FINAL REPORT

SPS-8 PROJECT 3508: ENVIRONMENTAL EFFECTS IN THE ABSENCE OF HEAVY LOADS I-10 FRONTAGE ROAD GRANT COUNTY, NEW MEXICO

FHWA/LTPP

SOUTHERN REGION COORDINATION OFFICE

May 1997

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FINAL REPORT - SPS-8 PROJECT 3508

STUDY OF ENVIRONMENTAL EFFECTS IN THE ABSENCE OF HEAVY LOADS I-10 FRONTAGE ROAD GRANT COUNTY, NEW MEXICO

INTRODUCTION

As part of the Strategic Highway Research Program's (SHRP) Long Term Pavement Performance (LTPP) Studies, sections of roadway are being selected to apply very specific treatments to study various facets of construction (both new and rehabilitation). These projects are referred to as Specific Pavement Studies (SPS). This particular project, on I-10 Frontage Road in Grant County, New Mexico, was identified as a potential candidate for inclusion in the Study of Environmental Effects in the Absence of Heavy Loads (SPS-8).

SPS-8 General Experiment Design

The specific products of the SPS-8 Experiment are included in table 1. In general, the experiment is intended to validate and/or improve the environmental effects models and in turn improve on the design of pavement structures in all environmental conditions.

Table 1. Key Products of SPS-8

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

Although the General Pavement Studies (GPS) sections provided valuable and timely information, controlled Specific Pavement Studies of newly constructed and reconstructed or rehabilitated (resurfaced) pavement sections are needed to provide an accurate estimate of the relative influence of key pavement elements that affect pavement performance. The importance of this experiment is highlighted by its ability to evaluate the interaction of traffic, structural parameters and climatic factors on pavement performance in a controlled manner.

SPS-8 test sites can include two flexible or two rigid sections with varying structural sections (or two of each if the participating agency is willing). As shown in table 2, the sections are to be built with specific pavement structures in a variety of environmental conditions to assess their impact on pavement performance.

For additional information on general experiment design for SPS-8, please refer to "Specific Pavement Studies: Experimental Design and Research Plans for Experiment SPS-8, Study of Environmental Effects in the Absence of Heavy Loads, August 1991."

Selection/Nomination of I-10 Frontage Road

This project was first offered for consideration by the State of New Mexico in July 1995. After reviewing the details provided by the state on this project and preparation of a tentative layout of the test sections (to ensure that adequate space was available for such a project), the project was officially nominated on 28 August 1995. Appendix A contains the nomination forms which provide information on the project location, significant dates, traffic information and the Agency's pavement structural design for the project in question. The section was officially approved for use by the FHWA/LTPP Division on 5 January 1996.

Specific Experiment Design for I-10 Frontage Road

Plans for this project were prepared by Keun-Wook Yi of the New Mexico State Highway and Transportation Department (NMSHTD). The typical sections for this particular project are included as figures 1 and 2, respectively.

The subgrade for this project is considered to have a sandy silt. The state elected to only build the two flexible sections on this project.

PRECONSTRUCTION MONITORING

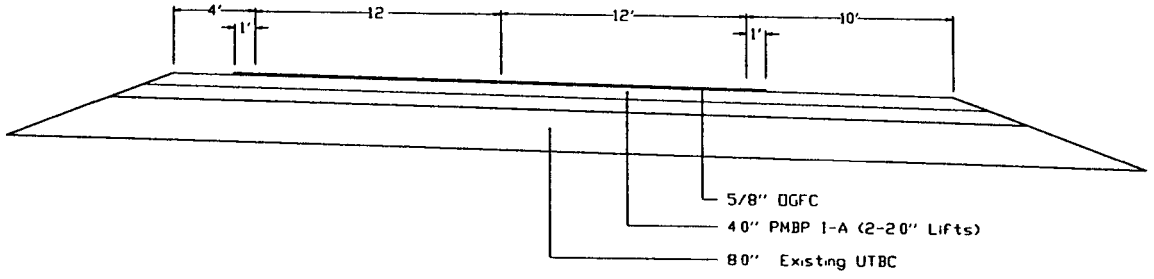
Because of the nature of this particular experiment (being new construction and primarily focused on the performance of the various asphalt mix designs), monitoring of preconstruction pavement surface distress and structural capacity were not required. The primary preconstruction monitoring included rod and level measurements made immediately prior to construction (See appendix B) to evaluate variability in the thicknesses of each layer placed, and extensive material sampling and testing to document the material properties for each of the layers incorporated in these test sections. As specified for all SHRP test sections, a thorough material sampling and testing program was established for these test sections on I-10 Frontage Road in Grant County, New Mexico (See appendix C). Preconstruction sampling focused on collection of bulk samples from each of the various pavement layers. All sampling and testing was conducted by the NMSHTD subcontractor. The subcontractor used a CME-85 drill rig for completing the augering, shoulder probes and subgrade sampling on 30 August 1996.

Table 2. Experimental Design for SPS-8, "Study of Environmental Effects in the Absence of Heavy Loads"

PAVEMENT STRUCTURE[1,2]			FACTORS FOR MOISTURE, TEMPERATURE, AND SUBGRADE TYPE[3]																			
			WET						DRY													
			FREEZE			NO-FREEZE			FREEZE			NO-FREEZE										
Type	Surface Thickness in.	Base Thickness in.	ACTIVE	FINE	COARSE	ACTIVE	FINE	COARSE	ACTIVE	FINE	COARSE	ACTIVE	FINE	COARSE								
FLEXIBLE	4	8	x		x		x		x		x		x		x		x		x		x	
	7	12	x		x		x		x		x		x		x		x		x		x	
RIGID	8	6		x		x		x		x		x		x		x		x		x		x
	11	6		x		x		x		x		x		x		x		x		x		x

Notes
1) Dense graded HMAC and jointed plain concrete for flexible and rigid pavements, respectively.
2) Dense graded aggregate base.
3) Active soil can be either frost susceptible or swelling type relative to the climatic zone.

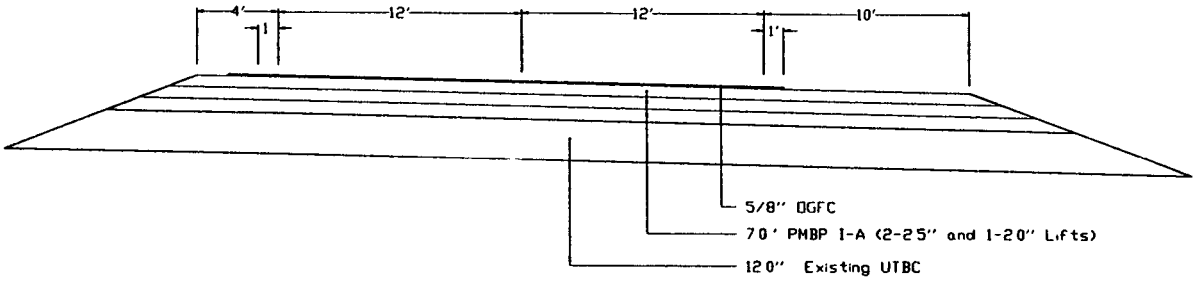
o Flexible and rigid pavement sectins may be constructed at the same site.



TYPICAL SECTION "N"
S.H.R.P. SECTION 350801
(Frontage Rd., Mainline STA. 840+00 TO STA. 848+00)

Figure 1. Typical Section, SHRP Site 350801

NEW MEXICO STATE HIGHWAY
AND TRANSPORTATION DEPARTMENT
MISCELLANEOUS
DRAWINGS
SPS-8



TYPICAL SECTION "0"
S.H.R.P. SECTION 350802
(Frontage Rd., Mainline STA. 840+00 TO STA. 848+00)

Figure 2. Typical Section, SHRP Site 350802

NEW MEXICO STATE HIGHWAY
AND TRANSPORTATION DEPARTMENT
MISCELLANEOUS
DRAWINGS
SPS-8

CONSTRUCTION

The following text details any and all unusual features relating to the construction and completion of the asphalt test sections on I-10 Frontage Road, Grant County, New Mexico for inclusion in LTPP's SPS-8 study. For the purposes of discussion here, "unusual" features will be defined as that information which cannot be, or has not been, recorded elsewhere on the data forms associated with this project, or those features which are considered to be particularly unique to this project. The construction data forms themselves are included as appendix D.

The project (State Project ACIM-010-1(69)34 extends from SH-146 to the I-10 on-ramp on the I-10 Frontage Road, for a total project length of 0.5 miles. At the preconstruction meeting on 6 September 1996, the contractor noted that they wanted to pave as soon as possible.

In August 1996, work began on the SPS-8 test sections beginning with the preparation of the subgrade. Traffic was allowed on the test sections during the construction of the subgrade. This allowed the subgrade to rut on 13 September, when it rained. The subgrade was allowed to dry and was promptly graded prior to the laydown of the DGAB.

Initiation of work on the DGAB was begun 16 September 1996. Rod and level shots were taken on the surface of the subgrade just ahead of the placement of the first layers of DGAB. Rod and level shots taken on the surface of the DGAB (19 September) provided initial indications that the actual thickness for the DGAB varied considerably from the 8-inch and 12-inch thicknesses desired for these test sections. As it turned out, section 350801 varied over 1-inch in thickness of base material, while section 350802 fell within tolerance. As can be seen from the rod and level summaries provided in appendix C "Surface Profile Data", although all reasonable efforts to achieve the 8-inch and 12-inch base thicknesses were attempted, the thicknesses (and their associated variability) are not entirely consistent with that desired for these test sections.

Prime coat was applied to the finished surface of the DGAB 19 September, after the subcontracted laboratory personnel obtained nuclear density readings and samples. On 23 September, placement of the hot mix asphalt concrete was begun on both sections. Elevation shots were taken once the paving operations were completed on 26 September. Interestingly enough, from reviewing the profile summaries provided in appendix C, the thickness variation in the hot mix surface appears to vary from ½ inch to 1-inch. What's more, these thickness deviations appear to offset one another, providing a total thickness fairly close to that originally specified.

Other than the concerns of thickness variability noted above, no other unusual features were noted with this project. It should be apparent from the construction dates discussed above, that the actual time for construction of these sections was only two weeks. There were a few rain delays during construction. The two sections are the only paved portion of the Frontage Road. These additional issues are particularly noteworthy, as traffic was carried on this small FM road throughout construction.

The Weigh-in-Motion (WIM) sensors were installed on 27 January 1996 by NMSHTD personnel. It was observed that the WIM is located inside section 350801 in the first 20 feet. It is believed that because of the remote location of this site, the location of utilities limited placement location options.

The AWS was installed mid-August near the rest area (MP 53) away from obstructions. The complete set of construction data forms for this set of test sections are provided in appendix D. Photos of the various construction operations are included in appendix E.

POSTCONSTRUCTION MONITORING

With the completion of the construction, postconstruction monitoring has been initiated. As one might expect, there is no surface distress to speak of and none is anticipated for the immediate future; however, surface distress surveys will be scheduled in early 1997 along with measurements of the surface profile and structural capacity. Rod and level measurements have been taken on the surface to complete the evaluations of layer thickness variability throughout the sections and postconstruction coring was completed on 4 October.

Samples were provided to the testing laboratory, along with those samples collected from preconstruction sampling. All laboratory testing is underway. Samples have also been provided to the Materials Reference Library (MRL), should these materials be needed in the future for additional testing.

SUMMARY

Having completed the construction and initial monitoring of these test sections, it appears that the test sections on I-10 Frontage Road in Grant County, New Mexico will contribute significantly to the evaluation of the environmental effects in the absence of heavy loads. This project would not have been possible without the support of the NMSHTD. In particular, much of the credit is due to the help of Gilbert Tafoya and John Tenison of the NMSHTD. We also want to express our appreciation to James Fields and Danny Marres, of Hamilton Construction, for their additional effort in completing this project.

With the construction completed, we now continue to monitor these sections with time, noting changes in the surface distress, surface profile and structural capacity, and compare those changes against the loadings these sections are exposed to (both environmentally and from traffic), and in combination with other projects like this one around the country, to improve on the knowledge of environmental effects in the absence of heavy loads.

APPENDIX A

SITE NOMINATION FORMS, APPROVAL CORRESPONDENCE AND OTHER PERTINENT INFORMATION

Brent Rauhut Engineering Inc.

21 July 1995

Mr. Monte Symons
Pavement Performance Division - LTPP (HNR-40)
Federal Highway Administration
Turner-Fairbanks Highway Research Center
6300 Georgetown Pike, Room F-215
McLean, Virginia 22101

Subject: New Mexico SPS Project Nominations

Dear Monte,

On 10 July, I was provided nomination forms for SPS-5, SPS-8 and SPS-9A projects by the New Mexico State Highway and Transportation Department. Copies of the nomination forms are enclosed for your review. The unique aspect of this is that the test sections for all three experiments are within the same construction project. We have reviewed the proposed project and recommend the acceptance of all three experiment nominations.

The construction project involves the rehabilitation of IH-10, west of Deming, New Mexico. As part of the rehabilitation activities, the NMSHTD will alter the plans to include SPS-5, and SPS-9A test sections in the eastbound main lanes. There is a frontage road adjacent to the eastbound lanes, but because this is a rural site, the frontage road provides access for two farms to the Interstate. The frontage road exists as a graded aggregate surface. The NMSHTD proposes to pave test sections in accordance with the SPS-8 criteria. A weigh-in-motion site and provisions for an automated weather station are also included.

For the record, we recognize and commend the initiative and creativity of the NMSHTD staff who have made this project possible. Recognition should also be given to the FHWA New Mexico Division office, who has been working closely with the NMSHTD in these efforts.

Your prompt consideration of these nominations would be greatly appreciated. As the project is scheduled for letting in the near future, we are expediting the preparation of

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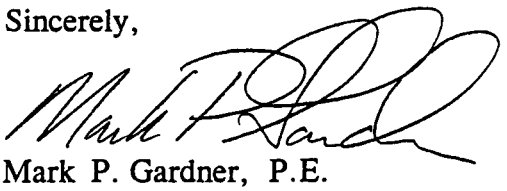
sampling and testing plans. If you need additional information or clarification, please contact me.

Sincerely,



Mark P. Gardner, P.E.
Project Engineer, SRCO

MPG:dmj

Enclosures: As stated.

c.w/Att: Gonzalo Rada, PCS/LAW

c.w/o Att: Fred Cooney, NMSHTD
Keun-Wook Yi, NMSHTD
Reuben Thomas, FHWA-NM Div.
Morris Reinhardt, RE/SRCO
Brent Rauhut, SRCO/File:

SHEET A. SPS-5 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE New Mexico

PROJECT LOCATION

ROUTE NUMBER IH-10

ROUTE SIGNING [X] Interstate [ ] U.S. [ ] State [ ] County

Other _____

PROJECT LOCATION Start Milepost 51 End Milepost 54

Start Station 900+00 End Station 1007+50

PROJECT LOCATION DESCRIPTION 1.0 Mile west of the Trant/Luna Co. Line.

COUNTY Grant

HIGHWAY AGENCY DISTRICT NUMBER 1

SHRP ENVIRONMENTAL ZONE

[ ] WET FREEZE [ ] WET NO-FREEZE [ ] DRY FREEZE [X] DRY NO-FREEZE

SIGNIFICANT DATES

LATEST DATE OF APPROVAL NOTIFICATION FROM SHRP _____

CONTRACT LETTING DATE Aug. 95

ESTIMATED CONSTRUCTION START DATE Oct. 95

PROJECT DESCRIPTION

YEAR OPENED TO TRAFFIC 1971

NUMBER OF LANES (One Direction) 2

[X] Divided [ ] Undivided

OUTSIDE LANE WIDTH (Feet) 12

OUTSIDE SHOULDER TYPE

[ ] Turf [ ] Granular [X] Asphalt Concrete [ ] Surface Treatment

[ ] PCC [ ] Curb and Gutter Other _____

OUTSIDE SHOULDER WIDTH (Feet) 10

SUBSURFACE EDGE DRAINS [ ] Placed at initial construction [X] Not Used

[ ] Retrofitted Retrofit Date _____

ASSESSMENT OF PRESENT PAVEMENT CONDITION [X] Fair [ ] Poor

PREDOMINATE DISTRESSES

[ ] Fatigue Cracking [X] Other Cracking [ ] Potholes/Patches [ ] Rutting

Comments Thermal Cracking

SHEET B. SPS-5 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE New Mexico

PAVEMENT STRUCTURE LAYER DESCRIPTIONS

LAYER[1] NO.	LAYER[2] DESCRIPTION CODE	MATERIAL TYPE[3] CLASS CODE	THICKNESS[4] (INCHES)	STRUCTURAL[5] COEFFICIENT
1	SUBGRADE (7)	5 9	___	___
2	0 5	2 3	1 2.0	0.0 8
3	0 3	0 1	9.5	0.3 0
4	___	___	___.___	0.___
5	___	___	___.___	0.___
6	___	___	___.___	0.___
7	___	___	___.___	0.___
8	___	___	___.___	0.___
9	___	___	___.___	0.___

NOTES

1. Layer 1 is the natural occurring subgrade soil. The existing surface will have the largest assigned layer number.

2. Layer description codes:

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

3. Refer to Tables 1 through 4 for material class codes.

4. If subgrade depth to a rigid layer is known, enter this depth for subgrade, otherwise leave blank for subgrade layer.

5. Enter AASHTO structural layer coefficient used in pavement design or typical coefficient used by agency for this material. For the subgrade, enter either AASHTO soil support value or estimated resilient modulus.

SHEET C. SPS-5 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE New Mexico

TRAFFIC DATA

ANNUAL AVERAGE DAILY TRAFFIC (TWO DIRECTION)	4110
% HEAVY TRUCKS AND COMBINATIONS (OF AADT)	51%
COUNT YEAR OF AADT ESTIMATE	1995
TRAFFIC GROWTH RATE SINCE PROJECT OPENED TO TRAFFIC (%/YR)	3%
18K ESAL RATE IN PROPOSED STUDY LANE (1,000 ESAL/YR)	8,021
YEAR OF ESAL RATE ESTIMATE	1995
ESTIMATED TOTAL 18K ESAL APPLICATIONS IN STUDY LANE[1]	218,000,000

REHABILITATION INFORMATION[2]

PRIMARY CAUSE FOR REHABILITATION Pavement structural enhancement

OVERLAY	Thickness (Inches)	Material Type Class Code
Surface Course	5/8"	OGFC
HMAC ~~Binder~~ Course	4.5"	HMAC

SURFACE PREPARATION PRIOR TO OVERLAY

[ ] Patching [ ] Crack Sealing [X] Milling Depth of Mill 3"

Other 3" Cold In Situ Recycling

OTHER CONSTRUCTION ACTIVITIES TO BE PERFORMED DURING REHABILITATION

Repair isolated failure areas.

NOTES

1. Leave blank if estimate is not available.
2. This information concerns the planned rehabilitation work to be performed by the agency on the non-experimental portions of the project.

SHEET D. SPS-5 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE New Mexico

TEST SECTION LAYOUT

NUMBER OF TEST SECTIONS ENTIRELY ON: FILL All CUT _____

SHORTEST TRANSITION BETWEEN CONSECUTIVE TEST SECTIONS (Feet) 200

COMMENTS ON DEVIATIONS FROM DESIRED SITE LOCATION CRITERIA None

OTHER SHRP TEST SECTIONS

DOES PROJECT CONFORM TO GPS-1 OR GPS-2 PROJECT CRITERIA?	[X] YES	[ ] NO
DOES AGENCY APPLIED TREATMENT QUALIFY FOR GPS-6B?	[ ] YES	[X] NO
IS PROJECT SUITABLE FOR SPS-3 TEST SECTIONS?	[ ] YES	[X] NO
IS AGENCY INTERESTED IN USE OF PROJECT AS SPS-3 SITE?	[ ] YES	[X] NO

DISTANCE TO NEAREST GPS TEST SECTION ON SAME ROUTE (Miles) None

TEST SECTION NUMBER OF NEAREST GPS SECTION N/A

SUPPLEMENTAL TEST SECTIONS

IF SUPPLEMENTAL EXPERIMENTAL TEST SECTIONS ARE PROPOSED, COMPLETE THE FOLLOWING

TOTAL NUMBER OF SUPPLEMENTAL TEST SECTIONS _____

FACTORS TO BE INVESTIGATED _____

SHEET A. SPS-8 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE NM SHRP SECTION NO. 3508

PROJECT LOCATION

ROUTE NUMBER IH-10

ROUTE SIGNING [✓] Interstate [ ] U.S. [ ] State [ ] County
Other Unpaved frontage road for I-10

PROJECT LOCATION Start Milepost 51 End Milepost 54
Start Milepost 840+00 End Milepost 856+00

DIRECTION OF TRAVEL [ ] North B. [ ] South B. [ ] West B. [X] East B.

