) (AASHTO T245 OR ASTM D1559) [__ __ N.__]

*16. NUMBER OF BLOWS [N __]

*17. MARSHALL FLOW (Hundredths of an Inch) [__ __ __ N.]
(AASHTO T245 OR ASTM D1559)

No Field Marshalls or Hveems performed.

*18. HVEEM STABILITY (AASHTO T246 OR ASTM D1561) [__ 4 7.]

*19. HVEEM COHESIOMETER VALUE (GRAMS/25mm of Width) [__ __ __ N.]
(AASHTO T246 OR ASTM 1561)

*20. TYPE OF ANTISTRIPPING AGENT USED [7 0]
(SEE TYPE CODES, TABLE A.21) OTHER (SPECIFY) "Aggrigrip" Koch Materials.

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

*22. AMOUNT OF ANTISTRIPPING AGENT USED (Percent) [__ 0.3]

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

PREPARER Marco Fellin EMPLOYER NCE DATE 8/24/95

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SPS-2 CONSTRUCTION DATA SHEET 13 PLANT-MIXED ASPHALT BOUND LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8-0 3-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8-0 9-9 5]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Number
Plant 1	[2]	Acme Materials	[_ _ 3]	[_ 5]	[0 3]
Plant 2	[_]		[_ _ _]	[_ _]	[_ _]

Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify______

4. MANUFACTURER OF ASPHALT CONCRETE PAVER Blaw-Knox

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER PF-150

6. SINGLE PASS LAYDOWN WIDTH (Feet) [1 6.0]

7. ATB PLACEMENT LIFTS: Layer Number [_ 3]

Nominal First Lift Placement Thickness (Inches) [1.8]

Nominal Second Lift Placement Thickness (Inches) [1.8]

Nominal Third Lift Placement Thickness (Inches) [N._]

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.) No tack coat was placed from Station ~~[illegible]~~ 1995+50 to Station 1992+00 on 8/8/95, on 2nd lift of ATB, in the passing lane. A thin lift was placed from 1993+50 to 1992+00, ie, the material scraped from the inside of the paver. This thin lift from 1993+50 to 1992+00 was tacked on the top on 8/9/95 and paved over

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PREPARER Marco Fellin EMPLOYER NCE DATE 8/11/95

SPS-2 CONSTRUCTION DATA SHEET 14 PLANT-MIXED ASPHALT BOUND LAYERS COMPACTION DATA ATB	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 8 - 0 3 - 9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 8 - 0 6 - 9 5]

*3. LAYER NUMBER Lift 1 & Lift 2 [3]

*4. MIXING TEMPERATURE (°F) [2 8 0.]

5. LAYDOWN TEMPERATURES (°F)

Mean.................. [2 4 5.] Number of Tests .... [5.]

Minimum............... [2 2 0.] Maximum .. .. [2 5 0.]

Standard Deviation... [8 7.]

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	__._				
7	B	Steel-Whl Tandem	__._				
8	C	Steel-Whl Tandem	__._				
9	D	Steel-Whl Tandem	__._				
10	E	Pneumatic-Tired	__._	____.			
11	F	Pneumatic-Tired	__._	____.			
12	G	Pneumatic-Tired	__._	____.			
13	H	Pneumatic-Tired	__._	____.			
14	I	Single-Drum Vibr.	__._		____.	.___	__._
15	J	Single-Drum Vibr.	__._		____.	.___	__._
16	K	Single-Drum Vibr.	__._		____.	.___	__._
17	L	Single-Drum Vibr.	__._		____.	.___	__._
18	M	Double-Drum Vibr.	1 7.1		____.	.___	__._
19	N	Double-Drum Vibr.	1 0.5		___0.	.___	__._
20	O	Double-Drum Vibr.	__._		____.	.___	__._
21	P	Double-Drum Vibr.	__._		____.	.___	__._
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	M	_	ENTERED
24	Coverages	2	2	__	
	INTERMEDIATE				FEB 28 1997
25	Roller Code (A-Q)	_	_	_	
26	Coverages	__.	__.	__ By	LN __.
	FINAL				
27	Roller Code (A-Q)	N	N	_	_
28	Coverages	2	2.	__.	__.
29	Air Temperature (°F)	8 0	7 0.	___.	___.
30	Compacted Thickness (In)	1.5	1.5	_._	_._
31	Curing Period (Days)	4.0	__.N	__._	__._