PROJECT LOCATION DESCRIPTION East of Hachita Interchange

COUNTY ~~Luna~~ GRANT
HIGHWAY AGENCY DISTRICT NUMBER 1
SHRP ENVIRONMENTAL ZONE
[ ] Wet Freeze [ ] Wet No-Freeze [ ] Dry Freeze [X] Dry No-Freeze

SUBGRADE SOIL CATEGORY
[ ] Active [X] Fine Grained [ ] Coarse Grained

TYPE OF ACTIVITY DEGREE OF ACTIVITY

[ ] Swelling [ ] Frost Heave [✓] Low [ ] Moderate [ ] High

SIGNIFICANT DATES

LATEST DATE OF APPROVAL NOTIFICATION FROM SHRP	Aug 95
CONTRACT LETTING DATE	Oct 95
ESTIMATED CONSTRUCTION START DATE	Oct 96
ESTIMATED DATE TEST SECTIONS OPENED TO TRAFFIC	Oct 96
ESTIMATED CONSTRUCTION COMPLETION DATE	

PROJECT DESCRIPTION

PROJECT TYPE [ ] New Route [ ] Removal and Reconstruction
[✓] Parallel Roadway
Other Construction for SPS-8 only

DESIGN TRAFFIC DATA

ANNUAL AVERAGE DAILY TRAFFIC (TWO DIRECTIONS)	Minimal
% HEAVY TRUCKS AND COMBINATIONS (OF AADT)	
ESTIMATED 18K ESAL RATE IN STUDY LANE (1,000 ESAL/YR)	
TOTAL DESIGN 18K ESAL APPLICATIONS IN DESIGN LANE	
DESIGN PERIOD (Years)	

SHEET B. SPS-8 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE NM SHRP SECTION NO. 3508

AGENCY'S PAVEMENT STRUCTURE DESIGN FOR SITE

LAYER[1] NO.	LAYER[2] DESCRIPTION CODE	MATERIAL TYPE[3] CLASS CODE	THICKNESS[4] (INCHES)	STRUCTURAL[5] COEFFICIENT
1	07	59		
2	05	23	12"	0.08
3	04	01	3.5"	3
4	04	15	3"	2.5
5	03	01	4.5"	4
6	03	02	.625"	0
7				
8				
9				

STRUCTURAL DESIGN METHOD [ ] 1972 AASHTO [ ] 1986 AASHTO [ ] Modified AASHTO
Other _____

AASHTO DESIGN RELIABILITY FACTORS R% N/A S$_o$ N/A

OUTSIDE SHOULDER TYPE

[ ] Turf [ ] Granular [X] Asphalt Concrete [ ] Surface Treatment
[ ] PCC [ ] Curb and Gutter Other _____

OUTSIDE SHOULDER WIDTH (Feet) 4

SUBSURFACE EDGE DRAINS [ ] Yes [X] No

NOTES

1. Layer 1 is the natural occurring subgrade soil. The pavement surface will have the largest assigned layer number.

2. Layer description codes:
   Surface Layer..... 03 Base Layer..... 05 Subgrade..... 07
   Subsurface HMAC... 04 Subbase Layer... 06 Embankment (Fill)... 11

3. Refer to Tables 1 through 4 for material class codes.

4. If subgrade depth to a rigid layer is known, enter this depth for subgrade thickness, otherwise leave subgrade layer thickness blank.

5. Enter AASHTO structural layer coefficient value, as appropriately modified, used in pavement design or typical coefficient used by agency for this material. For the subgrade, enter either AASHTO soil support value or resilient modulus value (psi) used in design.

SHEET C. SPS-8 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE NM SHRP SECTION NO. 3508

TEST SECTION LAYOUT

NUMBER OF TEST SECTIONS ENTIRELY ON: FILL 2 (ALL) CUT _____

SHORTEST TRANSITION BETWEEN CONSECUTIVE TEST SECTIONS (Feet) N/A

VERTICAL GRADE (Avg %) (+ upgrade; - downgrade) ≤1

HORIZONTAL CURVATURE (Degrees) [ ] Tangent ≤3

COMMENTS ON DEVIATIONS FROM DESIRED SITE LOCATION CRITERIA _____

OTHER SHRP TEST SECTIONS

FLEXIBLE - DOES AGENCY DESIGN CONFORM TO GPS-1 PROJECT CRITERIA? [X] Yes [ ] No

RIGID - DOES AGENCY DESIGN CONFORM TO GPS-3 PROJECT CRITERIA? [ ] Yes [ ] No

DISTANCE TO NEAREST GPS TEST SECTION ON SAME ROUTE (Miles) None

TEST SECTION NUMBER OF NEAREST GPS SECTION N/A

SUPPLEMENTAL TEST SECTIONS

IF SUPPLEMENTAL EXPERIMENTAL TEST SECTIONS ARE PROPOSED, COMPLETE THE FOLLOWING

TOTAL NUMBER OF SUPPLEMENTAL TEST SECTIONS N/A

FACTORS TO BE INVESTIGATED _____

SHEET A. SPS-9A CANDIDATE PROJECT NOMINATION AND INFORMATION

STATE NM SHRP SECTION NO. 3509

GENERAL PROJECT INFORMATION

PROJECT LOCATION

ROUTE NUMBER I-10

ROUTE SIGNING [X] Interstate [ ] U.S. [ ] State [ ] County

Other

PROJECT LOCATION Start Milepost 51 End Milepost 54

Start Station 900+50.00 End Station 1066+51.72

DIRECTION OF TRAVEL [ ] North B. [ ] South B. [ ] West B. [X] East B.

PROJECT LOCATION DESCRIPTION East of Hachita Interchange

COUNTY GRANT

HIGHWAY AGENCY DISTRICT NUMBER 1

ENVIRONMENTAL CONDITIONS

AVERAGE 7-DAY MAXIMUM PAVEMENT DESIGN TEMPERATURE		MINIMUM PAVEMENT DESIGN TEMPERATURE		MOISTURE (Annual Precipitation)	
< 52C (126F)	[ ]	> -46C (-51F)	[ ]		
< 58C (136F)	[ ]	> -40C (-40F)	[ ]	< 625 mm (25 inches)	(X)
< 64C (147F)	[X]	> -34C (-29F)	[ ]		
< 70C (158F)	[ ]	> -28C (-18F)	[ ]	> 625 mm (25 inches)	
		> -22C (-8F)	[ ]		
		> -16C (3F)	[X]		
		> -10C (14F)	[ ]		

SIGNIFICANT DATES

LATEST DATE OF APPROVAL NOTIFICATION FROM FHWA LTPP

CONTRACT LETTING DATE Aug. 95

ESTIMATED CONSTRUCTION START DATE Oct. 95

ESTIMATED DATE TEST SECTIONS OPENED TO TRAFFIC Oct. 96

ESTIMATED CONSTRUCTION COMPLETION DATE Oct. 96

SHEET A. SPS-9 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM
(Continued)

PROJECT DESCRIPTION

PROJECT TYPE [ ] New Route [X] Resurfacing Flexible [ ] Resurfacing Rigid
Other Rehabilitation and reconstruction of existing flexible pavement. Existing pavement to be cold in situ recycled and overlayed.
FACILITY [X] Divided [ ] Undivided NUMBER OF LANES (One Way) 2

DESIGN TRAFFIC DATA

ANNUAL AVERAGE DAILY TRAFFIC (TWO DIRECTIONS)	4110
% HEAVY TRUCKS AND COMBINATIONS (OF AADT)	51%
EST. 18K ESAL RATE IN STUDY LANE (1,000 ESAL/YR)	8,020,978
TOTAL DESIGN 18K ESAL APPLICATIONS IN DESIGN LANE	218,000,000
DESIGN PERIOD (Years)	20 yr.

SHEET B. SPS-9 CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE NM SHRP SECTION NO.

AGENCY'S PAVEMENT STRUCTURE DESIGN FOR SITE

LAYER[1] NO.	LAYER[2] DESCRIPTION CODE	MATERIAL TYPE[3] CLASS CODE	THICKNESS[4] (mm)	STRUCTURAL[5] COEFFICIENT
1	SUBGRADE (7)	59		
2	05	23	304.8	0.08
3	04	01	88.9	0.3
4	04	15	76.2	0.25
5	03	01	114.3	0.4
6	03	02	15.9	0.0
7				0.
8				0.
9				0.

STRUCTURAL DESIGN METHOD

[X] 1972 AASHTO [ ] 1986 AASHTO [ ] 1993 AASHTO [ ] Modified AASHTO

Other

AASHTO DESIGN RELIABILITY FACTORS R% N/A S_o N/A

OUTSIDE SHOULDER TYPE

[ ] Turf [ ] Granular [X] Asphalt Concrete [ ] Surface Treatment

[ ] PCC [ ] Curb and Gutter Other

OUTSIDE SHOULDER WIDTH (Feet) 10

SUBSURFACE EDGE DRAINS [ ] Yes [X] No

NOTES

1. Layer 1 is the natural occurring subgrade soil. The pavement surface will have the largest assigned layer number.
2. Layer description codes:

Surface Layer:	03	Base Layer:	05	Subgrade:	07
Subsurface HMAC:	04	Subbase Layer:	06	Embankment (Fill):	11

3. Refer to Tables A-1 through A-4 for material class codes.
4. If subgrade depth to a rigid layer is known, enter this depth for subgrade thickness, otherwise leave subgrade layer thickness blank.
5. Enter AASHTO structural layer coefficient value, as appropriately modified, used in pavement design or typical coefficient used by agency for this material. For the subgrade, enter either AASHTO soil support value or resilient modulus value (psi) used in design.

SHEET C. SPS-9A CANDIDATE PROJECT NOMINATION AND INFORMATION FORM

STATE NM SHRP SECTION NO. _____

TEST SECTION LAYOUT

NUMBER OF TEST SECTIONS ENTIRELY ON: FILL 4 CUT 0
SHORTEST TRANSITION BETWEEN CONSECUTIVE TEST SECTIONS (meters) 61
VERTICAL GRADE (Avg %) (+ upgrade; - downgrade) <1
HORIZONTAL CURVATURE (Degrees) <3 [ ] Tangent
COMMENTS ON DEVIATIONS FROM DESIRED SITE LOCATION CRITERIA Fourth site is over a culvert, but New Mexico would like to construct it and monitor it.

OTHER SHRP TEST SECTIONS

DOES AGENCY DESIGN CONFORM TO GPS-1, GPS-2 (GPS-6) OR GPS-7 PROJECT CRITERIA? [X] YES [ ] NO
DISTANCE TO NEAREST GPS TEST SECTION ON SAME ROUTE (Miles) N/A
TEST SECTION NUMBER OF NEAREST GPS SECTION N/A
ARE OTHER SPS SECTIONS LOCATED ON SAME PROJECT? [X] YES [ ] NO
IF YES: [ ] SPS-1 [X] SPS-5 [ ] SPS-6 [X] OTHER SPS-8

SUPPLEMENTAL TEST SECTIONS

IF SUPPLEMENTAL EXPERIMENTAL TEST SECTIONS ARE PROPOSED, COMPLETE THE FOLLOWING:
TOTAL NUMBER OF SUPPLEMENTAL TEST SECTIONS 1
FACTORS TO BE INVESTIGATED _____

US Department of Transportation
Federal Highway Administration

NAME	INFO	ACTN	COPY
BR			
MG	✓		✓
MR	✓		

File: Exam 13.2.5.2
13.2.8.2
13.2.9.2

RECEIVED JAN 2 2 1996

Memorandum

6300 Georgetown Pike
McLean, Virginia 22101
HNR-30 0196-96K-002

Subject: ACTION: Specific Pavement Study (SPS) New Mexico Allocation of Incentive Funds

Date: January 5, 1996

From: Director, Office of Engineering Research and Development

Reply to Attn of: HNR-30

To: Mr. Edward A. Wueste
Regional Federal Highway Administrator (HEO-06)
Fort Worth, Texas

We have received and reviewed the SPS-5, 8, and 9A project nominations in New Mexico for the Long-Term Pavement Performance (LTPP) program. These sites are approved for inclusion into the program. These sites are located on I-10 in Grant County.

The inclusion of these sites into the LTPP program allows New Mexico State Highway and Transportation Department (SHTD) to be eligible for incentive funds associated with the SPS experiments. This memorandum authorizes the obligation of $30,000 for the SPS-5 site, $30,000 for the SPS-8 site, and $30,000 for the SPS-9A site for fiscal year 1996 of appropriation code 96K funds subject to the following:

1. New Mexico SHTD's continued agreement to conform to all of the design and participation requirements of the experiment.

2. Funds are to be used for reimbursement of costs associated with the SPS projects that include: (a) the purchase and/or installation of weigh-in-motion and/or automated vehicle classification equipment; (b) conventional sampling and materials testing; and/or (c) traffic control expenditures that are incurred as part of these data collection activities.

The Federal share for the first $90,000 of the above work is 100 percent. Costs in excess of $90,000 may be eligible for reimbursement as part of the regular Federal-aid construction and/or research programs. The appropriation code 96B and the Fiscal Management Information System and regular Federal-aid procedures are to be used to track expenditures. By copy of this memorandum, we are requesting the Program Analysis Division

(HFS-30) to increase New Mexico's obligation limit by $90,000. These funds must be obligated by August 1, 1996, or the funds will be withdrawn.

Information from these sites and the other SPS-5, 8, and 9A locations will contribute significantly to achieving the goals of the LTPP program. Participation of the New Mexico SHTD and the cooperation and assistance of the FHWA Region 6 and New Mexico Division staff in the LTPP program is appreciated.
Upon receipt of this memorandum, the New Mexico Division Office is requested to officially notify New Mexico SHTD of the approval of the SPS-5, 8, and 9A sites and availability of the incentive funds.

Any questions concerning the incentive funds should be directed to Mr. Monte Symons at (703) 285-2730. Questions related to the project status, testing, and/or coordination should be directed to either Mr. Symons or Mr. Morris Reinhardt, LTPP Southern Regional Engineer. Mr. Reinhardt can be reached at (512) 346-7477.

Charles J. Nemmers, P.E.

cc: Mr. Morris Reinhardt

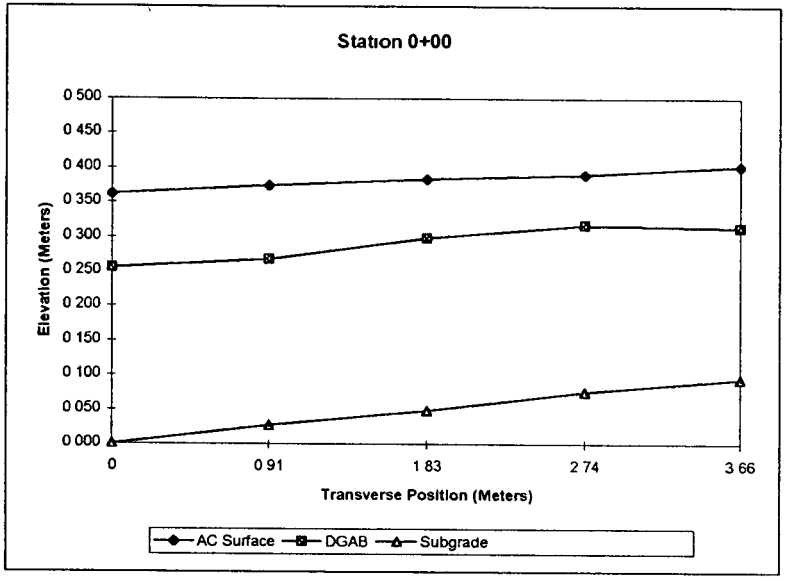
APPENDIX B

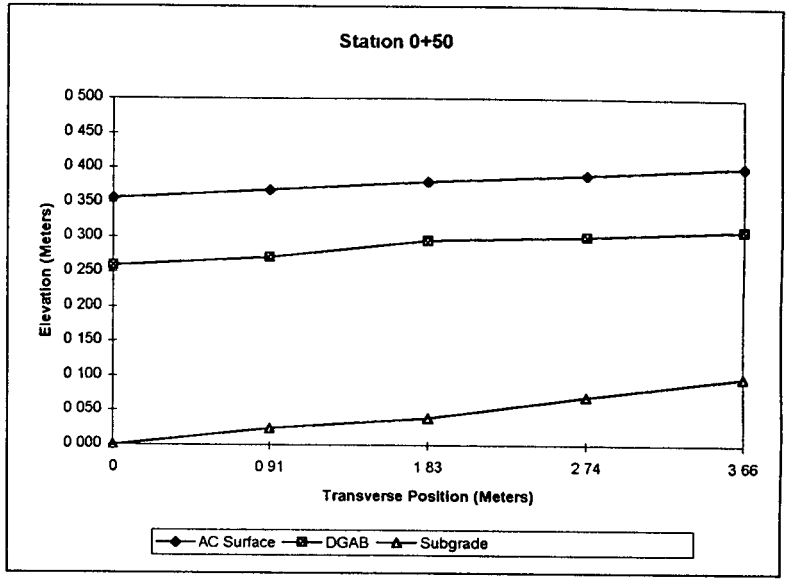
SURFACE PROFILE DATA

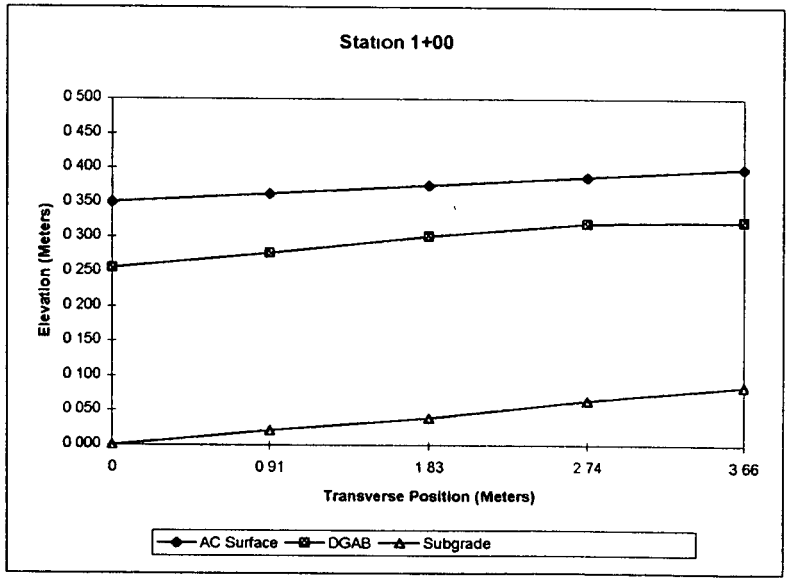
New Mexico, SPS-8 (350801)

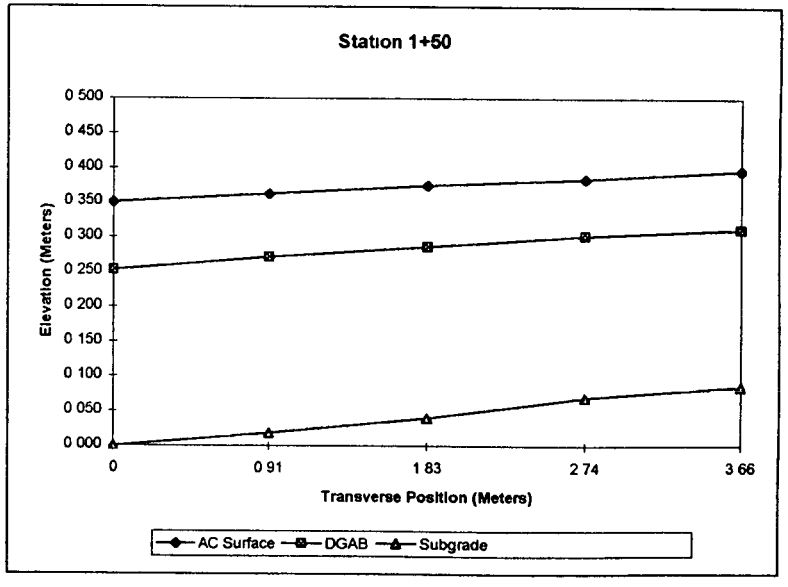
Transverse Offset	3	ELEVATION	AC Surface THICKNESS		DGAB THICKNESS		ELEVATION	AC Surface THICKNESS		DGAB THICKNESS		ELEVATION	AC Surface THICKNESS		DGAB THICKNESS		ELEVATION	AC Surface THICKNESS		DGAB THICKNESS		ELEVATION	AC Surface THICKNESS		DGAB THICKNESS	
	LAYERS	0					0 91					1 83					2 74					3 66				
		Meters	Meters	Inches	Meters	Inches	Meters	Meters	Inches	Meters	Inches	Meters	Meters	Inches	Meters	Inches	Meters	Meters	Inches	Meters	Inches	Meters	Meters	Inches	Meters	Inches
0+00	AC Surface	0 554	0 107	4 200	0 256	10 080	0 566	0 107	4 200	0 241	9 480	0 575	0 085	3 360	0 250	9 840	0 581	0 073	2 880	0 241	9 480	0 593	0 088	3 480	0 219	8 640
	DGAB	0 447					0 459					0 490					0 508					0 505				
	Subgrade	0 191					0 218					0 240					0 267					0 285				
0+50	AC Surface	0 682	0 098	3 840	0 259	10 200	0 694	0 098	3 840	0 247	9 720	0 706	0 085	3 360	0 256	10 080	0 715	0 088	3 480	0 232	9 120	0 727	0 091	3 600	0 213	8 400
	DGAB	0 584					0 596					0 621					0 627					0 636				
	Subgrade	0 325					0 349					0 365					0 395					0 423				
1+00	AC Surface	0 831	0 094	3 720	0 256	10 080	0 843	0 085	3 360	0 256	10 080	0 855	0 073	2 880	0 262	10 320	0 868	0 067	2 640	0 256	10 080	0 880	0 076	3 000	0 238	9 360
	DGAB	0 737					0 758					0 782					0 801					0 804				
	Subgrade	0 481					0 502					0 520					0 545					0 566				
1+50	AC Surface	0 926	0 098	3 840	0 253	9 960	0 938	0 091	3 600	0 253	9 960	0 950	0 088	3 480	0 247	9 720	0 959	0 082	3 240	0 232	9 120	0 971	0 085	3 360	0 226	8 880
	DGAB	0 828					0 846					0 862					0 877					0 886				
	Subgrade	0 575					0 593					0 615					0 645					0 660				
2+00	AC Surface	0 968	0 110	4 320	0 259	10 200	0 983	0 104	4 080	0 268	10 560	0 996	0 085	3 360	0 271	10 680	1 005	0 076	3 000	0 262	10 320	1 017	0 085	3 360	0 244	9 600
	DGAB	0 858					0 880					0 910					0 929					0 932				
	Subgrade	0 599					0 612					0 639					0 666					0 688				
2+50	AC Surface	0 990	0 104	4 080	0 262	10 320	0 999	0 098	3 840	0 262	10 320	1 008	0 091	3 600	0 256	10 080	1 017	0 088	3 480	0 247	9 720	1 026	0 088	3 480	0 238	9 360
	DGAB	0 886					0 901					0 918					0 929					0 938				
	Subgrade	0 624					0 639					0 660					0 682					0 700				
3+00	AC Surface	0 971	0 104	4 080	0 250	9 840	0 980	0 094	3 720	0 247	9 720	0 993	0 091	3 600	0 247	9 720	0 996	0 088	3 480	0 238	9 360	1 005	0 088	3 480	0 241	9 480
	DGAB	0 868					0 886					0 901					0 907					0 916				
	Subgrade	0 619					0 639					0 654					0 670					0 676				
3+50	AC Surface	0 929	0 101	3 960	0 247	9 720	0 941	0 091	3 600	0 250	9 840	0 950	0 082	3 240	0 250	9 840	0 962	0 082	3 240	0 247	9 720	0 974	0 082	3 240	0 238	9 360
	DGAB	0 828					0 849					0 868					0 880					0 882				
	Subgrade	0 581					0 599					0 618					0 633					0 654				
4+00	AC Surface	0 889	0 098	3 840	0 280	11 040	0 898	0 088	3 480	0 274	10 800	0 910	0 082	3 240	0 274	10 800	0 922	0 082	3 240	0 250	9 840	0 938	0 098	3 840	0 213	8 400
	DGAB	0 791					0 810					0 828					0 840					0 840				
	Subgrade	0 511					0 535					0 554					0 590					0 627				
4+50	AC Surface	0 843	0 091	3 600	0 262	10 320	0 862	0 085	3 360	0 268	10 560	0 874	0 079	3 120	0 265	10 440	0 889	0 070	2 760	0 271	10 680	0 904	0 094	3 720	0 229	9 000
	DGAB	0 752					0 776					0 794					0 819					0 810				
	Subgrade	0 490					0 508					0 529					0 548					0 581				
5+00	AC Surface	0 791	0 091	3 600	0 226	8 880	0 807	0 088	3 480	0 229	9 000	0 819	0 082	3 240	0 232	9 120	0 834	0 085	3 360	0 226	8 880	0 849	0 116	4 560	0 186	7 320
	DGAB	0 700					0 718					0 737					0 749					0 734				
	Subgrade	0 474					0 490					0 505					0 523					0 548				
	AVG	0 099	3 916	0 255	10 058		0 094	3 687	0 254	10 004		0 084	3 316	0 255	10 058		0 080	3 164	0 248	9 665		0 090	3.556	0.226	8 891
	MAX	0 110	4 320	0 280	11 040		0 107	4 200	0 274	10 800		0 091	3 600	0 274	10 800		0 088	3 480	0 271	10 680		0 116	4 560	0.244	9 600
	MIN	0 091	3 600	0 226	8 880		0 085	3 360	0 229	9 000		0 073	2 880	0 232	9 120		0 067	2 640	0 226	8 880		0 076	3.000	0.186	7 320
	STD	0 006	0 225	0 013	0 496		0 007	0 266	0 013	0 507		0 005	0 200	0 012	0 463		0 007	0 286	0.013	0 523		0 010	0 384	0.016	0 642

New Mexico, SPS-8 (350801)









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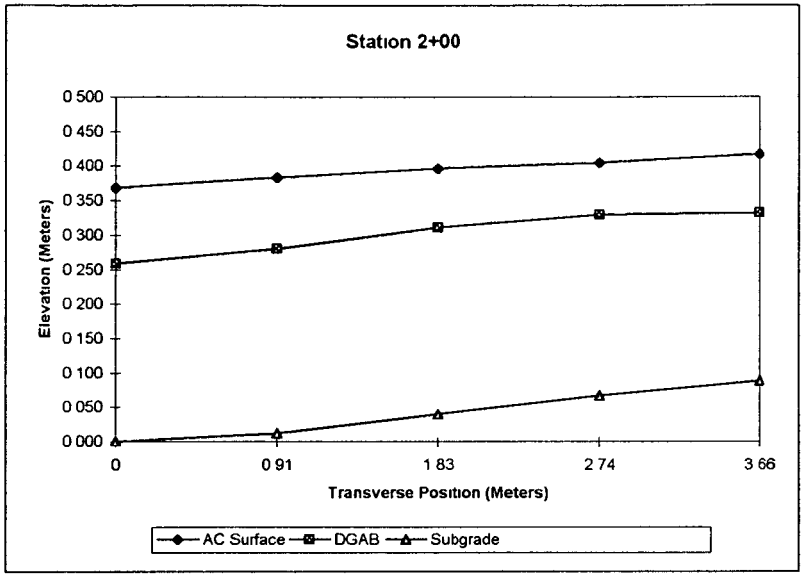

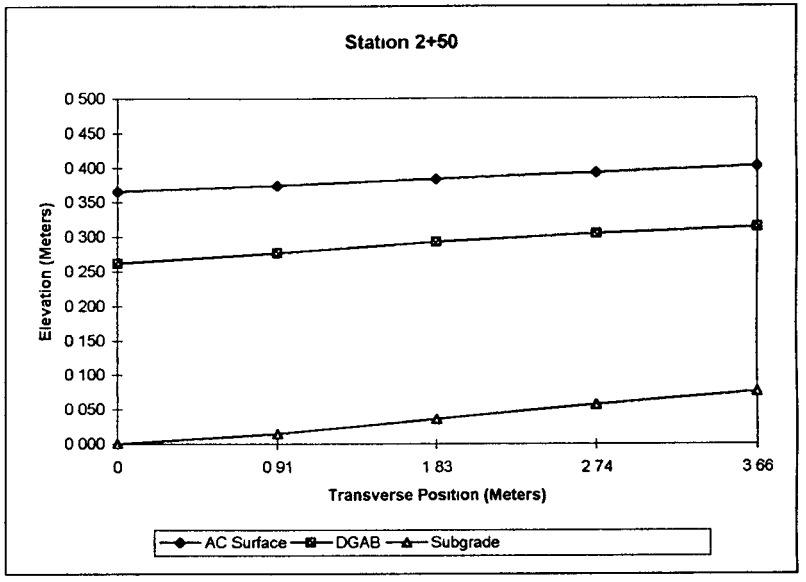

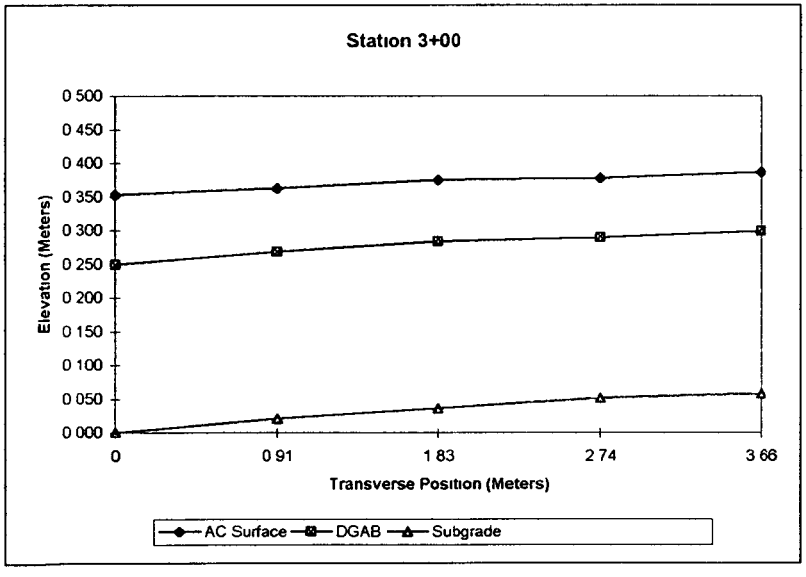

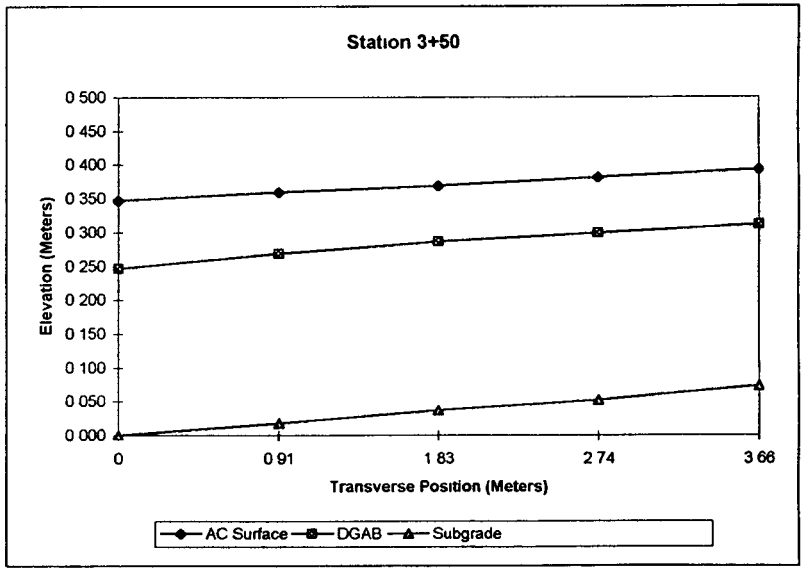

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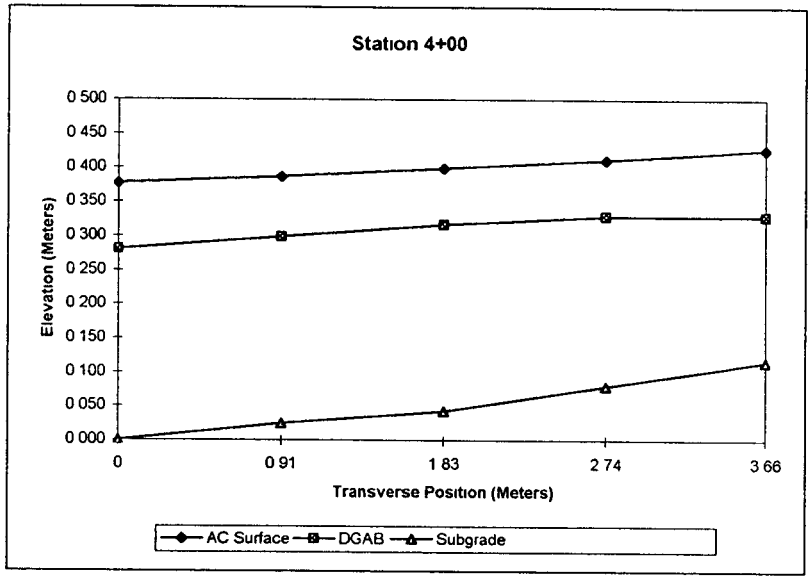
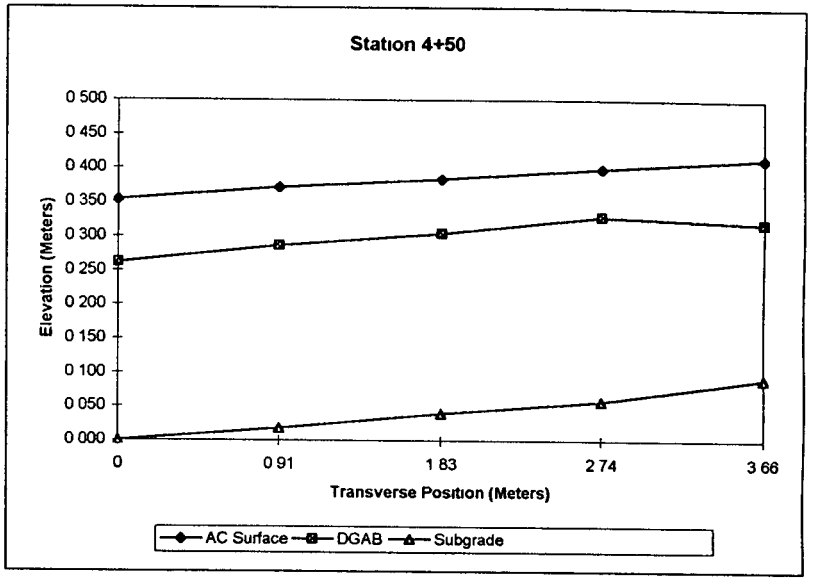
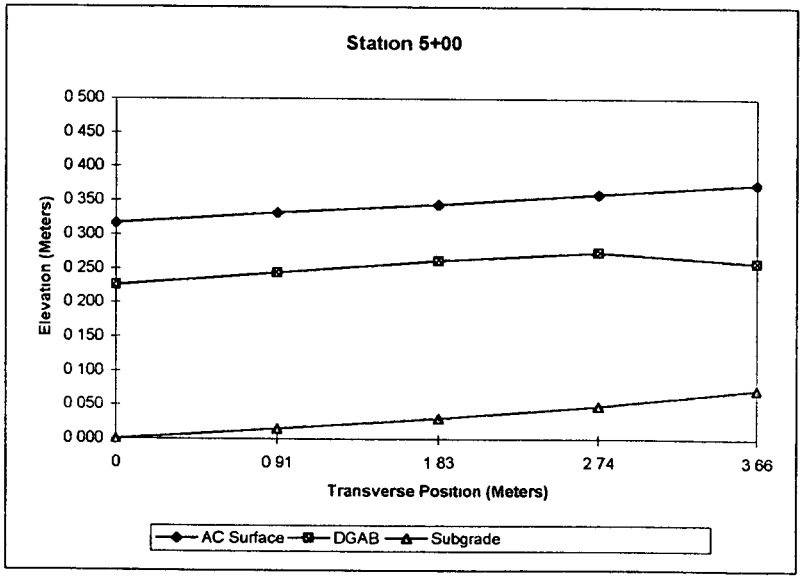


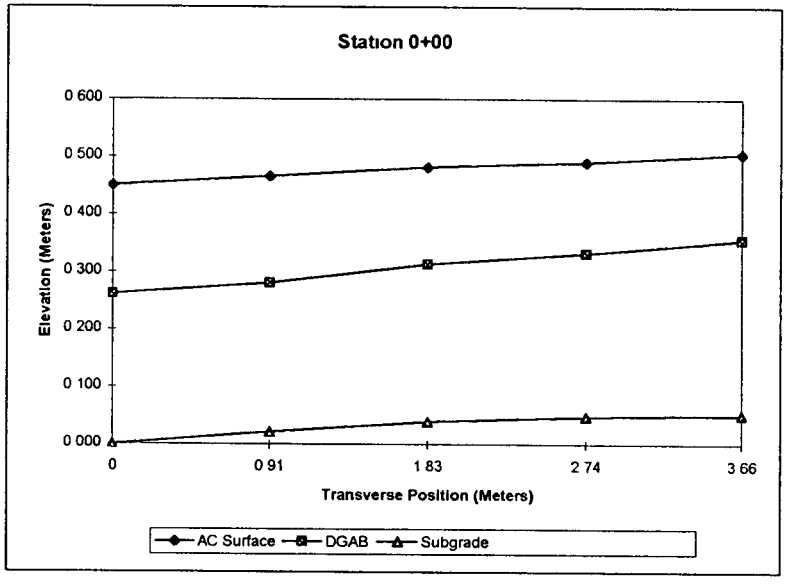


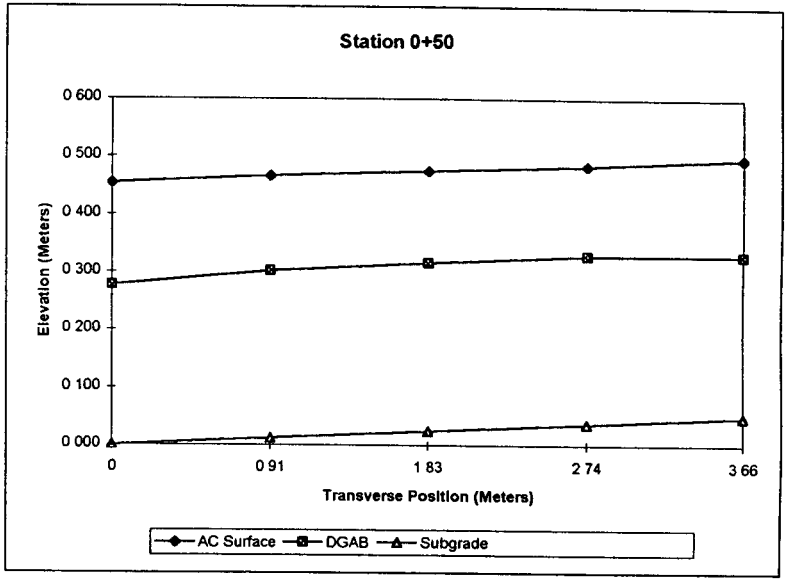


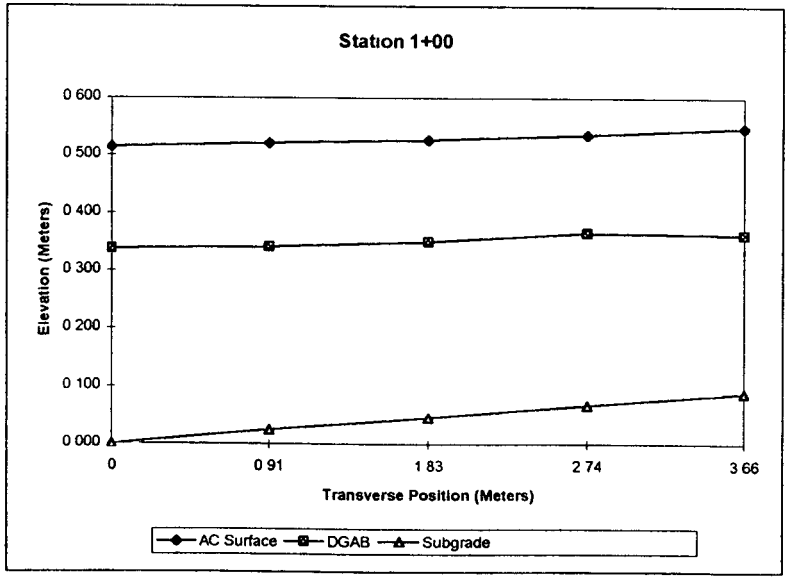
New Mexico, SPS-8 (350802)