PREPARER Marco Fellin EMPLOYER NCE DATE 8/9/95

February 1992

SPS-2 CONSTRUCTION DATA SHEET 15 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 - 9]

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

* 2. AVERAGE CONTRACTION JOINT SPACING (Feet) [_ 1 5.0]

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

* 4. SKEWNESS OF JOINTS (ft/lane) [~~0.40~~ 2]

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

* 6. ROUND DOWEL DIAMETER (Inches) [N._ _]

* 7. DOWEL SPACING (Inches) [1 2.]

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

9. DOWEL LENGTH (Inches) [1 8.]

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) [N]

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

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

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SPS-2 CONSTRUCTION DATA SHEET 16 PORTLAND CEMENT CONCRETE LAYERS-JOINT DATA CONT'D	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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

* 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 [1]
Butt...................... 1 Insert Weakened Plane..... 3
Sawed Weakened Plane...... 2
Other (Specify) ________________ 4

*5. AVERAGE DEPTH OF SAWCUT, FROM MEASUREMENTS (Inches)............... [2.7 0]

*6. TIME INTERVAL BETWEEN CONCRETE PLACEMENT AND SAWCUT (HOURS)....... [_ 1 2.]

7. TRANSVERSE JOINT SEALANT TYPE (AS BUILT) [3]
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)... [0.2 5]

9. DEPTH, (Inches)... [2.7 0]

LONGITUDINAL JOINT SEALANT RESERVOIR (AS BUILT)

10. WIDTH, (Inches)... [0.2 5]

11. DEPTH, (Inches)... [3.0 _]

12. BETWEEN LANE TIE BAR DIAMETER (Inches) ~~#5 Grade 40 Steel~~ [N._ _]

13. BETWEEN LANE TIE BAR LENGTH (Inches) [3 0.]

14. BETWEEN LANE TIE BAR SPACING (Inches) [3 0.0]

SHOULDER-TRAFFIC LANE JOINT SEALANT RESERVOIR (AS BUILT)

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

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16. DEPTH, (Inches)... [_._ _] Spri tin

By [illegible]

PREPARER Marco Fellin EMPLOYER NCE DATE 8/14/95

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SPS-2 CONSTRUCTION DATA SHEET 18 PORTLAND CEMENT CONCRETE LAYERS - MIXTURE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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

MIX DESIGN (OVEN DRIED WEIGHT - PER CUBIC YARD)

*2. Coarse Aggregate (Pounds).. [2 1 0 3.]

*3. Fine Aggregate (Pounds).. [1 0 8 7.]

*4. Cement (Pounds).. [_ 4 5 1.]

*5. Water (Pounds).. [_ 2 3 7.]

*6. TYPE CEMENT USED (See Cement Type Codes, Table A.11) [4 2]
(If Other, Specify ______________________)

*7. ALKALI CONTENT OF CEMENT, (PERCENT BY WEIGHT OF CEMENT) [_ 0.4]

ADMIXTURES (PERCENT BY WEIGHT OF CEMENT)

	TYPE CODE		AMOUNT
*8. ADMIXTURE #1	[0 1] 01	56.4 oz.	0.[0 0 8._]
*9. ADMIXTURE #2	[0 8] .08	5.6 oz.	0.[0 0 1._]
*10. ADMIXTURE #3	[1 0] 10		[_ 2 0.0]

(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	[0 1]	[_ 2 2.0]
12.	Coarse	[_ _]	[_ _ _._]
13.	Coarse	[_ _]	[_ _ _._]
14.	Coarse and Fine	[_ _]	[_ _ _._]

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SPS-2 CONSTRUCTION DATA SHEET 19 PORTLAND CEMENT CONCRETE LAYERS MIXTURE DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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

COMPOSITION OF COARSE AGGREGATE

	TYPE	PERCENT
* 2.	[1]	[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 (SEE GEOLOGIC CLASSIFICATION CODES, TABLE A.9) [0 7.]