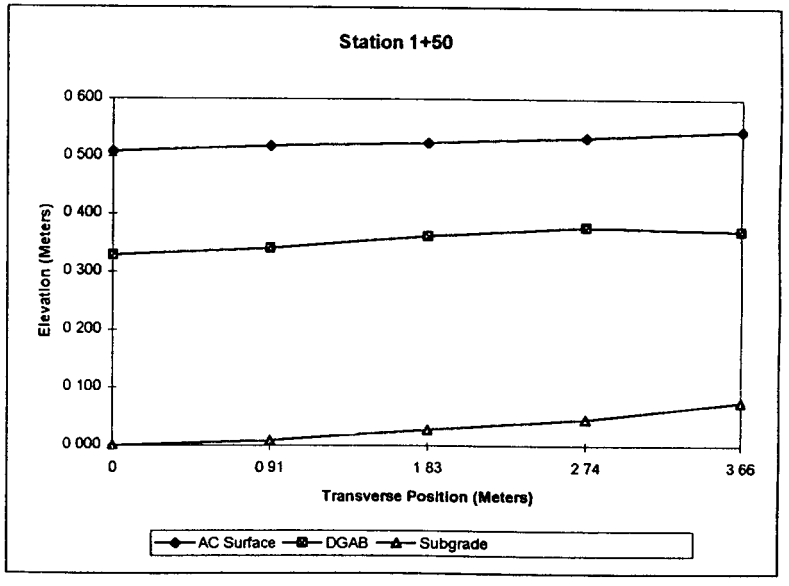
Transverse Offset	3	ELEVATION	AC Surface THICKNESS		DGAB THICKNESS		ELEVATION	AC Surface THICKNESS		DGAB THICKNESS		ELEVATION	AC Surface THICKNESS		DGAB THICKNESS		ELEVATION	AC Surface THICKNESS		DGAB THICKNESS		ELEVATION	AC Surface THICKNESS		DGAB THICKNESS	
	LAYERS	0					0 91					1 83					2 74					3 66				
		Meters	Meters	Inches	Meters	Inches	Meters	Meters	Inches	Meters	Inches	Meters	Meters	Inches	Meters	Inches	Meters	Meters	Inches	Meters	Inches	Meters	Meters	Inches	Meters	Inches
0+00	AC Surface	0 512	0 189	7.440	0 262	10 320	0 527	0 186	7 320	0 259	10 200	0 543	0 168	6 600	0 274	10 800	0 552	0 158	6 240	0 283	11 160	0 567	0 149	5 880	0.305	12 000
	DGAB	0 323					0 341					0 375					0 393					0 418				
	Subgrade	0 061					0 082					0 101					0 110					0 113				
0+50	AC Surface	0 573	0 177	6 960	0 277	10 920	0 585	0 165	6.480	0 290	11 400	0 594	0 158	6 240	0 293	11 520	0 604	0 155	6 120	0.293	11 520	0 616	0 168	6.600	0 280	11 040
	DGAB	0 396					0 421					0 436					0 448					0 448				
	Subgrade	0 119					0 131					0 143					0 156					0 168				
1+00	AC Surface	0 634	0 177	6 960	0 338	13 320	0 640	0 180	7 080	0 317	12 480	0 646	0 177	6 960	0 305	12 000	0 655	0 171	6 720	0 299	11 760	0 668	0 186	7 320	0.274	10 800
	DGAB	0 457					0 460					0 470					0 485					0 482				
	Subgrade	0 119					0 143					0 165					0 186					0 207				
1+50	AC Surface	0 701	0 180	7 080	0 329	12 960	0 710	0 177	6 960	0 332	13 080	0 716	0 162	6 360	0 335	13 200	0 726	0 155	6 120	0 332	13 080	0 738	0 174	6 840	0.296	11 640
	DGAB	0 521					0 534					0 555					0 570					0 564				
	Subgrade	0 192					0 201					0 220					0 238					0.268				
2+00	AC Surface	0 793	0 168	6 600	0 347	13 680	0 802	0 155	6 120	0 354	13 920	0 814	0 152	6 000	0 347	13 680	0 829	0 149	5 880	0 341	13.440	0 841	0 165	6 480	0 317	12.480
	DGAB	0 625					0 646					0 662					0 680					0 677				
	Subgrade	0 277					0 293					0 314					0 338					0 360				
2+50	AC Surface	0 911	0 171	6 720	0 332	13.080	0 921	0 165	6.480	0 332	13 080	0 936	0 165	6 480	0 341	13.440	0 945	0 158	6.240	0 332	13 080	0 957	0 158	6 240	0 323	12 720
	DGAB	0 741					0 756					0 771					0 787					0 799				
	Subgrade	0.409					0.424					0 430					0 454					0.476				
3+00	AC Surface	1 036	0 177	6 960	0 341	13 440	1 046	0 162	6 360	0 351	13 800	1 058	0 168	6 600	0 341	13 440	1 070	0 162	6 360	0 329	12 960	1 082	0 180	7 080	0 308	12 120
	DGAB	0 860					0 884					0 890					0 908					0 902				
	Subgrade	0 518					0 534					0 549					0 579					0.594				
3+50	AC Surface	1 171	0 152	6 000	0 360	14 160	1 183	0 152	6 000	0 354	13 920	1 195	0 155	6 120	0 351	13 800	1 201	0 152	6 000	0 338	13 320	1 210	0 162	6 360	0 329	12 960
	DGAB	1 018					1 030					1 039					1 049					1 049				
	Subgrade	0 658					0 677					0 689					0 710					0 719				
4+00	AC Surface	1 268	0 162	6 360	0 335	13 200	1 280	0 152	6 000	0 338	13 320	1 296	0 149	5 880	0 341	13 440	1 311	0 143	5 640	0 344	13 560	1 323	0 158	6 240	0 329	12 960
	DGAB	1 107					1 128					1 146					1 168					1 164				
	Subgrade	0 771					0 790					0 805					0 823					0 835				
4+50	AC Surface	1 350	0 152	6 000	0 341	13 440	1 363	0 149	5 880	0 338	13 320	1 375	0 143	5 640	0 338	13 320	1 387	0 143	5 640	0 332	13 080	1 399	0 149	5 880	0.320	12 600
	DGAB	1 198					1 213					1 232					1 244					1.250				
	Subgrade	0 857					0 875					0 893					0 911					0 930				
5+00	AC Surface	1.448	0 168	6 600	0 305	12 000	1.457	0 171	6 720	0 293	11 520	1 466	0 158	6.240	0.299	11 760	1.478	0 165	6 480	0.293	11 520	1 488	0 168	6 600	0.280	11 040
	DGAB	1.280					1 286					1 308					1 314					1 320				
	Subgrade	0 975					0 994					1 009					1 021					1 039				
	AVG	0 170	6 698	0 324	12 775		0 165	6.491	0 323	12 731		0 160	6 284	0 324	12 764		0 156	6 131	0 320	12 589		0 165	6 502	0 306	12 033
	MAX	0 189	7 440	0 360	14 160		0 186	7 320	0 354	13 920		0 177	6 960	0 351	13 800		0 171	6 720	0 344	13 560		0 186	7 320	0 329	12 960
	MIN	0 152	6 000	0 262	10 320		0 149	5 880	0 259	10 200		0 143	5 640	0 274	10 800		0 143	5 640	0 283	11 160		0 149	5 880	0.274	10 800
	STD	0 011	0 428	0 029	1 140		0 012	0.459	0 029	1 153		0 009	0 358	0 025	0 990		0 008	0 317	0 022	0 857		0 011	0.434	0 019	0 761

New Mexico, SPS-8 (350802)

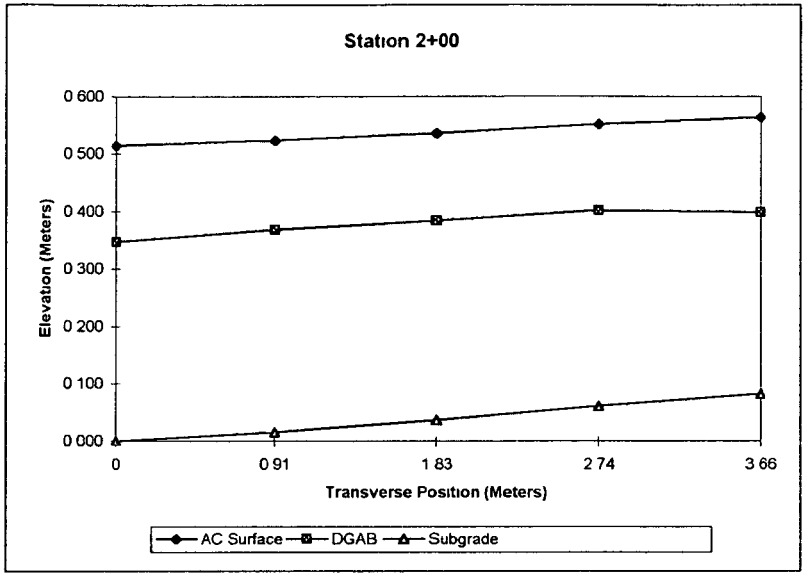


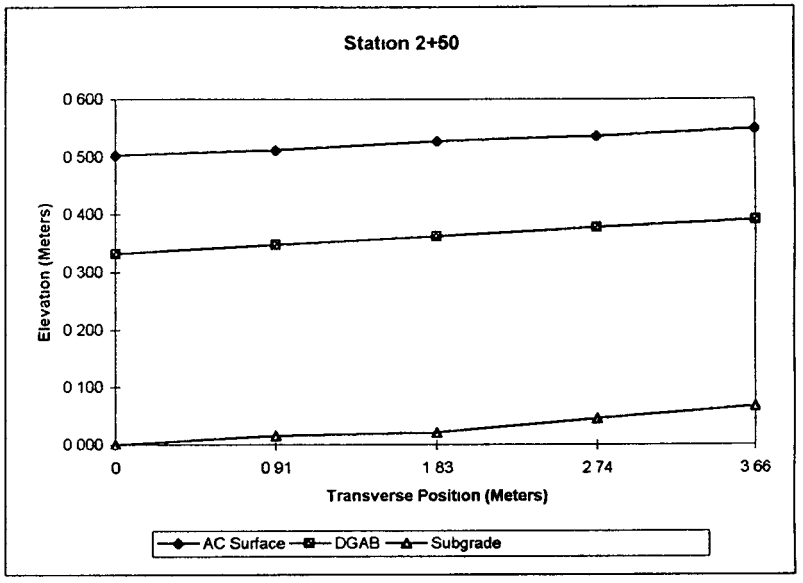


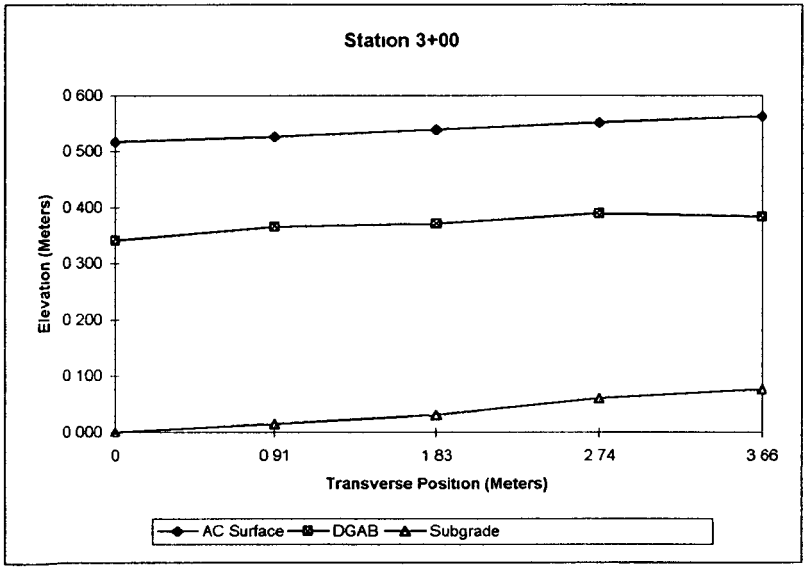


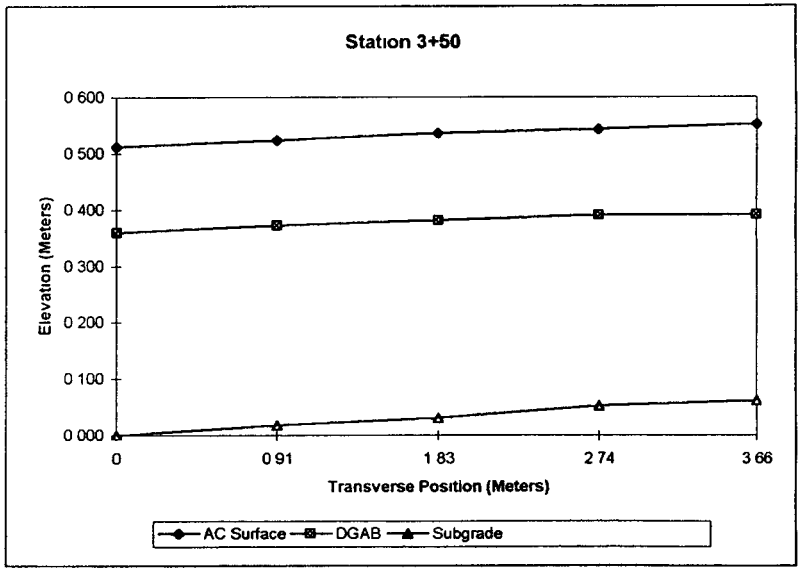


New Mexico, SPS-8 (350802)

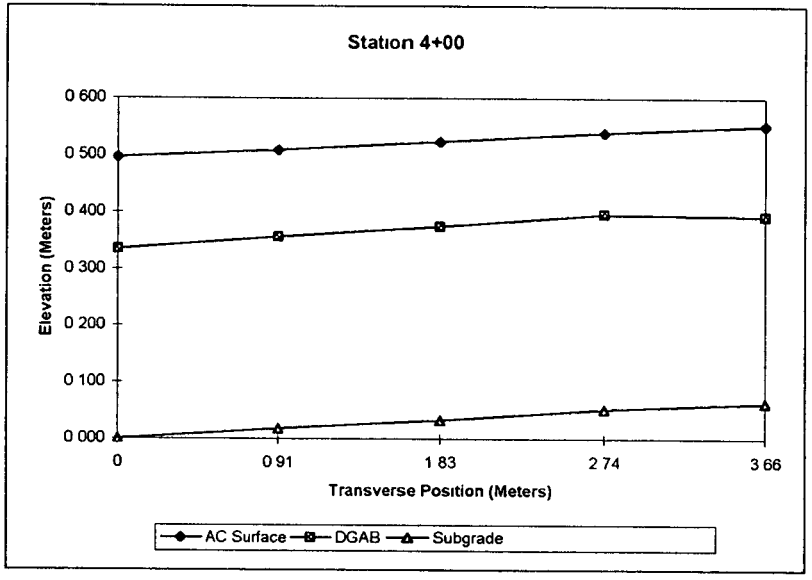


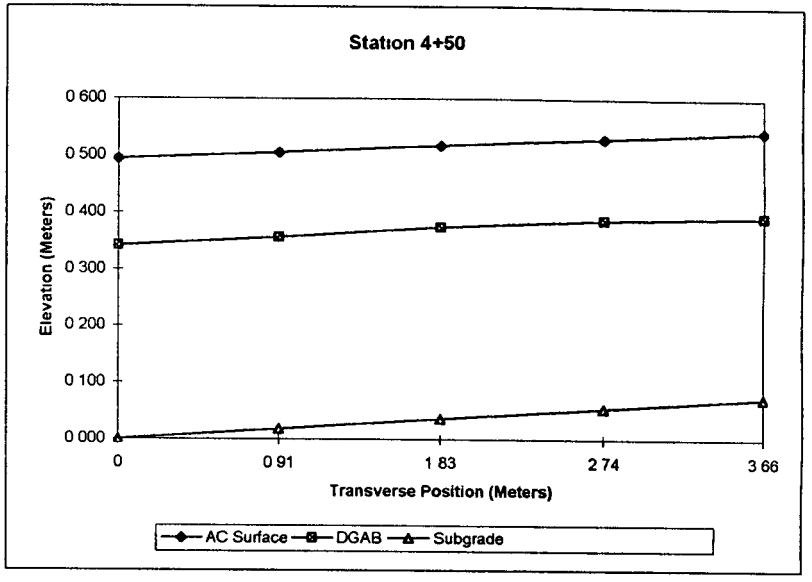


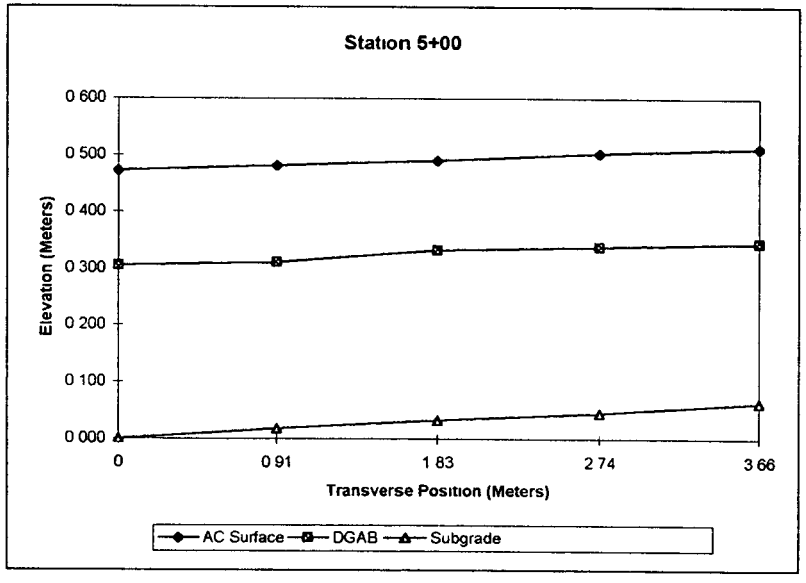




New Mexico, SPS-8 (350802)







APPENDIX C

MATERIALS SAMPLING AND TESTING PLAN

Brent Rauhut Engineering Inc.

14 August 1995

Mr. Keun-Wook Yi
Bituminous Engineer
Materials Lab Bureau
New Mexico State Highway
& Transportation Department
P.O. Box 1149
Santa Fe, New Mexico 87504

Subject: New Mexico SPS-8 Project (350800) Materials Sampling and Testing Plan

Dear Mr. Yi:

Enclosed is the plan for materials sampling and testing activities for the New Mexico SPS-8 project, located on the frontage road of IH-10 near Lordsburg, New Mexico. This plan has been prepared to identify details of the materials sampling, field testing, and laboratory materials testing to occur as part of the SPS-8 project construction.

If you have any questions or comments regarding the information provided in this plan, please do not hesitate to contact me. A copy of this document is also being provided to Mr. Monte Symons of the FHWA, for review and approval.

Sincerely,

Mark P. Gardner, P.E.
Project Engineer, SRCO

MPG:dmj

Enclosure: As stated.

c.w/Enc: Monte Symons, FHWA/LTPP-DC
Jim Stokes, NM-SHTD
Gonzalo Rada, PCS/LAW

MATERIAL SAMPLING
AND
TESTING PLAN

NEW MEXICO SPS-8 PROJECT 350800
GRANT COUNTY, NEW MEXICO
IH-10 FRONTAGE ROAD, EASTBOUND

PREPARED BY:

BRENT RAUHUT ENGINEERING INC.
FHWA/LTPP SOUTHERN REGION COORDINATION OFFICE
8240 MOPAC, SUITE 220
AUSTIN, TEXAS 78759

AUGUST 1995

MATERIAL SAMPLING AND TESTING PLAN
NEW MEXICO SPS-8 PROJECT (350800), IH-10 FRONTAGE RD, EASTBOUND
GRANT COUNTY, NEW MEXICO

INTRODUCTION

As part of their participation in the FHWA/LTPP studies, the State of New Mexico will construct an SPS-8 project to study the effects of the environment on pavement performance in the absence of heavy loads. This project will consist of two test sections with similar details and materials on the IH-10 Frontage Road, in the eastbound lane, in Grant County, New Mexico. It is the intent of this document to provide a complete plan for the material sampling, testing, and laboratory material testing that will occur as a part of this project.

This document has been prepared in accordance with guidelines provided by the Federal Highway Administration entitled "Specific Pavement Studies Material Sampling and Testing Requirements for Experiment SPS-8, Study of Environmental Effects in the Absence of Heavy Loads, August 1992". Recognizing the apparent variability in the construction of roadway projects, the goal of this effort is to develop a sampling and testing plan for the project materials that will be consistent with other projects in this experiment, and therefore make the information obtained suitable for analysis.

The objective of the SPS-8 study is to investigate the performance of selected flexible and rigid pavement structures constructed on different subgrade types in different environmental regions. For flexible pavements, the factors addressed in this study include different surface and base thicknesses. New Mexico's involvement in the study will provide critical information in the dry, no freeze environmental zone, on a fine-grained subgrade soil. The data produced by this experiment will be used to evaluate existing design methods and performance equations. The interaction of the factors previously discussed will be determined in combination with the effect of environmental region and soil type. The effects of these factors will be studied under realistic performance conditions with significant materials and construction control. Herein lies the need for a sampling and testing plan, provided in the following pages.

This sampling and testing plan has been developed by Brent Rauhut Engineering, Inc. the Southern Region Coordination Office under contract to the Federal Highway Administration. If, during the construction activities, any questions arise regarding the sampling and/or testing to be conducted, one should first coordinate these questions with the New Mexico State Highway and Transportation Department, who may refer them to the Southern Region Coordination Office.

This document has been prepared in three distinct parts, each covering a particular area of this rather formidable exercise. The three sections are:

A. General Layout Information

B. Materials Sampling and Testing

C. Laboratory Material Testing

The General Layout section provides tables and figures of the layout showing the two test sections along the roadway and the layer structure of both test sections.

The Material Sampling and Testing section defines in detail all of the material samples to be obtained, testing to be performed in the field, and provides an itemized list showing where each sample is to be shipped for laboratory testing.

Finally, the Laboratory Material Testing section outlines the laboratory material test program to be conducted and provides tracking charts showing the testing to be performed on each sample of each material in each laboratory.

SECTION A

GENERAL LAYOUT INFORMATION

SECTION A

GENERAL LAYOUT INFORMATION

This section of the plan provides a description of the SPS-8 project in terms of the location of the test sections along the roadway. Table A-1 lists the test sections in order of increasing station, providing an indication of the cross-section of each test section. Table A-2 tracks the test sections from the beginning of the first section at Station 840+00 to the end of the last section at Station 856+00. This table indicates transition areas between sections and the variation of pavement layer materials within these transitions.

Finally, Figure A-1 depicts the layout of the test sections along the roadway and shows the variation of material type and layer thickness.

The referenced project stationing was provided by the New Mexico SHTD in the form of preliminary project plans. If there are significant changes in alignment or stationing, this plan should be reviewed closely to determine if revisions are warranted.

TABLE A-1. TEST SECTION LAYOUT

Section (Cell ID)	Cross Section	Begin Station	End Station
350801	4″ AC Surface	840 + 00	847 + 00
	8″ DGAB		
350802	7″ AC Surface	848 + 00	856 + 00
	12″ DGAB		

TABLE A-2. ORDERING OF SECTIONS ALONG CENTER LINE STATIONING

Begin Sta.	End Sta.	Section ID	Thickness (In.)	
			AC Surface*	DGAB
840 + 00	847 + 00	350801	4	8
847 + 00	848 + 00	Transition	4-7	8-12
848 + 00	856 + 00	350802	7	12

* Combined Binder and Wearing Course Thickness

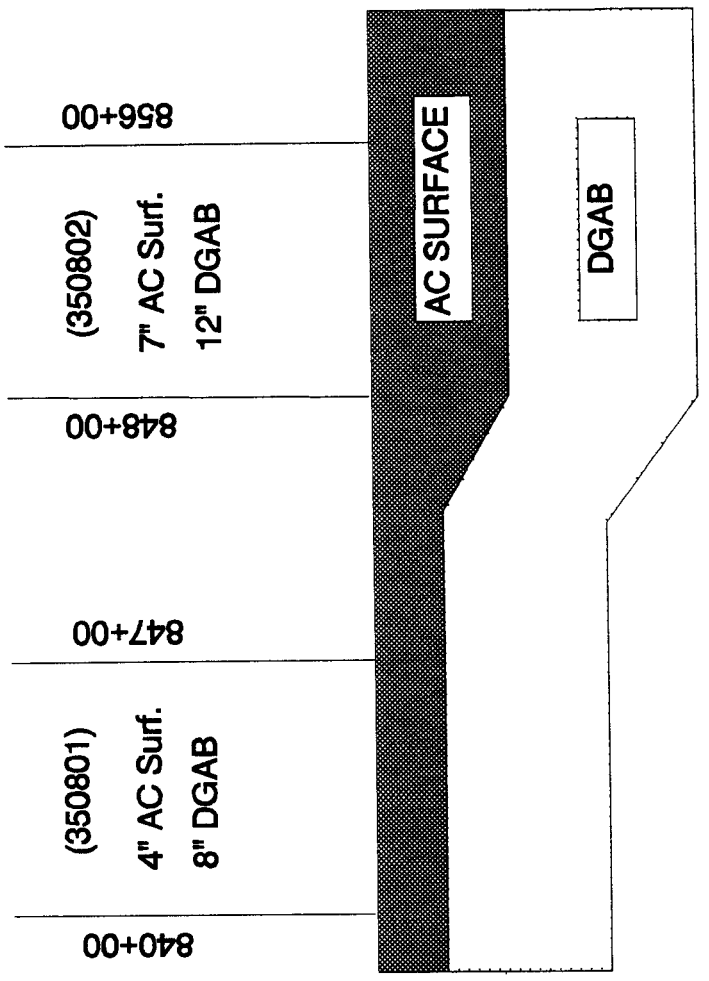


FIGURE A-1. LAYOUT OF TEST SECTIONS NEW MEXICO SPS-8 (350800)

SECTION B

MATERIAL SAMPLING AND TESTING

SECTION B

MATERIAL SAMPLING AND TESTING

This section of the plan provides for the material sampling and testing activities that occur in the field. Tables B-1 and B-2 provide the scope of the material sampling and testing activities, respectively. Table B-3 describes special sampling needs for the Materials Reference Library and provides contact information to coordinate sample shipping arrangements.

Figures B-1 through B-6 show the locations and numbering scheme for the many samples and tests scheduled. Figures B-2 through B-4 show the sampling and testing to occur for each stage of the paving, while Figures B-5 and B-6 show all sampling and testing scheduled for each test section.

Finally, Tables B-4 and B-5 list samples to be shipped to the state laboratory (or their designee), and those samples to be shipped to the FHWA/LTPP testing contractor, respectively. Shipment of samples to the FHWA/LTPP testing contractor, LAW Engineering in Atlanta, Georgia, should be coordinated through the Southern Region Coordination Office.

TABLE B-1. SCOPE OF MATERIAL SAMPLING

Material And Sample Description	Nº. Of Samples	Sample Location
Asphalt Concrete		
Coring - 4" Diam. Cores	16	C1-C16
Bulk Sampling - Surface Mix (200 lb/sample)	3	BV1,BV2,BV3-From Plant
Bulk Sampling - Asphalt Cement (5 gal/sample)	3	BC1,BC2,BC3-From Plant
Dense-Graded Aggregate Base		
Bulk Sampling (400 lb/sample)	3	B4-B6
Moisture Content Samples	3	B4-B6
Subgrade		
Thin-Walled Tubes (2 per hole)	12	A1-A6
Bulk Sampling (400 lb/sample)	3	B1-B3
Moisture Content Samples	9	A1-A6, B1-B3
Permeability	1	A2
Expansion Index	3	B1-B3

TABLE B-2. SCOPE OF FIELD TESTING

Material And Test Description	Nº. Of Tests	Location Designation
Asphalt Concrete		
In Situ Density (Nuclear Gauge)	10	T13-T18, SA1-SA4
Dense-Graded Aggregate Base		
In Situ Density, Moisture Content (Nuclear Gauge)	6	T7-T12
Moisture Content Samples	3	B4-B6
Subgrade		
In Situ Density, Moisture Content (Nuclear Gauge)	9	T1-T6, B1-3
Shoulder Auger Probe	2	S1-S2

TABLE B-3. MATERIAL SAMPLING FOR THE MATERIALS REFERENCE LIBRARY (MRL)

Material And Sample Description	Nº. Of Samples	Sample Location
Asphalt Cement (5 Gallon Containers)	3	From Plant
Aggregate (55 Gallon Drum Each Blend)	1	From Plant
Finished Asphaltic Concrete Mix (5 Gallon Containers)	3	From Paver

Note: Containers for this sampling will be provided by the LTPP Materials Reference Library (MRL). Scheduling information including (1) date containers needed, (2) state agency contact name, and (3) shipping address and telephone number should be provided to the MRL Contractor as soon as it is feasible to do so. The contact name, address and telephone number for the MRL Contractor are as follows:

Mr. Rod Soule
Nichols Consulting Engineers, Chtd.
1885 So. Arlington Ave., Suite 111
Reno, Nevada 89509
(702) 329-4955

These samples should be labeled according to applicable guidelines provided elsewhere and shipped to the MRL Contractor upon completion of sampling activities.

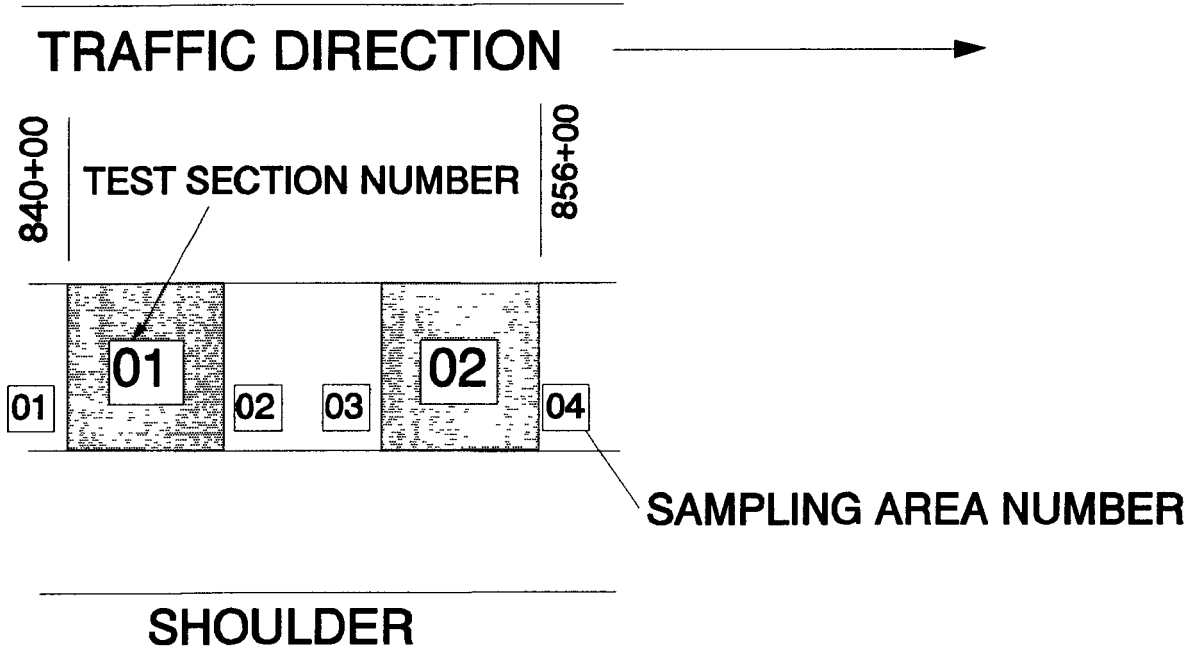


FIGURE B-1. SITE LAYOUT WITH SAMPLING AREAS NEW MEXICO SPS-8 (350800)

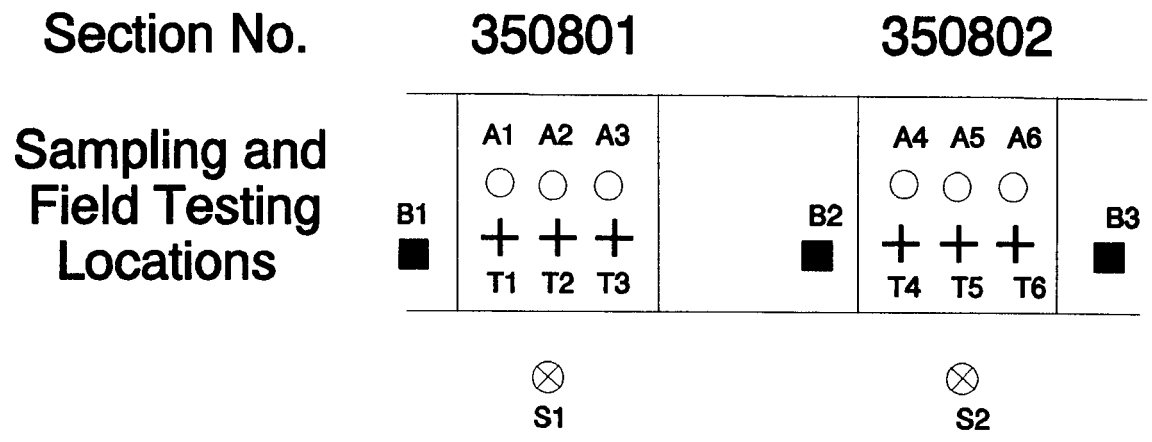
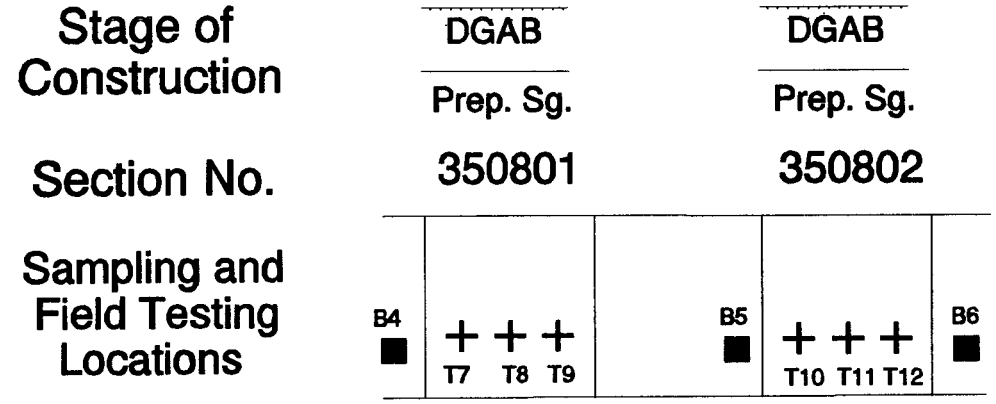


FIGURE B-2. SAMPLING AND TESTING LOCATIONS FOR SUBGRADE NEW MEXICO SPS-8 (350800)



LEGEND

+ Location of in situ density testing (T7 - T12)

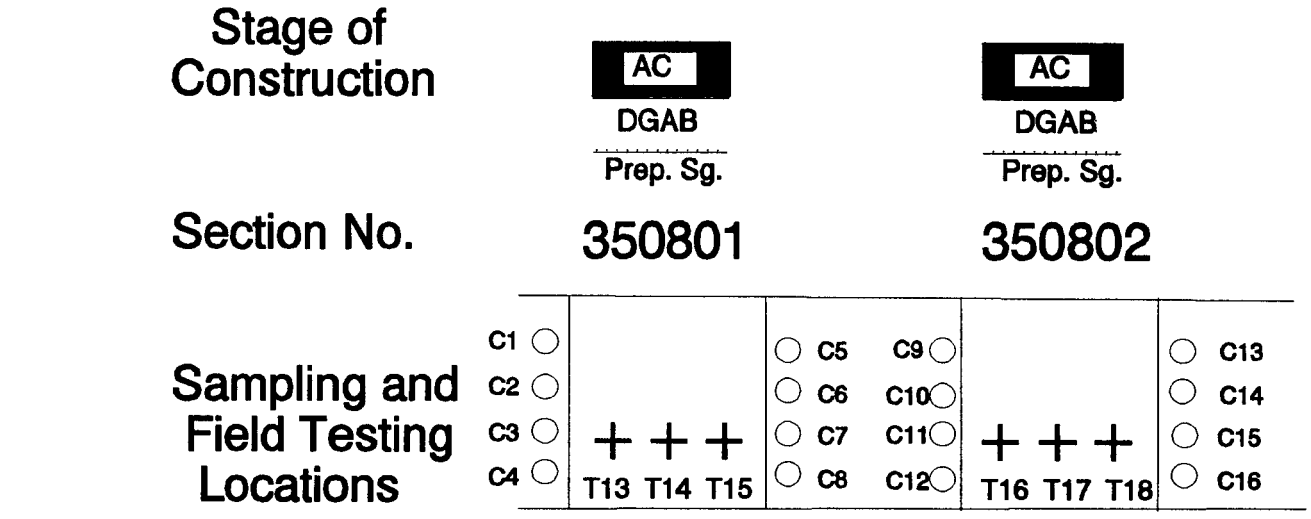
■ Location of bulk sampling of DGAB (B4 - B6)

Note: Nuclear density/moisture testing must be conducted at bulk sampling locations prior to excavation.

Prep. Sg. - Prepared Subgrade

DGAB - Dense Graded Aggregate Base

FIGURE B-3. SAMPLING AND TESTING LOCATIONS FOR DGAB NEW MEXICO SPS-8 (350800)



LEGEND

○ 4" OD Core of Asphalt Concrete Surface (C1 - C16)

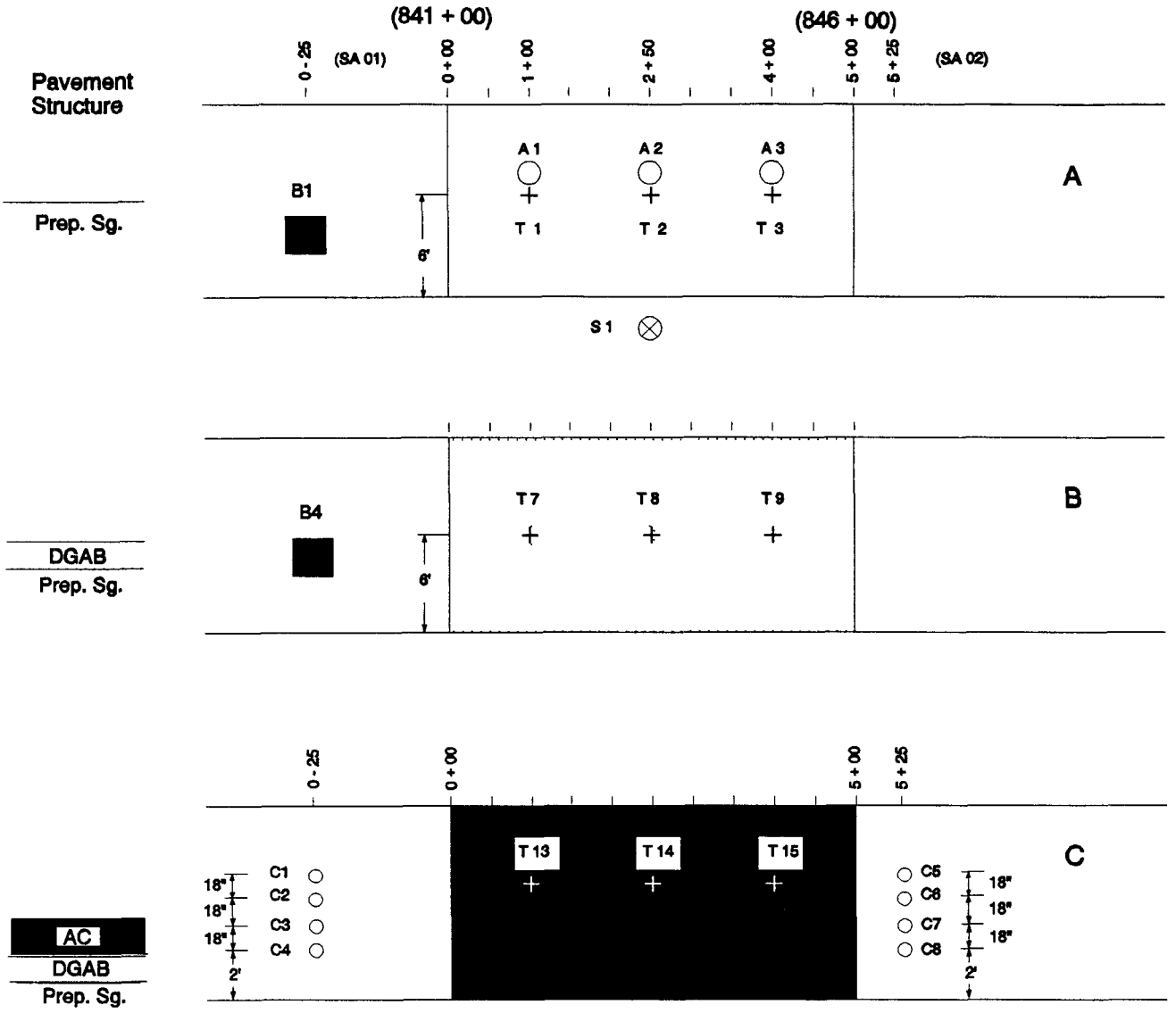
+ Location of in situ density testing (T13 - T18)