COMPOSITION OF FINE AGGREGATE

	TYPE	PERCENT
* 6.	[1]	[_ 1 2.]
* 7.	[2]	[_ 8 8.]
* 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"....	1 0 0
1"........	_ 9 7
7/8"......	_ _ _
3/4"......	_ 5 6
5/8"......	_ _ _
1/2"......	_ _ _
3/8"......	_ 1 1
No. 4.....	_ _ 2

11. GRADATION OF FINE AGGREGATE

Sieve Size	% Passing
No. 8.....	_ _ _
No. 10....	_ _ _
No. 16....	_ 5 1
No. 30....	_ _ _
No. 40....	_ _ _
No. 50....	_ 1 9
No. 80....	_ _ _
No. 100...	_ _ 7
No. 200...	_ _ 2

BULK SPECIFIC GRAVITIES:

12. Coarse Aggregate (AASHTO T85 or ASTM C127) [2.7 4 0]

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

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SPS-2 CONSTRUCTION DATA SHEET 20 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [1 0-0 3-9 5]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [1 0-0 3-9 5]

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

*4. CONCRETE MIX PLANT AND HAUL

	Name	Haul Distance (Mi)	Time (Min)
Plant 1	ACME	[_ _ 3]	[_ _ 6]
Plant 2	____	[_ _ _]	[_ _ _]
Plant 3	____	[_ _ _]	[_ _ _]

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

6. PAVER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman - Model

7. SPREADER TYPE (if applicable) Side Feed w/ Conveyor Belts - Both Sides

8. SPREADER MANUFACTURER AND MODEL NUMBER Guntert + Zimmerman Parts, Manufactured by ACME Materials + Const, no model number.

9. WIDTH PAVED IN ONE PASS (Feet) [2 6.0]

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

11. NUMBER OF VIBRATORS [2 4]

12. VIBRATOR SPACING (Inches) [1 4]

13. DEPTH OF VIBRATORS BELOW SURFACE (Inches) [_ 0.8]

14. ADDITIONAL VIBRATION APPLIED None

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SPS-2 CONSTRUCTION DATA SHEET 21 PORTLAND CEMENT CONCRETE LAYERS PLACEMENT DATA (CONTINUED)	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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

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

3, 5, and 1, in order.

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SPS-2 CONSTRUCTION DATA SHEET 22 PORTLAND CEMENT CONCRETE SURFACE LAYER PROFILE DATA	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

1. DATE PROFILE MEASURED (Month-Day-Year) [1 0 - 0 5 - 9 5]

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

3. PROFILE INDEX (Inches/Mile). [0.0]

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

5. HEIGHT OF BLANKING BAND (Inches) [0.2 0]

6. CUTOFF HEIGHT (Inches) [0.3 0]

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

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

IF YES COMPLETE THE FOLLOWING:

9. DATE DIAMOND GRINDING OPERATIONS BEGAN (Month-Day-Year) [1 1-0 3-9 5]

10. DATE DIAMOND GRINDING OPERATIONS COMPLETED (Month-Day-Year) [1 1-0 3-9 5]

*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) [__ 3 6 .0 0]

14. AVERAGE GROOVE WIDTH (Inches) [0 .1] (1/8")

15. AVERAGE SPACING BETWEEN BLADES (Inches) [0.1] (1/8")

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Marco Fellin EMPLOYER NCE DATE 1/12/96

SPS-2 CONSTRUCTION DATA SHEET 27 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [5 3] * SPS PROJECT CODE [0 2] * TEST SECTION NO. [5 9]

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

This Section was on a cut. The subgrade material was the same as on the other sections.

The PCC design strength was 650 psi for this section, compared to 550 psi and 900 psi for the other sections.

No dowels or tie bars were used for this section, since the State ~~des~~ design did not call for them.

The water cement ratio averaged 0.360 in this section, compared with the approximately 0.450 for the 550 psi mix and the 0.285 for the 900 psi mix.

The amount of air entraining agent was increased from 8.8 oz./yd.^{3} at the start of the section to 9.8 oz./yd.^{3} at the end of the section.

The amount of water reducer used was 56.4 oz./yd.^{3} compared with 47 oz./yd.^{3} for the 550 psi sections and 92.5 oz./yd^3 for the 900 psi sections.

In the transition from Sta. 1996+00 to 1994+85, the edges were slumping significantly, but the problem was corrected once into the 500' monitoring portion of the section.

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