Prep. Sg. - Prepared Subgrade

DGAB - Dense Graded Aggregate Base

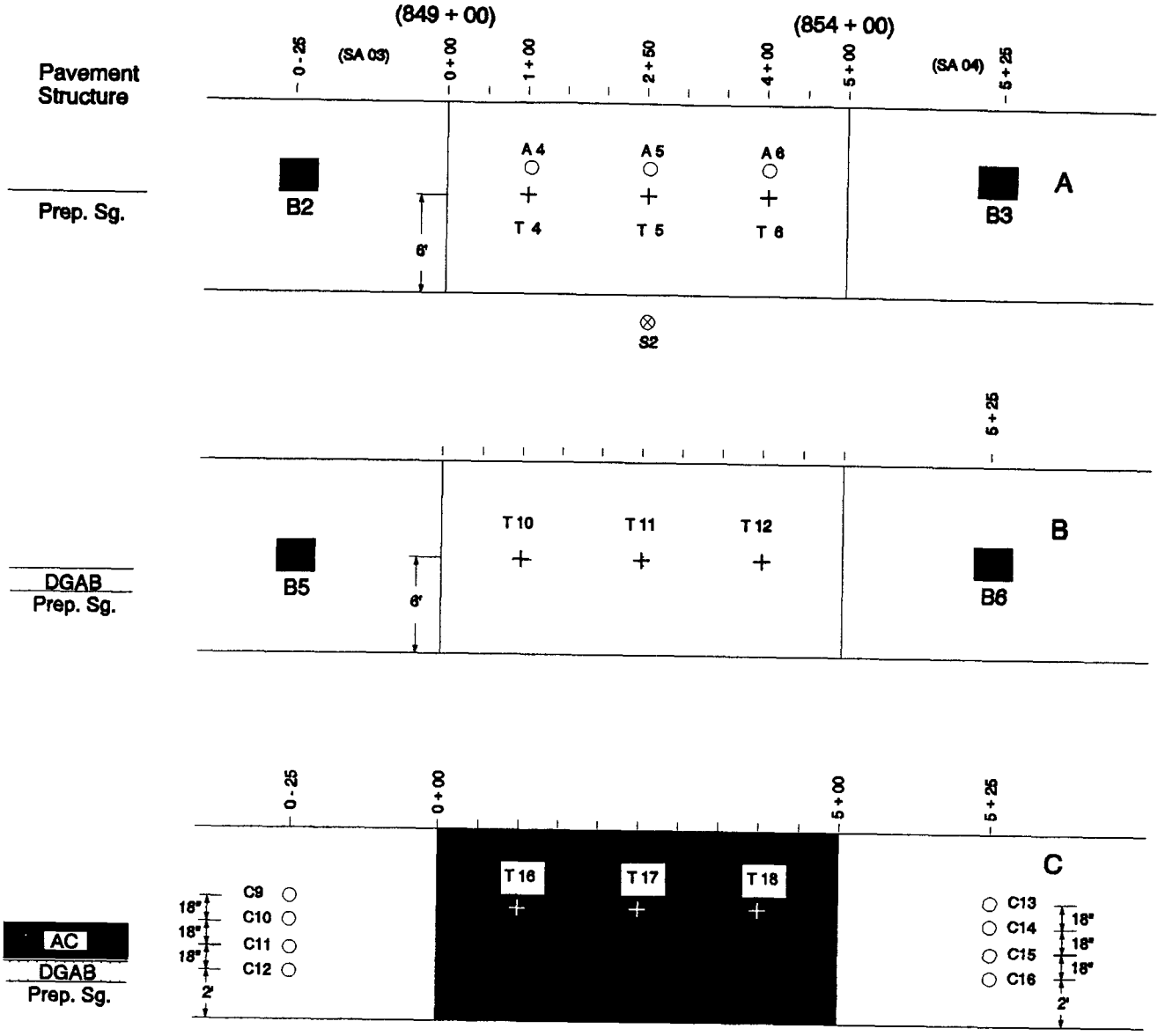
AC - Asphalt Concrete Surface

FIGURE B-4. SAMPLING AND TESTING LOCATIONS FOR AC SURFACE NEW MEXICO SPS-8 (350800)



A Testing on prepared Subgrade (T1 - T3, A1 - A3, S1, B1)
B Testing on compacted DGAB (T7 - T9, B4)
C Testing on finished AC Surface (T13 - T15)
Coring AC Surface (C1 - C8)

FIGURE B-5. SAMPLING AND TESTING PLAN FOR TEST SECTION 350801



A Testing on prepared Subgrade (T4 - T6, A4 - A6, S2, B2, B3)
B Testing on compacted DGAB (T10 - T12, B5. B6)
C Testing on finished AC Surface (T16 - T18)
Coring AC Surface (C9 - C16)

FIGURE B-6. SAMPLING AND TESTING PLAN FOR TEST SECTION 350802

TABLE B-4. SAMPLES TO BE SHIPPED TO THE STATE LABORATORY (OR THEIR DESIGNEE)

Sample Location	Sample Number	Lab Test Number	Type of Sample
Asphalt Concrete			
BV1	BA01	3	91 kg (200 lb) bulk sample
BV2	BA02	3	91 kg (200 lb) bulk sample
BV3	BA03	3	91 kg (200 lb) bulk sample
BC1	BC01	3	19 l (5 gal) bulk sample of asphalt cement
BC2	BC02	3	19 l (5 gal) bulk sample of asphalt cement
BC3	BC03	3	19 l (5 gal) bulk sample of asphalt cement
Dense-Graded Aggregate Base			
B4	BG01	2	45 kg (100 lb) bulk sample
B5	BG02	2	45 kg (100 lb) bulk sample
B6	BG03	2	45 kg (100 lb) bulk sample
Subgrade			
B1	BS01	2	45 kg (100 lb) bulk sample
B2	BS02	2	45 kg (100 lb) bulk sample
B3	BS03	2	45 kg (100 lb) bulk sample
A2	TS03, TS04	3	Thin-Wall Tube
A4	TS07, TS08	3	Thin-Wall Tube
A6	TS11, TS12	3	Thin-Wall Tube

TABLE B-5. SAMPLES TO BE SHIPPED TO THE FHWA-LTPP TESTING CONTRACTOR LABORATORY

Sample Location	Sample Number	Lab Test Number	Type of Sample
Asphalt Concrete			
C1	CA01	1	102 mm (4 in.) Core
C2	CA02	1	102 mm (4 in.) Core
C3	CA03	1	102 mm (4 in.) Core
C4	CA04	1	102 mm (4 in.) Core
C5	CA05	2	102 mm (4 in.) Core
C6	CA06	2	102 mm (4 in.) Core
C7	CA07	2	102 mm (4 in.) Core
C8	CA08	2	102 mm (4 in.) Core
C9	CA09	1	102 mm (4 in.) Core
C10	CA10	1	102 mm (4 in.) Core
C11	CA11	1	102 mm (4 in.) Core
C12	CA12	1	102 mm (4 in.) Core
C13	CA13	2	102 mm (4 in.) Core
C14	CA14	2	102 mm (4 in.) Core
C15	CA15	2	102 mm (4 in.) Core
C16	CA16	2	102 mm (4 in.) Core
Dense-Graded Aggregate Base			
B4	BG01	1	136 kg (300 lb) Bulk Sample
B5	BG02	1	136 kg (300 lb) Bulk Sample
B6	BG03	2	136 kg (300 lb) Bulk Sample
B4	MG01	1	Moisture Content Jar Sample
B5	MG02	1	Moisture Content Jar Sample
B6	MG03	2	Moisture Content Jar Sample

TABLE B-5. SAMPLES TO BE SHIPPED TO THE FHWA-LTPP TESTING CONTRACTOR LABORATORY (Continued)

Sample Location	Sample Number	Lab Test Number	Type of Sample
Subgrade			
B1	BS01	1	136 kg (300 lb) Bulk Sample
B2	BS02	1	136 kg (300 lb) Bulk Sample
B3	BS03	2	136 kg (300 lb) Bulk Sample
A1	TS01	3	Thin wall Tube Sample
A1	TS02	3	Thin wall Tube Sample
A3	TS05	3	Thin wall Tube Sample
A3	TS06	3	Thin wall Tube Sample
A5	TS09	3	Thin wall Tube Sample
A5	TS10	3	Thin wall Tube Sample
B1	MS01	1	Moisture Content Jar Sample
B2	MS02	1	Moisture Content Jar Sample
B3	MS03	2	Moisture Content Jar Sample

SECTION C

LABORATORY MATERIAL TESTING

SECTION C

LABORATORY MATERIAL TESTING

It is the intent of this section of the sampling and testing plan to provide an outline for the laboratory testing that is planned for the New Mexico SPS-8 project. The previous section ended with lists of samples to be shipped to each of two laboratories; the state designated laboratory and the FHWA/LTPP contracted laboratory. In this section, the tests to be performed on each sample are listed.

Table C-1 provides a reference project layer numbering scheme. It is important that the two laboratories reference the same layer by number to ensure meaningful results.

Table C-2 provides a listing of the tests to be performed for each material type and pavement layer, and the associated laboratory testing protocol. It is imperative that the protocols listed be strictly followed during testing.

Tables C-3 through C-5 provide tracking tables for the state designated laboratory for each material type. These tables itemize the testing to occur on each sample and provide an indication of whether the sample is to be disposed of. Tables C-6 through C-8 provide similar information for the FHWA/LTPP contracted laboratory.

TABLE C-1. PROJECT LAYER NUMBERING

Layer Nº.	LTPP Description	New Mexico Description
1	Subgrade	Subgrade
2	Dense Graded Aggregate Base (DGAB)	Untreated Base Course (UTBC) Type I-B
3	Hot Mix Asphalt Concrete Surface Course	Plant Mix Bituminous Pavement (PMBP) Type I-A

TABLE C-2. SAMPLES TO BE USED FOR LABORATORY MATERIALS TESTING

Material Type and Properties	LTPP Designation	LTPP Protocol	Minimum Nº. of Tests per Layer	Sampling Location	Test Conducted by: State	FHWA
SUBGRADE						
Sieve Analysis	SS01	P51	3	B1-B3		X
Hydrometer to 0.001 mm	SS02	P42	3	B1-B3		X
Atterberg Limits	SS03	P43	3	B1-B3		X
Classification	SS04	P52	3	B1-B3		X
(Visual-manual only on thin-wall tubes)			6	A1-A6	X	X
Moisture-Density Relations	SS05	P55	3	B1-B3		X
Resilient Modulus	SS07	P46	3	A1, A3, A5		X
Unit Weight (If thin-wall tube is not available, test is not conducted)	SS08	P56	6	A2, A4, A6	X	
Natural Moisture Content	SS09	P49	3	B1-B3		X
Unconfined Comp. Strength (If thin-wall tube is not available, test is not conducted)	SS10	P54	4	A2, A4	X	
Permeability	SS11	P57	1	A2	X	
In-Place Density		SHRP-LTPP Method	9	B1-B3, T1-T6	X	
Depth to Rigid Layer		SHRP-LTPP Method	2	S1, S2	X	
Expansion Index	SS12	P60	3	B1-B3		X
DENSE GRADED AGGREGATE BASE						
Particle Size Analysis	UG01	P41	3	B4-B6		X
Sieve Analysis (Washed)	UG02	P41	3	B4-B6		X
Atterberg Limits	UG04	P43	3	B4-B6		X
Moisture-Density Relations	UG05	P44	3	B4-B6		X
Resilient Modulus	UG07	P46	3	B4-B6		X
Classification	UG08	P47	3	B4-B6		X
Permeability	UG09	P48	3	B4-B6	X	
Natural Moisture Content	UG10	P49	3	B4-B6		X
In-Place Density		SHRP-LTPP Method	6	T7-T12	X	

TABLE C-2. SAMPLES TO BE USED FOR LABORATORY MATERIALS TESTING (Continued)

Material Type and Properties	LTPP Designation	LTPP Protocol	Minimum Nº. of Tests per Layer	Sampling Location	Test Conducted by: State	FHWA
ASPHALTIC CONCRETE SURFACE AND BINDER						
Core Examination/Thickness	AC01	P01	16	All Cores		X
Bulk Specific Gravity	AC02	P02	16	All Cores		X
Maximum Specific Gravity	AC03	P03	3	BV1-BV3 From Paver	X	
Asphalt Content (Extraction)	AC04	P04	3	BV1-BV3 From Paver	X	
Moisture Susceptibility	AC05	P05	3	BV1-BV3 From Paver	X	
Creep Compliance	AC06	P06	1	C9		X
Resilient Modulus	AC07	P07	3	C1-C3,C5-C7,C13-C15		X
Tensile Strength	AC07	P07	3	C4, C8, C16		X
In-Place Density		SHRP-LTPP Method	6	T13-T18	X	
Extracted Aggregate:						
Specific Gravity:						
Coarse Aggregate	AG01	P11	3	BV1-BV3 From Paver	X	
Fine Aggregate	AG02	P12	3	BV1-BV3 From Paver	X	
Type and Classification:						
Coarse Aggregate	AG03	P13	3	BV1-BV3 From Paver	X	
Fine Aggregate	AG03	P13	3	BV1-BV3 From Paver	X	
Gradation of Aggregate	AG04	P14	3	BV1-BV3 From Paver	X	
NAA Test for Fine Aggregate	AG05	P14A	3	BV1-BV3 From Paver	X	
Coarse Aggregate Particle Shape	AG06	P14B	3	BV1-BV3 From Paver	X	
Asphalt Cement (Abson Recovery):						
Abson Recovery	AE01	P21	3	BV1-BV3 From Paver	X	
Penetration at 4°C, 25°C, 32°C (50°F, 77°F, 90°F)	AE02	P22	3	BV1-BV3 From Paver	X	
Specific Gravity 16°C (60°F)	AE03	P23	3	BV1-BV3 From Paver	X	
Viscosity at 25°C (77°F)	AE04	P24	3	BV1-BV3 From Paver	X	
Viscosity at 60°C, 135°C (140°F, 275°F)	AE05	P25	3	BV1-BV3 From Paver	X	
Asphalt Cement: (From Tanker or Plant)						
Penetration at 4°C, 25°C, 32°C (50°F, 77°F, 90°F)	AE02	P22	3	BC1-BC3 From Plant	X	
Specific Gravity 16°C (60°F)	AE03	P23	3	BC1-BC3 From Plant	X	
Viscosity at 25°C (77°F)	AE04	P24	3	BC1-BC3 From Plant	X	
Viscosity at 60°C, 135°C (140°F, 275°F)	AE05	P25	3	BC1-BC3 From Plant	X	

TABLE C.3. TRACKING TABLE OF ASPHALTIC CONCRETE TESTING IN THE STATE LABORATORY (OR THEIR DESIGNEE)

Sample Location	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
BV1	BA01	3	See Figure C.1				No	(a)	Yes
BV2	BA02	3	See Figure C.1				No	(a)	Yes
BV3	BA03	3	See Figure C.1				No	(a)	Yes
BC1	BC01	3	AE02/P22	AE03/P23	AE04/P24	AE05/P25	No	(a)	Yes
BC2	BC02	3	AE02/P22	AE03/P23	AE04/P24	AE05/P25	No	(a)	Yes
BC3	BC03	3	AE02/P22	AE03/P23	AE04/P24	AE05/P25	No	(a)	Yes

Note: All of the core specimens noted herein shall be stored for possible future use. In the future, these specimens may be used to evaluate test procedures for the SUPERPAVE program.

TABLE C-4. TRACKING TABLE OF DENSE GRADED AGGREGATE BASE TESTING IN THE STATE LABORATORY (OR THEIR DESIGNEE)

Sample Location	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
B4	BG01	1	UG09/P48				No	(b)	Yes
B5	BG02	1	UG09/P48				No	(b)	Yes
B6	BG03	2	UG09/P48				No	(b)	Yes

TABLE C-5. TRACKING TABLE OF SUBGRADE TESTING IN THE STATE LABORATORY (OR THEIR DESIGNEE)

Sample Location	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
B1	BS01	1	No testing - samples stored				Yes	(b)	No
B2	BS02	1	No testing - samples stored				Yes	(b)	No
B3	BS03	2	No testing - samples stored				Yes	(b)	No
A2	TS03	3	SS04/P52	SS08/P56	SS10/P54	SS11/P57	No	(c)	Yes
A4	TS07	3	SS04/P52	SS08/P56	SS10/P54		No	(c)	Yes
A6	TS11	3	SS04/P52	SS08/P56			No	(c)	Yes
A2	TS04	3	SS04/P52	SS08/P56			Yes	(c)	No
A4	TS08	3	SS04/P52	SS08/P56	SS10/P54		Yes	(c)	No
A6	TS12	3	SS04/P52	SS08/P56	SS10/P54		Yes	(c)	No

TABLE C-6. TRACKING TABLE OF ASPHALTIC CONCRETE TESTING IN THE FHWA-LTPP TESTING CONTRACTOR LABORATORY

Sample Location	Sample Number	Lab Test Number	Steps Involved in Laboratory Handling and Testing Sequence						
			Required Laboratory Tests Per Layer				Extra Sample	Sample Storage	Sample Disposed?
			First	Second	Third	Fourth			
C1	CA01	1	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C2	CA02	1	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C3	CA03	1	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C4	CA04	1	AC01/P01	AC02/P02		AC07/P07 (ITS)	No	(a)	Yes
C5	CA05	2	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C6	CA06	2	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C7	CA07	2	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C8	CA08	2	AC01/P01	AC02/P02		AC07/P07 (ITS)	No	(a)	Yes
C9	CA09	1	AC01/P01	AC02/P02	AC06/P06		No	(a)	Yes
C10	CA10	1	AC01/P01	AC02/P02			No	(a)	Yes
C11	CA11	1	AC01/P01	AC02/P02			No	(a)	Yes
C12	CA12	1	AC01/P01	AC02/P02			No	(a)	Yes
C13	CA13	2	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C14	CA14	2	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C15	CA15	2	AC01/P01	AC02/P02	AC07/P07		No	(a)	Yes
C16	CA16	2	AC01/P01	AC02/P02		AC07/P07 (ITS)	No	(a)	Yes

TABLE C-7. TRACKING TABLE OF DENSE GRADED AGGREGATE BASE TESTING IN THE FHWA-LTPP TESTING CONTRACTOR LABORATORY

Sample Location	Sample No.	Lab Test No.	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed ?
			First	Second	Third	Fourth	Fifth	Sixth			
B4	BG01	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B5	BG02	1	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B6	BG03	2	UG01/P41	UG02/P41	UG04/P43	UG08/P47	UG05/P44	UG07/P46	No	(b)	Yes
B4	MG01	1	UG10/P49						No	(b)	Yes
B5	MG02	1	UG10/P49						No	(b)	Yes
B6	MG03	2	UG10/P49						No	(b)	Yes

TABLE C-8. TRACKING TABLE OF SUBGRADE TESTING IN THE FHWA-LTPP TESTING CONTRACTOR LABORATORY

Sample Location	Sample No.	Lab Test No.	Steps Involved in Laboratory Handling and Testing Sequence								
			Required Laboratory Tests Per Layer						Extra Sample	Sample Storage	Sample Disposed ?
			First	Second	Third	Fourth	Fifth	Sixth			
B1	BS01	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46*	No	(b)	Yes
B2	BS02	1	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46*	No	(b)	Yes
B3	BS03	2	SS01/P51	SS02/P42	SS03/P43	SS04/P52	SS05/P55	SS07/P46*	No	(b)	Yes
A1	TS03	3	SS04/P52	SS07/P46					No	(c)	Yes
A3	TS05	3	SS04/P52	SS07/P46					No	(c)	Yes
A5	TS09	3	SS04/P52	SS07/P46					No	(c)	Yes
B1	MS01	1	SS09/P49	SS07/P46*					No	(b)	Yes
B2	MS02	1	SS09/P49	SS07/P46 *					No	(b)	Yes
B3	MS03	2	SS09/P49	SS07/P46 *					No	(b)	Yes
A1	TS02	3	SS12/P60						Yes	(c)	No
A3	TS06	3	SS12/P60						Yes	(c)	No
A5	TS10	3	SS12/P60						Yes	(c)	No

* **Note:** SS07/P46 testing for bulk subgrade samples only required when tube samples are not available or suitable for testing.

ALS
6/17/96

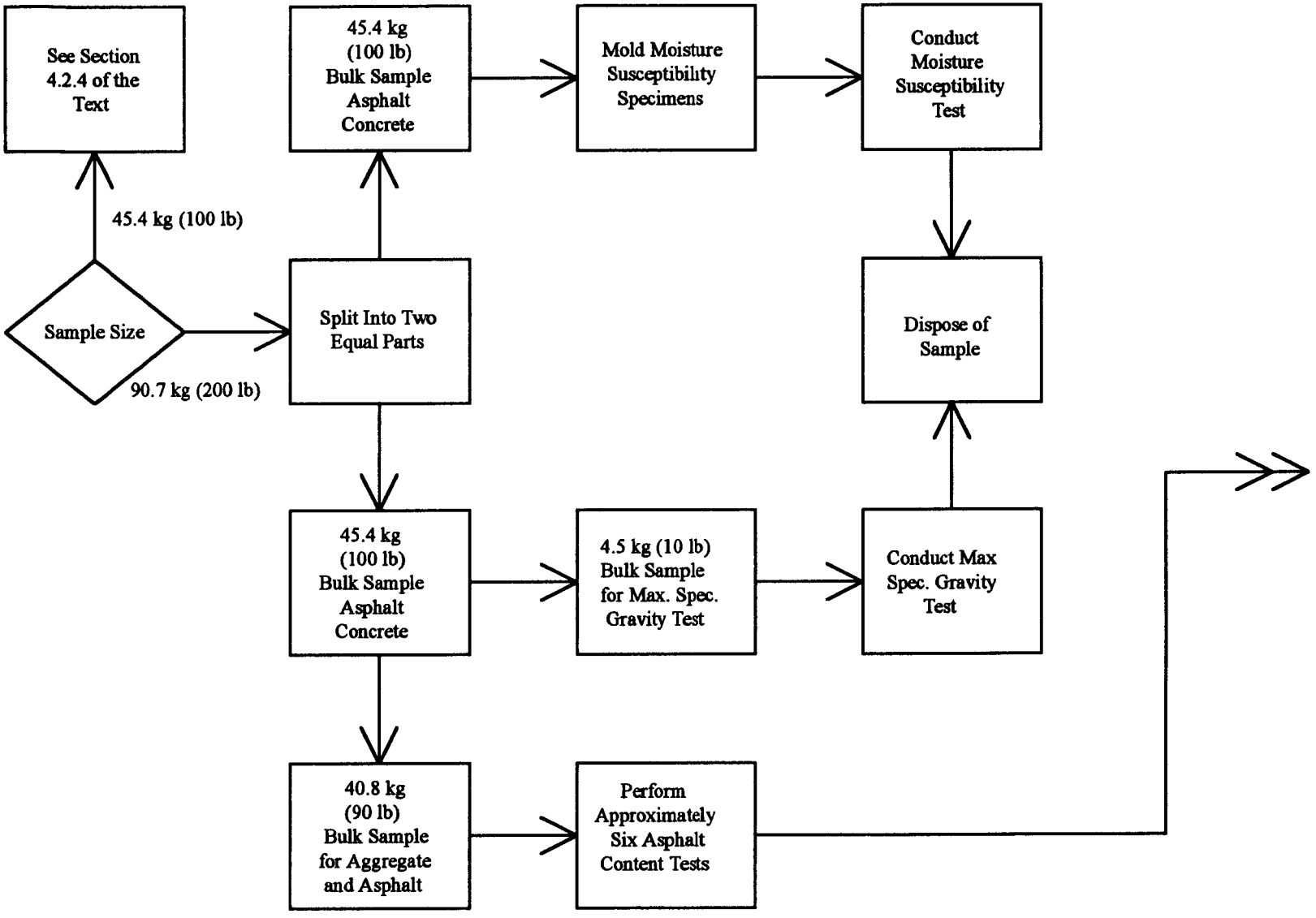


FIGURE C-1. FLOWCHART FOR ASPHALT CONCRETE BULK SAMPLES

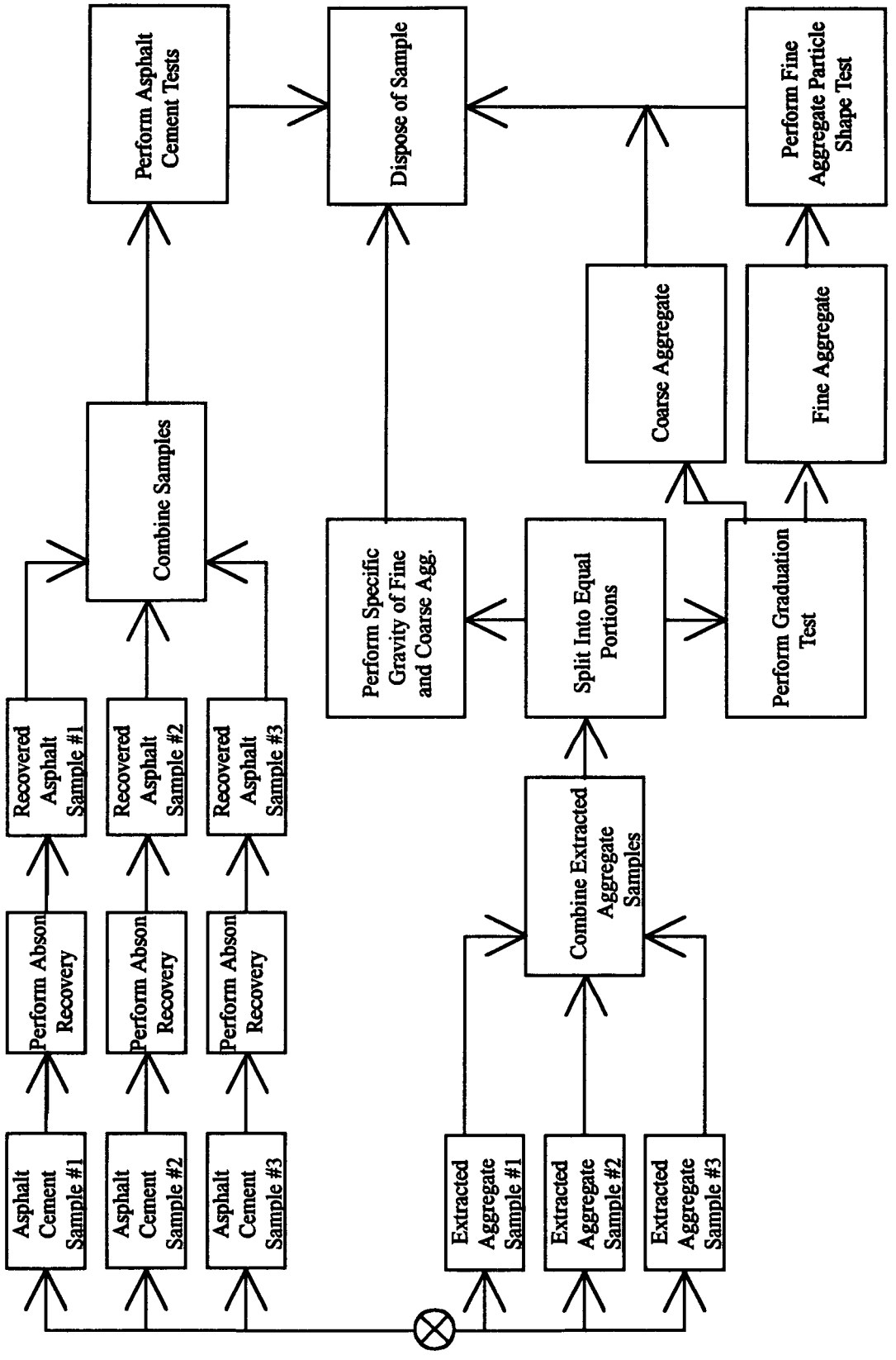


FIGURE C-1. FLOWCHART FOR ASPHALT CONCRETE BULK SAMPLES (Continued)

APPENDIX D

CONSTRUCTION DATA

SPS-8 CONSTRUCTION DATA SHEET 1 PROJECT IDENTIFICATION	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1.	DATE OF DATA COLLECTION OR UPDATE (Month/Year)	[11/96]
*2.	STATE HIGHWAY AGENCY (SHA) DISTRICT NUMBER	[01.]
*3.	COUNTY OR PARISH	[017.]
4.	FUNCTIONAL CLASS (SEE TABLE A.2, APPENDIX A)	[09.]
*5.	ROUTE SIGNING (NUMERIC CODE) Interstate... 1 U.S.... 2 State... 3 Other... 4	[1.]
*6.	ROUTE NUMBER	[___10.]
7.	TYPE OF PAVEMENT (01 for Granular Base, 02 for Treated Base)	[01.]
8.	NUMBER OF THROUGH LANES (ONE DIRECTION)	[1.]
*9.	DATE OF CONSTRUCTION COMPLETION (Month/Year)	[1 1/96]
*10.	DATE OPENED TO TRAFFIC (Month/Year)	[1 1/96]
11.	CONSTRUCTION COSTS PER LANE MILE (In $1000)	[_____.]
12.	DIRECTION OF TRAVEL East Bound... 1 West Bound... 2 North Bound... 3 South Bound... 4	[1.]
	PROJECT STARTING POINT LOCATION	
*13.	MILEPOINT	[_51.__]
*14.	ELEVATION	[_4554]
*15.	LATITUDE	[32° 15' __.__"]
*16.	LONGITUDE	[108° 15' __.__"]
17.	ADDITIONAL LOCATION INFORMATION (SIGNIFICANT LANDMARKS):	[Starts at Sta. 840+00 in front of stockpile on IH-10 Frontage Road]
18.	HPMS SAMPLE NUMBER (HPMS ITEM 28)	[__________]
19.	HPMS SECTION SUBDIVISION (HPMS ITEM 29)	[__.]

PREPARER Kenneth J. Hasta EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * 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)	[1 0.]	[1 0.]
*7.	PAVED WIDTH (FEET)	[1 0.]	[1 0.]
8.	SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3.]	[2 3.]
9.	SURFACE THICKNESS (INCHES)	[8 4 0]	[8 4 0]
10.	SHOULDER BASE THICKNESS (INCHES)	[8. 0]	[8. 0]
11.	DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES)		[.]
12.	SPACING OF LATERALS (FEET)		[.]

PREPARER Timothy A. Marks EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 3 REFERENCE PROJECT STATION TABLE	* STATE CODE [35] * SPS PROJECT CODE [0801] * TEST SECTION NO. [01]

ORDER	*1 TEST SECTION ID NO	REFERENCE PROJECT STATION NUMBER		*4 CUT-FILL[1]	
		*2 START	*3 END	TYPE	STATION
1	350801	0+00	5+00	3	
2	350802	7+00	12+00	3	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

*5 INTERSECTIONS BETWEEN TEST SECTION ON THE PROJECT ROUTE	PROJECT STATION NO.	RAMPS EXIT	RAMPS ENT	INTERSECTION STOP	INTERSECTION SIGNAL	INTERSECTION UNSIG
	+					
	+					
	+					

Note 1. Indicate the type of subgrade 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.

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[55]	[redacted]	[redacted]	[redacted]	[redacted]
2	[05]	[23]	[_9.7]	_7.3	11.0	_0.5
3	[03]	[01]	[_3.5]	_2.6	_4.6	_0.3
4	~~[09]~~	~~[22]~~	[_ _._]	_ _._	_ _._	_ _._
5	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
6	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
7	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
8	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
9	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
10	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
11	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
12	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
13	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
14	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._
15	[__ __]	[__ __]	[_ _._]	_ _._	_ _._	_ _._

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

NOTES:

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

2. Layer description codes:

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

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

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

JM 2/11/97

PREPARER Timothy J. Martin EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 5 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

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

	COMPOSITION OF COARSE AGGREGATE	TYPE	PERCENT
*2.	Crushed Stone... 1 Gravel... 2 Crushed Gravel... 3	[1]	[100.]
*3.	Crushed Slag... 4 Manufactured Lightweight... 5	[__]	[___.]
*4.	Other (Specify)... 6 _____	[__]	[___.]
	COMPOSITION OF FINE AGGREGATE	TYPE	PERCENT
*5.	Natural Sand... 1	[1]	[67.]
*6.	Crushed or Manufactured Sand (From Crushed Gravel or	[2]	[33.]
*7.	Stone... 2 Recycled Concrete... 3 Other (Specify)... 4 _____	[__]	[___.]

*8. TYPE OF MINERAL FILLER [2]
Stone Dust... 1 Hydrated Lime... 2 Portland Cement... 3
Fly Ash... 4
Other (Specify)... 5 _____

BULK SPECIFIC GRAVITIES:

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

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

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

*12. Aggregate Combination (Calculated) [2.095]

13. Effective Specific Gravity of Aggregate Combination (Calculated) [2.430]

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

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
14.	Coarse	[__]	[___.___]
15.	Coarse	[__]	[___.___]
16.	Coarse	[__]	[___.___]
17.	Coarse and Fine - Combined	[__]	[___.___]

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

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 6 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

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

*2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [04]
(IF OTHER, SPECIFY) _____

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [61]
(IF OTHER, SPECIFY) ____ _____

4. SPECIFIC GRAVITY OF ASPHALT CEMENT [2.083]
(AASHTO T228)

GENERAL ASPHALT CEMENT PROPERTIES **(If available from supplier)**

5. VISCOSITY OF ASPHALT AT 140°F (POISES)
(AASHTO T202) [_ _ _ _ _ _.]

6. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES)
(AASHTO T202) [_ _ _ _._ _]

7. PENETRATION AT 77°F (AASHTO T49) (TENTHS OF A MM)
(100 g., 5 sec.) [_ _ _ _.]

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

		TYPE	QUANTITY (%)
8.	MODIFIER #1	[N A]	[_ _.]
9.	MODIFIER #2 (IF OTHER, SPECIFY) _____	[N A]	[_ _.]

10. DUCTILITY AT 77°F (CM)
(AASHTO T51) [_ _ _.]

11. DUCTILITY AT 39.2°F (CM)
(AASHTO T51) [_ _ _.]

12. TEST RATE FOR DUCTILITY MEASUREMENT
AT 39.2°f (CM/MIN) [_ _ _.]

13. PENETRATION AT 39.2°F (AASHTO T49) (TENTHS OF A MM)
(200 g., 60 sec.) [_ _ _.]

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [_ _ _.]

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

PREPARER Timothy J. Martin EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 7 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [35] * SPS PROJECT CODE [09] * TEST SECTION NO. [01]

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

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

*3. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (AASHTO T209 OR ASTM D2041) [2.192]

BULK SPECIFIC GRAVITY (ASTM D1188)

*4. MEAN [2.096] NUMBER OF TESTS [09.]

5. MINIMUM [2.091] MAXIMUM [2.101]

6. STD. DEV. [0.006]

ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX) (AASHTO T164 OR ASTM D2172)

*7. MEAN [7.690] NUMBER OF SAMPLES [09.]

8. MINIMUM [7.690] MAXIMUM [7.690]

9. STD. DEV. [0.0__]

PERCENT AIR VOIDS

*10. MEAN [4.350] NUMBER OF SAMPLES [09.]

11. MINIMUM [3.700] MAXIMUM [4.920]

12. STD. DEV. [0.377]

*13. VOIDS IN MINERAL AGGREGATE (PERCENT) [__7.6]

*14. EFFECTIVE ASPHALT CONTENT (PERCENT) [__.__]

*15. MARSHALL STABILITY (LBS) (AASHTO T245 OR ASTM D1559) [4441]

*16. NUMBER OF BLOWS [__]

*17. MARSHALL FLOW (HUNDREDTHS OF AN INCH) (AASHTO T245 OR ASTM D1559) [__405.]

*18. HVEEM STABILITY (AASHTO T246 OR ASTM D1561) [___.]

*19. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) (AASHTO T246 OR ASTM 1561) [____.]

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 8 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES (CONTINUED)	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 1]

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

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

*3. TYPE ASPHALT PLANT [1]

BATCH PLANT... 1 DRUM MIX PLANT... 2

OTHER (SPECIFY)... 3 _____

*4. TYPE OF ANTISTRIPPING AGENT USED [0 0]
(SEE TYPE CODES, TABLE A.21)
OTHER (SPECIFY) _____

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

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

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 9 PLANT-MIXED ASPHALT BOUND LAYERS PLACEMENT DATA	* STATE CODE [35] * SPS PROJECT CODE [09] * TEST SECTION NO. [01]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-23-96]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [09-26-96]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[1]	Barber Greene	[13]	[20]	[3] [__] [__]
Plant 2	[__]	_____	[___]	[___]	[__] [__] [__]
Plant 3	[__]	_____	[___]	[___]	[__] [__] [__]

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-220 3035

6. SINGLE PASS LAYDOWN WIDTH (Feet) [12.0]

7. AC BINDER COURSE LIFT
   Layer Number [__ __]
   Nominal First Lift Placement Thickness (Inches) [__.__]
   Nominal Second Lift Placement Thickness (Inches) [__.__]

8. AC SURFACE COURSE LIFT
   Layer Number [03]
   Nominal First Lift Placement Thickness (Inches) [2.6]
   Nominal Second Lift Placement Thickness (Inches) [2.6]

9. SURFACE FRICTION COURSE (If Placed)
   Layer Number [~~04~~]
   Nominal Placement Thickness (Inches) [~~0.6~~]

10. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course [__ + __ __]
    Surface Course [__ + __ __]
    Surface Friction Course [__ + __ __]

11. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2
    (specify offset from O/S feet) [12.0]

12. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.)_____

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 2/11/97 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS COMPACTION DATA	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-23-96]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [09-26-96]
*3. LAYER NUMBER [3]

*4. MIXING TEMPERATURE (°F) [305.]

5. LAYDOWN TEMPERATURES (°F)
Mean..... 296.
Minimum..... 289.
Standard Deviation... 6.9
Number of Tests ..... 05.
Maximum..... 305.

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	11.4				
7	B	Steel-Whl Tandem					
8	C	Steel-Whl Tandem					
9	D	Steel-Whl Tandem					
10	E	Pneumatic-Tired	30.0	120.			
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.	11.4		2300.	.026	7.0
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
23	BREAKDOWN Roller Code (A-Q)	M	M		
24	Coverages	6.	6.		
25	INTERMEDIATE Roller Code (A-Q)	E	E		
26	Coverages	8.	8.		
27	FINAL Roller Code (A-Q)	A	A		
28	Coverages	2.	2.		
29	Air Temperature (°F)	90.	88.		
30	Compacted Thickness (In)	2.0	2.0		
31	Curing Period (Days)				

PREPARER Timothy J. Martin EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS DENSITY AND PROFILE DATA	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

1. NUCLEAR DENSITY MEASUREMENTS

LAYER TYPE	Binder Course	Surface Course	Surface Friction Layer
Measurement Method (A, B, C)[1]		A	
Number of Measurement		12	
Average (pcf)		131.3	
Maximum (pcf)		133.6	
Minimum (pcf)		129.8	
Standard Deviation (pcf)		0.6	
Layer Number		3	

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

2. MANUFACTURER OF NUCLEAR DENSITY GAUGE Seaman 200

3. NUCLEAR DENSITY GAUGE MODEL NUMBER

4. NUCLEAR DENSITY GAUGE IDENTIFICATION NUMBER

5. NUCLEAR GAUGE COUNT RATE FOR STANDARDIZATION

6. PROFILOGRAPH MEASUREMENTS

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

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

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches)			
		DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
0+00	0	10.1	—.—	4.2	—.—
	36	9.5	—.—	4.2	—.—
	72	9.8	—.—	3.4	—.—
	108	9.5	—.—	3.9	—.—
	144	8.6	—.—	3.5	—.—
0+50	0	10.2	—.—	3.8	—.—
	36	9.7	—.—	3.8	—.—
	72	10.1	—.—	3.4	—.—
	108	9.1	—.—	3.5	—.—
	144	8.4	—.—	3.6	—.—
1+00	0	10.1	—.—	3.7	—.—
	36	10.1	—.—	3.4	—.—
	72	10.3	—.—	2.9	—.—
	108	10.1	—.—	2.6	—.—
	144	9.4	—.—	3.0	—.—
1+50	0	10.0	—.—	3.8	—.—
	36	10.0	—.—	3.6	—.—
	72	9.7	—.—	3.5	—.—
	108	9.1	—.—	3.2	—.—
	144	8.9	—.—	3.4	—.—
2+00	0	10.2	—.—	4.3	—.—
	36	10.6	—.—	4.1	—.—
	72	10.7	—.—	3.4	—.—
	108	10.3	—.—	3.0	—.—
	144	9.6	—.—	3.4	—.—
2+50	0	10.3	—.—	4.1	—.—
	36	10.3	—.—	3.8	—.—
	72	10.1	—.—	3.6	—.—
	108	9.7	—.—	3.5	—.—
	144	9.4	—.—	3.5	—.—
3+00	0	9.8	—.—	4.1	—.—
	36	9.7	—.—	3.7	—.—
	72	9.7	—.—	3.6	—.—
	108	9.4	—.—	3.5	—.—
	144	9.5	—.—	3.5	—.—
LAYER NUMBER		02	——	03	~~04~~

PREPARER Timothy J. Clark EMPLOYER BRE, Inc DATE 1/27/97

JA 2/11/97

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 1]

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches): DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
3+50	0	9.7		4.0	
	36	9.8		3.6	
	72	9.8		3.2	
	108	9.7		3.2	
	144	9.4		3.2	
4+00	0	11.0		3.8	
	36	10.8		3.5	
	72	10.8		3.2	
	108	9.8		3.2	
	144	8.4		3.8	
4+50	0	10.3		3.6	
	36	10.6		3.4	
	72	10.4		3.1	
	108	10.7		2.8	
	144	9.0		3.7	
5+00	0	8.9		3.6	
	36	9.0		3.5	
	72	9.1		3.2	
	108	8.9		3.4	
	144	7.3		4.6	
__+__ __					
__+__ __					
__+__ __					
LAYER NUMBER		02		03	~~0~~4

PREPARER Timothy J. Martin EMPLOYER BRE, Inc DATE 1/27/97

JM 2/11/97

SPS-8 CONSTRUCTION DATA SHEET 13 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 1]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [0 9-1 6-9 6]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [0 9-1 9-9 6]

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

PRIMARY COMPACTION EQUIPMENT

*4. CODE TYPE [1]

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) [3 0.0]

*6. LIFT THICKNESSES
Nominal First Lift Placement Thickness (inches) [0 6]
Nominal Second Lift Placement Thickness (inches) [0 6]
Nominal Third Lift Placement Thickness (inches) [ ]
Nominal Fourth Lift Placement Thickness (inches) [ ]

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

7. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) Sections were open to traffic after each day of operation.

PREPARER Timothy J. Martin EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 14 SUBGRADE PREPARATION	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [01]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [09-09-96]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [09-13-96]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [2]

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) [30.0]

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

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

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

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

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

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 16 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 1]

N/A

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 28 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * 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.

N/A

PREPARED Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 1 PROJECT IDENTIFICATION	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

*1.	DATE OF DATA COLLECTION OR UPDATE (Month/Year)	[11/96]
*2.	STATE HIGHWAY AGENCY (SHA) DISTRICT NUMBER	[01.]
*3.	COUNTY OR PARISH	[017.]
4.	FUNCTIONAL CLASS (SEE TABLE A.2, APPENDIX A)	[09.]
*5.	ROUTE SIGNING (NUMERIC CODE) Interstate... 1 U.S.... 2 State... 3 Other... 4	[1.]
*6.	ROUTE NUMBER	[___10.]
7.	TYPE OF PAVEMENT (01 for Granular Base, 02 for Treated Base)	[01.]
8.	NUMBER OF THROUGH LANES (ONE DIRECTION)	[1.]
*9.	DATE OF CONSTRUCTION COMPLETION (Month/Year)	[11/96]
*10.	DATE OPENED TO TRAFFIC (Month/Year)	[11/96]
11.	CONSTRUCTION COSTS PER LANE MILE (In $1000)	[_____.]
12.	DIRECTION OF TRAVEL East Bound... 1 West Bound... 2 North Bound... 3 South Bound... 4	[1.]
	PROJECT STARTING POINT LOCATION	
*13.	MILEPOINT	[_51.__]
*14.	ELEVATION	[_4555]
*15.	LATITUDE	[32° 15' __.__"]
*16.	LONGITUDE	[108° 15' __.__"]
17.	ADDITIONAL LOCATION INFORMATION (SIGNIFICANT LANDMARKS): [Starts at Sta 848+00 just past stockpile on IH-10 Frontage Rd.]	
18.	HPMS SAMPLE NUMBER (HPMS ITEM 28)	[_____]
19.	HPMS SECTION SUBDIVISION (HPMS ITEM 29)	[__.]

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [3 5] * SPS PROJECT CODE [8 8] * TEST SECTION NO. [0 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 [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)	[1 0.]	[1 0.]
*7.	PAVED WIDTH (FEET)	[1 0.]	[1 0.]
8.	SHOULDER BASE TYPE (CODES-TABLE A.6)	[2 3.]	[2 3.]
9.	SURFACE THICKNESS (INCHES)	[7. 0]	[7. 0]
10.	SHOULDER BASE THICKNESS (INCHES)	[1 2. 0]	[1 2. 0]
11.	DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES)		[.]
12.	SPACING OF LATERALS (FEET)		[.]

PREPARER [signature] EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 3 REFERENCE PROJECT STATION TABLE	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

ORDER	*1 TEST SECTION ID NO	REFERENCE PROJECT STATION NUMBER		*4 CUT-FILL[1]	
		*2 START	*3 END	TYPE	STATION
1	350801	0+00	5+00	3	
2	350802	7+00	12+00	3	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

*5 INTERSECTIONS BETWEEN TEST SECTION ON THE PROJECT	RAMPS		|---INTERSECTION---		
ROUTE	PROJECT STATION NO.	EXIT	ENT	STOP	SIGNAL	UNSIG
	+__					
	+__					
	+__					

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

PREPARER Timothy J. Kasten EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 2]

*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]	[12.6]	10.2	14.2	1.0
3	[0 3]	[0 1]	[6.4]	5.6	7.4	0.4
4	~~[0 9]~~	~~[0 2]~~	[.]	.	.	.
5	[ ]	[ ]	[.]	.	.	.
6	[ ]	[ ]	[.]	.	.	.
7	[ ]	[ ]	[.]	.	.	.
8	[ ]	[ ]	[.]	.	.	.
9	[ ]	[ ]	[.]	.	.	.
10	[ ]	[ ]	[.]	.	.	.
11	[ ]	[ ]	[.]	.	.	.
12	[ ]	[ ]	[.]	.	.	.
13	[ ]	[ ]	[.]	.	.	.
14	[ ]	[ ]	[.]	.	.	.
15	[ ]	[ ]	[.]	.	.	.

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

NOTES:

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

2. Layer description codes:

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

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

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

PREPARER [redacted] EMPLOYER BRE, Inc. DATE 1/27/97

JM 2/11/97

SPS-8 CONSTRUCTION DATA SHEET 5 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

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

		TYPE	PERCENT
	COMPOSITION OF COARSE AGGREGATE		
*2.	Crushed Stone... 1 Gravel... 2 Crushed Gravel... 3	[1]	[100.]
*3.	Crushed Slag... 4 Manufactured Lightweight... 5	[__]	[___.]
*4.	Other (Specify)... 6 _____	[__]	[___.]
	COMPOSITION OF FINE AGGREGATE	TYPE	PERCENT
*5.	Natural Sand... 1	[1]	[67.]
*6.	Crushed or Manufactured Sand (From Crushed Gravel or	[2]	[33.]
*7.	Stone... 2 Recycled Concrete... 3 Other (Specify)... 4 _____	[__]	[___.]

*8. TYPE OF MINERAL FILLER [2]
Stone Dust... 1 Hydrated Lime... 2 Portland Cement... 3
Fly Ash... 4
Other (Specify)... 5 _____

BULK SPECIFIC GRAVITIES:

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

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

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

*12. Aggregate Combination (Calculated) [2.095]

13. Effective Specific Gravity of Aggregate Combination (Calculated) [2.430]

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

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
14.	Coarse	[__ __]	[___.___]
15.	Coarse	[__ __]	[___.___]
16.	Coarse	[__ __]	[___.___]
17.	Coarse and Fine - Combined	[__ __]	[___.___]

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

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 6 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 2]

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

*2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 4]
(IF OTHER, SPECIFY) _____

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [6 1]
(IF OTHER, SPECIFY) _____

4. SPECIFIC GRAVITY OF ASPHALT CEMENT [0.9 9 9]
(AASHTO T228)

GENERAL ASPHALT CEMENT PROPERTIES **(If available from supplier)**

5. VISCOSITY OF ASPHALT AT 140°F (POISES)
(AASHTO T202) [_ _ _ _ _ _.]

6. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES)
(AASHTO T202) [_ _ _ _._ _]

7. PENETRATION AT 77°F (AASHTO T49) (TENTHS OF A MM)
(100 g., 5 sec.) [_ _ _ _.]

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

		TYPE	QUANTITY (%)
8.	MODIFIER #1	[N A]	[_ _.]
9.	MODIFIER #2 (IF OTHER, SPECIFY) _____	[N A]	[_ _.]

10. DUCTILITY AT 77°F (CM)
(AASHTO T51) [_ _ _.]

11. DUCTILITY AT 39.2°F (CM)
(AASHTO T51) [_ _ _.]

12. TEST RATE FOR DUCTILITY MEASUREMENT
AT 39.2°f (CM/MIN) [_ _ _.]

13. PENETRATION AT 39.2°F (AASHTO T49) (TENTHS OF A MM)
(200 g., 60 sec.) [_ _ _.]

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [_ _ _.]

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

PREPARER Timothy J. Martin EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 7 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

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

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

*3. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) (AASHTO T209 OR ASTM D2041) [2.192]

BULK SPECIFIC GRAVITY (ASTM D1188)

*4. MEAN [2.096] NUMBER OF TESTS [09.]

5. MINIMUM [2.091] MAXIMUM [2.101]

6. STD. DEV. [0.006]

ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX) (AASHTO T164 OR ASTM D2172)

*7. MEAN [7.690] NUMBER OF SAMPLES [09.]

8. MINIMUM [7.690] MAXIMUM [7.690]

9. STD. DEV. [0.0__]

PERCENT AIR VOIDS

*10. MEAN [4.350] NUMBER OF SAMPLES [09.]

11. MINIMUM [3.700] MAXIMUM [4.920]

12. STD. DEV. [0.377]

*13. VOIDS IN MINERAL AGGREGATE (PERCENT) [__7.6]

*14. EFFECTIVE ASPHALT CONTENT (PERCENT) [__.__]

*15. MARSHALL STABILITY (LBS) (AASHTO T245 OR ASTM D1559) [4441]

*16. NUMBER OF BLOWS [__]

*17. MARSHALL FLOW (HUNDREDTHS OF AN INCH) (AASHTO T245 OR ASTM D1559) [__405.]

*18. HVEEM STABILITY (AASHTO T246 OR ASTM D1561) [___.]

*19. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) (AASHTO T246 OR ASTM 1561) [____.]

PREPARER Timothy J. Martin EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 8 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES (CONTINUED)	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 2]

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

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

*3. TYPE ASPHALT PLANT [1]

BATCH PLANT... 1 DRUM MIX PLANT... 2

OTHER (SPECIFY)... 3 _____

*4. TYPE OF ANTISTRIPPING AGENT USED [0 0]
(SEE TYPE CODES, TABLE A.21)
OTHER (SPECIFY) _____

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

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

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 9 PLANT-MIXED ASPHALT BOUND LAYERS PLACEMENT DATA	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-23-96]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [09-26-96]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[1]	Barber Greene	[13]	[20]	[3] [__] [__]
Plant 2	[__]	_____	[__ __]	[__ __]	[__] [__] [__]
Plant 3	[__]	_____	[__ __]	[__ __]	[__] [__] [__]

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-220 3035

6. SINGLE PASS LAYDOWN WIDTH (Feet) [12.0]

7. AC BINDER COURSE LIFT
   Layer Number [__ __]
   Nominal First Lift Placement Thickness (Inches) [__.__]
   Nominal Second Lift Placement Thickness (Inches) [__.__]

8. AC SURFACE COURSE LIFT
   Layer Number [03]
   Nominal First Lift Placement Thickness (Inches) [4.0]
   Nominal Second Lift Placement Thickness (Inches) [2.6]
   2.6

9. SURFACE FRICTION COURSE (If Placed)
   Layer Number [04]
   Nominal Placement Thickness (Inches) [0.6]

10. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course [__ + __ __]
    Surface Course [__ + __ __]
    Surface Friction Course [__ + __ __]

11. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2
    (specify offset from O/S feet) [12.0]

12. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.)_____

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS COMPACTION DATA	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-23-96]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [09-26-96]
*3. LAYER NUMBER [3]

*4. MIXING TEMPERATURE (°F) [305.]

5. LAYDOWN TEMPERATURES (°F)
Mean..... 296.
Minimum..... 289.
Standard Deviation... 6.8
Number of Tests ..... 05.
Maximum..... 305.

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	11.4				
7	B	Steel-Whl Tandem					
8	C	Steel-Whl Tandem					
9	D	Steel-Whl Tandem					
10	E	Pneumatic-Tired	30.0	120.			
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.	11.4		1300.	.026	7.0
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
23	BREAKDOWN Roller Code (A-Q)	M	M	M	
24	Coverages	8.	6.	6.	.
25	INTERMEDIATE Roller Code (A-Q)	E	E	E	
26	Coverages	8.	8.	8.	.
27	FINAL Roller Code (A-Q)	A	A	A	
28	Coverages	2.	2.	2.	.
29	Air Temperature (°F)	90.	91.	88.	.
30	Compacted Thickness (In)	3.0	2.0	2.0	.
31	Curing Period (Days)	.	.	.	.

PREPARER Timothy J Mahoney EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS DENSITY AND PROFILE DATA	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 2]

1. NUCLEAR DENSITY MEASUREMENTS

LAYER TYPE	Binder Course	Surface Course	Surface Friction Layer
Measurement Method (A, B, C)[1]		A	
Number of Measurement		12	
Average (pcf)		131.9	
Maximum (pcf)		134.5	
Minimum (pcf)		129.7	
Standard Deviation (pcf)		1.8	
Layer Number		3	

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

2. MANUFACTURER OF NUCLEAR DENSITY GAUGE _____

3. NUCLEAR DENSITY GAUGE MODEL NUMBER _____

4. NUCLEAR DENSITY GAUGE IDENTIFICATION NUMBER _____

5. NUCLEAR GAUGE COUNT RATE FOR STANDARDIZATION _____

6. PROFILOGRAPH MEASUREMENTS

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

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

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches)			
		DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
0+00	0	10.3	— — . —	7.4	— — . —
	36	10.2	— — . —	7.3	— — . —
	72	10.8	— — . —	6.6	— — . —
	108	11.2	— — . —	6.2	— — . —
	144	12.0	— — . —	5.9	— — . —
0+50	0	10.9	— — . —	7.0	— — . —
	36	11.4	— — . —	6.5	— — . —
	72	11.5	— — . —	6.2	— — . —
	108	11.5	— — . —	6.1	— — . —
	144	11.0	— — . —	6.6	— — . —
1+00	0	13.3	— — . —	7.0	— — . —
	36	12.5	— — . —	7.1	— — . —
	72	12.0	— — . —	7.0	— — . —
	108	11.5	— — . —	6.7	— — . —
	144	10.8	— — . —	7.3	— — . —
1+50	0	13.0	— — . —	7.1	— — . —
	36	13.1	— — . —	7.0	— — . —
	72	13.2	— — . —	6.4	— — . —
	108	13.1	— — . —	6.1	— — . —
	144	11.6	— — . —	6.8	— — . —
2+00	0	13.7	— — . —	6.6	— — . —
	36	13.9	— — . —	6.1	— — . —
	72	13.7	— — . —	6.0	— — . —
	108	13.4	— — . —	5.9	— — . —
	144	12.5	— — . —	6.5	— — . —
2+50	0	13.1	— — . —	6.7	— — . —
	36	13.1	— — . —	6.5	— — . —
	72	13.4	— — . —	6.5	— — . —
	108	13.1	— — . —	6.2	— — . —
	144	12.7	— — . —	6.2	— — . —
3+00	0	13.4	— — . —	7.0	— — . —
	36	13.8	— — . —	6.4	— — . —
	72	13.4	— — . —	6.6	— — . —
	108	13.0	— — . —	6.4	— — . —
	144	12.1	— — . —	7.1	— — . —
LAYER NUMBER		02	— —	03	~~04~~

PREPARER Timothy J. Martin EMPLOYER BRE, Inc DATE 1/27/97 2/11/97

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [3 5] * SPS PROJECT CODE [0 8] * TEST SECTION NO. [0 2]

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches): DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
3+50	0	14.2		6.0	
	36	13.9		6.0	
	72	13.8		6.1	
	108	13.3		6.0	
	144	13.0		6.4	
4+00	0	13.2		6.4	
	36	13.3		6.0	
	72	13.4		5.9	
	108	13.6		5.6	
	144	13.0		6.2	
4+50	0	13.4		6.0	
	36	13.3		5.9	
	72	13.3		5.6	
	108	13.1		5.6	
	144	12.6		5.9	
5+00	0	12.0		6.6	
	36	11.5		6.7	
	72	11.8		6.2	
	108	11.5		6.5	
	144	11.0		6.6	
+					
+					
+					
LAYER NUMBER		0 2		0 3	~~0 4~~

PREPARER [signature] EMPLOYER BRE, Inc DATE 1/27/97

[initials] 2/4/97

SPS-8 CONSTRUCTION DATA SHEET 13 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [09-16-96]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [09-19-96]

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

PRIMARY COMPACTION EQUIPMENT

*4. CODE TYPE [1]

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) [30.0]

*6. LIFT THICKNESSES
Nominal First Lift Placement Thickness (inches) [06]
Nominal Second Lift Placement Thickness (inches) [06]
Nominal Third Lift Placement Thickness (inches) [06]
Nominal Fourth Lift Placement Thickness (inches) [__]

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

7. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) Sections were open to traffic after each day of operation.

PREPARER Timothy J. Martin EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 14 SUBGRADE PREPARATION	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [09-09-96]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [09-13-96]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [2]

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) [30.0]

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

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

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

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) It rained 9/13/96 on the subgrade allowing it to cut w/ the traffic. It was promptly graded when dry before laydown of the OGAB.

PREPARER Timothy J Martin EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 16 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

N/A

PREPARER [signature] EMPLOYER BRE, Inc DATE 1/27/97

SPS-8 CONSTRUCTION DATA SHEET 28 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [35] * SPS PROJECT CODE [08] * TEST SECTION NO. [02]

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.

N/A

PREPARER Timothy J. Martin EMPLOYER BRE, Inc. DATE 1/27/97

APPENDIX E

PHOTOGRAPHS

		Page Nº.
1	Site Location and Preconstruction Sampling and Testing	E.2
2	Auger for Shoulder Probe	E.2
3	Shelby Tube Sample	E.3
4	Preparation of DGAB	E.3
5	Nuclear Density Testing of DGAB	E.4
6	Bulk Sampling of DGAB	E.4
7	Moisture Samples of DGAB	E.5
8	Hopper Used in Paving of AC Surface	E.5
9	Paver During Laydown of AC Surface	E.6
10	Compaction of AC Surface by Pneumatic Roller	E.6
11	Completed AC Surface	E.7
12	Automated Weather Station (AWS) Near Rest Area	E.7
13	Project Marking	E.8
14	Installation of WIM Located at Beginning of Test Section 350801	E.8

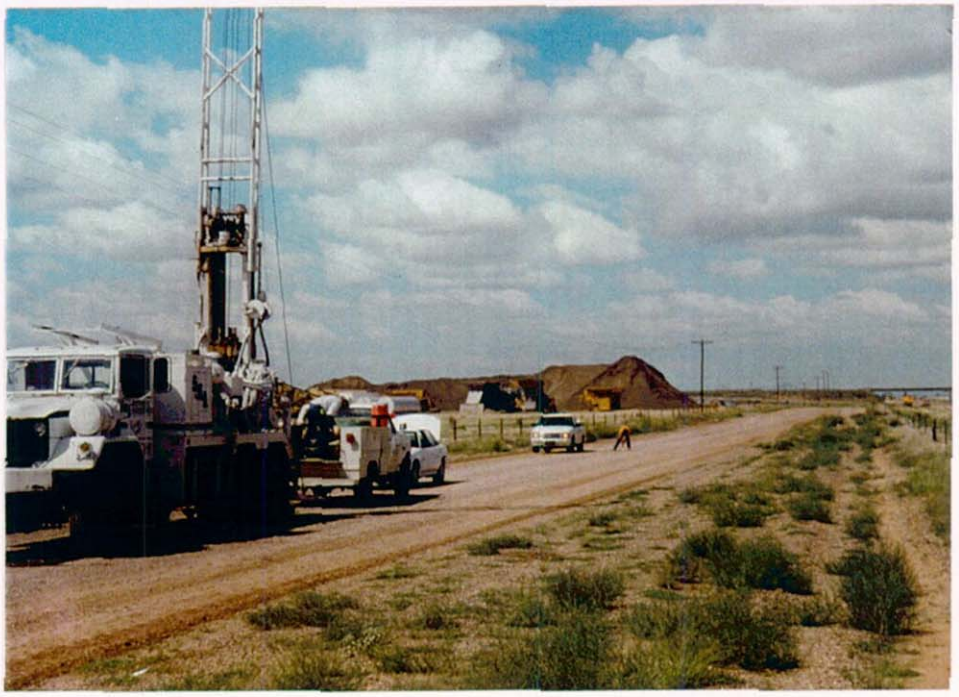


Photo 1. Site Location and Preconstruction Sampling and Testing

Photo 2. Auger for Shoulder Probe

Photo 3. Shelby Tube Sample

Photo 4. Preparation of DGAB

Photo 5. Nuclear Density Testing of DGAB

Photo 6. Bulk Sampling of DGAB

Photo 7. Moisture Samples of DGAB

Photo 8. Hopper Used in Paving of AC Surface

Photo 9. Paver During Laydown of AC Surface

Photo 10. Compaction of AC Surface by Pneumatic Roller

Photo 11. Completed AC Surface

Photo 12. Automated Weather Station (AWS) Near Rest Area

Photo 13. Project Marking

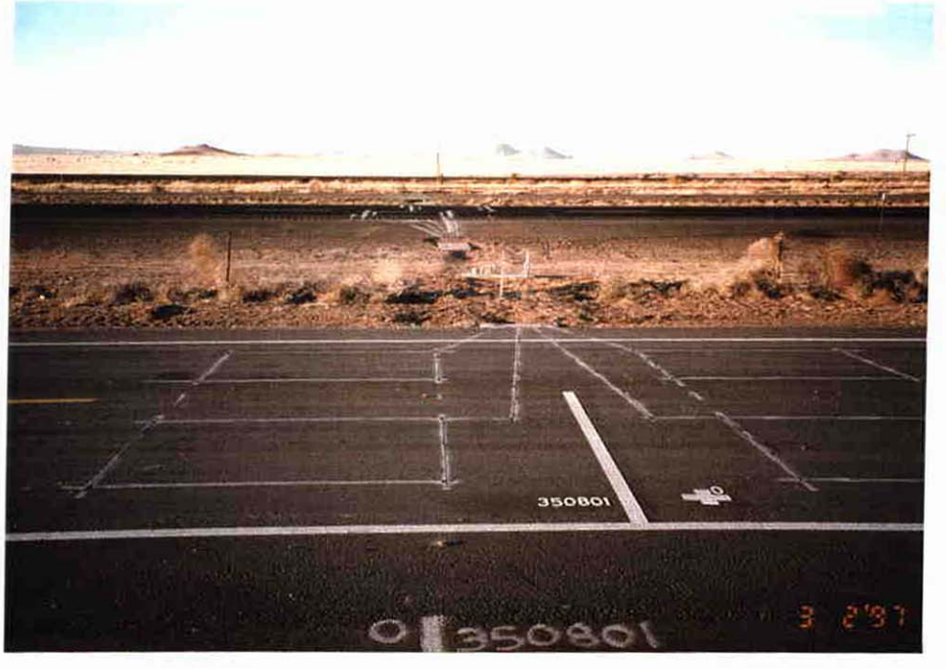


Photo 14. Installation of WIM Located at Beginning of Test Section 350801